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HARVARD

MAGAZINE

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A close-up photograph of a hand with weathered, brown skin holding a large, dark, jagged piece of coal. The hand is positioned at the bottom of the frame, with the thumb and fingers visible, supporting the coal. The background is solid black, making the hand and coal stand out.

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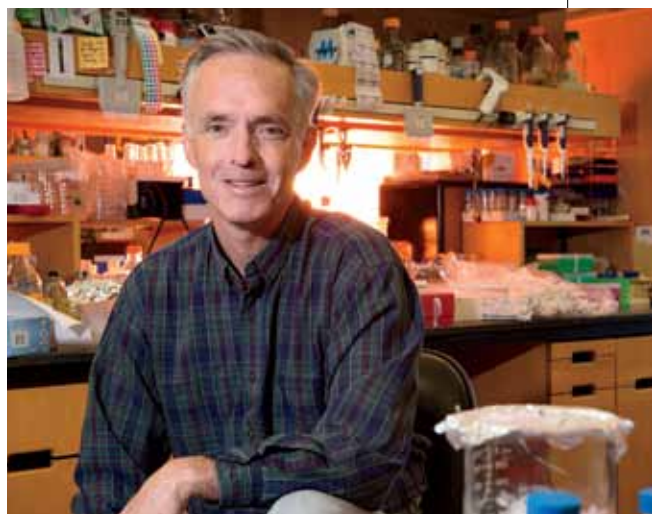
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Cambridge 02138

Social science, diversity, harpsichords, divestment, hemlocks

DEBATING DISRUPTION

IT IS REMARKABLE that your encomium to the “Disruptive Genius” of Professor Clayton Christensen, and his theory of “disruptive innovation” (July-August, page 38), appeared at almost the same time as a scathing critique of the historical underpinnings of that theory by Professor Jill Lepore appeared in the June 23 issue of *The New Yorker*.

Lepore delivers what appears to be a devastating analysis of both the theory and factual foundation for Christensen’s “Gospel” of disruptive innovation.

Lepore calls the theory of disruptive innovation a theory of history “founded on shaky evidence” that has been “subject to little serious criticism.” Perhaps her most damning criticism is that “Historical analy-

7 WARE STREET

Is Harvard Cool?

WITH DEVILISH TIMING, *The New York Times* home page published “...Harvard Is the Stanford of the East” at 1:19 P.M. last May 29, between the Commencement morning and afternoon exercises. It cited Stanford’s new eminence using “measures that Harvard once dominated”: undergraduate admissions yield, student picks of a “dream college,” fundraising prowess.

In an Internet era, Stanford is in a sweet spot. One-quarter of its undergraduates earn computer-science or engineering degrees, the *Times* reported. Its president has thrived in that field (and serves on the Google and Cisco boards). There is the siren song of Silicon Valley—center of perhaps the greatest wealth-creation in history. People prefer the climate, earthquakes notwithstanding.

That said, Stanford—more than Harvard and other institutions—suffers from a divide between “techies” and “fuzzies” (humanities students). And the world may become oversaturated with apps.

Cambridge and Palo Alto are not a competitive duopoly. But Harvard administrators do seem to have Stanford in mind. “Innovation” is constantly invoked—and backed tangibly by the iLab and recurrent grant competitions underwritten by the University. Venture capitalist James Breyer (a Stanford undergraduate with a Harvard

M.B.A. and deep ties to technology and new media) has been elected to the Corporation. The marquee capital-campaign priority is engineering and applied sciences.

Senior officials also bemoan the perception that Harvard, rooted in the Northeast, is “old and cold.” Perhaps partly in response to surveys showing that Harvard students are less happy about their experiences than those elsewhere (including Stanford), resources have flowed into “common spaces”: the Yard’s colorful chairs, the Science Center Plaza (which has yet to attain the status of Stanford’s White Plaza as a crossroads for student life).

Introducing Drew Faust on May 29, Harvard Alumni Association leader Kate Gellert said, “Harvard’s twenty-first president, Charles W. Eliot, in his inaugural address, 145 years ago, said, ‘The inertia of a massive university is formidable. A good past is positively dangerous if it makes us content with the present and thus unprepared for the future.’”

Harvard is *not* mired in inertia. Its leaders are pursuing improvements in pedagogy, research, and the student experience. As it builds applied-science expertise, it maintains strengths in the search for meaning and value—one of Faust’s themes, and more important long term than an app for scoring the best local taco. Stanford nonetheless has real momentum, winning students and recruiting professors. Is Harvard (still) cool? Sure. But Stanford is hot. —JOHN S. ROSENBERG, *Editor*

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A Goodly Company

I WILL ALWAYS REMEMBER my first library card, acquired during a childhood summer in a little town on Cape Cod. I would ride my bicycle to the local library, housed in a converted Victorian house that was always dark, cool and musty inside. There I experienced the thrill of independence and—owing to the ten book borrowing maximum—the agony of choice. I spent hours considering and reconsidering my options. Between visits, I read voraciously: wild adventures and exotic locales, new ideas and far-off places, and—my favorites—noble animals and brave girls. Though my interests have expanded and changed a bit over the years, my love of books and libraries, so vivid in my memories of that summer in the 1950s, has never faded. For me, the bicycle and the books meant a first taste of freedom.

In the decades since, I have come to appreciate that there is a special fellowship shared by scholars and other avid readers. As Harvard alumnus Henry Cabot Lodge put it, “...the true lovers of books are a goodly company one and all.” With those words, he welcomed a throng of well-wishers to the dedication of the Harry Elkins Widener Memorial Library at Commencement in 1915, nearly a century ago. Eleanor Elkins Widener, who had given her beloved son’s remarkable collection of books, manuscripts, and drawings to the University after he perished aboard the *Titanic*, funded the construction and was on hand to see her vision realized. As crowds looked on from the parapets and stairs, she presented a key to my predecessor A. Lawrence Lowell and gave Harvard one of its iconic and beloved spaces.

When it was completed, Widener held 600,000 volumes. Today, as we prepare to celebrate its 100th birthday, it holds 3.5 million volumes in ten stories of stacks and opens its doors—and turnstiles—to more than half a million people each year. Imagine the thrill that scholars and other visitors must experience as they ascend the steps (famously featured in the film *Love Story*) and enter for the first time, the latest in an endless stream of knowledge seekers that has flowed through the heart of Harvard’s library system for almost 100 years. It is a place of knowledge and of memory. You can almost see John Singer Sargent stepping back to admire his completed murals or Barbara Tuchman settling into her carrel surrounded by British history to draft her undergraduate thesis. Nearby, a young Norman Mailer searched for D.H. Lawrence’s *Lady Chatterley’s Lover*; and Margaret Atwood scanned the offerings in Canadian literature before moving on to witchcraft and demonology. My own scholarship has benefited from Widener’s rich collections in my field—including materials brought back from the South by Harvard alumni at the end of the Civil War—seemingly awaiting me and my 21st century questions.

The promise of such encounters attracts many faculty to Harvard and its libraries, and they are in turn ensuring that the next gen-



eration of scholars appreciates and benefits from our exceptional holdings. Last year, some 700 students attended more than 70 class sessions held in Widener. Under the guidance of librarians, curators, and bibliographers, they deepened their understanding of research methods, learned to navigate the ever-shifting landscape of information, and gained hands-on experience with objects including newspapers, diaries, journals, maps, and manuscripts. These experiences offer students a unique window on the world of ideas and challenge them to situate their own interests and work in the broadest possible context.

Today the quiet solitude of the stacks is complemented by new, digitally enabled means of accessing collections and lively exchanges in innovative spaces. Librarians are helping faculty discover and deploy letters penned by Lord Byron, ornamental maps of 19th century Japan, the papers of the Beecher-Stowe family, miniature books by Charlotte and Branwell Brontë—and are facilitating online access to these collections to learners across the globe. Libraries are home to a goodly company that grows greater by the day—happy 100th birthday, Widener.

Sincerely,

sis proceeds from certain conditions regarding proof. None of these conditions have been met [by disruptive innovation.]” Lepore deconstructs Christensen’s paradigmatic case of disk drives and the fate of Seagate Technologies. She concludes that, quite contrary to the theory of disruptive innovation, “victory in the disk-drive industry appears to have gone to the manufacturers that were good at incremental improvements, whether or not they were the first to market the disruptive new format. Companies that were quick to release a new product but not skilled at tinkering have tended to flame out.”

It would be interesting and informative for *Harvard Magazine* readers if you initiated a conversation between Lepore and Christensen to explore these questions further.

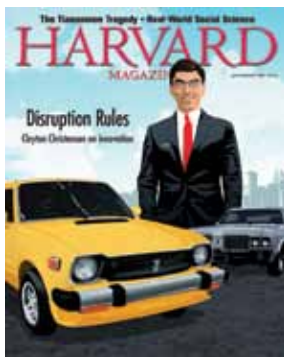
DAVID A. DRACHSLER, LL.B. '68
Alexandria, Va.

Editor’s note: Many readers (see additional letters online) commented on the coincidental, nearly simultaneous publication of *Harvard Magazine*’s profile of Harvard Business School’s Clayton Christensen and the appearance in *The New Yorker* of a critique of his work by Kemper professor of history Jill Lepore. Those interested in how the articles have intersected may wish to read “Clayton Christensen Responds to *New Yorker* Takedown of ‘Disruptive Innovation,’” available at www.businessweek.com/articles/2014-06-20/clayton-christensen-responds-to-new-yorker-takedown-of-disruptive-innovation.

CLAYTON CHRISTENSEN was my bishop in the Cambridge student ward of the Latter-Day Saint church many years ago. I have never met anyone who exuded more sincerity, humility, and love than he did. Because

SPEAK UP, PLEASE

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he was such an inspiration to me throughout my life, it is always with great interest that I read feature articles on him. He is well deserving of the positive press he gets not only for himself but for his faith.

CATHERINE MARTINES
MORTENSEN, M.P.A. '08
Fairfax, Va.

CRAIG LAMBERT suggests Christensen’s company, Ceramics Process Systems, “succeeded,” outsmarting DuPont, Alcoa, and Hoechst. Not so. I invested in CPS’s IPO, and so watched as the company promptly cratered, despite having been promoted to investors as can’t-miss technology with leadership by a Rhodes Scholar, Baker Scholar, White House Fellow, a tall man with youth on his side. CPS is gone. DuPont and Alcoa live on, while Hoechst became part of what is now Sanofi.

DUNDAS I. FLAHERTY, M.B.A. '62
Malibu

Clayton Christensen replies: CPS, located in Norton, Massachusetts, has become quite successful in the niche market of advanced ceramics. The other companies, while they continue to have success, no longer are in the advanced ceramics space. We didn’t have the theory of disruption when we created CPS. If we had, the advanced ceramics that CPS created would have been a sustaining innovation and the theory would say that it would have failed. So that fact that it survived was a miracle!

I’ve long enjoyed Christensen’s writings, especially on innovation and on how to measure one’s self, but thought his dismissal of the disruptive power of online learning for K-12 public education surprising. Initiatives such as Salman Khan’s [M.B.A. '03] Khan Academy demonstrate technology’s power to “Flip the Classroom,” and the logic is being extended: the Robert Wood Johnson Foundation is exploring how to “Flip the Clinic” and transform primary healthcare. I wonder if entrenched special interests are the biggest barrier to innovation in these fields?

ANDY ARENDS '92
Geneva, Ill.

I ENJOYED but am apprehensive about Craig Lambert’s optimistic article on Clay-

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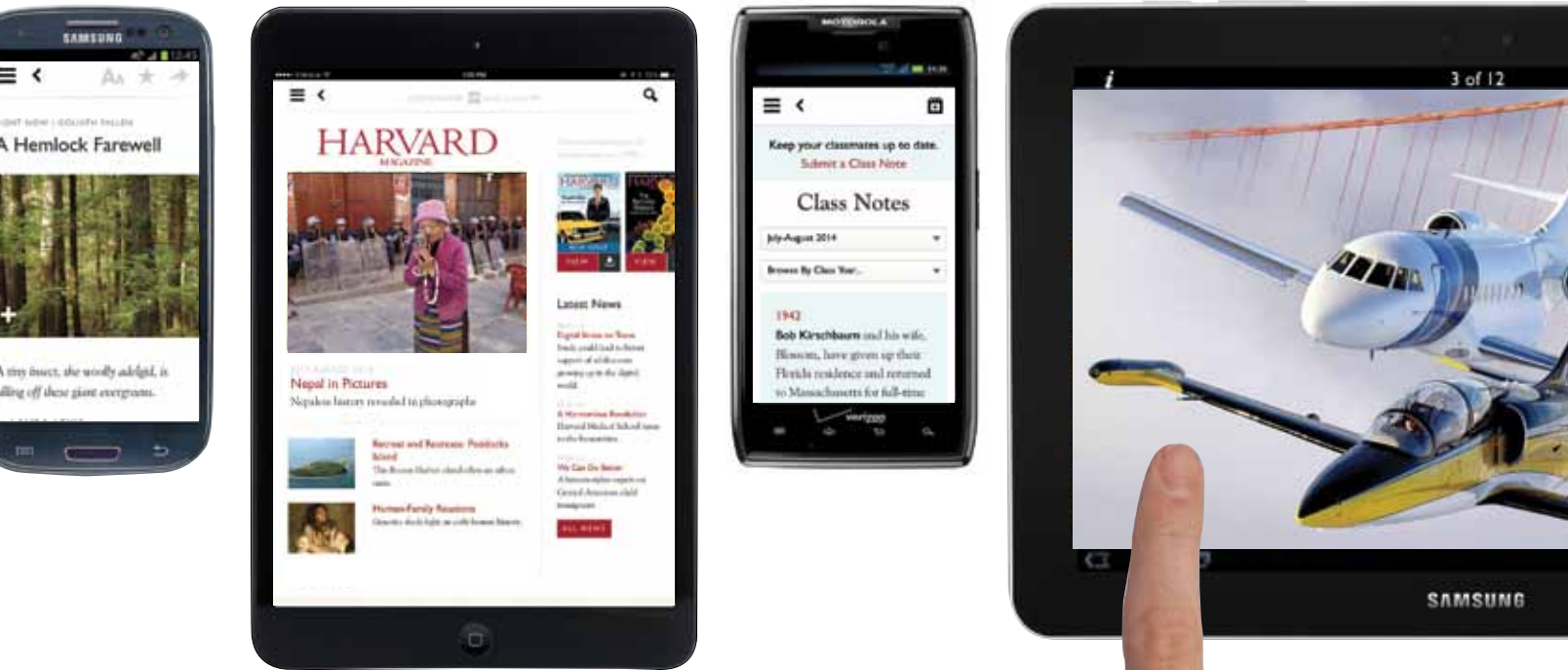


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ton Christensen's analysis of innovation. Understanding how businesses manage innovation is an excellent example of an important benefit of an education in business or liberal arts, namely to provide useful concepts for succeeding in wildly diverse careers.

Fifty years ago, Thomas Kuhn [⁴⁴, Ph.D. '49, JF '51] taught us about *The Structure of Scientific Revolutions* when he labeled disruptive ideas in science "paradigm shifts." Just as Kuhn's ideas help us understand the evolving nature of science and technology, Christensen's ideas will help us understand the evolving nature of business and technology.

Unfortunately, just as clever hucksters abused the idea of paradigms, I am concerned that contemporary gurus will misuse the ideas of disruptive innovation. Disruptiveness, novelty, or absurdity (think quantum mechanics, the flying car, the VW Bug, and the Ford Edsel) are not predictors of either success or failure. While the concept of disruptive innovation can help us develop a variety of options, it is up to us to use our intelligence to pick the option we think will work best and not base our decision on a single simple idea. Slogans can encourage creativity and motivation but are not a substitute for good old-fashioned hard thinking.

JACK LYNCH
South Portland, Me.

Is HAVING the breast-pocket handkerchief [on the cover illustration of Clayton Christensen] on the right a new innovation—or just a reversed image?

HENRY VAILLANT '58, M.D. '62, S.M. '69
Concord, Mass.

SOCIAL SCIENCE

"REBOOTING SOCIAL SCIENCE," by Elizabeth Gudrais (July-August, page 54), was a very interesting and important article. Of particular challenge is the observation, "There is no consensus on the consequences of inequality." In this regard, she cites Professor David A. Moss as saying, "[W]e may eventually be able to say with some confidence whether inequality actually causes certain societal outcomes."

Since the state of public health is a societal outcome, I believe one can answer the question at least in part, definitively, not eventually, but almost immediately by examining the data on the BMI and dental conditions of the people in the lower-

income groups as compared with those in the upper-income groups.

FRANK R. TANGHERLINI '48
San Diego

WHILE I congratulate Moss on his intent to generate theory that bridges the gap between action and theory in the social sciences, if the article is any indication, his selection of examples appears to be significantly biased.

All examples of capture listed in the article were capture of a regulatory agency by private corporations. What his studies apparently omit are capture of regulatory agencies by political interests.

What about capture of the EPA by conservation interests that ignore national interests such as productivity and employment? Capture of the IRS by politically motivated interests? Capture of the Justice Department by people interested in protecting the administration, not citizens? Capture of the FDA—not by pharmaceuticals but by interests demanding overly stringent testing that prevents development of new antibiotics?

It seems these examples of capture are perhaps more worthy of study than those that Moss and his team currently address.

WALLACE JUDD, Ed.M. '67
Leesburg, Va.

BETTER RESEARCH that focuses on overlooked problems and utilizes the wisdom of different social sciences can only be welcomed. While all problems are probably better understood upon closer examination, and research can help us in formulating remedies, the suggestion that research on inequality can lead to a conclusion as to its merits seems wrong and reminds us of the Southern position on the advantages of slavery in plantation agriculture. We do not need research on the "consequences of inequality" to be shocked by the huge and growing wealth of the American super-rich while many go hungry.

FRANCIS DUMMER FISHER '47, LL.B. '51,
IOP '71
Austin

THE TOBIN PROJECT strikes me as nothing more than a make-work project for academics and consultants who cannot or will not engage in productive, private-sector activities. In other words, the Tobin Project is a bunch of people who want to extend their

easy years in academia by claiming a new angle on issues that are already being studied ad nauseam. Nothing that they propose to study is not already being studied by at least a dozen think tanks in Washington, most of whom also fit this same description as "eternal students."

Furthermore, it seems likely to me that the only answer they will come up with, after five years of expensive study of the issues, is that "further study is needed," an answer that, not-so-coincidentally, will keep them all in salary for another five years.

The truth is that we already know the answers to these questions. They were known by Thomas Jefferson and Adam Smith in the 1700s and expounded upon by Ludwig von Mises a century later.

JONATHAN L. GAL '89
Provo, Utah

CUTTING COMIC

THANK YOU, Mindy Kaling ("Laugh Lines," July-August, page 20), for omitting the Ed School from your lampoon at Harvard Law School Class Day, recognizing that HGSE graduates are truly noble.

ALEZA BEAUVAIS, Ed.M. '99
Athol, Mass.

PRESIDENT FAUST ON DIVERSITY

AS A Black American alumnus, I was quite moved by Faust's powerful and poignant comments in "To Sit at the Welcome Table" (July-August, page 3). I too agree that Harvard University has done much to challenge racism, sexism, and classism at the interpersonal and institutional levels both within the university as well as domestically and globally. And, as the president so profoundly states, much work still needs to be done around these issues. President Faust's leadership is exemplary and role-models what many of us can do with our Harvard education and credentials along with courage to make this world more tolerant and inclusive.

JOE STEELE '79, M.B.A. '83
Craryville, N.Y.

I FOUND President Faust's letter to be more of the politically correct party-line pandering that has infiltrated and threatens to profoundly alter our institutions of higher learning—of which, I might add, Harvard



Visit harvardmag.com/extras for additional letters.

is supposed to represent the pinnacle. In my view, admission to Harvard should be based on past demonstrations of academic effort and achievement which hopefully insure future demonstrations of academic excellence and a continuing pursuit of learning that lasts a lifetime. Admission should *not* be based on race, religion, or gender. Harvard's faculty should be selected from the world's most illustrious scholars, who are also people devoted to the notion of communicating with a younger generation.

If Harvard or any other great educational institution focuses on these goals, its population *will* be diverse.

GRETCHEN BACHRACH
Arlington, Mass.

SEXUAL ASSAULTS

WHILE the topic of "Addressing Sexual Assaults" (July-August, page 23) is clear-cut, the conclusion is flatly wrong. The author writes: "The challenge in addressing sexual assault is that the University is populated by imperfect human beings, not angels."

To be clear: The challenge in addressing sexual assault is preventing Harvard

undergraduates from sexually assaulting other undergraduates because sexual assault is a harmful criminal act.

Any other interpretation is muddy and in fact part of the problem.

NANCY PAGAN, M.ED. '93
Cambridge

Editor's note: For an update on Harvard's sexual-assault policy, see harvardmag.com/assault-14.

HARPSICHORD HARMONY

WHO KNEW Hubbard was created by Harvard alums (Treasure, "Harpichords Extraordinaire," July-August, page 88)? Not that it would have made any difference, but I certainly did not when I ordered an "English Spinet" kit back in the 1980s as a project for my wife and me to undertake. We had built a small boat from a kit, so why not a harpsichord? Talk about enthusiastic ineptitude! Building the cabinet was not so terribly hard, once we got the hang of the veneering process. But that only produced a reasonably good looking piece of furniture. After reading the voicing instructions any

number of times and examining the implied tolerances between the wires to be plucked and the little pluckers, I realized that without serious help, all we would have would be furniture. To make a long story short, I begged and pleaded with a local expert here in midcoast Maine, and he eventually agreed to do the voicing job. It was finished roughly 20 years after the kit was purchased, and apparently that's about par for the course. The result looks fine and plays well, but is very sensitive to temperature and humidity, which tends to reduce its use. Who wants to tune every time before playing?

CLIFF RUSSELL, PH.D. '68
Alna, Me.

KUDOS to Mariana Quinn and Piano Technical Services (PTS) for any efforts to restore the Chickering-Dolmetsch harpsichords. Such restoration will enhance Harvard's musical-instrument collection, as well as providing a nice footnote to the history of the "Early Music Revival." I hope further that PTS will restore—versus rebuild—any premier pianos of 1920-1950 vintage Harvard may acquire in the future.

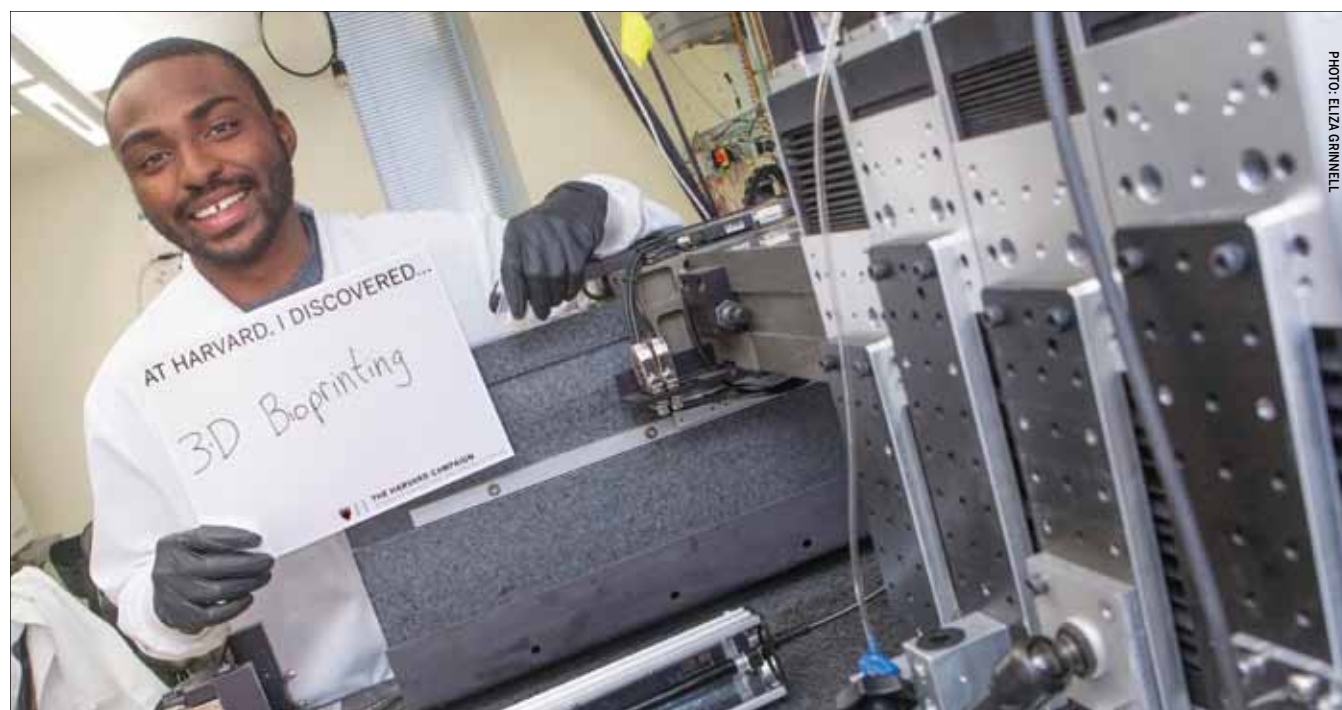


PHOTO: ELIZA GRINNELL

ROBERT HAWTHORNE '15 IS USING A 3D PRINTER TO CREATE TISSUE SCAFFOLDS SEEDED WITH LIVING CELLS. THESE REALISTIC TISSUES COULD ONE DAY BE USED TO TEST THE EFFICACY OF DRUGS OR REPAIR A WOUND IN THE BODY. HE IS WORKING IN THE LAB OF JENNIFER LEWIS, HANSJÖRG WYSS PROFESSOR OF BIOLOGICALLY INSPIRED ENGINEERING.

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LETTERS

As many serious pianists have observed, post-1950 pianos generally favor sonic power over refinement. Just compare Arthur Rubinstein's recordings of the 1960s to those of the 1930s!

IRA BRAUS, PH.D. '88
West Hartford, Conn.

DIVESTMENT

THE July-August issue quotes Michael Bloomberg noting that 96 percent of faculty donors contributed to Barack Obama and suggesting a lack of diverse political views in the University ("Talks, and a Text," page 19). But the same issue notes that, on October 3, President Drew Faust called climate change "one of the world's most consequential challenges" ("The Divestment Debate," page 22). Perhaps the Republican Party's refusal to acknowledge the impact of climate change explains the absence of faculty support.

RICHARD A. NEWMARK '61
St. Paul

IN LIGHT OF reporting in the July-August issue on Harvard's position on fossil fuel divestment, we wrote Messrs. Paul J. Finnegan and James F. Rothenberg [members of the Harvard Corporation, and Treasurer and past Treasurer, respectively], expressing the perspective summarized below.

Harvard currently holds substantial investments in fossil fuel. The past is no longer prologue for this asset class.

The scientific community—including Harvard's distinguished climate-related faculty—assert the world must hold global temperatures to no more than 2 degrees C above the preindustrial figure. Governments agree. And, yet, we have already gone half the distance to this ceiling, and are actually accelerating our rapid approach to it. We face an existential planetary threat.

By investing in fossil fuel companies that cling to the outdated business model of measuring success by discovery of new reserves, Harvard is encouraging (and expecting to profit from) the search for more fossil fuel—which will become unburnable if we stabilize global temperatures at levels necessary to sustain life as we know it. When the lid is put on, and carbon emissions are severely limited—as they must be—Harvard will be left holding stranded and devalued assets that can never be burned. (Proven reserves are three to four times what's needed to transition to renewables by 2050.)

Across the country, hundreds of student organizations work to persuade their institutions' endowments to divest. Sooner or later, as in the case of companies doing business in apartheid South Africa, divestment from fossil fuel companies will occur. Harvard should be among the first to do so. There are strong, independently sufficient arguments beyond the financial one of stranding to justify divestment. They include the moral (it is repugnant to profit from enterprises directly responsible for carbon emissions or to allow shareholder funds to be deployed in searching for more fossil fuel), the practical (a well-led institution should not wound itself by permitting endowment holdings to demoralize faculty and students, with adverse effects on quality of education, enrollment, and campus environment) and, in Harvard's case, the unique opportunity (and corresponding duty) it has, as one of a handful of world leaders in education, to lead on this planetary issue.

We support these other arguments for divestment. However, we wanted to bring the financial argument, in particular, to Harvard's attention. Over the past three years, equities in the coal industry declined by over 60 percent while the S&P 500 rose by some 47 percent. Coal, we submit, is the "canary in the oil well." Disinvestment now, before this opinion becomes commonplace, is just sound, risk-averse investment judgment, fitting well within the duties of a fiduciary.

BEVIS LONGSTRETH, J.D. '61

Retired partner, Debevoise & Plimpton; former member, Securities and Exchange Commission

TIMOTHY E. WIRTH '61

Former U.S. Senator; president of the United Nations Foundation, and Harvard Overseer

THEY EAT HEMLOCK

"A HEMLOCK FAREWELL" (Right Now, July-August, page 8) calls attention to the danger to certain species of hemlock caused by the woolly adelgid insect. But a correction is in order. The article says that "within the next 10 years, hemlocks in forests across the United States are projected to die off completely." Later, the article specifies what "across the United States" means: "from North Carolina to southern Vermont, southern New Hampshire, and southern Maine."

Harvard Magazine editors should be aware that for a long time now the United States has extended far to the west of the original

FUELING INNOVATION AT THE SCHOOL OF ENGINEERING AND APPLIED SCIENCES

During his 25th reunion last year, Ben Nguyen '88, MD '92, took a tour of the Harvard School of Engineering and Applied Sciences (SEAS) and liked what he saw. So did his kids.

"I was impressed by the projects, classes, and labs—including the flying robotic insects—and by Dean Cherry Murray's commitment to continue developing SEAS," Nguyen says of Harvard's newest School. "My sons loved using the robot arm to get candy and seeing the 3D printer."

SEAS, established in 2007 from a division of the Faculty of Arts and Sciences, fosters world-changing research, promotes entrepreneurship, and aims to spread technology literacy to all undergraduates.

Nguyen and his brother, Kim Nguyen '93, are supporting that mission by establishing the Ben L. Nguyen and Kim P. Nguyen Innovation Fund, a current-use fund that targets pressing research and teaching needs at SEAS, such as faculty and graduate student support, undergraduate research, laboratories and equipment, and course development. Says Kim, "I hope this fund will further Harvard's commitment to leadership, innovation, and social impact."

While an undergraduate, Ben concentrated in biology, lived in Lowell House, and was involved with Phillips Brooks House community service. Although he didn't take engineering classes in college (he says his roommate was one of the few engineering concentrators at Harvard in the 1980s), Ben got exposure while a student at Harvard Medical School. Today he practices neurosurgery—a technology-influenced field—and lives in McLean, Virginia, with wife Yvonne and their two sons, ages 13 and 12.

Kim is the chief business development officer at Pragmatics, an information technology

"BEING SURROUNDED BY STUDENTS WHO THINK BIG, YOU CAN'T HELP BEING INSPIRED TO THINK BIG YOURSELF."

—KIM NGUYEN '93



PHOTO COURTESY OF BEN NGUYEN

Kim Nguyen '93 (left) and Ben Nguyen '88, MD '92, are supporting the world-changing mission of the Harvard School of Engineering and Applied Sciences.

solutions company, founded by their father, that advises civilian and defense agencies such as the Department of Homeland Security. "I've seen first-hand the importance that technology plays in enabling the federal government to meet its mission," says Kim, who also lives in McLean.

As an undergraduate, Kim studied economics, lived in Cabot House, and was involved with Phillips Brooks House, the Harvard Vietnamese Association, the Asian American Association, and the Science Fiction Association. Like Ben, he worked throughout college.

Kim points to outstanding economics professors who encouraged his interest in developing countries, including the late Michael Roemer (his senior thesis advisor), David Dapice (his boss at Harvard's Indochina Program), and Byung-Nak Song, a visiting professor from

South Korea. Kim earned his PhD in economics from the University of California, Berkeley.

Asked how Harvard College helped shape him, Kim says: "Being surrounded by students who think big, you can't help being inspired to think big yourself. My fellow classmates motivated me to think about how I could impact the world."

Older brother Ben explains their rationale for creating an innovation fund at SEAS. "I thoroughly loved my time at Harvard," he says. "Although I have been giving back through the years, both Kim and I have reached a point where we could make a more substantial commitment. I hope this fund will spur even greater student and faculty development at SEAS. I can't wait to hear about the future projects that come out of the school."

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THE HARVARD CAMPAIGN
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LETTERS

13 colonies. As owner of 420 acres of forest land in the Pacific Northwest, I can assure you that our western hemlocks are doing well and will not die out in 10 years.

NEAL KOBLITZ '69
Seattle

PROVIDENCE, THEN AND NOW

FIRST OFF, many thanks for an excellent and engaging article on Jean McGarry's writings (Montage, "Rhode Island Blues," July-August, page 71): you've given me someone new to go look up at the Providence Athenaeum!

The point of my e-mail is a somewhat nitpicky correction on the captioning of the city photo accompanying the article, which reads: "Federal Hill in Providence, Rhode Island, today, with its Roman Catholic churches."

That photo, far from being from today, is from closer to when I graduated Harvard nearly a quarter-century ago: it cannot have been taken any later than the early fall of 1991, as the large Victorian Gothic church looming over the middle ground (center of the three churches readily visible in the picture) is the former Irish Cath-

olic parish of St. John on Atwells Avenue, which was torn down, in the main, in early February 1992. The tower remained for some years as a hulk, but was gone by 1995.

St. John's was the inspiration for H.P. Lovecraft's chilling tale "The Haunter of the Dark," though Lovecraft fudged on its date of construction, perhaps conflating it with the East Side's earlier St. John, Episcopal (now shuttered and decayed/threatened by neglect, also), saying it dated circa 1810-15, when it's patently the late Victorian Gothic of 1871.

Perhaps relevant to McGarry's tales of Irish Providence, I note that this was one of the two most imposing Irish parishes in Providence, the other being St. Patrick's on Smith Hill near the State House, and both have been demolished in the past 35 years, whereas their somewhat later, perhaps grander, Italian counterparts (such as the two flanking St. John's in your photograph), have not. I'm not sure what conclusions could be drawn from this, but it might be interesting fodder for one of Professor Stilgoe's students.

The St. John's site is now a small park

at the corner of Sutton Street and Atwells Avenue.

FRED ATHERTON '90
Providence

AMPLIFICATIONS AND ERRATA

WHEN he retired from the army last November, Jonathan Newmark '74, M.D., thought he was the oldest Harvard College graduate on active duty (The College Pump, July-August, page 80). Jim Bayley '73, M.D., reports that he retired from the army last December, after his fifth deployment to southwest Asia.

"The Divestment Debate" (July-August, page 22) reported that President Drew Faust "announced an initial \$1 million in innovation grants...for faculty and student projects at the iLab" [*italics added*]. The grants, intended to be the first element in a \$20-million program, are for research on innovations, but are *not* tied to the iLab. We regret our reporting error.

An editing error caused the misidentification of the Harvard degree earned by the late Geoffrey Searle, M.B.A. '65 ("Playing Together, Staying Together," July-August, page 74). We regret the mistake.



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ENGAGED PRIVACY

Can Pseudonyms Make Better Online Citizens?

PEOPLE SOCIALIZE ONLINE more than ever: posting photos on Instagram, job-hunting on LinkedIn, joking about politics on Twitter, and sharing reviews of everything from hotels to running shoes. Judith Donath, a fellow at Harvard's Berkman Center for Internet and Society, argues against using real names for most of these Internet interactions and relying instead on pseudonyms.

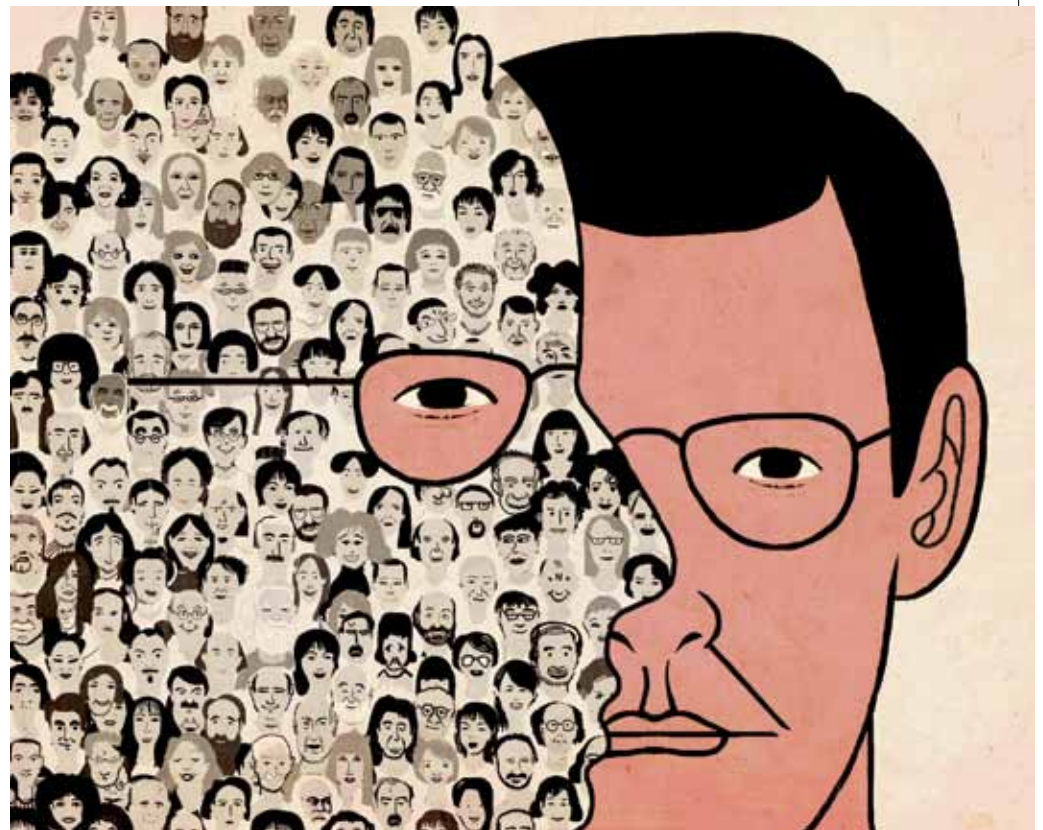
A made-up handle is essential to maintain privacy and manage one's online identity, she says. Her new book, *The Social Machine: Designs for Living Online* (MIT Press, 2014), also contends that well-managed pseudonyms can *strengthen* online communities, an idea that contradicts the conventional wisdom that fake names bring out the worst in people, allowing "trolls" to bully others or post hateful, destructive comments without consequences. Real names, such thinking goes, keep online conversations civil.

But Donath often uses a pseudonym online, not because she wants to "anonymously harass people or post incendiary comments unscathed," as she explained in a commentary published on Wired.com this spring, but because she prefers to separate certain aspects of her life. In the age of Google, a quick search of a person's name gathers

everything he or she has posted under that name, from résumés to college party photos. As a public figure who studies how people communicate online, Donath's academic writing can be found online under her real name. But when she writes product reviews on shopping sites such as

Drugstore.com, or restaurant reviews on Yelp, she might use a pseudonym. "I would like to be known online for what I write," she says. "I don't necessarily feel like I need to be known for what I've been eating."

Donath stresses that using a pseudonym is very different from posting anonymously. "The difference between being pseudonymous and being anonymous is history," she says. "For something to truly be a pseudonym, it has to have some kind of history within a particular context," such as how many times the person has posted on a site, the topics he or she comments on, and what he or she has said. (Such details might expose malicious users or instances of "astro-turfing"—the practice



of hiring writers to seed the Web with comments supporting a specific view on controversial topics. Posts from commentators whose contributions are limited to a single topic, such as gun rights, might be read with particular skepticism.)

Few sites currently share that kind of history. Donath has been exploring ways to allow websites to represent users with “data portraits” that make it “possible to see years of activity in a single glance.” In *The Social Machine*, she writes, “Data portraits...can help members of a community keep track of who the other participants are, showing the roles they play and creating a concise representation of the things they have said and done.” She continues, “Communities flourish when their members have stable identities,” and the protection of a pseudonym may free users to debate controversial topics more fully.

In the early days of online communities in the 1980s and '90s, idealistic writers praised these forums for untethering users from their physical bodies. They envisioned spaces where people could know each other not by their gender, age, or ethnicity, but by the words they wrote and the ideas they shared. “If you had a history of saying very smart, intelligent things, people would give a lot of credence to what you said,” Donath says. “If you had a history of being annoying, they would start to ignore you.” In the end, the reality was more complex: users became frustrated when people misrepresented themselves, and disposable e-mail accounts allowed people to generate spam or hate speech. In reaction, sites such as Facebook emerged to link Internet activity with a person's real-world life and name. Advertisers welcomed this effort to consolidate

all of a person's information for marketing purposes.

Donath is hopeful that establishing conventions such as the use of pseudonyms will provide “this amazing opportunity to develop online spaces that are truly different from what we can make happen face-to-face.” (The Internet, she says, could provide new options for difficult negotiations, for example.) One of her goals is to help readers recognize possibilities between real names and online anonymity. She believes pseudonyms could provide more information, not less. “We can simultaneously have a rich impression of others *and* privacy,” Donath says. “They're not [mutually] exclusive.”

—ERIN O'DONNELL

JUDITH DONATH WEB PAGE:

<http://vivatropolis.org/judith>

¿QUE PASA?

Unraveling “Racial Threat”

RIDING THE TRAIN to work every day in Chicago, Ryan Enos began to notice an intriguing pattern: at a certain downtown station, all the African-American riders seemed to get off just as Caucasian riders climbed aboard. “It was like a meeting of two worlds, where you could feel this palpable tension between

two communities that otherwise are strictly segregated from each other, but occasionally come into close proximity,” he says.

Now an assistant professor of government, Enos at the time was teaching high school in the historically poor and almost entirely African-American neighborhood of Englewood. The experience of moving

between two worlds and thinking about how that reality was an overwhelming presence in people's lives, shaping everything from the way they view others to their own political views, led Enos to pursue the study of “racial threat”—how people react with uncertainty to those of a different race—in graduate school and his subsequent professional career. In his most recent paper, “What the Demolition of Public Housing Teaches Us About the Impact of Racial Threat on Political Behavior,” he explores how individuals' politics are affected by the context in which they live.

Between 2000 and 2004, Enos and a group of Harvard graduate students studied a public-housing reconstruction project in Chicago that caused the displacement of more than 25,000 African Americans, many of whom had previously lived in close proximity to white voters. After the African Americans moved out of the voting district, a startling effect became apparent: the white voters' turnout dropped by 12 to 15 percentage points, leading Enos and his team to believe that white residents' previously higher levels of



When researchers placed Spanish-speaking riders on a Boston-area commuter-rail train, xenophobic attitudes first increased, then decreased.

civic engagement were in large part caused by feelings of racial threat.

"That's a lot of people. Political parties work really hard to try and turn out two or three percentage points of people—this is a 15 percentage point drop, so it's a huge swing in who votes and who doesn't," Enos notes. "What it looks like...[is that] when [whites] were living next to these black neighbors, they were 'racially threatened.' The presence of these African Americans was affecting their psychology in some way and causing them to vote in a certain way."

After dividing voters by race, Enos and his team measured how far they lived from the demolished housing projects and then estimated voting patterns, using a method called ecological inference (the process of using aggregate data to draw conclusions about individual-level behavior) developed by Weatherhead University Professor Gary King.

Enos found that the way people voted changed according to their proximity to housing projects: whites who lived nearby were voting for Republicans at a higher rate than whites living in other areas. "After those projects came down, they all voted Republican at the same rate," Enos adds. "It looked like the presence of those housing projects caused them to vote Republican."

Drawing on his Chicago experience, Enos has submitted for publication a report on an experiment in which two native Spanish-speakers were randomly inserted, for a period of days, into the daily routines of mostly white passengers on Greater Boston's commuter rail system. Surveying people on the train platforms about their views on immigration policy both before and after they were exposed to the Span-

ish-speakers, he found a significant rise in exclusionary attitudes among those interviewed. "The people riding the train were much more likely to say things like 'We should restrict immigration from Mexico' or 'We should send the children of undocumented immigrants back to Mexico' after they were exposed to the Spanish speakers," Enos reports. "This indicates that this feeling of racial threat is causing them to become sharply exclusionary."

He notes, however, that the initial response to this racial threat eventually gave way to more tolerant racial attitudes. After 10 working days, the team went back and re-interviewed the same passengers, and found their stances on immigration policy had become more liberal. "What's really good about public transportation is it exposes people to people, and they have this opportunity get to know each other, like you do when you enter grade school," he says. "While there is clearly this initial threat, it can lead to improved attitudes over time."

Overall, Enos adds, the point of this research is to start a national conversation on a topic that is often ignored. "It raises the main question of how do we respond to other groups?" he says. "It's important for Western societies, especially now, because we're becoming more and more diverse and we want to know how that affects things like our politics and how well we're going to function as a society." ~LAURA LEVIS

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RYAN ENOS WEBSITE:

<http://ryanenos.com>

WIRING MATTERS

Was the Human Brain Unleashed?

COMPARE HUMANS to other mammals and a distinguishing feature stands out: our large, cavernous craniums, and the densely folded brains stuffed into them. The human brain is more than triple the size of the brain of

chimpanzees, our closest relatives. In particular, it's the cerebral cortex—the wrinkled outer layer of the brain—that sets us apart. Whales and elephants also have big brains, but they can't match our cortex in the sheer number of neurons and billions of connec-

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tions among them.

It's obvious that our big brains are responsible in some way for enabling the unique things that humans do: developing languages, music, and art; using sophisticated tools and technologies; forming complex societies. But what is it about a bigger brain that makes these feats possible?

Randy Buckner, professor of psychology and of neuroscience, and his former student Fenna Krienen, Ph.D. '13, have proposed a hypothesis to explain how the evolution of a large cortex may have enabled the distinct cognitive skills that humans display. The key is not just *size* but *organization*. As the human brain swelled, they argue, the cells in newly evolved areas were increasingly freed from constraints that patterned the simpler connections in other areas, and thus able to

connect to each other in more complex ways that enabled new kinds of thinking.

The human cortex can be divided into two types of regions. One type includes the sensory and motor cortices, which process bodily sensations such as olfactory, gustatory, auditory, and visual information, and also control movements. These regions evolved early and are therefore similar in all mammals. But humans also possess a great deal of brain mass interspersed among these motor and sensory areas. Called "association cortices," those intervening areas are responsible for many of the tasks we associate with higher-level thought.

We know from animal studies that the flow of information in the sensory and motor areas follows a relatively simple, stepwise path. When visual information comes in from the retinas, for example, it's handed off from neuron to neuron through the visual cortex according to a chain of command. The raw sensory data are processed in more complex ways as they make

their way to different areas.

To understand the organization of these association areas in the cortex, Buckner's lab has imaged the brains of hundreds of people asked to lie in an MRI machine, doing nothing, so that researchers could study the spontaneous connections among different brain regions. Rather than follow a chain of command for information flow, the association areas seem to chatter with one another simultaneously through networks of cells connected across long distances. "Each of these networks has multiple components in each of the lobes across the brain," Buckner says. If the neurons in the sensory and motor areas seem to be playing a game of telephone, in which information follows serial paths, the cells in the association areas use a communications strategy more like the Internet—with lots of simultaneous connections and pathways.

Buckner and Krienen looked for a simple way to explain this phenomenon. Association areas not only *evolved* later in

humans, they also *form* later in an individual's development, explains Krienen, now a postdoctoral fellow at George Washington University. As new neurons form at specific sites in the developing brain, nearby cells secrete molecules that instruct the neurons on what part of the brain to travel to and what functions to perform. The sensory and motor areas are close to these instruction centers, but the neurons of the later-forming association areas are located between and far away from the centers where the instruction molecules originate.

These cells, Buckner and Krienen reason, may become increasingly untethered from the instructions that keep the older areas of the cortex so strictly patterned, and—freed from dedicated motor and sensory tasks—may instead de-

velop a new kind of organization. "We're making the hypothesis that as things get bigger, these in-between regions start wiring to each other," Buckner says. The organization didn't evolve specifically to let humans be social, develop language, or make elaborate plans for the future, he notes—but those abilities may have been made possible by the scattered networks that emerged. Thus, instead of relying on dramatic genetic changes to explain how the human brain evolved, the theory posits that the organization emerged as an effect of increasing size.

Buckner and Krienen outlined their "tethering hypothesis" last December in the journal *Trends in Cognitive Sciences*. Krienen hopes the work will spur other scientists to explain the basis of the seemingly unique qualities of human brains.

—COURTNEY HUMPHRIES

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ers, ice dancers, and Harvard's own figure skating club, along with enduring, new, and aspiring Olympians. All event proceeds benefit the Jimmy Fund of Dana-Farber Cancer Institute. (September 19-20)

(From left) From Ragnar Kjartansson's *The Visitors*, at the ICA; detail of the cotton and wire *Time of Ten Suns* (2013) by Carol Eckert, from *Game Changers* at the Fuller Craft Museum; primatologist Patricia Chapple Wright appears at the Harvard Museum of Natural History

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MUSIC

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FROM LEFT: COURTESY OF THE ARTIST; LUHRING AUGUSTINE, NEW YORK; AND ICA GALLERY; REYKJAVIK INSTITUTE OF CONTEMPORARY ART; FULLER CRAFT MUSEUM; AND DREW FELLMAN/HARVARD MUSEUM OF NATURAL HISTORY

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HARVARD SQUARED

Harvard University Band. (October 10)

Bands of the Beanpot

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EXHIBITIONS & EVENTS

Harvard Museum of Natural History

www.hmnh.harvard.edu

Saving Lemurs from Extinction: Conservation in Action. Stony Brook University professor and primatologist Patricia Chapple Wright, who won this year's Indianapolis Prize (from the eponymous zoo) for her work in Madagascar, shares her work and experiences. (October 2)

DeCordova Sculpture Park and Museum

www.decordova.org

Roberley Bell: The Shape of The Afternoon challenges what's "natural" and "artificial" by transforming the museum's roof terrace into a "garden" of fake flowers and plastic or resin-molded bulbous objects in neon colors. (Through October 6)

The Institute for Contemporary Art

www.icaboston.org

Icelandic artist Ragnar Kjartansson's ***The Visitors*** is a nine-channel video installation based on a musical performance by the artist's friends at the once-grand Rokeby Farm—now a bohemian meeting ground—and a perfect "backdrop to the film's eloquent homage to love, loss, and friendship." (Through November 2)

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Spotlight



Simon Fujiwara: *Three Easy Pieces*, a show of multimedia installations at the Carpenter Center, offers stark but absorbing theatrical narratives. *Studio Pietà* (King Kong Komplex), detailed above, is an attempt to re-stage a lost photo of Fujiwara's blonde, bikini-clad mother and her Lebanese boyfriend on a beach near Beirut where, it seems, she was a cabaret dancer. "Simon's work, while generally departing from facets of his biography," says James Voorhies, the center's new director, "beautifully interweaves fact and fiction to confront larger questions" about the nature of identity, creativity, sexuality, and politics. *Rehearsal for a Reunion* (with the Father of Pottery) explores Fujiwara's tenuous tie to his Japanese father, while *Letters From Mexico* points to the gross complexities of global interdependence and heritage.

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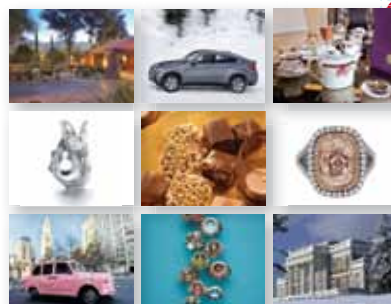
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tours are offered through October, or visit the website for special events, classes, and art shows.

LECTURES

The Radcliffe Institute for Advanced Study

www.radcliffe.harvard.edu

Kemper professor of American history and New Yorker staff writer Jill Lepore reveals “**How Wonder Woman Got into Harvard.**” (October 30)

FILM

Harvard Film Archive

www.hcl.harvard.edu/hfa

A retrospective on the Chinese-born director **Hou Hsiao-Hsien**, a progenitor of Taiwan’s New Wave cinema, highlights the nuanced sophistication of *City of Sadness*, *The Green, Green Grass of Home*, and *A Time to Live, A Time to Die*. (October 2 - November 3)



Also visit www.harvardmagazine.com for event listings.

STAFF PICK: Strings, Sax, and a Dash of Sass

Aiming to “mix up genres and provoke the audience,” says A Far Cry violinist Alex Fortes ’07, the chamber orchestra performs Béla Bartók’s *Divertimento* for strings, then joins saxophonist Harry Allen to explore the 1961 musical work *Focus*. Composed by Ed-



die Sauter for Stan Getz, the tenor saxophonist improvises against a score for strings. Why the pairing? Bartók’s piece “broke new ground in form and craft,” Fortes says. Bartók also championed Sauter, whose lead movement in *Focus*,

Concert music soars at the Gardner Museum’s Calderwood Hall

“I’m Late, I’m Late,” echoes Bartók’s *Music for Strings, Percussion, and Celesta*. The self-conducted A Far Cry has 17 young musicians (including Sarah Darling ’02 and Miki-Sophia Cloud ’04) all intent, Fortes says, on “inspiring and enlivening an audience through performance of classical music—broadly defined.” The group has released five albums, performed with Yo-Yo Ma ’76, D. Mus. ’91, among others, and is in residence at the Gardner Museum.

October 2, Isabella Stewart Gardner Museum, Boston
www.gardnermuseum.org

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A Park of One's Own

Where Frederick Law Olmsted lived his last good years • by Nell Porter Brown



WALK THROUGH the front archway at the Frederick Law Olmsted National Historic Site, and note how the dirt carriageway gently hugs an island grown wild with ferns, winged euonymus, and native barberry. In the middle, ivy runs up the rough and reddish trunk of a 90-foot Eastern hemlock. “Olmsted planted that soon after he bought the property in 1883,” park ranger Mark D. Swartz explained during a tour of the Brookline, Massachusetts, site. “He envisioned that it would eventually be a towering centerpiece that would command attention as people walked in.”

Some 131 years later, it does. Patient and persistent, Olmsted, A.M. 1864, LL.D. '93, angled the archway toward the tree, not his house, and likely knew that in time the structure would be hidden by boughs and foliage. America's most famous landscape



architect (with two honorary degrees from Harvard) “believed the natural world was a powerful medicine,” Swartz added, “an antidote to the adverse effects of the manmade urban environment that was rapidly expanding during his lifetime.” Here, the eye, first caught by the tree, follows the curving drive as it disappears behind the hemlock. Though small, the landscape Olmsted sculpted around his home holds pathways lined with mountain laurel and local pudding stone, a solitary American elm set on the rolling lawn, rock stairs patchy with moss that lead to a



Olmsted's vision is alive and well at the Frederick Law Olmsted National Historic Site. Clockwise from top left: meandering paths; the age-old hemlock on the carriage way; his home, as of 1883; and the arched entrance to it all.

shady hollow rich with vines, rhododendrons, cotoneasters, yews, and a shagbark hickory tree. All encouraged the same sense



of playful exploration, of grand mystery in the “natural” world, that imbue New York’s Central and Prospect Parks, Boston’s Emerald Necklace, and his other public projects.

At 61, Olmsted was famous when he and his wife, Mary Cleveland Perkins Olmsted, bought the farmhouse, naming it “Fairsted.” He was so intent on having the place, which sat on nearly two lush and hilly acres, that he cut a purchase deal with the elderly sisters who owned it: they moved into a cottage his son designed at the edge of the property, to live rent-free for the rest of their lives.

Still recovering from his final political battles over Central Park, Olmsted was lured to Boston as much by what would become the Emerald Necklace as by his friends and collaborators, the architect H.H. Richardson, A.B. 1859, and botanist Charles Sprague Sargent, the first director of Harvard’s Arnold Arboretum. They both lived nearby, and Isabella Stewart Gardner soon moved in next door. She was already collecting the art that would later fill her Boston

Rustic rock steps lead to a shady dell. museum, adjacent to Olmsted’s earliest

Boston project, the Back Bay Fens. There, he helped solve an engineering and public-health problem caused by chronic flooding and excess sewage. “He recreated a salt marsh that had been there, but enhanced it with a variety of new plants,” Swartz explained, building a more scenic testament to the original landscape. Pathways were added around the marsh, as was a carriageway, which became known as the Fenway, and two bridges, one designed by Richardson.

Gardner’s manse and other early estates still stand along the winding road to Fairsted. The Frederick Law Olmsted National Historic Site opened to the public in 1981, having been purchased the previous year directly from Olmsted’s firm, which was still there. The site now includes seven acres (five were bought from the Gardner estate and are conserved to protect the viewshed) and the original residence. Also open is the two-story addition that was built in stages, mostly after Olmsted retired in 1895, to house the landscape-architecture firm he founded and others continued to foster.

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for the Future: *The Olmsted and the American Landscape*, fills most of the first floor of the house and reflects the monumental impact of Olmsted's philosophy and work, emphasizing the collaborative nature of his legacy. "It was not just Olmsted's vision," Swartz says, "that made a major contribution to American landscape architecture."

Others took his ideas, as well as their

own, into the future—in particular, Olmsted's sons, John Charles Olmsted and Frederick Law Olmsted Jr., A.B. 1894. They worked with their father, then took over the firm when dementia forced his retirement. (He spent the last five years of his life at McLean Hospital, whose Belmont, Massachusetts, site he had helped choose years before; see Vita, "Frederick Law Olmsted,"

ALL IN A DAY: Portsmouth, New Hampshire

Sections of this seacoast city, where restaurants, shops, and architecture today charm herds of visitors, were once largely derelict. Residents resisted plans to bulldoze part of the downtown area in the 1950s, and instead helped turn 10 acres into the living history museum Strawberry Banke.

There, costumed reenactors explain the past while showing off buildings that date from about 1695 through World War II. "Mrs. Goodwin, wife of a Civil War-era governor of New Hampshire, is in her garden," reports marketing director Stephanie Seacord, "Mrs. Stavers is at the Revolutionary War-era Pitt Tavern, and Mrs. Abbott minds her 1944-ish store, talking about rations and making do." All are present, along with kids' games, cooking tips, and traditional artisans—blacksmiths, barrel-makers, weavers, coopers, and spinners—for the museum's seventh annual New Hampshire Fall Festival on October 11.

But any off-season visit, when summer crowds are gone, reveals the core vibrancy of this community. Local art appears in *Enormous Tiny Art* at the Nahcotta Gallery through September 28. New films migrate from Colorado to the Telluride by the Sea festival, at The Music Hall September 19-21. Live music, from college bands to folk and jazz ensembles, is played almost nightly at clubs, such as The Blue Mermaid and The Dolphin Striker (a classic surf and turf restaurant). The Portsmouth Athenaeum hosts maritime lectures, on October 15 and November 19, and a chamber music trio on October 19. And the historic John Paul Jones House is open through October.

Portsmouth's easy walk- and bike-ability is also a plus. Cyclists can take the Route 1B causeway to neighboring New Castle. The beach and park at Great Island Common are open year-round, as is the lesser-trod Fort Stark State Historic Site. Take a picnic and see the remnants of harbor defenses, which, like outspoken residents, proved integral to this coastal region's survival.



Spinning demonstration at Strawberry Banke; water's edge at the Fort Stark State Historic Site; lively gathering at the Nahcotta Gallery downtown.



Strawberry Banke
www.strawberrybanke.org
www.portsmouthnh.com/thingstodo

FROM TOP: STRAWBERRY BANKE; EMILY ST. AUBERT; NAHCOTTA GALLERY

July-August 2007, page 38.) Also pivotal was Charles Eliot, A.B. 1882, the son of Harvard president Charles William Eliot, whose cousin Charles Eliot Norton, Harvard professor of art history, was a good friend of Olmsted's. The younger Eliot apprenticed with Olmsted in 1883, then returned as a leading partner of the renamed Olmsted, Olmsted and Eliot, in 1893. The nation's first landscape architecture program was established in Eliot's honor at Harvard.

The family presence is only lightly felt at Fairsted. Olmsted married Mary, his brother's widow, in 1859, and adopted her three children, including John, who was already 31 and a landscape architect when the family moved to Brookline. (The couple's own son, Frederick Law Olmsted Jr., was about 13.) Vintage photographs



Conservators cleaned, repaired, and archived thousands of landscape plans found at the Olmsted firm.

of the former interiors are hung on walls, and visitors can flip through photo albums in the Olmsted-designed, pebbledash stucco-walled plant room. But the addition, where the firm was headquartered, has been restored and recreated circa 1930, when F.L. Olmsted Jr. was chiefly in charge and business at its peak, requiring about 70 employees. The sparsely decorated rooms—where bare bulbs on cords and on swinging metal arms light wooden tables and simple tools—capture the painstaking artistry of nineteenth-century design work: pen nubs and inkwells; a can of Pounce (powder used to blot ink); colored pencils and the sandpaper used to sharpen them; a velvet case for compasses and a metal canteen, both taken on field visits.

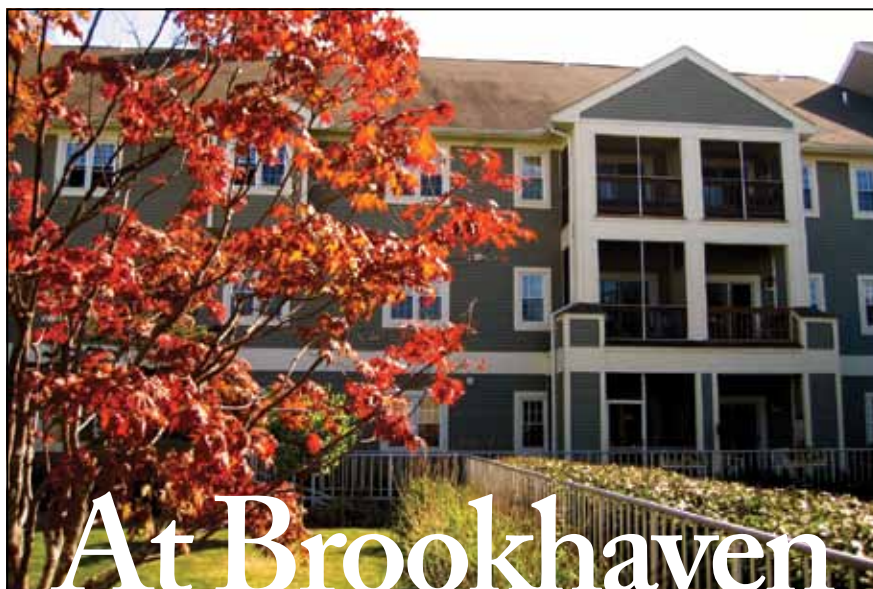
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Pinholes on the tables mark where thousands of landscape plans were labored over, and where lead drafting “whales” weighted the wooden arcs formed to draw Olmsted’s meandering paths. Employees serving as “copiers” sat at a “light table,” tracing fine lines of a design on paper uplit, through glass, by metal lamps on the floor. The tracings became blueprints: drawings were placed atop paper treated with cyanide salts and rolled



Visit harvardmag.com/ extras to see images from the Olmsted archives.

through windows onto racks outside to develop in the sun. Later, the 1904 Wagenhorst Electric Blue Printer, also on display, brought that process indoors.

By the time the federal government took over the site, business had dwindled for years and the firm had consolidated operations on the first floor. Some 139,000 paper plans were found in a storage vault, Swartz reports, most of them “dirty, stained, brittle, and torn,” he adds, “a few with mold growing on them.” It took paper conservators nearly 15 years to inventory and repair them. Altogether, more than a million archival documents are stored on site; researchers

The enduring, simple beauty of Olmsted’s landscapes is echoed in the rustic wooden interior of the restored drafting room at Fairsted.

may work there by appointment.

The restoration work outside was and is just as carefully considered. The hollow to the right of the hemlock and carriageway in front of the house, for example, is maintained as “wild,” Swartz says. Olmsted eschewed flower gardens, preferring the picturesque landscape and a palate of greens. Here, visitors descend rock steps into the hollow to find his differentiated shades, textures, shapes, and sizes cool to the eye, and more soothing to walk through.

Fairsted is ultimately a manmade environment. “He cut down all the elms out here,” Swartz explains, “except the one he wanted, in the middle of the South Lawn.” That tree survived until 2011. Much discussion of historic and scholarly inter-



pretations and practical realities (efforts to propagate cuttings from the original elm failed) led to replacing it in 2013 with a new, disease-resistant variety, the Jefferson elm. The young specimen stands alone on the lawn, cordoned off by ropes. “We’re protecting it,” says Swartz. The hope is that half a century from now, Olmsted’s visionary design will again offer the sense that nothing was placed here, that everything simply evolved.

CURIOSITIES: Staging Magic

In designing 106 costumes from scratch for the musical *Finding Neverland*, Suttirat Larlarb was challenged to depict Edwardian-era history with a fresh visual edge—and convey the explosive magic of the imagination. “You don’t want a museum piece set to music,” notes Larlarb, who was educated at Stanford and Yale. She has worked on numerous films (e.g., *Slumdog Millionaire* and *Trance*), and co-designed the 2012 Summer Olympics opening ceremony: recall the splendid “white-dove” cyclists? The ART’s world-premiere musical, based on the 2004 movie, has its own wings (for bumblebees), dancing servants, dogs, one mermaid, and a crew of sexy pirates. All contribute to the play’s modern meditation on the roots of creativity and the nature of youth, as

evidenced in J.M. Barrie’s relationship with the Llewelyn Davies family as he conjures up Peter Pan. Backed by Hollywood producer Harvey Weinstein, *Neverland* is a sumptuous production that is likely headed to London or Broadway. Like the fantastical sets, Larlarb’s creations intensify the drama. Barrie’s society-minded wife, Mary, strides around in a silky, lace dress with a proper high neck, curveloving bodice, and layers of ruffles

Thousands of swatches were sourced to find just the right Italian lace used in this gown for actress Jeanna de Waal (Mary Barrie).

too stiff to shimmy when she walks. (It was inspired by a 1901 dress at the Kyoto Costume Institute and a more recent design in *Vogue Italia*.) Even Mary’s satin evening gown is an “urban,” orderly, navy blue, Larlarb says, whereas her husband’s muse, Sylvia Llewelyn Davies, is a softer creature first seen playing in a park with her boys. She wears drapey, gauzy blouses and long skirts of pale oranges, pinks, and lavender—just “the right degree of bohemian hyperfemininity,” says Larlarb—and a peach-toned frock with an airy, flowery print at dinner. No matter how beautiful, the designer adds, costumes should not be signature artistic “concepts,” a word she dislikes. Instead, “they serve a larger ambition—the intended journey of the play.”



Suttirat Larlarb

Finding Neverland
American Repertory Theater
Through September 28
<http://americanrepertorytheater.org>

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Asta's diners stop, taste, and get excited.

A CLOSE LOOK at Asta's sign reveals the name of the storefront's old occupant, Café 47 Pizza and Pasta. "We realized that we could just spray paint over the rest of the sign and keep the 'asta,'" explains Shish Parsigian, who co-owns and runs the restaurant with her partner, chef Alex Crabb. "Our contractor was horrified."

Inside, this "design by subtraction" continued. They tore down the black drop ceiling, patching and painting the original tin panels gold, then used the same paint to touch up a picture of Zeus found behind

Chef/owner Alex Crabb shares the open kitchen with fellow cooks Tyson Wardwell and Nathan "Lazer" Phinisee.



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Even onion dishes are artfully composed at Asta.


a demolished wall—the logo for an even older incarnation, Despina's pizzeria. They also left the crooked, raw-plaster edging where the drop ceiling had been, and a swath of exposed bricks. “The contractor said, ‘I’ve got a guy who can get it straight and smooth—it’s going to look *prima*,’” reports Crabb. “And we were like, ‘No, we’re from Detroit. We like it. A lot.’”

Before opening Asta in early 2013, the L’Espalier veteran spent two months apprenticing at Copenhagen’s Noma, soaking up its spare Nordic style and almost primal focus on food. At Asta, diners sit at wooden tables with no apparent place settings (tip: open the drawers underneath). Dishes are vaguely titled “turnip,” “beef,” “fiddleheads,” and “onion.” Mis-

givings can ensue, Parsigian says, with a laugh: “‘What’s this crazy restaurant?’ But we are about making and plating this food and not about all the other trappings.”

Make no mistake: Asta is an original. Each night Crabb offers three tasting menus—three-course (\$45), five-course (\$70), and eight-course (\$95), to which wine pairings may be added. One night, a meal began with a shallow bowl of blanched and buttered peas with goat cheese. *Not* chèvre, this cheese is made in-house and is unrefined, so it has a clean, custardy texture. It comes with shavings of fermented rutabaga and diced preserved lemon; a purple chive blossom adds a hot nip. The turnip dish features the vegetable quartered and roasted, poached, and even raw (in moon-shaped discs), with a salted-plum vinaigrette, rolled-up, pickled green radish leaves, a cèpe foam, flecks of miso shortbread, and a baby nasturtium flower.

The food may appear fussy, but Crabb, who started working in kitchens as a teenager, lacks pretension. There is enough to eat, but diners leave truly sated because Asta’s inventive aesthetic is so stimulating:



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Nov. 25	Houston	7 PM
Nov. 29	Massachusetts	2 PM
Dec. 3	Northeastern	7 PM
Dec. 6	at Vermont	TBA
Dec. 8	Boston Univ.	7 PM
Dec. 21	at Virginia	Noon
Dec. 28	at Arizona State	TBA
Dec. 30	at Grand Canyon	6 PM
Jan. 10	at Dartmouth	2 PM
Jan. 14	at Boston College	7 PM
Jan. 20	at Bryant	7 PM

WOMEN'S SCHEDULE

Nov. 8	Colgate	2 PM
Nov. 17	at Boston Univ.	7 PM
Nov. 23-25	Hall of Fame Tournament ¹	
Nov. 30	vs. Temple ²	
Dec. 3	at Massachusetts	7 PM
Dec. 7	at Maine	2 PM
Dec. 20	Northeastern	2 PM
Dec. 29-30	Georgia Tech Tournament	
Jan. 2	Flo. Gulf Coast	7 PM
Jan. 5	UT Chattanooga	Noon
Jan. 18	NJIT	2 PM
Jan. 30	Princeton	7 PM
Jan. 31	Penn	6 PM

¹Played at TD Garden. All home games (in italics) are played at Lavietes Pavilion. Schedule is subject to change.

²Hall of Fame Tournament at Mahanogee. All home games (in italics) are played at Lavietes Pavilion. Schedule is subject to change.

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it forces people to slow down, take small bites, and enjoy the adventure of figuring out what's what. "We think that's fun," says Parsigian, a former manager at Hi-Rise Bread Company in Cambridge. "Then, when they are curious and excited, they call us over to find out what all the elements are."

And the onion dish is deceptively complicated. Crabb starts with a sweet roasted spring Vidalia for drama, then adds the "green unctuousness" of a poached scalion, with its "slimy chewiness." Petals of pickled pearl onions are placed on the plate with tweezers, then splashed with balsamic vinegar; another yellow dollop turns out to be "onion that has been cooked down with buttermilk whey and a little champagne vinegar," he reports. The black drizzles are burnt-onion oil—a bitter contrast to the dish's last touch: a luxurious spoonful of beer-and-cheddar purée.

Among the onions is a nest of twiggy, crispy beef—because Crabb often treats protein as a condiment. In this case, the fibers of a rib-eye steak cooked with wine are pulled apart, slow-fried, then seasoned. "It's not a beef dish," Parsigian tells patrons, "it's an onion dish." Almost every dish is just as carefully composed, although Crabb says the inspiration for the onion plate's "look" came one day when he saw wasted bits of fresh greens lying "in a nice circular pattern" around the sink drain.

When served, the ingredients form a crescent shape along the side of the plate. "And we will get the jokesters who say, 'Where's the rest of the food? Why is it all over there?'" reports Crabb. For him, it's obvious: "Because the negative space on the plate helps you focus on what's there."

That also explains why he cooks. Growing up in Michigan, he struggled with attention-deficit issues, and still does. But in the extreme chaos of commercial kitchens, Crabb found solace. His seemingly opposite traits—a sharp, kinetic intensity and the ability to shift quickly among diverse tasks—enabled him to thrive. "When I was 16 or 17, I was making omelets at a breakfast place," he says, "and those two-and-a-half hours of service were the only time my teenage mind was quiet. And it was so nice." ~N.P.B.

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A large, dark brass bell is being hoisted by a crane with multiple chains. The bell is suspended in the air, and two workers in safety gear are visible on a wooden platform below it, guiding the bell. The background shows the ornate, white facade of a building with classical architectural details like columns and arches. The sky is clear and blue.

JOHN HARVARD'S JOURNAL

STEEPLE SOUNDS. In 2011, the Memorial Church bell got a new clapper—and cracked; recordings replaced its ringing. This replacement, cast by John Taylor Bell Foundry, of the United Kingdom (which made the original in 1926), was hoisted into place on June 16. Genuine clangs resumed.

Photograph by Jim Harrison

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DUNSTER DECONSTRUCTION. Having practiced the art and craft of House renewal on parts of Quincy and Leverett houses, the College is now renovating an entire undergraduate residence. As soon as students decamped, the scaffolding went up, construction workers began stripping the roof and removing obsolete interior fixtures, and the courtyard was converted into a staging area for heavy equipment and building materials: the grass gave way to gravel and the iron gate facing the Charles River was removed for safekeeping (with the supporting towers protectively boxed). After a year-long diaspora—in part in the repurposed Inn at Harvard, which will have a swing-space dining hall—students should move back into their remade quarters in time for classes in September 2015.

Endowment Exit

ON JUNE 10, two days before its fortieth-anniversary celebration, Harvard Management Company (HMC)—which invests the University endowment and other assets—announced that Jane L. Mendillo, president and chief executive officer since July 2008, would depart at the end of this year. Her plan to step down surprised close observers. But the long lead time before her departure—making a regular search for a successor feasible—and general confidence in the organization and strategies suggest that the transition will proceed in an orderly way.

In an interview with Andrew Bary of *Barron's* in February, Mendillo called running HMC “the best job in the world” and

said, “I’d like to be here for as long as I’m adding value.” Paul J. Finnegan ’75, M.B.A. ’82—an HMC board member since March, whose selection as the University’s new treasurer was announced on May 28—said in conversation the day after Mendillo’s departure was reported that he was surprised. Discussing her tenure, he hastened to add that she had “joined at a less than ideal time” in world financial markets, and put in place changes in HMC and its controls and processes that made it “seem well positioned for future positive performance.” Mendillo herself, he said, felt the organization was “humming,” enabling her to “step back” without causing disruption.

Mendillo became HMC’s leader just months before the financial crisis erupted,

devastating the markets and threatening the University’s liquidity: during the fiscal year ended June 30, 2009, investment returns were a negative 273 percent, and the value of the endowment plunged nearly \$11 billion. It fell to Mendillo and colleagues to manage cash, steer through contracted commitments to invest funds with outside managers in future years, and build a new system for managing investment risk to meet the University’s cash needs. Returns were stronger as the markets recovered (11 percent in fiscal 2010; 21.4 percent in fiscal 2011) but still volatile (returns were a negative 0.05 percent in fiscal 2012 before recovering to 11.3 percent last year). The University’s financial leaders—the treasurer and chief financial officer—have made a point of projecting more subdued endowment investment gains in the future, compared to the mid- to high-teens long-term rates of return enjoyed for decades before the 2008 meltdown. President Drew Faust made such concerns a central theme of her academic-year opening remarks last September (see harvardmag.com/future-14).

Mendillo championed investing in certain real assets, such as timberland, and

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had enormous, early success in that area. (From 1987 to 2002, she was a senior investment officer at HMC, rising to become vice president of external investments and overseeing a portfolio that grew to \$7 billion; she then directed Wellesley's investments before returning to Harvard.)

Of late, slower growth in the developing world, particularly China, has put pressure on several kinds of real assets and commodities; Harvard's holdings underperformed their benchmark during fiscal 2013. HMC has also been challenged by less than stellar results in private equity, long a strong category for the fund managers, and now targeted for some 16 percent of the endowment's model policy portfolio. Because such assets are less liquid than public securities, investors expect *greater* returns for the risk they assume, but Mendillo's fiscal 2013 report on HMC stated that recent private-equity performance was "fair" and that for the past decade, "our private-equity and public-equity portfolios have delivered similar returns."

In the past few years, Harvard's performance has trailed that of peer institutions with the largest endowments and roughly similar investment strategies (see page 21): highly diversified assets, and a robust appetite for less liquid assets that promise greater long-term returns. (The strategies, actual investments, and universities' financial aims and needs of course differ. HMC no longer reports its performance relative to the Trust Universe Comparison Service, a common industry metric for large endowments.)

The differences in rates of return may not seem huge, but a percentage point on Harvard's endowment (\$32.7 billion as of June 30, 2013) is nearly one-third of a billion dollars: a large sum, particularly if compounded over time. (The 10-year annualized return captures Harvard's especially severe losses in fiscal 2009.)

In mid July, Bloomberg reported that HMC's employee compensation is *higher* than that of other university endowments, but investment returns during the past five years are *lower* ("Harvard Leads in Endowment Manager Pay as Returns Trail Peers"). HMC's pay packages, disclosed annually, are a perennial public-relations issue; other schools invest wholly with external money managers, many of whom no doubt earn much *more* than HMC staff members (as some of Harvard's external managers likely do, too)—but those fig-

HARVARD PORTRAIT



Tanya Smith

"Teeth have rhythms inside them that are very precise, regular, and consistent, like rings in tree trunks," says Tanya Smith, associate professor of human evolutionary biology. "And like tree rings, they can show you how long the organism has been growing—but on an even finer scale. Children's teeth lay down a mineralized record of growth *every day*. Your entire childhood is recorded in your teeth." The same holds for other primates. Thus Smith, using light microscopy, once examined a tooth section from a wild chimpanzee that died of Ebola in the early 1990s. After locating the "birth line," the birth process inscribed in teeth, she determined the chimp had lived 1,396 days; field notes showed she was off by only 24 days. Smith learned microscopy at SUNY Geneseo as a biology concentrator who also studied biological anthropology, earning her B.S. in 1997; her Ph.D. in anthropological sciences came in 2004 from SUNY Stony Brook. She then spent several years at the Max Planck Institute for Evolutionary Anthropology in Leipzig, arriving at Harvard in 2008. The ability to attribute precise ages to juveniles, even those from the early Pleistocene, can shed light, she says, on evolutionary riddles like the origin of the very long childhood, relatively late age at reproduction, and lengthy lifespan of human beings. Primates that grow and erupt teeth earlier also reproduce sooner and live shorter lives. "Earlier hominins like Neanderthals seem to have had faster dental development," she notes, "implying more accelerated overall growth and development than our species." Away from the lab, Smith is an avid kayaker who enjoys field research like studying apes, monkeys, and lemurs in their natural habitats: "I love being out in the wild."

Yesterday's News

From the pages of the *Harvard Alumni Bulletin* and *Harvard Magazine*

1919 The Endowment Fund Committee notes that faculty members have "been struggling along with truly admirable self-denial" on a pay scale set in 1905 [instructors earn \$1,200-\$1,500, assistant professors \$2,500-\$3,000, full professors \$4,000-\$5,500]. The committee urges a 50 percent increase, one of several urgent outlays that require raising the campaign's goal from \$10 million to \$15.25 million.

1934 The Harvard Corporation declines a gift for a traveling scholarship (for use in Germany) from twenty-fifth reunioner E.F.S. Hanfstaengl '09 because of his close association with "a political party which has [damaged German universities] through measures which have struck at principles...fundamental to universities throughout the world."

1959 The College's eighth House, Quincy, opens for business, complete with snack bar, washing machines, and one refrigerator and storage room per suite.

1969 Of 140 students in the Medical School's first-year class, 17 are black. During orienta-

tion, associate professor of surgery John C. Norman '50, M.D. '54, who had been asked to discuss "Possible Problems of the Black Student-Physician in the Harvard Community," noted instead that "on infrequent occasions one or two, but in no case more than three, American Negroes entered [the school] in any particular year" until that week. To his knowledge, said Norman, "it has not been demonstrated what these problems have been, because minority-group health sciences personnel, in any meaningful numbers, have not yet been included in the Harvard 'community.'"

1989 Harvard Divinity School opens a doctoral program in religion, gender, and culture—the first of its kind in the country and an outgrowth of the school's successful women's studies in religion program.

2004 For the first time, slightly more women (828) than men (818) enroll in the cohort of students entering the College, making the class of 2008 historic even before they begin their studies.

ures are private. The larger issue is the rate of return. HMC maintains that by managing 40 percent or so of assets in-house, it effects large expense savings. But even with those economies, which are included in the rate-of-return numbers, HMC's net performance lags behind peers' results.

As possessor of the largest endowment, Harvard may face the toughest performance challenge. Changes in its strategy may also enter into recent results. When asked if HMC's decisions—to adopt a more conservative posture meant to make the portfolio more liquid; to forgo leverage (borrowing) to boost returns—had penalized returns lately, Mendillo said such decisions were less consequential than "market-wide factors" in shaping current and prospective returns. Given low interest rates and a more subdued outlook for public- and private-equity gains compared to prior decades, she called it reasonable to expect lower market returns overall. And, she emphasized, "our alignment of the endowment with University needs for liquidity is improved" (a factor that might override any minor cost in terms of lower returns). Today, she said, "We know we can deliver what the University needs" and won't have to scramble to sell or redeploy assets, or take other emergency steps, in a future down market (the threat that forced Harvard to borrow \$2.5 billion in late 2008). "We feel good about that."

Finnegan—co-chief executive officer of Madison Dearborn Partners, a private-equity firm—noted that recent performance may be penalized by "legacy" issues from prior long-term investments, and may not indicate the expected results from newer investments. Indeed, Mendillo maintained that HMC has good "alpha generation opportunities" (the professional term for generating returns in excess of the market). She cited changes in regulation affecting other investors (such as commercial banks' allowed investments and required capital cushions) that create new opportunities for Harvard—plus the continuing strengths of the in-house real-assets and

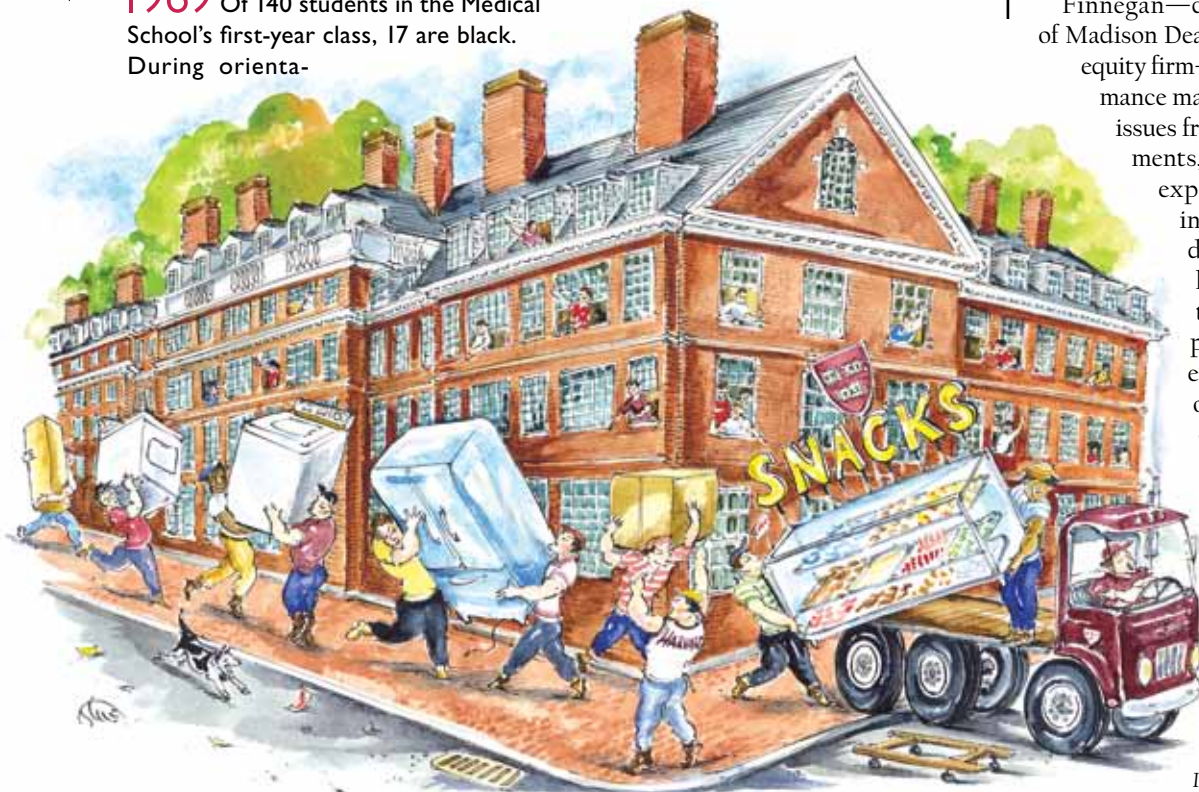


Illustration by Mark Steele

natural-resources asset managers, the new direct real-estate investments, and HMC's long-term fixed-income trading expertise.

Olshan professor of economics John Y. Campbell looked beyond particular investments or even asset classes to put HMC's outlook in a broader context. The largest endowments, including those at Harvard and Yale, were "early to adopt" the current model of highly diversified investments defined by a policy portfolio, use of illiquid assets, leverage, and so on. As first movers, they secured advantages, and returns to match, that have now attracted other investors. "The competition has wised up," said Campbell, a scholar of asset management, finance, and investing, and an HMC board member from 2004 to 2011. The top-performing endowment in any given year is now "more a matter of

For a larger endowment like Harvard, that translates into a smaller *percentage* of its assets, making it harder to achieve superior returns overall, even if the investment performs well. (Campbell knows about such matters: he is a founding partner of Arrowstreet Capital LP, a Boston-based quantitative asset-management firm with \$50 billion under management at last report.) Finally, he noted that Harvard's prowess in fixed-income arbitrage (a long-term source of superior performance for HMC) is somewhat blunted by today's very low interest rates, which limit absolute returns.

In light of such structural constraints, Campbell concluded, as an outsider, that HMC "is doing reasonably well." He also pointed to the much-enhanced coordination of HMC risk management and University financial planning, and the strengthening of both, as "one of the very important things about Jane's legacy."

The search committee has an interesting task. Harvard's assets are much more complex than those of,

say, a comparably sized fund consisting only of stocks or bonds. HMC's results are published and widely scrutinized, as is the compensation of its CEO and top fund managers: visibility that investment professionals at private firms can avoid. The investments themselves are subject to heightened scrutiny for environmental



STEPHANIE MITCHELL/HFAC

Jane Mendillo

and social impacts—witness the continuing advocacy by some students and faculty members for divestment of fossil-energy assets. The CEO reports to a board of experts in private equity, public securities, and other parts of the financial markets—a strength, one assumes, but perhaps challenging supervisors. The expanded Harvard Corporation itself now includes private-equity, venture-capital, and other investment experts. And The Harvard Campaign is drawing large gifts from the same community, and offering supporters who make substantial endowment gifts the long-term record—and presumably the hope of future strong investment returns. After six years, at age 55, Mendillo has chosen to step down from "the best job in the world," to take time to pursue personal and other interests—and pass the torch to someone eager to grapple with Harvard's emerging investment challenges.

For background and the text of the University announcement, see harvardmag.com/mendillo-14.

Investment Returns

Fiscal years 2010, 2011, 2012, 2013, and latest 10-year annualized rate

Harvard	11.0	21.4	(0.05)	11.3	9.4
Princeton	14.7	21.9	3.1	11.7	10.2
Stanford	14.4	22.4	1.0	12.1	10.0
Yale	8.9	21.9	4.7	12.5	11.0

luck," he added; it would be unwise to expect Yale and Harvard always to lead the rankings.

He also noted that the most successful external money-management firms (in private equity, for example) typically give big customers equal *dollar* allocations when raising new pools of funds to invest.

How the Faculty Feels

HARVARD FACULTY MEMBERS are a largely contented lot. They enjoy superb intellectual company, high-caliber students, and extraordinary library collections. But for a more objective and nuanced assessment, the office of the senior vice provost for faculty development and diversity undertook a new "climate" survey during the 2012-2013 academic year, and published aggregate findings just before Commencement. In general, among the 2,295 faculty members surveyed (1,090 tenured, 493 tenure-track, and 712 "non-ladder" lecturers, etc.), 72 per-

cent of whom responded:

- 81 percent were "very" or "somewhat" satisfied with being a faculty member at Harvard (49 percent and 32 percent, respectively)—those with tenure especially. Some 84 percent, given the chance to do their careers over, would still practice their craft in Crimson.

- Amid general happiness with libraries, students, opportunities to innovate in teaching, teaching load, and even their salaries, the areas where a quarter or more of faculty members indicated modest or significant dissatisfaction included availability of travel and conference funds; support

for securing grants (likely a rising worry, given federal funding constraints); and, especially, time available for scholarly work.

- Gender differences emerged regarding the academic "atmosphere." Male professors tend to be more favorable than their female colleagues in assessing the "fit" of their department in terms of collegiality, accommodating family responsibilities, and so on. The survey analysis, said senior vice provost Judith D. Singer, aimed to tease out such differences—over time; by faculty rank; by gender and race and ethnicity (not always possible in the latter cases, given the small cohorts of some (please turn to page 24)

Two Textual Traditions

Loeb Classical Library 1.0

WHEN JAMES LOEB designed his soon-to-be-launched series of Greek and Roman texts at the turn of the twentieth century, he envisioned the production of volumes that could easily fit in readers' coat pockets. A century later, that compact format is still one of the collection's hallmarks. Beginning in September, however, the iconic books will be far handier than Loeb had hoped: users of the Loeb Classical Library (LCL) will have the entire collection at their fingertips. After five years of dedicated work on the part of the library's trustees and Harvard University Press (HUP), which has overseen LCL since its creator's death in 1933, the more than 520 volumes of literature that make up the series will be accessible online. Besides allowing users to browse the digitized volumes, which retain the unique side-by-side view of the original text and its English translation, the Digital Loeb Classical Library will enable readers to search for words and phrases across the entire corpus, to annotate content, to share notes and reading lists with others, and to create their own libraries using personal workspaces.

LCL managing editor Michael Sullivan, whose position was created earlier this year to supervise the virtual library, said that the digitization project is "a major leap forward in the history of the Loeb." According to HUP executive editor-at-large Sharmila Sen, the launch of the digital LCL marks "a moment of rebirth" for the historic collection. She explained that in the years preceding the library's 2011 centenary, the trustees and HUP administrators began to think about how to make the LCL "relevant to the twenty-first century." Even though online databases of Greek and Latin literature have existed for years, said the library's general editor, Jeffrey Henderson, a classics professor at Boston University, the digital Loeb will be unprecedented in its accessibility and scope: for the first time, readers without knowledge of Greek and Latin will be able to explore a vast range of the classical literary heritage online through high-quality, modern translations. He added that the project, which cost the LCL foundation more than \$1 mil-

lion, will serve as a model for the digitization of other HUP series, noting, "It's strange that the oldest literature becomes the model for the digital age."

Consolidating a vast literary corpus involving two different alphabets into an interconnected, elegant, and easy-to-use website required much behind-the-scenes work, Sen said. Designing the software for the digital library and transferring the data have concluded, she noted, but the project overseers view the current product—which will be available by subscription to institutions and individuals—as only a 1.0 version. The website will be a dynamic workspace, Henderson pointed out, adding that user feedback will help the editors increase its functionality.

According to LCL executive trustee Richard Thomas, Lane professor of the classics, the digital library will have a remarkable pedagogical function. Instructors, he explained, will be able to link the digital texts directly to their syllabi—a feature he expects to be particularly useful in his own Latin courses. Assistant professor of classics Paul Kosmin plans to use the virtual library for his survey course, "Classical Studies 97a: Greek Culture and Civilization," which attracts both students familiar with the ancient language and those who are not. Accessing the bilingual Loeb online during section, Kosmin explained, will equalize the learning experience. "It's going to be a wonderful, wonderful resource," he noted, adding that his students will be able to analyze texts together on the digital platform using the annotation feature. Emma Dench, professor of the classics and of history and a scholar of ancient Rome (see *Harvard Portrait*, March-April 2010, page 49), said the up-to-date online versions will replace out-of-copyright trans-



The Loeb classics, newly available online

lations—which do not "read very nicely" and are less authoritative than the Loeb—that she has often had to use in the classroom. The virtual library, she added, will be especially valuable for instructors who teach courses that require many classical texts.

The impact of the digitization project will extend beyond classical studies, Thomas pointed out. The virtual library, he said, will be a "scholarly tool not just for classicists, but for those in English literature, Romance languages, philosophy, history, political science." Cogan University Professor Stephen Greenblatt wrote in an e-mail to *Harvard Magazine* that he can imagine using the digital LCL to explore Shakespeare's indebtedness to Roman authors like Plutarch, Ovid, and Cicero. "[The classics] remain, after thousands of years, a vital intellectual, scientific, cultural, and spiritual matrix," he added. Bemis professor of international law Noah Feldman said the virtual library will be useful in his courses on constitutional law and legal theory. "I would far rather refer students to a good text," he explained, "than have them wandering around on the Internet." He added that the digital LCL will be particularly helpful for an undergraduate general-education course on power and constraint that he is now designing.

Teaching aside, scholars and authors plan to use the digital library to conduct research. Kosmin, whose work on the Hellenistic period involves visiting archaeological sites and exploring the itineraries of ancient monarchs, will no longer need to carry all the relevant Loeb with him during his travels. Wien professor of drama and of English and comparative lit-

These articles were reported and written by Francesca Annicchiarico '16, the magazine's inaugural Daniel Steiner Undergraduate Editorial Fellow.

erature Martin Puchner (see *Harvard Portrait*, May-June 2013, page 50) said that the Loeb website will facilitate his research for a book about the history of world literature that will feature several classical authors. “I use [the Loeb series] to engage classical texts whose original language I know but not as fluently as I would like to,” he noted. Beyond the Harvard community, British novelist and historian Tom Holland said that he will browse the digital library to inform his forthcoming book about the Julio-Claudian dynasty, instead of paging through several printed volumes from beginning to end.

According to editors and faculty mem-

bers, the digitization project will not endanger the familiar red- or green-covered volumes. But keeping the print series, which will continue and expand, in sync with the online version will present new challenges, noted Henderson. “It’s important that people don’t get the idea that the print library is obsolete or that the most recent version is online,” he explained, “so we’re going to revise each in tandem.” Henderson added that he does not believe that the availability of the series online will harm print sales because the two libraries serve different purposes. Dench pointed out, “There is for me a limit to how much I actually want to read a book

cover-to-cover on the Internet.” She suggested that the launch of the website may even increase print sales as more people become aware of the collection.

Digitizing the Loeb will help preserve a literary heritage that, Sen noted, “has survived many technological upgrades” since antiquity. According to Feldman, the online project has a larger importance. “The commitment that the University and Harvard University Press have to these volumes is symbolic of our commitment to humanistic knowledge and education,” he suggested. “It’s wonderful and hugely important that that commitment not be seen as something archaic, but as something that’s alive.”

Tibetan Literature, Digitized

THIS SUMMER, Harvard Library has begun to upload onto its digital storage system 10 million pages of Tibetan literature that survived China’s convulsive Cultural Revolution, the movement between 1966 and 1976 that led to the destruction of countless Chinese and Tibetan literary texts. The project is the result of a partnership between Harvard Library and the Tibetan Buddhist Resource Center (TBRC), a nonprofit organization based in Harvard Square that has been acquiring, scanning, and digitally preserving Tibetan volumes since its founding in 1999.

Leonard van der Kuip, professor of Tibetan and Himalayan studies at Harvard and president of the center’s board of directors, explained that an enormous number of Tibetan texts disappeared during the Cultural Revolution, which affected the Tibetan plateau as much as it did the rest of China. “But many books were somehow saved by local Tibetans, monks and laypeople who buried the books, put them in boxes, wrapped them in cloth, and buried them in the ground,” he added. “And now, slowly, these books are coming out.”

TBRC developed from the vision of Gene Smith, a librarian and Tibetologist who started his private collection of Tibetan books while serving at the New Delhi field office of the Library of Congress between 1968 and 1985. With van der Kuip’s help, Smith established TBRC at the turn of the millennium in order to catalog, preserve,

and make available the Tibetan literary heritage. After scanning and cataloging Smith’s 12,000-volume collection, the center began its continuing search for more Tibetan texts to preserve. TBRC has so far digitally preserved approximately 20,000 volumes dating from the eighth century to the twentieth, covering subjects ranging from Buddhist teachings and theories to philosophy, history, poetry, architecture, and medicine.

Wallman and Richard Lesage, the Harvard librarian for South and South-East Asia who has helped spearhead the collaboration, said that it would take approximately a year to upload the files onto Harvard Library’s Digital Repository System (DRS), a digital storage service that will serve as a backup for TBRC’s own digital files. The DRS represents a “safe haven” for the digitized Tibetan texts, commented associate librarian for collection development Dan Hazen, who has helped coordinate the project. Harvard Library will also incorporate the TBRC catalog into the HOLLIS catalog,

making the Tibetan texts available to the library’s users. (HOLLIS will not provide access to TBRC’s collections directly, but will redirect users to the TBRC database.) Hazen defined the collaboration with TBRC as one of Harvard Library’s “hallmark projects” since its recent administrative and organizational restructuring.

Despite all the *political* tensions that have arisen concerning China’s governance of the Tibetan region and people, the climate in China is now particularly favorable to the preservation of the Tibetan *literary* heritage. The government has recently passed a law protecting the Tibetan language, said Greg Beier, the center’s director of sustainability. “This is an ideal time for really getting involved with looking for the texts and making them available to the world.”

For a complete report, see harvardmag.com/tibetan-14.



Tibetan texts on loan, awaiting scanning, and a Tibetan Buddhist woodblock (below), also recorded digitally



underrepresented minorities); and among peer institutions. Peer institutions reported similar differences between genders, suggesting that women in academia (as in other realms) are excluded from informal networks and more likely than men to perceive a need to work harder to be seen as legitimate scholars.

There were sharp differences at Harvard on other matters. Asked if their school or department makes genuine efforts to recruit female faculty members, 19 percent of women disagreed—but only 6 percent of men. Asked if the school or department

Tenure Track,” September–October 2010, page 48). That has made a world of difference: instead of conducting casual searches for junior colleagues, on the assumption that almost all would be leaving, professors now know they are searching for younger scholars intended to be reviewed for permanent appointments, as full peers—a much more serious undertaking. Professional counsel and guidance must therefore be the norm. In the 2013 survey, 72 percent of junior women reported having a formal mentor, as did 60 percent of their male peers—and almost all the rest had at least an informal mentor. Singer said the schools “deserve a lot of credit” for effecting this change quickly.

• Finally, the survey quantified the large issue still looming over academics and the society generally: the yawning gap between men’s and women’s household responsibilities. “This is not a Harvard phenomenon,” Singer noted. Among professors in a household with children and a working partner or no partner, women reported 10 hours more of household work weekly. Among junior faculty members in the same life circumstances, the gap doubled, to 20 hours more of childcare, adult care, or housework weekly (see graph)—during the period when the professional demands to build a record for tenure evaluation also peak. Skipping confer-

ences and declining to write papers “are career-defining events for our tenure-track faculty,” she said. For this cohort, the rule apparently is: forget about sleep or leisure.

When she was appointed in 2008, Singer recalled, the six campus childcare centers had long waiting lists. (Excellent care is enormously expensive in the local market, on the order of \$25,000 annually.) The need for periodic care—to attend a professional conference, for example, or conduct field research—was unmet. Since then, during renovations, some of the campus centers have been enlarged, and beginning in 2009, despite the financial crisis and budget cutbacks, deans have made available a cumulative total of \$5 million for income-based

subsidies of up to \$20,000 yearly for junior faculty members to meet daycare expenses, at Harvard centers or elsewhere. For ladder faculty, Singer said, “It is the best program in higher education today.”

The survey results show the effects: half of tenured and tenure-track professors with children age four and under now use Harvard-affiliated centers, up from one-third in 2007, and the share who sought but could not get a placement has dropped from 17 to 7 percent.

In 2008, Singer said, it was clear that Harvard as a whole had to invest in care facilities and other support if it wished to nurture the faculty generally, and the schools and departments had obligations to live up to the commitment to create and populate a tenure-track faculty with real promotion prospects. Given its evidence that on most measures faculty members report bettered conditions, the recent survey, she said, points more to actionable items “at the school level than the University level.” Opportunities for further gains lie in discovering and discussing local cases where disproportionate concerns are detected. There may be differences among the faculties in how clearly promotion criteria are spelled out and documented, for example, or in how mentoring occurs in a particular field or department.

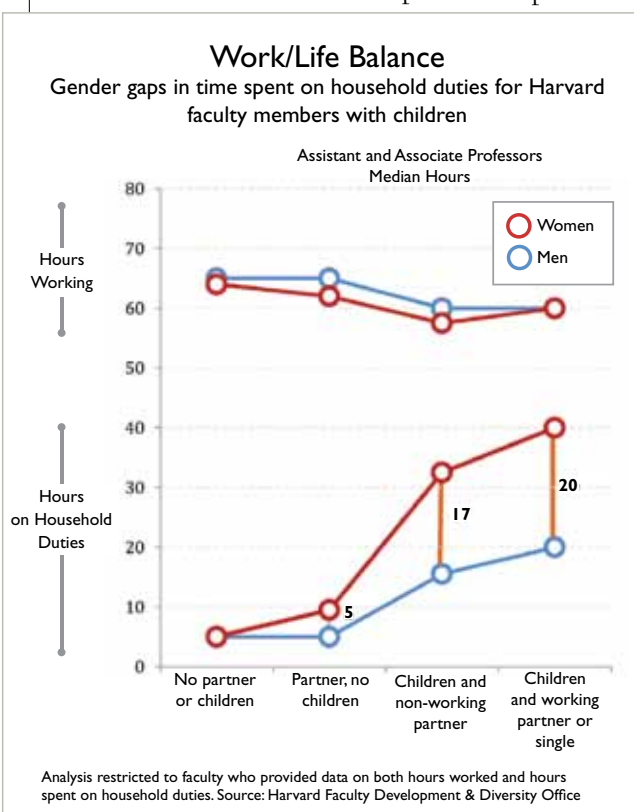
For Singer, a scholar of statistics in her academic capacity as Conant professor of education, this may be the ideal definition of the senior vice provost’s future role: as the source of data—backing deans, department chairs, and others with the facts about what Harvard is doing well, relative to peers, in the care and feeding of faculty members, and where and how it can do better still.

The climate survey findings are available at www.faculty.harvard.edu/sites/default/files/FCSfinal.pdf.

Citizen Scholars

“SOME of the smartest thinkers on problems at home and around the world are university professors,” *New York Times* columnist (and Harvard Overseer) Nicholas D. Kristof ’82 wrote earlier this year in an op-ed calling on professors to engage more with public life, “but most of them just don’t matter in today’s great debates.”

That essay probably rankled most across the Scholars Strategy Network (SSN), a nationwide organization of more



climate is at least as good for female as for male faculty members, 43 percent of women disagreed to some extent, versus 20 percent of men.

Similar, but less sharp, differences emerged when the questions were posed concerning minority faculty members: they evaluated conditions considerably less favorably than did their non-minority colleagues.

• A tenure track matters. One query captured a large change at Harvard. In the 2007 results, half of junior (assistant and associate) professors reported that they had only an informal mentor, and 12 percent had none. In the intervening years, a tenure track has been instituted (see “The New

than 400 academics dedicated to integrating scholarship into public policy by forging connections with policymakers, civic groups, and the media. Members of SSN's steering committee—including its founding director, Thomas professor of government and sociology Theda Skocpol—isued an open letter detailing SSN's efforts since 2009, and other scholars from the network joined in. Political scientist Amy Fried and sociologist Luisa Deprez, co-leaders of SSN's Maine chapter, published an op-ed entitled, "No, Kristof, Academics Aren't Cloistered Like 'Medieval Monks.'"

In academia of late,
"the conversations have
turned inward—each
specialty talking in its
own private language."

References to the Kristof kerfuffle elicited good-natured groans during SSN's two-day retreat in Cambridge this June—but the episode underscores challenges that motivate, and at times impede, the group's work. (Reached by e-mail, Kristof offered: "I love Scholars Strategy Network and think it's a model for connecting smart researchers with the public and policy-makers....There's no one solution to the problem, but SSN is great at building bridges to span that divide!")

"We all realized that there's so much excellent research and so many good ideas in the hundreds of colleges and universities," Skocpol [who is an Incorporator of this magazine] recalls of SSN's founding conversations. "But partly because American academia has expanded enormously over the last half-century, the conversations have turned inward—each specialty talking in its own private language."

This disconnect, she agrees, has hurt public policy. She cites immigration debates in which legislators clamor for taller fences, ignorant of research showing that fortified borders don't reduce illegal immigration, but do increase costs, keep undocumented workers from going home—and ultimately prompt them to bring in their families. "It's a perfect example," Skocpol remarks, "of how policy produced the



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exact opposite of what was intended, because people didn't understand how immigration works." Such examples prompted SSN, she continues, to try linking scholars to policy: "How can their work, their voices, their persons get more connected to the broader process of democratic politics?"

One answer has come through contact with national legislators. SSN was originally organized regionally—its members, hailing from 40 states, are spread across 19 chapters—but the group recently formed nationwide issue-based groups. Its criminal-justice group held a congressional briefing on

workers across the state. Their findings provided ammunition to Somos in seeking legislation to expedite wage-theft court cases; Governor Susana Martinez signed the legislation last year.

SSN Southwest has also focused on Affordable Care Act implementation in New Mexico, holding public lectures, sending members to testify before the state's Legislative Committee on Health and Human Services, and meeting (while Skocpol was visiting) with the editorial board of the conservative *Albuquerque Journal* to discuss whether Martinez, a Republican, should

expand Medicaid under the law. "At one point I looked across the table," Skocpol recalls, "and I said, 'It's really the taxpayers of Massachusetts who will be paying for healthcare for your poor people here in New Mexico.' And one of the editors piped up and said, 'Well, if we accept this, does that mean we might not have to pay as much in local taxes to help the hospitals pay for the care of uninsured patients?' 'Yes, that's what it means.' Everybody nodded their heads." A few days later, the paper accepted an op-ed from Skocpol and a Democratic state senator on the topic, and then, unexpectedly, the board endorsed

explanatory journalism sites—for "strong, empirical, interesting research."

Both Green and staffer Linda Naval advise SSN members on how best to pitch their work to media outlets, and the investment has paid dividends. SSN members have been cited in the news more than 1,500 times in the past year, and their articles are regularly accepted by national and regional publications. The Maine chapter has a weekly column in the *Bangor Daily News*, and a monthly series, "The People Next Door," that examines how public policy affects individual Mainers. Skocpol is quick to point out the democratic advantages of such a wide net: "I get more excited when we get something in *USA Today* than I do when we get something into the *Times*, because *USA Today* is in every hotel room across this vast country."

One striking feature of SSN's model is the group's 2011 decision to become a content creator. Its chief output—and prospective members' price of admission—is the "two-page brief." Skocpol calls the policy "both simple and extremely challenging. But it's the right challenge, because it represents what people who join need to learn to do: take an underlying book, article, or topic they know a lot about, and boil it down to two pages of crisp, clear English with no insider terms of any kind—no jargon, no acronyms, no methods-speak."

Beyond providing a vehicle for translating complex scholarship into clear prose, the group's roughly 450 briefs published to date serve as a valuable organizing tool. "The theory is that if something costs nothing, it means nothing—that's why we insist" on a first brief for membership, Skocpol explains. "Once we discovered that, then the thing took off—because there was something for each person who joined to do."

The membership requirement underscores what Skocpol calls the network's "profoundly 'small-d' democratic structure": "There are a lot of Ivy League professors, there are a lot of Harvard people—but there are also people from community colleges, from state universities, from small colleges. Everybody's equal." This federated, democratic, volunteer-driven structure harmonizes with Skocpol's own scholarship: in her 2003 book *Diminished Democracy*, she laments the bygone dominance of "major voluntary membership associations" inspired by "America's federally organized republican polity," and their more recent replace-



Theda Skocpol

mass incarceration, co-hosted by Representative Bobby Scott (D-Va.) and the Congressional Black Caucus, this past May.

Perhaps more important, noted Representative Rosa DeLauro (D-Conn.) at SSN's retreat, have been the group's efforts "beyond the Beltway." The regional chapters—partnering with local civic groups and media outlets—have notched some of the network's most significant victories. SSN's 15-member Southwest chapter, for example, has worked closely with a New Mexico organizing group called Somos Un Pueblo Unido to study illegal wage withholding among employers of immigrant

workers themselves. Martinez ultimately agreed.

ALTHOUGH SSN has built ties with policymakers and civic groups, perhaps its most natural constituency thus far—as the *Albuquerque Journal* anecdote suggests—has been the media. Avi Green, M.P.P. '99, SSN's director of civic outreach and development, points to several trends that make the group's work supportive of the media's, including the "tremendous economic pressure facing newspapers—particularly regional newspapers"; the "proliferation" of news websites with space to fill; and the hunger—evident in the rise of



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ment by “professionally managed advocacy groups” with large, centralized staffs and no chapters. SSN has three full-time staff members and an annual budget below \$1 million. Only two donors, Robert S. Bowditch Jr. ’61, LL.M. ’68, G ’92, and David desJardins, have funded the group since its inception, though SSN is now enlisting several “SSN Supporters”—benefactors who will donate between \$10,000 and \$25,000—to match its growing membership (each chapter gets a small stipend from headquarters to fund events and outreach). Skocpol calls it “one of the best buys in all of public life.”

It’s also a prime example of a scholar joining theory to practice. In *Diminished Democracy*’s conclusion, Skocpol argues that “new strategies for translocal association building must be devised”—and her colleagues are quick to praise her for devising one. Larry Jacobs, a professor at the University of Minnesota’s Humphrey School of Public Affairs and member of SSN’s steering committee, suggests that Skocpol “has had more impact on public policy than any other scholar over the last 40 years—and this may be her most important impact.”

Despite its progress, SSN still faces obstacles—including several trends Kristof

identified—chief among them, according to several members, the “publish or perish” culture of tenure committees, which are loath to credit “nonacademic” work. “Making your research accessible...has to be a hobby,” laments Cynthia Rogers, an associate professor at the University of Oklahoma and co-leader of SSN’s Oklahoma chapter. “My colleagues will say, ‘Great, thank you,’ in the halls [if I publish an op-ed], but when they’re assessing me, it’s, ‘What are your publications? What are your citations?’”

Scholars must also work to whet the public’s appetite for their deliberately sober offerings. Few see this obstacle as insuperable. “Most people—if you asked them, ‘Would you rather eat healthy green vegetables or highly processed artificial foods with lots of chemicals in them?’—would pick the vegetables,” contends desJardins, a mathematician, software engineer, and member of the MIT Corporation. “But they don’t love vegetables so much that they’re going to eat them if the processed food tastes good and the vegetables taste bad.”

And there are charges—voiced recently by former New York mayor Michael R. Bloomberg, M.B.A. ’66, LL.D. ’14, in his

Harvard Commencement address—that academics are not impartial arbiters of policy, but rather boosters of the partisan left. SSN’s leaders admit that their membership likely skews progressive, but emphasize that the organization remains nonpartisan. (SSN’s membership does include scholars, like Georgetown University’s Matthew Kroenig—a hawkish national-security expert—whose work diverges from liberal orthodoxy.) “I really believe,” says desJardins, “that if we have policies that are more based on facts, I’m going to be more happy with those policies...[Liberals and conservatives] all have good things to bring, but I think all of them could benefit from having better facts and reasoning behind their policies.” “We don’t inquire into people’s political commitments,” Skocpol maintains. “But we celebrate their commitments as citizens, whatever they choose to do.”

That support means a great deal to many of the network’s scholars. “I was almost in tears when I talked to Theda about this,” recalls Shauna Shames ’01, Ph.D. ’14. “I’ve been caught between wanting to do good research and wanting the research to be relevant—and sometimes too much of the latter is seen as not enough of the former. To believe that they could be mutually reinforcing is revelatory.” Shames worked at an activist organization before beginning doctoral studies; she left, she says, because she wanted to know that what she was claiming was true. “The danger,” she remarks, “is you go into academics and you can find truth, but then most people can’t benefit from it.” SSN “is trying to combat that,” she concludes, “and I don’t think there is any higher calling as an academic.”

SSN continues that work of joining insight to action, even if the mindsets of politics and the academy sometimes conflict. At one point during the SSN retreat, a member asked, rhetorically, “What does success look like?” and then supplied a tentative answer: “Basically plagiarism—having a scholar’s ideas picked up and put into a piece of legislation without attribution.”

Professors around the room chuckled. Jacobs’s eyes lit up.

“That’s not plagiarism,” he called out, grinning. “That’s influence!”

—MICHAEL ZUCKERMAN

Michael Zuckerman ’10, a writer and a resident tutor in Lowell House, begins his studies at Harvard Law School this fall.

University People

Math and Science Merit

The five inaugural winners of the \$3-million Breakthrough Prize in Mathematics (funded by Russian Internet investor Yuri Milner and Facebook founder Mark Zuckerberg ’06) include professor of mathematics Jacob Lurie, for work in derived algebraic geometry and other fields....The Howard Hughes Medical Institute has named 15 scientist-educators, including Smith professor of molecular genetics Andrew Murray (who also directs the Faculty of Arts and Sciences’ center for systems biology) HHMI professors. Each receives a \$1-million, 5-year



Robert Wood

grant to integrate their research with undergraduate student learning and engagement with science....And the National Geographic Society’s new cohort of Emerging Explorers in-

cludes Harvard School of Public Health research associate Christopher Golden, an ecologist and epidemiologist, and Charles River professor of engineering and applied science Robert Wood, a microrobotics pioneer (see harvard-mag.com/robot-14). Each was awarded \$10,000.

Development Dean

O’Neil A.S. Outar has been appointed senior associate dean and director of development for the Faculty of Arts and Sciences. He succeeds Paul Keenan, who has left the University for personal reasons, but remains associated in an advisory capacity. Outar has previously worked in fundraising at MIT, the University of Alberta, and Tufts—his alma mater.



O’Neil A.S. Outar

HPAG

Sexual-Assault Reforms

Harvard has promulgated new University-wide policies and procedures concerning sexual assault, harassment, and unwelcome conduct, in an effort to comply with new federal requirements. Salient features include adopting the “preponderance of evidence” standard of proof for adjudicating cases, and the creation of a new Office for Sexual and Gender-Based Dispute Resolution, to be staffed with trained investigators, charged with investigating cases, making findings of fact, and determining whether the new policies were violated. Discoveries will be referred to the individual schools (in the case of Harvard College, the Administrative Board) for disciplinary determinations. The policy and procedures were unveiled during the summer, in advance of federal clearance, so they can be implemented in the new academic year. See harvardmag.com/assault-14 for a full report.

Affirmative Action Upheld

The U.S. Court of Appeals for the Fifth Circuit ruled in mid July that the University of Texas at Austin’s consideration of race as one of many factors in its admissions was permissible. The Supreme Court ruled last year in *Fisher v. University of Texas* that public institutions could consider race in admissions under certain circumstances—a significant decision in the multiyear litigation over affirmative-action procedures—but ordered the appeals court to determine whether UT’s process was sufficiently focused to meet the standards narrowly drawn by the justices. The appeals panel has now determined that they were—but Abigail Fisher said she would pursue her suit, if necessary appealing to the Supreme Court anew. Harvard has supported UT’s procedures; for background, see harvardmag.com/action-14.

Re-engineering Higher Education

The American Council on Education’s

Brevia



AN HONORAND’S PASSING.

Harvard does not confer honorary degrees in absentia, or post mortem. The degree conferred on Gleason professor of fine arts emeritus and Cabot founding director of the Harvard University Art Museums emeritus Seymour Slive during the May 29 Commencement exercises—a sentimental favorite—proved especially timely: he succumbed to cancer on June 14. Read a fuller account, with a link to his past *Harvard Magazine* article, “Jacob van Ruisdael,” at harvardmag.com/honorand-14.

“Presidential Innovation Lab” (including MIT’s president, Penn’s provost, and Bates president A. Clayton Spencer—formerly Harvard’s vice president for policy) has published a white paper on “reimagining business models for higher education.” While predicting that “a very few institutions with deep fiscal resources and marquee brand names...may be able to continue conducting business with relatively minor adjustments,” the panelists foresaw “a future that is likely to look little like the past” for much of higher education. “In particular,” they said, “colleges and universities need to scrutinize every dimension of how they

budget for teaching and learning.” In the same mid-July week, Moody’s Investors Service issued an updated “negative outlook” for U.S. higher education “even as green shoots of stability emerge.” The credit-rating agency foresaw “limited revenue growth...while expense pressures will constrain the ability of many universities to adjust” in the next year or so, with “meager” tuition growth, public appropriations trailing rising expenses, “increasingly fierce” competition for research funding, and other concerns. And the Andrew W. Mellon Foundation is supporting 10 Pennsylvania liberal-arts colleges (including Bryn Mawr, Haverford, and Swarthmore) as they use technology to combine low-enrollment courses, share study-abroad sites, reduce procurement costs, and seek other efficiencies.

Elsewhere in Academia

Yale completed the \$500-million fundraising required to pursue construction bids for its planned two new undergraduate colleges (as its Houses are known), and expansion of enrollment by 15 percent, to 6,200. If acceptable bids are received, completion is envisioned for 2017....The Sidney Kimmel Foundation, a perennial supporter of cancer research, has donated \$110 million to Thomas Jefferson University, in Philadelphia, which will rename its medical college accordingly....Alumnus Geoffrey Cumming pledged \$100 million (Canadian) to the University of Calgary for medical research; the province of Alberta will match the gift.

Nota Bene

ENERGY ACTIONS. American and George Washington universities have partnered with Duke Energy to buy electricity from a 52-megawatt photovoltaic array to be built in North Carolina; it will supply half the current used by the two campuses, and one-third of the GW hospital’s demand, during the next two decades, reducing greenhouse-gas emissions by 60,000 metric tons yearly. Separately, the Uni-



PRESIDENTIAL PAIRING: In the bosky setting of the Aspen Ideas Festival, past and present Harvard presidents Lawrence H. Summers and Drew Faust met for a late-June conversation on the future of universities, pedagogical technologies, educational governance, the humanities, and what they taught each other about leadership. The conversation, gently moderated by Overseer, Aspen Institute president and CEO, and frequent Faust interlocutor Walter Isaacson, is available at www.youtube.com/watch?v=CQIMbdOf8f0.

versity of Dayton, a Catholic institution, announced in June that it would eliminate its public and private investments in companies that produce coal and fossil fuels.

CONFERENCE CENTER CLINCHED. The Business School, continuing Harvard's most robust building boom, announced in June that Seth Klarman, M.B.A. '82, and Beth Klarman have made the naming gift for Klarman Hall, the 140,000-square-foot conference center/auditorium complex it intends to build. It will replace Burden Hall, an auditorium erected in 1971 to a design by architect Philip Johnson '27, B.Arch. '43. For a full report, see harvardmag.com/klarman-14.

PSYCHIATRIC RESEARCH. The Broad Institute, the genomics offshoot of Harvard, MIT, and the Harvard-affiliated hospitals, announced a \$650-million commitment from philanthropist Ted Stanley to support research on psychiatric disorders; he previously donated \$175 million for the work. Former University provost Steven E. Hyman, professor of stem cell and regenerative biology, directs the program.

ARTS ADVANCE. Speaking at Radcliffe Day, dean Elizabeth Cohen revealed that its campaign had attracted half of a \$10-million University gift from Maryellie Kulukundis Johnson '57 and her husband, Rupert Johnson, to support the arts, and a \$2.5-million matching sum. The resources will endow the institute's faculty director of the arts (currently professor of history of art and architecture Yukio Lippit; see "Works and Woods," September-October 2008, page 44); and establish

a new "arts laboratory" at renovated gallery space in Byerly Hall, where Radcliffe Fellows are based.

SCIENTIFIC FITS AND STARTS. Two recent headline discoveries with Harvard roots have come under significant challenge. The January announcement of a simplified method for creating versatile stem cells, based on work by Charles Vacanti, Vandam/Covino professor of anesthesia, and a team of researchers in Japan, was retracted by *Nature* in early July, following an investigation that found evidence of scientific misconduct and errors in the Japanese laboratory. And the March announcement by Harvard-Smithsonian Center for Astrophysics researchers, led by associate professor of astronomy John Kovac, of fundamental discoveries concerning cosmic microwave signatures of gravitational waves from the formation of the universe in the Big Bang, has now been challenged on the grounds that the observers may have been misled by interstellar dust. Scientific scrutiny of the data continues.

INTERNET-ERA FESTSCHRIFT. For the seventieth birthday of Hobbs professor of cognition and education Howard Gardner, widely known for his work on multiple intelligences and other fields, his former student, Mindy Kornhaber, and his wife, Ellen Winner, chair of psychology at Boston College, invited colleagues to write about his work—yielding 116 essays. Gardner



Howard Gardner

has written a response to each, and the entire corpus is available in twenty-first-century formats: a free PDF (howardgardner.com/2014/05/27/mind-work-and-life), in print from Amazon, or for the Kindle.

MISCELLANY. Ford Foundation professor of democracy and citizenship Archon Fung has been appointed academic dean of the Harvard Kennedy School. Elsewhere at the school, Michael Ignatieff—former director of the Carr Center for Human Rights Policy, and then a member of parliament in his native Canada—has been appointed to the Murrow chair of press, politics, and public policy; and Maggie Williams—former chief of staff to former first lady Hillary R. Clinton—has been appointed director of the Institute of Politics....During the awards ceremony on June 8, the American Repertory Theater won Tony Awards for *All the Way* (best play, and best performance by an actor, Bryan Cranston, in a leading role) and *The Glass Menagerie* (best lighting design)....Following a sabbatical, Michèle Lamont will assume the directorship of the Weatherhead Center for International Affairs next July; she is Goldman professor of sociology and of African and African American studies....Former *New York Times* executive editor Jill Abramson '76, dismissed from that post in May, will teach narrative nonfiction as a visiting lecturer during this academic year; she has previously taught at Princeton and Yale. For more information, see harvardmag.com/abramson-14....Sheila Thimba, recently vice dean for administration in the school of arts and sciences at Rutgers, has been appointed Harvard College's dean for administration and finance.

Online Evolution

HARVARDX and other institutions continue to create new massive open online courses (MOOCs; see the current list at harvardx.harvard.edu/modules-courses). But with hundreds of offerings available on edX, Coursera, and emerging platforms (such as the Business School's HBX; see harvardmag.com/hbx-14), emphasis is now shifting to research on *applications* and *assessments*.

As reported, HarvardX's review of first-year MOOC enrollments revealed apparently vast online interest in signing up for courses (perhaps reflecting the ease of registration), but rapid attrition (see "Harvard Measures Its MOOCs," May-June, page 22). A *Chronicle of Higher Education* review of those data, published in mid June, reiterated the key finding that about half the registrants viewed *none* of the course content; of those who examined *any* content, "half looked at 11 percent of the course chapters or less."

The *Chronicle* also reemphasized that the Harvard- and MIT-based MOOCs tend to attract students who already have college

degrees, rather than earlier-stage learners. This is less a surprise (given the course requirements) than a useful reminder that many introductory, skills, or even remedial courses might issue better from public universities serving a broader student body. That might also hold true for international students in countries with little higher-education infrastructure or access, an intended audience for the online courses. That in turn raises questions about the "massiveness" of many MOOCs emanating from elite institutions.

These broad findings do not mean the first HarvardX courses—deliberately diverse in content, and driven by professors' desire to experiment with the technology—have no relevance. Nor do they imply that other approaches are pointless.

One promising avenue is the "blended" or "flipped" course, in which content such as recorded lectures is made available to students, like a multimedia textbook, *before* they meet with teachers in the classroom. Gordon McKay professor of computer science Harry R. Lewis described how he reengineered a course this way, with low-

tech recordings costing a tiny fraction of the tens to hundreds of thousands of dollars invested in a full-scale HarvardX offering, in "Reinventing the Classroom" (September-October 2012, page 54).

Such courses appeal for two very different reasons. They may deepen learning, if class time formerly spent on lecturing is used instead to grapple with difficult concepts or work through problem sets with fellow students. They can also be an avenue toward efficiency and economy as more students, in effect, share a lecturer.

Harvard, which has predicated its \$30-million edX investment on the presumed benefits for *in-class* education on campus, has begun evaluating blended courses that draw on MOOC material. Two reports in late July—by the Bok Center for Teaching and Learning (its director, Rob Lue, is also faculty director of HarvardX) and researchers at the Graduate School of Education (one of whom co-chairs research for HarvardX)—examined four courses, each previously offered in a traditional, residential format. Most had then been developed for fully online,

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MOOC presentation, and are now being taught in a blended version.

The Bok Center report, as summarized by HarvardX, focuses on implementation of the blended format, not its educational impact. Students found the online materials interesting and engaging, but reported little change in how they prepared for class. They valued the flexibility the online materials afforded in pacing their learning, but emphasized the continuing importance of in-person discussion sections (which were eliminated in three courses to accommodate online learning time; students wanted sections reinstated). Finally, students used the online material to cut corners, “causing some to integrate the materials in less-than-meaningful ways”—suggesting the need for faculty members to clarify expectations for students in blended courses. The education-school researchers attempted to probe the learning effects of blended teaching; based on exam scores, they found no “significant impact.”

Findings from a far more ambitious attempt to assess learning and possible pedagogical efficiencies in blended classes were also released in July. In “Interactive Online Learning on Campus,” Ithaka S + R researchers detailed the use of hybrid courses (principally made available free of charge by Coursera) at the University of Maryland. Comparing blended with conventional sections of the same course, the study found ways to “enhance productivity in higher education by reducing costs

without compromising student outcomes.” Across disciplines and student subgroups, those in hybrid sections “did as well or slightly better than students in the traditional sections in terms of pass rates and learning assessments.” The productivity gains weren’t free, however; in routine use, Coursera and other MOOC vendors would charge for course content, and Maryland professors reported working 150 to 175 hours to adapt the outside MOOCs to their classes. Moreover, “students in the hybrid sections reported considerably lower satisfaction....Many indicated that they would prefer to have more face-to-face time with instructors.” These results, requiring improved course design and delivery, might well be expected in such experiments; but in the meantime the suggestion of significant cost savings, with no sacrifice of learning, may carry the day in much of U.S. higher education. (Lawrence S. Bacow, a member of the Harvard Corporation and senior adviser to Ithaka, is credited for helping to shape the research.)

Indeed, the *Chronicle’s* 2014 survey of 350 four-year college presidents, published as *The Innovative University*, found that 81 percent expect “hybrid courses that have both face-to-face and online components” to have a positive effect on higher education—by far the largest positive score among seven, mostly technological, innovations. But 52 percent expect MOOCs to have the most negative impact (only 2 percent viewed them positively). Addressing the annual

meeting of the National Association of College and University Business Officers in Seattle in July, Bill Gates ’77, LL.D. ’07, who champions MOOCs and education technology, also propounded a more nuanced vision. He called most current MOOCs “mediocre,” of use only for “the most motivated students,” but predicted that improved versions, used as enriched textbooks, would in the near future provide huge opportunities for remedial math, writing instruction, and entry-level courses in general. (The Bill & Melinda Gates Foundation, which Gates runs, funded the Ithaka study, part of its larger investment in research on MOOCs.)

In the meantime, that future is arriving, outside the conventional boundaries of higher education. During the summer, Starbucks announced that its employee tuition-reimbursement program would shift toward degree-focused programs offered online by Arizona State University. And Udacity (like Coursera a for-profit online venture), which previously partnered with Georgia Tech and AT&T for a low-cost, online computer-science master’s degree, has now joined AT&T to offer a “NanoDegree”: basic programming skills required to qualify for an entry-level data-analyst or app-design job at the company. Each innovation is far from the ivy-covered halls of selective academia—but each is an interesting and possibly large-scale application of the new learning technologies to underserved populations not now enrolled in programs on the country’s campuses.

THE UNDERGRADUATE

“Charlie Parker, Who Played the Saxophone”

by NOAH PISNER ’14

I KEPT my spelling tests from third grade. My mother says this was an eight-year old’s effort to catalogue his vocabulary, and quotes me, apocryphally: *How else will I know which words I know?* There are 22, hole-punched in a binder, on the cover of which red gel pen hardened in tall, uneven letters:

DICTIONARY. (Did my teacher tell me to write this?) In all the tests I misspelled only one word. A red-ink correction tells me that word was *passion*. I wrote *passing*.

“Don’t so be so glum!” my mother said when I rediscovered the error. “Maybe this doesn’t mean you’ve passed up your

passion”—I was staring unhappily into my oatmeal—“but rather that your passion is in letting things pass!”

We had been clearing out my old projects from the basement, something I always said I would not do until school was over, which—as of the end of May—it was. Early in the process, I had come across a set of note cards from an oral report I was assigned to do on Charlie Parker for Black History Month in 1997. In preparing the report, I realized, I never listened to a Parker song. Silly as it sounds, it didn’t occur to my teacher or parents to play one for me. Instead I spent the time reading a Parker biography, weeping over how he spent so much of his life fighting morphine addiction and mental illness. I was seven and had never heard the

phrase *nervous breakdown*. Someone could have played me a 1945 Bird song, and said, “Hear that, son? Hear how it sounds like water through an open doorway? Sometimes music isn’t enough to get the sadness out.” Someone could have explained it with that trite, perfect zeal, and I would have known what jazz meant, or thought I knew. Maybe I would have felt inspired to become a saxophonist because of it. No—all I did was explain to my first-grade class how they, too, could lose their minds. I remember precisely how it began. His music was held as apposite: “Charlie Parker, who played the saxophone, was...”

I get angry with parents for missed opportunities: *If only they had given books instead of toys, or taken me to a Redskins game, or moved us to California—I could have been a reader, a Redskins fan, a Californian.* It upsets me, I realize, not because I would ever have wanted to be these things, but because I want to have something I can say is a lifelong passion. Do you know what I mean? I want to be like Flaubert, who raised his arms at the age of 12 and proudly declared that he would be a great French writer, and, by George, he was. I think of my best friend at Harvard who lived with the saxophone attached to his lips. Here’s a guy who aced Math 21a and knows books better than most English majors. But when it comes down to it, the sax is it. It’s always been it. Once, I asked him how he came to know this and he told me it was like learning to read: “You don’t remember learning, right? It just sort of happened.”

The passion could have even been mundane. My brother’s friend Matt just got his accounting license. When he was six, he knew himself very well and he’d tell people that his goal in life is to find things that are out of place and put them back into place. I love this. As a child on the playground, this meant returning balls to bins before the bell rang. Now as an adult, it means getting the numbers to add up right. “I have no desire to be a calculator,” he once told me. “But I *am* jealous of the file cabinets.”

Authorities on life—*authors*, for short—assure me that passion is the be-all and end-all, the *raison d’être* and *sine qua non* of really living. Seize your passion, they write, yield everything to it. I heard this at Commencement, too: “Do what you love!” “Dream big!”

It’s great advice—the *best*—but I’ve gotten to a certain age and I realize the reason more talented people don’t take it is



because they never even knew what they loved to begin with; they didn’t really have what Flaubert or Matt did. For me, I always assumed I’d figure out my passion in college—pick a passion, pick a major, pick a career. Sometime between freshman and sophomore year my heart would yelp and say, “Noah, the thing you want most in the world is to help the poor and make movies. *Now chop chop!*”

I assumed my passion would arise spontaneously, intuitively, perhaps after some exposure, like the flu. And yet here I am, months after graduating, second-guessing all my choices because I don’t know if I feel strongly enough about them. I panic: What if, this whole time, I was meant to be a zookeeper? Or a biplane pilot?

I HAVE an on-and-off mentor who recently asked me why I might want to be a writer. It wasn’t until I said that *I have to write* that he started taking me seriously. I’m still not sure if I was honest when I said this, though—there are days I’d prefer to dangle my feet in the pool. But supposedly all the best writers feel this passion. As Avi Steinberg put it in *The New Yorker* last year, a dedicated writer gets shunted off by Philip Roth’s advising, “It’s torture, don’t do it,” and replies, “You had me at torture.” Etymologically, this follows. Like *patience*, *passion* comes from the

Latin *pati*, which doesn’t mean *to flow with exuberance*. It means *to suffer*.

What am I willing to suffer for? Honestly, a lot. At Harvard, I learned to love so many things—I read poems with Peter Sachs, wrote history for Luke Menand, rapped jazz with Vijay Iyer, studied neurodegenerative disease with Dave Liu, promoted labor protection in India with my thesis adviser, Sadhana Bery—but now I have to prioritize these things, picking and choosing what among my liberal art studies (or outside them) is worth my time, is worth making a vocation of. It’s a fortunate situation for someone to be in, but lacking some semblance of lifelong passion, I’m hesitant to proceed. It’s easier, for now, to wait at the station, but as time gains momentum I will eventually have to pick a train, and the missed lines will multiply exponentially until I arrive at some point—far out along some branch of life’s sumptuous complexity—from which there’s no turning back. There’s a term chess players will use—*zugzwang*—to refer to a situation in which you’d prefer to skip a turn, as any move will make you worse off. That’s it exactly: I feel Lear-sized, but must be sonnet-precise.

Then again, maybe that’s what’s insufferable about passion. It’s not the sitting down and doing it, it’s the sitting down and doing it when it’s a beautiful day out-

side and the trout are peckish. It's choosing what among the things you care about you're willing to forfeit.

I could have foreseen this. There was a point in my childhood—I'm sure of it—when I was passionate about everything, before things started dropping off. Once, years ago, there was a boy who loved Melanie Price. They had the same piano teacher and walked a similar route to school. When the boy told his parents that he would marry Melanie Price, they told him that he would not, that he would one day forget about her altogether. So the boy

promised never to change the way he felt. He'd buck the system, and commit to the things he loved. *I will, he vowed, love Melanie Price until the day I die.* But today he no longer plays the piano and he cannot remember if the girl was in his grade at school.

Those graduation orators get ahead of themselves. There's a cold truth behind passion no one's talking about and it has left the term rotting. Passion is something teenagers write about on college apps to tell admissions committees that they've got a plan and they'll stick to it. According to the College Board, high-school se-

niors use the word *passion* more than any other noun in their essays. (I did it, too, albeit with a synonym because I was afraid of sounding clichéd.) It's the same after college. Passion has become one of those empty qualifications you put on résumés or eHarmony profiles or when trying to sum yourself up to a new acquaintance. I interviewed at only one hedge fund; they were looking for a writer to make their RFPs and due-diligence reports *sing*. I had a day of one-on-ones in a conference room with weary men in lovely suits whose most frequent question was, *Are you passionate about corporate asset management?* Where does one find the unbidden desire to market stock portfolios? I wish I knew. How nice it must be to feel so passionately about something that pays so well.

Perhaps I was correct to spell *passion* wrong, for the word, subject to overuse, has lost its original oomph—has been left dumb, clichéd. *Passion* used to signify unequivocal want, luring us into bed sheets, inspiring art, bringing peace and the most horrific wars at once. And now it's a word my neighbor uses to describe her fondness for craisins.

It is both a sad and honest deflation.

I hope I'm wrong and epiphany will strike. There's a scene in Stanley Crouch's *Kansas City Lightning* where a stumbling, teenage Charles Parker Jr. hears Lester Young wailing on his sax at the Subway. "As Parker was listening," Crouch relates, "he began to understand what the tenor saxophonist was doing, and he broke out into a cold sweat." I've often pictured myself, right at the moment I make a big life decision. Sweating coldly, I suddenly become aware of my passion. I see the play and make the right call. There are worse mistakes to be made than spelling errors.

Does passion greet you from the hole of a horn? Or does it fill up from beneath like well water? In the 1600s in France, when an apprentice got hurt, or tired, the experienced workers would say, *It is the trade entering his body*. For them, passion was possession, something whispered by God. I listen and listen and listen. But He is not saying anything to me so let me guess: What would He say if he did whisper? ▢

Berta Greenwald Ledecy Undergraduate Fellow Noah Pisner '14 will soon be moving to New York City, where it is hard to be a fisherman, but harder to be a writer.



Olivia Munk and
Melanie Wang

New Fellows

This magazine's Berta Greenwald Ledecy Undergraduate Fellows for the 2014-2015 academic year—selected from among nearly 30 applicants—will be Olivia Munk '16 and Melanie Wang '15. The fellows join the editorial staff and contribute to the magazine during the year, writing the "Undergraduate" column and reporting for both the print publication and harvardmagazine.com, among other responsibilities.

Munk, of Bellerose, New York (in Queens), and Leverett House, is concentrating in English and pursuing a secondary field in mind/brain/behavior. She is an associate editor of *The Harvard Crimson's* magazine *Fifteen Minutes* and a member of the features board of *The Harvard Advocate*, and an active director in the Harvard-Radcliffe Dramatic Club. She spent the summer in Berlin, enrolled in Harvard Summer School classes in film theory and documentary filmmaking.

Wang, of Wayland, Massachusetts, and Eliot House, is pursuing a social-studies concentration, focusing on gender and labor in the United States. She has been co-editor of *Manifesta*, the campus feminist magazine, and on the board of *Tuesday*, a literary magazine, and performs as a spoken-word poet. During the summer, she worked in Chicago organizing and conducting oral-history research with Walmart employees through Columbia University's Summer for Respect program.

The fellowships are supported by Jonathan J. Ledecy '79, M.B.A. '83, and named in honor of his mother. For updates on past Ledecy Fellows and links to their work, see <http://harvardmagazine.com/donate/ledecy-fellowships>.

Run Backward, on a Mission

Cornerback Norman Hayes's rituals include shutting down runs and passes.

NORMAN HAYES likes rituals. At Tucker High School in Tucker, Georgia, he ate the same dinner—chicken, green beans, mashed potatoes—before each football game. Then the town got quiet: nearly everyone was in the stadium before the team even arrived. Under “Friday night lights,” his Tigers (Hayes played quarterback) took up a prescribed formation in the end zone and made their ceremonial entrance onto the field. “Football in the south,” he says, “is unreal.” At Harvard, Hayes, the team’s captain, watches the 1996 sports comedy *Space Jam*, featuring Michael Jordan playing basketball with Looney Tunes cartoon characters, every Friday night before his Saturday games. “It calms my nerves,” the Eliot House senior says. “Reminds me that we’re just playing another game.”

The ritual observances have had positive results. Hayes’s high-school teams went 50-6 and won the state championship his sophomore year—and winning a state football title in Georgia is no cakewalk. In college, his three Crimson squads have posted a 26-4 mark and captured two Ivy titles, including an undefeated campaign in 2011.

Last fall, Hayes (now a defender who plays cornerback, nickel back, and safety) made the All-Ivy First Team. The star quarterback with a strong arm who runs well has come to love defense, and relishes a good hit. “Offense is structured. You play with composure and finesse,” he explains. “On defense you can be physical. It’s very liberating, taking out whatever aggression you have on the offensive guys. You impose

your will. You might not touch the ball, but it feels great to *stop* somebody from doing what they want to do.”

As a Harvard sophomore, Hayes announced himself with a splash in the 2012 Brown game. The Bears’ huge, 225-pound running back Spiro Theodosi, who outweighed Hayes by 30 pounds, sprinted wide on an outside run. Hayes came over unblocked and leveled Theodosi at full throttle, taking him off his feet and sending his helmet flying. “The best part of

The Game, Larkee saw Hayes “limping terribly, in real pain” in the hotel lobby. “But as soon as he noticed me, Norman stopped limping,” says Larkee, chuckling. On the field, Hayes declared, “No, I’m fine,” and gutted it out, not only playing about a third of the snaps, but breaking up a pass and forcing a fumble in Harvard’s 34-7 victory.

Hayes’s foot speed, quickness, reactions, and mobility impressed coaches who recruited him as a defensive back. Safeties and cornerbacks (including nickel backs,



Norman’s game is how he can tackle,” says defensive coordinator Scott Larkee. “He’s a natural—he does it exactly right. Every game he makes at least one spectacular, highlight-film stop.”

Last fall, Hayes sustained a severe ankle sprain against Penn, and didn’t practice in the week before the Yale game. “I assumed we didn’t have him for Yale,” says Larkee. “He could barely walk.” On the morning of

“In the secondary, we’re the last line of defense,” says Norman Hayes, a speedy, versatile defender. “If we get beat, it’s likely to mean a touchdown.”

the “third” cornerbacks who at times join the defense, putting five men—hence “nickel”—in the secondary) are the fastest defensive players, as they need to stay with the fleet-footed wide receivers. In straight-line acceleration, wide receivers may be

the fastest players on the field, but the secondary defenders are close, and excel at running backward and changing direction at full speed as they mimic the receivers' zigzag routes.

Defenses ordinarily design their schemes to funnel running plays toward the linebackers, who, as a group, are the best tacklers. Cornerbacks make sure that running backs do not get outside of them, and try to push ball carriers inward. When a cornerback has too much success thwarting the run, offenses often try to draw him off the play by sending a wide receiver toward his sideline: does he take the bait, or still read the running play? Defenders play cat-and-mouse games of their own. "Sometimes we bait the quarterback to throw to a certain location by making it look like we are out of position," Hayes explains. "You act like you're covering a different zone, and leave a wide-open area to throw into. Then when he throws there, you go get it."

"Sometimes we bait the quarterback to throw to a certain location by making it look like we are out of position."

That can lead to pass interceptions or breakups. In his first start at cornerback, as a sophomore, Hayes had a nation-high five pass breakups against San Diego. When disrupting a pass, "You always want to secure the tackle with one hand, and with the other hand knock the ball away," he says. Interceptions with runbacks rank among the game's most exciting plays. They are superb opportunities to move the football, because the opponents' offense, not defense, is on the field, and they are likely in a disorganized state—they were trying to complete a pass, not stop a ball carrier. In the meeting room, Harvard defenders like to joke about the razzle-dazzle plays they plan to make: "When I intercept the ball, you come up behind me and I'll pitch it to you."

In real life, the first rule of interception returns, Hayes explains, is for another defensive back to immediately block the intended receiver: "They are the closest to the ball, and, besides us, the fastest guys

on the field, so they have the best chance of catching up with whoever made the pick."

Hayes, a psychology concentrator, is also active off the field in the Omega Psi Phi fraternity, Harvard Men Against Rape, and the Porcellian Club. On the gridiron this fall, he'll take the field with stalwarts like defensive end Zach Hodges '15, last

fall's Ivy League Defensive Player of the Year. And in the secondary, his mission is clear. "Our job," he says, "is to make sure that whatever happens in front of us, we'll be there to save the day." That, and a DVD of *Space Jam*, may be all that Hayes, and Harvard, need.

~CRAIG LAMBERT



"Cleat" Hands Off

Among many other accomplishments, John T. Bethell, this magazine's editor from 1966 through 1994, covered a lot of Harvard football games. He began writing, beautifully, about the sport he loves, in the *Harvard Alumni Bulletin* of September 20, 1971, reporting on new coach Joe Restic's first day of practice. That dispatch appeared above Bethell's initials. But for the October 11 issue, he adopted "Cleat," the *nom de football* used by an earlier editor, Bill Bentinck-Smith, who may have thought it up. Bethell says undergraduates had long confected the *Bulletin's* football columns; lacking a suitable candidate, he assumed the task "temporarily." Now, he is hanging up his cleats.

It has been a remarkable run. Readers have come to rely on the archetypal "Cleat" dispatch, full of the historical resonances and records—long thought invincible, only to be overcome—that make college athletics such vivid fun. Of late, "Cleat" has upped his game, filing weekly online reports, e-mailed to registered readers. "I think I've seen all but two or three home games over the past 43 seasons," Bethell recalls. "Haven't traveled to Ithaca since the early 1970s, and had to skip a few other road games." But only last September, beginning what became his final season, "Cleat" was there when the Crimson opened their campaign at the University of San Diego. His final dispatch, "Over the Moon" (January-February, page 34), taking in a 34-7 win in The Game, concludes on this characteristic note:

Harvard's seven-game winning streak eclipses what had been the longest streak in the H-Y series, a

string of six shutouts posted by Yale from 1902 to 1907. How long will the current streak last? "Statistically, this is unsustainable," said coach Murphy at his postgame news conference. "Yale is coming back." Time will tell.

But Bethell/"Cleat" won't do the telling. Happily, however, the magazine's tradition of rich, nuanced football coverage continues, in the capable hands of Dick Friedman '73, who spent two decades as an editor and writer at *Sports Illustrated*. One of his most enjoyable tasks was helping edit *SI's The College Football Book* (2008), for which he could call on more than a half-century of watching Crimson football. Friedman saw his first Harvard game at the Stadium at

To receive weekly football reports, sign up at harvardmag.com/email.

age seven, in 1958. Harvard lost to Penn, 19-6. "I was too young to know it, of course," he says, "but that first chilly plunge readied me for a lifetime of disappointments and triumphs."

His forthcoming history of the golden age of Harvard football, *Crimson Autumns: When Harvard Was Number One*, chronicles the 1908-1915 teams coached by the brilliant, innovative Percy Duncan Haughton, A.B. 1899, who "would be thrilled by the brainy play of current coach Tim Murphy's teams." Look for Friedman's dispatches, continuing the "Cleat" tradition, online after games and in print throughout the season.



Talking about her father's coma, Meghan Cleary '11 brought Lowell listeners to stunned silence.

The Lowell Speeches Project

“Community-building magic” through public, personal reflections

by MICHAEL ZUCKERMAN

EVERY YEAR around Valentine’s Day, traffic on the Lowell House Speeches Project’s Vimeo page spikes. The first time this happened was the night of February 13, 2011, just after Meghan Cleary ’11, L ’16—then a Lowell House senior—gave the eighteenth Lowell Speech. Cleary spoke of being at pre-season cross-country training, a few weeks before the start of her freshman year, when her dad suffered a cardiac arrest.

“I came home from New Hampshire to find my dad in a coma,” Cleary explained as her speech entered its second minute. She continued:

When his heart had stopped, he had gone without oxygen for several minutes, and his brain had been damaged. The doctors didn’t know how badly. He remained in a coma for about a week, which was the most terrifying of my life. When he finally woke up, his memory was gone. He couldn’t remember how to speak or swallow. He couldn’t remember how to walk. He knew nothing of his

life. He was a 50-year old newborn infant. A blank slate.

During the next few minutes, Cleary offered a story, linked to the eve of Valentine’s Day, that brought the crowded Lowell House dining hall—some 100-odd students, tutors, dining staff, and Lowell House master Diana Eck and co-master Dorothy Austin—to stunned silence and then catharsis. Every Valentine’s Day, on e-mail, Facebook, Vimeo, and the Lowell House website, this process repeats itself in electronic miniature. I played the speech for my girlfriend this past February 14; by the end of the speech, she was weeping.

THIS WINTER, the Lowell Speeches will enter its fifth season. During the past four years, nearly 150 Lowell House students have crafted and delivered more than 175 five-minute speeches on topics of personal significance. Each speech is filmed and uploaded to the Web, where most students choose to make them public. The videos have been played more than 31,000 times in 113 countries, from Mexico to Madagascar, from Malaysia to Moldova.

“Everybody in your life is going to have an idea of what you should talk about—that giant, juicy question—and you should get them on the hook there.”

The presentations take place on weeknights throughout the first seven weeks of the spring term, but the project begins in early December. That’s when Sandy Alexander, J.D.-M.P.P. ’06, a resident scholar who founded the program with Eck and Austin, affixes an enormous sign-up sheet with 50 slots (in 120-point type)—two per night—and a fat Sharpie marker to the wall outside the dining hall.

The slots fill—giving way to a waiting list—within days, during which time the speakers are bombarded with e-mails meant to acclimate them to what Alexander terms the “intensity” of the project. Everyone who has signed up is then invited to a “Mandatory Dessert”—sometimes in the Junior Common Room, sometimes in Eck and Austin’s residence—where they are plied with *Synsepalum dulcificum* (miracle fruit) and an assortment of citrus. The unfamiliar fruit temporarily transforms the eater’s taste buds to make sour taste sweet—setting the tone for a program that is, by turns, intense, whimsical, surprising, and transformative.

The dessert begins a three-month collaboration in which much of the Lowell community participates. Each student speaker chooses a member of the Lowell Senior Common Room (SCR)—a body of resident tutors, graduate students, and faculty members affiliated with the House—to work with, one-on-one. Each “SCR mentor” serves as an adviser throughout the project, as the student chooses a topic and hones it into a polished text under the 750-word limit. As their speech nights approach, groups of two or four speakers meet for rehearsals to get reactions from each other and from Lowell tutors who volunteer to give feedback. On each speech night, just after dinner concludes, each of the night’s one or two speakers is introduced by her SCR mentor and then delivers her speech from a podium in the center of the dining hall, often to a crowd of more than 100 Lowellians and guests. Through it all, Eck, Austin, and Alexander serve as mentors-at-large, dropping into rehearsals and working with speakers across the project. (Each has also served as the official SCR mentor to many: Austin, for example, was Cleary’s mentor.)

I am not a disinterested bystander here: I helped Alexander pull off the first season of the Lowell Speeches in 2011, gave a speech myself, and now, as a resident tutor, have served with Seth Packrone ’10, L ’15, as one of the program’s two coordinators. What I have witnessed during the past four years convinces me that this project—and what we can learn from it about building a team, writing, speaking, reflecting, and building a community—is worth sharing.

Eck reflected recently on what the speeches contribute to the House:

We get to know each other in a different way. And the things I’ve learned about students because of situations they’ve talked about—with their family, as immigrants, as people who have struggled with summer projects, as students who have launched an educational startup in Kenya or in China—all this is really important. And it’s important for them to be able to articulate it, and it’s important for all of us to be able to hear it. And what’s amazing to me is how many people linger in the dining hall at 7:15 just to listen. People don’t all get up and leave and think, ‘Uh oh, now

the speeches’—they stay! And other people come—people from other Houses, or from their sports teams, or from their class. It’s this wonderful joy of realizing how not only hugely talented, but very reflective, our students are. This gives them a chance to show that.

AT LAST DECEMBER’S Mandatory Dessert, as he has every year, Alexander unveiled the latest iteration of the Rules for the Lowell Speeches—his not-too-serious way of shaping the atmosphere of the project.

The first rule of the project is “Team,” and Alexander tells the speakers it’s his favorite—and not just in the Lowell Speeches project. “It’s my first rule in all of life,” he explains. “If you become obsessed with this one rule, then wonderful things will happen to you all the time.”

Alexander exhorts students to “fish for teammates” in the project, using the “fabulous piece of bait” that “you have been invited to give a speech at Harvard on any topic of your choice and you have to pick what to talk about.” “Start there!” he exclaims. “Talk about it with your *mother*. Talk about it with your *lover*. Go get a haircut and talk about it with your barber! Everybody in your life is going to have an idea of what you should talk about—that giant, juicy question—and you should get them on the hook there.”

Students I’ve spoken with have valued the team-building dimension of the program, especially the exposure to tutors and faculty members in the SCR. Perry Choi ’15—who spoke as a sophomore about stepping outside his comfort zone and this year, as a junior, about what he’d learned from battling depression—refers to the “intimate mentorship from a Senior Common Room member of your choice” as a “rare, invaluable opportunity.”

The mentors, for their part, seem to enjoy participating as well—and 64 faculty members, administrators, and graduate students have advised student speakers these past four years. Harvard Business School senior fellow David Ager—who previously taught Sociology 109: “Leadership and Organizations,” one of the most popular undergraduate courses—has advised nine student speakers so far. “I think it’s great to have an opportunity to work with students,” he explains, describing the joy of watching the “evolution from a little kernel of an idea” to a written, rewritten, and practiced text. Most rewarding, he says, is “when I get to go on that entire journey—going from ‘I don’t know what I’m going to do’ to getting to go hear this wonderful talk and see the audience totally engrossed.”

The lengthy journey Ager describes is closely aligned with Alexander’s second rule: “Time.”

“The valuable things in this project all take time,” Alexander tells the audience at the dessert. “When we asked you to say what you’re hoping to accomplish, you named things that are really precious, but also really slow. So, for example, you want to reflect on your life. You want to learn more about yourself. You want to say something honest. You want to inspire people. Those things are not going to happen in a hurry.”

This theme leads to an idea about writing that, in recent years, Alexander has taken to illustrating by bringing a hydraulic jack to the dessert.



“Writing is a tool like a three-ton jack,” he declares, holding it up. “If used properly, writing concentrates weeks of ordinary-strength work into a few moments of superpower.”

He continues:

Imagine that Harvard requires you, as a requirement for graduation, to lift a truck that weighs 6,000 pounds. You could walk over to the truck, and you could try to pick it up with your two hands...and you would not be able to lift it—and you would not graduate. Unless you have a special tool and you know how to use it....[The jack] takes the superhuman task of lifting the truck, and it breaks it down into very many human-strength tasks. And you’ve gotta do them over and over, and you’ve gotta do them right.

Now here’s the point: writing really is a special device for intellectual work, just like my jack is for lifting. If you spread the work out over a lot of time, and you make the right kind of effort, over and over again, writing and re-writing and rewriting, then you can create insight and you can express ideas with superhuman force. Force that otherwise is not possible. The movements of a thoughtful writer are more complicated than the movements you need to operate my jack. But they can still be learned and practiced in this project.

“There are not many superpower tricks in life,” Alexander concludes, “but there are some. And we are going to use them in this project.” As he says this, his five- and eight-year-old daughters, Susan and Lucy, use the jack to lift him high into the air, until his head almost touches the ceiling.

EPONYMOUSLY, the project also provides valuable public-speaking practice, something that many students say is in short supply elsewhere on campus.

Avinaash Subramanian ’14, who delivered rollicking addresses—on weight-loss tactics, attempts to avoid aging, and finding himself amid academic setbacks—during his three years in Lowell, says he practiced public speaking throughout high school, but found it tough to pursue the passion at Harvard. “There are lots of opportunities for writing here, but not a lot of opportunities for actually voicing your opinion or speaking on a topic,” he volunteers. Participating in Lowell Speeches, he says, has been a way of “rekindling” the love of oratory he discovered in high school.

Though some students, like Subramanian, come in with lots of speaking experience, many—like Cleary—are trying it out for the first time. “I remember being like, ‘Oh my God, I can’t do that, I’m not good at public speaking—I’m not going to be able to stand up and give a speech,’” recalls Cleary, who is now a nonresident tutor in Lowell and advises students in the project. “I think it’s a really useful exercise in public speaking. It introduces students to the way that you write a speech and perform it—that it’s a long process, that you have to hone it and practice it a lot—and [to] the kinds of things you think about: making sure you’re speaking slowly, making sure you’re speaking clearly. Those weren’t things I learned anywhere else at Harvard.”

Faculty members praise the public-speaking practice as well. “These are things that people, no matter who they are, are going to have to do in life, so it’s great to have this kind of practice and feedback,” Eck notes. “I learned a lot about public speaking



The speech schedule tells the House community who among them will appear—but barely hints at the cathartic discoveries that may await.

early on because I was a high-school debater—and so I practiced a lot—and then I became a professor, and at first I practiced my lectures a lot to make sure they had a good pace to them, and that I wasn't running over or running short. The idea that you just get up and talk with no practice is something we need to re-think—people do need some practice. They need practice using a text and not being wedded to it."

Ager agrees that the practice serves an important curricular need: "It's a very specific, core skill that takes practice and therefore needs an audience. It's one thing to sit around a table with 20 other people and share your ideas about a reading—it's a very different thing to have to prepare five minutes' worth of an idea and then deliver it in front of 100 people." That skill, he suggests, is central to Harvard's purpose. "I think, in our mission, we aspire to create leaders," he reasons. "Insofar as we are trying to turn out great women and men who will go forth and do great things in the world, the ability to speak to large numbers of people in ways that engage them and capture their imagination and motivate them to action—I think we do have a responsibility to develop that in them."

Underlying all these comments is the sense that undergraduate demand for such training dramatically exceeds supply. Apart from Expository Writing 40 (which, in one recent year, received more than 100 applications for 12 slots) and some public-speaking training in other courses, funded through the Elson Family Arts Initiative, classroom opportunities to practice writing and delivering a crafted text are slim. Ethan Pierce '13, who spoke in 2013 about coming out as a gay man and an artist, says, "You can take a public-speaking course, or a course that engages specifically with public speaking, or you can join the debate team, or you can be one of the Class Day speakers—those are essentially your podiums. I think it's great that the Lowell Speeches [program] has created another podium, and has ignited the potential for creating further podiums within other spaces at Harvard."

AS IMPORTANT as public-speaking practice is, most students insist it is secondary to the value of having an opportunity to reflect deeply on something important to them. "I think one of the main

purposes is to have a chance to show people a side of you that they might not see on a daily basis," Subramanian reflects. "I think of Perry Choi talking about mental health—it was a hard speech to give, and it was really helpful to understand that other people are going through these same things, and everyone has a story to tell, and you don't have to hide it. And not just him, but a lot of the other speech-givers as well."

Choi agrees, writing: "I've given two speeches so far, and although my speaking and writing skills have improved from these experiences, more importantly, I have learned something profound and new about me."

The process can also stir up strong emotions. Vi Nguyen '15 used her speech to reflect on her "first love," at age eight: a friend named Aidan who, four years later, moved away to transition genders, and whom Nguyen hasn't seen since. "I found giving the speech to be very cathartic," she explains. "I have been holding Aidan's story inside me because I was ashamed, but I've also been waiting for the right time and place to speak about him."

Pierce spoke similarly of his speech:

It was difficult to tell, but there was a cathartic process to giving this story to other people. And I really hoped that it would give some students here access to a narrative that they could relate to and use to at least let percolate some idea of coming out in their own lives—whether that's coming out in a role that's nontraditional to them, or their families, or their backgrounds, or the perception that people have of them; or in terms of a new activity or a new profession; or whether it has to do with a new identity, religion, profession, or sexual politics. There really are so many ways to come out today, and so I wanted to interweave the way I came out.

Speakers value this radical introspection—"writing a speech that only you could give," as Sandy Alexander puts it—for its own sake. But with 50 speeches condensed into seven weeks in a House dining hall, all this reflection also amalgamates into a kind of community-building magic.

"I felt so much more connected to the community after giving my speech," Cleary recalls. "I think Lowell does an awesome job of that already, but the speeches help. After giving my speech, there were whole groups of people in Lowell that I became friends with that I probably wouldn't have been friends with, but because I had given this very personal speech, it was like I had opened a door."

Subramanian feels the same way. After his "Mr. Body Beautiful" speech, he recalls, "Suddenly, in the dining hall, I'd have people coming up to me, and they'd be like, 'Avinaash!' And I'd think to myself, 'Okay, who are you?' And they'd be like, 'I saw your speech—it was awesome.'"

At the dessert, Alexander is careful to point out this effect. "Before we leave the rules for tonight," he declares, "we should agree on *some good thing* that is going to happen as a result of you following these rules. And I know, because this happens to me several times every year....I'm in the dining hall after a speech and somebody comes over to me and they say, 'Sandy, what's up? I've known that speaker for three years—she's my blockmate. I see her every day. And I just learned something I never knew before!'"

"These people, they look at me like I'm gonna give 'em an expla-

nation,” he continues, pausing to flash a wily smile. “But I don’t explain it! I just say, ‘Yeah—our students are special.’ But the trick, which I will explain to you, is that when you follow these rules—when you work with a team for a long time on something that is personally significant and you write and you rewrite the right way—you can say in five minutes something you have never been able to say before.”

THE LOWELL SPEECHES PROJECT is not the only place on campus where this kind of reflecting and sharing goes on. Lowell borrowed the model from a place where it has been under way, in some form, since 1636: Morning Prayers at Harvard’s Memorial Church, which features a five-minute talk by a member of the community (and which Austin was running when she, Alexander, and Eck invented the Lowell House program).

In recent years, versions of the Lowell Speeches have begun to pop up in other Houses as well. Kirkland Reflections, initiated and run by Nikhat Dharani ’14, featured eight Kirkland students speaking on three Tuesdays this past April; Dharani has been pleased to see some of the dynamics that Lowell students value taking root. “There were topics people talked about that I had no idea were important to them,” she reflects. “It didn’t show up anywhere else, and it wouldn’t have shown up anywhere else.”

Like many of the Lowell speakers, Dharani locates much of the program’s value in the practice of reflection itself. “I see this as a learning opportunity for ourselves,” she says. “There are so many different things going on in the different communities we’re a part of, and having speeches or reflections is a way to ask how we’re connected to those things, how we’re influencing others, and how they’re influencing us.”

The diffusion of the Lowell Speeches into other Houses (Dharani notes that Adams and Cabot have also piloted versions) is, in its own way, an embodiment of Alexander’s sixth rule: “Afterlife.”

This rule arises directly from Alexander’s personal experience: after giving a talk at Morning Prayers about his childhood choirmaster, he e-mailed the text to three people from his family’s church in North Carolina; the speech ultimately found its way to the choirmaster himself. “I realized,” Alexander recalls, “that I had given this guy one of the best gifts I was ever going to give anybody—this five-minute speech I had written about this experience that we shared. And instead of just filing it, I e-mailed it to those three people. It terrifies me to think that if I had not e-mailed it to those three people, I might have buried this gift—killed it.”

He stresses this point to the speakers; it also explains the substantial time invested in filming and publishing each speech. “These speeches deserve to be shared and read and heard,” he explains, “so we try to make that happen.”

The Internet afterlife of the speeches allows me, and many others, to return to Cleary’s



Gorick Ng ’14 worked with his coach, David Ager, when preparing to speak to the House audience in 2012.

speech each Valentine’s Day, and to many more speeches every year. Just as importantly, it has allowed speakers to share their reflections far beyond the yellow walls of the Lowell dining hall.

“I guess what I really didn’t expect was all the stuff that happened after the speech,” Cleary confesses. “I sort of thought it would be a cool thing to do—to talk about a story that had happened to me and share that with people—but I certainly didn’t expect to be talking about it now, four years later. Or that people would be really affected by it. My brothers texted me after it and told me they were crying, which was *not* a normal thing for them to do. It had become a hard thing for people in my family to talk about—and [after the speech] it was kind of just *out there*. You could have conversations about it.”

The speech, she adds, has also connected her to new people at Harvard Law School. “I was at a law-journal editing session,” she recalls, “and I was working with this boy for a few hours in a small space. At the end, we were just chatting, and it came up that we had both gone to Harvard...so the standard question was, ‘What House were you in?’ I mentioned that I was in Lowell, and he mentioned something like, ‘It seems like people who were in Lowell feel really connected to it in a way that’s different from other Houses.’ And then he said, ‘I know about the Lowell Speeches project. There was this girl who had given a speech about her dad, and her dad had had, like, a stroke or something, and had lost his memory. And the speech totally went viral, and all of my friends still share it with each other on Valentine’s Day, and we watch it every year.’

“And I said, ‘Yeah—that was my speech.’ And it was such a strange moment, because all of a sudden he knew this very personal thing about me. But it was cool.”

Michael Zuckerman ’10, a writer and resident tutor in Lowell House, has just begun his studies at Harvard Law School.

Other Lowell Speeches

selected by *Harvard Magazine* editors:

Andrew Campbell ’14, “An Olympic Failure”
Marina Connelly ’12, G ’19, “...And Words Are All I Have”
Abiola Laniyonu ’13, “The Shared Embrace of Grief”
Peggy Mativo ’14, “The Year of the Dream”
Chloe Veron ’14, “The Definition of Normal”

Many of the student speeches are available online at <http://vimeo.com/lowellspeeches>.

Synthetic Biology's New Menagerie

Life, reengineered

IN THE SUMMER of 2009, a team of Cambridge University undergraduates built seven strains of the bacterium *Escherichia coli*, one in each color of the rainbow. Red and orange carotenoid pigments were produced by inserting genes from plant pathogen *Pantoea ananatis*; a cluster of genes from *Chromobacterium violaceum* were likewise modified to yield green and purple. The students' technicolor creations, dubbed "E. chromi" in reference to the organisms' scientific name, won the Cambridge team the grand prize at that year's International Genetically Engineered Machines (iGEM) competition, in which high-school and college students engineer biology.

The students' goals were not merely chromatic. Instead, they were building parts for biological machines. They engineered the genes into standardized forms called BioBricks: pieces of DNA that, like genetic Legos, are designed to be mixed and matched at will. Several thousand of these BioBricks, fulfilling various functions, are already housed in the MIT-based Registry of Standard Biological Parts. Some BioBricks detect chemicals like arsenic; others act as "tuners" that determine the threshold level of chemical input needed to turn on a certain gene. By combining the new color-producing genes with existing parts, the thinking went, one might easily construct biosensors that, in the presence of environmental toxins, produce output visible to the naked eye.

"E. chromi" struck a chord with designers Alexandra Daisy Ginsberg, G '06, and James King, who began a collaboration with the iGEM team. In a short video that was named best documentary at the Bio:Fiction synthetic biology film festival in 2011, Ginsberg and King imagined possible futures for living color. Soon, they suggested, scientists might search the natural world for new biological pigments and the genes responsible, revolutionizing dye production. "E. chromi" in probiotic yogurt might monitor human disease while traveling through the gut; microbes in the atmosphere might change color to indicate air quality.

"I think it's a new term to most of the public, *synthetic biology*," mused the host



of National Public Radio's *Science Friday* in the fall of 2009 when he interviewed the Cambridge team. "But I guess we're going to be hearing a lot more of it."

How to Build a Biological Machine

ARMED with powerful new genetic tools and a penchant for tinkering, synthetic biologists have built a new menagerie. Photographic "E. coliroid" darken in response to light. Sensor bacteria record the presence of a chemical in a mouse's gut by turning on certain genes. There are strains of *E. coli* that count input signals and others that carry out logical operations—steps toward biological computers. Still other strains smell like wintergreen and bananas instead of like the human gut. In 2005, festive researchers "wrote" the first verse of Viktor Rydberg's Christmas poem "Tomten" into the genome of yet another *E. coli* strain, using triplets of

DNA nucleotides to represent each letter; the resulting bacterium, they wrote, was "the first example of an organism that 'recites' poetry."

Insofar as a common theme unites these diverse creations, it is the transformation of biology into an engineering discipline. Traditional genetic engineering amounted more or less to biological cut-and-paste: scientists could, for instance, transfer a cold-tolerance gene from an Arctic fish into a tomato. Synthetic biology aims for a more radical reorganization. Its organisms are built to be biological machines, with DNA and proteins standing in for circuit components or lines of computer code. In combination, the biological parts perform functions unknown to nature: processing signals, producing new chemicals, storing information.

"I like to say that biological carbon is the silicon of this century," says Pamela A. Silver, Adams professor of biochemistry and systems biology at Harvard Medical School (HMS; see "Biology in This Century," September-October 2011, page 72). Just as computers revolutionized the past hundred years, she says, biology is poised to transform the next. "The building of biological machines and biological computers—all of that should soon become a reality."

To a certain mind, a cell already resembles a tiny, complex machine. It takes

BY KATHERINE XUE

PORTRAITS BY STU ROSNER

ILLUSTRATIONS BY STUART BRADFORD

in chemicals from the environment and performs reactions to build new biological parts; it monitors signals and turns genes on and off in response. Cells have been compared to computers, to factories, to automatons. For a synthetic biologist with such complex systems already at hand, the task is to identify and manipulate the appropriate parts. “Many of the biomolecular components we’re not building from scratch,” says James J. Collins, Warren Distinguished Professor at Boston University and founding core faculty member at Harvard’s Wyss Institute for Biologically Inspired Engineering. “We’re taking native systems and then modifying them.”

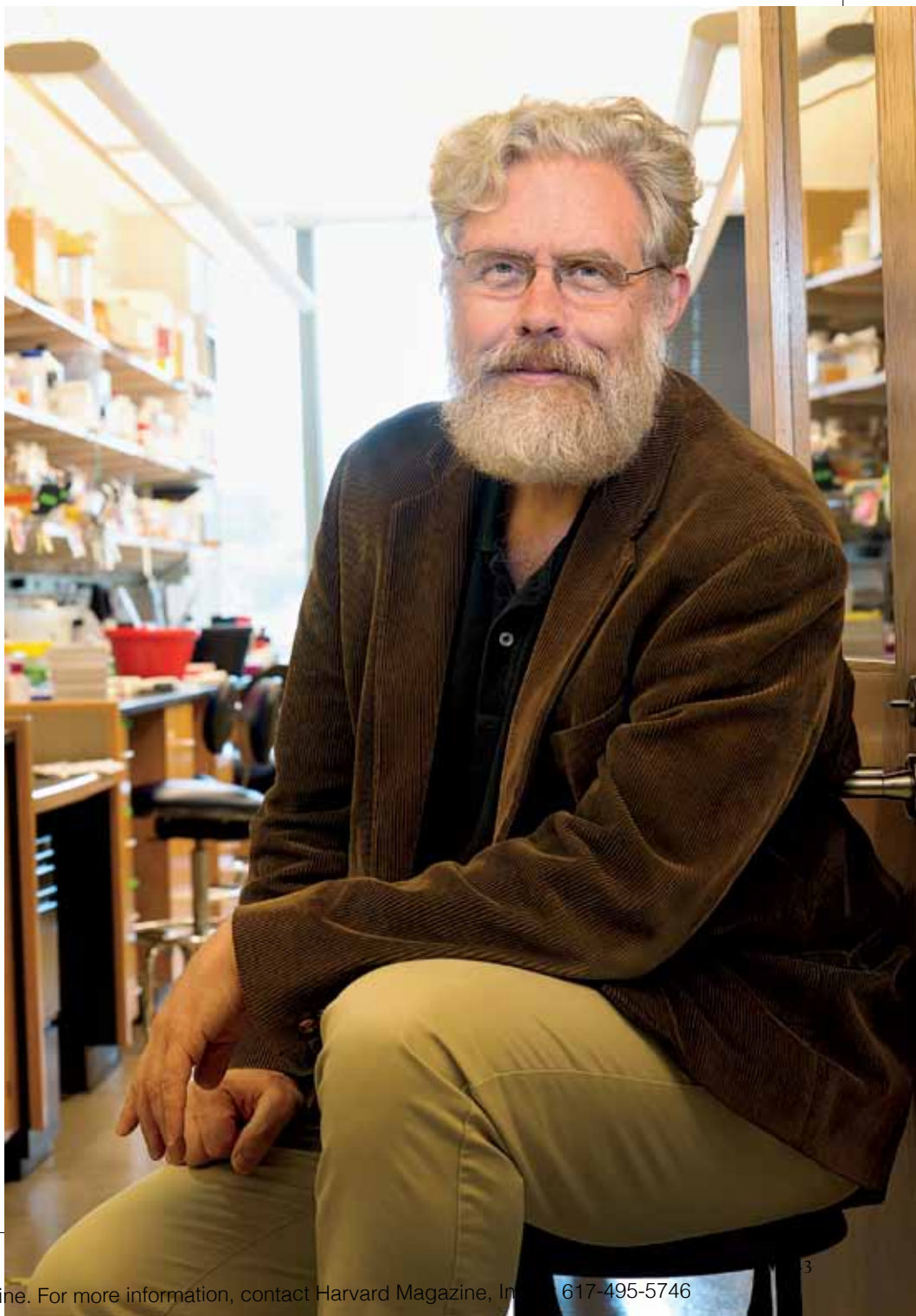
Understanding and manipulating this elaborate machinery is a tough job. “I think of it as if some alien intelligence just dropped onto us all their intellectual property without documentation,” says George Church, Winthrop professor of genetics at HMS (see “DNA as Data,” January-February 2004, page 44). There’s no direct biological equivalent of a capacitor or the delete command, and synthetic biologists must creatively recombine existing biological parts in order to build new functions.

Take, for instance, the toggle switch, one of the simplest circuit components. A nonbiological example would be a light switch: it can be flipped between two discrete states, on or off, with nothing in between. In an abstract sense, the toggle switch amounts to a kind of memory, with its two states tantamount to 0’s and 1’s. Such bistability has some analogues in nature. Venus fly traps, for instance, have structures that alternate between open and shut (see “Leaves That Lunch,” May-June 2005, page 14). Specific signals instruct cells whether to remain dormant or divide. Some viruses also toggle between two distinct states of dormancy or active infection.

When Collins’s lab built a *bacterial* toggle switch—one of the first pieces of biological circuitry—they made it from two genes. Each encoded a repressor protein for the opposite gene; once one gene was turned on, it turned the other gene off. The switch could be flipped by giving the cell a specific chemical signal, disabling the active repressor protein and allowing the other to take hold. With the second gene now turned on, turning off the first, the switch would stay flipped long after the signal had disappeared. “As a cellular memory unit,” wrote Collins when his team published its design in 2000, “the toggle forms the basis for ‘genetic applets’—self-contained, programmable, synthetic gene circuits for the control of cell function.”

Genetic applets (perhaps more aptly, apps today) are one of synthetic biology’s defining goals. Some 40 years after scientists began learning to rearrange DNA, genetic engineering remains something of a cottage industry. In a time-consuming, almost artisanal craft, researchers modify organisms *ad hoc* to suit their particular needs. Synthetic biology was born out of a desire for greater, more versatile control, says Silver, who took part in early meetings of the Synthetic Biology Working Group at MIT. “The question that forms the core of synthetic biology is, ‘Why can’t biology be easier and more predictable to engineer?’”

George Church’s lab has reengineered the genetic code of the bacterium *Escherichia coli* to make it resistant to viral infection.



Indeed, for synthetic biologists, it is not enough to have painstakingly built genetic switches and biological machines. “Right now, people—especially graduate students—just spend an inordinate amount of time making DNA and figuring out how to put DNA together,” says Jeffrey Way, senior staff scientist at the Wyss Institute, who is married to Silver. “It’s extremely time-consuming.”

Early on, he says, synthetic biology took its cues from the computer industry, where early common standards for computer chips allowed multiple circuits to be combined. One of the field’s key aspirations is modularity—the ability to mix and match genetic parts. In an article in *Scientific American* in 2006, Church, Collins, and several other researchers outlined principles for what they called a “bio fab,” a set of standards and methods to make genetic circuits easier to build and recombine. “Part of the vision was that you should be able to abstract away part of how biology works and not have to worry about the details,” says Way, who worked at the Molecular Sciences Institute, an independent research lab in California, where many of synthetic biology’s principles were initially conceived. “A computer programmer never worries about how a computer chip works—they don’t actually need to know how the commands are executed by the machine.”

Yet progress toward such abstraction has been mixed, researchers acknowledge. “What do you need to know to use a part?” asks Silver, who is a board member of the nonprofit BioBricks Foundation, which promotes the bio fab vision. “What constitutes a characterization?” Way goes further, questioning the analogy between circuits and living things. “In biology, the key difference is that the equivalent of computer chips—pieces of DNA, proteins, and so forth—those are all made by nature and not by human design,” he says. “They may seem modular, but

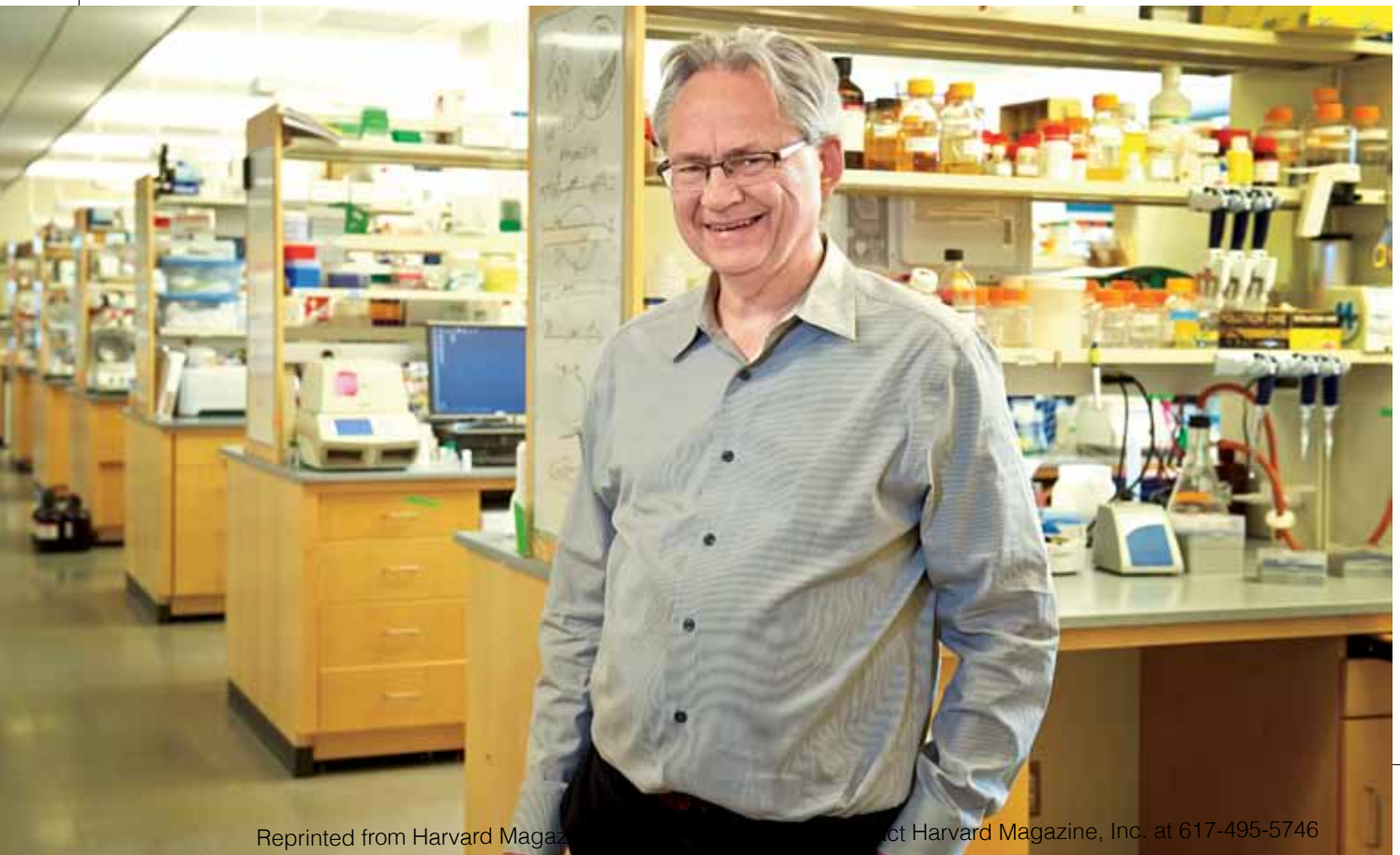
it’s an open question as to whether that’s the way that biology is, or whether that’s an artifact of human understanding.”

For now, says Way, synthetic biologists still must hew tightly to the contours of nature, closely studying biological systems to identify and make use of special properties. For instance, in a project published this spring, he and Silver collaborated with Collins to engineer bacterial “reporters.” Once fed to mice, the bacteria take up residence in the gut, where they detect the presence of the antibiotic-like molecule anhydrotetracycline and record it by flipping a genetic switch. Silver and Way, both trained as molecular biologists, made use of a well-studied natural switch from bacteriophage lambda (a virus that infects bacteria) that has two convenient properties. It is extraordinarily stable, maintaining its state through multiple bacterial generations, and it imposes a negligible burden on the bacterial host, helping it survive in the mouse gut. Silver and Way were both present at Harvard in the 1980s when key work on phage lambda was done, giving them deep familiarity with the virus’s genetic switch. “Rational design is really feasible—provided you know enough about the system,” says Way. “Knowing all the quirky stuff about the biology of an organism was critical in making the whole thing work.”

Synthetic Biology Remakes Nature

SOMETIMES LIFE is just too hard to understand. Such was the conclusion of current Stanford professor Drew Endy, then at MIT, after several years spent trying to computationally model the bacteriophage T7. The virus is one of the simplest and most well-studied biological systems, and after 60 years of research, Endy thought, scientists should have T7 down to a T. But this proved far from so: his simulations, which sought to predict how mutations would affect viral development, simply did not match experimental results.

Jeffrey Way is part of a team that engineered cyanobacteria to produce sugars from photosynthesis more efficiently.

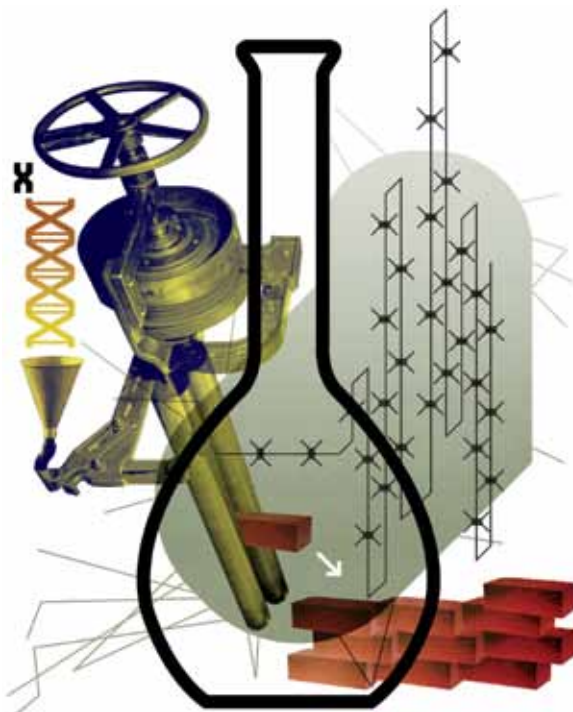


Faced with biological complexity, Endy decided to get rid of it. In 2005, he and collaborators published a report on a virus they dubbed “T7.1,” a version of T7 they designed to be easy to understand and manipulate. Evolution may have been responsible for the diversity of biological functions, but to a human scientist, those functions could appear byzantine and impossible to comprehend, let alone engineer. T7, for instance, had multiple overlapping genes, meaning that mutations in one gene could affect others in unpredictable ways. Endy’s team built “T7.1,” by separating the virus’s genes into discrete parts—all the better for rational design. “T7.1” survived its massive genome reordering, though barely. Compared to T7, its fitness was considerably reduced.

“‘T7.1’ is a perfect example of what makes synthetic biology different from other post-genomic disciplines in the life sciences,” says Sophia Roosth, assistant professor in the history of science. As a graduate student at MIT, Roosth conducted an ethnographic study of synthetic biology, doing extensive fieldwork in Endy’s lab. In her forthcoming book, *Synthetic: How Life Got Made*, she uses projects like “T7.1” as lenses to examine the concepts of nature and design that motivate synthetic biologists’ work. “Instead of trying to rebuild the model, Endy’s team wanted to rebuild the phage to be more understandable. That’s a symptom of the move to manufacture in the life sciences—comprehensibility becomes a design principle, and making becomes a form of inquiry. Knowledge about how life works is furthered not by experimenting on life, but by making new forms of it.”

Indeed, synthetic biology’s mission of making biology easier to engineer has occasionally entailed wholesale *remaking*. Unexpected cellular behaviors can still complicate the best-laid plans. The basic design of the toggle switch, for instance, followed a computational model that Collins’s lab had developed prior to beginning experiments, but it nevertheless took several months of trial and error to tune the switch so that one gene did not overpower the other. Building a biological circuit remains a much more uncertain endeavor than building its electronic counterpart. “The environment inside cells is very noisy,” says Collins. “There are a lot of fluctuations that make it challenging to have genetic circuits that behave reliably. And because cells are dense and highly complex with their host machinery operating, the circuits that we’re building are interacting with the host in ways we don’t fully understand.”

One strand of synthetic biology aims to lessen this unpredictability by creating minimal “chassis” organisms, designed to serve as neutral, well-characterized backgrounds upon which genetic circuits can be built. For example, the J. Craig Venter Institute (JCVI), founded and led by the eponymous genome-sequencing pioneer, has eliminated one gene at a time from *Mycoplasma genitalium*, the bacterium with the smallest known cellular genome, in order



to identify the smallest set of genes needed to carry out basic, self-sustaining functions of cell metabolism and replication. Of the organism’s 482 protein-coding genes (humans have an estimated 20,000), Venter’s team estimated that 265 to 350 are necessary for survival. They plan to synthesize an altered genome consisting of this minimal set and transplant it into *Mycoplasma* cells whose own genomes have been removed, forming an organism they call “*Mycoplasma laboratorium*.”

Other researchers are focusing on building chassis chromosomes. “Imagine if you had a piece of DNA, and you knew everything about it—there were no mysteries,” says Silver. Her lab is working with the Venter Institute to design a mammalian artificial chromosome, in which the

complex processes of mammalian gene regulation would be more fully characterized and understood. Earlier this year, researchers from New York University and Johns Hopkins announced the creation of an artificial yeast chromosome, with nearly one in six base pairs of the genetic scaffold modified to make genes easier to insert and remove. The artificial chromosome is the first step in building synthetic yeast, whose entire genome is similarly redesigned.

Such massive genome remodeling also lends itself to more radical possibilities. Church’s lab, for instance, is working to alter the genetic code. All living things have cellular machinery that interprets DNA instructions, mapping three-nucleotide sequences called codons into the amino acids that make up proteins. In 2011, Church’s group reported that it had massively reengineered the *E. coli* genome, replacing each instance of the codon “TAG” with “TAA” (see “Life: The Edited Version,” November-December 2011, page 14). Both are stop codons, signaling that a series of genetic instructions is complete, but each codon is interpreted using different cellular machinery. With the “TAG” codon now gone, the researchers deleted the machinery that handled its translation. In its absence, if a virus were to invade the engineered organism—dubbed “rE. coli”—the viral “TAG” codons would be ignored, dooming its attempted infection. Using techniques like those that built “rE. coli,” Church says, it might someday be possible to engineer humans to be similarly virus-free.

“Today we are at the point in science and technology where we humans can reduplicate and then improve what nature has already accomplished,” wrote Church in the introduction to the popular-science book he coauthored, *Regenesis: How Synthetic Biology Will Reinvent Nature and Ourselves*. “We too can turn the inorganic into the organic. We too can read and interpret genomes—as well as modify them. And we too can create genetic diversity, adding to the considerable sum of it that nature has already produced.”

Life on a Leash

PROJECTS OF SUCH SCOPE give many observers pause. A mosaic of religious frescoes, reordered and recombined, adorns the cov-

er of Church's *Regenesi*s, placing front and center the language and imagery that has frequently dominated public discourse about the field. In her book, Roosth describes how notions of "design," imported into synthetic biology from engineering, sometimes retain religious resonances, especially in connection with terms like "creation." In 2008, *Radiolab* ran a segment on synthetic biology titled "Intelligent Design?"

One of the most disquieting acts of whole-scale biological recreation came in 2002, when researchers were able to produce live, infectious poliovirus by synthesizing its genome. In 2005, researchers at the Centers for Disease Control and Prevention used similar methods to reconstruct the virus responsible for the 1918 pandemic of Spanish flu. In 2006, using private addresses and identities, reporters from *The Guardian* were able to mail-order a small segment of the smallpox genome, though additional equipment and expertise would have been required to assemble the entire genome and bring the virus to life.

Indeed, the logical extreme of making biology easier to engineer is that anyone could do it. In a 2007 essay, "Our Biotech Future," published in the *New York Review of Books*, Nobel Prize-winning physicist Freeman Dyson drew an analogy to the computing industry, predicting a world in which genetic engineering was literally child's play. "The final step in the domestication of biotechnology will be biotech games," he wrote, "designed like computer games for chil-



dren down to kindergarten age but played with real eggs and seeds rather than with images on a screen."

"There are distinct challenges coming out of synthetic biology," says Kenneth A. Oye, Ph.D. '83, professor of political science at MIT. "Modularity and repurposing potentially decrease barriers to diffusion, and the potential for more artificial organisms renders obsolete regulatory approaches that are based on standardized lists of dangerous wild-type organisms."

Oye works with synthetic biologists to study questions of safety and security raised by new technologies as part of the Synthetic Biology Engineering Research Center, or Synberc, funded by the National Science Foundation (NSF). "I believe that engineers and scientists should ac-

cept responsibility for addressing or engaging with risks that are associated with what they're creating," he says. "By 'responsible,' what I mean is taking an active interest in identifying and doing research to identify potential problems, and not just simply responding or reacting to problems that others raise."

Twin concerns of safety and security, the latter focused on preventing malevolent use, have prompted synthetic biologists and policymakers alike to closely examine the opportunities and challenges of the new field. "I think something that both scientists and lay audiences forget is just how much safety engineering goes into a mature field," says Church. "You look at a car, and it doesn't take

THIS JULY, Wyss Institute fellow Kevin Esvelt and Winthrop professor of genetics George Church coauthored a paper in the journal *eLife* outlining how new technologies containing self-replicating pieces of DNA could potentially be used to genetically reengineer entire species in the wild. A recently discovered bacterial system called CRISPR-Cas, named after the DNA and proteins involved, has allowed scientists to make highly specific genetic modifications with greater ease than ever before (see harvardmag.com/genomic-14). As Church and colleagues predicted in the recent paper, certain genetic changes that themselves include a CRISPR-Cas system could copy themselves in a process called a "gene drive," enabling a modification to spread through an entire species during the course of many generations. Scientists might one day be able to alter or even eliminate entire species—reengineering herbicide susceptibility into populations of resistant weeds, for instance, or suppressing malaria mosquitoes or invasive plants.

Church's technical paper was published simultaneously with a policy paper in *Science* that assessed the technology's possible impacts. The environmental and security effects of

Synthetic Biology in the Wild

gene drives are still unclear, wrote the authors, a team of scientific and legal experts that included technologists Church and Esvelt, Ph.D. '10, evolutionary ecologist and former

National Science Foundation director for population biology and physiological ecology James P. Collins, and lead author Kenneth Oye, Ph.D. '83, professor of political science at MIT. Moreover, regulatory gaps remain: domestic and international policies, built narrowly around lists of dangerous toxins or organisms, fail to address the uniquely broad character of gene drives. The authors made 10 recommendations for managing environmental and biosecurity risks. Certain types of gene drives might reverse prior genetic changes or immunize organisms from further modification, for instance, and new regulatory structures might adopt broader definitions of biological impact. The authors also called for a public discussion on how the new technology ought to be used. "For emerging technologies that affect the global commons, concepts and applications should be published in advance of construction, testing, and release," they wrote in conclusion. "Lead time will allow for broadly inclusive and well-informed public discussion to determine if, when, and how gene drives should be used."

much reflection to remember that they have seatbelts, air bags, crushable fenders. There are also other things you don't see so much, like licensing, speed traps, and Breathalyzers. It's harder to do in a new field because you don't even *know* what you don't know, and that freaks people out."

Church's lab works actively on both building and testing the biological equivalents of seat belts, which might be designed into future chassis organisms. "We're building genetically modified organisms that can't escape and can't influence the ecosystem because they are genetically and metabolically isolated," he says. "They're on a very short leash." With an altered genetic code, he argues, a synthetic organism could neither give nor receive DNA, since it would process genetic instructions differently from its wild relatives. His lab's genetically recoded "rE. coli" is already unable to live more than a few minutes without an inexpensive compound that is only available in the lab, says Church. Moreover, "we're building more radically recoded organisms that literally can't use natural DNA from their environment, since it must be processed by cellular machinery that these organisms lack." Collins's lab has devised another solution, developing a genetic "kill switch" that responds to certain chemicals by producing toxic proteins that kill the cell.

Other safeguards for synthetic biology are under construction, and many of them are, likewise, self-imposed. After *The Guardian* exposed the ease of ordering pathogens' DNA, DNA-synthesis companies voluntarily created collaborative consortia to screen orders against databases of known pathogens and toxins and to flag suspicious behavior. All competitors in the iGEM bioengineering competition are required to submit their projects for review by a safety committee, which works with teams to modify projects that provoke concern, and several federal agencies have also sponsored educational programs to sensitize competitors to biosecurity issues.

Indeed, says Oye, synthetic biology is on its way to developing what he calls a "culture of responsibility." It aims to augment rather than supplant traditional regulatory measures, he says, and can influence both the nature of regulation and how researchers think about the projects they pursue. For instance, when Silver and Way led a team that engineered cyanobacteria to more efficiently produce sugars via photosynthesis, their team and Oye's group conducted a joint risk-assessment exercise. Ecologists, microbiologists, and regulators from the Environmental Protection Agency came together to discuss the environmental implications of release of the engineered organisms, with attention to competition with wild bacteria, for instance, as well as potential gene transfer and evolution.

"By 'culture of responsibility,' what I mean is the inculcation of a set of values and mores," Oye says. "Over the long term, it makes

quite a difference. It makes a difference in the kinds of projects people decide to do. It makes a difference in terms of their willingness to work with others to discourage bad activity and to lean hard on the side of openness and responsible conduct."

Imagining the Future

QUESTIONS of scientific responsibility featured prominently in the 1970s, when similar concerns arose as scientists began learning how to manipulate organisms' genes. In 1974, researchers

Pamela A. Silver and colleagues engineered bacteria that detect and report on the presence of a certain molecule in a mouse's gut.



working on genetic engineering undertook a voluntary moratorium to assess the impacts of their work, a moratorium that ended with the convening of the landmark 1975 Asilomar Conference on Recombinant DNA. There, a group of leading molecular biologists discussed safeguards for the new field, designating avenues of research that should not be pursued and settling on a self-imposed strategy of containment to reduce the risk that engineered organisms would escape the lab.

There have been calls of late for a second Asilomar to address synthetic biology's new possibilities, but to some observers, the frequently invoked conference falls short of current needs. In an essay in the forthcoming collection *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*, which investigates how states variously conceptualize the roles of science and technology, Arizona State University assistant professor J. Benjamin Hurlbut, Ph.D. '10, examines the influence of what he terms "Asilomar-in-memory," documenting how the conference—controversial in its time—has come to be regarded as an exemplar of scientific responsibility and restraint. "Asilomar is remembered as a success because, in retrospect, important forms of scientific autonomy were maintained, and a powerful molecular biology and biotechnology emerged out of it, with some good social and economic consequences," he says. "But there were also social and political consequences that we've been playing catch-up on, because those questions were intentionally set aside at the time."

James J. Collins led a team that built a genetic toggle switch, a first step to constructing biological circuits and computers.

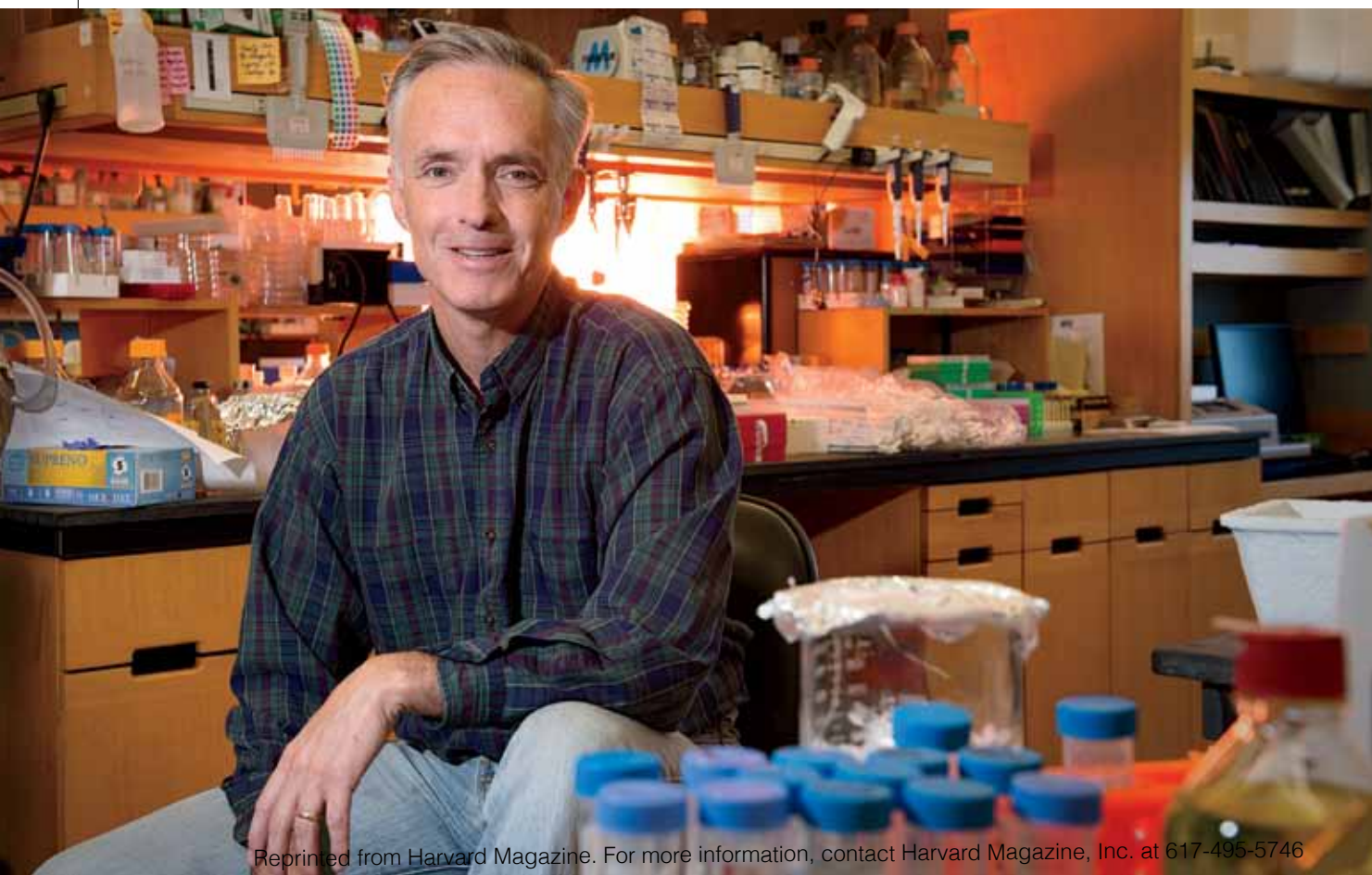
Asilomar's attendees were almost entirely molecular biologists, and as a result, the scope of the conference's debate was considerably narrowed, argues Pforzheimer professor of science and technology Sheila Jasanoff—Hurlbut's

graduate adviser and editor of *Dreamscapes of Modernity*—in her 2005 book *Designs on Nature: Science and Democracy in Europe and the United States*. Asilomar purposefully bracketed questions of ethics and bioterrorism, she says. On legal issues, conference attendees focused primarily on product regulation and risk assessment, leaving aside more general questions around the processes by which the organisms were created.

More problematically, argues Hurlbut, Asilomar assumed and reinforced the mindset that scientists, by virtue of their specialist knowledge, were best positioned to define which issues arising from genetic engineering merited concern—a mindset that endures today. "At stake is how we ask questions about what ought to be done," he says. "What kinds of technological futures do we want? What kind of world do we want to live in, and how is it that projects in science and technology can and should contribute? That's a very difficult problem, but it's not a problem of who knows best in the purely *scientific* sense of who has the best knowledge. It's a question of who knows best in a *democratic* sense—of how we ask questions collectively about what's good for us."

Jasanoff cautions that, compared to earlier federally funded research initiatives like the Human Genome Project and the National Nanotechnology Initiative, Synberc has far fewer avenues of funding available for unaffiliated researchers to study synthetic biology's legal, social, and ethical implications. The consortium's primary principal investigators (13 currently, including Silver and Church) are chosen from the program's five university partners—the Universities of California at Berkeley and at San Francisco, as well as Stanford, Harvard, and MIT—and they nominate and vote to approve other affiliated researchers; Oye is the only primary researcher who is not an engineer.

"In this country, we seem to be structuring our oversight to be-



come more and more ingrown, built into the sciences and technologies that we're trying to oversee," says Jasanoff. "To some degree, the old model of self-regulation coming out of the Asilomar era in molecular biology is being re-imposed, with even less room for public oversight." At a 2009 symposium in Washington, D.C., titled "Opportunities and Challenges in the Emerging Field of Synthetic Biology," she posed several framing questions for the developing field. "How do we assign meaning to innovation? Who is responsible for both good and bad consequences," she asked. "Who gets to imagine the future?"

One pointed answer came from activist Vandana Shiva, as quoted in the declaration "Principles for the Oversight of Synthetic Biology," released by the environmental group Friends of the Earth. "Synthetic biology, the next wave of genetic engineering," she wrote, "allows seed, pesticide and oil companies to redesign life so that they can make more money from it." Indeed, on the point of ownership, synthetic biology evidences deep divides. Some strands of synthetic biology have aligned themselves closely with open-source ideals. The BioBricks Foundation has the mission of making its biological parts available for free, and it hosts OpenWetWare, the field's version of Wikipedia, complete with experimental protocols and lab notebooks, sometimes in exhaustive detail. By contrast, the Venter Institute has filed for a patent on the minimal "Mycoplasma laboratorium" genome, prompting legal challenges in response.

A second answer comes from some of the field's most unlikely adherents. The Do-It-Yourself Biology (DIYbio) or "biohacker" community, in a twist on the field's favored computer-industry metaphor, styles itself after the hacker subculture of programming, aiming to transform genetic engineering into an activity that amateurs can do in their homes or garages. On an open e-mail list with subject lines like "Inexpensive gel electrophoresis system?" and "Need a paper please," its practitioners swap genetic engineering tips and tricks. Communal hackerspaces hold workshops to teach basic lab techniques. While some biohackers are new to the lab, many have significant training and even advanced biology degrees. "In many ways, I think DIYbio is about where you do research, rather than who you are," says Roosth, who observed the movement's 2008 Cambridge beginnings. "By doing biological research at home, biohackers are critiquing the way biotechnology has been done in the last 30 years—the move toward big science, toward the patenting of biological parts."

Indeed, in an essay titled "A Biopunk Manifesto," biohacker Meredith Patterson argued for the necessity of citizen science (see "Popular Science," January-February 2014, page 54). "Biopunks deplore restrictions on independent research, for the right to arrive independently at an understanding of the world around oneself is a fundamental human right," she wrote. "Come, let us research together."

Synthetic Biology's Rorschach Test

FROM SYNTHETIC BIOLOGY'S BEGINNINGS, its practitioners have never been shy about sharing their lofty goals. Harnessing biology



could mean new fuels, plastics, and food-stuffs; more diverse drug molecules and more quickly developed vaccines. More precise methods for genome editing mean that gene therapy, after early setbacks, is rapidly developing as an option to treat disease. It may become possible before long to reengineer species that have gone extinct. "Synthetic biology has made people feel like they can dream about things and take risks," says Silver. She cites one of the mottos of the field: "Engineering biology for the good of the world."

No surprise, then, that synthetic biology has exerted such an outsize influence on the public imagination. The National Science Foundation has sponsored an initiative called "Synthetic Aesthetics" that pairs research scientists with designers; its initial products were published this spring in a coffee-table book of the same

name. The first synthetic biology film festival, in 2011, drew 130 entries, and a second will take place in Vienna this October. This year, iGEM drew 245 collegiate and 54 high-school teams; an estimated 15,000 students, instructors, and advisers have participated in the competition since its beginnings as a January course at MIT in 2003. Last year, in a crowd-funded campaign, a community lab in San Francisco called BioCurious raised nearly half a million dollars to build plants that glow; seeds are slated to reach the market this fall.

This fervor has prompted some critics to dismiss the field as no more than hype. "Similar to other new and trendy fields, synthetic biology has been defined so loosely that it can seem like all things to all people," noted a 2009 feature in *Nature News*. As MIT associate professor of chemical engineering Kristala Prather quipped in the article, "If you ask five people to define synthetic biology, you will get six answers."

PERHAPS AT ITS CORE, synthetic biology is a space upon which scientists and nonscientists alike project their own imaginings. For biologists, it means a rethinking of metaphors. If a cell is a computer and genes are circuits, then what will be the nature of the new menagerie? Elsewhere in the public consciousness, synthetic biology has found itself at the center of many social debates about the proper role of science and technology, highlighting and often undermining the established manner in which biology has been done, demanding an answer to the question of what is next.

Whatever synthetic biologists' original intent, the field has become a scientific Rorschach test, composed of equal parts scientific novelty and the sum of society's collective hopes and anxieties. As Hurlbut says, "Synthetic biology is less a field or a set of technologies, than a bunch of people with a vision."

It is perhaps fitting that synthetic biology has taken on a life of its own. ▽

Former associate editor Katherine Xue '13 has entered the genome-sciences doctoral program at the University of Washington.

Francis Parkman

Brief life of America's epic historian: 1823-1893

by CASTLE FREEMAN JR.

PERHAPS no American writer's life has been front-loaded more drastically, or to better purpose, than that of Francis Parkman. Still the grandest and most ambitious of our historians, he built his life work, an epic saga of North America's discovery, exploration, and settlement, on impressions and experiences gained within a matter of months before he turned 25.

Born into the topmost ranks of Bostonian society, Parkman was the son of a prominent Unitarian minister who set him on the conventional path to Harvard (Class of 1844, LL.B. '46) in order that he be trained in a respectable profession, having observed that the young man showed signs of eccentricity. While still a boy, Parkman had become fascinated with nature. (He later served a year as professor of horticulture at Harvard.) He loved the life of the forest, and in particular the lives of the forest's people—the American Indians.

During two summer vacations from college, Parkman and Harvard friends headed for the deep woods of northern New Hampshire and western Maine, camping, canoeing, bushwhacking, hunting, and living among woodsmen and Indians. In that near-wilderness, Parkman was not simply a tourist. As a college sophomore, he had formed a grand ambition: to write the history of the 200-year contest between France and England for dominance in North America, from the earliest voyages of Cartier and Champlain to the final defeat of the French at the Battle of Quebec in 1759. This work inspired and directed his entire life.

It was to further his long-range plan that Parkman embarked on his life's great adventure. Needing firsthand knowledge of Indians and their lives, hardly to be had in the East any longer, the 22-year-old, and a cousin, took off in April 1846 for the West, following pioneer routes across the Great Plains in a journey of six months and about 2,000 miles. The climax of the trip was the roughly three-week period near Laramie, Wyoming, where Parkman lived, traveled, and hunted with a band of Oglala Sioux, people of a toughness, hardihood, and stoicism totally unexampled in his patrician milieu.

On returning to that milieu, Parkman found himself in need of all the toughness and stoicism he could muster. His health had long been uncertain. He suffered from insomnia and poor digestion, his eyesight sometimes failed for months on end, and an arthritic knee often confined him to a wheelchair. He was also the victim of obscure depressive symptoms, what he called a "whirl in the brain," a nonspecific anxiety or agitation that made concerted mental work impossible. Back in Boston, he broke down completely. For nearly 20 years—essentially the middle of his life—he was a virtual invalid.

Even so, Parkman summoned the will and the patience to advance his work. Unable to write, he composed long passages of prose in his head and dictated them to secretaries. He used readers

and copyists. He published *The Oregon Trail*, his famous account of his Western travels and always his best-known book, in 1849.

Through the 1850s and '60s, sometimes slowly and painfully, he pushed ahead on his major work, *France and England in North America*, comprising eight separate books. He thought of it as "the history of the American forest." When his health permitted, the tireless and super-meticulous researcher traveled to Canada, Florida, Paris (at least three times), and London to consult original documents. Reference materials for one volume ran to 6,000 pages.

More remarkable than his research, however, was the vitality and color of his writing. His history, for all its scholarship, is never dry. The major figures—the explorers Champlain and, especially, LaSalle; Frontenac, the royal governor of New France in Canada; Braddock, Howe, and Wolfe, the doomed British generals—are brought memorably to life, as are their settings: the dark Canadian wilderness, the vast grasslands of the Plains with their endless herds of buffalo, the Mississippi and Gulf of Mexico. Parkman had an ability unsurpassed among writers for putting the reader in the scene.

Nor was he only a painterly romantic. His passages of straight narrative and of analysis and exposition are invariably lucid and graceful. Much of their energy comes from a pervasive irony related to the contrast between the human actions described and the scale of the continent that is their stage. In *LaSalle and the Discovery of the Great West*, he tells of the explorer's arrival at the mouth of the Mississippi River and his vainglorious proclamation that half North America was now, henceforth, and forever the property of Louis XIV:

On that day, the realm of France received on parchment a stupendous accession. The fertile plains of Texas; the vast basin of the Mississippi, from its frozen northern springs to the sultry borders of the Gulf; from the woody ridge of the Alleghenies to the bare peaks of the Rocky Mountains—a region of savannas and forests, sun-cracked deserts, and grassy prairies, watered by a thousand rivers, ranged by a thousand warlike tribes, passed beneath the scepter of the Sultan of Versailles; and all by virtue of a feeble human voice, inaudible at half a mile.

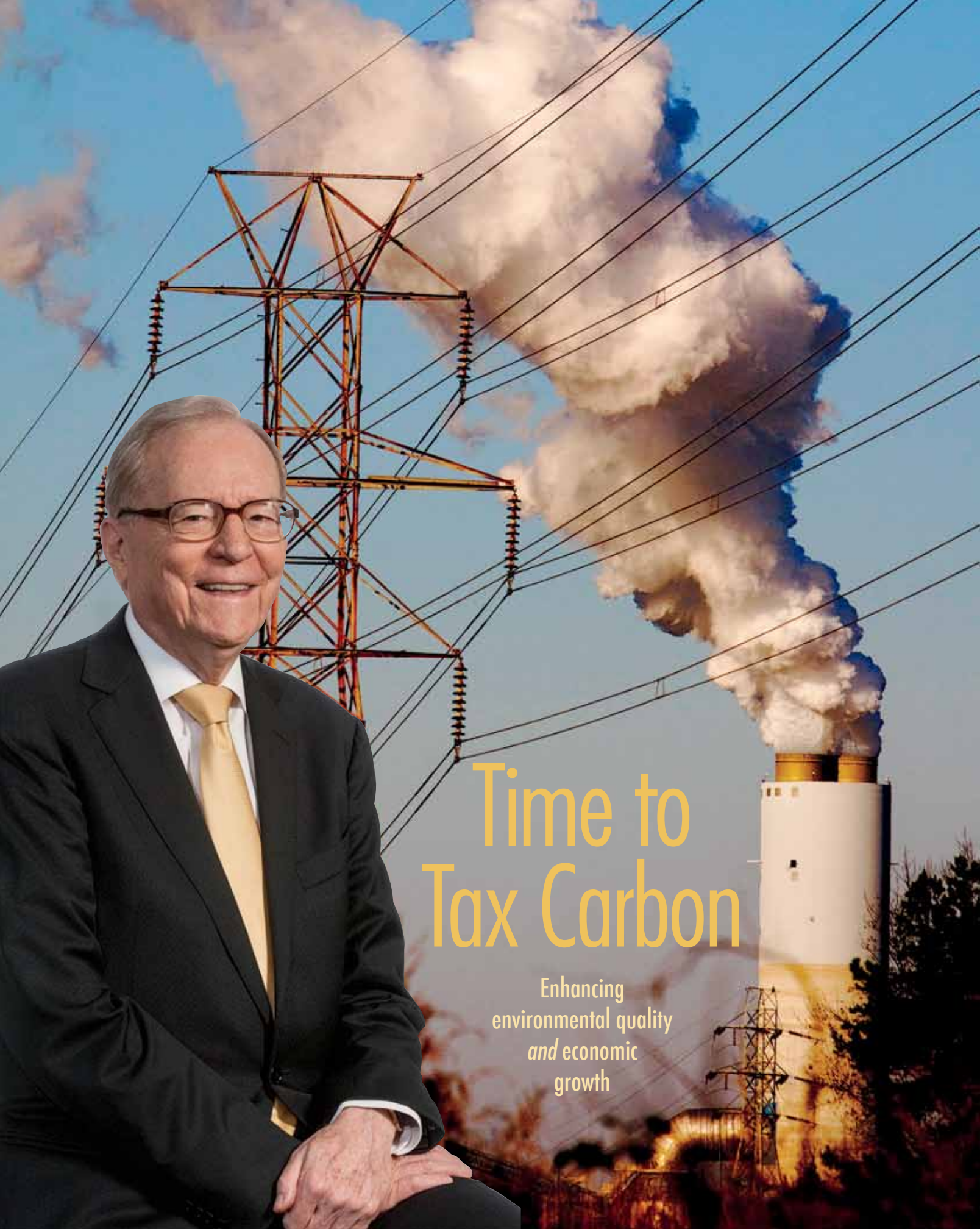
Parkman's health improved in the 1870s and '80s. He had been bringing out the main volumes of his history since 1865 and published the final one in 1892. At his death, he was recognized, according to one biographer, as "a great historian, the greatest perhaps who had ever appeared in the country." Parkman, and his readers, might agree that those few months in the woods and on the prairies 50 years before had stood him in good stead. ▢

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Parkman circa 1890. His vocation and avocation, history and horticulture, both sprang from his passion for nature and "the American forest."

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Time to Tax Carbon

Enhancing
environmental quality
and economic
growth

NEXT YEAR, representatives from nations around the world will meet in Paris to discuss a global climate-change agreement that would take effect in 2020. Central to those discussions will be setting a price on carbon and its equivalents—a figure that captures the social costs of releasing greenhouse gases into the atmosphere. The impacts of those emissions range from the health effects of burning fossil fuels, to inundation and adaptation of coastal cities threatened by rising seas, to extinction of plant and animal species as a consequence of rapidly changing environmental conditions. These costs amount to nearly \$1.6 trillion annually worldwide, based on Yale scholars' estimates of the damages at \$44 per metric ton of CO₂ and 2013 emissions of 36 billion metric tons.

As the no doubt fraught scientific and political discussion in the French capital nears, the work of Morris University Professor Dale Jorgenson, an economist known for his ability to marry theory and practice, is especially important. Jorgenson has studied the factors that drive economic growth, the relationship between energy and the environment, and the effects of tax policy on both. His 2013 book, *Double Dividend: Environmental Taxes and Fiscal Reform in the United States*, is the first to examine what would happen if revenues from a carbon tax—based on the price of carbon that will be the subject of debate in Paris—were recycled into the nation's economy. After examining four strategies for deploying the

revenue from a carbon tax, Jorgenson and coauthors Richard J. Goettle of Northeastern University, Mun S. Ho, Ph.D. '89, a visiting fellow at Harvard's Institute for Quantitative Social Science, and Peter J. Wilcoxon, Ph.D. '89, of Syracuse University, found that one strategy in particular—reducing taxes on capital—leads to an increase in economic efficiency that improves economic well-being despite greater inequality, as well as a decrease in carbon emissions: the “double dividend” of the book's title. Jorgenson has also studied economic growth, energy utilization, and environmental quality in China, the world's largest emitter of carbon. There, and in other developing countries, he projects a triple dividend, because a carbon tax would also lead to major improvements in human health.

As a means of limiting greenhouse gases, a tax on the carbon content of fossil fuels competes with proposals for outright regulations (such as those advanced by the Obama administration) that would limit electric power-plant emissions, and with cap-and-trade systems that let such big polluters trade permits among themselves, always seeking the most efficient means of reducing emissions. No solution to this massive problem will make everyone happy, so the best outcome will involve striking an optimal balance. A carbon tax may do that because it raises revenue, and thus the additional possibility of redeploying those funds in ways that stimulate economic growth.

Harvard Magazine interviewed Jorgenson in June. An edited version of the conversation appears here.

—Jonathan Shaw

Harvard Magazine: The premise of your work is that a carbon tax is a more efficient way of achieving reductions in carbon emissions than any other type of reform, such as cap-and-trade systems or new rules and regulations—like those just proposed by the Obama administration for electricity-generating power plants. Why is that?

Dale Jorgenson: The issue that surfaces when you talk about carbon taxes, that does *not* apply with cap and trade or rules and regulations, is what to do with the resulting revenue—because it is the only one that *does* generate revenue.

Cap and trade typically involves imposing a cap—a particular level of emissions or an emissions target—and then issuing permits that allow people to collectively achieve this cap by trading the permits. The question is how to allocate those permits. In legislative proposals, permits are given to existing polluters, and then the number is gradually ratcheted down to achieve a more and more stringent target.

That leaves out the possibility of generating revenue and using it to offset the impact of the tax (or the permit price, which has the same effect), which has imposed a cost on the economy. So in order to achieve the double dividend—curbing emissions while *simultaneously* achieving economic growth—you have to collect the tax and recycle the revenue. Then the question is, How do you make use of the revenue? That's the subject of *Double Dividend*. We considered

a wide range of alternatives, and we ended up recommending that it be used for a capital-tax reduction.

HM: You compared four options: reducing

capital-tax rates on incomes of businesses and individuals; reducing labor tax (i.e. income tax) rates on individuals; proportionally reducing both capital- and labor-tax rates; and, finally, redistributing tax revenues through lump-sum payments to individuals across the income spectrum.

Jorgenson: Yes, exactly right. The reason that reducing capital-tax rates is the most effective type of revenue recycling is that it has the effect of stimulating investment. In other words, it substitutes *capital* for the use of *energy*, as money that is returned to households and businesses in the form of lower capital taxes is used for saving and investment, rather than for expenditures on energy. The idea is to reduce the emissions from the use of energy by raising its cost. And capital, when deployed in place of energy, makes it possible in fact to *improve* the performance of the economy. That's the basic idea. You might ask, why doesn't reducing labor tax [income tax] rates do the same thing? The answer is that labor-tax reduction affects people's decisions about labor supply—when income taxes are lower, people work more and take less leisure time, and they consume more, too, while saving and investing less, and that turns out to produce a less favorable impact.

HM: Are you saying that when individual workers' income-tax rates are reduced, they increase the amount of time that they work in order to consume more? And this in turn lowers capital formation, slightly hurting savings and investment?

Jorgenson: Yes, that's right.

HM: There are probably hundreds of books on carbon taxes. What do they overlook?

Dale Jorgenson.
Background:
A coal-fired power
plant, southern
United States

Jorgenson: They don't have the framework needed to analyze this issue of recycling the revenue. So that's the problem that we solved. We put a lot of effort into it.

HM: Isn't reducing capital taxes on property such as stocks somewhat regressive, with fewer benefits for people at the lower end of the income scale?

Jorgenson: Yes, that's exactly what we show. But on the other hand, the double dividend consists of a range of policies that enable you to simultaneously improve economic performance and reduce pollution. That involves separating the overall impact, which we call *welfare*, or people's overall well-being, into *efficiency* and *equity*. Taxing energy and reducing the cost of capital leads to large gains in the efficiency of the economy overall, as goods and services are produced less energy-intensively. For society as a whole, you end up with a positive impact on economic well-being because the large gain in the efficiency of the economy outweighs the increase in inequality.

HM: So because everyone gains when the economy performs better, both rich and poor would benefit on an absolute basis, but the rich would be relatively even better off?

Jorgenson: Not everyone would benefit, but higher economic growth as a result of the investment would have a positive impact on economic well-being through greater efficiency.

Taxing energy and reducing the cost of capital leads to large gains in the efficiency of the economy overall, as goods and services are produced less energy-intensively.

HM: If the U.S. economy were projected to grow 2 percent annually, adding the carbon tax and recycling revenue as you project would lead to annualized growth in GDP of 2.2 to 2.4 percent?

Jorgenson: Yes, it's a big gain.

HM: On the order of 10 to 20 percent faster growth, if annual growth in GDP were 2 percent?

Jorgenson: Right. Gross domestic product is a measure of efficiency. But it doesn't take into account equity—the differences in the way the benefits are distributed according to income, and therefore is not a measure of any particular household's overall well-being, or welfare. The impact on equity matters, therefore it's very important to consider both efficiency and welfare.

The Cost of Carbon

HM: You consider a range of carbon taxes from \$10 to \$50 per ton. What is the optimal price?

Jorgenson: That's a very important issue. The way economists usually approach it is to ask, "What would be the price in an international agreement where everybody in the U.S., in China, in Europe, and so on, had to pay the same price to mitigate carbon pollution?"

The answer has been worked out in great detail by many econ-

omists, but probably the most prominent is [William D.] Bill Nordhaus, [Sterling professor of economics] at Yale. He comes up with a price of about \$30, right in the middle of the range of prices that we've considered.

That's optimal for trading off carbon emissions against the growth of the world economy. In other words, this level of taxation leads to a significant reduction in carbon pollution, without imposing too high a cost on global economic growth.

HM: That would raise about \$150 billion of revenue in the United States—a lot, although not a large percentage of either GDP or the national budget. But what about the impact on individuals? Your book suggests that beyond a carbon tax rate of \$20 per ton, the poorest households begin to experience small losses in overall welfare because as energy prices rise, they'll have to pay proportionally more of their total income for essential heating costs and fuel for electricity and transportation.

Jorgenson: The question is, What are you trying to achieve? You want a lower level of carbon in the atmosphere so that you can avoid global warming. That affects all individuals in the same way because everybody's exposed to the effects of climate change. So you have to ask yourself, what is the optimal rate for everybody, for the whole world economy? And so Nordhaus in his book, *The Climate Casino*, ends up with a path that's right in the middle of those we consider. He discusses how an international agreement would work, and what the carbon-price regime would mean for the world economy.

HM: How much carbon does the U.S. emit now?

Jorgenson: In 2000, emissions were around 5 billion metric tons. And in 2010, considerably less. Since around 2005, emissions have decreased by something like 13 percent. Part of that is the result of the economic downturn and the slow recovery, but a very important part is due to the unexpected availability of large amounts of natural gas from

fracking—hydraulic fracturing to release gas and oil captured in subterranean rock formations (see "Fracking's Future," January-February 2013, page 24). That has resulted in a massive substitution within the electric-utilities sector away from coal, toward natural gas, as a fuel. The carbon-intensity of natural gas is about one-half that of coal—so that's had a huge impact as the plants that can be converted to burn gas (and most can be converted easily) have been converted at a prodigious rate to reduce the amount of coal that's used.

One of the big questions about the Obama administration's proposal to regulate power-plant emissions is, how much will this policy actually do? We've already had this 13 percent reduction in carbon dioxide emissions, due to the substitution of natural gas. The administration is talking about a 30 percent reduction between 2005 levels and those in 2030, 15 years from now. Over that period, we could have another very substantial substitution [simply because natural gas is so cheap], and in fact do away with a lot of the coal that we're using simply due to market forces.

These coal plants are generally close to the end of their economic lifetimes, in many cases. A lot of them were built during the boom period before the energy crisis of 1973. And so a lot of substitution from coal to natural gas, wind, or solar power will take

place anyway, likely leading to a reduction in emissions from that effect.

So a reduction of the sort the administration is talking about is certainly within the realm of feasibility already—it's not going to destroy the economy or cause major economic disruptions.

HM: What impact does a tax on carbon of \$30 per ton have on the cost of a gallon of gasoline or home heating oil?

Jorgenson: A tax of \$30 per metric ton of carbon dioxide is equivalent to a tax of 24.4 cents per gallon of gasoline.

Toward International Agreement

HM: Do you examine the effects of a carbon tax only on the United States, or are you thinking about the international realm, too?

Jorgenson: We're thinking about a situation where the U.S. is part of an international agreement. The context is that a series of about 20 international negotiations has taken place annually since the initial Conference of the Parties [COP 1] in Berlin in 1995, including the very important meeting in 1997 in Kyoto, resulting in the Kyoto Protocol. That proposed international agreement unfortunately did not attract the support of a large range of countries [including the United States, which signed but didn't ratify it] and didn't have much of an impact, but it has represented world climate policy until now.

The Kyoto Protocol expires in 2020, and the target for this international negotiating body is to reach a new agreement in Paris in 2015—next year. So their goal is to have a proposal like the ones in Nordhaus's book ready for discussion in Paris, and to include a carbon price that could be used as a basis for an international agreement that would attract a much broader base of support: the U.S., China, Europe. It's much more likely now to actually produce some kind of international consensus, as the economic costs of climate change have become clearer. I'm sure a lot of people will be left out, but I think there's going to be a much broader basis for agreement.

This is critical because unless you get the major polluters to agree, you'll have "leakage": the nations that don't agree won't have to impose any kinds of limits on emissions, with the result that economic activity will leak away from the countries that do impose the taxes to countries that do not. Economists refer to that risk as the free-rider problem. The purpose of these international agreements is to prevent free riding, to avoid leakage.

HM: You've worked in China for a decade, and last year wrote [with Mun Ho and Jing Cao, Ph.D. '07, an associate professor of environmental economics at Beijing's Tsinghua University] about



Air pollution in Beijing, December 2013

the economics of environmental policies there [see chapter 9 in *Clearer Skies Over China, Reconciling Air Quality, Climate, and Economic Goals*, co-edited by Ho and Harvard China Project executive director Chris Neilsen]. What is happening in China?

Jorgenson: China has recently become the world's largest carbon polluter. Until three years ago, the U.S. was.

HM: China manufactures goods for countries around the world because they can do so more cheaply. Is this exacerbating carbon pollution?

Jorgenson: They are polluting on our behalf. About 80 percent of their energy supply is from coal. They use some oil, mainly for transportation, almost no natural gas. They want to move away from using coal, but right now, their economy is very coal-intensive, especially their system for generating electricity.

China has very modest oil resources and almost no domestic natural gas. That doesn't mean they couldn't develop it, but in terms of what they actually produce, most of their domestic resources are now based on coal. They mine a lot, and they import coal from Australia, Indonesia, and other places.

In our work there, we've been trying to design a system of taxes and revenue recycling that would enable the Chinese to participate in an international agreement and still continue their program of rapid economic development. Their traditional approach to economic policy has been to focus on growth, and they've had spectacular success since 1978, with the great reforms of Deng Xiaoping. They want to be convinced that it's possible to reduce their pollution and simultaneously maintain economic growth. So that's been the focus of our research.

We have a model of the Chinese tax system, just like the model of the U.S. system in *Double Dividend*, and we trade off a carbon tax against the other taxes that are used in China. In fact, China relies more on business taxes than we do, so there's a big payoff using an approach that involves revenue recycling.

India has a very coal-intensive economy, too. They're operating at a different level than the Chinese, with about half the level of GDP per capita, but their electricity generation is very coal-intensive, and they need to consider similar policies.

The starting point for these policies would be an internationally agreed-upon price for carbon, imposed by each individual country and used as a basis for generating revenue within that country. That way there's no *international* transfer of funds. And each country would choose its own revenue-recycling policy, depending on how the energy sector would respond to changes in the labor and capital taxes that we've been discussing.

These are major differences from the Kyoto climate treaty, and should prove to be key inducements to reaching a consensus: each

ly if the economy relies, as China's does, on coal—because most of the dirt in the air, whether it's sulfur dioxide or the particulates in smoke, is due to combustion of coal.

By the way, even though the Chinese get a lot more publicity, the conditions are equally bad in India. And in both countries, the effect of imposing an internationally agreed-upon carbon tax would be to deal with the domestic air pollution problems in a very effective way. That's what we show.

For the United States, on the other hand, given our relatively high standards and a long-established policy of controlling air pollution, such benefits are long since exhausted. We have relatively clean air. We can certainly improve it, but it's nowhere near as dirty as the air in China and India.

It turns out that by using a carbon tax, you can control air pollution very effectively if the economy relies, as China's does, on coal.

country could make its own choice, determined on the basis of domestic considerations, not international ones. What would be agreed upon internationally would be the carbon price—that's what Nordhaus's book is about.

HM: What would induce the Chinese to participate?

Jorgenson: To put it very simply, China has a severe problem of conventional air pollution. It has nothing to do with carbon. It has to do with sulfur dioxide, particulates—in other words, components of smoke.

This has a huge impact on health. There are lots of sick people, there are lots of premature deaths—it's a very costly policy. They've been talking for years about what to do. It turns out that by using a carbon tax, you can control air pollution very effective-

HM: Would a carbon tax obviate the need for regulations like the Clean Air Act, or substitute for some of them? Or would they just be layered on top of each other?

Jorgenson: The latter. In other words, I think that the carbon tax would be focused on *climate* policy in the U.S., and would have relatively modest impact on the *other* pollutants. Let me just say that I've had

an opportunity to revisit the Clean Air Act amendments and they look even better in terms of effectiveness than they did 10 years ago. It was an expensive way to proceed, but it was very *effective*, and produced a lot of health benefits in this country. That's still a frontier in Chinese environmental policy, and in India. They don't have these kinds of regulations, and the result is that they have very dirty air and very severe associated health problems.

HM: Does your model take into account the possibility of carbon capture and storage [see "Fueling our Future," May-June 2006, page 40]?

Jorgenson: We considered that. Carbon capture and storage is on the drawing boards: the engineering and technology are pretty well understood. But no version to date has achieved any kind of commercial success. For that reason, we represent carbon capture and storage by providing an engineering description, as opposed to our work on other technologies, which is based on looking at the behavior of firms and individuals, and how they react to prices. We have a vast range of data on how people substitute between, say, coal and natural gas, depending on prices, or how electric utilities choose different fuels in response to prices. We have a lot of behavioral information about that we analyze, and *Double Dividend* puts it all together. We don't have that kind of information on carbon capture and storage. But we do show how to incorporate that potential development, and certainly it could be analyzed if there's a serious possibility of a commercially viable version.

We've tried to (please turn to page 78)



**Smog in New Delhi,
February 2013**

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TIME TO TAX CARBON

(continued from page 56)

study whether, with higher carbon prices, carbon capture and storage would be more attractive. The answer is no. It's still not commercially viable in the kind of scenarios that we're talking about.

World Problem, Regional Solutions

HM: Your book accounts for the health costs of climate change. Given recent science asserting that the West Antarctic ice sheet will inevitably melt, raising the sea level significantly, do you also consider the destruction of coastal cities?

Jorgenson: This is where we hand off the baton to Nordhaus and his colleagues. They have incorporated all the benefits of mitigating climate change, including avoiding property damage and health benefits and so on, in calculating the appropriate carbon price. That is a world problem, because of

analysis of the U.S., because there are obviously huge differences in the two countries' economies—and so recycling will make a big difference. Given China's existing environmental regime and the fact that the air is so dirty, they get a very substantial *non-climate* benefit from imposing a carbon tax, too. As I mentioned, in the U.S., this benefit is relatively modest.

HM: So a triple dividend for China?

Jorgenson: That's exactly right. Better economic performance, control of climate change, and improved quality of the air.

HM: Would every country experience at least a double dividend?

Jorgenson: Yes, because carbon taxes have a relatively similar effect in advanced countries, which are by and large pretty energy-intensive. The effects in Europe, in Canada, in Japan are going to be similar to those in the United States.

improved economic performance and the control of pollution with the same policy.

HM: Do you recommend any accommodations for the distributive problems that arise when reducing taxes on capital, since those who have lots of property would benefit most? Or do you think it's not a problem overall?

Jorgenson: The ruling principle in introductory economics is that you endorse policies only if everybody's better off. Unfortunately, that doesn't take you very far on climate policy. So we introduced the idea of a social-welfare function that captures the impact on individual welfare: we weighed the impact on equity against the impact on efficiency to determine the net impact on welfare.

We are convinced that distributional considerations are important. Every country should be looking at both the equity and the efficiency impacts. You're not going to get a story about climate policy that makes everybody better off—so you're going to have to figure out how to find a balance.

We spent a lot of time on that issue because it's so central to climate change. Why? The answer is that poor households spend a much larger fraction of their income on energy, either directly or indirectly, in the form of energy-intensive goods.

Everybody needs to heat the house, everybody needs to have transportation, and therefore equity has got to be included in the story. That itself is unfamiliar, even to many economists. How do you incorporate equity into the evaluation of a policy? Governments will have to weigh it off against efficiency. We view that as central—not something that can be simply set aside.

HM: The new rules governing power plants proposed by the Obama administration are presumably not necessarily the most economically efficient way of controlling emissions. Why choose this approach?

Jorgenson: A little bit of history helps here. President Obama tried to pass a national cap-and-trade system in 2009, and unfortunately failed to attract any Republican support. In the final House vote, there were altogether four Republicans in favor. All of the support was from Democrats. And when this legislation went to the Senate, they couldn't even get to the point of taking a vote, even though the chamber was controlled by Democrats.

You're not going to get a story about climate policy that makes everybody better off—so you're going to have to figure out how to find a balance.

course if there's sea-level rise, it's going to affect coastal areas around the world, not just in the U.S. It's something you need to address when you're setting the appropriate carbon price at the world level.

HM: The choice of how to recycle the revenues from a carbon tax would be in the hands of each country. You've found that reducing taxes on capital would produce the best outcome for United States. Might one of the other strategies lead to better outcomes elsewhere?

Jorgenson: Choosing among these different alternatives does not affect the reduction in carbon emissions—the effects of these different taxes are almost uniform. Changing the carbon tax *rate* has a big effect on abatement, but choosing which recycling option to adopt doesn't.

There will be big differences in economic performance. That's our basic story. It's very important that each country consider very carefully how to do the recycling.

That's why we did a very detailed analysis of China, and another very detailed

But of course the mix of fuels used to generate electricity differs from one country to another. People in Europe, for example, use a lot of coal. In Japan, they use a relatively modest amount of coal. They rely much more heavily on imported natural gas and a little bit on imported petroleum.

Summing up, if you think about countries at different levels of development—China, India, the United States—the differences are enormous in terms of the impact. Leaving the determination of the recycling strategy to each individual country makes sense because of these differences in levels of development, and also because of the nature of the energy sector and the way electricity is generated.

HM: But in each country, a tax and revenue recycling would be superior to something like cap and trade?

Jorgenson: Exactly. The reason is that the only way to achieve a double dividend is to have a tax that will control pollution *and* to use the revenue to mitigate the impacts on economic performance: achieving both

So now the president is taking an indirect approach, relying on the Clean Air Act.

The regulatory approach sets percentage caps for one industry only: the electric-generating industry. That industry generates about 35 percent of the greenhouse-gas pollution in the United States. So you're focusing specifically on that industry, and setting caps for every state except for Vermont, which has no fossil-fuel generation.

The traditional rationale for cap and trade is that all the polluters, through trade [in emissions permits], will end up paying the same cost for pollution. In other words, they will pay the same price to emit a ton of carbon. The new Obama proposal rules that out. It says that the price of permits is going to be different in every single state jurisdiction. That means it's a cap-and-trade system imposed by regulation: one that essentially goes against the rationale for the cap-and-trade system in the first place. The whole cap-and-trade theory, originally, was to have a *national* system where everybody pays essentially the same price—and to have the same principle apply at the international level: namely, that you could have a system of caps that would be determined for individual countries by agreement, and then a system of internationally tradable permits.

That seems to me to be rather unlikely. It's much more likely that countries could agree on a carbon price than that they could agree on a system of caps that differs like this one does among states.

It's worth noting that under the Obama proposal, cap and trade is only one option. Other options that could be used by individual states to meet their targets—it's up to them to choose—would be more renewable energy, more conservation (use less energy), and even the possibility that states could choose to impose a carbon tax.

No states have done that in the United States, but there are countries that have a carbon tax in Europe, such as Ireland, Sweden, and Norway. The province of British Columbia, in Canada, also has one. But none of these taxes so far focus on recycling the revenue, on integrating the tax with the rest of the fiscal system. That's the frontier.

Fundamentally, this Obama proposal is very much like the Clean Air Act: it's an inefficient way of achieving a desirable objective. At the moment, it's being offered without the framework of an international agreement. We're a long way



Children protecting themselves from smog and pollution, New Delhi, 2012

from achieving an international agreement that would replace Kyoto, and we're going to hear a lot about this as the Paris negotiations approach.

HM: Will Obama's regulatory framework outlast his presidency?

Jorgenson: Environmental regulations are very rarely rolled back. If enacted, it's very likely that this regime will remain in place, just as the relatively inefficient approach in the Clean Air Act remains in place.

HM: If negotiators in Paris can agree on a price that reflects the cost of emitting a ton of carbon, what happens next?

Jorgenson: As the international agreement unfolds over the period between now and, say, 2020, when the Kyoto Protocol is scheduled to be replaced, every country should be doing this kind of analysis of revenue-recycling and of the potential ancillary health benefits. They'll have to if they're going to try to maintain economic performance while adhering to an international agreement.

I think that from the political point of view, the fact that taxing carbon is going to produce very substantial conventional improvements in air-pollution control will induce them to participate in an international agreement.

Once developing countries understand this, they should be champing at the bit to

have an international agreement like this. That's the thrust of our argument about China. A carbon tax for the emerging economies has these ancillary benefits that are extremely important, and I think will drive an international agreement when we get around to the negotiations.

HM: How would your proposal for an international price on carbon interact with President Obama's proposed power-plant regulations?

Jorgenson: There's a period of public comment on those regulations for at least a year. That takes us very close to the Paris meeting. I think the hope for people who want to use an efficient approach is that a national carbon tax will be enacted in the meantime, replacing the proposed regulatory regime.

In other words, Congress will decide in its wisdom to legislate on this issue. I think having the prospect of a relatively inefficient system may stimulate a lot of interest in a carbon tax. There's already a sub rosa discussion going on in Washington. I think that will surface as this period of public comment unfolds. So I think we're going to have a big debate over this, and that all of this is going to be resolved in the next 12 to 18 months.

HM: That's an extraordinary prediction, given the recent congressional standoffs.

Jorgenson: I'm quite optimistic. That's why I spent a lot of time and effort making sure that this book got out so that we could be part of this discussion. ♡

Montage

Art, books, diverse creations



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The big production number “What You Want,” from the London production of *Legally Blonde*

of the 2001 Reese Witherspoon film. Their production opened in 2007, ran for 595 performances on Broadway (and thousands more worldwide), and earned Benjamin and O’Keefe a Tony nomination for best original score. With Kevin Murphy, O’Keefe wrote the musical *Heathers*, based on the 1988 film. It premiered off-Broadway this April and earned its authors a Drama Desk Awards nomination for outstanding music. Benjamin was busy working with Tina Fey at the same time on a musical version of Fey’s 2004 film *Mean Girls*. “Our competing, terrifying, high-school

musicals,” she says. In July the couple mounted a cabaret show, *The Songs of Nell Benjamin and/or Laurence O’Keefe*, at Manhattan’s 54 Below supper club.

And that opera about Stalin? In 2012 Benjamin and O’Keefe introduced a small-scale production of *Life of the Party*. Set in the Soviet Union in 1953 and chronicling the making of a socialist-realism movie musical, it’s a tragedy with a heavy dose of black comedy. The score resounds with grand opera, old-fashioned adventure music, and dead-on socialist-realism prattle:

Laughter and Lyrics—*Legally*

Musicals by Benjamin and O’Keefe excite Broadway.

by DICK FRIEDMAN

“PRETTY MUCH any Broadway producer would take a call from us if we had an idea,” says Laurence O’Keefe. “Of course, it might be a short call.” “Yeah,” says Nell Benjamin. She imagines a pitch. “‘We’d like to write an opera about Stalin.’ ‘Well...thanks, Larry and Nell!’”

They both laugh. Partners in art and life (married in 2001) since they met at Harvard during auditions for the improv group On Thin Ice, Benjamin ’93 and O’Keefe ’91 have gone from writing Hasty Pudding shows (1993’s *Romancing*

the Throne) to a coveted Broadway niche as musical composers and playwrights. They are on a short list of those who can reliably deliver accessible, clever, high-energy (and sometimes high-decibel) productions. “We like to write fast-moving shows in which the plot changes during the songs,” says O’Keefe.

“We don’t feed you the clues about how you’re supposed to feel,” Benjamin says. “Catch up with us. Come on the ride with us.” Their biggest success to date is the sprightly *Legally Blonde*, the musical version

"Our progress is extraordinary/Our cast and crew energetic./ They do all that's necessary/To form a unified aesthetic."

In 2001, O'Keefe revealed his protean talents in the music and lyrics for what became one of the theater world's most

unlikely recent cult successes: *Bat Boy: The Musical*. That venture grew out of supermarket tabloid story alleging the discovery of a cave-dwelling humanoid who escapes into civilization. O'Keefe turned the premise into an affectionate sendup of

show music. From the opening number—"Hold Me, Bat Boy!"—which wouldn't be out of place on a Led Zeppelin album, he runs through a cornucopia of musical idioms. He has gleefully pleaded guilty to borrowing from, among others, Stephen Sondheim, Leonard Bernstein '39, D.Mus. '67, Frank Loesser, Kurt Weill, Alan Jay Lerner '40 and Frederic Loewe, Gilbert and Sullivan, plus the rock world's Bad Company, Boston, and Queen. "My musical influences. I've been stealing from them ever since college," he says cheerfully. "You might hear a chord from *West Side Story*, but Bernstein stole that from *Petrushka*....When [in *Bat Boy*] it was time to show the simple townfolk of West Virginia, there'll be a country sound. When it was time for the terrible dark secret from the past to erupt, you'll get grand opera. So content dictates form."

But he constantly strives for a twist. "You can have a song with a very traditional harmonic structure and a very traditional melody," O'Keefe explains. "Put a weird timbre on it and a cool new beat, and you have a brand new sound....The novelty itself sparks a new kind of emotion. Nell keeps me honest." And vice versa: they amiably finish each other's thoughts and punch lines, aided by what Benjamin labels their "shorthand."

Both grew up close to the New York City theater scene. After college they worked for 10 years in Hollywood on sitcoms and TV movies, then moved back to Broadway. Along the way they had to learn to lose some of the trappings of their Harvard fields of concentration, English (hers) and social anthropology (his). "It was weird for us to realize that words come last," recalls O'Keefe. "We were told, 'Yeah, thanks for the five-minute patter song with a thousand syllables...audiences aren't gonna like that.'"

The need to discard also came into play on *Legally Blonde*, says Benjamin: "At one point we wrote a rather ingenious song about passing the LSATs. It was very well-crafted....and [everyone was] totally uninterested." As they compose in their Manhattan apartment, where they live with their 20-month-old daughter, Persephone, the couple tolerate each other's meddling—usually. "If I'm working on a lyric that doesn't have music yet, and he's

O P E N B O O K

The Brink of Revolution

frequently erupts in a confusing cacophony of competing writings. Nor do its opinions always offer a comprehensive and transparent view of the Court; sometimes they are downright misleading." They attempt to deal with the uncertainties. From the prologue:

H. L. Mencken reputedly said, "For every complex problem, there is a solution that is simple, neat, and wrong."

Understanding the Supreme Court undoubtedly qualifies as a "complex problem." The nine justices currently issue more than 70 opinions every year, some of them thunderbolts that rock American life and others rightly destined for obscurity. With a hand in nearly every major issue of our time, from privacy and affirmative action to gun rights and health care, the Court is inescapable. Yet it is also mysterious and secretive, committed to rituals and reasoning that even experts struggle to understand. Its opinions are poked and prodded, examined under a microscope and held up to the light. The public hangs on to rumors of backroom drama, while scholars read tea leaves and prophesy the future. Clear trends predominate in certain areas of law, but efforts to develop a unified field theory of the Court...inevitably fall short. Even in this age of statistical models that seek to wring hidden meaning out of human behavior, the nine men and women who make up the Court intrigue and surprise us....

Of course, an effort to understand the Roberts Court...must reckon with more than just its results. The Court issues opinions in which the justices grapple

How to make sense of the U.S. Supreme Court? "Judicial opinions...can defy easy comprehension," write Loeb University Professor Laurence Tribe, who often argues cases there, and Joshua Matz, J.D. '12, in *Uncertain Justice: The Roberts Court and the Constitution* (Henry Holt, \$32). "It doesn't help that in controversial cases, the Court

with fundamental principles, argue over what the Constitution means and what role they should play in giving it life, and offer signals of where they are heading. These opinions open a window into the justices' hearts and minds, giving us a glimpse of how they view the world....

In some important domains of constitutional law, a majority of the Roberts Court stands on the brink of revolution yet seems profoundly uncertain about whether and how to proceed. In other domains, it has already initiated major changes whose long-term effects are clouded in mystery. Some of these developments reflect a desire by the justices to remake our constitutional understanding, while others have been forced by dramatic cultural, technological, and political upheaval.



ISTOCK

(Right) Two scenes from Benjamin and O'Keefe's improbable musical *Life of the Party*, set in the Stalinist USSR of 1953. (Far right) The creative couple

working on different music, I have to be in another room," says Benjamin. "Otherwise my lyric will scan to whatever's coming out of the room next to me."

"Either one of us might propose a lyric," says O'Keefe. "The tunes can come from either of us. The job of polishing the music usually falls to me. We don't write the lyric first and then the music. We write the first verse of the lyric and maybe the first chorus of the lyric, then turn it into music...which changes the lyric. We go back and write the second verse and second chorus. I might say, 'OK, You have eight syllables, then three...can we make it more like six and two, because I have a cool melody which you're suggesting.' It literally bounces back and forth, very fast...music/lyric, music/lyric."

Consider "What You Want" from *Legally Blonde*. "I didn't know the tune yet," says Benjamin, "but I knew the scansion." O'Keefe adds, "When I heard it, I said,



you want, what you want, what you want is right in front of you! That's what they'll remember." The finished number became a show-stopping centerpiece while meeting O'Keefe's top criterion: "Try to start a song with a bang or a surprise and then end with a bang or a surprise."

Producers can expect many more calls from the team. "We have a backlog of 10 to 20 ideas that we love," O'Keefe says. "We're trying to build a larger tent to contain the things we want to talk and sing about."

'Where's the chorus?' It needs a chorus! You have thousands of ideas bouncing off each other and now we need a moment that's repetitive, memorable, and witty—as a break from all the wit. 'What

Bears, Oars, Metaphors

John Casey explores woods and stories.

WHILE STUDYING with Kurt Vonnegut at the Iowa Writers' Workshop in the late 1960s, John Casey '61, LL.B. '65, enjoyed quite a range of experiences. A neighboring farmer taught him to castrate pigs; the next day in class he was reading Proust. Such contrasts were hardly a shock to the budding author. As a boy, he'd stayed in the New Hampshire woods with his Uncle Charlie, who taught his nephews to fish, hunt, and cross-country ski. Young Casey also frequented Paris, home to his Uncle Drew, a highly cultured gay man and denizen of the Left Bank who, with two of his equally cosmopolitan friends, took the boy around the City of Light. "Then it was back to the woods," he says. Now, at 75, Casey proffers a concise bio: "One-third of

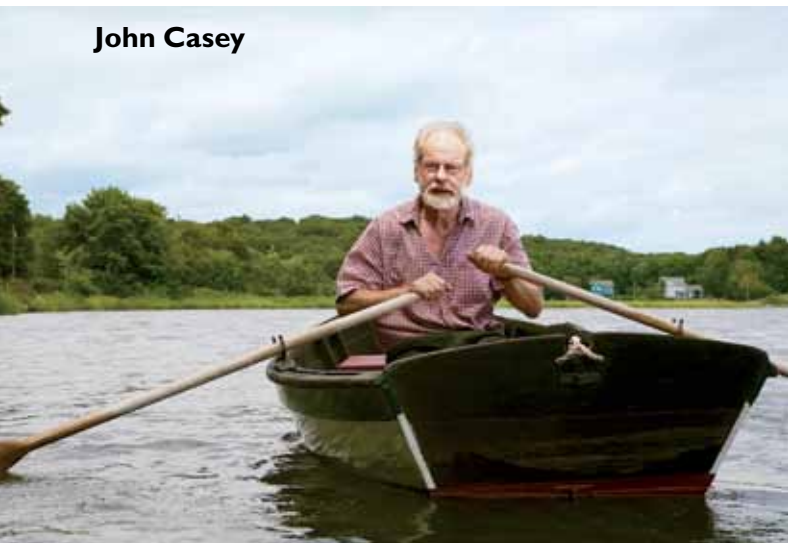
my life is writing and reading, one-third is getting outdoors, and one-third is...just life."

The "just life" part includes his three marriages and four daughters. The rest of Casey's trifecta shines in a pair of new books. *Room for Improvement: A Life in Sport* describes the wild outdoor adventures he has pursued across more than 50 years as an "adrenaline junkie." *Beyond the First Draft: The Art of Fiction* is crammed with stories and ruminations on creative writing, a subject Casey (johnndcasey.com) has taught at the University of Virginia since 1972. He knows the craft intimately, having published five novels, including *Spartina*, a summer saga of a coastal Rhode Island "swamp Yankee" and his adventures spearing swordfish, building a boat, and dealing with love, which won the 1989 Na-

tional Book Award; one novella; and a raft of nonfiction that culminates in this year's two-book salvo.

Their author is an unusual athlete. Though it involves some bona fide sports, *Room for Improvement* narrates an astonishing collection of what might be called adventures. At age 30, for example, he and his wife lived four years on an island in Narragansett Bay in a house without electricity, furnace, or telephone. One night there, Casey, rowing a skiff, guided a lost, and probably drunk, stranger's yacht through two miles of rocky water to a marina. On his fiftieth birthday, he celebrated by walking 50 kilometers through the Blue Ridge Mountains from midnight to eight a.m. in January. Casey acknowledges the appeal of several popular incentives for athletic exploits: health, vanity, mastery, playfulness, and the siren song of endorphins. In addition, "I wouldn't write if I didn't read a lot," he notes in *Room's* preface. "I also wouldn't write if I didn't get

John Casey



DANA SMITH

out into the physical world in my own body, sometimes as a 'sojourner in nature,' as Thoreau puts it, but sometimes pushing hard enough to feel and see the earth's surface differently."

In the dead of winter, the 38-year-old endured an 11-day Outward Bound course in Maine. Casey opens this particular narrative by advising the reader, when out skiing, snowshoeing, or walking in snow, to "look at the nearest snowdrift and consider how you would do if you had

things just to see what happens: to encounter some unpredictable circumstance and find out what it offers. His quest might be simply to learn. Take the 70-kilometer trek Casey invented to mark his seventieth birthday: it embraced rowing, bicycling, skating, dog walking, and rollerblading, an athletic menu probably never attempted by another human. He savors rewards like "Redemption," he writes. "There's redemption of a bad day at the writing desk. Okay, that was five hours of nothing—let's blow

to spend the night in it." After noting the obvious misgivings anyone would have—like freezing to death, or just feeling plumb miserable—he adds that in his own case, he didn't think of asking himself, "Will it be, in its peculiar way, fun?" Sure enough, for him, it was.

Room for Improvement's bracing exploits suggest that the author does

it off by running five miles."

There have been more good days than bad at Casey's desk during a prolific literary career. He started with a bang while at Iowa when the venerable William Maxwell bought three of his stories for *The New Yorker*. *Beyond the First Draft* narrates illustrative anecdotes and shares lessons gleaned from decades as a student and teacher of writing. He opens with the age-old question, "Can you teach someone to write?" and answers with two versions of "No," both qualified: "No, but if someone is talented to begin with, I can save her a lot of time," and "No, I can't teach someone to write, but I can sometimes teach someone to rewrite." Hence the title.

Casey compares fiction to acting, something he did plenty of in college, where he concentrated in Russian history and literature. In both, "There's the same link between being cooped up in yourself and being let loose on a stage as somebody else," he explains. Nor are you cooped up in yourself all that much when cross-country skiing at daybreak in Sweden, mollifying a huge black bear while trout fishing in Pennsylvania, or goaltending for a Swiss school ice-hockey team—as no one but John Casey can tell you. ~CRAIG LAMBERT

Cinema with Gravitas

Bill Haney's films train a lens on injustice.

IT WAS NOT much of a house at all: just a simple shack, with a dirt floor and ramshackle walls. But its owner, a Haitian sugarcane worker in the Dominican Republic, graciously let in the strangers who'd knocked at his door, offering them respite from the broiling summer sun.

Little did he know what would ensue. The visitors were documentary filmmakers

ers who were interviewing workers lured into a form of indentured servitude on sugar plantations. The Haitian told them his story, and the next day, with the camera crew gone, the plantation owner ordered his shack demolished. "He had the poorest possible house—it was just tiny pieces of corrugated metal," says the film's director, Bill Haney '84. "You had the feeling that tension was in the air, and I feared for what would happen to the people around me."

Such is the weight of Haney's gripping 2007 documentary *The Price of Sugar*. Narrated by Paul Newman, the film—which Haney wrote, produced, and directed—was short-listed for the Academy Award for Best Documentary. It is now available



Scenes from *The Price of Sugar*: armed guards on horseback often patrol workers' shantytowns; (at left) Father Christopher Hartley with a Haitian plantation worker

through Netflix and on DVD. The movie follows a gutsy British-Spanish priest, Father Christopher Hartley, who was trying to open a hospital for the poor in the Dominican Republic when he met Haney, who was there to deliver medical supplies to local hospitals on behalf of a charity he'd established, World Connect. Riding through workers' shantytowns that were patrolled by guards on horseback, armed



FROM THE PRICE OF SUGAR

Off the Shelf

Recent books with Harvard connections

Immigration Economics, by George J. Borjas, Scrivner professor of economics and social policy (Harvard, \$49.95). A Kennedy School scholar's technical synthesis of the theories and models used to analyze the flow of labor across boundaries. The econometrics aside, the author is aware of, and has been in the thick of, the "contentious policy concerns" accompanying the basic fact that "immigration has consequences," because "some people lose while others benefit."

Law of the Jungle, by Paul M. Barrett '83, J.D. '87 (Crown, \$26). A journalistic account of the litigation led by Steven Donziger, J.D. '91, against Texaco (and later its postmerger parent, Chevron), for pollution in Ecuador; the \$19-billion judgment against the oil company; and the subsequent court proceedings that revealed misconduct on his part in pursuing the case for two decades.

Transformation of the African American Intelligentsia, 1880-2012, by Martin Kilson, Thomson professor of government emeritus (Harvard, \$29.95). The first Africa-American faculty member to teach in Harvard College (1962) examines the evolution of a black elite from the post-Reconstruction era of institutionalized racism through the present.

The Land of the Elephant Kings, by Paul J. Kosmin, assistant professor of the classics (Harvard, \$49.95). A scholarly history of the Seleucid Empire (311-64 B.C.E.), from Central Asia through Bulgaria, drawing on archaeological evidence and primary sources; the instability and human misery in many of the same regions today suggest the need for such historical perspective.

American Railroads, by Robert E. Gallamore, M.P.A. '65, Ph.D. '68, and John R. Meyer, Ph.D. '55, late Harpel professor of capital formation emeritus (Harvard, \$55). A comprehensive history of the in-

dustry's decline and renaissance, by railroad lovers Gallamore, now retired from Union Pacific, and his mentor (also with experience at that company), who did much to establish the field of transportation economics and held faculty

positions, over time, in the economics department and at the Business and Kennedy Schools.

Cheap and Clean: How Americans Think about Energy in the Age of Global Warming, by Stephen Ansolabehere, professor of government, and David M. Konisky (MIT, \$27.95). "Americans are pragmatic," the researchers find. They want cheap energy, and they want to avoid harm to their health. This "consumer model" dictates low economic and social costs: a local focus that treats global warming as a secondary concern (if that)—but still leads toward a changed energy future.

Projective Ecologies, edited by Chris Reed '91 and Nina-Marie Lister (Graduate School of Design, \$34.95). Lots of people on campus know the work of Chris Reed, principal of Stoss Landscape Urbanism, and in fact walk on it daily: he designed the Science Center Plaza. In this edited volume, with ample representation from Harvard authors (the design school, the Arnold Arboreum), contributors probe the relevance of ecology for design and planning.

Reaching Down the Rabbit Hole, by Allan H. Ropper, professor of neurology, and Brian David Burrell (St. Martin's, \$25.99). Cases of brain disorders and diseases, evoking empathy for the neurologically impaired, presented for lay readers. And in a separate medical vein, **Working Stiff**, by Judy Melinek '91 and T. J. Mitchell '91 (Scribner, \$25), classmates and a San Francisco couple (she's the forensic pathologist, he's the writer) collaborate on "two years, 262 bodies, and the making of a medical examiner"—a click-magnet subtitle if ever there were one.

Judging Statutes, by Robert A. Katzmann, Ph.D. '78 (Oxford, \$24.95). The author, chief judge of the U.S. Court of Appeals for the Second Circuit—and one of the rare federal judges with a doctorate in government—emphasizes the

role of judicial interpretation of legislators' work. In so doing, he poses challenges to a strictly textualist interpretation of the Constitution as an invariant guide to judicial reasoning when weighing what Congress *thought* it meant.

The Barbara Johnson Reader: The Surprise of Otherness (Duke, \$99.95; \$28.95 paper). A collection of essays by the late professor of English and comparative literature and Wertham professor of psychiatry and law in society, who died in 2009; Johnson was a prominent literary and cultural theorist and critic, and a celebrated translator of Jacques Derrida's *Dissemination*.



James Joyce, Dublin, 1904, from *The Most Dangerous Book*

Censors at Work, by Robert Darn-ton, Pforzheimer University Professor and University Librarian (W.W. Norton, \$27.95). The preeminent historian of the book examines "how states shaped literature" (the subtitle) in eighteenth-century France, the British Raj in India, and communist East Germany. And in **The Most Dangerous Book: The Battle for James Joyce's *Ulysses***, by Kevin Birmingham, Ph.D. '09 (Penguin, \$29.95), a younger scholar (a lecturer on history and literature) examines the "transgressions" and lawyering over an iconic modern work.

COURTESY OF THE BEINECKE RARE BOOK AND MANUSCRIPT LIBRARY/YALE UNIVERSITY



Local activists (at left and above) and lawyer Robert F. Kennedy Jr. '76 speak out against the mountaintop-removal of coal in Haney's film

The Last Mountain.

with machetes, the filmmaker followed Hartley as he tried to improve conditions for the Haitian workers in the face of death threats from powerful plantation owners. "He was, in a way, an ordinary man," Haney says, "who found within himself the ability to do something extraordinary because his principles required him to."

Something similar might be said of Haney. His 12 documentary films have a common thread: dealing with social injustice. For PBS, he's produced *The Road to Reconciliation* (2002), on Northern Ireland's troubles and quest for peace, and *Gift of the Game* (2002), exploring U.S.-Cuban relations through the lens of U.S. baseball players seeking members of a Cuban "little league" team that Ernest Hemingway founded in 1940s Havana. *A Life Among Whales* (2005) examines one man's lifelong passion for the wild. *Racing Against the*

Clock (2004) explores the world of women in their fifties through eighties who compete in state and national track-and-field competitions. *American Violet* (2008) is based on the story of Regina Kelly, a victim of Texas police drug-enforcement tactics.

The entrepreneurial Haney, who also started an eco-housing business, Blu Homes, that sells prefabricated, affordable "green" houses, began filmmaking at 35, when a childhood neighbor, a prominent topiary gardener, became a subject in the award-winning 1997 Errol Morris documentary, *Fast, Cheap, and Out of Control*. Haney and Morris "became friends, and I played a small part helping him get it [the film] done," he explains.

Haney says he makes films to tell stories that move people, and although he

does not begin his process by looking for stories of a particular flavor, he does find inspiration in tales of ordinary folks who rise to the occasion when needed. Tim Disney '83, of the moviemaking family, has been Haney's partner (as co-writer or producer) on virtually all his films, and Haney credits Disney's "tal-

ent, insight, and eye refined by many years of filmmaking experience" for much of their success.

"My philosophy is to focus on the story, first and foremost, and the characters who propel it," he says. "Everything else is in service to bringing the characters and their story to life in a genuine, unaffected way."

The Last Mountain (2011), for example, narrates the fight for the last great mountain in central Appalachia: mining companies who want to blow it up for the coal inside versus locals who want to stop them and build a wind farm instead. Implicitly, it explores how democracy works—or doesn't—at a community level, and how money and power can corrupt bureaucracy. Sundance made it an official selection in 2011. "By the time I was done, I saw the coal industry as having its dark hands on the throat of the American public," Haney says. "There are two simple—not easy—ways to stop climate change, and one of them is to stop mining coal." (In what is a continuing struggle, a federal appeals court in July upheld an Environmental Protection Agency effort to crack down on so-called mountaintop-removal mining.)

Haney's current project, now in post-production, concerns eating habits in the United States—specifically how Americans obtain and think about food. Twenty-five years ago, he points out, it was illegal for California restaurants to buy produce from a farm stand: "If you were a local restaurant, you could not buy apples from the local orchard and put them in your food." The film, he says, "is about the shift in the United States from a time when the only restaurants in certain towns were a misbegotten Chinese place of very low quality and an Italian-American one that covers stuff with red sauce—using only ingredients from the big food processors—to the organic, local, sustainable, farm-to-table movement we have today." ~LAURA LEVIS

Chapter & Verse

Correspondence on not-so-famous lost words

Sally Charin hopes someone can identify a poem beginning: "admit impediments, accept alarms, and random incompatibilities...." She recalls the author's being identified as a Radcliffe graduate of the 1930s.

More queries from the archives:

"The saved man goes to the zoo with his child on a Sunday afternoon."

"He that keepeth the law becometh master of the intent thereof."

"Oh, do not think because I make/Arrogant wounded unkind stabs/At suffering prowling man/ That I'm not partisan to all

the fumbles in his mind. Whence else these lines? For whose sake?"

"I'll pretend I'm teaching" (July-August). No citations have arrived, but Eve Menger and Carlota Dwyer noted the quotation's similarity to a remark often attributed to Soviet workers: "They pretend to pay us, and we pretend to work."

Send inquiries and answers to "Chapter and Verse," *Harvard Magazine*, 7 Ware Street, Cambridge 02138 or via e-mail to chapterandverse@harvardmag.com.

Ensnared

From personal catastrophe to enforced poverty

“ON A CRISP California morning in February 2012...Marcella Wagner was driving down the interstate toward Chico State University, where she had just entered the nursing program...when suddenly another driver swerved in front of her. To avoid a collision, she jerked the wheel hard, and her car veered off the freeway. It rolled over, crushing the roof. The other driver sped off, never to be found. Marcella was seven-and-a-half months pregnant. Miraculously, the baby survived and was not harmed. But Marcella was left a quadriplegic, paralyzed from the chest down and with little use of her hands. She needs a wheelchair and round-the-clock personal care assistance to this day.”

Few works of social science—nowadays, all data sets and algorithms—begin this way. But this is not the lead of a news story or work of fiction. Marcella Wag-

ner is the sister-in-law of Andrea Louise Campbell '88, professor of political science at MIT, who studies American social-welfare, health, and tax policy. That accident not only sent a mother and a new family into physical and emotional crisis, but also thrust a new set of Americans into “the world of means-tested social assistance programs, the ‘safety net’ of public programs for the poor.” Marcella’s husband, Dave Campbell, works for a small company that offers no benefits. Marcella had temporary care for her pregnancy and for her newborn’s first two months. Once enrolled in school, she would have had coverage in a student health plan—on her way to a high-demand career where benefits are routinely available. Absent the driver at fault, whose liability insurance might have been a source of funds, Dave, Marcella, and the prematurely delivered Logan

instead faced fending for themselves, with catastrophic needs.

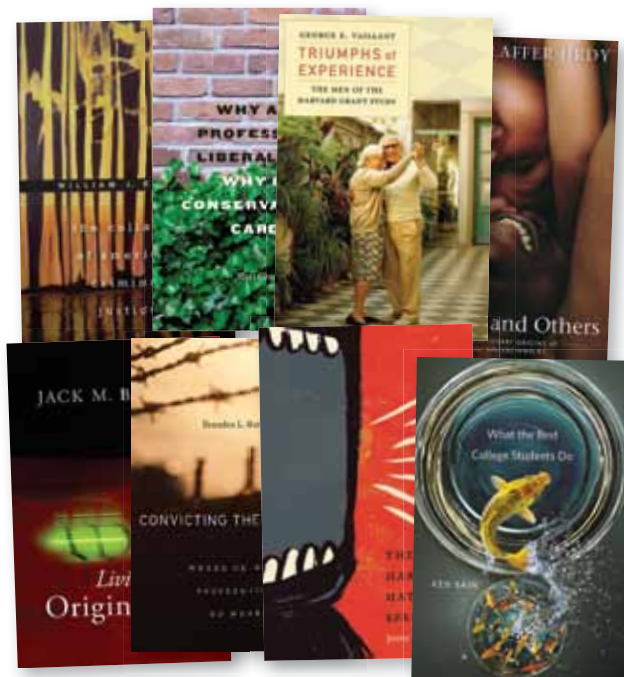
Confronting this close-to-home case gave a new direction to Campbell’s work. *Trapped in America’s Safety Net* is, to be sure, a brisk work of policy analysis: a thorough—even relentless, and deeply dismaying—survey of U.S. social-insurance and -assistance programs (Social Security and Medicare in the first case; food stamps, and what is left of welfare—SNAP and TANF to use the formal acronyms—among many others, in the second) and the circumstances of those who rely on them. But Campbell grounds her work in the Dickensian details of her relatives’ exhausting new existence. Among the af-

fronts:

- “Medicaid will pay for incontinence supplies, although fewer than Marcella actually needs; every month she has to apply and get approval for 30 additional catheters.”

Andrea Louise Campbell '88, *Trapped in America’s Safety Net: One Family’s Struggle* (University of Chicago, \$45, paper \$15)

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● Under California's Medicaid asset limit (which exempts their house and one vehicle, Marcella's wheelchair van), Dave is constrained in arranging transportation to his job, so "he decided to keep a 1968 Dat-sun pickup" because of its low value. "It has no modern safety features. So the only able-bodied adult in the household will have to drive an unsafe car to work. And he can't transport Logan in it because it has no backseat."

● Medi-Cal pays for six prescriptions per month—fewer than Marcella requires.

● Marcella, whose needs seem obvious, must provide Dave's pay stubs to maintain coverage for assistance programs, at intervals varying from three months to annually.

● And, uniquely heartless and absurd, "A local café fell behind on

its taxes. Rather than see it close down, loyal patrons held a fund-raiser, which happened to take place shortly after Marcella's accident. The café owner told the local newspaper she would give Marcella any extra funds raised....Only problem is, the social worker reads the paper too. After the fund-raiser, she called up: *Where's the money?* A lump sum could violate Dave and Marcella's asset test"—all of \$3,150. *Anything* beyond that—retirement savings, funds for the baby's future education—is impermissible.

Campbell characterizes this last humiliation as "the feeling of being hunted." Although she prefers other apt metaphors (the book's title, or falling down the social-assistance "rabbit hole"), this sense of entanglement in a spider's web, struggling against ever-tighter snares, pervades her depiction of those in need. The system of assistance for the needy (which, she notes, at some point includes households to which *two-thirds* of Americans between

the ages of 25 and 65 belong) is designed to make such aid "inferior to the alternative—the worst jobs at the worst wages." Given pressure on low-wage work during recent decades, and current policy (not adjusting minimum wages for inflation, for instance), "most programs for the poor leave recipients in poverty." After all, designing aid programs so recipients cannot, for example, save to educate their children seems a formula to destroy human capital.

Campbell's analysis of how assistance programs intersect with the realities of intermittent and low-wage employment prompts a range of reactions. On the one hand, amid a welter of overlapping and inconsistent programs, one might urge policymakers to pursue thorough reform: to reallocate all current funds, at least, on the basis of recipients' basic needs (so Marcella, for instance, doesn't have to scrounge for catheters or prescriptions). From another perspective, the problems Campbell describes seem an insoluble morass of

government malfunction that calls for junking the whole system and relying on the invisible hand of the market to pay people what their skills merit—and nothing more. But Marcella's admittedly extreme circumstances compel at least some moral deliberation: what ought society do for those who are utterly vulnerable and dependent?

Campbell explains that Americans tolerate an incredibly patchwork "system" for dealing with life's uncertainties. If you have a generous employer—as Campbell does, at MIT—you are reasonably well-protected. (But note: only the very rich are prepared for a lifetime of personal-care assistance, should the need arise; everyone else will end up impoverished, reliant on Medicaid. Recent Harvard fellow Michael J. Bush, impelled by his

teenaged brother's brain injury on an oil rig more than three decades ago, seeks a private-insurance mechanism to provide such help; see "Advancing Leadership," March-April, page 38.) Those employed, but without private benefits, at least have access to a tier of reasonable public supports—like Dave. For those unable to work, or who have not accumulated sufficient service at a single employer, the means-tested social-assistance remedies are nightmarish—witness Marcella's experience.

In other contexts—the level of taxation suitable for high-income workers, for instance—American policy has generally settled on lowering marginal rates, lest effort be discouraged. Perversely, social assistance hews to the opposite principle. "As [individuals] leave social assistance for paid work and their income rises, even modestly, they lose their eligibility for program after program," Campbell finds. Earn a dollar more than the Medicaid threshold



and you meet an “eligibility cliff,” losing coverage entirely. As Campbell drily puts it, “This is the essence of the ‘means test’ imposed” by social assistance: “as your means rise, you fail the test,” falling victim to “huge marginal taxes on those exiting social assistance for work,” a “powerful disincentive” toward behavior that anyone considers socially productive. (*The Economist*, no less, in mid July critiqued America’s “outdated social safety net, which manages both to be stingy and to discourage work.”)

Or take another example: “There’s one thing Dave could do to get out from under Marcella’s Medi-Cal restrictions: divorce her.” That would impoverish his wife, but it would free Dave and Logan to benefit from a higher income, if he could earn one; to accept help from family members; and to save for retirement and college expenses.

Campbell’s systematic review of the low level of American social assistance (compared to other industrial nations); its incompleteness; and its “fifty different worlds” of coverage (criteria vary by state, effectively undercutting the meaning of national citizenship, which is *not* the case for Social Security and Medicare) points toward wholesale rethinking and reform.



Newlyweds Marcella Wagner and Dave Campbell: from joy to catastrophe

Nothing in today’s politics suggests either the willingness or capacity to do so. That means Americans at large confront a reckoning, just as Marcella did. The population is aging; social insurance for the aged is becoming more costly; lower-income workers are ill-served by eroding employment-based benefits, and by assistance programs that do not focus on them; and

those unable to work are even worse off.

“What’s crazy about this system,” as Campbell puts it, “is that Americans work hard and yet get so little help to facilitate working.” Compared to other nations, “Where the United States clearly fails is in not providing a basic level of protection to everyone.” Even though it is hard to be hopeful about coherent action in the current environment, two of her conclusions perhaps point toward room for bridge-building across the ideological chasm.

First, policymakers “like to believe that means-tested programs are designed to give a hand up, but some are actually designed in a way that keeps people down.”

But second (lest that be taken as an excuse to junk social assistance), “What’s contradictory is not a market economy combined with a social welfare state but rather a system that requires work but lacks the policies that make work possible.”

It should not take the extremes of suffering endured by Marcella and her family to clarify these issues. It is an act of both social-science rigor and human grace that Campbell has drawn on the details of their lives to illuminate some larger failing at the center of contemporary America.

—JOHN S. ROSENBERG

ALUMNI

“Global Charge”

Nina Lahoud rallies support for gender justice.

SIX United Nations peacekeeping missions have taken lawyer Nina J. Lahoud ’78 to some of the worst war-torn regions in recent history. There she found both devastation and inspiration.

Lahoud was in Namibia in 1989 and 1990, where she says she saw extreme “poverty and servitude” under the apartheid regime of the South African administration, and helped monitor the elections that ultimately led to independence. A few years later, in Cambodia, she was a polling-station supervisor during the 1993 election of the Constituent Assembly.

Between 1999 and 2001, she took part in UN transitional administration activities in Kosovo and what is now Timor-Leste (as East Timor was renamed in 2002), and among other duties worked on building judicial infrastructure. “Despite the horrific destruction and pillage, ethnic-related violence, grave human-rights abuses, and war-crimes violations (including massive rapes) that had been inflicted on these populations,” reports Lahoud, an Advanced Leadership Initiative senior fellow at Harvard, “most [people] were eager to support UN efforts to promote peace and reconciliation even though our progress was often slow

in tackling the tremendous obstacles faced: the governing institutions were no longer functioning, the economy was in total disarray, and militias were still roaming about.”

In every country, however, perhaps most disturbing has been the plight of women. “It was apparent that women account for the vast majority of those adversely affected by conflict,” she asserts, and “there is a pressing need for serious action to be taken to arrest the spiral of pervasive violence and human-rights abuses against them if there is to be any real security.” Now on unpaid leave from the UN (she was most recently principal officer in the Asia and Middle East division of its Department of Peacekeeping Operations), Lahoud is working on an independent, private project she started in 2013 called the Gender Justice Leadership Pathway Initiative. Still in development, the project aims to “enhance opportunities for women from conflict-affected countries to obtain legal education and cross-regional mentoring and peer networking support,” she ex-



Nina Lahoud

plains, “to enable them to assume critical leadership functions in their countries and be better positioned to promote gender-justice reforms during post-conflict peace-building processes.”

In effect, she hopes to help realize an aspect of the UN Security Council’s sweeping landmark Resolution 1325, passed in 2000, that, among other things, formally recognizes the particular impact of armed conflict on women and girls. Timor-Leste and Liberia are ideal starting points. They are part of the “fragile and conflict-affected countries” that comprise the g7+ (a voluntary association of 20 countries that are or have been affected by conflict and are now in transition to the next stage of development). Their presidents, Taur Matan Ruak and Ellen Johnson Sirleaf, M.P.A. ’71, LL.D. ’11, have both met with Lahoud and are honorary members of her project’s advisory board.

Within the last year and a half, Lahoud has gained other international support, including from the Stockholm-based International Legal Assistance Consortium (ILAC). In July, she traveled to Timor-Leste, where 11 Timorese women lawyers and judges completed the online application form to become “Gender Justice Mentees” in the pilot phase of the project’s Network of Gender Justice Mentors and Peers.

Liberian officials have also expressed interest in participating in the pilot phase.

The work is incremental. “I’m very positive regarding the passion and merit and support for this,” says Lahoud. “My next challenge is the money.” So far, she has paid her own travel and other expenses, but will continue seeking outside funding.

It’s not the first time Lahoud has dreamed this big. As a Lebanese-Syrian American, she grew up in one of the few “ethnic families” in Littleton, New Hampshire. Her Lebanese grandfather opened a dry-goods and grocery store there in 1920 that has since become Lahoud’s Country Clothing & Ski Shop. (She switched her name to its original spelling while at Harvard.) She credits her father—who insisted his children watch the evening news—and a few innovative teachers—who introduced a history project on Africa and spurred debates on *Newsweek* articles, for example—for giving “us a small, daily escape from that small town to the broader international world.” Lahoud studied special education as a freshman at Smith, but took a formative solo trip to Lebanon that summer of 1975, just after the start of its 15-year civil war. In her junior year, she transferred to Harvard to focus on Middle Eastern studies. In 1981, she earned a law degree and a certificate in Islamic law

from a joint program of the University of Pennsylvania’s Law School and Middle East Center, and two years later joined the UN. “I was,” she notes, “the first woman appointed as a legal adviser to the head of a UN peacekeeping operation.”

Throughout her subsequent work on rule of law, development, and peace-building, Lahoud was always drawn to “the need for the empowerment of women”—partly because she has seen what women can achieve. Her own mentors include Noeleen Heyzer, currently the UN Secretary General’s special adviser for Timor-Leste, for whom Lahoud worked as special adviser on peace and security and rule-of-law programs when Heyzer was executive director of the UN Development

Fund for Women. Heyzer advocated for Resolution 1325, and is now an advisory board member for Lahoud’s project.

Earlier, when Lahoud was a chief of staff for the UN Interim Administration Mission in Kosovo in 2000, she worked with Kosovo lawyer Nekibe Kelmendi, who had recently been appointed co-head of the administrative department of justice there. Kelmendi was helping to establish Kosovo’s judicial and penal systems. She was wearing black: in March 1999, her husband, Bajram Kelmendi, Kosovo’s leading human-rights lawyer, and their two sons had been abducted; their bodies were found a few days later. To this day, Lahoud says, Kelmendi—who later became the Republic of Kosovo’s minister of justice—“remains, for me, the ultimate heroine of peace and a source of inspiration to continue in this line of work.” Referring to the “daunting challenges” faced by the two UN peacekeeping missions in Kosovo and in Timor-Leste, she emphasizes, “while most families had faced personal tragedies, and the fate of many of their loved ones remained unresolved, they somehow managed to rise above their own trauma and have the will to work toward the broader goal of bringing greater stability and freedom to their society.”

—NELL PORTER BROWN

PUSHING DISCOVERY TO THE MOLECULAR LEVEL



A group of Harvard scientists—including team leader Amir Yacoby, professor of physics and of applied physics, and research assistant Yuliya Dovzhenko—is taking MRI technology and shrinking it down, in the hopes of one day producing 3D images of individual molecules, which could have a wide-ranging impact on health care and other industries.

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Cynthia A. Torres



Embodying Access

An alumni leader's long-term engagement to Harvard

AFTER SPENDING more than two decades in the financial-services industry, Cynthia A. Torres '80, M.B.A. '84, founded College Decisions, LLC. The Santa Monica-based company emphasizes improving access to college through educating a clientele of mostly middle-class families about admissions and financial aid. Torres saw a need for these services six years ago, partly because California's education-budget crisis had led to cutbacks in public-school guidance counselors. But her mission is also personal. "I came from a lower-class background and grew up in urban Los Angeles," says the new president of the Harvard Alumni Association (HAA). "My Harvard experience was very exciting and stimulating. It made me much more aspirational than I might have been, and set me on a life course trajectory I could not have imagined. So I feel very strongly about access."

Torres, who takes office during the University's \$6.5-billion capital campaign, is a longtime alumni leader. An admissions interviewer for more than 30 years, she has also led numerous HAA committees and task forces and is a past president of the Harvard Club of Southern California and

a former secretary of the Harvard Club of Hong Kong. Most recently, she led the HAA's review of Shared Interest Groups (SIGs), and also established ways for alumni to teach and mentor students during Harvard's Wintersession.

In May, during the traditional HAA presidential Class Day speech to graduating seniors—a group including her older son, Spencer Gisser '14 (see Commencement Confetti, July-August, page 17)—Torres noted that she has "volunteered for Harvard every year in every city I have lived in—and I have moved a lot. Whenever I moved someplace new, I would contact the local Harvard club and ask how I could help." (A global couple, Torres and her husband, Michael V. Gisser '77, a senior mergers and acquisitions partner at Skadden, Arps, Slate, Meagher & Flom, now split their time among Los Angeles, Hong Kong, and New York City.) As a freshman, however, Torres was much less sure she'd find any niche at Harvard, and not only because she had never lived with snow. "My father grew up in poverty as a Mexican-American migrant farm worker, and my mother was a homemaker raising four children on a tight budget," Torres told the crowd gathered in Tercentenary Theatre. Her years at Harvard were "transformational," the government concentrator added, and her continuing involvement with the University

has continued to teach her about the world.

As first vice president of the HAA last year, Torres traveled to Bulgaria, Chile, and Australia to meet with alumni; she expects to spread the word about Harvard as "an open and welcoming place" this year across the country and abroad. "I've been able to see the power of the Harvard network," she said during a recent interview, "and it's truly extraordinary to see people turn out because the University means so much to them." As president this year, she plans to sustain the HAA's mission to help alumni "engage and connect" with the University, and is working with the HAA to develop

alumni leaders among Harvard clubs, SIGs, reunion classes, and younger graduates, especially those using social media. Her years in finance, including investment banking at Goldman, Sachs & Co., institutional business development at Fidelity Investments, and marketing and client services at Diamond Portfolio Advisors, provide valuable skills toward these ends.

And she has never lost sight of a larger goal in her work: to make "the American way of life truly open to our students." In addition to her counseling business, Torres and the HAA have collaborated with the University's Office of Career Services, the Office for the Arts, and the dean of public service to better connect alumni with students for career guidance. Torres also organized alumni participation in the Wintersession, which offers elective programs on a range of topics, including the arts, politics, and entrepreneurship, and now routinely draws about 250 alumni to campus each January to connect with about 750 students. One highlight is the annual public-interest careers conference; other events spotlight postgraduate life in the arts. "This is an opportunity for alumni to come back and share their wisdom, careers, and experience," says Torres. "It turns out that this is an area a lot of alumni care a lot about—and they have really stepped forward to help." ~N.P.B.

Expanding the Mind

The Harvard Institute for Learning in Retirement plans to grow.

WHEN retired physician Ross Neisuler '62, M.D. '66, and his wife, Susan Gottsegen Neisuler, joined the Harvard Institute for Learning in Retirement (HILR) a decade ago, it soon became "the centerpiece of our lives," he says. "It is not only a place to study and teach, but a community of enduring friendships, group trips abroad, music and art events, distinguished speakers, activity clubs for hiking, theatricals, committees, and volunteer work. It is a way of life."

A branch of Harvard's Division of Continuing Education, HILR was established in 1977 and offers peer-to-peer teaching and learning, along with year-round events. Long housed in shared, and sometimes cramped, classrooms at 51 Brattle Street, the organization will more than double its space this September, says HILR director Leoni Gordon, by moving into the "grand and spacious former Bunting Institute," at 34 Concord Avenue, just outside Harvard Square.

The 10,000-square-foot building was renovated by architect Graham Gund, M.Arch. '68, M.A.U. '69, in 1989, but when HILR signed a five-year lease, the structure had been vacant since 2009. Construction during the summer was slated to make the building handicapped accessible and create a variety of new spaces for HILR's 550 members. Along with classrooms, a large lecture hall-cum-performance venue, a library, and a technology center, the building has a writing room, art studios with skylights, a full kitchen, and a common room that fits up to 90 people for daily brown-bag lunches. "There is a high level of sociability here," Gordon explains. "We have a very devoted membership, and we are a major service to people who live in Greater Boston and like to learn. It would appeal to alumni, a lot of whom don't know about it."

HILR follows the peer-teaching model established in 1962 by the New School for Social Research's Institute for Retired Professionals, in Manhattan. The notion is that active people who are no longer devoted to full-time careers, but who have a wealth of knowledge and experience, may enjoy continued learning

In addition to peer-led classes, the Harvard Institute for Learning in Retirement offers lectures, concerts, and other events.

and teaching among like-minded colleagues. Such opportunities have grown exponentially in the last few decades, and similar programs are affiliated with Tufts, Lasell College, and Brandeis—but "We have the most academic program of this kind in the country," says Gordon, who has led HILR for 18 years (and has worked at Harvard for 40). "That's our reputation and it's important to uphold that core. People come here to learn about everything from philosophy to Shakespeare to quantum physics."

Each semester HILR offers up to 70 courses that meet once a week for two hours. Weekly reading is required, but the absence of tests, papers, and grades, Ross Neisuler points out, allows people to focus on "the fun of learning. People purposely study in fields which are new and initially strange to them." Recent courses have covered the poetry of Seamus Heaney, Mexican muralists, George Eliot and *Middlemarch*, the language of DNA, the life and times of Bayard Rustin, African women writers, and China's twenty-first century transformation. (Visit <http://hilr.dce.harvard.edu> for additional offerings, or attend this year's annual HILR Cobb Memorial Lecture, which is free and open to the public: "The Second Machine Age: How Exponential Progress with All Things Digital Is



STEPHANIE MITCHELL/HPAC

Changing Our Economies and Societies," featuring Erik Brynjolfsson and Andrew McAfee, co-founders of MIT's Initiative on the Digital Economy, on October 1 in Sanders Theatre.)

About 40 percent of HILR members have a Harvard affiliation (alumni, faculty, or staff), Gordon says, but anyone can apply. Moreover, with the expanded quarters come broader membership criteria: members may now be semi-retired (instead of fully retired), and Gordon will add a second-tier "associate membership" for those who want to try out classes and/or only want to attend HILR events. (Full membership is \$800 and associate membership is \$150 annually.) With controlled growth, Gordon adds, the expanded space can accommodate 50 to 80 new members each year. The prospect pleases Ross Neisuler. "HILR certainly made me feel a lot better about aging," he attests, "just by showing me how accomplished, stimulating, creative, and energetic people can be, many into their eighties and some in their nineties."

~N.P.B.

Hiram Hunn Awards

SEVEN ALUMNI are to receive the Hiram S. Hunn Memorial Schools and Scholarships Awards, presented by the Harvard College Office of Admissions and Financial Aid, on September 19. The awards' class of 1921 namesake recruited and interviewed prospective students for more than 55 years.

James V. Baker, '68, M.B.A. '71, of Surrey, United



James V. Baker

Kingdom, has interviewed candidates since 1972, primarily in the United Kingdom. He is also a former HAA president, president of the Harvard Club of the United Kingdom, HAA regional director for Europe, and 2013 recipient of the Harvard Medal.

William B. Fisch '57, of Columbia, Missouri, is professor emeritus of law at the University of Missouri and has been an alumni interviewer since 1985. Fisch has



William B. Fisch

ALUMNI

also chaired the mid-Missouri subcommittee of the St. Louis Harvard Club's schools committee since 2006.

Vivian Lee '81, of Los Altos, California, served as chair of the New York City schools and scholarships committee from 1989 to 2000, and as co-president of the Harvard Club of Silicon Valley from 2008 to 2009.

Randall A. Mackey, M.B.A. '70, of Salt Lake City, is a former president of the Harvard Alumni Association of Utah, and has been a director there since 1987. Since 1995, he has served as chair of the Utah schools and scholarship committee.

Julie Gage Palmer '84, of Deerfield, Illinois, has been an alumni interviewer since 1985. In 2006 she joined the Harvard Club of Chicago's board of directors, where she coordinates a program that pairs alumni with local schools that now include more



Vivian Lee



Randall A. Mackey

and scholarships committee for many years, and oversaw an expanding pool of applicants from the region.

Betsy K. Wanger '85, of Washington, D.C., has interviewed candidates in Washington, D.C., since the late 1980s, served as area co-chair for the local club's schools and scholarships committee, and coordinates the Harvard Prize Book awards for high schools in the greater D.C. area.



Julie Gage Palmer

than 130 members. Palmer is also co-chair of the Chicago area schools and scholarships committee.

E. Douglas Richards '80, of Lexington, Kentucky, was both interviewer for and chair of the local Harvard club's schools



E. Douglas Richards



Betsy K. Wanger

HAA Awards

ESTABLISHED in 1990, the Harvard Alumni Association (HAA) Awards recognize outstanding service to the University. This year's awards are scheduled to be presented on September 18 during the HAA board of directors' fall meeting.

Robert R. Bowie Jr. '73 of Monkton, Maryland, has dedicated countless hours to Harvard across nearly four decades, starting with his work as an alumni interviewer for his local Harvard club. A former HAA president, Bowie has also led the national schools and scholarships committee, and co-founded the HAA's Early College Awareness program for middle-school students. In 2009, he received the Hiram S. Hunn Memorial Schools and Scholarships Award for his more than 30 years of service as an interviewer.



Robert R. Bowie Jr.



Marilyn J. Holifield, J.D. '72, of Miami, helped initi-

Marilyn J. Holifield

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ate the Global Month of Service program as a leader of the HAA's Public Service Task Force, and is also a former HAA elected director and secretary and member-at-large of the executive committee. At Harvard Law School, she has helped with class fundraising and was an honorary committee member for the 2013 event "Celebration 60, Women Transforming Our Communities and the World." Holifield is currently a board member of the Harvard Club of Miami.



Winifred White Neisser

HAA Global Series alumni event in Toronto.

Winifred White Neisser '74, of Los Angeles, was a Harvard Overseer from 1994 to 2000 and currently serves on the HAA's Committee to Nominate Overseers and Elected Directors.

Long active in Radcliffe affairs, she was on the ad hoc committee for the founding of the Radcliffe Institute and on its tenth anniversary regional committee. A former HAA elected director and vice president of the Harvard-Radcliffe Club of Southern California, where she helped lead the schools and scholarship committee, Neisser has also served on her class reunion-planning committee and has interviewed candidates for admission to the College.

Eleanor Gossard Shore '51, M.D. '55, M.P.H. '70, of Needham, Massachusetts, began her University career as a primary-care physician in the health-services department in 1961, then held administrative

roles, such as assistant to then president Derek Bok for health affairs, and assistant to the Committee on Natural and Applied Sciences of the Board of Overseers. When she retired in 2005, Shore was dean for faculty affairs at Harvard Medical School (HMS) and deputy director of the HMS Center in Excellence in Women's Health. She is now a senior consultant to the Office for Academic and Clinical Affairs. She and her husband, Bullard professor of psychiatry emeritus Miles Shore '50, M.D. '54, initiated the HMS 50th Anniversary Fellowship Program for Scholars in Medicine in 1995, renamed for the couple in 2004.

Maria A. Skirnick, J.D. '69, of Plandome, New York, is on the Dean's Advisory Committee at Harvard Law School (HLS) and has been active with the Harvard Law School Association. She was the sponsorship chair of the HLS Public Interest Law Celebration and has established the Skirnick Fellowship for Public Interest Law. At the HAA, she has been an executive committee treasurer and regional director, has led both the Alumni Leadership Conference and the clubs committee, and recently helped rewrite the HAA constitution. A former president of the Harvard Club of Long Island and a director of the Harvard Club of Chicago, she is currently on the Committee to Nominate Overseers and Elected Directors and the Committee on University Resources.



Maria A. Skirnick



William R. Horton Jr.

William R. Horton Jr. '77, of Oakville, Ontario, is a long-time alumni interviewer and is a former chair of the Harvard schools and scholarships committee in Alberta. In addition, Horton was a founding executive board member of the Harvard Club of Edmonton, and has been a vice president of the Harvard Business School Club of Calgary and president of the Harvard Club of Toronto. A former HAA regional director for Canada, he has recently reinvigorated the orientation program for new board members. Horton has twice chaired the annual Alumni Leadership Conference and, in 2007, he led the



Eleanor Gossard Shore

Aloian Award Winners

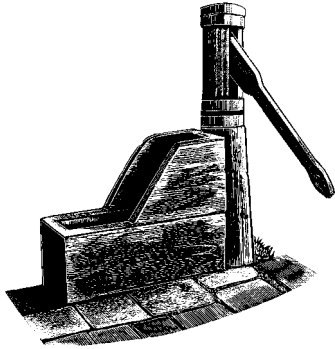
Seniors Rob Gunzenhauser '15, of Adams House, and Mathilde Montpetit '15, of Winthrop House, received the Harvard Alumni Association's (HAA) annual David '49 and Mimi Aloian Memorial Scholarships at the fall meeting of the HAA's board of directors. The awards, named for the master and co-master of Quincy House in the 1980s (David Aloian was also HAA executive director), recognize exemplary leadership in enhancing quality of life in the Houses.

Rob Gunzenhauser, of Palos Verdes Estates, California, is co-chair of the Adams House Committee. He spearheaded the renovation of the House's cardio and weight rooms, working with fellow students and House administrators to complete the project, and organized an inter-House August event, College-wide Field Day.

Mathilde Montpetit, of Boston, co-chairs the Winthrop House Committee and organized the Lion Buddies program (Winthrop's shield boasts a lion rampant), which connects incoming freshmen to upperclassmen in the House. In addition, Montpetit coordinated a Housing Day Stein Club with a live band, which drew an unusually large crowd of almost 300 students, **Mathilde Montpetit and Rob Gunzenhauser**



xHviri



"Your wooden arm you hold outstretched
to shake with passers-by."

THE ICONOGRAPHIC device serving as the headline for this column means "Ten Thousand Men of Harvard." In the words of the beloved fight song, they want victory today.

The logo was born in the spring of 2010. Daniel Mee '81, of Brighton, Massachusetts, is vice president of the Friends of Harvard Football. He and a few friends were thinking of giveaways for the annual FHF golf tournament, and Michael Durgin '81, of Salem, Massachusetts, suggested a bumper

Members of the undefeated 2001 Crimson football team show flags at a 2011 tailgate in New Haven. Jared Lewis '02, far left, holds the ancient Little Red Flag, which has been to many Harvard-Yale football games. He designed the new flag, and Kelly Goff made it. It is brandished, from left, by Justin Stark '02, Jason Hove '02, and Samuel Taylor '02.



COURTESY OF JARED LEWIS

sticker declaring "10 K Men." They decided to do it in Latin. "I came up with a draft, and we were ready to go to press," says Mee. "But I woke up that night in a cold sweat: what if it's wrong.... Yale would never let us forget it! The next day I went to my pastor, Msgr. William Fay of St. Columbkille Church in Brighton. He sent the text to one of his Pontifical Gregorian University classmates in Rome, who was then the lead translator of all papal bulls into Latin. The next day I got word that we did have an error: the *x* was underscored, when it needed to be overscored to indicate 'multiply by 1,000.' With confidence, we went to press. Subsequently, the logo has found its way onto jackets, lapel pins, and a flag."

"In Latin '10,000 men' would normally be *decem milia virorum* (literally, 'ten thousands of men,' with 'of men' in the genitive case), so the nominative form *vir* could be problematic," advises Richard J. Tarrant, Pope professor of the Latin language and literature. "The way around the difficulty would be to arrange the words in the opposite order, i.e., *vir* *Harvardiani* *decem milia* ('men of Harvard to the number 10,000'), in which case the nominative is correct. I suppose the logo could be construed that way, and in any event its creator deserves high marks for ingenuity!"



POLISHED HARVARDIAN. Few of the 10,000 men have shoes as shiny as the left shoe of the statue of John Harvard in the



BROOKS CANADAY/HPAC

Yard. Tour guides instruct tourists to rub that shoe for luck, and rub they do. Artist and writer Sylvia Maynard '44 of Cambridge attended her seventieth reunion last June and subsequently reflected on John's toe-coverings.

Asymmetrical John

In solemn bronze he sits on high
With book on knee. His pensive eye
Seems gazing far beyond the Yard
Named after him, with no regard
For touring worshippers below.

Each, in turn, grabs that nearest toe,
While posing for the camera so.
Smile, click, it's done. The next in line
Will rub that left shoe to a shine.
Until tour busses be abolished,
It's perpetually polished,
Signaling shutterbugs "Come hither!"—
Yea, till the stock of the Puritans wither.

Still, I ponder—and put it to you:
Won't somebody shine his other shoe?

~ PRIMUS V

Catastrophe Mapped

A new way of seeing World War I

THE CENTERPIECE of an exhibition now at the Harvard Map Collection is a pieced-together map eight feet high by nine feet wide that shows at a glance the dimensions of the Western Front in World War I. German trenches are depicted in blue, Allied trenches in red, stretching for hundreds of miles. Winston Churchill later wrote of the scene at home: “We sit in calm, airy, silent rooms opening upon sunlit and embowered lawns, not a sound except of summer and of

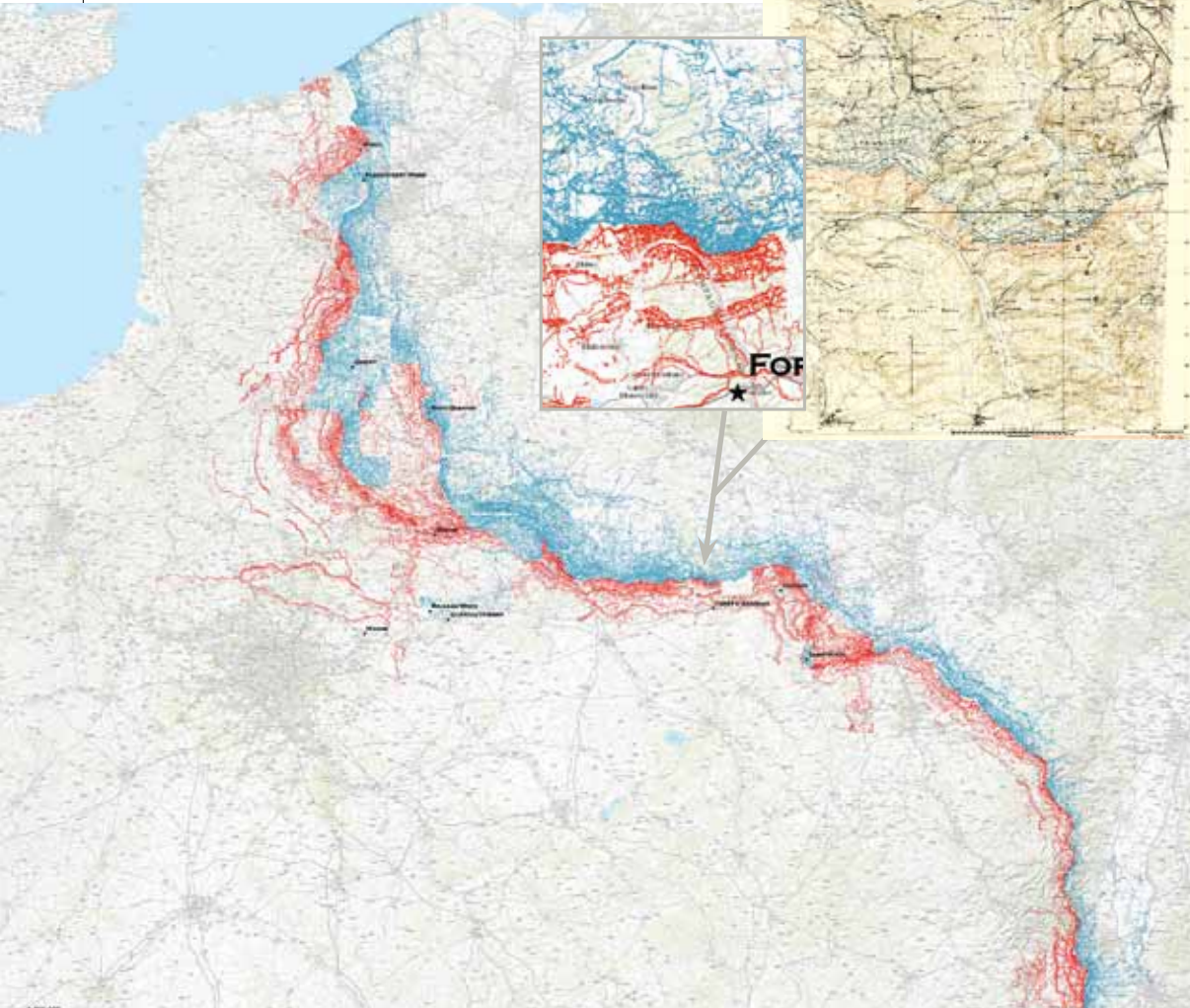
husbandry disturbs the peace; but seven million men, any ten thousand of whom could have annihilated the ancient armies, are in ceaseless battle from the Alps to the Ocean.”

Bonnie Burns, librarian for geographic information services, is the curator of *From the Alps to the Ocean: Maps of the Western Front*, at the collection in Pusey

Library. During the war, she explains, “the massive changes that occurred in the field of military technology were mirrored in the field of mapmaking. New technologies, such as aerial photography, led to new cartographic techniques and

to an increased reliance on maps. On the battlefield, cartographers were churning out maps of the trenches almost daily. At home, maps were being used to rally the home front in Europe and to try to convince the United States to join the Entente powers. Immediately after the war, maps were used to help decide how to redefine Europe.”

The collection has 350 individual maps of the front done by the French army mapmaking agency. At left are a map of the Argonne Forest showing the trenches, done on July 23, 1918, and a detail of those trenches from the large map. The scale of the large map is 1:300,000 (roughly 4.7 miles to the inch), but the original maps are at a scale of 1:20,000 and were updated as battlefield conditions altered, so that a student of the Western Front can track the waxing and waning of the slaughter. It ended, as this innovative exhibition will, on Armistice Day, November 11. ~ C.R.



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