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Challenges Facing American Higher Education

The University and the City

*John Sexton, Ruth J. Simmons, Robert M. Berdahl,
and Jared L. Cohon*

The Future of Our Research Universities

John L. Hennessy

The Great American University

Jonathan R. Cole



The Future of Power

Joseph S. Nye, Jr.

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The Andrew W. Mellon Foundation and the NEH
Support Data for the Humanities

Nuclear Reactors: Generation to Generation
Stephen Goldberg and Robert Rosner

The Financial Crisis & Economic Policy
Benjamin M. Friedman and Robert M. Solow



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Calendar of Events

September 30 – October 2, 2011

Induction Weekend – Cambridge

October 27, 2011

Stated Meeting – Berkeley

Healing the Troubled American Economy

Speakers: Christina Romer (University of California, Berkeley) and David H. Romer (University of California, Berkeley)

November 9, 2011

Stated Meeting – Cambridge

*Awarding of the Talcott Parsons Prize
and Response: Two Systems in the Mind*

Speaker: Daniel Kahneman (Princeton University)

November 12, 2011

Stated Meeting – Chicago

WikiLeaks

Speakers: Geoffrey R. Stone (University of Chicago Law School), Judith Miller (formerly of *The New York Times*), and Gariel Schoenfeld (Hudson Institute; Witherspoon Institute)

December 7, 2011

Stated Meeting – Stanford

The Future of the Military

Speakers: John L. Hennessy (Stanford University) and David M. Kennedy (Stanford University)

December 14, 2011

Stated Meeting – Cambridge

Holiday Concert

Speaker: Christoph Wolff (Harvard University)

Performer: Robert Levin (Harvard University)

For information and reservations, contact the Events Office (phone: 617-576-5032; email: mevents@amacad.org).

Nuclear Reactors: Generation to Generation

The repercussions of the March 2011 crisis at Japan's Fukushima nuclear complex will be felt around the world. However, the incident at the Fukushima Daiichi nuclear power plant is unlikely to reverse the demand for nuclear power. Despite the events in Japan, the governments of Turkey, Poland, Chile, Indonesia, and Algeria have announced that they are moving forward with their nuclear power development programs. Abu Dhabi broke ground for its first nuclear reactor three days after the earthquake and tsunami off the coast of Japan. Although the pace of the nuclear renaissance may be slowed, a number of states are still committed to their nuclear energy plans.

For more than three years, the Academy's Global Nuclear Future (GNF) Initiative has brought together technical experts, policymakers, and proliferation specialists from around the world to identify and promote measures that will limit the safety, security, and proliferation risks raised by the growing global appetite for nuclear energy.

A new monograph, *Nuclear Reactors: Generation to Generation*, provides background on

the cost, safety, and security attributes of the major nuclear reactor designs, as well as their properties with regard to refueling and fuel disposition requirements.

In assessing the features of reactor designs, both those already deployed and those on the drawing board, the authors, GNF Senior Advisors Stephen Goldberg (Argonne National Laboratory) and Robert Rosner (University of Chicago), focus on two of the key questions that will determine the future of nuclear power around the world: "What is safe enough?" and "What are we going to do about the nuclear waste?" Cost, regulatory burdens, possible terrorist incidents, and the fate of alternative sources of energy are other factors that will play an important role in the nuclear future.

Since the nuclear power plants in Fukushima share design features with many reactors in the United States, Goldberg and Rosner predict there will be greater public scrutiny of all domestic nuclear facilities, including increased pressure to retire some nuclear generating facilities earlier than their scheduled design life.

Nuclear Reactors: Generation to Generation is available on the Academy's website at www.amacad.org/publications/nuclearReactors.aspx.

The Academy is grateful to Robert Rosner and Stephen Goldberg for writing this timely paper, and to GNF codirectors Steven Miller (Harvard University) and Scott Sagan (Stanford University). The GNF Initiative continues to have influence in the United States and abroad, thanks to valuable guidance from its advisory committee: Albert Carnesale (University of California, Los Angeles); Thomas Isaacs (Stanford University and Lawrence Livermore National Laboratory); Richard Meserve (Carnegie Institution for Science); George Perkovich (Carnegie Endowment for International Peace); and John Rowe (Exelon Corporation).



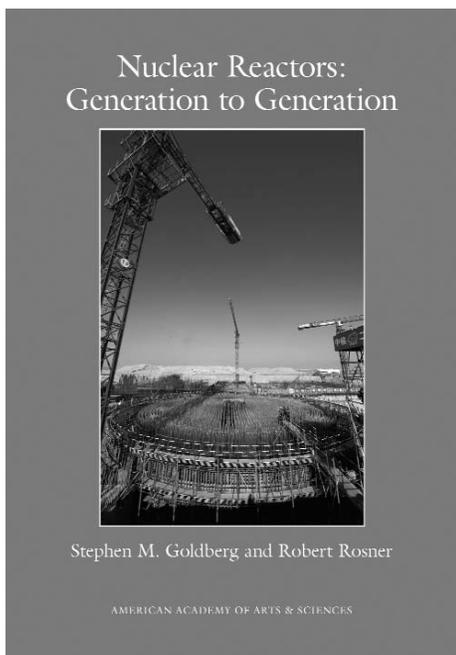
Robert Rosner



Stephen Goldberg

Other publications from the Global Nuclear Future Initiative available on the Academy's website include:

- The two-volume special issue of *Daedalus* on The Global Nuclear Future (www.amacad.org/publications/daedalus/fall2009/coverPage.aspx);
- *Multinational Approaches to the Nuclear Fuel Cycle* (www.amacad.org/publications/nuclearCycle.aspx);
- *Shared Responsibilities for Nuclear Disarmament: A Global Debate* (www.amacad.org/publications/nuclearShared.aspx); and
- *Nuclear Energy in the Middle East: Implications, Challenges, Opportunities* (www.amacad.org/pdfs/abudhabiReport.pdf). ■



The Andrew W. Mellon Foundation and the National Endowment for the Humanities Partner with the Academy to Expand the Humanities Indicators

The American Academy of Arts and Sciences has received major awards of support for data collection in the humanities that will significantly increase knowledge of the state of humanistic education and research in the United States.

Grants from the Andrew W. Mellon Foundation and from the National Endowment for the Humanities (NEH) will support the Academy's *Humanities Indicators* (www.HumanitiesIndicators.org), the first comprehensive collection of statistical data about the humanities in the United States.

"We are grateful to the NEH and to the Andrew W. Mellon Foundation for their commitment to the humanities and their confidence in the Academy," said Leslie Cohen Berlowitz, President of the Academy and project codirector. "With their support, we will continue to be able to provide critical data on the state of the humanities to scholars, policy-makers, and the public that will inform and enrich our national discussions for years to come."

The American Academy works closely on this project with the National Opinion Research Center (NORC) under the leadership of Norman Bradburn. Developed in collaboration with national humanities organizations, the *Humanities Indicators* provide reliable benchmarks to guide analysis of the state of the humanities in five areas: primary and secondary education, undergraduate and graduate education, the workforce, funding and research, and the humanities in American life. The *Humanities Indicators* website has attracted more than 1.5 million visitors since it was launched in January 2009.

"Before the *Humanities Indicators*, data concerning issues as fundamental as the number of students enrolled nationwide in courses devoted to the humanities either were entirely lacking or were inconsistently assembled, hard to access, poorly disseminated, unwittingly ignored, and routinely underutilized," said Francis Oakley, President Emeritus of Williams College and cofounder of the Academy's Initiative for Humanities and Culture. "Those of us who try to assess and write about the state of humanistic studies nationwide are grateful for the assistance that the *Humanities Indicators* has finally made so readily available."

The Andrew W. Mellon Foundation's grant will help ensure that the *Indicators* remain accessible and updated with the latest available statistics and analysis. The NEH will join in these efforts and help support the Academy's first update to the *Humanities Departmental Survey*. The survey collects data from the chairs of art history, English, foreign language, history, history of science, linguis-

tics, and religion departments at 1,400 four-year colleges and universities. The survey results will reveal up-to-date information on data trends in the curriculum and workforce.

"The Academy's *Humanities Indicators* project offers a much-needed yardstick for measuring the health and impact of humanities research and education in America today," said Carole Watson, Deputy Chairman of the NEH. "The National Endowment for the Humanities is pleased to assist in this effort to provide academic leaders and policy-makers the data they need to make informed decisions on humanities curricula, funding, and programs."

Recent data from the *Indicators* reveal that:

- Humanities degrees as a proportion of all bachelor's degrees declined 46 percent over the past 30 years.
- More than half of students graduating from U.S. high schools in 2006 failed to demonstrate basic knowledge of history, and more than a third lacked basic knowledge of civics.
- In 2003–2004, 28.2 percent of high school students were taught history by someone without certification or a postsecondary degree in history, a greater percentage than for any other measured subject area.
- The United States ranks in the bottom third internationally in the percentage of its population possessing prose literacy skills necessary for successful secondary school completion (47 percent).

The National Endowment for the Humanities was created in 1965 as an independent federal agency. It supports research and learning in history, literature, philosophy, and other areas of the humanities by funding selected, peer-reviewed proposals from around the nation.

The Andrew W. Mellon Foundation is devoted to sustaining the humanities and the arts. It currently makes grants in five core program areas: higher education and scholarship; scholarly communications and information technology; museums and art conservation; performing arts; and conservation and the environment. Including previous support, giving from the Andrew W. Mellon Foundation in support of the *Humanities Indicators* project totals more than \$1 million. ■

Academy Presents Scholar-Patriot Award to Yo-Yo Ma

The American Academy of Arts and Sciences presented the Scholar-Patriot Award to acclaimed cellist and humanist Yo-Yo Ma in recognition of his lifetime achievements as a musician, educator, and champion of multicultural understanding.

The Scholar-Patriot Award is one of the Academy's most prestigious honors, given for extraordinary contributions of individuals who share the founders' vision of service.

Academy President Leslie Cohen Berlowitz and Chair of the Board Louis W. Cabot presented the award to Yo-Yo Ma on March 23, 2011, at the Academy's Cambridge headquarters.

"The motto of the American Academy is 'Cherishing Knowledge, Shaping the Future' and Yo-Yo Ma exemplifies these ideals," said President Berlowitz. "Through his solo and collaborative interpretations of Bach and other masters, he has reinterpreted and enriched the classical tradition. And by drawing on diverse genres and cultures, he has added profoundly to the musical vocabulary of this generation." Berlowitz also noted Ma's extensive educational work, including his training and mentorship of thousands of youth around the world and his innovative Silk Road Project.

Ma was elected a Fellow of the American Academy of Arts and Sciences in 1993. He currently serves as a member of the Academy's national Commission on the Humanities and Social Sciences.

Citation

In your hands, a cello made by Stradivari in the eighteenth century, from the riches of three continents, has become the voice of the twenty-first-century global community. You have traveled from Carnegie Hall to the White House, from Juilliard to Harvard, from Sesame Street to the Silk Road – and you have taken all of us on your journey.

Twice named United Nations Messenger of Peace, you train and mentor the young and inspire us all with your music, your limitless curiosity, and your enduring optimism. A student of Pablo Casals and Irven Devore, Leonard Bernstein and Fred Rogers, you have embraced every branch of learning and every musical style – from Bach to bluegrass to the songs of the Bushmen of the Kalahari. Bridging



cultures and generations, you are an ambassador for the ideals upon which the American Academy was founded – cherishing knowledge and fostering collaboration in service to the public good.

Prodigy and virtuoso, student and teacher, impresario and engaged citizen, we honor you for your creative genius, boundless enthusiasm, appetite for innovation, and dedication to harmony among all peoples. ■

The University and the City

Robert M. Berdahl, Jared L. Cohon, and Ruth J. Simmons

Moderator: John Sexton

Welcome: Leslie Cohen Berlowitz

1964th Stated Meeting, held in collaboration with New York University on December 8, 2010, at New York University School of Law

Welcome by Leslie Cohen Berlowitz

Leslie Cohen Berlowitz is President of the American Academy of Arts and Sciences. She was elected a Fellow of the American Academy in 2004.

We are privileged to have four distinguished academic leaders – Presidents Robert Berdahl, Jared Cohon, Ruth Simmons, and our host, John Sexton – to speak about the university and the city. Today’s university presidents are leaders both in academic life and in the civic community, and the panel tonight is composed of four presidents who have been exemplary in this regard.

The work of the Academy has always been closely associated with the development of our universities, in part because many of our Fellows are among the nation’s leading scholars and scientists, but also because our founders recognized that centers of intellectual life would be critical to the nation’s economic and cultural vitality. Brown University, Carnegie Mellon University, New York University, and the other members of the Association of American Universities (AAU) contribute to their cities, to the nation, and to the world in countless ways. They drive innovation in science, technology, and engineering; in health, medicine, business, and law; in education, the arts, and urban planning. They nurture the liberal arts and the humanities and advance intellectual and ethical inquiry. Borrowing from the motto of the Academy’s founders, they help cherish knowledge and shape the future. Our institutions of higher education are also critical economic engines. Last year, expenditures by U.S. colleges and universities equaled 3 percent of the gross domestic product, according to the National Center for Education Statistics. And that figure does not even take into account the economic benefit that results from university research and innovation, work that enriches all of our lives.

Tonight’s distinguished group of university leaders has thought deeply about the complex and evolving role that universities play in America’s urban centers. The panel is led by John Sexton, the President of New York University. John assumed the presidency in 2002, and in just eight years he has led this institution, my alma mater, to global prominence. John was elected to the Academy in 2001. I hope that in this Academy anniversary year he will permit me to compare him to one of the Academy’s most determined and intense founders, John Adams. Adams felt that an institution of knowledge would be crucial to the welfare of any competent nation. He understood the differences between an ivory tower and an institution embedded in the active life of the community. That is a distinction that John Sexton has also keenly appreciated, whether here in Washington Square or in Abu Dhabi or Shanghai or the study abroad programs that now span no less than five continents. He demonstrates a profound commitment to the city and its intellectual buildings, like the other presidents here with us. And like John Adams, he believes that active engagement in the community helps develop more enlightened citizens.



Washington Arch in Manhattan, New York

Image © Atlantide Phototravel/Corbis



John Sexton

John Sexton is President of New York University, the Benjamin Butler Professor of Law, and Dean Emeritus of New York University School of Law. He was elected a Fellow of the American Academy in 2001.

Leslie has reminded me that my first appearance at an Academy event like this was with Lee Bollinger. We have been friends since 1979, and we share a lot in common. He was named president of Columbia University the same month I was named president of NYU. We both clerked for the same judge, and we were law school deans contemporaneously. The Academy meeting was held in a club uptown where NYU's greatest nineteenth-century president, Henry McCracken, had given a speech at the close of his presidency, proposing that NYU and Columbia merge into one great university. I remember pointing out the comparison between Lee and McCracken and me and Columbia's then president. McCracken was an eloquent, erudite scholar, like Lee, and the president of Columbia, Seth Low, was a shipbuilder from Brooklyn who bought the Columbia presidency for a million dollars. He went on to become the mayor of New York, and Low Library is named for him. I told the Academy that night, as they sat listening to my heavy Brooklyn accent, "Before you dismiss guys from Brooklyn, you should know that Seth Low invented the paid sabbatical."

9/11 got all of us thinking about the city in a very different way, seeing that it has a special role to play in the world, that this particular city is a miniaturization of the world in a way no other city is.

We are gathered in the great room of NYU's law school – a special, sacramental space, one where I have spent many of the great moments and sad moments of my life. Here one can easily channel the founder of NYU, Albert Gallatin. Gallatin was Thomas Jefferson's and James Madison's secretary of treasury. While ambassador to France, he and Jeremy Bentham began to talk about the universities of their day. In a letter from Gallatin to Bentham, Gallatin observes that the universities of their time, the great ones in the United Kingdom and here, were withdrawn and contemplative. He wrote that the time had come for a new paradigm, a new kind of university. The time had come for universities that were "in and of the city." I first read Gallatin's words in 2001 after I had been named president of NYU. That was about four months before 9/11, just before we crossed that critical threshold in the story of our city and our country and the world. When I read those words, NYU suddenly made sense to me in a way it hadn't until that point. Being in the law school, in this room, in this building, was like being in a parish; it was a place, like the bar in *Cheers*, where everybody knew your name and everybody knew everybody else's name. NYU, viewed from here, seemed abstract to me, cacophonous and complex. But once I read Gallatin's phrase, I came to understand that what he and his successors – down to the great John Brademas, whose arrival in 1981 represented a pivotal point in the history of this university – had done was to create a university without gates. Most of NYU's buildings are not next to each other. Once you leave Washington Square – and more than a hundred of our buildings are not in the square – you can exit most of our build-

ings, look to your left, to your right, and across the street, and not see an NYU building. To see another, you have to walk a block or two. Upon reading Gallatin's phrase, I began to realize the strength of being in and of the city in this radical way. Of being ecosystemic with it. Of declaring it completely symbiotic with you. That got me thinking more about the city. And then 9/11 got all of us thinking about the city in a very different way, seeing – for some of us at least – that it has a special role to play in the world, that this particular city is a miniaturization of the world in a way no other city is.

Flash forward to February 2005. I had been talking informally to folks around town about the relationship of universities and cities when Mike Bloomberg asked if I would run a two-day retreat for his commissioners. He wanted me to visualize what would be needed to make New York City great in 2050. Seven months before his race for a second term as mayor and he was thinking forty-five years out. His commissioners found this frustrating. They said, it is not going to make any difference what we think if we are not reelected, Mr. Mayor. He said, no, but keep your eye on

Even in this time when all kinds of industries move, the city's universities stay and they anchor. We depend on our cities, and they depend on us in a deep way.

it. In preparing for the retreat, I began to talk to my colleagues here at NYU – because really all I am is their mouthpiece – about what had made the city great and what would make the city great fifty years from now. They taught me that what made cities great in the twentieth century – at least, what made New York City great – was FIRE: Finance, Insurance, Real Estate.

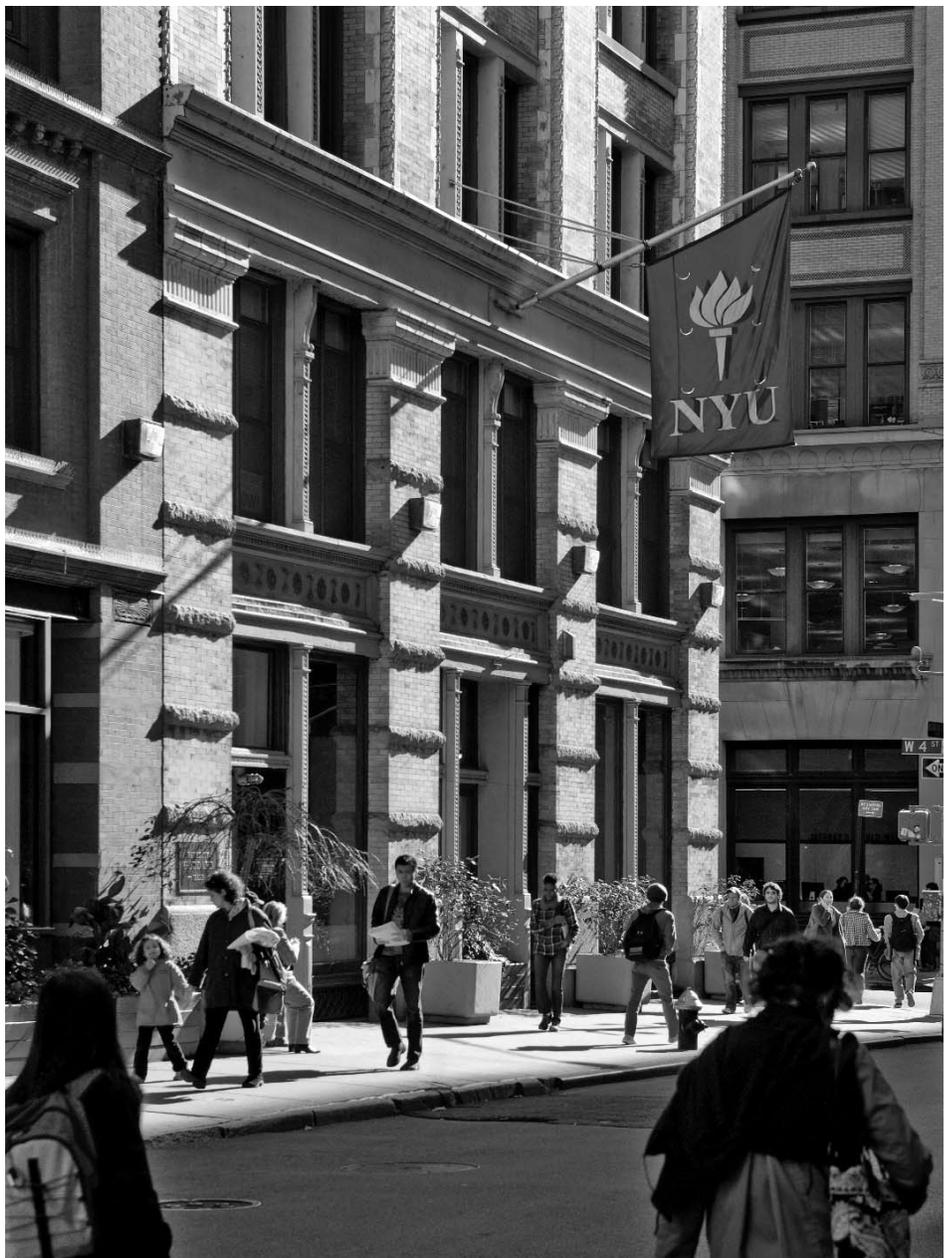
So, I had a concept of what was needed. But although I knew FIRE would be necessary in 2050, I also knew it would not be

Academy Meetings

sufficient. Something else was happening. I could feel it as we tried to attract talent to the university. What does talent want? It wants other talent – but not just similar talent. A talented geologist wants a critical mass of other talented geologists, but he or she also wants to be able to go to a good play, hear a good symphony, and have a good conversation over dinner with a philosopher, and he or she wants the same for his or her family. I had to come up with a name for this concept. But even as I was in the car driving over to Staten Island for the retreat, I still hadn't found it. In sharing with the Academy how I finally came

What is going to be needed to make New York City great in 2050 is not just FIRE – finance, insurance, and real estate – but also ICE – the intellectual, the cultural, the educational.

up with a catchy acronym to go with FIRE, I hope my membership isn't revoked. People think the label came from the Frost poem or the Valhalla myth, because I am an intellectual, after all. The fact of the matter is that my wife was the president of the Charles Revson Foundation, and I knew through Lisa that Revson's biography, named for his great lipstick, was *Fire and Ice*. So, I went to the retreat, and I said, "What's going to be needed in 2050 is not just FIRE – finance, insurance, and real estate – but also ICE – the intellectual, the cultural, the educational." Then I discovered Daniel Patrick Moynihan's great phrase, that if you wanted to build a great city, you should create two great universities and wait 200 years. Today, of course, things happen much more quickly. But even in this time when all kinds of industries move, the city's universities stay and they anchor. We depend on our cities, and they depend on us in a deep way.



New York University

If you asked me to name my four heroes among the leaders of higher education in this country, the three people on our panel would be three of the four. These are three of the wisest, most extraordinary, most virtuous, and most visionary people that I know. When we get together at the AAU each year, I always try to make sure I have a chance to hug them, and, if I can, I entice

them to a cup of coffee so I can learn more from them. Each of the three has, in different ways, helped me be better both as a person in the world and as a president.

Image © NYU Photo Bureau: Johnson



Robert M. Berdahl

Robert M. Berdahl is President of the Association of American Universities. He is the former Chancellor of the University of California, Berkeley, and also served as President of the University of Texas at Austin. He was elected a Fellow of the American Academy in 1999.

Throughout much of their history, until relatively recently, most American universities have not been closely linked with the development of urban America. The settlement and growth of the cities along the eastern seaboard brought with it the founding of some of the earliest universities in the colonial cities – King’s College (Columbia) in New York City; the Academy of Philadelphia (Penn) in Philadelphia; and, in the early years of the republic, NYU, founded by Albert Gallatin. But most early colleges were located in small towns, perhaps reflecting the model of Oxford and Cambridge, after which the location of Harvard was named. As the nation spread westward, the state universities, like nearly all of the new liberal arts colleges, were located in small towns remote from the major cities – Ann Arbor, not Detroit; Champaign-Urbana, not Chicago; Bloomington, not Indianapolis; Columbia, not St. Louis. The list could go on, including Berkeley rather than Oakland or San Francisco.

Universities were located in small towns at a distance from cities for many reasons. In most cases, something of a bidding war took place, with towns offering up land or money or a building associated with an existing school. The location of the university went to the town that bid the most. Small towns, hoping to become cities, sought to attract colleges just as they sought to attract railroads, recognizing the synergy both could provide for growth. State legislatures, as political bodies, also brokered deals to distribute the public goods throughout their states – the penitentiary went here, the insane asylum (as state mental hospitals were then called) went there, and the state university somewhere else.

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The passage of the Morrill Act establishing land-grant universities in the states, with its emphasis on “agriculture and the mechanic arts,” also encouraged the placement of land-grant universities in rural locations, where land for experimental agricultural plots was readily available. In a number of states, cities made an effort to insist that the mechanical arts should provide the foundation for the universities and that the university should therefore be located close to the industrial centers, but the cities rarely prevailed. Of the early land-grant universities, only Minnesota located its university in the major population center of the state.

But the location of universities in small towns also reflected a basic American, Jeffersonian antipathy toward cities. Jefferson’s view of cities as “pestilential to the morals, the health, and the liberties of man” was widely shared by early educa-

tors and contributed to the bias for locating colleges in rural settings. An 1876 popular guide to colleges observed, “If Yale were located in Williamstown, Harvard at Hanover, Columbia at Ithaca, the *moral character* of their students would be elevated in as great a degree as the *natural scenery* of their localities would be increased in beauty.”¹ Crowded, noisy, unclean, and corrupt, cities were considered antithetical to scholarly thought; they were filled with distractions and unsuitable places for young people. Some state legislatures explicitly forbade the locating of public universities in cities.² In their removal from urban life, universities cultivated the image of an “ivory tower,” remote from the gritty realities of the world. For students drawn largely from the middle class, the four years of college were to be a kind of “time out” from ordinary cares and work – a time for learning and maturity, to be sure, but also a relatively carefree period of life. Much of the generational conflict of the 1960s, I believe, resulted from differing perspectives of what the college years should be about: the older generation saw the college years as a youthful escape from the world; the younger generation, which had come of age during the civil rights movement and the antiwar movement, believed they should engage the world as adults and be treated as adults. The *in loco parentis* role of universities had to be set aside.

Neither the public universities built in the nineteenth century nor the older private elite universities effectively served American cities. Columbia and Penn, which had moved away from downtown centers in the early nineteenth century, were once again enveloped by their cities in the early twentieth century. But they were not predominantly local institutions. After World

¹ Frederick Rudolf, *The American College and University: A History* (New York: Vintage, 1962), 93.

² Margaret P. O’Mara, “Beyond Town and Gown: University Economic Engagement and the Legacy of the Urban Crisis,” *Journal of Technology Transfer*, published electronically July 30, 2010, doi:10.1007/s10961-010-9185-4. See also David Riesman, “The Urban University,” *The Massachusetts Review* 8 (3) (Summer 1967): 476–486; and Maurice Berube, *The Urban University in America* (Westport, Conn.: Greenwood Press, 1978).

The location of universities in small towns also reflected a basic American, Jeffersonian antipathy toward cities.

War II, for example, Penn effectively closed itself off from the city surrounding it, making it, in the words of its plan, “a community of scholars residing in and around a campus closed off to vehicular traffic.”³ Those colleges and universities founded primarily to serve the urban population were largely sectarian, predominantly established by the Catholic Church, intended to serve the heavily Catholic immigrant population of cities.⁴ In 1963, Kermit C. Parsons, a professor of urban planning at Cornell, described the relationship between most universities and cities in the following way:

The strategy of the universities has been characterized either by retreat before the advance of the city or by voluntary isolation from it. The tactics of the universities and their scholars have been limited to occasional sallies from their ivory towers to throw fine intellectual dust, verbal pebbles, and occasionally a useful critical rock at the follies of the cities. For their part, city officials and most citizens hardly knew that the universities were there. They did little or nothing to preserve and advance educational institutions when they were threatened by physical and social change in the city.⁵

Not until the surge of enrollments and the demand for access to higher education in the 1960s did universities begin to turn their attention to the needs of the urban population. A coalescence of social forces led to the expansion of universities and the construction of branch campuses in the urban centers of many states. The civil rights efforts of the 1960s forced universi-

ties to recognize how little they had served the cities and their minority population; the arrival of the baby-boomer generation at college age led to demand for broader access; the Great Society expanded federal support for college attendance; Sputnik spurred investment in research; and the National Defense Education Act added funding for graduate education. Other federal legislation also helped build a linkage between universities and cities. The National Housing Act of 1959 included a section (Section 112) that provided two to three dollars of urban renewal money to cities for every dollar an educational institution spent in acquiring land or structures adjacent to an urban renewal project. (The AAU actively worked to secure passage of this section.)⁶ This act enabled the expansion of NYU, Fordham, Drexel, Temple, Penn, and Pitt and facilitated contributions to urban renewal by Columbia, MIT, Chicago, and Yale, among others.

Crowded, noisy, unclean, and corrupt, cities were considered antithetical to scholarly thought; they were filled with distractions and unsuitable places for young people.

The expansion of higher education during the 1960s produced bold new ideas for the reconceptualization of universities. In 1967, Clark Kerr, who had designed the expansion of the University of California system, proposed the creation of 67 federal “urban-grant” universities, “one for each city of over a quarter million and several for the very large cities.” He proposed that these urban-grant universities be funded by federal grants, submitted by both public and private institutions, and that they broaden access to underserved urban populations. Kerr proposed that the urban-grant university should not only be concerned with the “mainstreams of intellectual thought and discovery” but should also be concerned with “the urban environment in its totality,

its architecture, its space use, its cultural programs and recreational facilities.” He saw the urban-grant university as “a new model, eventually affecting all the others.”⁷ His vision was never realized. However, perhaps less systematically than under Kerr’s vision, urban universities did continue to develop, with serving the needs of urban populations a central part of their missions.

A coalescence of social forces led to the expansion of universities and the construction of branch campuses in the urban centers of many states.

The importance of university research to the welfare of the nation became clear during World War II. In his seminal report, *Science, The Endless Frontier*, presidential advisor Vannevar Bush argued in 1945 for federal investment in university-based research as the basis for the future health, security, and economic growth of the nation. But scientific innovation for economic development was rarely used to justify the building of urban universities in American cities in the 1960s. The primary justification for investment in universities was advancing the public good by building human capacity, especially among the urban underclass. To the extent that urban universities were considered catalysts for economic development, it was not through innovation and the creation of new technology but as agents of urban renewal, restoring and building neighborhoods. It was less that universities created new jobs than that they provided jobs. Many became the largest employers in their cities and counties.

With the emergence of high-technology companies in the 1970s, some spawned directly by universities and all dependent on universities for ideas and graduates, universities themselves helped produce the

³ Judith Rodin, “The 21st Century Urban University: New Roles for Practice and Research,” *Journal of the American Planning Association* 71 (3) (Summer 2005): 238.

⁴ O’Mara, “Beyond Town and Gown.”

⁵ Kermit C. Parsons, “Universities and Cities: The Terms of the Truce between Them,” *The Journal of Higher Education* 34 (4) (April 1963): 205.

⁶ *Ibid.*, 205–207.

⁷ Clark Kerr, *The Urban-Grant University: A Model for the Future*, lecture given to Centennial Meeting of the City College Chapter of Phi Beta Kappa, October 18, 1967 (New York: The City College, 1968).

With the emergence of high-technology companies in the 1970s, some spawned directly by universities and all dependent on universities for ideas and graduates, universities themselves helped produce the growth of metropolitan centers, attracting industry and an educated population.

growth of metropolitan centers, attracting industry and an educated population. The passage of the Bayh-Dole Act in 1980, granting universities the rights to inventions arising from federally funded research, led to an explosive growth in universities' collaboration with industry in the transfer of scientific discoveries into commercial applications, strengthening the claim that universities were major agents in the economic development of their regions. Some concentrations of technology firms developed because of resident universities, with the impact of Harvard and MIT on Route 128 near Boston being a prime example. Other metropolitan areas grew out of more rural settings because of the proximity of major universities. Stanford, for example, still refers to its campus as "the farm," but it is no longer a bucolic rural setting because of the rapid growth of the metropolitan area and its scores of high-technology companies in Silicon Valley. While nothing on the scale of Silicon Valley happened elsewhere, a similar symbiosis between research universities and tech firms developed in the Research Triangle in North Carolina and in Austin, Texas. Likewise, the University of California (UC) stimulated the growth of metropolitan areas around its new campuses; one in four U.S. biotech companies is located within 35 miles of a UC campus, and one in three California biotech firms (and one in six nationwide) was founded by UC scientists. Thus, increasingly, universities that were

not originally established in urban centers became centers of economic growth and magnets for metropolitan growth.

While these are not typically urban universities, their metropolitan settings caused them increasingly to resemble recently developed urban universities with their concentrations of educated people and their contributions to the social and cultural life of their region. Inevitably, like urban universities, these research-intensive universities also became more frequently embroiled in conflicts with their local communities. Perceived as wealthy, somewhat insular and privileged, and often immune from local jurisdictions, their tax-exempt status removing ever-larger portions of the landscape from the tax rolls, universities have often found themselves at odds with the very communities they have helped develop.

The growing connections between universities and industry after Bayh-Dole and the emphasis on universities as agents of economic development led universities to give greater emphasis to science, engineering, and applied disciplines. Professional schools, especially engineering, law, and business, grew in size and influence within universities and brought with them a problem-solving mentality. Among the practical problems to be solved were those of the cities and the neighborhoods of universities. The deterioration of cities and the decline of public education now presented problems that universities felt they needed to address. This has produced the closest linkage between universities and their cities in the history of American higher education.

For example, the University of Pennsylvania, though located in Philadelphia, began to insulate itself from the city after World War II, creating, in the words of former Penn President Judith Rodin, an "enclosed perimeter, fostering a fortress-like appearance to passersby while providing the desired academic sanctuary for the faculty and students within." By 1994, when Rodin assumed the presidency, the Penn neighborhood had deteriorated markedly, with high levels of poverty and crime and overcrowded and inadequate schools. Rodin concluded that the university could not

flourish unless the neighborhood flourished, so she launched the West Philadelphia Initiatives.⁸ Penn's short-term strategy called for improving the appearance of the neighborhood, quickly addressing small crimes, and improving sanitation. A long-term strategy had five parts: making the neighborhood clean, safe, and attractive; providing diverse, high-quality housing options; encouraging retail development by attracting shops and restaurants; spurring economic development by directing university contracts to local businesses; and improving the public schools. In addition, the university committed not to expand into residential neighborhoods, not to act unilaterally without community involvement, and to leverage its own short-term investments to secure long-term investments from the public and private sectors.

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Rodin recognized that success depended on embedding relations with the city in the mission and tasks of the university. She saw that these relations needed to be "holistic" interactions engendering trust by both parties and that improvement would require patience and a long-term commitment. Over the decade of her tenure, and with a continuing commitment by the board of trustees under Rodin's successor, Amy Gutmann, Penn has worked to achieve each of the five

⁸ For a description of the West Philadelphia Initiatives, see Judith Rodin, *The University and Urban Revival: Out of the Ivory Tower and into the Streets* (Philadelphia: University of Pennsylvania Press, 2007); and Rodin, "The 21st Century Urban University," 237–249.

goals of the West Philadelphia Initiatives. The initiatives have been remarkably successful. They reduced neighborhood crime by 31 percent, halted and reversed the residential exodus, attracted new shops and restaurants, and spurred new business development. Because they are embedded in the fabric of the university, the initiatives have contributed to the academic mission of Penn, including the creation of the University of Pennsylvania Institute for Urban Research. The challenges of the city became a central research project for the university, engaging nearly all of the disciplines and professional schools in the complexities of improving urban life.

Richard Levin, who became president of Yale in 1993, has a similar story to tell. Yale historically had little systematic engagement with the city of New Haven. Levin observed, “Outsiders have long regarded the presence of Yale as one of the city’s major assets, but, except for episodic engagement, the University’s contributions to the community did not derive from an active, conscious strategy of urban citizenship.”⁹ He recognized the need for a comprehensive strategy to employ Yale’s assets to improve the community. Yale’s strategy involved four areas of focus: encouraging economic development, especially the transfer of technology from the university to local enterprises; strengthening neighborhoods by creating incentives for Yale employees to live in the community; increasing the safety and appearance of the downtown; and changing the prevailing perceptions of the city of New Haven as a city in decline.

Yale’s Homebuyer program, which subsidized the purchase of homes in New Haven by Yale employees, was one of the initial, visible projects representing Yale’s investment in the city. Yale mobilized faculty and students from its schools of architecture, law, and management to help neighborhood residents develop a comprehen-

sive plan for neighborhood revitalization. A federal grant supporting job training, housing improvements, and the improvement of local elementary schools enabled the implementation of the neighborhood plan. Yale opened the campus to local

American universities have discovered that they are essential elements in the ecology of cities and that they will ultimately flourish only if their cities flourish.

schools with summer sports programs and a citywide science fair. The university made major investments to develop downtown retail shops, with the requirement that they remain open evenings to give life to the street. To alter the image of the city, Yale inaugurated an annual summer Festival of Arts and Ideas, which has drawn organizations such as the Royal Shakespeare Company and the Metropolitan Opera to New Haven. In November 2010, Yale announced that it will provide to all New Haven high school freshmen who maintain a 3.0 grade-point average until graduation a full-tuition scholarship to any state college or university in Connecticut.

A third example is that of Tulane University, which has been an essential element in the rebuilding of New Orleans after Hurricane Katrina. In a recent article, Tulane’s president, Scott Cowen, and his daughter, Amanda Cowen, describe how Tulane seized upon the crisis of Katrina, which threatened the very survival of the university, to restructure the university and the university’s relationship to the city.¹⁰ They write, “Although Tulane is a global institution, in confronting the realities of a post – Katrina New Orleans, we learned the true extent of our local interdependencies. Before the storm, Tulane

was New Orleans’s largest private employer. As such, we viewed the institution as an economic catalyst and a local resource for research and service-learning programs. However, although we’d been in New Orleans for 175 years, we were not quite of New Orleans.” The Cowens describe the details of Tulane’s engagement: a new Center for Public Service developed 300 service-learning courses and established relationships with more than 100 community-based organizations. Scott Cowen chairs a committee to develop a plan to rebuild and transform New Orleans’s schools, and the university is actively involved in school reform. The School of Medicine has built a community health care system with eight neighborhood clinics that provide all citizens access to primary care. The School of Architecture has led the Tulane City Center initiative, matching architecture students and faculty with local groups to provide design consultations on more than fifty projects to rebuild and enhance the environmental quality of urban life.

The Cowens conclude, “Our commitment to the revival of New Orleans had to extend beyond areas that impacted Tulane as an institution, such as housing, health care, and public schools. To truly invest in the city’s renewal and instill in our students a passion for social change . . . this commitment had to be a strategic priority for the entire university and an integral part of our daily activities.”

These are but three examples. Dozens more could be offered by universities all over the country. Over the last two decades, American universities have been more completely engaged in urban life than ever before in their history. They have discovered that they are essential elements in the ecology of cities and that they will ultimately flourish only if their cities flourish. They have learned that leadership from the top is required but that the entire university must in some measure be involved and that their efforts can enhance their curriculum. They have discovered that engagement requires a long-term commitment. Perhaps it is time to dispose of the metaphor of the ivory tower.

⁹ Richard C. Levin, “Universities and Cities: The View from New Haven,” Inaugural Colloquium, Case Western Reserve University, January 30, 2003.

¹⁰ Scott S. Cowen and Amanda P. Cowen, “Innovation amidst Crisis: Tulane University’s Strategic Transformation,” *Innovations* 5 (3) (Summer 2010): 3 – 11.



Jared L. Cohon

Jared L. Cohon is President of Carnegie Mellon University. He served as Dean of the School of Forestry and Environmental Studies at Yale University and was Associate Dean of Engineering and Vice Provost for Research at Johns Hopkins University.

Carnegie Mellon and the University of Pittsburgh also represent a case of a city's universities turning their attention, explicitly and intentionally, to the economic development and the welfare of the city in which they are located. Pittsburgh's story is important – certainly to Pittsburghers but also to the country and to the world. In a span of eighteen months from 1980 to 1982, Pittsburgh lost 120,000 jobs when almost all of the steel mills in the city closed. Pittsburgh is not a large city. In 1980, the city had about 500,000 people, and the metropolitan area had only about 2 million. Losing 120,000 jobs in such a short period of time is social and economic devastation. That Pittsburgh, less than thirty years later, would host the G-20 Summit (as it did in September 2009) is amazing. In fact, no one was more surprised than Pittsburgh. The story goes that when President Obama's press secretary announced that Pittsburgh would host the G-20, some in the pressroom laughed, "Pittsburgh? You've got to be kidding." The real gift of hosting the G-20 turned out to be the 2,500 or so journalists

who traveled to the summit, each of whom had to file a story answering the question, "Why Pittsburgh?" The answer is that Pittsburgh had made a notable recovery from the social and economic devastation of less than thirty years before.

The recovery was the result of a lot of hard work by a lot of Pittsburghers and Pittsburgh institutions, including the universities, which played an important role. Pittsburgh is unusual among midsize American cities in having two major research universities. Several areas that are much bigger than Pittsburgh – Boston/Cambridge, New York, Atlanta, Chicago, Los Angeles, and the San Francisco Bay Area – have multiple research universities, but Pittsburgh is unique for its size. In addition, Pittsburgh's two research universities, Carnegie Mellon and the University of Pittsburgh, are literally right next door to each other, unlike any other pair of major research universities. Over the last

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twenty years, we have worked hard to leverage that proximity. In 1982, after Pittsburgh lost those 120,000 jobs, the two universities had total sponsored research of about \$100 million. Today, twenty-eight years later, our sponsored research has increased by a factor of ten to \$1 billion. The AAU estimates that every million dollars of sponsored research produces twenty-nine jobs (that's direct jobs plus the multiplier effect). So, a billion dollars is about 30,000 jobs. In a city the size of Pittsburgh, that is a lot of jobs. The University of Pittsburgh Medical Center (a separately incorporated entity from the University of Pittsburgh, but their numbers are included in that billion) is now the largest employer by far in the city.

In 2005, we embraced economic development as one of Carnegie Mellon's strategic priorities.

Something else has happened, especially in the last ten years. Before 1997, a year before I came to Carnegie Mellon, the university was spinning out about two companies per year – not especially significant or noteworthy. We made an effort to increase that number and got it to about five companies per year. Then, in 2005, we did something unique for a private research university. We embraced economic development as one of our strategic priorities. We did so for two reasons: on the one hand, we wanted to be a good citizen; on the other hand, it was in our own self-interest to do so. To compete with other universities for the faculty and students we want, we need a vibrant technology sector in Pittsburgh. Anything that contributes to the vibrancy of Pittsburgh is therefore good for Carnegie Mellon. So we adopted economic development as one of our priorities. We looked at our technology transfer policy and changed it radically. Our provost, Mark Kamlet, made a brilliant observation, which seems simple in retrospect (most brilliant observations are). He recognized that the way the process worked then, and still works at most other universities, was broken and didn't make any sense. In most places the process works like this: you, a faculty member, invent something; then you present yourself to the technology transfer office and disclose your invention. You say, "I'd like to start a company." The tech transfer office says, "Great. Let's negotiate." Some weeks or months later (or maybe never), you reach an agreement, and you go off and start the company. Provost Kamlet observed that the minute a university and its faculty start negotiating with each other, something is lost. No matter how it comes out, the message conveyed to the faculty is that the university's interest and the faculty's interest are not aligned. How dumb is that? So we decided to get rid of the negotiation. And thus was born the policy we call "5 percent and go in peace." Now when the faculty member says, "I want to start a

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company,” we say, “Great. Sign here. Give us a 5 percent equity stake, which we can protect from dilution only by putting in more money. Now go in peace.” We now generate ten to fifteen start-ups a year, and we are second in the country in number of start-ups per million dollars of sponsored research. Not only that, the faculty are thrilled, they are happy, to our great shock. A couple of years ago we had in an advisory board in computer science. At the end, the board reported, “Your faculty are very happy about your tech transfer policy.” The provost and I looked at each other and started to laugh. We just couldn’t believe it. Our faculty are delighted, and we are making a real contribution to Pittsburgh.

Another of our initiatives was to construct a building on our campus specifically to entice large technology companies to set up engineering and research centers in

Pittsburgh. The building has succeeded to a degree we never thought possible. Within a year, it was filled with Apple, Intel, and Google (the only building in the world with those three in it).

Google has since expanded its presence in Pittsburgh, recently dedicating new offices in a part of the city called East Liberty. Imagine the most blighted area of New York City – if any such areas are left! – and you have an idea of East Liberty. For former Pittsburghers to hear that “Google is in East Liberty” is a total shock. Google’s presence marks a phenomenal success and means that Pittsburgh not only has a vital and vibrant economy; it’s cool, too.

Carnegie Mellon, the University of Pittsburgh, and University of Pittsburgh Medical Center are located in a neighborhood

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of Pittsburgh called Oakland. If Oakland were a separately incorporated city, it would be the third largest central business district in the state of Pennsylvania. It is extremely active. Two years ago, at the height of the recession, the vacancy rate for office space in Oakland was zero. The leaders of the universities have been active as leaders in the community with regard to economic development. My prede-



Carnegie Mellon University



Carnegie Mellon University's Hammerschlag Hall at night

cessor, Robert Mehrabian, spent countless hours – he had something like 150 community meetings around the metropolitan area – trying to convince Pittsburghers that innovation and technology-based development were the keys to Pittsburgh's future. He provided outstanding leadership, and it had a big impact.

That is the glass-half-full part of the story. The half-empty part is that Pittsburgh still struggles in a lot of ways. The population of the city is 350,000, half the size it was fifty years ago. Pittsburgh is the only major city in the United States to have lost population every decade since World War II. The decline has finally bottomed out, but the population has not yet started to grow. The suburbs around the city have grown, though, so the metropolitan area is about the same size as thirty years ago. But the city tax base has been dramatically

To compete with other universities for the faculty and students we want, we need a vibrant technology sector in Pittsburgh.

eroded as a result of the exodus of people from the city. Pittsburgh is broke, which creates a lot of the problems. The universities might be the major employers, but we are viewed as greedy and not shouldering our fair share because we are tax-exempt. Our young mayor – at 26 he was the youngest mayor in America when he assumed office – who is otherwise dynamic and interesting, proposed a tuition tax two days after his election last November. His idea, a 1 percent tax on tuition on every student in

the city of Pittsburgh, is understandable from the sort of simpleminded calculus of “I’ve got a budget deficit, I’ve got a bunch of rich kids coming to Carnegie Mellon, what’s 1 percent?” He was quoted as saying college students are a burden on the city of Pittsburgh. Fortunately, the mayor eventually withdrew the proposal, but the budget challenges of the city are a long-term problem.

Despite the challenges, though, some of which are unique to Pittsburgh, the story of the past thirty years is a great story; it shows the impact that the modern research university can have – and has had – on one American city.



Ruth J. Simmons

Ruth J. Simmons is President of Brown University and Professor in the Departments of Comparative Literature and Africana Studies. She served as President of Smith College from 1995 to 2001. She was elected a Fellow of the American Academy in 1997.

I had the opportunity, for part of my career, to work at the University of Southern California (USC). According to an apocryphal story about USC and the Watts riots, during those perilous moments the violence went right up to USC and stopped. The story is all about the relationship that existed between the African American community and USC. Now, that relationship didn't have a lot to do with overt efforts by USC; it had more to do with having a great football team, recruiting from the community, and the fact that USC does a lot of outreach in Southern California.

At the time, USC was able to admit a lot of students from the area. One of the difficulties one encounters as president of a place like Brown is that our relationship with our city and state begins with a dilemma. As a highly selective university, we are not able to have the same outreach that many universities can have. Thus, the relationship begins with a troubled question: Why can't you admit more local students?

A second dilemma is that when you become president of a university – at least this was the case for me – nobody tells you

about the civic role that accompanies the position. When I accepted the presidency at Brown, I really thought I would be behind these wonderful ivy walls, dealing with faculty and students, and it never occurred to me that the city was going to be a major part of what I had to deal with.

But I should have guessed. The day I arrived in Providence to make a speech upon my appointment, people along the way were giving me the thumbs-up as the car was driving up the hill. I thought, what do they know? I quickly learned, however, that a major part of my position involved the city. The relationship between Brown and the city of Providence is longstanding. We are older than our state and city, which can be particularly awkward when the matter of taxes comes up. When the city threatens to tax us, we bring out our charter from the King of England. For some reason, they don't like that very much.

One of the difficulties one encounters as president of a place like Brown is that our relationship with our city and state begins with a dilemma: Why can't you admit more local students?

Since its founding, Brown has been working closely with its neighbors, and that continues today. Our alumni have been leaders in the community for decades. Our current governor, our governor-elect, our lieutenant governor, our attorney general, the mayor of Providence, and our newly elected congressman might not always share the same political views, but they do share the fact that they are all Brown alums. We have the opportunity to work with them to identify ways to stimulate the economy and enhance the quality of life in our small state, where we have a large impact.

A recent analysis conducted by an independent consultant estimated that Brown directly and indirectly accounted for nearly 8,200 Rhode Island jobs and \$660

In recent years, we have seen attempts by the city council, the mayor's office, and the state legislature to impose taxes on private colleges. This issue has strained our relationship with policy-makers and, to some extent, with the public.

million in economic output in 2009. That is a big deal for our small state. Brown, which employs 4,455 people, is the sixth largest private employer in Rhode Island and the second largest private employer in Providence. We have a major impact on the economy of Rhode Island, which is both good and fraught.

It is fraught because inasmuch as we are a major player in the state of Rhode Island, that very visibility leads to more and more demands being placed on us, particularly when problems arise. But we believe that we are playing an honorable role. For example, during the recent downturn, we proceeded with capital projects precisely because we didn't want to withdraw those projects and have the jobs disappear as a consequence. Knowing the condition of our city and state, we wanted to make sure we paid attention to the city and its economic problems even as we were trying to address our own internal issues with the budget.

In 2009, Brown was one of the largest individual taxpayers in the city, paying \$2.2 million in property tax. We paid another \$1.1 million in voluntary payments to Providence. These figures are important, especially given the issues that the city and state are facing. Rhode Island has one of the highest unemployment rates in the country. In January 2010, Providence had an unemployment rate of 13.9 percent. Rhode Island's overall rate was slightly lower at 13.4 percent, and today they are both in the 11 percent range. Since 2002, the city has lost 18,000 private-sector jobs,



Mike Cohea

Brown University

We have been working closely with a number of partners in the public, private, and non-profit sectors to jumpstart a knowledge-based sector that builds upon the research done by institutions like Brown, our hospital partners, the University of Rhode Island, Rhode Island School of Design, and others.

while the education, health care, and social service sectors created 13,000 new jobs. Without the not-for-profits, Rhode Island would have been in a much worse state.

In recent years, we have seen attempts by the city council, the mayor's office, and the state legislature to impose taxes on private colleges. This issue has strained our relationship with policy-makers and, to some extent, with the public. This is a source of great pain to all of us at Brown because we are working as hard as we can to help the city and state, but the demands just keep coming. The efforts to undo the not-for-profit status of the university are relentless.

But we are trying to help expand the city's tax base. We have been working closely with a number of partners in the public, private, and nonprofit sectors to jumpstart a knowledge-based sector that builds on the research done by institutions like Brown, our hospital partners, the University of Rhode Island, Rhode Island School of Design, and others. I appointed a senior officer at Brown to serve as an economic development champion for the effort. In addition to his work as planner and eco-

omic advisor, he works with other institutions and businesses and civic and political leaders to build support for the goals of the knowledge-based economy and to develop a plan for achieving those goals.

Our focus for this undertaking is an area of the city known as the Jewelry District, formerly the world capital of jewelry manufacturing. This district, once dying, is now in the process of being transformed into a locus of bioengineering, life sciences, health care, and green technology research. Brown is considered the anchor for this enterprise. We made a decision to locate our laboratories for molecular medicine there in 2003, and subsequently decided to put more of this kind of activity in the area. We are now working on a medical school building there, and we purchased ten other buildings in the area in order to spur development.

We view the occupancy of space in this district as a contribution to the health of

As an educational institution, we can also spend a lot of time thinking about what we should be doing for the children in our area.

Providence. But sometimes local officials resist the idea of our taking more space off the tax rolls, even though we are paying taxes on a declining basis as the properties come off the tax rolls. Still, they argue that we are gobbling up space, this despite the fact that the vacancies in Providence today are significant. The market in downtown Providence has approximately 1.35 million square feet of vacant office space. The total vacancy rate is about 21.5 percent.

Universities can also take a leadership role in other kinds of endeavors in their cities. We talk a lot about efforts such as building a knowledge-based economy, but universities represent so much more, particularly in the areas of humanistic thought. Another extremely important thing we can do is address standards of citizenship in our country.

As an educational institution, we can also spend a lot of time thinking about what we should be doing for the children in our area. Brown recently completed a study of the history of the region, the history of Brown, and particularly the history of slavery in the area. One result of that study was that our campus recommended a series of things that we ought to be doing in education.

So we committed to building a \$10 million endowment for the children of Providence to supplement the educational programs in the Providence public schools. With our first round of grants, we were able to keep music programs in the schools, supplement mathematics and science education, and do other things that the schools, at the current level of funding, are not able to do. I am extremely pleased with the program, and I think we will be doing much more of this kind of intervention.

We have also started a program to enable students to get a master's degree in urban education at Brown tuition-free, provided that they commit to work in the public schools in Providence. That, too, has been a successful effort.

Despite our efforts, every year we see a new proposal to tax colleges and universities because the public is outraged that we are not doing enough. Policy-makers and the public never seem to understand fully the contribution we are making to our cities. We worry a lot about this at Brown. The question I see before us is, what can we do to persuade our public that we are doing all that is appropriate to help our cities?

Question

What is the proper role of higher education in K – 12 education?

Ruth Simmons

The overarching obligation of higher education is to stop separating ourselves so rigidly from K – 12. When colleges became elite, K – 12 educators became second-class educators, who do not have the same sense of pride, the same sense of lofty goals, the same sense of satisfaction with their jobs, and so on.

We ought to try to eradicate that line and bring teachers into the realm that we inhabit. As long as we continue to categorize K – 12 teaching as “less than” – for example, by calling ourselves “professors,” while they are only “teachers” – we will not be able to solve the problem of the quality of instruction at the K – 12 level.

The overarching obligation of higher education is to stop separating ourselves so rigidly from K – 12.

One measure of the seriousness of the problem is that so many of our students – who are among the most outstanding students in the country – consider a career in teaching as not acceptable because they do not respect the profession. I attribute

some of that attitude to what we do in higher education. Schools of education are off to the side, often not supported at the requisite level, often not challenged to be a full part of the community of higher education. That is a problem. When it comes to training teachers, when it comes to establishing the importance of this community of educators, what happens in our world of higher education has a tremendously important effect on what happens.

Question

At the beginning of the session we were talking about creating symbiotic relationships between communities and academic institutions. But NYU's actions in acquiring more property and building more buildings seem destructive rather than creative. Because of the construction, playgrounds in communities are being destroyed, for example. What is your take on that, President Sexton?

John Sexton

We are all frustrated by our inability to communicate adequately the extraordinary efforts the university community has made to embrace and enhance our cities. Our families live in these communities; our children play in these playgrounds. NYU in particular is ecosystemic with both the neighborhood and the city in which we live. We have taken great care in enhancing the community, trying to do so with balance, even as we seek to address the desperate need for space, both for our university and for research universities in general. That need is growing because knowledge itself expands exponentially decade by decade. Forty years ago, the field of genomics did not exist. Today it does, and NYU recently built a genomics building on Waverly Place to accommodate the professors, students, and post-docs involved in this field. NYU has a long-term plan that anticipates the need for an additional 6 million square feet of space over the next twenty years. That sounds like a lot, but it is only about 0.5 percent of all the space available in Manhattan. And most of it will be on land the university already owns. In the long term, the parks,

playgrounds, and other enhancements that come out the other side will be superior to what exists now.

We will always have people who want to make their careers by criticizing, and everything that is presented in the media is point-counterpoint, so small but strident voices get elevated to the point where they seem to have an equal status. But we have worked hard at being more closely related to this community – a community in which we live, in which we raise our children, and in which we are neighbors. We are committed to that community and to the people who live in the ecosystem with us.

NYU in particular is ecosystemic with both the neighborhood and the city in which we live.

Jared Cohon

As a general matter, if a piece of land is going to be developed and you have your choice of entity to develop it, choose a university. They bring their institutional values to everything they do, including the way they develop land.

In Pittsburgh and Providence, the universities have been thoroughly beaten up by politicians and the media over the issue of tax-exempt land and the tax base of the cities. The argument is that we are not paying our fair share. From a political perspective, such attacks make for good politics. Attacking us makes great political sense because we represent many fewer votes than the people to whom they are appealing with those statements.

But if you look at the facts in Pittsburgh, the reality is stunning. Many in the city believe that our tax base is what it is because we don't pay taxes on the land that we own and that Pittsburgh is unique in this respect. In fact, Pittsburgh is average, exactly on the median in terms of the percentage of land that is tax-exempt. And the vast majority of the tax-exempt land is not owned by us but by the government.

One way in which Pittsburgh does stand out, however, is in the number of people who work in Pittsburgh but don't live in Pittsburgh. Pittsburgh is second only to Atlanta in the percentage of jobs in the city held by people who don't live in the city. Until two years ago, commuters in Pittsburgh paid \$10 a year for the privilege of working in Pittsburgh. Today the rate is \$1 a week, \$52 a year, and it is not going to get any higher, because you cannot find a politician who represents people who live outside the city who is going to vote to increase taxes on his or her constituents, even though doing so would help the city. Instead we get crazy ideas like taxing tuition.

Question

Education has always faced a lot of challenges, both in the lower schools and in higher education. Right now, we have the additional challenge of the computer. Teachers often feel that the computer was placed in the classroom as a cure-all. But more and more we are finding out it is a tool. Students have realized this and now feel they can find all of the answers themselves. How are educational institutions going to convince students that the institution is still relevant, that reading a book is much more educational than using Google to find the answers?

Robert Berdahl

The younger generation has grown up with the computer; it is their vehicle for communication, for acquiring information, and for presenting themselves to the world. Our universities have been somewhat slow to employ that technology in the most effective ways that it can be employed.

I worry that with our failure to really engage the technology to its fullest, we have ceded some of the instructional use of technology to the for-profit institutions, the University of Phoenix and other online universities, of which there are now dozens and dozens. For certain kinds of training, online learning is very effective. But the dangers are that the public will get the perception that this is the best way, the cheapest way, and the most effective

Our leading institutions need to explore the use of computer technology where it is applicable, guard against the use of it where it is not applicable, and educate students to know the difference.

way of delivering education, and that students attracted to the technology will feel that it is also the most effective way of getting an education. Our leading institutions need to explore the use of that technology where it is applicable, guard against the use of it where it is not applicable, and educate students to know the difference.

Jared Cohon

For at least twenty-five years, we were sure that computers would be the answer to education. Unfortunately, we were so sure of it that we were deeply disappointed when we saw how miserably they performed at every level. Our disappointment has created a discrepancy between our expectations and what the technology has delivered.

Great advances have recently been made in cognitive science, in understanding how people learn. Advances have been made in computer science, in designing effective and attractive interfaces, and in embedding artificial intelligence into educational software. We also now have much more powerful computers. We are at the beginning of an era of educational technology that does make a difference.

This does not answer the fundamental question, though, of what role computers should play. If anything, it joins the question in a particularly acute way, because now they really can create a learning environment that is effective.

On the issue of educating our students about how to access information, all of the institutions of higher education that I know now take this issue seriously. They work to help students understand how to parse information, qualify it, how to iden-



Brown University

tify the good from the bad, the useful from the junk. It is not easily done, but we now see it as our responsibility, and it is a core part of the education in all of our institutions.

Ruth Simmons

We had a midyear graduation recently, and I was thinking about what to say to students, so I decided to talk about poetry. We want students who have the capacity to range across many areas. Whether students will take that goal seriously will be determined in part by the job market. In my conversations with employers about the many skills they need in workers, I always come away with the impression that there is always going to be a demand for students who are educated in this much broader way.

I was recently in China talking with educators about a new effort there to create a liberal arts version of their universities. Because of worldwide competition, we might end up needing to do more reaching across the curriculum. If China and India commit to a move away from the narrow technological approach to education and toward an all-encompassing educational approach, our students will need to be able to compete against the students such systems would produce. ■

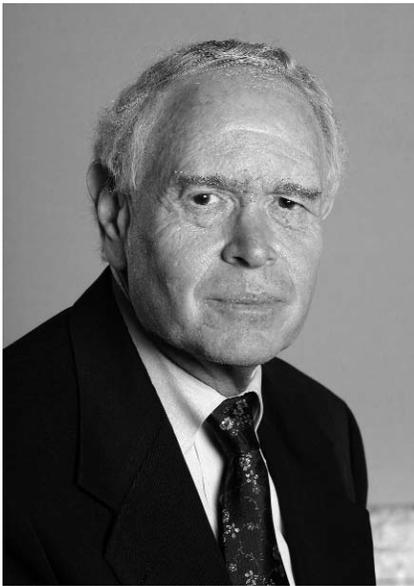
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The Future of Our Research Universities: Challenges and Opportunities

John L. Hennessy

Introduction by Paul Brest

1966th Stated Meeting, held at the Stanford University Faculty Club on January 5, 2011



Paul Brest

Paul Brest is President of The William and Flora Hewlett Foundation and Professor and Dean Emeritus of Stanford Law School. He has been a Fellow of the American Academy since 1982.

Introduction

I am pleased to be here with Fellows of the American Academy and distinguished guests – and honored to introduce John Hennessy, Stanford's tenth president.

I have had the privilege of serving under four great presidents, each of whom surmounted major challenges and brilliantly seized opportunities to make Stanford the great institution it is – even as they helped strengthen research universities throughout the United States and beyond.

Dick Lyman withstood violent attacks on the freedom of inquiry that lies at the very core of the research university. During his tenure, the University also began to undergo the social changes – perhaps accelerated by some of the same forces – that resulted in its wonderful intellectual and cultural diversity.

If Dick's main challenge came from the left on campus, Don Kennedy's came from a populist attack on the academy from Capitol Hill. As enervating as this battle was, it did not distract Don's focus on improving undergraduate education. (It's hard to believe now, but undergraduate education was then a somewhat neglected domain at Stanford.)

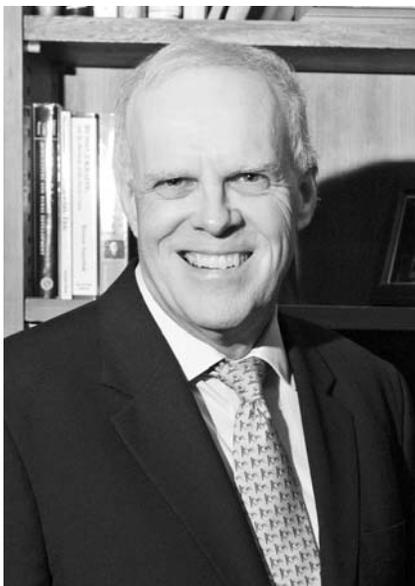
Gerhard Casper turned the task of reconstructing the campus in the wake of the Loma Prieta earthquake into an opportunity to improve the campus's architecture. And he redoubled Don's efforts at improving undergraduate education.

Each of these presidents also guided the University through serious financial setbacks. But I think it's fair to say that they did not confront fiscal crises of the magnitude that John Hennessy has faced – and faced up to with a vision and decisiveness that has set the foundation for the University's future. As you can see from a walk around campus, this has not been a time of circling the wagons or retrenchment but a period of aggressive development (in every sense of the word).

An electrical engineer, John has devoted as much attention to the humanities and sciences as any of his predecessors. And (aided by Helen and Peter Bing's endless generosity) he has helped realize Gerhard's dream for a major concert hall on campus.

As dean of the Law School, I had the privilege of serving on the University cabinet with John, first when he was dean of the School of Engineering and then briefly when he was provost. In those days our discussions were not of fundamental challenges to the American research university but rather the arcane subject of university cost accounting and the byzantine and sometimes contentious financial relationships between the central university and its schools.

But that's for another time, perhaps over a drink. Now to less parochial matters. It is my great pleasure to introduce John Hennessy.



John L. Hennessy

John L. Hennessy is President of Stanford University. He has been a Fellow of the American Academy since 1995.

Presentation

Thank you, Paul. I was tempted, after Monday night, to turn this into a discussion about leading great football schools and tell you that the secret is to find a quarterback who is an engineering major. Instead, I am going to share some thoughts I have developed while serving on the National Academy of Sciences committee that is focused on the future of our research universities, a committee driven by a congressional request to identify the ten most important actions we could take inside the university and at the state and federal levels to address what is perceived to be a major challenge coming from outside the United States. Those of you outside of science, engineering, and medicine will forgive me if this talk becomes science-, medicine-, and engineering-centric. We do have problems outside those areas, but those problems are less tied to the issues surrounding U.S. scientific, medical, and engineering competitiveness. Also, should we suffer major blows to our leadership in science, medicine, and engineering – the technology fields – the decline of the rest of the university will not be far behind.

That said, I am going to start with a little good news, then talk about some of the challenges to the health of our public institutions and to the financing of research and education in science and engineering. Finally, I will talk about opportunities. Any plan addressing the challenges we face has to think not only about challenges and changes at the federal level but also about what we might do inside the institutions to improve our own operations.

The Good News

American research universities are widely considered to be the best in the world. We are widely admired. In any set of studies you look at, whether Shanghai Jiao Tong University's *Academic Ranking of World Universities* or *Times Higher Education's* world university rankings, the United States is in a leadership position. That is the good news. We also have by far the best track record for moving our innovations from the research laboratory out into industry, where they contribute to the economic vitality of the country. The innovative and entrepreneurial spirit, for the most part, remains strong inside our universities. Competition among institutions has bred excellence. We don't just compete with Berkeley on the football field. We compete with them for faculty and for students, and this competition has made all of us better. The competition between public and private institutions of higher education in the United States is a model that we should think about as we contemplate the reforms needed in K – 12 education.

The Challenges

What challenges do we face? The National Academies report *Rising Above the Gathering Storm* talks about the key issues: stagnating research support; emerging well-funded competition, particularly in Asia; the lack of U.S. student interest in science and engineering; and a graduate student body that is increasingly international – not that that is not a great thing. This country has been built with incredible talent from around the world. But whether that will remain the case in the future is uncertain, both because of occasional uncertainty in Washington about visa policies and how they should work and be-

cause competition for the best and brightest is increasing worldwide as more and more countries look to create their own knowledge-driven economy. To the report's list of challenges, I would add the lack of broad scientific literacy among the U.S. populace.

In 2010, a revised edition of *Rising Above the Gathering Storm* was released with a subtitle that declares, "Rapidly Approaching Category Five." The report's key insight was that little progress has been made, and, especially on research funding and the budget, things have actually gotten worse. Public institutions in particular are under incredible stress right now.

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If our research investments are to be the seed corn for economic growth in this country, then those investments must keep pace with the growth in our GDP. Since 1976, despite a few periods of increasing R&D funding relative to GDP, the general trend line has been a slow decrease over time. That's a trend we need to worry about. However, the picture is not the same for all disciplines. For example, the budget for the National Institutes of Health (NIH) has gone way up. But if you look at other areas, funding has gone down or stayed flat in terms of real dollars, which means that funding overall is declining as a percentage of GDP. Particularly in the engineering disciplines, this is an increasing concern. The U.S. percent-



Linda A. Cicero/Stanford News Service

Corridor of Arches at Stanford University

The competition between public and private institutions of higher education in the United States is a model that we should think about as we contemplate the reforms needed in K–12 education.

land now outdistances us by a considerable margin. Indeed, many of the countries that we used to be ahead of or tied with have surpassed us. As the number of young people with science and engineering degrees has gone up in other parts of the world, the number has gone down, as a percentage of population, in the United States. The trend is deeply concerning.

For a long time, the United States has awarded visas allowing foreign students to enroll in graduate programs and earn PhDs from U.S. universities. In 2003, 50 percent of engineering doctorates were awarded to non-U.S. citizens. Considering how our own K–12 students are doing in science, mathematics, and engineering, we cannot afford to lose this flow of talent coming into the United States. Fixing the core problems of our K–12 system will take years. Thus, our only choice, if we are going to produce people to work in these fields, is to continue to import the best and brightest from around the world.

We've got to ensure that that can continue, that we can get through possible visa issues. Unfortunately, we have people in this country who don't believe we should keep that door open and would like to see it shut or would like to see people, once they get their degree, mandatorily sent home. I am in the group that believes that we should staple a green card to the diploma of every international student with an advanced degree in science and engineering. After all, to make a quarter- or half-million dollar investment in somebody who gets his or her PhD in one of these fields and then to say, "Well, you must go home right away," is just foolhardy.

age of worldwide R&D is also declining. From 1996 to 2007, R&D expenditures rose from half a trillion dollars to \$1.1 trillion worldwide. But the North American and European shares decreased over the period while spending in the Asia/Pacific region rapidly accelerated. Governments in Asia are making investments in these areas while we are reducing our investments, at least in real terms.

Asia, especially China, is leading the world not just in growth of R&D expenditures but in other important science and technology factors such as high-tech exports,

articles published, and number of researchers. The amount of growth in these areas since 1996 is astonishing. Asia is changing quickly and will play a major role.

The United States is also being outpaced in the number of science and engineering degrees its citizens are earning. In 1975, the ratio of first science and engineering degrees among U.S. twenty-four year olds was about four per one hundred. That was good enough for fourth or fifth place in the world, tied with a lot of other countries, including Finland. In 2000, the rate was about six per one hundred, and Fin-

This country has been built with incredible talent from around the world. But whether that will remain the case in the future is uncertain.

Public interest in science-related issues, particularly in medical discoveries, remains amazingly high, which is perhaps unsurprising. But the public is also interested in other new technology. The one thing that has fallen off is space exploration, although the little robots NASA has sent into space were very popular. So, the solution is to send more of them.

Public interest in science might be high, but how is the public's scientific literacy? One recent survey that asked people to answer basic scientific questions found that not just the United States but the whole world has a problem with scientific literacy. I was amazed by some of the survey's findings. For example, something on the order of 25 or 30 percent of Americans respond incorrectly when asked whether the earth goes around the sun or the sun goes around the earth. The public does know that the center of the earth is hot. They have seen it in science fiction. But the lack of basic knowledge about real science is striking, especially when you consider that the survey looked at knowledge of fairly basic concepts and didn't even touch on subjects that require more understanding, such as why there are seasons or why there are tides.

We face a significant challenge here. One way of approaching it might be to restore the teaching of scientific progress to our American history textbooks. Jonathan Cole, the former provost of Columbia, has written about the elimination of scientific progress in the teaching of American history. He points out that many American history books have lots of things to say about modern culture, about the sexual revolution, about women's liberation, but say little about the way in which science and technology have changed the world we live in. If we don't tell people this is

important and why they need to understand it, we are going to suffer the consequences. And imparting this knowledge is especially important when the country is making such a large investment in science and engineering; it is important for people to understand why that investment is important to them and how it is changing their world.

Our public research universities are also in significant difficulty. In constant 2006 dollars, state appropriations to public research universities in the top two Carnegie classifications have steadily decreased since 1987, significantly undermining these institutions. They are probably experiencing one of the most difficult times they have ever been in. One result of this financial difficulty has been a steady boost in tuition. Net tuition in public universities as a percentage of revenue has gone from 24.5 percent in 1984 to 37.3 percent in 2009. At Stanford, by comparison, about 13 percent of revenue comes from tuition. Public universities are now highly tuition dependent, which leads them to look more and more toward tuition as a natural solution to their increasing revenue needs. One of the key factors driving down state appropriations to public universities has been Medicaid spending, which rose from 0.4 percent of the gross state domestic product in 1980 to 0.9 percent in 2001. In some states, Medicaid spending has already surpassed investment in K-12 education.

What has happened with the federal budget is cause for even greater concern and is the real reason I worry about research funding. I worry that the coming crisis in the growth of entitlement spending means we have not seen the worst-case scenario by a long shot. Sometime between 2040 and 2050 – assuming that tax revenue as a percentage of GDP remains flat – the combination of Social Security, Medicare, Medicaid, and interest on the debt will exceed all the U.S. government's tax revenue. All the tax revenue. That leaves no money for national defense. No money for investing in infrastructure. No money for investing in education. If we cannot solve this gigantic crisis, we will enter a death spiral: cutting back on investments in research and

education will lead to a lower GDP growth rate, which will lead to entitlements taking an even larger portion of the pie, which will lead to even less investment in the things that will lead to growth in the GDP – in short, a cycle that is very difficult to get out of. The problem we face is in convincing the American public that a crisis 30 to 40 years from now must be worried about now and not in 30 or 40 years. If we don't begin to turn the curve now, we are never going to solve the problem.

The United States is being outpaced in the number of science and engineering degrees its citizens are earning.

Opportunities: What Can Universities Do?

What can our universities do? What role can we play? Many of the challenges we face require policy changes at the federal level. Convincing Congress that appropriate investment for our country means not cutting research funding levels but growing them at the GDP rate would make an enormous difference. We must also urge Congress to make visa reform a priority so that we can encourage the best and brightest international students to stay. But universities must also ask what they can do to help themselves. We must continue to speak out against earmarking and in favor of merit-based research programs, which have been one of the stronger aspects of our entire research funding. We must also continue to educate great leaders, innovators, and teachers. We must prepare people for a world shaped by science and technology. We must engage all our citizens. And we must make ourselves better by improving efficiency throughout the university system.

Educating Leaders, Innovators, and Teachers

A residential, liberal education is the foundation that has made our education system the envy of the world. Many Asian countries started out by emphasizing their

Public interest in science might be high, but the United States and the whole world have a problem with scientific literacy.

desire for engineers and scientists. Now they are beginning to think about the value of a broad, liberal education that brings together people from different backgrounds in a residential program and trains them to be lifelong leaders and learners.

We have to nourish entrepreneurial spirit and technology transfer. At the same time, we must address the challenges raised by conflict of interest. If we don't, congressional concern with conflict of interest might lead to Congress building a wall between universities and industry, which would destroy a partnership that works well in this country. Already, I have had junior faculty tell me they don't want to have anything to do with companies because they fear the NIH won't fund them if they do.

Finally, we must educate teachers. Fixing science and math education in our K – 12 system is the key to the future of the universities over the long term. According to the International TIMSS math and science tests, our students do roughly as well as Bulgaria in math and science, trailing many other OECD countries. Bulgaria spends about one-tenth as much per student as we spend. One of the key reasons our students perform so poorly in science and math is that only a small number of teachers, particularly in grades 5 through 8, have backgrounds in science and math; they are teaching topics they were not trained in. In science and math, this is a difficult problem to overcome. And the problem is worst in inner-city schools, where science and math scores are much lower than the national average.

A major overhaul of what we do in K – 12 education is needed, because the only way we are going to persuade talented people who have a degree in science or mathemat-

ics to become teachers when they could get a high-paying job elsewhere is to persuade them that in K – 12 education they will be treated as professionals, they will be compensated reasonably well, and they will make a big difference in the lives of young people. If we don't do that, we are never going to fix the problem. We can train all the people we want, but if we have a K – 12 system that doesn't treat them as professionals, it won't work well.

We have also got to work on attracting a broader fraction of the population, especially our minority population, into the STEM fields – into science, technology, engineering, and medicine. In 2007, about 39 percent of our K – 12 public enrollment was underrepresented minorities. The percentage drops to about 26 percent for undergraduate enrollment. It drops again for science and engineering degrees. And again for master's degrees. And it plummets when we get to doctoral degrees. Minorities constitute 39 percent of our K – 12 population but just over 5 percent of our PhDs. And the demographics of the population continue to change. By 2050 mi-

Public universities are now highly tuition dependent, which leads them to look more and more toward tuition as a natural solution to their increasing revenue needs.

norities will constitute more than 50 percent of the population. If we don't figure out how to do a better job of attracting and retaining underrepresented minorities in science, engineering, medicine, and mathematics disciplines, we are not going to fix this problem in the long term. The good news is that we have made progress on similar problems in the past. Thirty years ago, the chart for women in these disciplines would have looked a lot like today's chart for underrepresented minorities. The representation of women in STEM disciplines is not a problem that's com-

pletely behind us, but in most disciplines, we are doing much better. By focusing on such problems, by thinking about our education system, we can make progress.

We must also better prepare high school students for college-level work. I believe lack of preparedness is the major reason Latinos, blacks, and Native Americans do so much worse than whites and Asian Americans in completing STEM degrees. Even though the percentage of underrep-

Convincing Congress that appropriate investment for our country means not cutting research funding levels but growing them at the GDP rate would make an enormous difference.

resented minorities who aspire to STEM degrees and ultimately complete such degrees is better over a five-year period than over a four-year period, the completion percentages for both periods are significantly lower than those for whites and Asian Americans. The fact is, you cannot walk into college thinking you are going to major in a STEM discipline without having had an adequate high school background in calculus and physics. The university can and must do a better job on mentoring, but we are also going to have to fix the challenge of preparation for these young people.

How do universities do on PhD education? In engineering, only 64 percent of the people who start PhDs finish in ten years. In the humanities, only half finish in ten years. Four or five years working on a PhD is not necessarily a complete waste of time, but those years represent a gigantic investment – both of money and lost opportunity cost. Each individual enrolled in a PhD program – who is almost by definition a highly capable individual if they have made it into such a program – could instead be out making other contributions to society, earning a living, doing other things. Even paying taxes. The fact that so many of these indi-

viduals are taking so long to complete their PhDs is thus a real problem. Stanford's numbers are better than the average, but they are not 100 percent. They are not even close. In engineering, for example, we are at around 75 percent completion. The really bad news from the PhD completion rate data is that students who drop out don't do so in their first or second year. They drop out in their third, fourth, fifth, or sixth year. If these students were all dropping out in their first year, concluding that a PhD really

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wasn't for them, we could live with that. But they are dropping out later than that, and that represents a significant investment loss. At Stanford we calculated what percentage of our graduate research funding goes to students who don't complete their PhD and found it is around 9 percent. Nationally, the rate is probably closer to 15 percent.

We must also work on time to degree, the number of years graduate students take to complete their PhD, as well as the average age at which PhDs are earned. Average time to degree peaked at close to ten years and now hovers around eight years. As people take longer earning their degrees, they begin professional careers later in life. The average age of a first NIH grant is now thirty-seven at Stanford, and I think it's forty-two nationally. The average age at first appointment is in the low thirties. A related issue is the number of people getting PhDs who then turn to nonacademic careers. The number has gone up significantly because there simply isn't that much growth anymore in the universities. When people spend as long as they are spending to complete PhDs and then head to a nonacademic career, this seems to me like a double waste. We can't say anymore, oh, they are working on their publications, they are developing their

skills as a faculty member, and then have them leave for an industry job. At the same time, we could better prepare our students for careers outside the academy and make an investment in that. The size of our PhD programs is driven in part by federal research investment, but it is also driven by the size of the intellectual community we would like to have. If we want to maintain our intellectual community at its present size, we have to think more constructively about career alternatives for people who will not remain in the academy when they finish their training.

The challenges facing the university can leave us all too depressed. But I think the present moment is also an incredible time for universities. Universities have become the home of research and advancement. Industry simply doesn't make the long-term investment in research that it once made in this country. The Bell Labs of the world are gone. IBM Research is not what it once was. Our friends at Xerox PARC are not what they once were. Enormous changes have taken place, and I think it is up to universities to continue to make that investment. We face gigantic intellectual and technical problems, from what to do when silicon is no longer an option for integrated circuits, to the issues around energy and solving the energy problem, to the issues we face in computer science.

One of the things I fear most is that we have encouraged society with all this wonderful technology we have built – the Internet and the World Wide Web – but we may have encouraged them before we have actually figured out how to solve is-

We must continue to educate great leaders, innovators, and teachers.

issues like privacy and security. When people find that everything they have done online is essentially accessible to the public, we could find ourselves in a very difficult situation. Of course, young people today just put everything up on Facebook and give it away anyway, but that's a different problem. We have before us

great opportunities in areas of the social sciences and the humanities: How can we govern better? What do we do about economic development around the world? These and other key problems are areas we could work on and really make a contribution to.

I want to finish with a story that shows how the work we do at the university can help change the world and improve the lives of its poorest people. Several years ago Stanford's Hasso Plattner Institute of Design began to offer a course called Entrepreneurial Design for Extreme Affordability. Jim Patell, a professor in Stanford's business school, currently leads the course, which puts together interdisciplinary teams of students. MBA students work with engineering students and sometimes with students from the medical school. For two quarters, the course takes over their lives, as teams research and create products for the most challenged 50 percent of the world. This generally means countries where the average salary is less than \$2 a day. Students in the class have worked on low-cost solar lanterns, better manual irrigation pumps, and high-efficiency stoves. But the project I love the most involved designing a low-cost baby incubator. A group went to Nepal and found that one of the major causes of early infant death there is low birth weight. Low-birth-weight babies can't maintain their body temperature and thus are at risk for hypothermia. When the group returned, they asked how could they solve this problem. Western-style incubators cost \$25,000 and require electricity, which is not available in many rural areas of the world. Even jerry-rigged incubators made with lightbulbs cost about \$2,500 and still require electric power. The group set out to design an incubator that would cost \$25 and not require electricity. They came up with a tiny sleeping bag for babies. The design uses a piece of technology from MIT, a wax substance in a bag that can be dropped in a pot of boiling water where it melts. The substance then maintains a steady-state temperature for an extended period of time. The warmer goes in a back pocket on the sleeping bag, and the baby goes in the front. The bag can then be tightened like a mummy bag, and with it

We must prepare people for a world shaped by science and technology.

you can maintain the baby's temperature for about four hours. If the transport time to a better medical facility is longer, you can take out the wax pouch and drop it in another pot of boiling water. One thing people in the developing world do have access to is heating sources, so they can reheat the wax, put the pouch back in, and continue their journey. What started at Stanford with a multidisciplinary group of graduate students became a nonprofit named Embrace and moved to a hospital in Delhi, India, that works with nearby rural communities. The hospital agreed to pilot the project, and in May of last year the incubator helped save its first baby – Nisha – who was born prematurely. GE is now interested in the project and has placed an order for 10,000 units, which they will distribute in various parts of India and Nepal. This is the kind of thing that universities can do to change the world for the better. Our potential is great, and, although we face a lot of challenges, I think the opportunities before us are remarkable.

Question

How do you resolve the tensions between maintaining a world-class research university, a world-class undergraduate program, and a world-class football and basketball team? That's a serious question.

John Hennessy

It is a serious question, and I think Stanford is able to resolve that problem in a different way than many other institutions can. We can resolve it by recruiting a select group of individuals who not only want to excel at their athletics but also want to leave here with a Stanford degree in their hands. So we can recruit those students who are capable of doing the work. That's the only way we can survive. If you are a talented, intellectually capable person and you are a great athlete, this is simply the best place in the country to come. The problem is much more difficult at

many other institutions, and we are now seeing some extremely tough situations play out. Keeping the word amateur in college athletics is going to be an increasingly difficult problem as coaches' salaries go through the roof. The difficulties this can cause are easy to see. An agent approaches a young man, often one from a tough, underprivileged background, and says, "Your coach is making \$5 million a year, and you're the star. What are you getting paid?" In basketball we see the rise of the one-and-done philosophy where there's not even a notion that this person is going to get a degree. They're going to come in, play semiprofessional basketball for a year, and go to the draft. These are real problems. We'll see what Mark Emmert, the new head of the NCAA, can do to fix them.

We must better prepare high school students for college-level work.

Question

You mentioned the problems with research funding, but you didn't say where the solution is. As federal research funding continues to decline, what are the alternative funding sources? How will we manage some of the pressures that come, for example, from industrial funding, which tends to pull us into short-term time horizons?

John Hennessy

Some funding from industry clearly will help, as will funding from foundations. But we have to balance the time horizon. The best model we have seen for working with industry is a consortium-like model, where we have multiple companies coming together and agreeing on a research agenda. This tends to lead to a more long-term agenda because the focus is on a common set of big problems faced by all members of the consortium rather than on problems related to getting one company's next product to market. We are going to have to continue to build those sources of funding, but the honest truth is that I don't think they can ever replace or

even make a significant dent in replacing federal funding. So, we are going to have to hope that we can convince the people in Washington that investment in research is, over the long term, in the country's best interest.

Question

You mentioned K – 12 education and why the current state of affairs is a huge problem. What is being done to turn that around?

John Hennessy

The K – 12 problem has multiple parts. One is the issue of understanding what works, building up an understanding of how to make K – 12 better based on experiment and quantitative measurement, based on hard data about what makes a difference. In California we have spent a lot of money reducing class size. Smaller class size doubtless has some benefits, but we now know that improving teacher quality is more important and more effective than reducing class size. So, we could have used that money more effectively if we had sought to improve teacher quality and to attract and keep good teachers.

We know a lot of other things about improving education. One of the things we don't know, though, is what makes good teachers. We know that teachers, as you would expect from any distribution, fall in a wide variety of levels. Teachers in the lower quartile contribute very little. One study found that if we eliminated the lowest 10 percent of math teachers in Texas, we would close more than half the achievement gap between minorities and whites. But the lowest 10 percent of Texas's teachers are more heavily represented in poor districts than they are in rich districts. So eliminating the worst teachers would actually mean eliminating 20 to 30 percent of the teachers in poorer districts.

We need better data for better understanding. Then we need to reorganize how we think about teachers. Why is it in this country that being a professor in college is a well-respected, reasonably compensated job, but being a teacher in K – 12 is something that people don't respect and don't

compensate well? We need to fix that. Until we do, we'll never attract and keep those great teachers.

Question

First, what fraction of Stanford engineering undergraduates go on to graduate school in science and technology? Second, Stanford is in the middle of Silicon Valley. Yet the number one or number two major at Stanford among the undergraduates is in finance and economics rather than science and technology. Is that of concern?

John Hennessy

A large fraction of our students go on to get a master's degree, but a relatively modest number go on to get PhDs. The institutions that are most successful at sending their students on to get PhDs in science and engineering are the small liberal arts colleges. Pomona and Reed send a higher percentage of their students on to get PhDs than does Stanford.

Stanford is in Silicon Valley, and having that magic so close does lead many students to go into industry. We don't push them, though. Students can make up their own minds. They're smart people. We do have a lot of economics majors, and that reflects what students can readily see about how we compensate engineers and scientists compared to how we compensate investment bankers. To change that, we need to think about how, in society, we can change the rewards for those professions.

Question

The data you have shared with us are extremely persuasive. But I want to make a couple of observations about them. First, your presentation would not be surprising coming from a social scientist; it's somewhat more surprising coming from an engineer who is accustomed to solving problems in addition to analyzing them. What we have here is an excellent exposition of a large number of problems, but you stopped before you were able to suggest

any answers. Let me help you on that. One of the reasons it's so difficult for university people to suggest serious solutions to some of these problems is that when they are discussed in universities and by university people the universities themselves are presented as victims rather than as institutions complicit sometimes in the creation of the problem and sometimes in the maintenance of the problem; for example, research earmarks. They are not primarily a congressional problem.

John Hennessy

I agree with you 100 percent; it's a university problem, and it undermines our peer review. I actually led the effort to try to get all my colleagues in the Association of American Universities to put a ban on

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earmarks. Out of sixty-five institutions, twenty wouldn't sign on. Even though, in the bigger picture, we're not talking about a lot of money, it's still bad.

Question

It corrupts the research system, and that is a bad thing. On the improvement of elementary and secondary education, a lot of good things are coming out of universities. A million experiments and a million reform efforts are under way. But you will look long and hard before you find a concerted, systematic effort by the major universities to agree on a set of priorities for research and for the investment of their resources in the improvement of the system. The scattered efforts that are going on now, no matter how many of them there are, aren't going to succeed, because they are scattered and unfocused. I would hope that university presidents, like you,

would make an effort to bring your colleagues together to think coherently about what universities can do to deal with these issues.

John Hennessy

I think we can do something here. My biggest fear, though, is that we succeed in training high-quality teachers who then go out into the field the way it's currently operated, with the current compensation system and treatment of teachers. Our high-quality teachers will stay for five years and then go get another job. They will get out of the discipline because K-12 teaching is not at present the kind of career that somebody coming from this institution is going to want to stay in. That is the real dilemma we have to solve.

Regarding universities' complicity in the problems we face, I agree with you. But notice that I did talk about two problems that we have to solve internally: PhD completion rates and time to degree. Adjacent to that is preparing our PhD students for nonacademic careers. If we can't do a better job there, we should just cut the size of our PhD programs, because it does not make sense to educate those people, have them spend that kind of time here, and not be prepared for a career outside the academy. ■

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The Great American University

Jonathan R. Cole

1956th Stated Meeting, held in collaboration with Boston University on September 16, 2010, at Boston University



Jonathan R. Cole

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Presentation

When most educated Americans think about our great universities, they probably don't think about the origins of lasers, FM radio, magnetic resonance imaging, global positioning systems, barcodes, the Google algorithm, the fetal monitor, the nicotine patch, antibiotics, the Richter scale, buckyballs and nanotechnology, the discovery of the insulin gene, the invention of the computer, or the development of bioengineering through the discovery of recombinant DNA. Nor do they think about improved weather forecasting, cures for childhood leukemia, the pap smear, scientific agriculture, surveying and measuring public opinion, or the

concepts of congestion pricing, human capital, and the self-fulfilling prophecy. They almost certainly don't think about the electric toothbrush, Gatorade, the Heimlich maneuver, or Viagra. Yet all these discoveries and innovations have their origins at American research universities.

Most people think of universities in terms of undergraduate and professional education – of teaching and the transmission of knowledge – rather than in terms of the creation of knowledge. This point of view is understandable: Americans are concerned about the education of their children and grandchildren, and they base their understanding of universities on their own experiences in education. Certainly, teaching undergraduate and graduate students is critically important and an integral part of the university's mission. But what has made our universities the greatest in the world is not the quality of our undergraduate education – as important as that is – but our ability to fulfill one of the other central missions of leading universities: the production of new knowledge through the discoveries that change our lives and the world.

In *The Great American University*, I tell the story of how American universities became the greatest engine of innovation and discovery the world has perhaps ever known, how that success was achieved in a relatively short period of time, and how our universities are under threat today. On what evidence do I base the claim that our universities are the best in the world? During the past century, the United States has produced an abundance of creative scientists – more than any other nation.

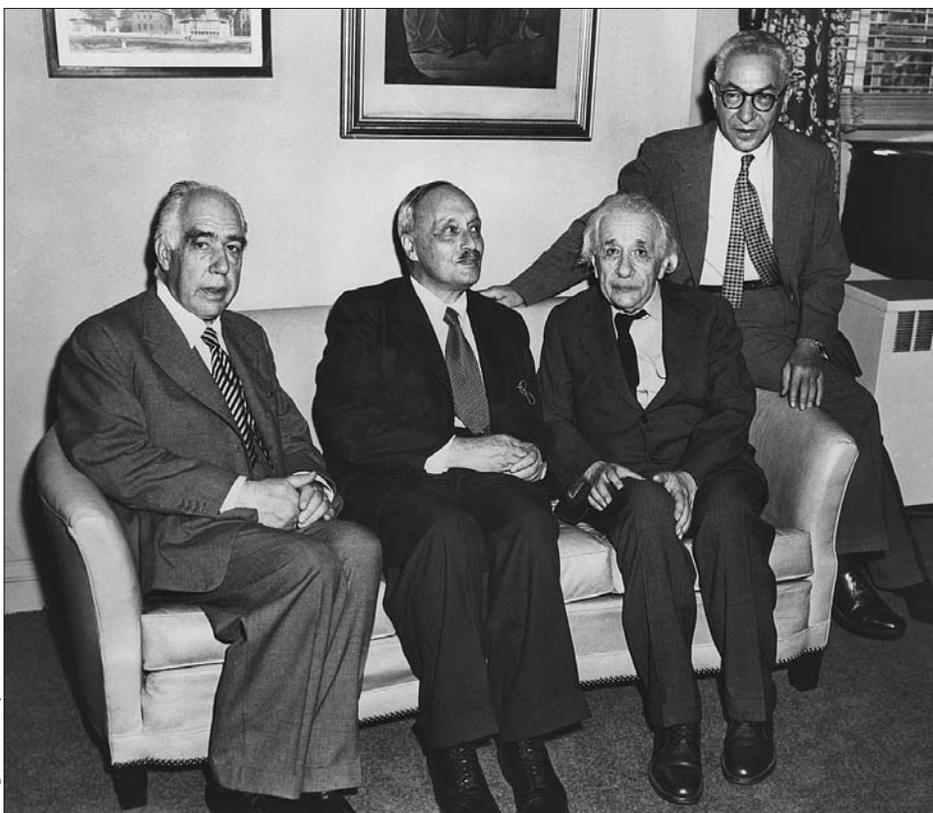
In numerous surveys and rankings, 80 percent of the top 20 universities in the world are in the United States; American universities make up 75 percent of the top 50 and roughly 60 percent of the top 100. Econo-

mist Henry Rosovsky approximated these basic ratios years ago, and the numbers still hold today. There is not one German university in the top 50, nor one Russian university in the top 75 (unless they do their own rankings). By China's own accounting, there are no Chinese universities in the top 200. Furthermore, 60 percent of all Nobel Prize winners in science since World War II have been Americans or foreign nationals working at American universities. The most widely cited scientific literature is dominated by American scientists and scholars. Indeed, American universities have become the envy

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of the world. Because many of the brightest and most able young people throughout the world want to attend and work at them, our universities may collectively represent the only American industry that currently has a favorable balance of trade.

Contrary to what most people think, the American research university is amazingly young, and it is highly embedded in the dynamics of the larger American society. It did not originate in 1636, when Harvard University opened its doors, or with the founding of Yale University or Columbia University, though we tend to think of these institutions as old, great universities. In reality, the American research university dates to one hundred years after the signing of the Declaration of Independence, when Johns



Niels Bohr, James Franck, Albert Einstein, I. I. Rabi

Hopkins University was opened in 1876. Research universities are for the most part twentieth-century institutions. Their growth can be traced to the last quarter of the nineteenth century; by the 1930s, the system's core set of values was in place. The critical period of growth began in January 1933 and took off after World War II. Essential to this growth was a remarkably enlightened post-war science policy – the best in the history of this country, certainly, and maybe in the history of any nation. That science policy provided the impetus for increasing the distinction and preeminence of our universities and paved the way for the life-changing discoveries I cited above. However, I must also emphasize that these institutions are fragile. They periodically come under attack, and I believe they are threatened today.

The great transformation of the American university took place in 1876. Johns Hopkins was built from a hybrid model based on educational systems in Germany and England. Many nineteenth-century leaders in Amer-

ican education and university life fell in love with the German system. Accordingly, the American system became an amalgam of the German model, which emphasized advanced research, and the British model, which emphasized undergraduate colleges. But in many ways, the American university improved on models that existed elsewhere. For example, it was much less rigid and hierarchical than the German system and was more democratic in its organization and structure. In fact, many of the scientists and scholars who came to the United States from Germany in the 1930s remarked on the openness of the U.S. system. Students could talk to professors, using their first names, and could volunteer to contribute ideas when not necessarily called on. The American system was also far more open to opportunities than the British system in the early twentieth century.

This vision of a new kind of university, fostered by the first president of Johns Hopkins, Daniel Coit Gilman, began to attract the interest of established and prospective scholars in the United States. Gilman, who was

not averse to recruiting stars from other institutions, set his sights on places like Harvard. At first, his model was not overwhelmingly well received. Charles Eliot, who led Harvard in the late nineteenth and early twentieth centuries, said the Hopkins and German systems of higher learning would fit Harvard freshmen “about as well as a barnyard would suit a whale.” As the competition rose and Eliot anticipated the loss of great faculty members to Johns Hopkins, Harvard's model began to change, as others did elsewhere. That transformation catalyzed a great deal of interest in the new American university.

Along with the influence of the German and other European systems, the late nineteenth and early twentieth centuries witnessed a growing belief in the potential of science and technology. During the Civil War, the federal government became involved with universities. Responding to a demand for agricultural colleges, President Lincoln and Congress passed the Morrill Act of 1862, providing funding for land-grant colleges. The Act – which likely passed during the Civil War because the Southern states were not represented and therefore could not filibuster against it – fostered agricultural revolutions in the United States and made possible the establishment of state universities and research stations.

The emergence of organized academic disciplines further shaped the American university model. At the end of the nineteenth century, presidents of universities, such as Harvard's Eliot or Columbia's Nicholas Murray Butler, took on the responsibility of assessing the quality of academic work at their institutions. As the breadth of knowledge grew, it became increasingly difficult to assess the value of this work. Instead, many university presidents embraced the growth of disciplines, which allowed them to hand off the task of evaluating the quality of work to a set of peers in the appropriate academic disciplines.

All the factors mentioned above led to a social compact between government, the universities, and society. The government, on the one hand, would provide resources and – remarkably – autonomy from government control. This is a remarkable concept: that

government would give resources to universities, expecting certain things from them but trying to remain hands-off. Universities, for their part, would prepare people for more highly skilled jobs, produce better-educated citizens who could participate in the democratic process, and encourage the discoveries that have changed our lives.

Of the dozen core values I discuss in *The Great American University*, four were central to the developing university system. These values were first formulated during the Enlightenment and the growth of scientific knowledge that occurred, for example, in seventeenth-century England. I should mention that these values are represented as

Sixty percent of all Nobel Prize winners in science since World War II have been Americans or foreign nationals working at American universities.

ideals; to this day, they are not necessarily entirely approximated. First was the value of universalism, or meritocracy. That is, individuals were to be judged on the quality of their work, not on the basis of any ascribed characteristics, such as gender, nationality, social origins, or race. A second core value was organized skepticism, or the incessant questioning of claims to fact and truth, which meant being open to radical ideas but conservative in determining the methodology needed to demonstrate the fact value of those ideas. Third, universities embraced the free and open communication of ideas, whereby secrecy, prior restraint, censorship, and privileging certain kinds of knowledge were anathema to an open system of communication on which knowledge could be built. A fourth core value was free inquiry and academic freedom, which was not to be viewed as a privilege but as foundational to great universities. Free inquiry was considered essential for releasing the imagination and challenging established orthodoxies and prevailing views in science and society. This principle lies at the heart of the way universities are organized to

create their own criteria of excellence, independent of government or external political ideology. Some nations still have not learned that this is a necessary condition for greatness.

It was not just a matter of values, however. Exceptionally talented people were brought into the system from around the globe. Enlightened and bold leadership was extremely important for recruiting talent in the early years. For example, no more than a decade after he founded the University of Chicago in 1892 – using Rockefeller’s money, in short order – William Rainey Harper, a tireless recruiter with a truffle-hunting dog’s nose for talent, had made the University of Chicago one of the top five research universities in the United States. Eventually, leaders such as Harper, Eliot, Gilman, Butler, and Andrew Dickson White of Cornell University handed over their work to a new set of extraordinary leaders in the 1920s and 1930s.

Beyond leadership, American universities cultivated a strong belief in competition and enjoyed a high level of autonomy from the state. Competition has played a central role in the development of quality in American higher education; indeed, one might argue that competitiveness among elite institutions today has reached problematic heights. Academic free agency dates back to the formation of the University of Chicago, when universities began to compete for outstanding talent. After World War II, as unprecedented public resources were invested to build excellence in the university system, institutional autonomy endured; the impact of this government support was far greater than what private philanthropy or foundations alone could have achieved.

Among the leaders who championed core values in the 1920s and 1930s, two were extraordinarily important. Robert Maynard Hutchins, president of the University of Chicago from 1929 to 1951, was perhaps the greatest champion of academic freedom and free inquiry in the history of American higher education. One anecdote is particularly striking: During the McCarthy period, the state of Illinois attempted to pass legislation that would have made it unlawful for a member or former member of the Communist Party to teach in Illinois public

schools or at the University of Chicago. Hutchins gave the legislative committee nothing short of a civics lesson when he testified against the proposal. Indeed, he brought the whole commission to its knees, and the legislation, needless to say, never passed. Hutchins initiated the tradition that believes universities must cultivate a culture of open and free inquiry. He advocated a meritocracy of ideas that is still integral to the culture at the University of Chicago.

James Conant, president of Harvard University from 1933 to 1953, was also a champion of meritocracy. The idea of meritocracy, however, wasn’t new: for example, Cornell opened with a broad sense of meritocracy that invited women and minorities to the

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University. Prior to his appointment, Harvard had purged itself of its undergraduate population of Jews. Quotas were set to limit the number of Jewish undergraduates who could attend and remained in effect for many years. Conant transformed the admissions system according to his belief that admissions should be based solely on merit. He defended the conviction that Harvard should recruit students of talent, regardless of means or background. Thus, Conant, Hutchins, and other university presidents of their generation defined these core values as essential to the development of the university system.

Why do I identify January 1933 as the inflection point for the ascendancy of American universities? It would be a mistake to think that prior to that point there did not exist, for example, a growing body of able young

physicists in this country. The United States had a great deal of young talent – people who, when they traveled abroad, were fascinated by universities in Germany. But when they came home, they were in need of leaders. In the early 1930s, a wave of immigration provided the U.S. system with new leadership. After Hitler came to power in January 1933, the German university system caved in. By April of that year, Hitler had purged, on ideological and religious grounds, the great leaders of the German universities.

Contrary to what most people think, the American research university is amazingly young, and it is highly embedded in the dynamics of the larger American society.

This turn of events, while catastrophic for German universities, was a great boon for American institutions. The United States became the beneficiary of the intellectual migration from Europe that followed Hitler's rise: 50 percent of theoretical physicists emigrated; 25 percent of German particle physicists left. These brilliant thinkers included physicists Albert Einstein, Hans Bethe, and Enrico Fermi; physicist-turned-biologist Leó Szilárd; father of molecular biology Max Delbrück; sociologists Paul Lazarsfeld and Theodor Adorno; writers Thomas Mann and Bertolt Brecht; architect Mies van der Rohe; composer Béla Bartók; and the father of psychoanalysis and his wife, Sigmund and Anna Freud. Some came from Germany, others from Hungary, Italy, and those countries most affected by Hitler's regime. The existing disciplinary communities largely decided where the thinkers ended up: that is, they determined which university would most benefit from each scholar's potential for leadership, based on who was already working on certain issues at that institution. These placements created a new and extraordinary chemistry between thinkers. American universities benefited, on the one hand, from the horizontal mobility of émigré scholars and, on the other, from

the vertical mobility of up-and-coming American academics, many of whom were Jewish and came from underprivileged backgrounds.

Along with this infusion of talent, a new science policy was put in place after World War II, laid out in *Science, the Endless Frontier*. MIT engineer Vannevar Bush (no relation to the Bush clan of more recent history), an instrumental figure in developing scientific work to aid the war effort, was the primary author. President Roosevelt inspired Bush to write the report by asking the question: what will happen to American science, engineering, and technology after the war? Scientists who had developed the first nuclear weapons would leave Los Alamos National Laboratory, somewhat discouraged by what they had achieved, to return to university settings, wanting to get away from big science and the first nationally organized scientific enterprise. What would happen then?

Bush, who was Roosevelt's advisor, said, "It's going to be a complete disaster." "Well, let's do something about it," Roosevelt replied. With some help from committees assigned to various tasks, Bush produced the prescient, brilliant, and extraordinarily consequential policy document. First, he advocated for the creation of a National Research Foundation, a government-endowed, independent organization that would subsidize fundamental research in science and engineering – pure science, in particular – after the war. That idea morphed into the National Science Foundation, which was formed in 1950.

Beyond leadership, American universities cultivated a strong belief in competition and enjoyed a high level of autonomy from the state.

Perhaps even more important, Bush argued cogently for the use of public money to support research at universities – in essence, outsourcing research and knowledge production to universities rather than state-controlled agencies or institutions. A system of peer review, as a measure of quality, would also

The United States became the beneficiary of the intellectual migration from Europe that followed Hitler's rise.

be the domain of universities. He argued for linking research to teaching missions in the universities and laboratories. Today, we emphasize undergraduate education, but we often overlook the forming or curricular teaching that takes place at universities in graduate laboratories. Not only are graduate students contributing to the growth of knowledge, but they are engaged in an interactive form of learning. In this way, the American system differentiates itself from many other systems around the world.

After the war, two university leaders emerged as exemplars of two polarly opposed visions: one forward-looking, the other backward-looking. Frederick Terman, provost of Stanford University from 1955 to 1965, was perhaps the greatest provost in the history of American higher education. A student of Vannevar Bush, he ran the antisubmarine laboratory efforts at Harvard during the war but spent the rest of his career at Stanford. He envisioned how universities would be reorganized and restructured, and he capitalized on that vision. For example, Terman and Stanford President Wally Sterling moved the university's medical school from San Francisco to the Stanford campus in Palo Alto. This happened in the late 1950s, three or four years after Watson and Crick discovered the double-helical form of DNA. Terman realized that the future of medicine was linked to genetics and biology and had the foresight to directly connect the biological sciences with medicine and its applications. Though the move was costly – four buildings at the price of \$12 million – it turned out to be a huge success.

Once that project was under way, Terman turned to recruiting. He predicted increasing relationships between industry and the universities; he strengthened engineering disciplines; and he oversaw the creation of the Center for Advanced Study in the Behavioral Sciences, which would bring social scientists to Stanford. He was clever as hell.

Image courtesy of the Barbara McClintock Papers,
American Philosophical Society



Barbara McClintock



Vannevar Bush

Image © Corbis

He wanted to recruit young and talented people and bring them in on the cheap. As a member of the National Academy of Sciences, he had access to the ballots of all the young people being nominated to the Academy. He looked for all those who just missed the cutoff and did not get in, and he went after them. He brought them to Stanford; they eventually got elected to the Academy; and they became leaders in their fields, with many of them receiving Nobel Prizes.

In contrast to Terman's forward-looking style, the preeminent historian Jacques Barzun, dean of faculties and provost of Columbia from 1958 to 1967, favored a return to Cardinal Newman's university of the 1850s. He wanted universities to remain sanctuaries, or cloistered enterprises, and was wary of the government's increasing involvement with the research university. Thus, Columbia resisted new developments, undergoing a period of relative stagnation. Columbia resisted the growth of laboratory life and industry-university relations, which were anathema to Barzun.

Terman's vision laid the foundation for Silicon Valley. He didn't originate the term, but he did originate, on campus, the work of Hewlett and Packard, for example. He gave them some space in one of his garages, where they built the first elements of their company. Today, too few universities look, in a systematic way, at their economic im-

pact on their local communities and states. Stanford is one of the few that does, and the University reported in 2008 that faculty members, students, and alumni have founded more than 2,400 companies. A subset, including Cisco Systems, Google, and Hewlett-Packard, generated \$255 billion in total revenue among the Silicon Valley 150 in 2008. MIT also tracks its economic impact: in 2008, it reported approximately 4,000 MIT-related companies that employ 1.1 million people and have annual world sales of \$232 billion – slightly less than the gross domestic product of South Africa and Thailand, which means that MIT companies form one of the forty largest economies in the world. Moreover, this reporting does not account for the multiplier effect: it is not just the companies, but the services to those companies, that creates jobs.

At present, the United States has the greatest system of higher learning in the world, especially at the level of elite universities. That said, one threat many people fear is global competition, or the perception that Chinese and European competitors could overtake American universities. This scenario is not imminent. Although some countries have enormous potential for building human capital, the state-controlled systems in Asian and European nations are impeded by an absence of competition; the profes-

sors are characterized by a state-employee mentality that does not exist in American state universities. Furthermore, some countries have set up systems of internal competition with their own universities. For example, French elites want to send their kids to the *École Normale Supérieure*, the *École Polytechnique*, and the other *grandes écoles*, which are far more prestigious than French public universities. In Germany, the state-run universities are second to the Max Planck Institutes, which are run by the central government, are not involved with teaching, and offer better salaries and resources for research. Such internal competition makes countries less competitive globally.

In Europe, the flow of talent is outward, at the moment. The systems there are structurally rigid and do not allow young people to shift their interest or attention to new topics. Research and teaching missions are separate. Take, for example, the French National Center for Scientific Research (CNRS), which is somewhat comparable to the U.S. National Science Foundation or the National Institutes of Health. Scientists at the CNRS have tenure the first day they step into the laboratory. There is no real form of accountability or quality review. Many people run businesses on the side while they hold their CNRS appointments. Moreover, initiating reform in this and other similar societies is difficult.

There is another, equally important dimension to this discussion: we should not fear global competitors. Foreign competition would be good for the American system and the growth of knowledge. Even if the United States did not boast 80 percent of the top 20 universities in the world, we would still have enough. Increased global competition would mean more universities contributing to the growth of knowledge, to finding cures for diseases, and to advancing the welfare of a nation's people. Many such accomplishments would be transferable across national borders.

If not global competition, then what are the threats to the American university? To paraphrase Walt Kelly's wonderful cartoon character Pogo, "We have met the enemy, and he is us." In the United States, government ideology intrudes into the research processes of the universities, especially in moments of national crisis. During World War I, professors who spoke out against the draft were fired; tenure did not hold much force at the time. Other perceived dissidents were fired during the Red Scares of the 1930s and 1940s. Recent attacks on universities

American universities benefited, on the one hand, from the horizontal mobility of émigré scholars and, on the other, from the vertical mobility of up-and-coming American academics.

go beyond academic freedom of speech to target the research mission itself. Anti-terrorism legislation, specifically the USA PATRIOT Act of 2001 and the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, contains provisions that influence and can curtail scientific research.

The case of Thomas Butler is an interesting example. Butler was one of the nation's leading immunologists working on plague. For twenty-five years, he had transported

bacteria from Tanzania and was developing antibiotics that might be used to defend against bioterrorist acts. He was arrested and indicted on sixteen charges for violating the PATRIOT Act. The FBI searched his laboratories, lab notebooks, and tax records – then added fifty additional charges to his case. Eventually, he was fired from his

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university. Despite the fact that the jury exonerated him on all but one minor charge related to the PATRIOT Act, he was convicted of tax evasion, among other infractions, and was sent to jail for nine years. (The sentence was later reduced to two years.) He had to pay his university \$250,000 in fines.

The consequences of such actions, which are little known to the wider public, led Cornell physicist Robert Richardson, recipient of a Nobel Prize, to disclose the effects of the PATRIOT Act on research at Cornell. Before the legislation was passed, Cornell had thirty-eight laboratories studying disease- and scourge-causing agents. After two years with the Act in force, and after a number of experiences like Thomas Butler's, only two such labs remained. According to Richardson, "We've got a lot less people working on interventions to vaccinate against smallpox, West Nile virus, anthrax, and any of the 30 other scourges." Thus, anti-terrorism legislation has in fact inhibited research. It has also influenced the composition of university laboratories. A student from Iran – deemed to be a country that supports terrorism – cannot so much as walk into a laboratory that is doing research with select agents without placing the faculty member in charge of that laboratory at risk of criminal indictment and punishment. Consequently, the government is telling faculty whom they can have as graduate students and whom they can hire.

Another major factor is restrictive visa policies. The United States produces so few science and technology majors – certainly not enough to staff both K – 12 programs

as well as colleges and universities – that we are in jeopardy of losing the source of great talent that has come from abroad. In fact, 93 percent of public school students in the fifth through eighth grades in the United States are taught the physical sciences by a teacher without a degree or certificate in the physical sciences. In addition, government investigators have endeavored to review and potentially restrain the publication of biology papers, thereby violating the principle of open communication. There has been increased surveillance in university libraries; outside investigators do not have to show probable cause to search library records and computer files, and librarians are not permitted to inform individuals that they are the object of investigations.

External to the universities, the politicization of science and the resurfacing of anti-intellectualism in America have further imperiled important research. The next stage of embryonic stem cell research has been delayed by controversy over whether to develop new cell lines. Global climate research is slowed by government efforts to censor scientific reports by prominent climatologists such as Jim Hansen, whom the Bush administration attempted to muzzle from giving talks because his views differed from its official policy and ideology. In a dramatic effort to promote abstinence-only sexual education, the Bush administration dismantled Centers for Disease Control

Anti-terrorism legislation has inhibited research. It has also influenced the composition of university laboratories. . . . The government is telling faculty whom they can have as graduate students and whom they can hire.

and Prevention websites on reproductive health that mentioned condoms as a method for preventing the spread of HIV. The peer-review system is also at risk, as efforts to name political appointees to the National

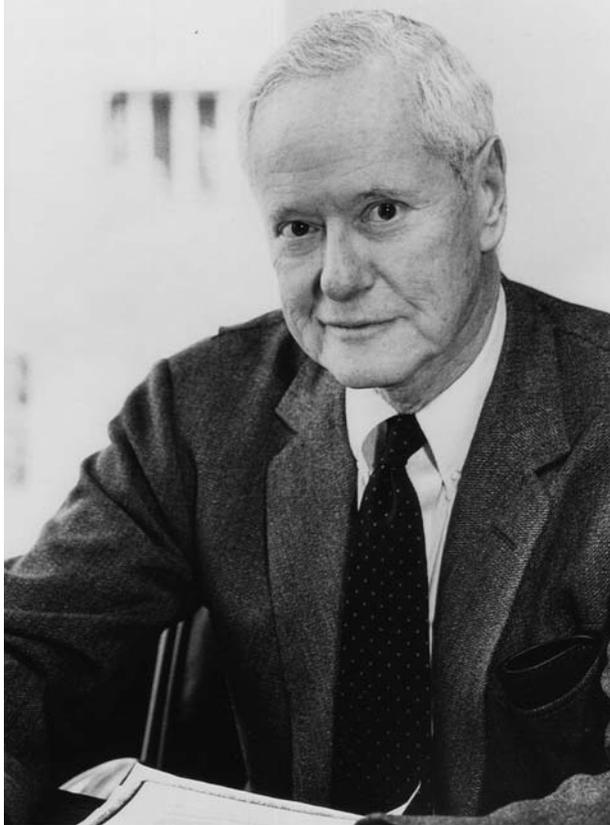
Peer Review Committees threaten the system's integrity. In recent years, scholars have come under attack for expressing non-dominant views that challenge American foreign policy.

It is also possible that a lack of funding will dismantle public universities in this country. The University of California, which has long provided access, opportunity, and research quality in one system, is being starved at the moment. California legislators who are voting for this starvation policy do not seem to appreciate its cascading effects. If the university system begins to lose faculty members who are great scholars and scientists, it will lose great graduate students as well as federal and other forms of research money.

It will have poorer teachers.

It will not produce the spin-off companies that influence and lead to innovation and new high-technology jobs in the local and national economies. The state of California is not alone in its efforts to cut spending, but it provides one example in which legislators overlook the fact that it is infinitely harder and far more costly to rebuild lost excellence than to maintain it.

Universities themselves are not immune to internal challenges. First, the commercialization of intellectual property has eroded scholarly impartiality. One hundred years ago, scholars and scientists believed they should not profit from their discoveries. Today, that norm has become obsolete. Most great universities foster the use of intellectual property for good, productive reasons, following the Bayh-Dole Act of 1980 and its 1982 amendment. But given the real and potential conflicts of interest that have been exposed, how do universities reformulate a balance that reinforces essential norms and institutional core values while using intellectual property for the benefit of society?



Robert K. Merton (Image © Sandra Still)

Second, even in universities that foster open discourse and a marketplace of ideas, there is a tendency to gravitate toward intellectual orthodoxy. If we are honest, there are certain things we just don't talk about openly, even at the great universities. We hear most about a culture of resistance to new ideas on the social, political, and humanistic levels, but it goes on in the sciences, too. New and radical ideas are not acknowledged, and orthodoxy tends to hold forth. The truth is that there is not a huge amount of intellectual courage in American universities. There's not a great deal of it anywhere, but we certainly don't have a superabundance. There is no impulse, as Max Weber said, to recognize and teach inconvenient facts or possibilities.

Third, we have problems with the structural balance required for innovation and excellence. Some of the old structures, which have been in place for a hundred years, are becoming fetters on the growth of knowledge. Information expands much more rapidly than does the university's

structural ability to adapt to the free explosion of new knowledge. For example, despite movement toward interdisciplinary work, the sense of control and power that is locked into individual schools and departments inhibits the pursuit of knowledge via multidisciplinary study. Can the university adapt, as any organism must adapt, to environmental changes?

A fourth problem is that the rich are getting richer in this country, not only in the general population but in universities, too. Fifty years from now, perhaps five or ten universities will have substantial endowments that double at the same rate as everyone else's endowment – roughly seven to ten years. If Harvard's endowment is roughly \$30 billion, in seven to ten years it becomes \$60 billion, then \$120 billion. Columbia's endowment of \$7 billion doubles to \$14 billion, then \$28 billion. Eventually, the disparity between great universities and those with far smaller endowments than Columbia, the University of Pennsylvania, MIT, Chicago, or Boston University will have real consequences. Will smaller universities simply become farm systems for a handful of universities that will become the Oxfords and Cambridges? Will real competition be lost, especially in the high-priced, expensive fields?

How do we prevent the skewing of wealth? I would not support taxation, or the sharing of revenues – aside from laboratory work – among the various schools. That would prove disastrous, but some mechanisms need to be found to keep the competition among our great universities alive. (As poor as Columbia's football program has been over the years, I don't think Harvard is interested in giving us money to improve it – or to make us more competitive with them in places where we are competitive, such as neuroscience or art history.) While I believe that President Obama understands the full scope of the university's mission, thus far I am disappointed by what he has been able or willing to do. Certainly, nothing has changed with the anti-terrorism legislation. In fact, in some ways the effects have worsened. The stimulus package was beneficial, but one-time funding is not the same as base funding. The average age

of researchers in the medical and biomedical sciences who receive first-time R01 grants is forty-three; younger scientists cannot operate laboratories independent from their mentors. Those strictures must be attacked if we are going to remain extraordinary and strong.

There are good reasons to believe the United States should be able to maintain its dominant position among preeminent research universities. We should not fear foreign competition, which I believe is not imminent and, at any rate, will be good for the international system of higher learning and for the growth of knowledge once it emerges. I also believe that there continues to be enormous, unrealized potential in the American system. Not all threats are absolute; many simply slow down the rate of improvement. I am interested in the slope of that line: does it continue on an upward trajectory or flatten horizontally? There are choices to be made. If we follow the path taken by many states in dealing with their great universities, the American education system may lose its luster. That is the great test we face, and whether we will pass remains an open question.

Question

European bureaucracies can engage in large scientific projects more effectively than the American bureaucracy. Is this difference a threat?

Jonathan Cole

While this may be true, it seems to me that American scientists are deeply implicated in the very large European projects, as they should be. On the more general level, bureaucratization of the university, in terms of big – almost global – science, is an important problem that we face. Universities add bureaucracy after bureaucracy; the bureaucracies are linked to interest groups; and the interest groups are stakeholders in the university. It becomes increasingly difficult for university leaders to move in any direction without facing opposition to almost any idea that they have. The bureaucratization and the change in scale of the university indeed represent threats.

Question

Could you speak briefly about the challenges that face the social sciences and humanities?

Jonathan Cole

We cannot deal with the sensibilities of being human, of making moral and ethical choices, without an education in the humanities. Increasingly, even large-scale science projects employ philosophers and ethicists who are actively engaged in some of the problems that arise, for example, in the fields of nanotechnology and nanoscience. A great university necessarily integrates the humanities, the arts, and the social and behavioral sciences. This issue is not adequately addressed in my new book, but it is critical to the success of any enterprise seeking greatness.

If the university system begins to lose faculty members who are great scholars and scientists, it will lose great graduate students as well as federal and other forms of research money. . . . It will not produce the spin-off companies that influence and lead to innovation and new high-technology jobs in the local and national economies.

Question

This week, Barack Obama named the historically black schools as a key segment of our educational system that he wants to invest in. What role do you think those schools will play in Obama's interest in the future of education?

Jonathan Cole

Supporting historically black schools is important. Their graduates have a much higher probability of going on to graduate school and becoming members of faculties.

We have not been good at articulating in a persuasive way the multiple missions and the achievements of our universities.

We are becoming an increasingly diverse society; soon, a majority of the population will be members of minority groups. If we do not begin to tackle persistent disparities, we will face mounting problems, especially in the areas of science and technology development. Beyond supporting historically black colleges, a much bolder plan is needed to sustain the quality of American universities. In *The Race Between Education and Technology*, Harvard economists Claudia Goldman and Larry Katz argue that the United States has excelled in education and technology development in part because it has a record of being open to social mobility and education at the mass level since the beginning of the twentieth century. Historically, as more people finished high school and college, they acquired the skills necessary for jobs in a technological society. We have since lost that edge to European and other nations that have opened up their systems significantly. It is not clear that our K – 12 schools, or even many of the undergraduate programs around the country, can ensure a labor force – as envisioned by Vannevar Bush in *Science, the Endless Frontier* – equal to the task of succeeding in the knowledge-based twenty-first century.

Question

Could you elaborate on the elements of the post-World War II educational policy that you find most attractive? Would these elements still be useful today?

Jonathan Cole

Historians of education often muse on the “golden age” of higher education: the 1960s enjoyed the aftermath of Sputnik and the infusion of increased federal expenditures in science and technology laboratories and research. I'm skeptical about “golden ages.”

The same historians who nostalgically look back on the Golden Age of funding during the 1960s often forget to mention that the campuses were torn asunder by ideological disputes, including over the war in Vietnam. Campuses were not harmonious systems where everyone joined together under common values and common objectives. The policies that were represented in postwar science policy were instrumental over the long run in differentiating the American system of higher learning and had an enormous positive effect on the growth and quality of universities here. But once set in motion, these policies did not determine a golden age.

Question

Why have research universities been unable to increase awareness among the broader educated public about the benefits universities bring to culture and society, whether in the sciences or the humanities? What can members of the university community do to increase awareness among the broader public?

Jonathan Cole

Many leaders of American universities spend seventeen hours a day solving immediate problems and lack the luxury of time. That said, I think they ought to begin to make this case wherever they can in whatever way they can. Part of the reason for my particular point of view in the book was to address the reality that few people out there – including members of Congress and state legislatures – really understand that undermining the quality of universities equates to turning off a pipeline that is essential for national excellence and for the upward trajectory of the quality of life in American society. We have not been good at articulating in an offensive way the multiple missions and the achievements of our universities. Instead, we have played defense against highly esoteric matters, such as indirect cost recovery or claims relating to conflicts of interest. We have failed to realize what mathematician and philosopher Alfred North Whitehead called the “fallacy of misplaced concreteness.” We focus on the

trees; we do not give people the broader picture of the forest in which the trees are embedded and why it is important to preserve the forest. ■

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Jonathan R. Cole, *The Great American University: Its Rise to Preeminence, Its Indispensable National Role, Why It Must Be Protected* (PublicAffairs, 2010)

The Financial Crisis and Economic Policy

Presentations by Benjamin M. Friedman and Robert M. Solow

Comments by Peter Temin

Introduction by John Y. Campbell

1961st Stated Meeting, held at the House of the Academy on November 10, 2010



John Y. Campbell

John Y. Campbell is the Morton L. and Carole S. Olshan Professor of Economics and Chair of the Department of Economics at Harvard University. He was elected a Fellow of the American Academy in 2000.

Introduction

Within the past week, we have seen not only a national election but the announcement that the Federal Reserve Board will take extraordinary new measures to stimulate the economy and job growth by buying \$600 billion in long-term treasury securities through the first half of next year. The program is known as “quantitative easing round two,” or QE2. This is an un-

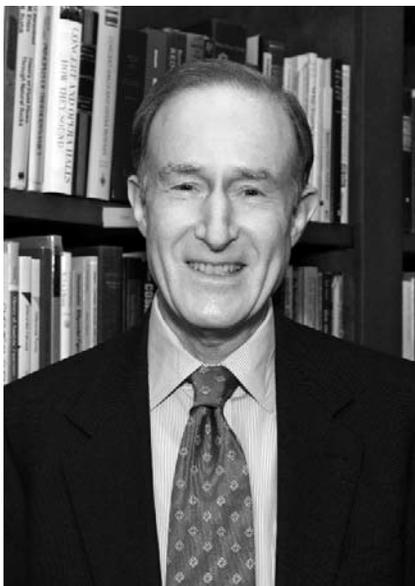
precedented step, and it is a sign that both the United States and the world economy are facing exceptional problems as a result of the global financial crisis that developed and unfolded from 2007 to 2009. Crafting effective monetary and government strategies to get growth back on track is a challenging task.

The Fall 2010 issue of *Dædalus*, edited by Ben Friedman and Bob Solow, dissects the causes of the collapse and the impacts that government policy can have both before such an event and in its aftermath. The issue’s authors approach this subject from a variety of scholarly perspectives, including the law, political science, economics, and finance.

Our first speaker is my colleague Benjamin Friedman, who is the William Joseph Maier Professor of Political Economy at Harvard University and the author or editor of thirteen books, including *The Moral Consequences of Economic Growth* (2005). His *Day of Reckoning: The Consequences of American Economic Policy under Reagan and After* (1988) received the George Eccles Prize for Excellence in Economic Writing from Columbia University. Ben is a director of the National Council on Economic Education and an advisor to the Encyclopaedia Britannica. He is also a predecessor of mine as Chair of the Harvard Economics Department and in fact recruited me to Harvard. Ben has been a Fellow of the American Academy since 2009.

Second to speak will be Robert Solow. Bob is Institute Professor Emeritus at MIT and a giant of the economics profession. In 1961, he was awarded the John Bates Clark Medal of the American Economic Association. In 1987, he received the Nobel Prize in Economics, in recognition of his contributions to the theory of economic growth. In 1999, he received the National Medal of Science for his creation of the modern framework for analyzing the effects of investment and technological process on economic growth. Bob is also well known for his wit. I vividly remember attending a conference at which he discussed a paper that was rather indiscriminate in its use of assumptions. Bob compared the paper to a ride on the New York subway, with assumptions getting on at one station and then off at the next as new assumptions got on . . . and so forth down the line. Bob is a long-standing Fellow of the American Academy, and when I say long-standing, I mean that he has been a Fellow since 1956, two years before I was born.

We have also with us tonight one of the contributors to the *Dædalus* volume, Peter Temin. Peter is the Elisha Gray II Professor Emeritus of Economics at MIT. He is well known for his influential books on American economic history, including themes of slavery and industrialization in the nineteenth century and two books on the Great Depression. Peter has served as President of the Eastern Economic Association and the Economic History Association. A Fellow of the American Academy since 1986, Peter’s essay in the *Dædalus* volume is “The Great Recession and the Great Depression.”



Benjamin M. Friedman

Benjamin M. Friedman is William Joseph Maier Professor of Political Economy at Harvard University. He was elected a Fellow of the American Academy in 2009.

A person would have to have been living in a closet not to understand that something very wrong happened to the U.S. economy and to the broader world economy over the past several years. We are all aware as well that much of what went wrong has to do with events within our financial system. Not surprisingly, these events, unfortunate as they were, have touched off an enormous public conversation about what we can do to ameliorate the consequences of such events, as well as what we can and should do to prevent such events from happening in the future or at least to lower the probability of their happening again.

I sympathize with this line of conversation and the public debate to which it has given rise. My concern, though, and this is the direction of my own contribution to the *Dædalus* volume, is that something more fundamental needs to be addressed, and the public conversation has not done that yet.

I take the role of the financial markets in a free enterprise economy to be one of allocating the economy's scarce investment

capital. In an economy like ours, we devote approximately 20 percent of what we earn and produce to investing for our economy's future. Nobody decrees that 20 percent is the right share of what we produce, and no central authority decrees how that 20 percent ought to be allocated. The decisions that determine how much goes into business equipment, into machinery, into new factories, into new houses, or to this industry rather than to that one are instead the result of the countless daily decisions made, on one side, by individuals, families, and firms that are bringing their funds to the market to be put to work in banks or mutual funds or through direct investment, and, on the other side, by individuals, families, and firms that are coming to the market to be financed. Allocation of the economy's capital is what our financial markets do.

The financial system also provides other services that are valuable. But I highlight the allocation of the economy's capital because for all of the financial system's other functions – for example, running the payment system (making sure that when you write a check the money gets to where you want it to go); allowing families to save for their retirement or have liquid funds at their disposal; and providing insurance –

I take the role of the financial markets in a free-enterprise economy to be one of allocating the economy's scarce investment capital.

we have well-established alternative models that don't run on a free-enterprise basis. Government knows how to do those things. The one thing our financial markets are doing that is important and specific to a free-enterprise economy is allocating our economy's capital.

The question I think we are now entitled to ask – indeed, are obligated to ask after the experience through which we have just lived – is whether our economy is being well served by our financial system. Is

its capital allocation mechanism doing its job well and at a cost that the economy can afford?

When we talk about the economy's problems and the recent financial crisis, we mostly talk about the losses that various investors have incurred on the paper assets that they hold. People's stocks lost value. People's mortgages defaulted. Banks took losses. The key thing to keep in mind is that the losses incurred on pa-

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per assets are merely the financial reflection of what is happening in the real economy. The fact that losses occurred means that assets were mispriced and resources, therefore, were badly allocated. For example, the fact that mortgage interest rates were so low and lenders were so willing to advance mortgage credit on a no-money-down and no-documentation basis meant that millions of Americans built and bought houses that now stand empty. These houses were not costless to build. They used investment capital that could have been allocated elsewhere. Maybe new airports, maybe new industries, maybe new research facilities. These houses also took labor that could have been allocated to other applications. What happened with the housing and mortgage market was not unique, either. A similar event occurred ten years ago, when we had the high-tech bubble in the stock market. The overpricing of tech stocks, especially in the communications industry, meant that these firms were able to raise money to invest in assets – for example, fiber optic cable lines – that then became worthless. The United States now has tens of millions of miles of fiber optic cable that have never been lit and presumably never will be lit. Why? Because the



Foreclosure sign in front of a townhouse in Herndon, Virginia, November 22, 2007

financial market didn't do its job correctly when pricing the stocks of these communications firms.

Financial markets are supposed to allocate an economy's capital. This is their fundamental function in an economy like ours. They are supposed to determine how much capital goes to fiber optic cable, how much goes into new manufacturing facilities, how much into automobile plants, how much into new apartment buildings. The recent evidence, however, indicates that the financial system has been making big mistakes.

Financial markets are supposed to allocate an economy's capital. This is their fundamental function in an economy like ours.

We also need to ask how much it is costing us to operate this financial system that allocates our capital. The answer is a lot. The newspapers have emphasized the fact that the share of all profits earned in the economy – in other words, the share of the returns on the capital being invested – that gets siphoned off to pay for the mechanism that does the allocating has been rising dramatically. Thirty years ago, the cost of running the financial system was 10 percent of all of the profits earned in America. Fifteen years ago, the financial system cost somewhere between 20 and 25 percent of all profits earned in America. In the first half of this decade, before the crisis hit, running the financial system took one-third of all profits earned on investment capital. Moreover, the profits earned by financial firms represent only one part of what it actually costs us to run the financial system. Financial firms pay salaries and bonuses and rents; they have advertising budgets, travel budgets, and so on. Maybe the financial system really could not allocate capital adequately without hours and hours of advertising during primetime television. If so, that merely means that the function of allocating capital is all the more expensive. Maybe, too, we couldn't allocate capital without banks, hedge funds, and

Photograph © Paul J. Richards/AFP/Getty Images

asset management firms taking up much of the prime real estate in Manhattan. But if that is also true, then it simply means that the cost of this activity is all the higher.

The time has come for a serious evaluation of the costs and benefits of running our financial system.

As someone who teaches undergraduates at the local university, I must say that the most obvious cost to me is the fact that so many of our best undergraduates go off into the financial world, where they participate in this process. These are people who could be doing something else. If it is necessary to have that share of our nation's best talent engaged in the allocation of our economy's capital, then so be it. But if that is so, it means that this process is costing us, in terms of resources used, a great deal.

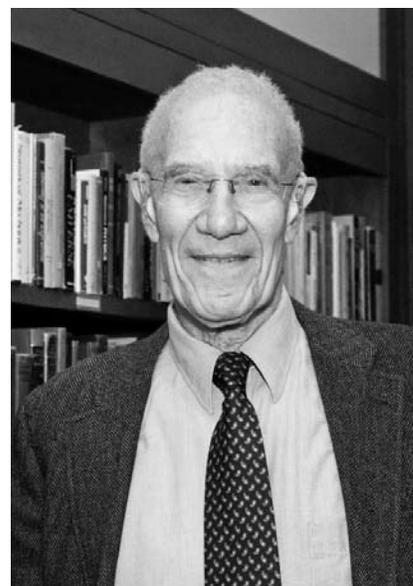
In my contribution to the Fall 2010 *Daedalus* volume, I suggest the time has come for a serious evaluation of the costs and benefits of running our financial system. Understanding the cost is itself a major enterprise, which no one has yet done. We simply don't have, to my knowledge, an all-in estimate of the cost of allocating our economy's capital. We know what the profits are. We have some notion of the salaries. But we don't know the overall cost. We need to undertake a major project to understand the costs involved in the allocation of the economy's investment capital – including, especially, the costs of the occasional disruptions to which our current system exposes us. This is difficult to do empirically, but at least it is conceptually straightforward.

The harder part of the assignment is to evaluate not the costs but the benefits. The problem lies in establishing some benchmark against which to understand how well our economy's allocation of capital is doing. Compared to what, though? To a Soviet-type or Maoist-type central planning mechanism? There the answer is clear. We are doing well compared to such

a system. But that is not the benchmark we should have in mind. Instead, we should be asking questions such as, what if our financial system were smaller, as it was thirty years ago? What if some particular part of our financial system didn't exist? Would we really be allocating capital any differently if the firms that engage in super-high-speed trading didn't exist? Would we be allocating capital any worse if minute departures of prices from their true value were resolved in two nanoseconds instead of four nanoseconds? I don't think we would. But the cost of operating those firms – including not just the profits but the salaries, bonuses, rents, the travel budget, and so on – is a major levy against what we could otherwise do with our resources. How about the market for what are called collateralized debt obligations (CDOs), a type of derivative? Has our economy operated better because of the existence of these obligations? Does anybody think they are worth what this market costs us to operate? I don't think so myself, but I don't have much more than a guess. What we need is some serious evaluation.

We need to ask how much it is costing us to operate this financial system that allocates our capital. The answer is a lot.

I do have some suggestions for policies that we could pursue in the interim, but what we most need is a serious project – perhaps even an American Academy project – to evaluate both the costs to run our financial system in its current form and the benefits we get from it in terms of the allocation of capital. Once something costs more than the benefits it generates – whether that something is a car or a manufacturing facility or a financial system – the time has come to change it. In view of what seems to be an erosion of the effectiveness of our economy's capital allocation mechanism, together with the clear increase in costs, the time has now come to evaluate the question seriously.



Robert M. Solow

Robert M. Solow is Institute Professor Emeritus at the Massachusetts Institute of Technology. He was elected a Fellow of the American Academy in 1956.

One of the intellectual merits of the Fall 2010 issue of *Daedalus* is that it focuses so strongly on the fact that the financial system justifies itself, justifies its existence, only to the extent that it makes the real economy operate more efficiently. Finance has its charm and its excitement. Large sums of money are made and lost in a hurry. *The Boston Globe* entertainment section recently had an article noting that ten movies about Wall Street, about finance, are now in circulation. I do not recall a single movie about the index of industrial production. One wants always to focus on this question of what is the financial system doing for the real economy. Its charm is beside the point.

Ben raised the question of how efficiently the financial system performs its function. To his list of examples that might cause one to wonder whether the system is as efficient as it might be, I would add credit default swaps. The total nominal value of credit default swaps in the United States two years ago was estimated – although I have no idea how – to be something like \$60 trillion. The gross domestic product (GDP) of the United States at the time was

We have learned that a financial system of our kind tends more and more to resemble a casino. More and more it tends to create risks rather than allocate risks.

about \$14 trillion, and productive capital stock was maybe two or, at most, three times that. One wonders about how much of the \$60 trillion consisted of insurance against the risks that arise in the real economy and how much consisted simply of gambling, of bets, of wagers on whether A would default on its obligations to B.

We have learned that a financial system of our kind – and learned this most especially after the computer revolution and the growth of financial engineering – tends more and more to resemble a casino. More and more it tends to create risks rather than allocate risks. In the course of doing this, it generates enormous complexity, including many complex assets that are hard to evaluate. Highly complex assets invite asymmetries of information and asymmetries of understanding and therefore offer opportunities for enormous profits. However, operations like this add little to the efficiency of the real economy, to the volume of valuable, real output that our economy or the world economy is able to generate out of its resources.

By the way, all this stuff about how the financial system is supposed to improve the efficiency of the economy is not just “blah blah blah”; it is, in fact, real. We would not do well with a barter economy. Careful studies have been made of emerging economies, economies that are growing into the modern industrial world, and the data make clear that financial depth – some level of nontrivial financial infrastructure – actually does promote efficiency and growth in emerging economies.

Like most human enterprises, finance is subject to diminishing returns, so it is capable of becoming too large. When that happens, a second danger arises. As we

have learned from our very recent financial history, financial systems of a sufficient degree of complexity and size contain a large potential for instability. All these complex, risky assets – about which you may understand only a little more than the person with whom you deal – provide an irresistible temptation for leverage, for borrowing – sometimes to borrow short term in order to purchase risky assets, often at the long term. Financial institutions borrow from one another to acquire complex, risky assets. If you are a financial institution, you may not understand your creditor’s balance sheet. You may not understand the balance sheet of the people to whom you have loaned. But if you don’t understand their balance sheet, then you don’t understand your own balance sheet. The recent crisis has provided a lot of evidence that lack of understanding has been widespread.

Like most human enterprises, finance is subject to diminishing returns, so it is capable of becoming too large. As we have learned from our very recent financial history, financial systems of a sufficient degree of complexity and size contain a large potential for instability.

Keep in mind that this kind of situation is difficult to avoid in any modern industrial economy and is almost inherent in the idea of limited liability, without which an elaborate, real economy like ours could not exist. In an economy with limited liability, a highly leveraged owner of risky assets can lose only the equity. If things go well, though, the amount of gain is almost unlimited. The possibility of highly leveraged, complex asset structures not fully understood by anyone – certainly not by many of the participants – thus offers the possibility of instability. Any adverse event

can lead to real damage – first of all, to financial institutions. Such markets may not correct themselves but may in fact magnify disturbances as they occur.

In an unregulated or lightly regulated financial system like ours – and on the scale and complexity of our system – the danger of instability is always present.

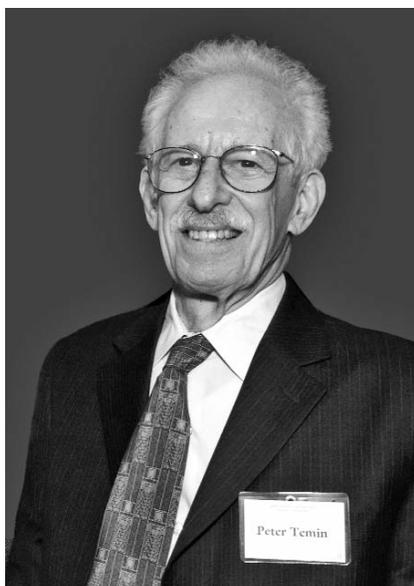
Once large-scale damage to the financial system is in the offing, the system can lose its capacity to perform the real functions that God created it to perform: to lend to businesses, to allocate savings, to provide liquidity, to provide diversification possibilities to savers. In an unregulated or lightly regulated financial system like ours – and on the scale and complexity of our system – the danger of instability is always present. The system is not always self-correcting. From day to day it is, but there come occasions when it is not.

The natural response to such occasions is to regulate, to forbid the most dangerous activities, to limit sharply the leverage, perhaps to disallow the most complex kinds of assets. However, as we have seen in the wake of our recent financial crisis, this is not easy to do. Indeed, the possibility of adequately regulating a financial system like ours is slim, and for two reasons. First, the industry is politically powerful; it lobbies on an extremely large scale and spends its considerable sums of lobbying money nonideologically to protect its chances of earning large incomes. In a politically polarized environment, the lobbying arm of the financial industry can be very effective indeed. One of the articles in the Fall 2010 issue of *Dædalus* (“Political Fortunes: On Finance and Its Regulation,” by Nolan McCarty, Keith Poole, Thomas Romer, and Howard Rosenthal) is about the political economy of regulation, and I strongly recommend the essay to you.

I am inclined to think that the problem of how to regulate the financial industry has no neat solution and that having multiple lines of defense – lots of regulatory bodies, even if they get in one another’s way – is probably a good idea.

The second reason why regulating a complex financial system is so difficult is that, regardless of what laws are passed, achieving effective regulation is extremely difficult. The regulatory capacity of our political system is not that great. The regulatory competence of the system is also not that great. Regulatory competence cannot keep up with the industry. Industry salaries are much higher than regulators’ salaries. Industry attracts the best people from your university and mine. And industry keeps pushing the envelope. Regulation has an extremely difficult time keeping up with what industry does. The *Daedalus* article by McCarty and his colleagues suggests that some kind of taboo is attached to effective regulation. The official explanation is always that problems are caused by bad apples, by bad people at Enron or bad people at Bear Stearns. This explanation is just a way of avoiding stringent regulation of the good apples or what are thought to be the natural tendencies of the industry.

I am inclined to think that the problem of how to regulate the financial industry has no neat solution and that having multiple lines of defense – lots of regulatory bodies, even if they get in one another’s way – is probably a good idea. This might not be the most efficient way to regulate, but when any given formula for regulation is likely to fail or give way at some point, having another one in place would be good.



Peter Temin

Peter Temin is Elisha Gray II Professor Emeritus of Economics at the Massachusetts Institute of Technology. He was elected a Fellow of the American Academy in 1986.

In my contribution to the Fall 2010 issue of *Daedalus*, I write about the parallels between our current condition and the Great Depression. One of the parallels is ideological. A large community of opinion today in the United States and Europe supports the idea of minimal government, free competition in finance and industry, and stable exchange rates, a view that is reminiscent of the views of the gold standard that got us into so much trouble in the interwar period. We saw a small demonstration of that recently when the president of the World Bank said we should reconstruct not the domestic system Bob has talked about but the international financial system and suggested that we use gold as the index of expectations. That set off a little firestorm in the press.

The problem with this kind of ideology is it leads people to think the best policy at the moment is to limit the government, to reduce its activities in order to get to this combination that they support. One lesson we learned from the Great Depression, which evolved much more slowly than we think things are evolving now, was that by 1936 both the government and the Federal

Reserve System thought they had recovery well enough in hand that they could each tighten up in their appropriate ways. So they did, and the result was a sharp recession in 1937 – 1938. That ideology is slightly dangerous at the moment.

Discussion

John Campbell

Bob and Ben have both expressed some skepticism that the U.S. financial system is socially productive enough to justify its high costs, whether you measure those by bank profits or the high pay of bankers or the flow of talented young people into the industry. I think that is an important and good question that needs to be asked. But it raises a further question: if the financial system is too expensive, how has it persuaded market participants to pay its bills? One can think of a few possible answers.

One line of thought would argue that the customers are suckers. An analogy can be made to bank overdraft fees, which have recently been regulated. Many people thought their bank accounts were free because they didn’t realize they would be paying overdraft fees. Then they bought

If the financial system is too expensive, how has it persuaded market participants to pay its bills?

too many checking services because they thought these accounts were free when in fact they were not. Similarly, some people argue that active mutual fund management is fruitless and expensive. On that view of the world, the problem is that the people who buy such mutual funds are not savvy enough. The customers, you and I, the people in the economy, are not savvy enough, and so we have allowed the system to grow too big.

Another line of thought would argue not that the customers are suckers but the taxpayers, because we have set up a system that provides the financial industry with

guarantees that allow it to extract what are essentially rents from the taxpayers. If we had a clear theory of how the industry persuaded market participants to pay its high costs, it might guide our regulatory or political response.

Benjamin Friedman

I think both answers are right: it has something to do with customers and something to do with taxpayers. But the real issue – to use a phrase that Louis Brandeis used as the title of a book almost one hundred years ago – is that it is all done with *other people's money*. Bob implicitly referred to the point that what we see happening in the financial system today is based in part on leverage but also in part on equity contributions from other people.

Leverage means that the owner of a pool of assets is taking risks, much of which do not accrue to the owner of the pool of assets but rather to some debt holder somewhere. You could call the risk-takers customers of the casino, or you could take the more practical view that they understand that in the event of a problem they will be bailed out by the taxpayer. The point is that the equity owner – be it a bank, a hedge fund, or some other kind of entity – of the pool of assets is taking risks that get laid off on other people.

What we see happening in the financial system today is based in part on leverage but also in part on equity contributions from other people.

A typical hedge fund is entirely equity; but its decision-makers are people who will be paid regardless of whether the fund gains or loses money. If the fund does well, they will be paid more, but the main point is *they will be paid*, and handsomely, regardless of whether the fund does well or badly. A similar compensation structure is in place at most major American financial institutions. At a typical, even modest-size bank, senior officers

The arrangements are such that the financial system's decisions are being made by people who have a financial interest but whose potential returns are bounded from below and in such a way that the risk doesn't really accrue to them.

will be better compensated when the financial institution does well than when it doesn't do well.

But even when the financial institution does so badly that it goes broke, the managers will still be compensated extremely well. My favorite current example is Citibank. In the year 2008, the shares of Citibank lost 95 percent of their value. But for taxpayer assistance, the loss would have been 100 percent. Despite this, the management of Citibank decided that forty-four people working at the bank had done such a wonderful job enhancing the value of their shareholders' stock that they were each entitled to bonuses of more than \$5 million.

The real answer to your question, John, is Brandeis's answer: it's other people's money, whether the taxpayer's, the bondholder's, or the depositor's. The arrangements are such that the financial system's decisions are being made by people who have a financial interest but whose potential returns are bounded from below and in such a way that the risk doesn't really accrue to them.

Robert Solow

John asks the right question. First of all, some believed – including, notoriously, Alan Greenspan – that the creditors of financial institutions would keep those institutions from doing foolish things. After all, Greenspan said – and correctly so – these are not two-bit players we are talking about. These are big-time operators

who are lending to other big-time operators. You expect big-time operators to be smart enough to see that they are taking a risk, and a big risk, and to ask a large enough price for that service to limit the amount of risk that is taken. That is not an implausible thought, but we have seen an example in the last couple of years where things didn't seem to work that way.

Another interesting thing about which I have puzzled, as I imagine John and Ben have puzzled, is what to do about the moral hazard. What do we do about the willingness of the taxpayer (or the taxpayer's representatives; you might have noticed that the taxpayers have recently indicated their bitter resentment of their representatives' actions) to bail out large failing institutions? What do we do about the risk-taker who says, "Oh, well, I'm too big to fail. I will be rescued if I go sour." Can we seriously expect the federal government to say, "Nobody is too big to fail. If you fail, you fail. We won't help you at all." What if the failure of a large institution does enormous damage to the real economy?

What do we do about the willingness of the taxpayer (or the taxpayer's representatives) to bail out large failing institutions?

Let me put the proposition to you in a simple way. Suppose the government announced it would not rescue commercial fishermen who went to sea on a rough day. After all, a moral hazard arises when fishermen go out when they shouldn't go out because they know that the Coast Guard will come after them if they get in trouble. So the Coast Guard says, "Now we won't rescue you," but the fishermen still go out, and the storm comes. With twelve Rhode Island trawlers about to sink in Rhode Island Sound, can you really imagine the Coast Guard saying, "We told you so"? Of course not. To avoid moral hazard is politically and socially difficult.

Question

Does the huge financial reform package deal with any of the problems you talked about?

Benjamin Friedman

The answer is yes. The Dodd-Frank bill has some useful steps in it. If I had been asked to vote yea or nay on the bill, I would have voted yes. My own view, though, is that it is all thin beer. If you thought we were about to enter an era in which, step by step, we would move toward a more sensible financial system with not just Band-Aid regulations but something more fundamental, then Dodd-Frank was a nice first step. My suspicion, however, for many of the reasons that Bob articulated, is that the rosy view is just that.

Banks don't want to have to buy in the marketplace the insurance against failure that they are currently receiving free from the government.

The sense of urgency has now disappeared from the public conversation. People no longer think it is going to be 1933 all over again tomorrow morning. Therefore, the Dodd-Frank bill is not going to end up being the first of a sequence of efforts. Viewed that way, I find it is all very disappointing. In my own piece in the *Dædalus* issue, I indicate a few obvious things that we should have done that are not in Dodd-Frank, and one could go on in that vein with quite a few others. Was it a bill worth having? Yes. Was this a good use of our once-in-a-generation opportunity to do something in a climate of perceived public urgency? I think we missed the opportunity.

Robert Solow

I think Rahm Emanuel might say we let the crisis go to waste.

Question

Paul Krugman has claimed that the economics profession has unlearned the macroeconomic lessons of the 1930s through the

1960s. The economist Hyman Minsky claimed that there is nothing wrong with macroeconomics that another depression would not cure. I think what he meant by that was that economists – the economics profession – would relearn their Keynes. I think one of the things Krugman was pointing out was that some major economists at major institutions don't know the first thing about Keynes. Did the Great Recession prove Minsky right? Are people re-learning their Keynes, and what other lessons should the economics profession learn from this crisis?

Peter Temin

I think we are having a Great Recession rather than another Great Depression partly by luck and partly by policies. The crisis has produced a little soul-searching, as you can see in the *Dædalus* volume, but not a lot. Keynes never confronted the kinds of issues that Ben and Bob have been talking about tonight. Thus, although I think Keynes has something to tell us, he doesn't have everything. If we are looking for a revolution in our thinking, we perhaps need a bigger shock than we have had.

Benjamin Friedman

Alas, Paul Samuelson is not here to remind us of what Planck said about science advancing funeral by funeral. One does not expect economists of a certain age to learn new lessons. This does not happen. Also, although people have not relearned Keynes, they have relearned Minsky, and that is important. I see this in the work of younger people in our department. But the tendency to do economic work as if there is no such thing on the planet as a person who is unemployed or who would like to get a job at the current wage rate but cannot find one is undiminished by the recent experience. I do not know what unemployment rate would be required to change that view among most of my colleagues, but clearly it would have to be a lot greater than 9.6 percent.

By contrast, I am impressed with the number of young scholars in economics, both in my department and elsewhere, who are working in what I would call a Minskian mode. People use lots of buzzwords for

this. They talk about “financial frictions,” for example. People have now internalized Minsky's central idea that as the elapsed time from the last great crisis increases, people become more and more willing to take on greater risk. People also have understood, in a way that Minsky would have approved of, the notion that financial markets are able to inflict real damage on the rest of the economy. While I am not optimistic that you will see Keynes's lessons reappear in modern economics any time soon, I am more optimistic about Minsky's future.

Robert Solow

Hy Minsky was a dear friend. So dear a friend that one day, probably in 1942, when he was a graduate student in economics at Harvard, he said to a Radcliffe sophomore of his acquaintance, “You know, there's a Harvard student with a part-time job in the stacks of Littauer Library with whom I think you would get along well.” The Radcliffe sophomore did nothing about it, but she and I met otherwise, and we have now been married for about sixty-six years.

The insight that the longer it has been since you were burned, the more likely you are to play with matches, while a valid insight, never struck me as deep. It offers little in the way of a method for making solid inferences about when the next match might go off, or what might ignite that

What do we do about the risk-taker who says, “Oh, well, I'm too big to fail. I will be rescued if I go sour”?

match, or what action you could take that would not be too painful but would perhaps prevent someone from playing with matches. Let's face it; there wasn't enough theory in the insight. Still, I fussed over it with Hy Minsky probably until the year he died. The recent crisis probably was a “Minsky moment.” But I am afraid the key word here is moment, and I don't think too many PhD theses that pass muster with you will go down that line.

What will happen to Keynes, I don't know. I am disqualified from speaking about this because I never forgot. Here we had this enormous earthquake, and I detect only the tiniest tremors in the macroeconomics profession. I find that sad.

Question

Wouldn't it be good to think about this failure in the market as a kind of market failure? Wouldn't it be worth thinking about the information that's produced about securities as being a public good, because it is information? Wouldn't it be good to think about the fact that that information is not publicly provided and is instead being kept secret as proprietary information, creating a great breeding ground for fraud, as Bob was suggesting? Wouldn't it be better to have a single government agency rather than 120 regulatory agencies to organize the rating of securities by nonconflicted companies, to organize the appraisal of the collateral of the securities, to organize the full disclosure in real time of the securities, and to verify all the statements (e.g., the income of the borrower and the employment history) on these securities? And wouldn't it be good to have all the financial intermediaries that are protected by a limited liability turned into mutual fund companies so that all the investment comes in the form of equity, thus eliminating leverage? We would then have mutual funds investing in these securities that the single regulator was fully vetting and disclosing on the Web so that we actually knew what it was we were buying in the financial marketplace. Wouldn't it be good to have that kind of a system, because we would never have another financial collapse? Mutual funds, by definition, cannot go broke. They can lose the value of their investments, but they can't actually collapse. Wouldn't it be good to think about our financial system that way?

Robert Solow

A much stronger control of leverage would certainly be desirable, but you can't run a bank without some leverage. You can't earn a decent return on the difference between the lending rate and the borrowing rate without a little bit of leverage. Much

stronger control would be desirable. But that is just the sort of thing the Dodd-Frank bill was unable to do, for perfectly obvious political reasons. (I would love to see a detailed description of the financial services industry's lobbying efforts on the Dodd-Frank bill.)

One idea is to require corporations—financial and nonfinancial—to have a living will that lays out in advance what should happen in the event of a bankruptcy.

The question of what to do with the rating agencies is a very good one. But I am not sure that a public rating agency would be a good idea, because rating complex securities is not easy and whatever the rating agency learned to do industry would soon learn to do better and subtler and in a more complex way. That doesn't mean one doesn't have to reform the system of rating agencies. What we have is clearly unsatisfactory. Whether by opening it up and having a more competitive industry and having it pay in different ways would work well, I don't know, but I would sure be game to try.

Benjamin Friedman

I am sympathetic to a lot of the things suggested in the question and certainly to the spirit of the suggestions, but I haven't thought through the details. And I have the same kind of reservations on some of these things that Bob does. I also have a concern with the scale of the activity that is necessary to do this kind of verification. For example, for the last twenty-odd years, I have been a trustee of one or another of these Boston-based families of mutual funds. I have seen the kinds of disclosures people make to the Securities and Exchange Commission (SEC). For the SEC to verify all of that information in a detailed way would be a massive undertaking that would require an SEC far beyond the scale of anything we currently have.

One other good idea that was in the public discussion but never made it in a serious way into the Dodd-Frank bill was a requirement that banks, if they are to continue to be leveraged institutions (as a practical matter, they will), be required to issue some of their liabilities in convertible form so that under some definable set of events people who start off as bondholders would become equity holders. The banks resist this idea because, presumably, such securities would be more expensive for them to issue. If you are a bondholder who knows that your liabilities could be converted—not at your option but because of some sequence of events—to equities, you would demand a higher yield, and the banks don't want to pay that higher yield on their securities.

But what does that tell you? What it says is that banks don't want to have to buy in the marketplace the insurance against failure that they are currently receiving free from the government. If somebody offered me free homeowner's insurance, I would take it. The banks now get this insurance free from the government, and of course they resist having to pay for it in the form of market-based insurance.

Robert Solow

I discuss briefly some of these ideas in my contribution to the Fall issue of *Dædalus*. A similar idea is to require corporations—financial and nonfinancial—to have a living will that lays out in advance what should happen in the event of a bankruptcy.

Benjamin Friedman

But the difference is that when you write your will, the assets that you are disposing of are your assets and your wife's assets. When the bankers write the living will for the bank, they are planning for the disposition of somebody else's assets. To them, it's *other people's money*. ■

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The Future of Power

Joseph S. Nye, Jr.

Introduction by Jack Landman Goldsmith

1967th Stated Meeting, held on February 16, 2011, at the House of the Academy



Jack Landman Goldsmith

Jack Landman Goldsmith is the Henry L. Shattuck Professor at Harvard Law School. He was elected a Fellow of the American Academy in 2010.

Introduction

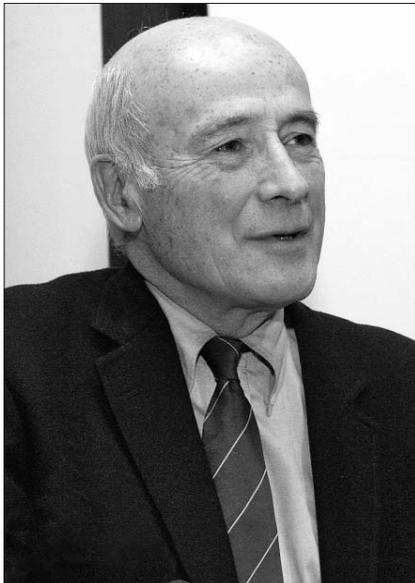
It is a cliché to say that a speaker needs no introduction, but in Joe Nye's case the cliché happens to be true. Joe is University Distinguished Service Professor at Harvard; a long-time former dean at the Kennedy School; a former top official in the U.S. State Department, Defense Department, and in the intelligence community; and the author of at least a dozen books on international politics and related topics. His new book, *The Future of Power*, is one of his best. Sober but not terribly pessimistic – or at least not as pes-

simistic as many – it reflects on the arc of American power in all its guises. Like all of Joe's work – and this is what makes it so powerful – it is serious about theory and ideas but at the same time is informed by deep practical knowledge of how international politics works and how government works.

One of the most important themes in his new book is that power diffusion is potentially a greater threat to American power than power transition; that is, the threat from nonstate actors may be greater and more serious than the threat from, say, China. This comes through most powerfully in his discussion of cyber power. If you have read in newspapers all the scary stories about cyber attacks, cyber war, and cyber exploitation and you are wondering about their significance, you will find no better analysis than in this book. The extent to which Joe's book anticipates and helps us understand what is going on right now in the Middle East, on WikiLeaks, and so on is amazing. The book frames the developments we are reading about in our morning papers and puts them in a larger theoretical framework.

A little less than two years ago, a group of us at MIT and Harvard were working together on the problem of cybersecurity under the guise of a grant called Minerva. We were desperate to get Joe involved in the project. He asked me, "Should I really do this? I'm not sure I understand the technology." I didn't know Joe well at the time, and I said, "Yes, you should. The technology's not that hard to understand; you don't need to understand it too deeply to understand the problems." Well, to my surprise,

he did get involved, and he has been leading a series of lunches with a group of people from around Cambridge twice a month on the problem of cybersecurity, and it has been one of the best intellectual experiences I have had since I have been at Harvard. The meetings are great because of how many different people are around the table but also because Joe has been a great discussion leader. Because of his efforts to learn about the topic, he is now an expert on cyber power. By leading us, pushing us, helping us stay organized, and by being generous with his time and intellect in order to help others improve their work, he has also been an exemplar of what an intellectual and an academic should be. His generosity of mind and spirit makes him a rare thing at Harvard and in the academy generally; it is also what makes his work so wonderful.



Joseph S. Nye, Jr.

Joseph S. Nye, Jr., is University Distinguished Service Professor at Harvard University and former Dean of the Harvard Kennedy School. He was elected a Fellow of the American Academy in 1984.

Presentation

What is power, and why does it matter? I define power as the ability to affect others to get the things you want. You can do that in three ways: you can use coercion, sticks; you can use payments, carrots; or you can use attraction and persuasion, soft power. In the twenty-first century, the ability to combine these as smart power will be one of the main challenges not just for the United States but for any actor in international politics. Today we are seeing two big shifts in how power is used in international politics and world affairs. These shifts, which are the result of the information revolution and globalization, are *power transition* among states and *power diffusion* from states to nonstate actors.

The power transition occurring in this century is sometimes called the rise of Asia, but it is more accurately called the recovery of Asia. In 1800, more than half of the world's population was in Asia and more than half of the world's product was in Asia. One hundred years later, more than half of the

population was still in Asia, but only about 20 percent of world product was. Now, in the twenty-first century, we are getting back to proportions that are historically more normal. The shift began in the twentieth century with Japan after World War II, moved on to Korea, and then to the so-called smaller East Asian states. Now it is in China, and it is about to be in India. In the days of Teddy Roosevelt, the American view was that power would migrate around the globe from east to west; that is, from Europe to the United States. That view was realized, only the migrating didn't end here. Power continues to migrate westward. In the twenty-first century, we are going to see more of the world's economic activity centered in Asia.

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The other great power shift, power diffusion, is the movement of power from governments, whether East or West, to non-governmental actors or nonstate actors. Nongovernmental actors have always played important roles, but their development and the growth of their influence has become much more rapid and much more widespread as a result of the information revolution. *Information revolution* is just a fancy term for the extraordinary decrease in the costs of computing and communications. From 1970 to 2000, the cost of computing decreased a thousand-fold. If the price of an automobile had decreased as rapidly as the price of computing power, you could buy a car today for five dollars. One consequence of the information revolution has

Power is the ability to affect others to get the things you want.

thus been a significant lowering of the barriers to entry to the stage of world politics. Consider the ability to communicate simultaneously to all points of the globe. In 1970, if you wanted to be in Cambridge and communicate with Johannesburg, Beijing, Moscow, and London all at the same time, you could do so; it was technically possible but very, very expensive. Today, anybody can do so for the price of entry to an Internet café or, if you use Skype at home, for free. Consider also something that was a deep secret and cost billions of dollars when I was serving in the State Department in the 1970s: the ability to take a picture of any place on earth with one meter resolution. At the time only the United States and the Soviets had this capability. Today, anybody can view such images by using Google Earth, a free program. This is an extraordinary lowering of the barriers to entry. And with such changes you get a different kind of politics. Sometimes people say these changes portend the decline or even the end of the nation-state, but that is not the right way to think about what is happening. The state and governments remain the most powerful actors in international politics, but they are no longer alone on the stage, and sharing the stage with many new actors makes for a different type of politics. As we try to think our way through this, we have to realize that we haven't quite caught up with this diffusion of power, and while we know a lot about power transition through history, we don't know anything about such rapid power diffusion.

The recent events in Egypt, Tunisia, and the rest of the Middle East are illuminating in that sense. The conventional wisdom among those who looked at the Middle East used to be that you had a choice either of supporting the autocrat or being stuck with the religious extremists. The extraordinary diffusion of information created in Egypt and other Middle Eastern countries reveals a strong middle that we weren't fully aware of. What is more, new technologies allow this new middle to coordinate in ways unseen before

Twitter, Facebook, and so forth, and this could lead to a very different politics of the Middle East. This introduces a new complexity to our government's dealings with the region. With Egypt we watched the Obama administration try to deal with the hard power elements, with issues such as military assistance to the government, peace with Israel, the balancing of Iranian power, and so forth – issues that can't just be ignored and that thus force us to deal with governments. But at the same time, the Obama administration had to deal with civil society, with what was going on in Tahrir Square, with a new generation. If we think of stability as dealing only with existing institutions and the government and don't think about the future, we are missing dynamic stability. We will fall behind the curve. To deal with a government and with a civil society requires an extraordinary ability to use both hard and soft power – on the one hand, to use the threat of reduced or eliminated military assistance to encourage the Egyptian

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army not to shoot people; on the other hand, to craft a narrative that will attract young people of the new generation. The Obama administration had to walk a policy tightrope and, although it wobbled a bit along the way, by and large it crossed the chasm – likely the first of many that will characterize this new and different type of politics – successfully.

We forget how new cyber is. Yes, the Internet may be forty-or-so years old, but the Web is only about twenty years old, and the millions of people who were on the Web in the 1990s has today grown to 1.7 billion people. This is an extraordinary pace of change, and it means the entry into the game of a lot of

actors who previously were not able to play. Recall that wonderful *New Yorker* cartoon with the caption, “On the Internet, nobody knows you're a dog.” Well, if you are attacked and something happens to your systems, you don't know who the attacker is – probably it isn't a dog, but you don't know whether it is a hacker, a criminal group, a terrorist group, or another government, and if a government, a large or small government. People can now send electrons across borders to do things that you previously had to do by sending bombers or spies who could be caught or defended against. Stuxnet, the worm that essentially disabled Iran's uranium centrifuges – an attack probably mounted by a government or governments, though we don't know for certain – illustrates the type of attack that could also be mounted against us.

The United States may be ahead of other countries in its offensive capabilities in cyber, but because it depends so much on cyber, it is also more vulnerable. What, then, should our policy be? When it comes to thinking about cyber, we are at about the same place people were in 1950 when thinking about the nuclear revolution. We know it is something new and big and that it is transformative, but we haven't thought out what offense means, what defense means. What is deterrence in such a world? What is strategy? How do we fit the pieces together? Can we establish rules of the road? Can we find an analogue in arms control, or is that an unlikely model for something that is apparently unverifiable? The first efforts at arms control didn't bear fruit until twenty years after the first nuclear explosion and came about largely to deal with third parties (the Nuclear Non-Proliferation Treaty) or because of concerns with environmental fallout (the Limited Test Ban Treaty). Not until the 1970s, some thirty years after the technology emerged, were the first bilateral arms control agreements signed, and not until the 1980s did leaders of the two superpower nations proclaim that nuclear war cannot be won and must never be fought. Forty years were needed to develop a powerful basic normative agreement. In cyber, we are still around 1950. What this means is that we can no longer treat cyber and the other aspects of power diffusion as something to be left to the technocrats or the intelligence specialists.

We have to develop a broader awareness in the public and in the policy community to be able to think clearly about how we trade off different values and develop sensible strategies for cyber.

To deal with a government and with a civil society requires an extraordinary ability to use both hard and soft power.

In learning to deal with the problems, many of them unprecedented, raised by power diffusion, we will need a much better account of what power is. We still tend to think of power in old-fashioned ways, as hard power, discounting soft power. We often use definitions like the one Robert Dahl, the distinguished Yale political scientist, proposed in the late 1950s: “Power is the ability to get others to do what they otherwise wouldn't do.” That is a good definition for one part of power, but it doesn't encompass all of power; it misses the ability to set the agendas, which determine how others see issues. And it misses the ability to establish the preferences of others, to affect minds, so that you might not have to twist arms when push comes to shove.

Our way of thinking about the great powers is also old-fashioned. The British historian A.J.P. Taylor wrote in his wonderful book *The Struggle for Mastery in Europe* that “The mark of a great power is the ability to prevail in war.” Well, the ability to prevail in war remains important in the twenty-first century, but in an information age it is not just whose army wins; it is whose story wins, and if you don't understand the importance of that narrative in shaping preferences and setting agendas, then you are going to have a foreign policy that relies on only one part of the spectrum of power, that uses only some of the tools in the toolbox. Sometimes this seems to be understood better in countries other than the United States. In 2007, Hu Jintao told the Seventeenth Party Congress of the Communist Party of China that China had to invest more in its soft power. That is a smart strategy. If your economic and military hard power is

increasing, you are going to scare others, and they will form coalitions against you. But if you can accompany your hard power with soft power so you look attractive and friendly, you are less likely to create these countervailing coalitions. After Hu Jintao urged China to invest more in soft power, the nation followed up with billions of dollars of expenditures – not only things like the Beijing Olympics and the Shanghai Expo but Confucius Institutes around the world.

We can no longer treat cyber and the other aspects of power diffusion as something to be left to the technocrats or the intelligence specialists. We have to develop a broader awareness in the public and in the policy community.

In the United States, however, where we are sometimes good at soft power – all the way back to John Winthrop and the “City upon a Hill” – we don’t discuss it in our public discourse. I once talked to a congresswoman, a friend of mine, who said, “You know, you’re absolutely right about the importance of soft power, but I can’t get up on a political platform and say the word *soft*, because I will not be elected.” In practical terms this leads to situations like the one in which Hillary Clinton, the secretary of state, and Bob Gates, the secretary of defense (who does talk about soft power) agreed to transfer an aid program from the Defense Department to the State Department so that these tools of soft and hard power could be more effectively integrated. But after the program was transferred from Defense to State, Congress cut the budget in half – but not because anything had changed in the program. Rather, the cut is a reflection of a political culture and discourse in the United States that makes developing a balanced strategy difficult. Clinton talked about smart power during her confirmation hearings for secretary of state, about the need to balance hard and soft power and, as she put it, to “use all the tools in the toolbox.” But how little that

discussion enters our broader political discourse is remarkable. To stand on a stump and get money for defense is still a lot easier than to get money for exchange programs or aid programs in the State Department. But if we are going to succeed in this world of diffusion of power, we are going to have to think much more subtly about what is involved in power, and we will need a public that is educated to understand and engage in this broader discussion of our policies.

Unfortunately, one of the narratives currently being used to help us try to understand the power transition that I called the recovery of Asia is the narrative of American decline. We are told that countries have life cycles, America is past its peak, we are now in decline, and that is the narrative of the twenty-first century. I think using such narratives is a big mistake because countries don’t have natural life cycles, so the organic metaphor of natural decline is misleading when applied to countries. Yes, the 2008 financial crisis was a disaster, much of it made in America, but I suspect the idea that this shows the beginning of American decline – as President Medvedev of Russia has suggested – will be proven wrong as the economy recovers. In the eighteenth century, after Britain had lost its American colonies, Horace Walpole lamented, “We shall be reduced to a miserable little island; and from a mighty empire sink into as insignificant a country as Denmark or Sardinia.” Of course, he missed the point that Britain was on the verge of its second century of ascendancy because of the Industrial Revolution. Rome went on for some 300 years after the apogee of its power, and when it finally did collapse, it collapsed not before another country but because of internal decay and the onslaught of barbarians. We don’t know where America is in the trajectory of its history. Thus, the metaphor of organic decline misleads us into conflating relative and absolute decline when we ought to think of these two separately.

Absolute decline is not what we are seeing in America. The severe problems we face – including the budget deficit and the issues of secondary education – do not prove absolute decline. These are problems that, in principle, have solutions. That doesn’t mean

we will necessarily achieve a solution, but we shouldn’t pretend that no solutions are possible. The Bowles and Simpson commission shows that solutions to, for example, the deficit problem are possible. That possibility doesn’t mean we will have the will to put solutions into effect; just that it is not a situation where you can’t imagine solutions. Throughout American history people have expressed concern that the

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country is in decay, but if you compare American society today to that of the McCarthy period or the 1920s or the beginning of the century, we have a healthier society today. We have always complained about immigration, and yet immigration is what we are. We are a nation of immigrants, and fortunately we will be inefficient enough that we won’t be able to stop the flow of newcomers.

Once when I was talking with former Singaporean Prime Minister Lee Kuan Yew about his projections of what would happen in the contest between the United States and China in the twenty-first century, he said, “You know, the Americans have a unique advantage. The Chinese can draw from the talents of 1.3 billion people; the Americans can draw upon the talents of 7 billion people. And what’s more, when the Americans take these talented people, they recombine them with diversity to create a new and creative generation, which the Chinese can’t do because of ethnic Han nationalism.” To the extent the United States maintains that openness, worries about American society being in absolute decay are probably over-



Image © Cooperphoto/Corbis

China *will* decrease the gap between its power and that of the United States, but I don't think it is likely to surpass the United States in the next few decades. On one measure, size of economy, the Chinese probably will pass the United States sometime in the 2020s, and that stands to reason. With 1.3 billion people and a growth rate of 10 percent, China is bound to get bigger. But having similarly sized economies does not mean having economies equal in composition. Per capita income is a better measure of the sophistication or composition of an economy, and China is not likely to equal the United States in per capita income until

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close to the middle of the century, if then. The other mistake people make is to look only at one-dimensional projections of power. Most people, when they talk about China passing the United States, are looking only at growth in gross domestic product (GDP) and the size of the economy. They neglect military power and soft power. In military power, however, the Americans are well ahead of the Chinese, and the Chinese are unlikely to catch up in the ability to project military power globally for several decades. China *is* investing billions of dollars to increase its soft power, but it is limited by the characteristics of its domestic political society. An authoritarian system has a hard time generating soft power because much of soft power is generated by civil society, not by governments. American soft power comes from Hollywood and Harvard and the Bill and Melinda Gates Foundation and from many, many others. The Chinese have been unwilling to unleash their civil society. I was once asked by a Chinese student at Beijing University, "How can we increase our soft power?" I said, "By relaxing your censorship. Look at India. Bollywood makes more movies than Hollywood, but if you compared India's directors, actors, and actresses to those in

stated. The World Economic Forum's latest *Global Competitiveness Report* places the United States fourth on its competitiveness index behind Switzerland, Sweden, and Singapore. China is ranked twenty-seventh. We are still the innovation leaders in areas like nanotechnology and biotechnology, and American universities and higher education lead the world. The United States has its share of problems at the moment, but the picture they paint is not of absolute decay. Yes, we are going through a miserable trough of extreme partisanship in our political debate, but we have seen worse periods. The 1930s was one. Even among the founding fathers we can find examples of

extreme partisanship – look at the relations between Adams and Jefferson and Hamilton. This type of political debate comes from deep in our roots as a people and does not lead me to believe we are in absolute decline.

Our present mood is one of declinism, and it is a mood we have felt before. After *Sputnik* we thought the Russians were ten feet tall. In the 1980s, it was the Japanese. Now, after the 2008 financial crisis, the Chinese are ten feet tall. You can find polls showing that a majority of people think the Chinese economy is now larger than the American economy. We will outgrow this. These cycles of declinism tell us more about the American psyche than about reality.

China, you wouldn't say India's film professionals are more talented – but they do have fewer censors.” I think that was the right advice to give my Chinese interlocutor, even if it was totally useless as advice!

You can see the difficulties China will have in generating soft power in the problems it has faced in the last year. After all its efforts to invest in soft power with the Olympics and the Shanghai Expo, China locks up Liu Xiaobo and prevents him from going to the Nobel Peace Prize ceremony, essentially shooting itself in the foot. The Chinese are unlikely to equal the Americans in soft power until you see a transformation of the political system in China, and I don't think that is likely to come quickly. Recent polls taken by the Chicago Council on Global Affairs show that, even after the disastrous first part of this past decade for American soft power, the United States is still ahead of China and the other Asian countries when it comes to measuring or judging soft power.

The Chinese are unlikely to equal the Americans in soft power until you see a transformation of the political system in China.

Finally, when considering whether China will pass the United States in overall power, you have to take into account the geopolitical circumstances in Asia. Asia is not monolithic. Bill Emmott, in his fine book *Rivals*, points out that Japan, India, Vietnam, and others have quite different views of the rise of Chinese power than China does, which makes them natural allies for the United States. The situation is analogous to Canada and Mexico inviting China to come in to North America to balance American power. Fortunately, because of our soft power, that is not a problem with our neighbors, but China does have that problem. The argument that China is bound because of its GDP growth to pass the United States seems to me a rather simplistic, unidimensional view of power.

Why does all of this matter? Certainly, power is not about being able to brag we are number one. We are not the Green Bay Packers of world politics. Instead it matters because power is not good or bad per se. Power is a lot like calories in a diet – too little and you expire; too much and you become obese. Understanding the different dimensions of power and the right strategy for using it is what we need to look at. Understanding our own power, its strengths and its limits, and having others understand it, is particularly important if we are to manage one of the great questions of power transition, the rise of China. Thucydides said that the Peloponnesian War, which tore apart the Greek city-state system, was caused by the rise of the power of Athens and the fear it created in Sparta. Many people have said World War I, which tore the European state system apart, was caused by the rise in the power of Germany and the fear this created in Britain. Some analysts today say this story will be repeated in the twenty-first century as the rise in the power of China creates fear in the United States. But that is bad history. By 1900, Germany had already surpassed Britain economically. If my analysis is correct and China will not surpass the United States for another decade, or even two or three decades, then we have time to deal with this change. We have time to manage the rise of China without succumbing to the second part of the Thucydidean trap: overreaction because of fear. But we face a concurrent problem, the danger of Chinese belief in American decline. Such belief could lead to Chinese hubris, which would make it even more difficult for us to then make compromises and accommodate China because every time we made a compromise it would be read in Beijing as proof of American decline. Managing well our relationship with China over the next decade or so is going to be extremely difficult, but we can succeed if we design our policies intelligently.

We need not repeat the mistakes that led to the great disaster of World War I. But avoiding a similar outcome will take a much more sophisticated understanding of the present power transition than the current commonplace narrative of American decline.

Understanding our own power, its strengths and its limits, and having others understand it, is particularly important if we are to manage one of the great questions of power transition, the rise of China.

Power in world politics today resembles a three-dimensional chess game. On the top board of military power among states, the world is unipolar, and the United States is likely to remain the dominant power for another decade or two. On the middle board of economic relations among states, the world is multipolar and has been for two decades. In this domain, Europe can act as an entity, and when it does, its economy is larger than that of the United States. On the bottom board of transnational relations, things that cross borders outside the control of the government, whether terrorists or international cyber crime syndicates or whether impersonal forces like pandemics or global climate change, power is distributed chaotically; the traditional terminology of unipolarity and multipolarity makes no sense here. Dealing with the challenges that emerge from the bottom board of transnational relations requires cooperation, and that is where our soft power comes in. With many of these transnational issues, which pose serious challenges to us, power *with* others is as important as power *over* others. Therefore, we have to think of positive-sum and zero-sum games simultaneously. To deal with this world of power transition and power diffusion, we need to think more clearly about how we treat power. We have to understand that the rise of the rest is not necessarily a sign of American decline. We have to keep our wits about us if we are not to succumb to the fear that Thucydides warns against. When we deal with power diffusion issues, we have to think about how we can use the full set of tools in our toolbox, the soft-power instruments as well as the hard-power instruments. As Anne-Marie Slaughter of Prince-

ton put it, the unique capacity of the United States to maintain alliances, to create networks, and to use institutions puts us in a good position to be the most powerful state. If we think in terms of the ability to coordinate collective action to deal with the diffusion of power rather than thinking in the old traditional terms of military hegemony, which I believe is an obsolete conception of power, then we might well get through these next decades of the twenty-first century in reasonable shape. But in dealing with power transition and power diffusion in the twenty-first century, we are going to have to learn as a people to think and talk about power in different ways and to become a truly smart power.

Question

Where do corporations fit in the category of nonstate actors, and can a company become more relevant, more powerful than the nation? For example, Facebook has two hundred million more users than the American population and was the tool that brought down Mubarak; Google took on China in a way that the American government could not. Also, if China is astute enough to realize the need for soft power and to succeed in the way it did with the Olympics, what is it so scared of when it comes to the Nobel Peace Prize or Falun Gong?

Power with others is as important as power over others.

Joseph Nye

Multinational corporations have long been important nonstate actors – this goes back centuries – and many multinational corporations have annual revenues that are larger than the GDP of many countries. What companies don't have are the resources of force. They also don't have the resources of legitimacy that governments in many cases still have. So the idea that companies are taking over the world is a bit simple. Yes, Google and Twitter helped to find ways – for example, with speak-to-tweet – that allowed protestors to get past the Internet cutoff in Egypt, but it is also worth remem-

bering that when Google and China squared off a year ago, the Chinese government did better. We should not overestimate, but companies, and information companies in particular, are becoming more important. Let's just not overstate the decline of governments as a result.

During recent trips to China, I asked Chinese there why the government felt it had to lock up Liu Xiaobo and make the fuss it did about his Nobel Peace Prize, actions that I believe were counterproductive for the government. I said, "You know, I don't think you're quite that fragile. You could afford to lighten up." But they don't see it quite that way. They see a situation where, as the joke goes, it's a market-Leninist system. With the Chinese Communist Party now, you have a political control apparatus in which nobody believes in communism. So legitimacy comes from high rates of economic growth and ethnic Han nationalism. The Chinese themselves report that more than 100,000 riots, demonstrations, and incidents occurred in the past year. The possibility that these more-or-less isolated local incidents could become something more if they were connected through the Internet greatly worries Chinese authorities.

Question

One issue I think needs more discussion is internal affairs, which has been the cause of decline of many great powers. I was horrified by the campaigns preceding our recent midterm elections, by what they revealed about American ignorance of and lack of interest in the outside world, by the concentration on ludicrously parochial issues, and by the unwillingness to take seriously some of the challenges that will undoubtedly develop. The basic industrial situation in America reminds me of what it was in France in 1950. The unwillingness of a large part of the American population, judging from the political scene, to take seriously the state of our infrastructure and instead to look at the future exclusively in terms of what needs to be cut is likely to be a bigger contributor to our national decline than competition from other nations. Tocqueville predicted that in democracies people would think only about their private affairs and thus would

let the government take over everything, which is largely what happened in France. What I find in the United States is that people think primarily about their private affairs and have little sense of community, and therefore nobody speaks for the community. It is not that the government has taken over, though; the poor government is handicapped by a constitution that was designed to make the use of power impossible. As long as this little problem remains unaddressed, I think we will be in trouble.

To deal with this world of power transition and power diffusion, we need to think more clearly about how we treat power.

Joseph Nye

I can't disagree with your characterization of current politics, and I agree that the American government was designed so that King George couldn't rule over us and neither could anybody else, but that also gives us a sense of historical perspective. Our polity was designed to be inefficient; the emphasis was on preserving greater liberty rather than on greater efficiency. We have had a couple hundred years of this. We have been through worse periods in the past than we are in now; for example, the middle of the nineteenth century, when we broke apart into a civil war; or the 1930s; or the 1950s, with McCarthyism. We have had some quite bad periods in our politics. We are in an unfortunate period now, but I don't think it is one in which we won't overcome the obstacles we face. I suspect that the budget deficit probably will not be solved in the next two years (instead we will see a lot of posturing), but I wouldn't be surprised if a political consensus develops after the 2012 election to implement with greater seriousness some of the things that are important for our long-term financial health. That won't be sufficient, but it is a base from which to start, and it does go to your point about community. As I read Bob Putnam, we haven't lost that community; it is not nec-

essarily centered on the government, but if you look at volunteers and the quality of community life in the United States, we still compare relatively well. Trying to assess the question of internal decay independently and from within our immediate historical circumstances is always hard. We can't step back as well as we need to. But as I look back at history, the fact that we have made it through worse times with our deliberately inefficient governmental system makes me think we might be able to make it through again.

Question

What about Europe? It has the tools for smart power. What is its future?

Joseph Nye

I tend to be relatively optimistic on Europe, which is not fashionable now. One is supposed to be pessimistic. But Europe's accomplishments over the past four or five decades are incredible; it has created a Kantian island of peace in the international system; it showed that France and Germany need not go to war again, that the prospect of such a war could even become unthinkable. The Europeans have created not a single European nation but a different relation among European peoples, what Bob Keohane and I once called a "complex interdependence." This is tremendously healthy. Will it last? Some people say the euro is going to collapse and bring down Europe. I was at the Munich Security Conference in early February 2011, and I was struck by the strength of the political commitment Angela Merkel expressed in defense of the euro even though she is facing domestic problems about who pays Greek bills and so forth. Examples like that make me more optimistic about Europe than the current conventional wisdom. When Europe acts as an entity, it is the world's largest economy; it still has enormous capacity.

Question

Some thinkers, Richard Rosecrance and others, have written about the rise of the virtual state. Do you address this issue in your book as you discuss power diffusion?

Joseph Nye

I don't quite know what it means to be a virtual state. The chapter in my book where I address cyber power doesn't use the term *virtual state*; instead I talk about a state that has to adapt to the fact that it is fully penetrable by electrons crossing its borders and has made itself vulnerable in this way by its dependency on cyber. Perhaps that fits the definition of a virtual state. But the state also retains powerful traditional capacities. The Internet doesn't reside in a cloud; it relies on physical servers and cables that are located within the sovereign jurisdiction of nation-states, and governments have traditional hard power options like economic sanctions and police powers with which to handle Internet service providers and other actors that are within their jurisdiction. But that isn't virtual power; it is very traditional.

Question

If a book called *The Future of Power* were to have come out of China or India, what would the conclusion of that book have been?

Joseph Nye

One of my Indian friends says that by 2050 the world will have three powers: India, China, and the United States. His comment to me was, "We may not like the United States, we may have trouble with the United States at times, but when it comes to living with China, we would rather be with the United States." That is the picture the book would have painted had he written it. In population terms, he is right too. India will be the largest country, China will be second, and the United States will be third. The United States will be the only rich country maintaining its current demographic position.

If the book had been written in China, it would probably talk about American decline. Many, but not all, Chinese scholars are now writing about American decline and tend to believe that it is true. When I was in Beijing in January 2011, I spoke with an important Chinese academic who said that what worried him was the debate inside China about how to write that book. He agreed with me that the Americans will remain ahead, but his great worry was that the people who write the book in China will write the opposite of my book and that this will lead to disastrous policies. He argues – and I think he has a case – that since the start of the recent financial recession, China has been more assertive in its foreign policy. One of the reactions to its new assertiveness has been worsened relations with India, Vietnam, South Korea, and Japan, not to mention the United States. ■

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As of press time, several Fellows of the Academy, listed below, had been nominated or appointed to key posts in the Obama administration:

Susan Athey (Harvard University): Member, President's Committee on the National Medal of Science

Robert J. Zimmer (University of Chicago): Member, National Science Board, National Science Foundation

Select Prizes and Awards

National Humanities Medal, 2010

Daniel Aaron (Harvard University)

Bernard Bailyn (Harvard University)

Jacques Barzun (San Antonio, Texas)

Roberto González Echevarría (Yale University)

Stanley N. Katz (Princeton University)

Philip Roth (New York, New York)

Gordon S. Wood (Brown University)

National Medal of Arts, 2010

Donald Hall (Wilmot, New Hampshire)

Quincy Jones (Quincy Jones Productions)

Sonny Rollins (New York, New York)

Recent Honorary Degrees

Leslie Cohen Berlowitz (American Academy of Arts and Sciences): Honorary Doctorate of Humane Letters from Northeastern University

William Jefferson Clinton (William J. Clinton Foundation): Honorary Doctorate of Law from New York University

Claire M. Fagin (University of Pennsylvania): Honorary Doctorate of Science from New York University

Evelyn Fox Keller (MIT): Honorary Doctorate of Science from Purchase College, State University of New York

Arthur E. Levine (Woodrow Wilson National Fellowship Foundation): Honorary Doctorate of Humane Letters from the University at Buffalo

Jane Lubchenco (National Oceanic and Atmospheric Administration): Honorary Doctorate of Humane Letters from Loyola University

Henri A. Termeyer (Genzyme Corporation): Honorary Doctorate of Global Business from Northeastern University

Ada E. Yonath (Weizmann Institute of Science): Honorary Doctorate of Science from New York University

Other Awards

Peter Agre (Johns Hopkins University) was named a Gilman Scholar at Johns Hopkins University.

Cornelia Bargmann (Rockefeller University) is the recipient of the 11th Perl-UNC Neuroscience Prize. She shares the award with **Catherine Dulac** (Harvard University).

Charles Bennett (Johns Hopkins University) was named a Gilman Scholar at Johns Hopkins University.

May Berenbaum (University of Illinois at Urbana-Champaign) was awarded the 2011 Tyler Prize for Environmental Achievement.

Mina Bissell (Lawrence Berkeley National Laboratory) is the recipient of the 2011 Jill Rose Award, given by the Breast Cancer Research Foundation.

Helen M. Blau (Stanford University School of Medicine) was awarded the Seventh Annual AACR-Irving Weinstein Foundation Distinguished Lectureship.

Stephen Carpenter (University of Wisconsin-Madison) was awarded the 2011 Stockholm Water Prize.

John M. Connors, Jr. (Hill, Holliday, Connors, Cosmopoulos) was inducted into the American Advertising Federation's Advertising Hall of Fame.

Titia de Lange (Rockefeller University) was awarded the Vilcek Prize in Biomedical Science.

Esther Duflo (MIT) received the 2011 Thomas C. Schelling Award, given by the Harvard Kennedy School.

Catherine Dulac (Harvard University) is the recipient of the 11th Perl-UNC Neuroscience Prize. She shares the award with **Cornelia Bargmann** (Rockefeller University).

Carol S. Dweck (Stanford University) was named a 2010 recipient of the Elizabeth Hurlock Beckman Award.

Claire M. Fagin (University of Pennsylvania) is the recipient of the NYU College of Nursing Helen Manzer Award.

Drew Gilpin Faust (Harvard University) was named the 40th Jefferson Lecturer in the Humanities by the National Endowment for the Humanities.

Andrew Feinberg (Johns Hopkins University) was named a Gilman Scholar at Johns Hopkins University.

Marcus Feldman (Stanford University) is the recipient of a Dan David Prize.

David Ferry (Wellesley College) was awarded the Ruth Lilly Poetry Prize by the Poetry Foundation.

Eric Foner (Columbia University) was awarded the 2011 Pulitzer Prize in History for *The Fiery Trial: Abraham Lincoln and American Slavery*.

Elaine Fuchs (Rockefeller University) was awarded the 2011 Albany Medical Center Prize in Medicine and Biomedical Research.

Susan Gottesman (National Institutes of Health) is the recipient of the 2011 Abbott-ASM Lifetime Achievement Award.

Earl G. Graves (*Black Enterprise* Magazine) was inducted into the American Advertising Federation's Advertising Hall of Fame.

Carol Greider (Johns Hopkins University) was named a Gilman Scholar at Johns Hopkins University.

Philip C. Hanawalt (Stanford University) was awarded the fifth Annual AACR Princess Takamatsu Memorial Lectureship for International Collaboration.

Susan Howe (State University of New York at Buffalo) was named the 2011 winner of Yale University's Bollingen Prize in American Poetry.

Takeo Kanade (Carnegie Mellon University) is the 2010 winner of the ACM/AAAI Allen Newell Award.

Fred Kavli (The Kavli Foundation) is the recipient of the 2011 Bower Award for Business Leadership, given by the Franklin Institute.

Cynthia Kenyon (University of California, San Francisco) was awarded a Dan David Prize. She shares the prize with **Gary Ruvkun** (Harvard University).

Joseph LeDoux (New York University) is the recipient of the 2011 Karl Spencer Lashley Award.

Arthur Levinson (Genentech) is the recipient of the American Association for Cancer Research Margaret Foti Award for Leadership and Extraordinary Achievements in Cancer Research.

Maya Lin (Maya Lin Studio) is the recipient of the 2011 Thomas Jefferson Foundation Medal in Architecture.

John McDowell (University of Pittsburgh) is the recipient of a 2010 Distinguished Achievement Award from the Andrew W. Mellon Foundation.

Richard A. Meserve (Carnegie Institution for Science) is the recipient of the first Vannevar Bush Dean's Medal, given by Tufts University School of Engineering.

Peter G. Peterson (Peter G. Peterson Foundation) is the recipient of the 2011 Thomas Jefferson Foundation Medal in Citizen Leadership.

Menahem Pressler (Indiana University) is the recipient of the Lifetime Achievement Award from the 2011 International Classical Music Awards.

Carol L. Prives (Columbia University) was awarded the Fourteenth Annual AACR Women in Cancer Research Charlotte Friend Memorial Lectureship.

Hilary Putnam (Harvard University) was awarded the 2011 Rolf Schock Prize in Logic and Philosophy.

C.N.R. Rao (Jawaharlal Nehru Centre for Advanced Scientific Research) received a Dhirubhai Ambani-UAA Lifetime Achievement Award.

Judith Resnik (Yale Law School) was named a 2010 recipient of the Elizabeth Hurlock Beckman Award.

Adam Riess (Johns Hopkins University) was named a Gilman Scholar at Johns Hopkins University.

Gary Ruvkun (Harvard University) was awarded a Dan David Prize. He shares the prize with **Cynthia Kenyon** (University of California, San Francisco).

Jonathan D. Sarna (Brandeis University) is the recipient of the 2011 Martin E. Marty Award for the Public Understanding of Religion, given by the American Academy of Religion.

Charles Simic (University of New Hampshire) was awarded the Vilcek Prize in Literature.

Solomon Snyder (Johns Hopkins University) was named a Gilman Scholar at Johns Hopkins University.

Gabrielle Spiegel (Johns Hopkins University) was named a Gilman Scholar at Johns Hopkins University.

Claude M. Steele (Columbia University) was named a 2010 recipient of the Elizabeth Hurlock Beckman Award.

Moshe Vardi (Rice University) is the recipient of the IEEE Computer Society's 2011 Harry H. Goode Award.

Bert Vogelstein (Johns Hopkins University) was named a Gilman Scholar at Johns Hopkins University.

Paul Volcker (New York, New York) received the 2011 Richard E. Neustadt Award, given by the Harvard Kennedy School.

Harry H. Wellington (New York Law School) received the President's Medal of Honor from New York Law School.

Jeannette Wing (Carnegie Mellon University) is the recipient of the 2011 Distinguished Service Award of the Computer Research Association.

Amnon Yariv (California Institute of Technology) is the recipient of the 2011 IEEE Photonics Award.

Matthew Zapruder (May Sarton Award recipient; University of California, Riverside) was awarded a Guggenheim Fellowship by the John Simon Guggenheim Memorial Foundation.

Academy Fellows elected to the American Philosophical Society, April 2011

Svetlana Alpers (New York University)

John C. Avise (University of California, Irvine)

Richard Stephen Berry (University of Chicago)

Kenneth Burns (Walpole, New Hampshire)

Natalie Zemon Davis (University of Toronto)

Marcus William Feldman (Stanford University)

Graham R. Fleming (University of California, Berkeley)

Richard J. Franke (John Nuveen Company)

Paul H. Freedman (Yale University)

Benjamin W. Heineman, Jr. (Harvard University)

Sarah Blaffer Hrdy (Winters, California)

Elena Kagan (U.S. Supreme Court)

Larissa Adler Lomnitz (Universidad Nacional Autónoma de México)

Glenn C. Loury (Brown University)

Kyriacos C. Nicolaou (Scripps Research Institute; University of California, San Diego)

Olufunmilayo Olopade (University of Chicago)

Robert C. Post (Yale Law School)

Robert J. Sampson (Harvard University)

Anne-Marie Slaughter (U.S. Department of State; Princeton University)

Patrick Thaddeus (Harvard University)

New Appointments

Kwame Anthony Appiah (Princeton University) was reelected President of PEN American.

James Cuno (Art Institute of Chicago) has been named President and Chief Executive Officer of the J. Paul Getty Trust.

Kenneth Kaushansky (State University of New York at Stony Brook) was elected to the Council of the Association of American Physicians.

Richard Klausner (Column Group) was appointed Chairman of the Strategic Development and Scientific Advisory Council of Sanofi-aventis.

Maria Klawe (Harvey Mudd College) was appointed to the Board of Directors of Broadcom Corporation.

Anita K. Jones (University of Virginia) has been named to the Federal Advisory Board of Digital Reasoning.

Cathy E. Minehan (Arlington Advisory Partners) has been named Dean of the Simmons College School of Management.

Hunter R. Rawlings III (Cornell University) has been named President of the Association of American Universities (AAU).

Henry Samuelli (Broadcom Corporation) was appointed to the Board of Directors of Broadcom Corporation.

Theda Skocpol (Harvard University) was named a Director of the Association of American Colleges and Universities.

Matthew Tirrell (University of California, Berkeley) has been appointed founding Pritzker Director of the University of Chicago's Institute for Molecular Engineering.

Margaret C. Whitman (Atherton, California) is Strategic Advisor at Kleiner Perkins Caufield & Byers.

Select Publications

Poetry

Carl Phillips (Washington University in St. Louis). *Double Shadow*. Farrar, Straus and Giroux, March 2011

Robert Pinsky (Boston University). *Selected Poems*. Farrar, Straus and Giroux, April 2011

Fiction

Chinua Achebe (Bard College). *Chike and the River*. Anchor, August 2011

Susan Howe (State University of New York at Buffalo). *That This*. New Directions, December 2010

Bharati Mukherjee (University of California, Berkeley). *Miss New India*. Houghton Mifflin Harcourt, May 2011

Francine Prose (New York, New York). *My New American Life*. Harper, April 2011

Nonfiction

Charles Bernstein (University of Pennsylvania). *Attack of the Difficult Poems: Essays and Inventions*. University of Chicago Press, May 2011

David Brooks (New York Times Company). *The Social Animal: A Story of Love, Character, and Achievement*. Random House, March 2011

James Carroll (Boston, Massachusetts). *Jerusalem, Jerusalem: How the Ancient City Ignited Our Modern World*. Houghton Mifflin Harcourt, March 2011

Joshua Cohen (Stanford University). *The Arc of the Moral Universe and Other Essays*. Harvard University Press, January 2011

Robert Darnton (Harvard University). *Poetry and the Police: Communication Networks in Eighteenth-Century Paris*. Belknap Press of Harvard University Press, November 2010

Ronald Dworkin (New York University School of Law). *Justice for Hedgehogs*. Belknap Press of Harvard University Press, January 2011

Claude S. Fischer (University of California, Berkeley). *Still Connected: Family and Friends in America since 1970*. Russell Sage Foundation, January 2011

Susan T. Fiske (Princeton University). *Envy Up, Scorn Down*. Russell Sage Foundation, April 2011

Henry Louis Gates, Jr. (Harvard University). *Black in Latin America*. New York University Press, March 2011

Henry Louis Gates, Jr. (Harvard University) and David Bindman (University College London), eds. *The Image of The Black in Western Art*. Belknap Press of Harvard University Press, November 2010

Oscar Hijuelos (Duke University). *Thoughts Without Cigarettes: A Memoir*. Gotham, June 2011

Henry Kissinger (Kissinger Associates, Inc.). *On China*. Penguin Press, May 2011

David McCullough (West Tisbury, Massachusetts). *The Greater Journey: Americans in Paris*. Simon & Schuster, May 2011

Bill Moyers (Public Affairs TV, Inc.). *Bill Moyers Journal: The Conversation Continues*. New Press, May 2011

Sigrid Nunez (New York, New York). *Sempre Susan: A Memoir of Susan Sontag*. Atlas & Co., April 2011

Martha C. Nussbaum (University of Chicago Law School). *Creating Capabilities: The Human Development Approach*. Belknap Press of Harvard University Press, April 2011

Meghan O'Rourke (May Sarton Award recipient; *Paris Review*). *The Long Goodbye: A Memoir*. Riverhead, April 2011

Orhan Pamuk (Columbia University). *The Naive and the Sentimental Novelist*. Harvard University Press, November 2010

Judith Resnik (Yale Law School) and Dennis Curtis (Yale Law School). *Representing Justice: Invention, Controversy, and Rights in City-States and Democratic Courtrooms*. Yale University Press, January 2011

Jonathan D. Sarna (Brandeis University) and Adam Mendelsohn (College of Charleston), eds. *Jews and the Civil War: A Reader*. New York University Press, May 2010

Simon Schama (Columbia University). *Scribble, Scribble, Scribble: Writings on Politics, Ice Cream, Churchill, and My Mother*. Ecco, April 2011

Theda Skocpol (Harvard University) and Lawrence R. Jacobs (University of Minnesota), eds. *Reaching for a New Deal: Ambitious Governance, Economic Meltdown, and Polarized Politics in Obama's First Two Years*. Russell Sage Foundation, August 2011

Charles M. Taylor (McGill University). *Dilemmas and Connections: Selected Essays*. Belknap Press of Harvard University Press, February 2011

Gordon S. Wood (Brown University). *The Idea of America: Reflections on the Birth of the United States*. Penguin Press, May 2011

Exhibitions

Wayne Thiebaud (University of California, Davis): Exhibition of works on view at The Morandi Museum in Bologna through October 2011.

We invite all Fellows and Foreign Honorary Members to send notices about their recent and forthcoming publications, scientific findings, exhibitions and performances, and honors and prizes to bulletin@amacad.org. ■

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Academy President Receives Honorary Degree

Leslie Cohen Berlowitz, President of the Academy, was awarded an Honorary Doctorate of Humane Letters from Northeastern University during its commencement ceremony on May 6, 2011.

In announcing the honorary degree, Northeastern President and Academy Fellow Joseph E. Aoun cited her national leadership on humanities scholarship and policy. Aoun called Berlowitz “a champion of the liberal arts and a strategic thinker about issues that affect higher education.”

Academy Fellow Henri A. Termeer (Genzyme Corporation) received an Honorary Doctorate of Global Business from Northeastern University and was the commencement speaker at the ceremony.



Joseph E. Aoun and Leslie Cohen Berlowitz

Courtesy of Mary Knox Merrill/Northeastern University

Special Thanks to Academy Members and Donors

A total of \$7.4 million was raised in the fiscal year completed on March 31, 2011. The Academy's Annual Fund surpassed the \$1.5 million mark for the fourth consecutive year with nearly 1,200 donors contributing; additional gifts and grants totaled \$5.9 million. "Every gift and grant was important to achieving these results," said Alan Dachs, Development and Public Relations Committee Chair. "The Academy is fortunate to have the interest and support of so many Fellows, foundations, university and corporate affiliates, friends, and staff members." Dachs expressed his deep appreciation to the Fellows serving as members of the committee during the past year, including Louise Bryson, Richard Cavanagh, Jesse Choper, Michael Gellert, Charles Haar, Stephen Stamas, Donald Stewart, Samuel Thier, and Nicholas Zervas, along with the continuing involvement of Board Chair Louis Cabot.

"We are particularly grateful to a growing number of leadership donors," said President Leslie Berlowitz. "Our research projects are having increasing impact in shaping informed national policy. This work, a wide range of publications, and our programs around the country depend on the resources provided by successful fund-raising efforts."

A complete list of 2010 – 2011 contributors will appear in the Academy's *Annual Report*, which will be published in the fall. ■