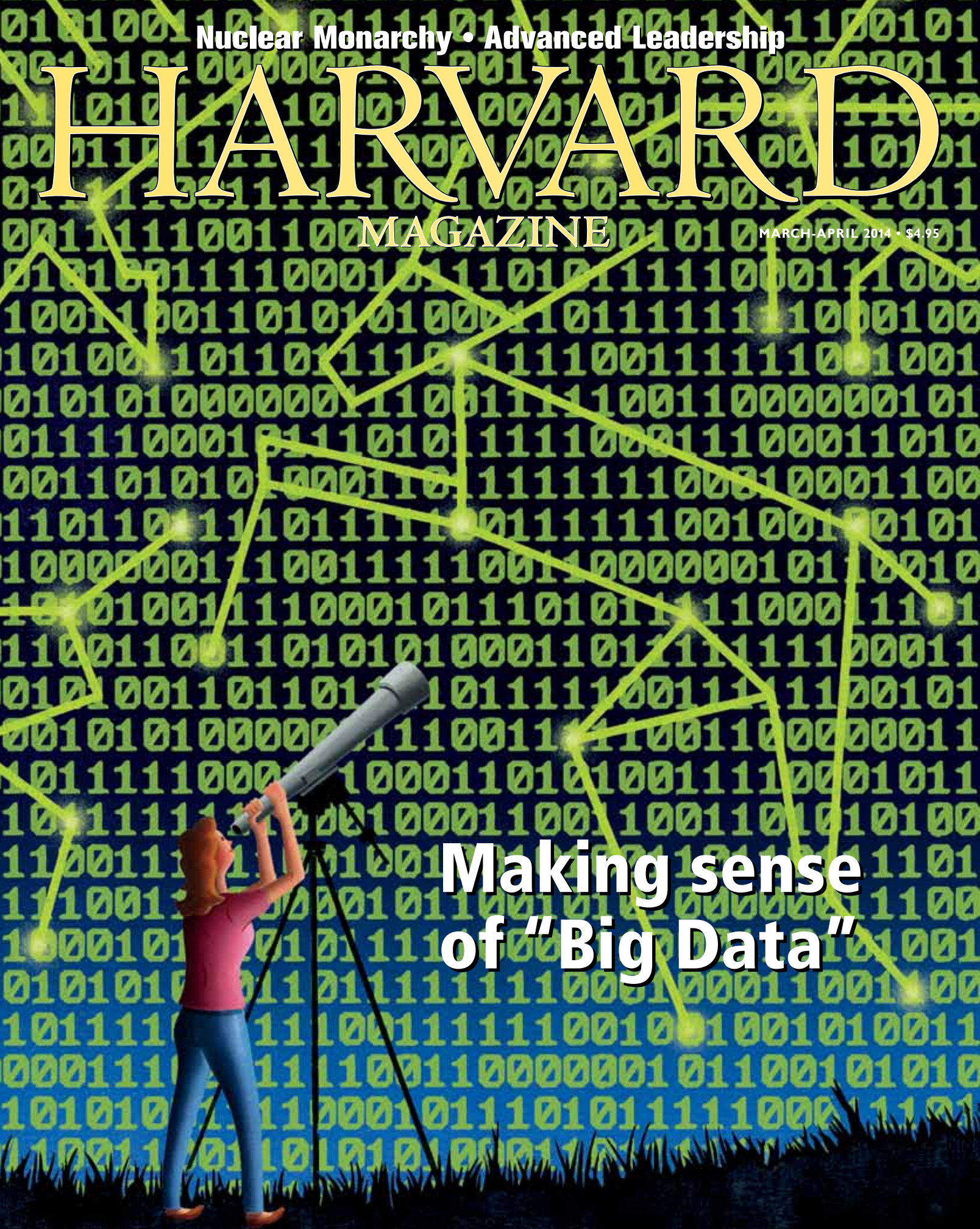
Nuclear Monarchy • Advanced Leadership

HARVARD MAGAZINE

MARCH-APRIL 2014 • $4.95



Making sense of "Big Data"

MAKE EVERY DAY A PLAYDATE IN

"America's Happiest Seaside Town."

{Coastal Living Magazine}

Kiawah Island® REAL ESTATE

*Island Resort Living 21 miles from historic Charleston, SC, Top City in the World** | *HOME OF THE 2012 PGA CHAMPIONSHIP*

EXCLUSIVE HOME LISTINGS: 866.307.1191 • KiawahIsland.com/HarvardFeb | *PLAN A VISIT:* 866.687.5696 • KiawahResort.com

Obtain the Property Report required by Federal law and read it before signing anything. No Federal agency has judged the merits or value, if any, of this property. Void where prohibited by law. An offering statement has been filed with the Department of State of the State of New York. A copy of the offering statement is available, upon request, from the subdivider. The filing of the verified statement and offering statement with the Department of State of the State of New York does not constitute approval of the sale or lease or offer for sale or lease by the Department of State or any officer thereof, or that the Department of State has in any way passed upon the merits of such offering. This project is registered with the New Jersey Real Estate Commission. Registration does not constitute an endorsement of the merits or value of the project. Obtain and read the NJ Public Offering Statement and read it before signing anything. (NJ Reg #89/15-175). *Conde Nast Traveler, 2013 **A KIAWAH PARTNERS AFFILIATE**

MARCH-APRIL 2014 VOLUME 116, NUMBER 4

HARVARD MAGAZINE

p. 38

FEATURES

JOHN HARVARD'S JOURNAL

DEPARTMENTS

p. 10

p. 52

On the cover: *Illustration by Pete Ryan*

FROM TOP: STU ROSNER; JIM HARRISON; JESSICA AMBATS

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Cambridge 02138

Loving L.A., Robert Frost, Keystone continued

EVICTION IMPACTS

Kudos to Elizabeth Gudrais for her article on Matthew Desmond and the victims of eviction ("Disrupted Lives," January-February, page 38). However, Desmond should have spent some "immersion" time with the other victims of eviction—the landlords.

I have been a landlord for many years, and can tell you from experience that just from financial considerations, eviction is the last resort when all other options have been exhausted. Based on my experience, evicting a tenant costs the landlord at least the equivalent of six months' rent (legal, carrying costs, repairs, etc.).

So when a tenant fails to pay the rent on time, the landlord usually tries to contact the tenant to resolve the situation by payment plan, moving-on help, etc. The breakdown comes after no response from the tenant or multiple breaking of promises or commitments.

And the author should note that anyone in the eviction process has at least received a letter from the landlord, and been legally served, and notified of a court date, and the judgment. So a tenant saying that they didn't know about the eviction is either ly-

7 WARE STREET

Counting Costs

No public figure exists for Harvard's investment in Allston since the 1980s: property purchases, planning consultants for the research campus envisioned a decade ago, design fees and construction for the halted science complex (about to be rebooted for engineering and applied sciences), permitting and community benefits for recent projects and their price tags, and financing for all of the above—totaling at least many hundreds of millions of dollars. Few if any other universities could have absorbed the cost.

One source of development funds was an annual half-percent "decapitalization" from the endowment put in place by President Neil L. Rudenstine in 2001, for five years, to pay for Allston infrastructure. President Lawrence H. Summers broadened its scope and extended its duration, to reconfigure the campuses old and new. From fiscal 2002 through 2013, that levy has yielded $1.523 billion. (The figure, now 10 percent of the annual endowment operating distribution, is no longer published, and the proceeds are considered a central administrative assessment, not an Allston line item per se.) Those revenues could have paid some of the up-front costs, and supported substantial construction debt.

But as reported in the last issue (page 31), the University has in the meantime incurred another Allston expense: from fiscal 2008 through last year, Harvard paid $1.255 billion to unwind interest-rate swap agreements it put in place in late 2004 to finance planned borrowing for fast-tracked construction. Money is fungible: dollar for dollar, the disbursements from the half-percent decapitalization may not have paid directly for undoing the swaps. But that money had to come from Harvard's resources, and the facts remain: about $1.5 billion of endowment funds were disbursed; Harvard had to pay $1.255 billion to undo the swaps; effectively, very little of the sum released from the endowment has been available to defray costs to date for actual development in Allston (the original rationale for the assessment)—at a time when the endowment has declined in value, limiting academic budgets.

Recent changes in how administrators and the Corporation manage capital projects and finances should help avoid repeating such costly missteps, as planning for Allston's future resumes (see page 18). So will Harvard's new preference for donor and partner funding, instead of debt. More transparency would be desirable, too.

—John S. Rosenberg, *Editor*

HARVARD
MAGAZINE

EDITOR: John S. Rosenberg
SENIOR EDITOR: Jean Martin
MANAGING EDITOR: Jonathan S. Shaw
DEPUTY EDITOR: Craig Lambert
ASSOCIATE EDITOR: Katherine Xue
ASSISTANT EDITOR-ONLINE: Laura Levis
ASSISTANT EDITOR: Nell Porter Brown
ART DIRECTOR: Jennifer Carling

BERTA GREENWALD LEDECKY UNDERGRADUATE FELLOWS
Noah Pisner, Jessica C. Salley

EDITORIAL INTERN
Nu Xiong

CONTRIBUTING EDITORS
John T. Bethell, John de Cuevas, Adam Goodheart, Elizabeth Gudrais, Jim Harrison, Courtney Humphries, Christopher S. Johnson, Adam Kirsch, Colleen Lannon, Christopher Reed, Stu Rosner, Deborah Smullyan, Mark Steele

HARVARD MAGAZINE INC.
PRESIDENT: Henry Rosovsky, JF '57, Ph.D. '59, LL.D. '98. DIRECTORS: Suzanne Blier, Peter K. Bol, Jonathan L.S. Byrnes, D.B.A. '80, Thomas F. Kelly, Ph.D. '73, Randolph C. Lindel '66, Lars Peter Knoth Madsen, John P. Reardon Jr. '60

BOARD OF INCORPORATORS

This magazine, at first called the *Harvard Bulletin*, was founded in 1898. Its Board of Incorporators was chartered in 1924 and remains active in the magazine's governance. The membership is as follows: Stephen J. Bailey, AMP '94; Jeffrey S. Behrens '89, William I. Bennett '62, M.D. '69; John T. Bethell '54; Peter K. Bol; Fox Butterfield '61, A.M. '64; Sewell Chan '98; Jonathan S. Cohn '91; Philip M. Cronin '53, J.D. '56; John de Cuevas '52; James F. Dwinell III '62; Anne Fadiman '74; Benjamin M. Friedman '66, Ph.D. '71; Robert H. Giles, NF '66; Richard H. Gilman, M.B.A. '83; Owen Gingerich, Ph.D. '62; Adam K. Goodheart '92; Philip C. Haughey '57; Brian R. Hecht '92; Sarah Blaffer Hrdy '68, Ph.D. '75; Ellen Hume '68; Alex S. Jones, NF '82; Bill Kovach, NF '89; Florence Ladd, BI '72; Jennifer 8 Lee '99; Scott Malkin '80, J.D.-M.B.A. '83; Margaret H. Marshall, Ed.M. '69, Ed '77, L '78; Lisa L. Martin, Ph.D. '90; David McClintick '62; Winthrop L. McCormack '67; M. Lee Pelton, Ph.D. '84; John P. Reardon Jr. '60; Christopher Reed; Harriet Ritvo '68, Ph.D. '75; Henry Rosovsky, JF '57, Ph.D. '59, LL.D. '98; Barbara Rudolph '77; Robert N. Shapiro '72, J.D. '78; Theda Skocpol, Ph.D. '75; Peter A. Spiers '76; Scott H. Stossel '91; Sherry Turkle '69, Ph.D. '76; Robert H. Weiss '54; Jan Ziolkowski.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

See, Compare, Reason, Decide

In January, I gathered with hundreds of Harvard alumni and friends in London, and from there made the trip to Davos, Switzerland for the World Economic Forum. In both places, I was struck by how often conversations centered on the value of the humanities. Introducing a faculty discussion at Guildhall in London, alumnus Don Guiney described Harvard as having "handed him a looking glass," an invaluable perspective that stretched beyond himself and yet at the same time cast his own life into new view. For the next hour, Harvard faculty members David Hempton, Jill Lepore, and Michael Norton explored the ways in which the ideal of a "successful life" has changed over the centuries. In Davos, an alumnus told me that, while at Harvard, he took a course called "Thinking About Thinking" that continues to influence all he does. I met later with Boris Johnson, the Mayor of London, who credits his reading of Classics at Oxford with shaping his views on everything from politics to public transportation. The common refrain was that such courses did more than transmit knowledge: they taught you how to imagine, adapt, assess, interpret, change, create.

Yet—at Harvard and elsewhere—students worry aloud about the repercussions of following their interest in art or linguistics or any of the other humanities disciplines. Given recent public discourse, their concern is understandable. It seems that every few weeks another column or report comments on bleak job prospects for recent graduates who did not major in something "useful." Never mind that gaps in unemployment rates between degree holders are sometimes just one percent—as is the case with accounting and English language and literature—or that liberal arts majors close the salary gap over the course of their careers. Short-term snapshots translate into real anxiety for students and their parents, and it is imperative that we continue to make the case for education that encourages flexibility and invites change.

Why study the humanities? Interpretation, judgment, and discernment will always be in demand, and they are cultivated and refined in the humanities. We learn, for example, how civilizations have varied across space and time. We come to understand that the world has been different and could and will be different again. Literature and the arts enable us to see through a new lens, to look at the world through others' eyes. Students in the humanities learn how to think critically and communicate their ideas clearly, and those transferrable skills lead to rewarding lives and careers in every field of endeavor.

If we hope that the next generation of leaders will build a world that is better than the one we inhabit, we must teach them the importance of stepping back from the urgent present to imagine a different future. The ability to innovate—a skill that nine of out ten employers agree is *the* most important for new hires—requires thinking beyond immediate needs and making creative leaps. Where better to model this approach than in the arts and humanities? They champion boldness in doing and thinking, leading to new and deeper understandings of the world. Training students narrowly for jobs that they can occupy immediately upon graduation is shortsighted: how many of those jobs will even exist a decade or two from now? Far better to create in students the capacities to confront the circumstances of life with a combination of realism and resilience and with habits of mind and skills of analysis that transcend the present.

In 1869, Harvard President Charles W. Eliot noted that "...to make a good engineer, chemist, or architect, the only sure way is to make first, or at least simultaneously, an observant, reflecting, and sensible man, whose mind is not only well stored, but well trained also to see, compare, reason, and decide." While we now would of course add women to his prescription, we must continue to embrace his goal. We must challenge ourselves to ensure that our graduates are indeed prepared to "see, compare, reason, and decide." The humanities are a critical part of that work. Understanding derives from both what is measurable and what is unmeasurable—it is enhanced by scientific insights and mathematical proofs, by philosophical puzzles, and by literature and art that transform the heart as well as the mind. Education must encompass all of these as it seeks to fashion not just employees and employers, but human beings who can help create a better future—for themselves and for the world.

Sincerely,

Drew Faust

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

ing, or someone in their household is disposing of their mail.

And while it is unfair to make generalizations about evicted tenants' character, these tenants often cause massive damage to the apartment. Or what about Desmond's roommate, "Woo," who had been jailed for delinquent child-support payments. Was he a hard-luck victim or an irresponsible and uncaring father?

I don't pretend to know the solution to this problem. However, I would suggest some research be done on how to stop the household perpetrators of eviction who victimize so many of those who sadly depend on them.

Richard Odessey, Ph.D. '74
Lawrenceville, Ga.

My most recent issue arrived in my mailbox on Christmas Eve. I talked to at least two people yesterday who will soon be evicted from their homes. I had to tell them that there was nothing that I, as a legal-aid attorney, could do to stop it. The best advice I could give them was to start packing and see if they could store their belongings with family or friends. This happens on a daily basis for me and my colleagues at legal services and other social-services agencies across the country.

To Matthew Desmond and to *Harvard Magazine*, I have this to say: *thank you* for your important work, and for telling the stories of my clients' lives, and for sharing these with the wider Harvard community.

Kathleen Flaherty, J.D. '94
Newington, Conn.

I appreciate this article and the sincere work that Professor Desmond does on a subject most would rather look away from. I would ask that sociologists direct more of their research, however, toward solutions, and that we spend more time talking to those in poverty about how poverty can be overcome and explaining how poor decisions lead to and can keep persons in poverty.

For those born into poverty, we need to communicate loudly and often that no matter what the circumstances or the macroeconomic environment, poverty can be overcome and/or avoided by doing three things: complete high school (at a minimum); work full time; and marry before you have children.

For those currently in poverty, we need to communicate loudly and often that this can be temporary if you make better choices. Choose to stay in school and earn your high-school diploma. Choose to learn a trade if college is not appropriate. Choose to take a minimum-wage job without benefits at a fast-food restaurant rather than remain unemployed. Choose to delay having children if you don't have or earn enough money to support them.

I was born 50 years ago into a family on public assistance residing in low-income, public housing in a small town in Georgia. I was able to overcome this circumstance as did all my siblings. We need to spend less time, as this article seems to suggest, categorizing the poor as "victims" and assigning others blame for their state. I recommend we share more about what is possible when working with those in difficult situations. Life is a series of choices and one's fate is predominantly self-determined. It is not just what I believe but what I know to be true.

Harold S. Lewis '85
Atlanta

I would hope that the next article about Matthew Desmond's work would examine the problems owners experience in dealing with tenants who boldly lie on their rental application, trash the property once ensconced therein, and work the system to avoid paying rent for which they are legally responsible.

John Purdy, M.B.A. '62
Tucson

"disrupted lives" was jarring. Kudos to Matthew Desmond and his colleagues for their courage to take an ethnographic research approach to exposing eviction as a significant source of degrading the poor further into a class tantamount to that of the homeless refugee. Moreover, this body of research throws a mirror up to the plethora of public-health issues that eviction generates,

SPEAK UP, PLEASE

Harvard Magazine welcomes letters on its contents. Please write to "Letters," *Harvard Magazine*, 7 Ware Street, Cambridge 02138, send comments by e-mail to yourturn@harvard.edu, use our website, www.harvardmagazine.com, or fax us at 617-495-0324. Letters may be edited to fit the available space.

HARVARD
MAGAZINE

PUBLISHER: Irina Kuksin

DIRECTOR OF CIRCULATION AND FUNDRAISING: Felecia Carter

DONOR RELATIONS AND STEWARDSHIP MANAGER: Allison Kern

DIRECTOR OF ADVERTISING: Robert D. Fitta

NEW ENGLAND ADVERTISING MANAGER: Abby Shepard

CLASSIFIED ADVERTISING MANAGER: Gretchen Bostrom

DESIGNER AND INTEGRATED MARKETING MANAGER: Jennifer Beaumont

PRODUCTION AND NEW MEDIA MANAGER: Mark Felton

ASSOCIATE WEB DEVELOPER: Jeffrey Hudecek

GIFT PROCESSOR AND OFFICE MANAGER: Robert Bonotto

IVY LEAGUE MAGAZINE NETWORK
DIRECTOR, SALES AND MARKETING: Ross Garnick, www.ivymags.com

EDITORIAL AND BUSINESS OFFICE
7 Ware Street
Cambridge, Mass. 02138-4037
Tel. 617-495-5746; fax: 617-495-0324
Website: **www.harvardmagazine.com**
E-mail: **harvard_magazine@harvard.edu**
@harvardmagazine
facebook.com/harvardmagazine

Harvard Magazine (ISSN 0095-2427) is published bimonthly by Harvard Magazine Inc., a nonprofit corporation, 7 Ware Street, Cambridge, Mass. 02138-4037, phone 617-495-5746; fax 617-495-0324. The magazine is supported by reader contributions and subscriptions, advertising revenue, and a subvention from Harvard University. Its editorial content is the responsibility of the editors. Periodicals postage paid at Boston, Mass., and additional mailing offices. Postmaster: Send address changes to Circulation Department, Harvard Magazine, 7 Ware Street, Cambridge, Mass. 02138-4037. Subscription rate $30 a year in U.S. and possessions, $55 Canada and Mexico, $75 other foreign. (Allow up to 10 weeks for first delivery.) Subscription orders and customer service inquiries should be sent to the Circulation Department, *Harvard Magazine*, 7 Ware Street, Cambridge, Mass. 02138-4037, or call 617-495-5746 or 800-648-4499, or e-mail addresschanges@harvard.edu. Single copies $4.95, plus $2.50 for postage and handling. Manuscript submissions are welcome, but we cannot assume responsibility for safekeeping. Include stamped, self-addressed envelope for manuscript return. Persons wishing to reprint any portion of *Harvard Magazine*'s contents are required to write in advance for permission. Address inquiries to Irina Kuksin, publisher, at the address given above.
Copyright © 2014 Harvard Magazine Inc.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Start at Harvard. Go anywhere.

As a Harvard alum, you're on a unique personal journey. Enhance that journey with the best-in-class travel rewards that only come from the Harvard Alumni World MasterCard®. Book any flight, hotel, cruise, or car rental, with no restrictions, blackout dates, or limitations. You'll also help Harvard students begin their journey with support for Harvard student scholarships. For more information or to apply for your Harvard Alumni Card, please go to **www.harvardcard.com.**

HARVARD ALUMNI ASSOCIATION
TRAVELS
Travel the world with fellow alumni and Harvard study leaders. **Choose from more than 50 trips annually.**

FEATURED TRIPS

JUNE 6–15, 2014
REMEMBERING THE GREAT WAR: BELGIUM, FRANCE & GERMANY
STUDY LEADER: **SUE WEAVER SCHOPF**, ASSOCIATE DEAN, HARVARD EXTENSION SCHOOL

JULY 23–AUGUST 1, 2014
HIDDEN GEMS OF THE AEGEAN ON *HARMONY V*
STUDY LEADERS: **HARVEY COX**, HOLLIS RESEARCH PROFESSOR OF DIVINITY; **NINA TUMARKIN**, PROFESSOR OF HISTORY, WELLESLEY COLLEGE

SEPTEMBER 8–16, 2014
TOWN & COUNTRY LIFE: PROVENCE TO PARIS ON *AMADEUS SYMPHONY*
STUDY LEADER: **ROBERT DARNTON**, CARL H. PFORZHEIMER UNIVERSITY PROFESSOR AND UNIVERSITY LIBRARIAN

TO BOOK YOUR NEXT TRIP, CALL US AT 800-422-1636.
FOR MORE TRIP OPTIONS, VISIT **ALUMNI.HARVARD.EDU/TRAVELS.**

HARVARD Alumni Association

as well as our collective need to solve these problems in our communities.

As an aside, your readership may consider the ironic juxtaposition of the magazine's front cover, "Eviction: A plague on America's poor," with the back-cover ad for Maserati, "The Key to an Extraordinary Life Is Quite Literally the Key," in questionable taste. Frankly, it speaks volumes about the challenges we face as a "great society."

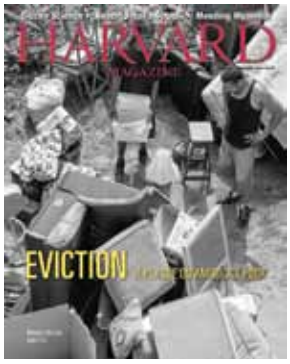
ROBERT G. DENMARK, M.P.H. '92, S.D.M. '94
Lafayette Hill, Pa.

THANK YOU for publishing the excellent article on eviction. I would just like to note a couple of additional ironies. In Massachusetts, if a family leaves its housing after receiving an eviction notice but before the sheriff arrives to toss its belongings onto the sidewalk, the state considers that the family left shelter voluntarily and so is not eligible for aid through the homeless assistance program. Most families, of course, are not aware of this Catch-22 and believe they are doing the right thing by leaving before undergoing the public humiliation (and public expense) of being physically expelled.

The article notes that sociologist Matthew Desmond advocates increasing access to free legal counsel for tenants to protect their housing rights. However, during the recent era of increasing rents, support for legal aid has *fallen*, not risen. One reason is that a major source of funding for legal aid is interest on lawyers' trust accounts. Since interest rates have fallen drastically, legal-aid groups have lost up to 80 percent of the funds they receive from this resource. That's how it seems to go with services for the poor in hard times: more need, less access.

JANE COLLINS '71
Medford, Mass.

PRIOR TO STUDYING the poor, Matthew Desmond, the sociologist in Elizabeth Gudrais's article, wrote *On the Fireline*. There, he examines why firefighters "choose to enter such a risky profession, and how their upbringing socializes them to underestimate just how dangerous it is." To promote firefighter safety, Mr. Desmond concludes that the U.S. Forest Service should "focus more on teamwork and less on individual responsibility."



HM Many more correspondents weighed in on eviction, Keystone XL, and other issues. Read additional letters at http://harvard-mag.com/letters-14.

Next, Desmond studied the "involuntarily displaced," explaining that the poor create "disposable ties" for urban survival. However, these disposable ties "fray or break off after a short duration." Desmond also states that displaced children live "a transient existence that is known to affect children's emotional well-being and their performance in school."

Succinctly put, instability creates more instability.

The questions Desmond ponders in relation to firefighters are applicable to the poor as well: why do some people choose to engage in risky behaviors and does their upbringing socialize them to underestimate just how dangerous their behaviors can be?

Can the same remedy Desmond suggested for the firefighters work for the poor? Can society focus more on teamwork, i.e., the nuclear family, and less on the individual?

Gudrais and Desmond ignore the obvious instability of the nuclear family with the evicted poor. Who are the "relative" children with Danielle Shaw and Jerry Allen? Why are Shaw and Allen living together in the first place, especially since they are both so young and neither has a stable job? Where are their parents? Where is the husband of the woman who works two jobs, with two children, one of whom is two months old? How can Woo consider marrying someone else when he does not support the children he has with another woman?

No problem in society will be fixed while the family is broken. Period.

BETH DONOFRIO, ED.M. '94
Nokomis, Fla.

LOS ANGELES, DEFENDED

WHILE I COMMEND Noah Pisner's choice of university, persistence, and writing ability (The Under- *(please turn to page 72)*

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Right Now

The expanding Harvard universe

THE X AND Y FILES

Sex Science and Gender Culture

MEN ARE FROM MARS, and women are from Venus. Right? The subject of sex differences is a staple of popular culture, and various fields—sociology, psychology, neurobiology, and, recently, genomics—have taken on the topic. Studies have argued that women talk more than men, that men occupy both high and low extremes of intelligence, and even, recently, that there are strong differences in the very wiring of male and female brains.

In her new book *Sex Itself: The Search for Male and Female in the Human Genome*, Sarah S. Richardson, an assistant professor of the history of science and of studies of women, gender, and sexuality, examines science's claims to reveal "what is really real about male and female." Her focus is on the sex chromosomes, the stretches of DNA referred to as X and Y that together determine biological sex in most mammals: individuals with two X chromosomes are female, and those with one X and one Y are male. The sex chromosomes, says Richardson, are "objects of scientific knowledge that have circulated between popular culture and scientific research in a way that tells us a lot about how gender beliefs"—socially constructed ideas about masculinity and femininity—"enter the cognitive work of science."

She begins her series of case studies by examining the discovery of the sex chromosomes themselves at the turn of the twentieth century. Contrary to what the Victorian period's rigid sexual mores might suggest, sex was considered fluid and spectrum-like at the time, Richardson notes; early theories hypothesized that environmental signals like nutrition or temperature could affect sex determination. Attention shifted from such external factors to each individual's chromosomal makeup after researchers established that sex in humans correlates exactly to the presence or absence of the tiny Y chromosome. Together with the later discovery of sex hormones, the X and Y chromosomes established a new biological framework for understanding sex.

In midcentury, Richardson writes, this framework increasingly became a vehicle for social notions of gender difference, with male and female presented as opposite and complementary. In the 1970s, scientists observed that males with an extra Y chromosome were overrepresented

"Because my genetic programming prevents me from stopping to ask directions—that's why!"

Cartoon by Donald Reilly, The New Yorker *Collection/The Cartoon Bank*

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

in prison populations and hypothesized that XYY "supermales" had received an additional dose of "male" traits like aggression and physical strength. Later studies thoroughly discredited the "supermale" theory: XYY and XXY males were found to have similarly high rates of imprisonment (now attributed to slightly lower average intelligence caused by chromosomal imbalance). Even so, the XYY "supermale" theory captured the public imagination—highlighting, Richardson argues, how the X and Y chromosomes have been persistently conflated with social notions of gender.

Examples such as the XYY "supermale" theory illustrate how social ideas of gender can shape scientific inquiry, says Richardson. She is concerned not only with "black-and-white" cases of gender bias; in fact, she introduces the term "gender valence" to illustrate the varied and sometimes productive intersection of cultural and scientific understanding. Thus she highlights scientific debate over the theory of Y-chromosome degeneration, which posits that the Y chromosome is rapidly losing genes and may eventually disappear; the discussion, Richardson argues, consciously engages with societal anxieties over the status of men in a postfeminist world. "Gender beliefs are playing a role in the science here, but it doesn't have the pejorative connotation of bias," she explains. "Bias, in my view, happens when we insert our assumptions into scientific research in a way that is not reflective, that's invisible to us."

She ends by examining modern research into sex differences. In the related area of race-based research, scientists have found that individual humans have similar amounts of genetic variation, whether they are from the same or different populations, and critical dialogue has revealed the potential pitfalls of ascribing biological significance to socially constructed racial categories. Sex-difference research, Richardson argues, requires this critical perspective as well. Per the *New Yorker* cartoon, she cautions that "older, once debunked, theories of sex difference [have been revived] decades later in the language of molecular genetics," as mechanisms of gene expression or neurological wiring are used to reinforce existing ideas of gender. Building on several published statistical criticisms, Richardson finds that many sex-difference studies have fundamental logical flaws: for instance, scientists often fail to distinguish properly between biological and social influences, she observes, even though gendered norms in areas ranging from exercise to workplace interactions can complicate what appear to be essential biological differences.

The errors, Richardson writes, illustrate a broader conceptual problem. It has been too convenient to think of male and female as opposite, she says; the sexes must be seen *not* as "natural kinds"—distinct and separate categories—but rather as "permanently paired and dynamically interacting." "Looking over 30 or 40 years of critical discussions of gender in science," she says, "we can document how those conversations have begun to change and benefit the science" by pointing out gendered assumptions and suggesting alternative models. "The book makes the argument that we should continue to cultivate these discussions as we move into an age in which genomics will proliferate findings of human differences."

—KATHERINE XUE

SARAH RICHARDSON WEBSITE:
http://www.sexitself.com

UPDATING DR. DOOLITTLE?

Fusing Faculties of Mind

WHAT IF PEOPLE could communicate with animals, and even with each other, using only their thoughts?

Such direct brain-to-brain communication became a reality, at least in a very basic sense, at Harvard last year, when a team of researchers led by associate professor of radiology Seung-Schik Yoo developed the first interspecies "brain-to-brain interface" (BBI). The mechanism retrieves a signal from a human's brain (generated by staring at a flashing light) and transmits it into the motor cortex of a sleeping rat, causing the rodent to move its tail. "We were interested in creating a way for information to be transmitted between two brains without using nerves or mus-

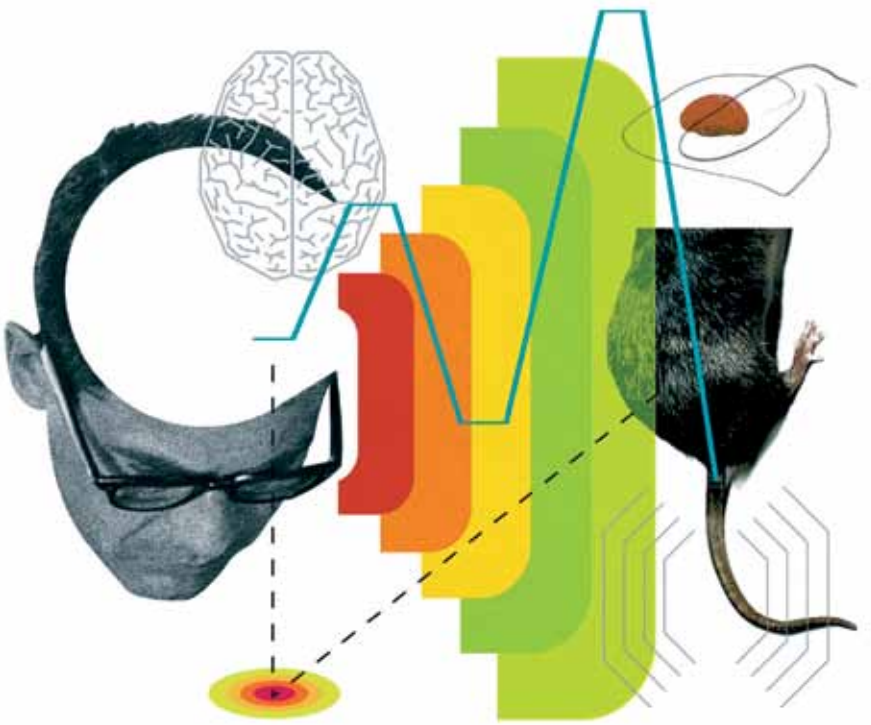


Illustration by Stuart Bradford

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

"We were interested in creating a way for information to be transmitted between two brains without using nerves or muscles."

cles," says Yoo, who found—as reported in the journal *PLOS ONE* in mid 2013—that a human subject could successfully control tail movement 94 percent of the time.

To achieve this advance, Yoo and his colleagues incorporated discoveries made by others in the rapidly growing field of computer-brain interaction. In recent years, scientists have overcome immense technical challenges to build computers that read and interpret signals directly from the brain. These brain-computer interfaces (BCIs) have been adapted for use in clinical settings—for instance, doctors use them to allow quadriplegic and "locked in" patients to move computer cursors, mechanical arms, and even their own wheelchairs.

Using this research, Yoo and his team built a machine that not only receives signals from the brain using existing BCI technology, but also inserts those same signals into the brain of a separate organism. "The real challenge was figuring out how a computer can somehow control the brain activity in the rat—the *computer*-brain interface," he explains. "The difficulty was to create a method that offered a fine level of control without having to perform surgery" to insert electrodes into the brain.

The most common method of noninvasive brain stimulation—transcranial magnetic stimulation—is not accurate enough to stimulate the tiny region of the rat's brain associated with tail movement, Yoo says. Instead, he and his team relied on a technology that he has been studying since 2007, "focused ultrasound" (FUS), that enables stimulus of specific areas of the brain using focused beams of acoustic energy. One challenge of ultrasound imaging is that the sound waves cannot penetrate bone. But Yoo's team "found that you can overcome those limitations if you are using low acoustic frequencies."

In their experiment, the researchers attached an FUS machine, calibrated to activate the specific cortical region associated with tail movement, to a rat's skull and placed a human volunteer in a BCI machine that reads neural signals using an electroencephalogram. Then they linked the two interfaces together via computer. In order to generate a command to send to the rat's brain, the human subjects were asked to stare at a flickering light pattern on a computer screen whenever they intended to move the rat's tail. This elicited a particular pattern of brain waves, which triggered a focused burst of ultrasound connected to the rat's brain, causing its tail to move.

Despite the success of the experiment, Yoo sees three areas for improvement. First, he'd like to achieve the same results when the rat is awake. Second, the existing device is essentially just an on/off switch controlling the rat's tail, but future brain-brain interfaces might be used

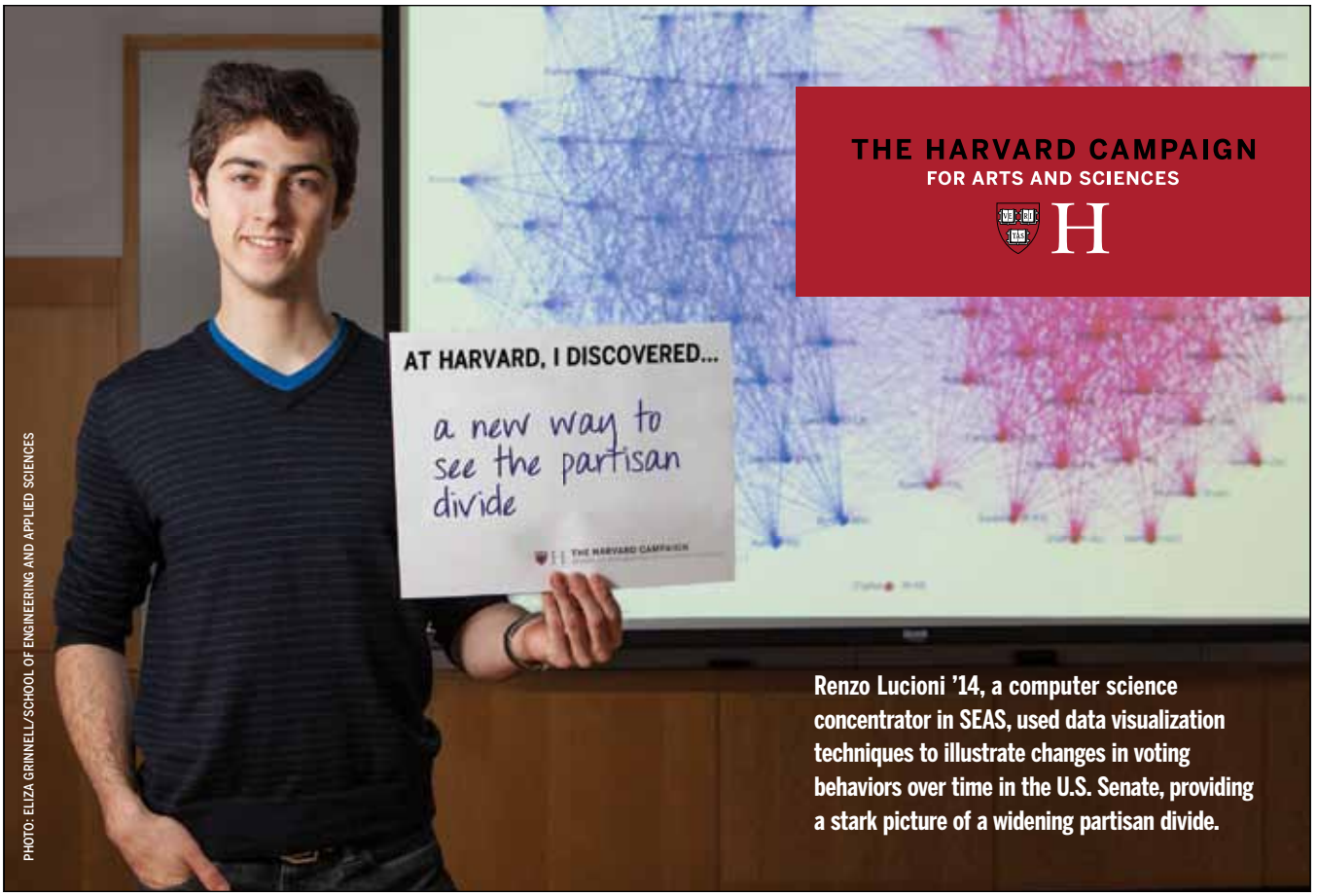


PHOTO: ELIZA GRINNELL/SCHOOL OF ENGINEERING AND APPLIED SCIENCES

Renzo Lucioni '14, a computer science concentrator in SEAS, used data visualization techniques to illustrate changes in voting behaviors over time in the U.S. Senate, providing a stark picture of a widening partisan divide.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

to send more sophisticated messages that would affect the rat's entire range of motion. And finally, he would like the system to be bidirectional, allowing in a more distant future for two-way communication between humans, perhaps facilitating brain-to-brain messaging across great distances via the Internet. Eventually, these technologies might even be used to promote social understanding and empathy through a technique called "neural coupling," in which one person's neural patterns and experiences are transmitted into the brain of another, allowing the recipient to experience the thoughts and mental states of others.

These mind-boggling possibilities, Yoo says, are likely to be questions for future generations. His own experiments are not conducted in order to achieve any practical outcome, he points out. "For me, this is more philosophical than practical," he says. "It is really just my boyish curiosity."

—PETER SAALFIELD

SEUNG-SCHIK YOO E-MAIL:
yoo@bwh.harvard.edu

GIVING PAUSE TO POLICY

The Price of Healthy Eating

ANECDOTALLY, the cost of a healthy diet—rich in fruits, vegetables, fish, and nuts, for example—has been assumed to be higher than that of a diet consisting of unhealthy processed foods. Now research from the Harvard School of Public Health (HSPH) has quantified that cost difference, often cited as a barrier to eating well, as roughly $1.50 more per person per day. That's "smaller than many people might have expected," says senior study author Dariush Mozaffarian, an associate professor at HSPH and Harvard Medical School. It's "the cost of a cup of coffee," or about $550 a year ($2,200 for a family of four).

ISTOCK

The findings, based on a meta-analysis of 27 studies undertaken in 10 high-income countries, are part of a larger effort to understand how government policy and existing food-supply systems affect health. The research shows that a healthy diet is affordable for most people, Mozaffarian says, given that "for 60 percent to 70 percent of

1838 Celebrating 175 Years 2013

Knowing wealth. Knowing you for 175 years

Jay Emmons, CFA, *President* | Adrienne Silbermann, CFA, *Director of Research* | Charlie Haydock, CFA, *Chief Investment Officer,* A.B. 1974

Why has Welch & Forbes thrived for 175 years?
Relationships.
Relationships built on accessibility, trust and stability. For us it's the only way.
If you value an enduring relationship with a firm expert in comprehensive portfolio management and tax, trust and estate planning, call Charlie Haydock '74 at 617-557-9800.

WF
WELCH & FORBES LLC www.welchforbes.com | 45 School Street, Old City Hall, Boston, MA 02108 | 617.523.1635

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

THE DEAN'S INNOVATION FUND AT SEAS

WHEN A TEAM OF HARVARD scientists and engineers demonstrated a new type of battery that could fundamentally transform the way electricity is stored on the grid, it made headlines worldwide. The metal-free "flow battery," based on safe, inexpensive organic molecules, could one day make power from renewable energy sources such as wind and solar a far more significant contributor to our electricity supply.

The research results, published in the journal *Nature* in January 2014, were the culmination of years of work by a team led by Michael J. Aziz, Gene and Tracy Sykes Professor of Materials and Energy Technologies, and collaborators Roy G. Gordon, Thomas Dudley Cabot Professor of Chemistry and Professor of Materials Science, and Alán Aspuru-Guzik, Professor of Chemistry and Chemical Biology.

It all started with a seed grant from the TomKat Charitable Trust.

In 2011, Kathryn "Kat" Taylor '80 was talking with SEAS Dean Cherry A. Murray about the future of the School. What would it take, she wondered, to realize Harvard's aspiration of moving SEAS to the top echelon of engineering and applied sciences programs?

"We honed in on an innovation fund to spur high-risk, high-reward research at its earliest stages," Murray says. "It is common for faculty to want to try out ideas that are so innovative that they can't get funding elsewhere."

Taylor and her husband, Thomas Steyer, have an avid interest in sustainability and environmental protection. In keeping with their priorities. Murray has used the multi-year gift from TomKat to direct flexible research funds to SEAS faculty pursuing a variety of environment and energy projects, from novel fuel cells for transportation and electronics applications, to the monitoring of greenhouse gases in urban areas.

Kat Taylor (left) and her husband, Thomas Steyer, gave flexible research funds after talking with Dean Cherry A. Murray (right) about how best to support innovation at SEAS.

"It is rewarding to see this gift used to jump-start some truly imaginative and impactful research," Taylor says. "Harvard is one of a handful of institutions that has the breadth and capacity to take on research that can have transformative consequences for the future of the planet."

Thanks to the initial TomKat support, the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) awarded Aziz and his team a one-year proof-of-concept grant in 2013 and recently extended its support with a three-year, multimillion-dollar award.

"One never knows exactly how an idea will pan out in the laboratory," Aziz says. "To really explore radical solutions you need a bit of a leap of faith and the funds to test your ideas."

A PRIORITY OF THE CAMPAIGN IS TO STRENGTHEN THE SEAS DEAN'S INNOVATION FUND TO PROVIDE FLEXIBLE, EARLY-STAGE SUPPORT TO RESEARCHERS.

"Our faculty are tackling big, complex problems on the frontiers of energy and environmental science and engineering—as well as translational life sciences, computational science, robotics, and nanotechnology," Murray says. "We have an unparalleled opportunity to fundamentally advance science in ways that will improve people's lives."

VISIT CAMPAIGN.HARVARD.EDU/FAS

PHOTOS: LINDA RUSSELL; ELIZA GRINNELL/SCHOOL OF ENGINEERING AND APPLIED SCIENCES


Dariush Mozaffarian

Americans, $1.50 a day is not a big deal." Nevertheless, he adds, it *is* a "big barrier" for the remaining 30 percent to 40 percent of the population—even though the economic costs of chronic diseases related to poor diet vastly exceed the higher price of healthy food. There is a public benefit, therefore, to ensuring that everyone eats well, as he and his fellow authors, including research fellows Ashkan Afshin, Gitanjali Singh, and Mayuree Rao (the lead author), point out.

There is broad consensus about which foods are particularly good or bad. "We should emphasize reducing the things we know are unhealthy like processed meats, highly refined starches, sugars, and carbohydrates, trans fat, and sodium," Mozaffarian says, and "highlight the things we know are good like fruits, vegetables, nuts, vegetable oils, and fish. Many other foods, like chicken or eggs, are "kind of in the middle"—neutral in terms of health effects.

Unhealthy diets cost less, in part, because producers are focused on providing "inexpensive, high-volume commodities. This is partly an accident of history," Mozaffarian explains. "The main goal of food production through most of human history and even into the 1950s and '60s was producing as many inexpensive calories as possible that were safe from bacterial contamination and toxins. A whole system was built around creating, shipping and storing a handful of products—rice, wheat, soy." New systems "to grow, ship, and store fruits, vegetables, nuts, and seafood," could be created, "but it could take decades without strong government support."

Even though the detrimental design of the present system "wasn't purposeful," he continues, large companies now have "a financial interest in selling processed foods that have very inexpensive ingredients, often [costing only] pennies on the dollar."

To change that, Mozaffarian advocates taxing unhealthy foods and using the revenue to subsidize healthy choices. When a tax and subsidy are paired, he explains, food on balance costs the same, and healthier diets actually become *less* expensive.

U.S. policies are in fact counterproductive to bringing healthy foods to supermarkets in low-income neighborhoods, he points out: for example, food stamps are used to purchase $2 billion of sugar-sweetened beverages a year. "The average lower-income teen drinks two to three servings of soft drinks per day," he reports. "Using our tax dollars to create death and disability that we then pay for in our healthcare system—that's obviously insane." He advocates reforming the program so that it adheres to the same sensible nutrition guidelines required by WIC, the federal government's special supplemental nutrition program for women, infants, and children.

"That would have a transforming effect on the food supply," he concludes. Because most food-stamp recipients live in low-income neighborhoods, a policy shift would change what was stocked in local stores. "Many have only a 7-11 for shopping. [Removing that] incentive to pack the aisles with Coke, candy, and chips would improve the health not only of people on food stamps, but the health of the entire neighborhood."

Mozaffarian's interest in the cost of healthy food is not just domestic—it is global. Because existing food-aid programs focus on hunger and calories, he says, "I fear that we are making the same mistake in low-income countries that we made in the U.S. in the last 100 years. By focusing only on getting as many calories as possible to people without thinking about the quality," he warns, policymakers are promoting the same harmful long-term price disparities, and, ultimately, "We risk recreating there the same obesity and diabetes epidemic we have here."

—JONATHAN SHAW

Unhealthy diets cost less, in part, because producers are focused on providing "inexpensive, high-volume commodities."

DARIUSH MOZAFFARIAN E-MAIL:
dmozaffa@hsph.harvard.edu

Photograph by Jim Harrison

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

New England

REGIONAL SECTION

FROM LEFT TO RIGHT: HARVARD MUSEUM OF NATURAL HISTORY; DAYVE WARD/THE ARNOLD ARBORETUM; PEABODY MUSEUM OF ARCHAEOLOGY AND ETHNOLOGY

Extracurriculars

SPECIAL EVENTS

http://ofa.fas.harvard.edu/boxoffice
617-496-2222
• March 10; March 24; and March 31, at 4 P.M.
http://mahindrahumanities.fas.harvard.edu/content/norton-lectures. (Tickets are free, limited to two per person, and will be available at the box office starting at noon on the day of each lecture.)
The 2014 Norton Lectures by Herbie Hancock. The series, "The Ethics of Jazz," is presented by the Mahindra Humanities Center.
• April 10-11
www.radcliffe.harvard.edu/event/2014-who-decides-conference
617-495-8277
The ***Radcliffe Institute for Advanced Study*** conference, "Who Decides? Gender, Medicine, and the Public's Health," features a performance by playwright Eve Ensler. Radcliffe Gym.
• May 1-4
http://ofa.fas.harvard.edu/arts
617-495-8676
The annual ***Arts First Festival*** offers dance, theater, music, and other student and faculty performances—and honors the 2014 Arts Medalist: novelist, poet, and environmentalist Margaret Atwood, A.M. '62, Litt.D. '04.

MUSIC

Sanders Theatre

http://ofa.fas.harvard.edu/boxoffice
617-496-2222
• April 11 at 8 P.M.
"A Joyful Noise!" features ***Harvard-Radcliffe Collegium Musicum*** and the Joyful Noise Chorus.
• April 26 at 8 P.M.
The ***Harvard Glee Club, Radcliffe Choral Society, Harvard-Radcliffe Orchestra,*** and ***Harvard-Radcliffe Collegium Musicum*** present "VISITAS Concert: Giuseppe Verdi's *Requiem.*"

THEATER

• March 27 through April 6
www.hrgsp.org/happeningnow.htm
ofa.fas.harvard.edu/boxoffice
617-496-2222
The ***Harvard-Radcliffe Gilbert & Sullivan Players*** present *Patience; or, Bunthorne's Bride.* Agassiz Theatre.

American Repertory Theater

www.americanrepertorytheater.org
617-547-8300
• Through March 16
Witness Uganda. A young American volunteers for a project in Africa that changes his life forever. Inspired by a true story, this new, award-winning musical is staged by A.R.T. artistic director Diane Paulus.
• April 5-27
The Shape She Makes explores, through a mix of dance and theater, how early experiences with an absent father and bartender mother affect the adult life of a woman striving to succeed in the professional realm.

NATURE AND SCIENCE

The Harvard-Smithsonian Center for Astrophysics

www.cfa.harvard.edu/events/mon.html
617-495-7461; 60 Garden Street
Observatory night lectures with night-sky viewing, weather permitting, at 7:30 P.M.
• March 20: "A More Perfect Heaven: How Copernicus Revolutionized The Cosmos."
• April 17: "Jupiter and Mars Return!"

The Arnold Arboretum

www.arboretum.harvard.edu; 617-384-5209
As spring unfolds, check the website for a

Left to right: the now extinct passenger pigeon, at the Harvard Museum of Natural History; Beatrix Potter's home, gardens, and tales of small creatures, at the Arnold Arboretum; the fine art of crafting and using Native Americans' birch bark canoes, at the Peabody Museum

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

plethora of other classes, lectures, exhibits, tours, and events.

• March 9, 2-3:30 P.M.

Explore ***Beatrix Potter's Gardening Life: The Plants and Places that Inspired the Classic Children's Tales*** with landscape consultant and historian Marta McDowell.

• March 27, 7-8:30 P.M.

Mikyoung Kim's Transformational Landscapes. The landscape architect will discuss the creative process that led to projects such as the ChongGae Canal Restoration in Seoul, Korea, and the Crown Sky Garden for the Lurie Children's Hospital in Chicago.

• April 14, 7-8:30 P.M.

Uncorking The Past: The Quest for Wine, Beer, and Extreme Fermented Beverages features a talk by Patrick E. McGovern, scientific director of the Biomolecular Archaeology Laboratory for Cuisine, Fermented Beverages, and Health at the University of Pennsylvania Museum. (Tastings of recreated, ancient-style brews are included for those aged 21 and older.)

FILM

The Harvard Film Archive

http://hcl.harvard.edu/hfa
617-495-4700

• March 23

A Spell to Ward Off the Darkness. A screening of this beautifully filmed existential "participatory ethnography" by avant-garde filmmakers Ben Rivers and Ben Russell. Russell will be on hand for a discussion.

HARVARD CENTER FOR ASTROPHYSICS

Jupiter is well-placed for viewing at the Center for Astrophysics early this year.

EXHIBITIONS & EVENTS

Carpenter Center for the Visual Arts

www.ves.fas.harvard.edu; 617-495-3251

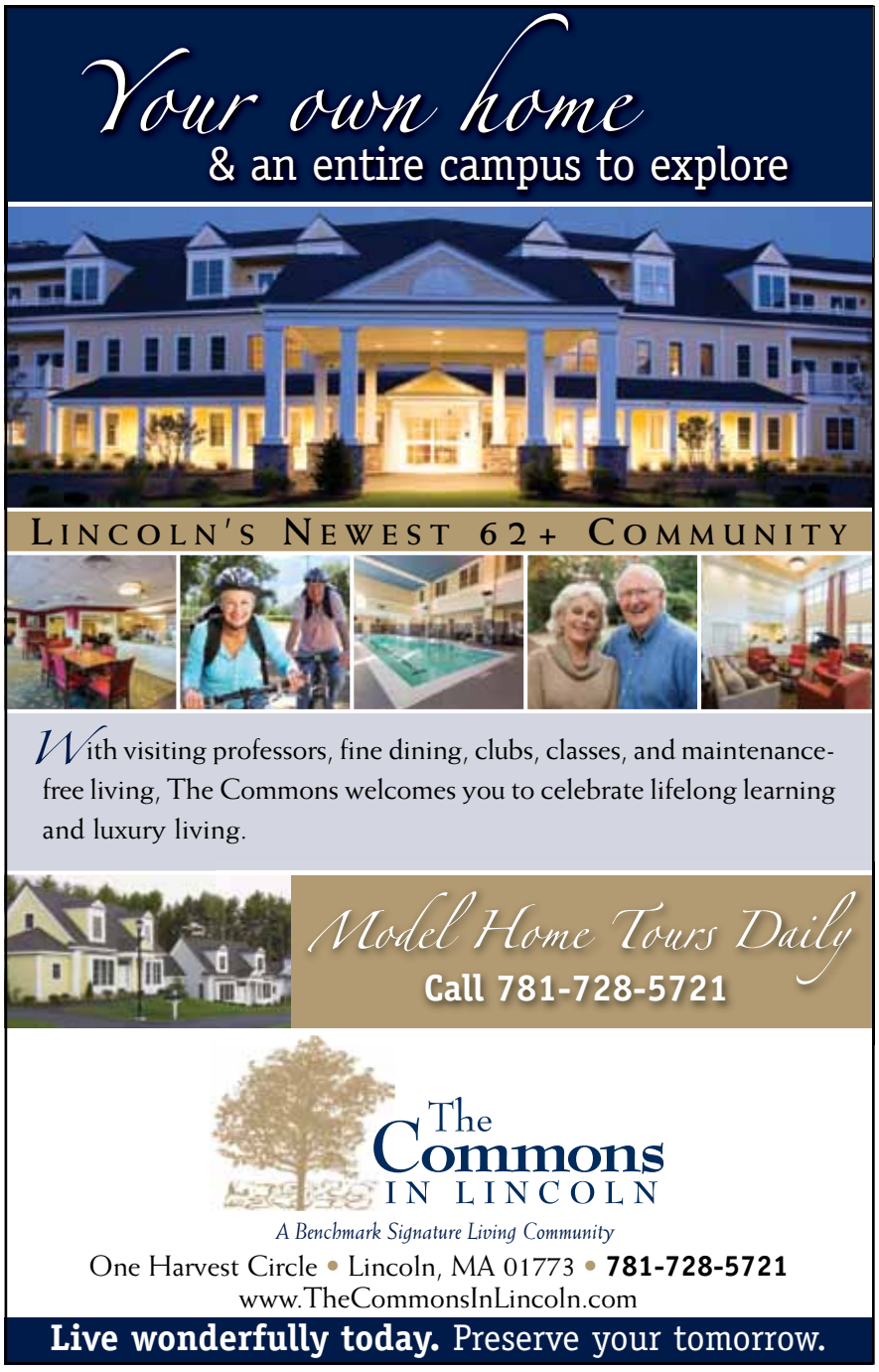
• March 27 at 6 P.M.

"An Evening with Nato Thompson," chief curator of the New York City-based public arts organization Creative Time, is connected to the current exhibit, ***Living as Form (The Nomadic Version),*** which examines the daily interactions between art and human culture through new works by artists in Cambridge, Boston, and Providence.

Harvard Art Museums

www.harvardartmuseums.org
617-495-9400/4544.

The museum galleries are closed for renova-



Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Hammond Residential

Cambridge SINGLE FAMILIES Set Records!

Average Sales Price
2011 - $1,074,837
2012 - $1,195,111
2013 - $1,271,065

Cambridge...Radcliffe Neighborhood. Circa 1894, renovated 2003. 10 light-filled rooms, 4 bedrooms, 3 full & 2 half bathrooms. Quarter-sawn oak parquet floors. Fenced yard. Garage. Visit 36Bowdoin.com. $2,775,000

Somerville...Near Vibrant Davis Square. 2014 gut renovation. 1,700+ square feet on two levels. Kitchen with custom cabinetry. Fireplace. Three bedrooms. $699,000

Somerville...Excellent location. Dramatic five-room, two-bathroom unit. 2014 construction. Light-filled rooms w/double ceiling height. Luxurious master bedroom. Parking. $635,000

Cambridge CONDOMINIUMS Set Records!

Average Sales Price
2011 - $497,761
2012 - $510,725
2013 - $591,694

Allston...Sunny, south-facing 2-bed, 1.5-bath corner unit with balcony and garage deeded parking. Rooftop pool, exercise room, 24-hour concierge, A/C, near Mass Pike. $380,000

Arlington...Remarkable home with a blend of breathtaking period detail and modern design. Light and airy kitchen, informal dining areas. Other rooms have stunning preserved 19th-century features. Rare offering. $1,575,000

Somerville...Renovated three-bedroom, 2.5-bath duplex on top two floors outside Porter and Davis Squares. Open plan, high ceilings, parking. Visit 104HudsonStreet.com. $725,000

Cambridge residential real estate is in high demand. If you've been thinking about a move, this is a good time to sell!

www.hammondre.com
Cambridge, Belmont, Arlington, Watertown & Somerville
Residential, Commercial, Rentals & Property Management
Cambridge Office 617-497-4400 • Belmont Office 617-484-1900

View our latest interactive on-line magazine at: www.hammondmagazines.com

Custom-designed Team Building & Leadership Development Programs

Create Positive & Lasting Change for your Organization

THOMPSON ISLAND
OUTWARD BOUND PROFESSIONAL

(617) 328-3900 ext. 114
eharris@thompsonisland.org
www.thompsonisland.org

Fresh Pond Ballet

Ballet classes:
age 3 - teen,
adult & pointe

Dance your way to grace and wellness!

Visit us at:
www.freshpondballet.com

Or on Facebook at:
facebook.com/FreshPondBallet

Nina Alonso, Director, FPB
1798a Mass Ave, Cambridge
617.491.5865

Cadbury Commons
AT CAMBRIDGE

Independent and Assisted Living
Specialized Memory Care

What do Harvard alumni have in common?

Cadbury Commons
A Remarkable Senior Residence

The Harvard alumni who chose Cadbury Commons may have retired from work, but not from life.

Museum Visits • Play Reading
Symphony Selections • Lecture Series • Yoga • Organic Gardening

Call (617) 868-0575 to arrange a personal tour, or visit www.cadburycommons.com

66 Sherman Street, Cambridge, MA 02140 • (617)868-0575

NEW ENGLAND REGIONAL SECTION

HARVARD ART MUSEUMS

Byzantine coins at the Sackler Museum

tion until the fall, but some special events are being held in the lecture hall at the Sackler Museum, 485 Broadway.

• March 13 at 6 P.M.

A lecture on ***"Byzantine Money: The Politics and Aesthetics of a World Currency,"*** by Eurydice Georganteli, a fellow in the history of art and architecture.

Harvard Museum of Natural History
www.hmnh.harvard.edu; 617-495-3045

• March 9 at 2 P.M.

Discussion and book signing with Joel Greenberg, author of *Echoes of Their Wings: The Life and Legacy of the Passenger Pigeon*, in conjunction with the museum's current exhibit ***Final Flight: The Extinction of the Passenger Pigeon,*** which commemorates the species that once filled the North American skies by the millions.

Peabody Museum of Archaeology and Ethnology
www.peabody.harvard.edu; 617-496-1027

• April 12

The Legacy of the Penobscot Canoes: A View from the River showcases Native American birchbark craft and inventions.

LECTURES

Radcliffe Institute for Advanced Study
www.radcliffe.harvard.edu/event/2014-rosalind-w-picard-lecture; 617-496-8600
Fay House, 10 Garden Street

• March 11 at 5 P.M.

Part of the "Smart Clothes" science lecture series, "Your Future Smart Wristband" examines how sensors collect important physiological data related to emotions and health. The speaker is MIT media arts and science professor Rosalind W. Picard, who directs the Affective Computing Group at the MIT Media Lab.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

More Than Skin Deep

Regional spas offer "a place to ease burdens." • *by Nell Porter Brown*

Clockwise from top left: Take a dip in the pool at the Equinox Resort & Spa pool, boogie down at a dance fitness class at Canyon Ranch, or just relax in quiet privacy at The Spa at Norwich Inn.

CLOCKWISE FROM TOP LEFT: EQUINOX RESORT & SPA; CANYON RANCH; THE SPA AT NORWICH INN

When she finally felt confident leaving her one-year-old with relatives, Robin Lockwood Heffernan '02, Ph.D. '07, lived out any new mother's dream: she spent a few days at The Spa at Norwich Inn. There, in the depth of New England's snowy January, she swam in a warm, freshwater pool, had a massage, and padded around a cozy room in a thick robe and slippers. "I especially love having my feet rubbed," admits Heffernan, a chemical engineer and healthcare business consultant in Boston. During her one-hour foot treatment, she recalls, "they soaked my feet, did a salt scrub and an aromatherapy scrub, and ended with a pedicure." Meanwhile, her husband took advantage of the fitness center and reveled in a back massage. "There is tons of stuff to do here," she says of the Connecticut hotel spa, which also happens to be near the Mohegan Sun casino. "There's a good balance: all the relaxation elements, but you can also have a good workout and take classes, get a facial, and then go to the restaurant for a really nice dinner."

Heffernan is far from the only one enjoying such healthful pleasures. There are 19,960 spas across the country—"places devoted to overall well-being through a variety of professional services that encourage the renewal of mind, body, and spirit"—according to The International Spa Association (ISPA).

In 2012, the trade group reports, these spas generated about $14 billion in revenue thanks to 160 million visits, slight increases over figures from the previous year.

Andrea Foster, vice president and national director of spa and wellness consulting for PKF Consulting USA, in Boston, further defines the true spa as a place that provides "a relaxing and rejuvenating experience that includes massage, body treatments, and could also include facials, nutrition counseling, and fitness training." In short, hair and nail salons are not automatically spas, she says, nor "are the dental offices that say they have a massage chair."

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

lifecare living is as good as it looks.

Brookhaven at Lexington offers an abundance of opportunities for intellectual growth, artistic expression and personal wellness. Our residents share your commitment to live a vibrant lifestyle in a lovely community.

Call today to set up an appointment for a tour!

A Full-Service Lifecare Retirement Community

BROOKHAVEN AT LEXINGTON

www.brookhavenatlexington.org

(781) 863-9660 • (800) 283-1114

LYCÉE INTERNATIONAL DE BOSTON
INTERNATIONAL SCHOOL OF BOSTON

Teaching the World

Prepare Your Child to Thrive at the Next Level

To learn more, call 617.499.1459 or visit **www.isbos.org**

45 Matignon Road | Cambridge, MA 02140

ISB is accredited by NEASC (New England Association of Schools and Colleges), CIS (Council of International Schools), MEN (French Ministry of Education) and IB (International Baccalaureate).

thank you

to Our Valued Advertising Partners

Brookhaven
Canyon Ranch
Cadbury Commons
Cambridge Inns
The Charles Hotel
Gail Roberts/Coldwell Banker
Barbara Currier/Coldwell Banker
The Commons in Lincoln
Fresh Pond Ballet
Carol & Myra/Hammond
Brattle Office/Hammond
International School of Boston
Lux, Bond & Green Fine Jewelry
McLean Hospital & Pavilion
Thompson Island
Welch & Forbes

Support from these advertisers helps us produce the independent, high-quality publication Harvard alumni rely on for information about the University and each other.

TWIN FARMS

Twin Farms offers an intimate setting in the woodlands of Vermont.

Foster's company publishes the annual Trends® in the Hotel Spa Industry report. "We are seeing continued demand growth [for spas], and within that, there is a need for more skilled labor now for existing spas and for the projected spa growth," she says. Also clear is a qualitative shift in overall demographics and, therefore, changes in spa services and new facilities. For one thing, more spa-goers are aging and, consequently, more likely to have disabilities, chronic conditions, and medical needs: they may want spa services to address challenges such as pain relief and physical rehabilitation. Or, that group wants to focus on strengthening their bodies to prevent injuries and maintain an active lifestyle. "With baby boomers aging, there is a growing need [for them] to incorporate into their lifestyles a wellness approach," Foster says. "I think we will see increased demand for those services, and I expect to see the supply of spas with medical components grow at an appropriate pace." Teens and young adults are also a growing spa customer base, as is the slowly rising number of male guests, who now account for between 20 and 25 percent of all spa visitors. "Typically," Foster reports, "they are first taken by a female, and then realize the benefits and return by themselves."

One "early adopter" is Manchester, Vermont, native Max Levis, M.T.S. '11, a tutor

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746


PATEK PHILIPPE
GENEVE
Begin your own tradition.
You never actually own a Patek Philippe.
You merely take care of it for the next generation.
LUX BOND & GREEN
JEWELRY WATCHES GIFTS • SINCE 1898
416 Boylston Street · Boston 617-266-4747
46 LaSalle Road · West Hartford 860-521-3015
Annual Calendar Ref. 5205G, Calatrava cufflinks.

in the Harvard psychology department. He grew up going to the Equinox Resort & Spa because it was near his parents' hotel, The Wilburton Inn, and his mother is a longtime member who takes movement classes and gets facials, massages, and other treatments. He swims in the pool and loves the sauna and steam room, which, he asserts, are "definitely health benefits." "Part of the fun is also sitting outside on a snowy day in the hot tub," he adds. Equinox is "elegant and indulgent," he allows, but it's also "a healing place...it offers time and space for reflection. There's a fire going and people are there to help you. It's a place to let go of distractions—work, personal life, or the headaches we are carrying around with us. It's a place to ease our burdens."

TOPNOTCH

Topnotch's outdoor lounge has a roaring fire and mountain views.

Such gentle catering to the "mind, body, and spirit" is, arguably, especially important in New England, where residents often struggle with the transition from the slumberous wintry months to the energetic nature of spring.

Robin Heffernan began trying spas at Starwood Hotels while traveling for work. She found the treatments so helpful that she began sampling day spas in Greater Boston, including H2O, Exhale, Corbu, and Massage Envy. "My general philosophy is that I treat massage as I would diet and exercise or any other wellness activity, as more than a luxury event," explains Heffernan, who also plans to return to the Norwich spa later this year. "I wholeheartedly regard the

PREMIER PROPERTIES

The Currier Family Team
Three Decades in Cambridge Real Estate
An in-depth knowledge of each of Cambridge's unique neighborhoods, local businesses and schools.

BARBARA CURRIER
THE CURRIER TEAM | FINE PROPERTIES
Maggie, Barbara & Dick Currier, Victoria Kennedy, and Austin Scott
COLDWELL BANKER RESIDENTIAL BROKERAGE
P: 617-593-7070 | F: 617-876-7576
E: BarbaraCurrier50@gmail.com
www.BarbaraCurrier.com
171 Huron Avenue | Cambridge | MA | 02138
617.864.8566 | www.NewEnglandMoves.com

Hammond Residential
Real Estate
TOWNHOUSES WITHIN BLOCKS OF HARVARD SQ.

This end-unit townhome offers eight rooms of sunny living space. Four bedrooms and three bathrooms, including a top-floor master en suite with a private deck. Fully appliances kitchen with custom cherry cabinets. Private rear patio and city garden. Garage parking. Extensive renovations just completed.
... $999,500

Victorian-style townhouse with three levels of living space, including three bedrooms, a study, and two and one-half bathrooms. Gas fireplace. Hardwood flooring, custom closets, stainless-steel appliances, and a private rooftop deck and rear patio add to the amenities. Garage parking for two cars.
... $980,000

CAROL KELLY & MYRA VON TURKOVICH Vice Presidents, Hammond Residential Real Estate
Two Brattle Square | Cambridge, MA 02138 | 617.835.5008 & 617.834.0838
carolandmyra.com | hammondre.com

If you would like to list a property in our May-June issue, contact Abby Shepard: 617.496.4032.
HARVARD MAGAZINE

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

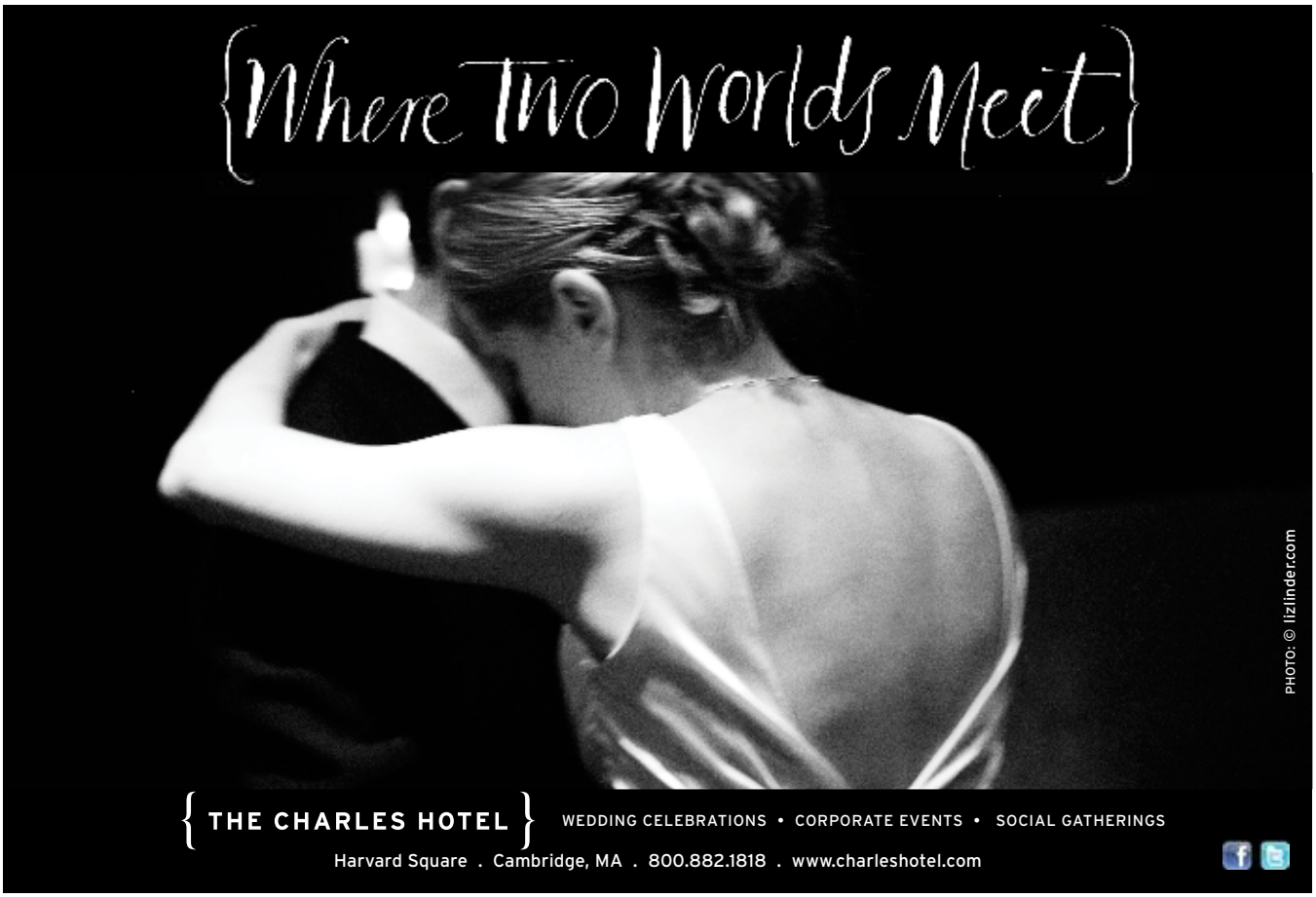
relaxation experience and physical benefits of massage as essential to health and well-being."

New England's hotel and resort spas provide just that through dedicated "getaway vacations" that come without the added hassle and unpredictability of airplane travel—or even having to waste too many hours in a car. The spas range widely in price (roughly from $250 to more than $1,000 per person, per night) and degree of luxuriousness. But many also offer all-inclusive packages (including meals), seasonal rates, or special deals with ad hoc fees for various services, all of which can bring the cost down.

Foster notes that New England's spas tend to focus on "simple, beautiful spaces and excellent services," whereas elsewhere "you may see spas topping each other in how fancy or glamorous they can be." Perhaps characteristically, "based on typical spending patterns and behavior," she adds, "by nature New Englanders are more,—I don't know if *frugal* is the word, but they tend to be more conservative in their behavior, and in their spending. They want value—and to see results."

The Berkshires and locales around New York City, including places throughout Connecticut, have become known as "spa destinations," Foster reports. In Connecticut, for example, the Mayflower Inn & Spa is another popular destination. The Berkshires have three distinct spa resorts located in and around the town of Lenox (also the home of Tanglewood). Canyon Ranch is an adult-only "destination spa" focused on health and wellness, that includes optional classes as well as medical evaluation and treatments. Cranwell is more of a traditional resort, with golf, family activities—and a sizable spa. "The wide range of spa services are an option on your vacation, but may not be the primary purpose of the stay," Foster explains. Kripalu, an epicenter for yoga and mindfulness, also offers body treatments, but in a less obviously luxurious atmosphere than the other two spas boast. Further north, Foster notes, are the high-end Omni Mount Washington Resort, in New Hampshire, the White Barn Inn, in Maine, and several others in Vermont: Twin Farms, the Equinox Resort & Spa, Topnotch Resort, and The Woodstock Inn & Resort, among others.

New England spas seem to be thriving and even growing, in terms of added services and lodgings. Canyon Ranch, which opened in 1989, has a 100,000-square-foot spa and additional lodgings. In addition to indoor and outdoor pools, tennis courts, a running track, and fitness classes, the resort offers medical evaluations, spa treatments, and even, within the last several years, the increasingly popular "metaphysical" consults (e.g., astrology, Tarot card and clairvoyant readings, numerology, and handwriting analysis). Laurie Matthews, Ed.M. '79, M.B.A. '83, found a special rate that enabled her to spend her first spa va-



Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

cation there, almost four years ago. That's when her planned health and fitness trip to Mexico was canceled at the last minute; in looking for an alternative, she found Canyon Ranch, which is only two and a half hours from her house, and went. It also happened to be the week the resort runs its "Gotta Dance" program. "It was three and a half days of dancing and rehearsals, five to six hours a day" with professional dance instructors and choreographers, Matthews reports. "Then, you put on a show. I loved ballet and dance as a kid and I found the classes inspiring. Dance is a lovely form of self-expression and joy. You get to channel your own inner Ann Reinking!"

Matthews, a director in the Harvard Business School's career and professional development office, has returned for the semi-annual Gotta Dance program ever since. She has also enjoyed the spa's daily hikes, a tai chi workshop, a labyrinth on its well-manicured grounds, or just relaxing in the café lounge. All that, and spa treatments: one day it's hot-stone massage, the next day it's deep-tissue work. "Canyon Ranch is phenomenal at making you feel taken care of," she says. "There, I am not just in touch with my body, but I'm of a more quiet mind and surrounded by beauty, looking out at the Berkshire Hills."

The experience, however, is more than mere pampering. Her periodic retreats are not really what many people call "spa vacations," Matthews adds. It's more like "an immersion in an active, healthy experience," she says, and reflects "a gift to myself." As the April Gotta Dance program nears, she is ready and waiting in the wings. "As mothers, wives, partners, parents, children of elderly parents, as managers and bosses, and co-workers," she adds, "we can be more productive and better with others when we ourselves are in balance. My philosophy is a twist on the golden rule: It's important to give unto ourselves as we give unto others."

Spas around New England

All the establishments below offer visitors the chance to "get away from it all" and linger, lounge, and otherwise soak up the spa experience during an overnight (or multiple-night) stay.

Canyon Ranch
Lenox, Massachusetts
www.canyonranch.com/lenox
413-637-4100

Chatham Bars Inn
Chatham, Massachusetts
www.chathambarsinn.com
800-527-4884

Cranwell
Lenox, Massachusetts
www.cranwell.com
413-637-1364

Equinox Resort & Spa
Manchester Village, Vermont
www.equinoxresort.com
800-362-4747

Kripalu
Stockbridge, Massachusetts
www.kripalu.org
866-200-5203

Mayflower Inn & Spa
Washington, Connecticut
www.mayflowerinn.com
860-868-9466

Omni Mount Washington Resort
Bretton Woods, New Hampshire
www.omnihotels.com/mtwashington
603-278-1000

Saybrook Point Inn & Spa
Old Saybrook, Connecticut
www.saybrook.com
860-395-2000

The Spa at Norwich Inn
Norwich, Connecticut
www.thespaatnorwichinn.com
860-886-2401

Topnotch Resort
Stowe, Connecticut
www.topnotchresort.com
802-253-8585

Twin Farms
Barnard, Vermont
www.twinfarms.com
802-234-9999

Wentworth by the Sea
Portsmouth, New Hampshire
www.wentworth.com
888-252-6888

The White Barn Inn
Kennebunk, Maine
www.whitebarninn.com
207-967-2321

The Woodstock Inn & Resort
Woodstock, Vermont
www.woodstockinn.com
802-457-1100

Dining room at The White Barn Inn

THE WHITE BARN INN


Guest room at the Woodstock Inn & Resort

WOODSTOCK INN & RESORT

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

COLDWELL BANKER
RESIDENTIAL BROKERAGE

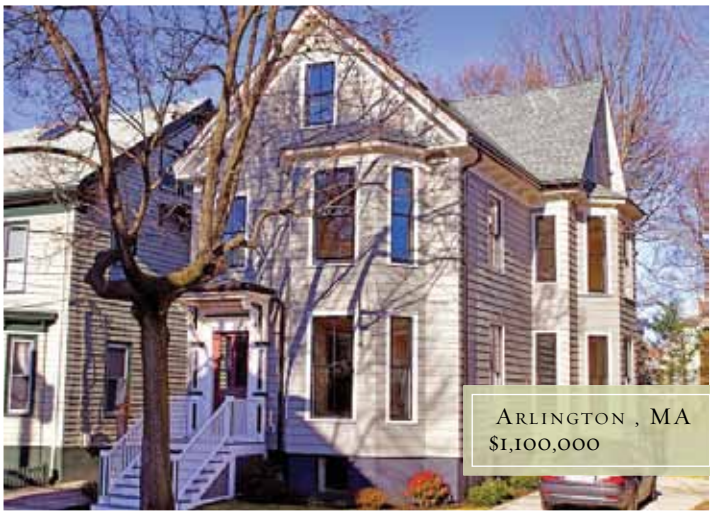
GAIL ROBERTS & TEAM

1730 Massachusetts Ave
Cambridge, MA 02138
617 245-4044

Cambridge, MA
$2,245,000

Somerville, MA
$939,000

Cambridge, MA
$2,400,000



Arlington , MA
$1,100,000

Building Community One Home at a Time

No. 1 in New England, No. 7 in North America for Coldwell Banker*

Call for our new spring properties

*Rankings based in the Coldwell Banker network for GCI in 2012

Global Kitchen

A French-Tunisian chef's personal touch in Cambridgeport

The small Baraka Cáfe lays out a feast of North African fare.

A few blocks from Central Square, a cozy jewel-box of a restaurant has quietly served up North African fare—Berber bread, *merguez* sausage, *bastilla*—and a flawless chocolate torte since 1997.

At night, Baraka Café's 25 seats can fill up fast. Regulars savor the food and stylish, homegrown décor. Both reflect the roots of Alia Radjeb Meddeb, Baraka's feisty executive chef and co-owner. Raised in Paris by Tunisian immigrant parents, Meddeb is also a pastry chef and restaurant veteran. "My first job in this country was as a dishwasher at the Algiers Café, in Harvard Square, in 1976," she says. "I had to work my way up. It wasn't easy!" (She is also the sister of celebrated chef Moncef Meddeb, founder of L'Espalier in Boston.)

But Baraka is undoubtedly her place: she picked out the purple disco-glittering fabric tablecloths, pillows that line bench seating, an iron scrollwork screen, and Moroccan-style tin and glass lampshades that add moody romance. "I am going to hire someone to think for me? Of course not," she says. "Maybe if you have the dollars you can do that, but I like to make sure I design the things themselves the way I like it."

She also painted the rear brick wall gold (a doorway leads to the tiny galley kitchen) and has hung mirrors, along with posters and paintings of North African landscapes. (The co-owner/chef, Krimo Dahim, is from Algeria).

No alcohol is served. But nearly as bracing is the *cherbat* ($2.50), a house-made lemonade infused with rose water and cinnamon that tingles the nerves.

Bold flavors and spices rule. Meddeb marinates green olives ($4) in *harissa* (hot chili sauce) and most often adds parsley, mint, and cilantro. The smoky Algerian eggplant dip ($5), loaded with roasted red peppers, garlic, and parsley, is topped with *labne* (a yogurt cheese). Flat Berber bread, cooked until it's burnt and bitter in spots, helps blunt the heat and comes in various forms. It is laid thick with thyme, sesame seeds, lemon juice, salt, and sweet caramelized onions in the *zaatar coca* appetizer ($7) and also supports the open-faced sandwiches (from $7 to $9.50)—try the grilled housemade *merguez*, flavored with paprika, cumin, and *ras el hanout* spices ("top of the shop"—the best). That one comes with a salad dressed with a black caraway, thyme, and mustard vinaigrette, and some of the best fresh *pommes frites* we've had.

The classic *bastilla torte* must be ordered 36 hours in advance and features homemade phyllo layered with tender chunks of squab or chicken, mixed with cinnamon, saffron, and almonds (market price). But all the regular dishes are very good. The vegetarian couscous stew ($11) has carrots, squash, potatoes, lentils, and fava beans in a complex bouillon. The baby lamb chops, also marinated with *ras el hanout*, are paired with an almond and saffron tartlet, as well as mint sauce and a sautéed medley of spinach, shallots, and leeks ($21).

The intriguing entrées make it easy to forget about dessert. Don't. Meddeb often makes her flourless chocolate torte ($7), akin to a soufflé, but she also likes to mix it up. "Right now I have the Key lime condensed milk and mascarpone cheesecake with the grape compote," she said in a recent phone call. "But I will also make the baklava with hazelnuts and a honey rose-petal sauce. It all depends on what I feel like that day. It's all up to me." —N.P.B.

BARAKA CAFÉ
80 Pearl Street
Cambridge
617-868-3951
www.barakacafe.com

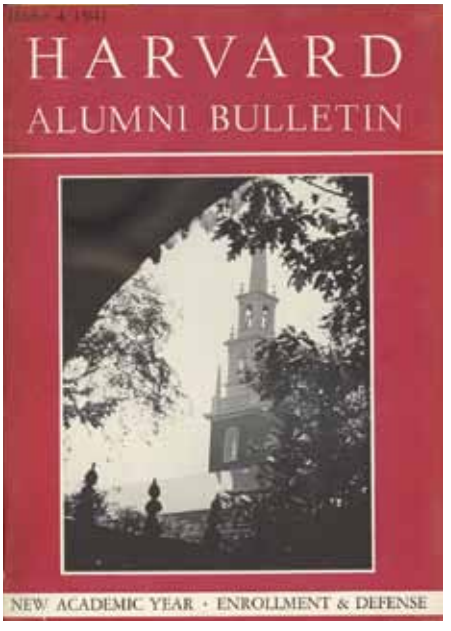
Photograph by Jim Harrison

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

From this...

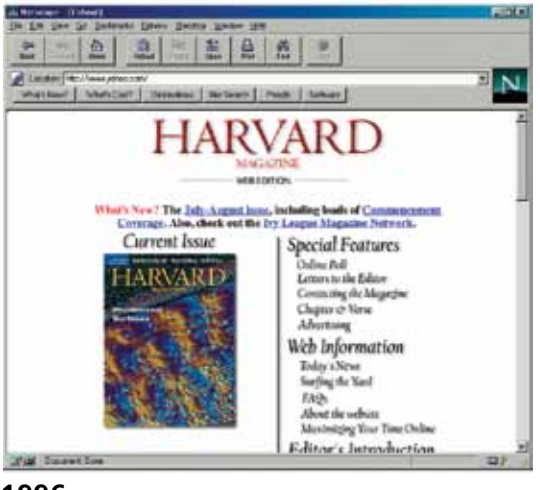

THE HARVARD BULLETIN.

1898



1946

1982



1996

to this...

Introducing the

Ready When *You* Are

The app meets readers where you read—on the bus, the beach, a plane, or a picnic—*it even works offline*. You can save favorite articles for reading later, or download an entire back issue for browsing on the go.

It's Custom

From science to sports, and people to public policy, you choose the topics you want to read in the **"My Magazine"** section of the app homepage. Add your school and class year to get even more news pertinent to you.

Best of Both Worlds

You get full print issues as well as constantly changing breaking news from the website—in one seamless reading experience. Not to mention *class notes and obituaries,* sortable by issue or class year.

A 2012 survey showed that more than three-quarters of the magazine's readers own a tablet or smartphone. The *Harvard Magazine* app supports iPads (version 2 and later), iPhones (4s and later), and iPod touch (4 and 5). Supported Android devices (on which Chrome is the recommended browser) include the Samsung S III and Motorola Droid Razr phones, as well as the Samsung Galaxy Tab 10.1. (The app may function on other devices, but those are not officially supported.)

Harvard Magazine app

Better Reading Experience

Beautiful layouts have been specially designed for *ease of reading on tablets and smartphones.* Adjust the font size, swipe between stories, browse galleries of images, even watch a video.

It's print plus.

Intuitive

Navigate issues from a table of contents, or simply swipe to browse. A built-in user guide explains simple icons for accessing the main menu, searching, saving favorite articles, downloading an issue, or returning to a previous story.

Harvard Magazine created this new platform in response to *your* suggestions. By providing the content in formats designed for tablets and smartphones, we aim to meet readers wherever you are, whether on the go or at home. For the first time, this app allows us to offer a print-like reading experience to international alumni, who have not received the magazine in the past.

Providing this new service required tremendous resources, including hundreds of hours of staff time and a substantial financial investment of more than $250,000, drawn from the magazine's reserves. We hope that you will *try the app free* for three months and then *choose to sponsor this project* for $12. Your sponsorship will bring to a broadened audience a better way to read coverage that is thorough, comprehensive, lively, and fair. It's a movable feast. And now you can have it to go.

HM For more, see http://harvardmag.com/mobile

app.harvardmagazine.com

RELIGION
RADCLIFFE
AGRICULTURE
CULTURAL IDENTITY
WOMEN'S EMPOWERMENT
MENTORING
MUSIC
VOLUNTEERING
ARCHITECTURE AND URBAN PLANNING

"Through my involvement with the Harvard Alumni Entrepreneurs SIG, I discovered what an amazing resource the University-wide alumni base is, and I learned how enriching it is to connect with alumni from such diverse backgrounds and geographies, all with a common passion."

–JOHN J. WEST, JR. MBA '95

SCIENCE FICTION
VETERANS
MODEL UN
PROFESSIONAL SPORTS
ARTS
SINGING
NONPROFITS
GLOBAL DEVELOPMENT
GENDER IDENTITY
NEGOTIATION
LEADERSHIP
WINE AND FOOD
THE ENVIRONMENT
ENTREPRENEURSHIP
CRIMSON KEY
REAL ESTATE
POLITICS
DANCE
GLOBAL FINANCIAL MARKETS FORUM
MEDIA AND ENTERTAINMENT

WHAT'S YOUR PASSION?

Harvard's Shared Interest Groups (SIGs) connect you with alumni who care about the same things you do. Food and wine, music and dance, cultural identity, entrepreneurship—these are among a host of topics offered through the SIG network. With 48 SIGs—and counting—we have a group for you.

Curious about who shares your passion?

LEARN MORE AT *ALUMNI.HARVARD.EDU/SIGS*

HARVARD
ALUMNI ASSOCIATION

JOHN HARVARD'S

JOURNAL

HUB OF THE (UNDERGRADUATE) UNIVERSE. The Inn at Harvard, shown in late January, is being converted into residential space to accommodate students during House renovation. Dunster is the first scheduled to be closed in toto, after Commencement, for complete renewal during the ensuing 15 months, following completion of pilot projects at Quincy and Leverett. Dunster's diaspora will house students in existing swing spaces along Massachusetts Avenue; apartment buildings and a renovated frame house (former home of Expository Writing) on Prescott Street; and the repurposed Inn, a hub including common dining and social spaces for House affiliates during their temporary displacements. House renewal will be on the new College dean's agenda (see page 23); renderings of the Dunster renovation appear on page 21; and complete House renewal coverage is available at http://harvardmagazine.com/search/node/house%20renewal.

Photograph by Jim Harrison

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

The Long Game in Allston

Following approval of the University's Institutional Master Plan (IMP) by the Boston Redevelopment Authority last October, the work of envisioning much larger, longer-term academic and commercial growth on Harvard's Allston properties has now begun. President Drew Faust signaled the news in a low-key e-mail, titled "Allston Update," just before the December holiday break. It announced that provost Alan Garber and executive vice president Katie Lapp would direct three committees charged with advising on "the creation or relocation" of academic facilities; planning "a community of commercial and nonprofit" entities in an "enterprise research campus"; and consolidating these ideas and putting them into a University, regulatory, and financing context.

Harvard's aspirations for Allston have come in waves. Ambitious plans early in the previous decade for a multimillion-square-foot research campus, perhaps with new undergraduate Houses, fell to financial realities. Construction on one large laboratory complex halted in 2010, when the University felt unable to incur more debt (at least several hundred million dollars) to complete it. Now reenvisioned as a home for much of the School of Engineering and Applied Sciences (SEAS), the building is a major capital-campaign priority; work is under way to redesign the site and proceed to completion soon. Construction has also begun on Barry's Corner: residential and retail buildings at the northwest corner of the Western Avenue–North Harvard Street intersection. Other projects are under way (renovation of the hockey arena) or just completed (Tata Hall, the new executive-education residence at Harvard Business School—HBS).

The IMP authorized nine projects, most within, or at the periphery, of the existing HBS campus and the athletic facilities. They include renovation or replacement of executive-education, housing, and conference buildings; construction of new HBS offices; and the Harvard Stadium renovation. There are three greenfield projects: a new basketball arena with housing, behind Barry's Corner; "a gateway" office building at the northeast corner of that intersection; and a hotel-conference center on Western Avenue—the only facility truly separated from the existing campus or current building sites. (The draft environmental impact report, published January 6, has comprehensive maps and a schedule for the IMP projects; see **evp.harvard.edu/allston%20**.)

But *most* of Harvard's Allston plans remain unformed. Schematic "long-term vision" diagrams from recent filings show new road systems, academic quadrangles on the parking lots and playing fields south and west of HBS, new academic and commercial buildings lining Western Avenue to the Charles River, and a large enterprise campus behind the Genzyme factory and beside the Massachusetts Turnpike interchange. In time, these developments may approach the scope of the plans from a decade ago. (See diagrams, page 23.)

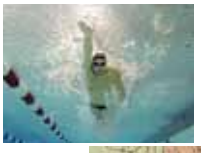
The committees "formalize a structure for the next phase of planning for Allston," said Provost Garber during a mid January conversation—beginning the process of "thinking hard about what else will go into Allston" for academic and other facilities as the area develops. Allston has been part of his agenda continuously, he noted. The new committees had begun to take shape even before approval of the IMP. Their unveiling, he said, formally starts long-range planning beyond the IMP, and in effect reboots the larger process of thinking about Allston.

The academic planning committee, which he chairs, will revisit research and teaching needs identified before the recession in light of current aspirations, Garber said (all three committee rosters are posted at **www.provost.harvard.edu/reports**). Purpose-built facilities in Allston may better suit research synergies emerging in new fields or across disciplinary lines than opportunities in Cambridge. (And SEAS will have a large presence in the vicinity now; the new planning will

HM Explore More

Harvardmagazine.com brings you continuous coverage of University and alumni news. Visit to find these stories and more:

The Next Level
page 26 | Watch members of the Harvard swim team practicing techniques to improve their speed.



Mapping the Border
page 76 | View maps from Harvard's collection that helped establish the Canada-United States border.

Wynton Marsalis on the Soul of Jazz
The bandleader blends performance and storytelling to paint a picture of jazz in nineteenth-century New Orleans. *harvardmag.com/marsalis*

Rediscovering the Unconscious
In a visit to Harvard, Nobel laureate Daniel Kahneman discusses decisionmaking and happiness with Walmsley University Professor Cass Sunstein of Harvard Law School. *harvardmag.com/kahneman*

Harvard College's Honor Code?
The faculty debates a new, formal approach to undergraduate academic integrity. *harvardmag.com/honorcode14*

VISIT HARVARDMAGAZINE.COM

IN THIS ISSUE

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

be influenced by what might locate near those applied scientists, by the non-SEAS users sited there, and by shared facilities incorporated into the structure.)

Identifying those fields involves judgments about how research will evolve in the next decade to 15 years, he indicated—a process in which the views of the Harvard community will be solicited. To that end, the committee members are drawn from most Harvard schools—including SEAS, on a growth trajectory, and the Graduate School of Design, which is out of space in Gund Hall. Members will help winnow the focal fields for Allston, consider faculty and student space needs, investigate how to pay for the plans, and see where these fit in Allston overall: a major role in shaping Harvard's future.

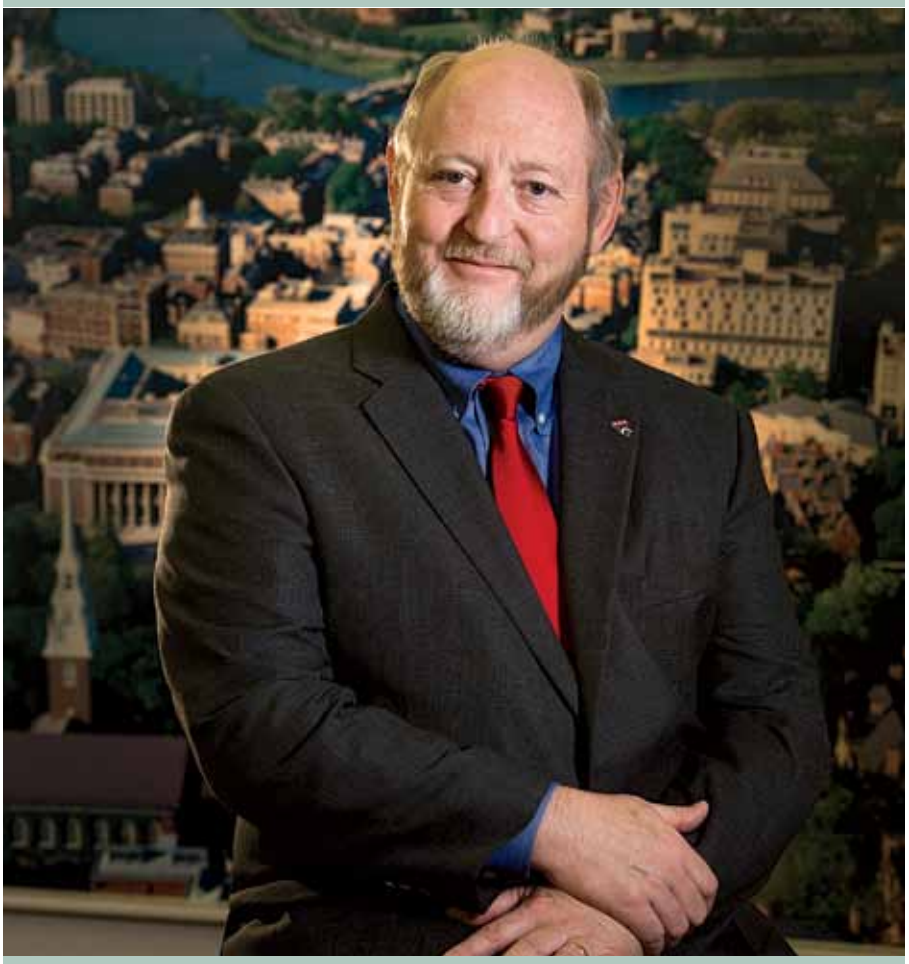
Asked whether the committees' creation signals anything about the pace of the Harvard Campaign and ambitions to accelerate the Allston timetable, Garber observed only that philanthropy and external economic conditions (such as endowment returns) were unpredictable—but having plans in place would enable Harvard to move quickly if the means become available.

The enterprise campus site is near "one of the greatest concentrations of research, students, and faculty in the world."

External conditions, aided by planning foresight, will also affect the timing for the 36-acre enterprise research campus. It is intended to accommodate commercial space capitalizing on discoveries from Harvard and other universities. The site, near what he characterized as "one of the greatest concentrations of research, students, and faculty in the world," is one-fifth larger than Kendall Square, the area around MIT that has become a magnet for biotechnology, pharmaceutical, and information technology businesses.

That planning committee, co-chaired by

HARVARD PORTRAIT



Photograph by Jim Harrison

Huntington Lambert

In the old farmhouse in Dover, Massachusetts, where "Hunt" Lambert grew up, "everything was broken." His chore as an eight-year-old was to wake up early and take a blowtorch to the pipes, so the water could get past the ice—or, if ice had burst the pipe, to cut out that section and weld in a new one. "I'm a handyman—all I do is fix things," he says. "I went from pipes to fixing multinational corporations and now, fixing higher education. Toasters are my specialty, but multinational corporations pay better." As dean of continuing education and University extension since 2013, his ambitions run large: "to ensure that high-quality education is available at a fair price to the 20 million Americans who need better education to participate in a knowledge economy." At 10 years old, the "massively dyslexic" Lambert couldn't read, but *could* break down and reassemble a car. He became an expert cliff-jumping and mogul skier who turned into a "really serious" student at Colorado College, where he majored in psychology and business, met his wife, Kelly, now a lawyer, and graduated in 1980. Next he joined a venture-capital company before earning an M.S. in management from MIT's Sloan School in 1984. He worked in strategic marketing for US West in Denver, then moved to Colorado State University, where he taught, directed the Center for Entrepreneurship, and, with a team, created a public online university in 11 months. Now, Harvard is offering HarvardX MOOCs, with student services, for credit at low tuition. "Besides the 20 million in America, let's talk about the two billion *outside* America," he says. "We all know that the only path to sustainable freedom is education."

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Yesterday's News

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

1924 The statue of John Harvard is moved from the Delta, west of Memorial Hall, to today's position at University Hall.

1939 Each undergraduate House has gradually acquired a nickname for its residents: "Gold Coasters" (Adams); "Pioneers" or "Funsters" (Dunster); "Elephants" (Eliot); "Deacons" (Kirkland); "Rabbits" (Leverett); "Bellboys" (Lowell); and "Puritans" (Winthrop).

The *Harvard Crimson* (reportedly sacrificing more than $2,000 in advertising) inaugurates "a campaign to eliminate [local] tutoring schools as an organized vice racket violating University rulings and ethics"; a front-page editorial denounces "intellectual brothels [where] cheating and illegitimate tutoring [are] elevated to…a large scale commercial enterprise," thus enabling some undergraduates to pass courses without doing any work whatsoever, "making a mockery of a Harvard education, a lie of a Harvard diploma."

1954 After 17 years of partial assistance, the Business School agrees to become a full partner in Radcliffe's one-year Management Training Program, the "closest thing to a Harvard Business School education available for women."

1974 Thanks to $180,000 from the National Endowment for the Humanities, the Faculty of Arts and Sciences has set up a major program of instruction in oral literature, including the study of folklore, natural magic, balladry, and mythology.

1984 Roger Brockett, McKay professor of applied mathematics, is assembling Harvard's first robotics laboratory in an effort to improve ways to incorporate the humanlike capacities for vision, touch, and manipulation into a robot's repertoire.

1989 Plans announced in January to assign one-sixth of the freshmen to the upperclass Houses randomly are retracted (at least for a year) by dean of the College L. Fred Jewett under pressure from irate first-years and worried House masters.

Olympians Lane MacDonald '89 and Allen Bourbeau '89 help lead the men's hockey team to sudden-death overtime victory and the NCAA championship in St. Paul.

Illustration by Mark Steele

Lapp and Rick McCullough, vice provost for research, includes faculty members versed in real estate and economic development, and administrators responsible for technology licensing and campus planning and construction. They have been charged to think "expansively," Garber said. Given Boston's process for negotiating taller, denser development than Cambridge permits, the resulting facilities, in toto, could represent a *big* investment (presumably led by private investors, on terms to be discussed). He emphasized that no one envisions a biotech or IT park per se: the uses will emerge with discovery and might embrace fields of research, as yet unknown, with commercial potential. Much planning, permitting, and infrastructure investment must precede construction, but the torrid pace of building in Kendall Square and on the Boston waterfront makes it attractive to prepare the site, should developers' appetite extend westward.

The academic and enterprise groups will exist for a few years at least, Garber suggested, assisted where necessary by support staff and consultants. They report to a steering committee. Garber is chair, joined by Lapp; the deans of law, design, SEAS, HBS, and the Faculty of Arts and Sciences (FAS); a professor of urban planning who has completed significant assignments in Boston (including the master plan for the Seaport innovation district); and administrators—significantly including Harvard's senior development, government relations, and financial officers. They are responsible, he said, for "Allston development from a holistic perspective": how pieces fit together, design, financing, and permitting. The steering committee will coordinate its work with the detailed planning and capital-budgeting functions managed by Katie Lapp, and with the schools, and issue recommendations to Faust. The Corporation's finance and capital-planning committees will also weigh in, before the governing board decides to authorize development projects.

The schematic plan for greater Allston laid out in the

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Brevia

Compensation Costs Clarified

In recent financial reports, the University has emphasized the importance of reining in burgeoning compensation costs, particularly for **employee benefits** (for instance, see "Fiscal Portrait," January-February, page 28, for the 6 percent rise in benefits costs during fiscal 2013)—a point for protracted bargaining with some of Harvard's unions. Such costs have *not* been adjusted for growth in the workforce, on which data are now available. From a low of 15,203 full-time-equivalent faculty and staff members during 2009, in the wake of the financial crisis and cost-cutting, Harvard's census has risen each subsequent year, to nearly 16,600 last October. Benefit costs per employee do rise—as healthcare expenses increase beyond changes in plan terms, payroll taxes expand with higher salaries and promotions, and so on. But given annual employment growth averaging 2 percent in recent years, the *per capita* increase in benefit costs is significantly lower than the aggregate figure.

A RENOVATION REVEALED. Dunster, the first undergraduate residence scheduled for a complete overhaul as part of House renewal, will feature enhanced social, arts, and exercise spaces, and a contemporary classroom, as shown in these renderings released in late January. Construction, which is scheduled to last for 15 months, will begin immediately after Commencement.

The Giving Spirit

The **Graduate School of Design** has received a $10-million gift from **John K.F. Irving** '83, M.B.A. '89, and **Anne Irving Oxley** in honor of their father, John E. Irving; they had previously endowed a professorship in landscape architecture. The gift endows fellowships, research funds for junior professors, and research in landscape architecture; it also supports funding for innovations, the undergraduate architecture concentration, and Gund Hall renovations. John K.F. Irving will chair the school's campaign....Media-industry leader **Sumner Redstone** '44, LL.B. '47, has donated $10 million to **Harvard Law School**, to fund postgraduate public-service fellowships.... Separately, **Harvard Medical School** is one of six research institutions each to receive a $90-million endowment from Ludwig Cancer Research; it will support work on the disease's resistance to therapy, as fully described at **http://harvardmag.com/cancer-14**. Days later, **Weill Cornell Medical College** announced a $75-million gift for cancer research and care, and the **University of Southern California** (in the middle of a $6-billion capital campaign) unveiled a $50-million gift toward a 190,000-square-foot bioscience, engineering, and medical research center.... On January 20, **Columbia** president Lee C. Bollinger announced that its campaign, launched in 2006, had concluded with $6.1 billion raised—including $1 billion for financial aid, a like amount for facilities, and more than 260 endowed professorships.

Primate-Care Penalties

The U.S. Department of Agriculture has cited **Harvard Medical School** (HMS) for 11 violations of the Animal Welfare Act from early 2011 through mid 2012—four of which resulted in the death of primates—and levied penalties of $24,036. Many of the problems have been previously reported (see "Animal Research Reforms," May-June 2012, page 45). HMS announced last April that it would close the New England Primate Research Center, in Southborough, its principal venue for animal experiments; it cited financial pressures on research as well as the estimated large capital cost of renovating the facility (see **http://harvardmag.com/primate-14** for more information).

Thinking Spatiotemporally

The National Science Foundation has funded a **Center for Spatiotemporal Thinking, Computing, and Applications** (www.stcenter.net) to support research and development of solutions to large challenges where spatiotemporal analyses could be decisive (in climate change, reduction of risks from natural disasters, and so on). In addition to business and government-agency partners, the collaborating schools, to date, are the University of California at Santa Barbara, George Mason, and Harvard—through the **Center for Geographic Analysis** (http://gis2.harvard.edu—see "Hello, Geotech," November-December 2006, page 44). The new center's anticipated research budget is more than $2 million annually, for at least several years.

On Other Campuses

As further evidence of changes in higher education driven by new conditions in the financial and competitive landscapes,

Renderings courtesy of Harvard Public Affairs and Communications

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Inside Higher Education (*IHE*) has reported that **Haverford College** may restrict its no-loan aid packages, at least for students from somewhat higher-income families. Cornell and Virginia have recently announced similar refinements. *IHE* also reported that **Johns Hopkins** is discussing larger, longer stipend packages ($30,000, five years, up from $22,000 now) for graduate students, accompanied by reducing graduate enrollment by 25 percent during a five-year period; it is also "leaning junior"—emphasizing hiring junior professors to succeed retiring senior faculty members.

Nota Bene

Early app avalanche. The College announced in December that 992 applicants from a pool of 4,692 were granted **early-action admission** to the class of 2018, entering this autumn. During 2011 and 2012—when early action was reinstated after a four-year hiatus—774 and 892 applicants were admitted. Because admitted early applicants have a strong propensity to enroll, members of the regular admissions pool face an extraordinarily low admissions rate—heading toward 3 percent. Total applications were 34,295, down 2 percent from last year.

Bomb scare. Undergraduate exams were disrupted on December 16 when University police and others received e-mailed threats that explosives had been placed in Sever, Emerson, Thayer, and the Science Center—especially alarming following the Boston Marathon terrorism last April. After the e-mails were traced, **Eldo Kim** '16 was charged with making the threats in order to avoid an exam—and could face five years in prison and a $250,000 fine. For a full report, see **http://harvardmag.com/kim-14.**

Arts honorand. Novelist and poet Margaret Atwood, A.M. '62, Litt.D. '04, returns to campus on May 1 to receive the Harvard Arts Medal during the annual Arts First festival. She was the Radcliffe Medalist in 2003 (see **http://harvardmag.com/democracy**).

JEAN MALEK

Margaret Atwood

Making book. Five Harvard affiliates are finalists for National Book Critics Circle awards for works published in 2013; winners will be announced on March 13. They are: **Amy Wilentz** '76, *Farewell, Fred Voodoo: A Letter from Haiti* (autobiography); **Leo Damrosch**, Bernbaum professor of literature emeritus, *Jonathan Swift: His Life and His World* (biography); **Kevin Cullen**, NF '03, and Shelley Murphy, *Whitey Bulger: America's Most Wanted Gangster and the Manhunt That Brought Him to Justice* (nonfiction); **Frank Bidart**, A.M. '67, *Metaphysical Dog*; and **Lucie Brock-Broido,** a former Briggs-Copeland poet, *Stay, Illusion* (the latter two both in poetry).

Commercial connections. In further signs of Harvard's interest in business connections and sponsorships, the athletics operations' affiliation with John Harvard's Brewery extends into winter-season sports with the **"Crimson Pub"** offering food and a cash bar in Dillon Lounge before games, at intermission, and post-game. At the **School of Engineering and Applied Sciences**, the third annual symposium on the future of computation, presented by the Institute for Applied Computational Science on January 24, was underwritten by Liberty Mutual Insurance (platinum), VMware (gold), and Microsoft (the student computational challenge sponsor). The Women Engineers Code Conference was "made possible by" Goldman Sachs, Facebook, Intuit, Rackspace, Google, Qualcomm, Microsoft, and others. And **Hasty Pudding Theatricals'** man and woman of the year extravaganzas are now sponsored by Related Companies, the New York-based real-estate developer (with Boston operations).

Football facilities. As plans advance to renovate **Harvard Stadium** (including the addition of 350 enclosed seats and reduction of overall capacity from 30,262 spectators to 22,333), another storied venue is about to be overhauled, too. **Notre Dame** has announced that it will spend $400 million to add 750,000 square feet of new buildings to the south, east, and west sides of its stadium. The structures will house academic departments; student organizations and recreation and career centers; and up to 4,000 premium seats.

Miscellany. **Sandra Naddaff** '75, Ph.D. '83, senior lecturer on literature and comparative literature and director of the freshman-seminar program, has been appointed dean of Harvard Summer School. She served as Mather House master from 1993 to 2010....Skanska USA, the construction company, has announced a $57-million contract to build Harvard Business School's **Ruth Mulan Chu Chao Center**, a replacement for Kresge Hall, part of the executive-education complex at the eastern end of its campus (see full details in **http://harvardmag.com/chao-14**). Work is to begin in March, and to be completed for Commencement 2016.

STEPHANIE MITCHELL/HARVARD PUBLIC AFFAIRS AND COMMUNICATIONS

Sandra Naddaff

HARVARD MAGAZINE/JC

Rebuilt to a LEED gold sustainability standard and expanded by 10,000 square feet, the Tozzer Library building on Divinity Avenue will, this May, help bring together all the sub-disciplines of the anthropology department, as the social anthropologists (now in William James Hall) move in to join the archaeologists in the adjacent Peabody Museum. In accord with larger discussions about the changing role of academic libraries, the project has reconceived Tozzer as a series of collaborative spaces, rather than simply as storage for the 54,000 volumes that will remain.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

SOURCE: DRAFT ENVIRONMENTAL IMPACT REPORT, DECEMBER 2013

Harvard in Allston, now and in development (above left): The figure shows existing uses, such as the athletic facilities (the Stadium is the blue *U*) and the Business School campus. Orange and blue blocks are projects authorized by the Institutional Master Plan; yellow blocks, previously approved, include the science center (the large quadrilateral, lower center). Allston imagined (above right): the schematic indicating potential building along Western Avenue and filling the enterprise research campus (lower right).

IMP and environmental report is exactly that, he emphasized: provisional at best. But clearly, as FAS, the design and medical schools, and others plan for future research and teaching space; as the IMP and other projects morph from plan to reality; and as Boston's building momentum resumes and the University's fundraising gains momentum, the sap is running again for a new season of imagining the Allston, and Harvard, of the future. Said Garber, "We're excited to move forward."

The College's New Dean

Rakesh khurana, Bower professor of leadership development at Harvard Business School and professor of sociology in the Faculty of Arts and Sciences (FAS), will become dean of Harvard College on July 1. He and his wife, Stephanie Ralston Khurana, have served as master and co-master of Cabot House since mid 2010, and will retain those posts when Khurana assumes his new duties in University Hall. FAS dean Michael D. Smith announced the appointment on January 22. It follows a formal search, and concludes a somewhat difficult decanal transition from Evelynn M. Hammonds, who departed at the end of the 2012-2013 academic year, to Donald Pfister, who serves as interim dean this year.

As a House master, Khurana is already deeply involved with undergraduates' daily lives outside the classroom, an important aspect of the College dean's responsibilities. In inclination and intellect (he studies leadership development, organizational behavior and effectiveness, and management as a profession), he is known for building consensus, listening and creating opportunities for others to be heard, and enthusiastic engagement with the students in Cabot House. (For a full report on Khurana's background and Harvard commitments, see **http://harvardmag.com/khurana-14**.)

In his statement, Dean Smith said Khurana "brings to the deanship an intimate understanding of the Harvard College experience, a profound commitment to the values of a liberal-arts education, and a warm and compassionate personality that accompanies his belief in the importance of community and an inclusive approach to decision-making." The new dean, he continued, "will advance undergraduate education with both a respect for enduring values and the

11th Annual

Attention Juniors Class of 2015 Enroll Now... College Application Boot Camp ®

Intensive 4-day Camp Summer 2014
Join us in Cambridge, MA
Complete your college applications with leading admission pros:
Dr. Michele Hernandez,
former Assistant Director of Admissions at Dartmouth College and author of ***A is for Admission***
and
Mimi Doe,
parenting guru and author of ***Busy but Balanced***
• *Last 10 years were sellouts*
• *Call now to reserve your space*

COLLEGE BOOT CAMP APPLICATION

Application Boot Camp ®
ApplicationBootCamp.com
1-781-530-7088
Email: Kristen@ApplicationBootCamp.com

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

ability to embrace change. He understands the interplay of academic, extracurricular, and residential life at Harvard...."

Speaking by telephone from Davos, where he was participating in the World Economic Forum, Khurana said that he and his wife insisted on remaining at Cabot House, citing their enjoyment of the responsibility and its importance in informing their sense of student needs as he shapes College policy. Asked about FAS's prospective academic honor code for undergraduates (Khurana serves on the committee leading this work), he broadened the conversation this way: "There is a strong thirst among students, faculty, and staff to discuss these issues and create space for these discussions to happen. That is a really important part of the College education. It goes back to the roots of the liberal arts," as students shape their "moral identities" and determine "the people they hope to become." That work goes on not only in the classroom but also in the Houses, he said. "It's hard to have those conversations without considering the whole person," and he expressed hope that the opportunities for such exchanges and reflections could be strengthened—part of his desire, as College dean, to "work in ways that create a transformative experience for our students."

Rakesh Khurana

STEPHANIE MITCHELL/HARVARD PUBLIC AFFAIRS AND COMMUNICATIONS

Read more about the Khuranas' perspectives on the undergraduate experience in "Learning, and Life, in the Houses" (November-December 2013, page 46).

THE UNDERGRADUATE

Baby Talk

by JESSICA SALLEY '14

About halfway through freshman year, one of my roommates made a startling confession. "You know, before we all got to school...I thought you had a baby."

My roommates and I were draped across the futons in our common room, and as she said it, she burst out laughing. Everyone else followed, but I stayed silent.

"Wait. What?" I asked, dumbfounded.

"Well, you had that Facebook album just called 'BABY!' and someone left a comment on it saying, 'I didn't know you had a kid!'"

"Uhh. That's my 40-year-old half-sister's son," I finally said. "And the commenter was my friend Anthony, who sat next to me in math class for three years. I'm pretty sure he'd have noticed if I'd had a baby."

She held up her hands, as if accused by the law. "I know. I figured that out when you showed up to school and didn't have a kid," she responded, still laughing. "My brother and I just had this theory that you were a teen mom and you wrote a really moving essay about it, and that's how you got in. It was sort of a joke, but, I mean, you are from Louisiana...." She trailed off, unsure whether she was still in friendly territory or had overstepped the line.

I laughed, because what else can you do when your freshman roommate tells you she thought you would show up to Harvard dragging a baby carriage up the stairs of your freshman dorm, saddled with a carry-on diaper bag, a suitcase full of formula, and a baby on your hip?

My laughter turned a little more genuine when I tried to picture it myself. I'm not exaggerating when I say I completely lack whatever complex mental or chemical processes comprise "maternal instinct." When my half-sister first handed me my newborn nephew, the BABY! from my Facebook album all those years ago, I looked into his beautiful steel-blue eyes, took in the reality of his teensy button nose and his little yawning mouth, and promptly shoved him toward my father.

He looked at me, concerned. "Is something wrong?" he asked.

"No. No. I mean, no, I just didn't know what to do with that thing."

Four years later, not much has changed in that department. I teach civics to fifth-graders in Allston once a week, and I'm quite fond of all of them. They are witty, insightful little people who drive me insane in their own individual fashions, but who also sometimes restore my faith in humanity. At the same time, I appreciate the statutes that prevent me from making physical contact with them, if only because this has legally justified my awkward, two-pat-on-the-shoulder response to the few instances in which they've rushed to greet me or seek comfort from me. (This mostly happens in attempts to trump up charges of meanness against classmates.)

At school, even my friends in serious relationships think mostly like me: for most of us, having children, and even marriage, are entirely abstract ideas at this point. In conversations with my roommates, it's about Pinterest boards full of bridesmaid dresses or arguments on DJs versus live bands. "When I get married to Justin Timberlake" is still a pretty common way that these dreams take form, whether or not a flesh-and-blood significant other is in attendance. We have no idea whom we'll marry, or when; we just like the idea of planning a big party with an open bar that all of our friends will feel obligated to attend.

When conversations about marriage and having children turn more serious, we talk of the unrealistic expectations set up for us by the media. We share blog posts about how race, class, and womanhood are represented in TV shows from *Girls* to *Scandal*. We've read books like *Lean In*, and if we haven't, we know how to talk as if we have. We ultimately agree that we want to be established in our careers before we can really consider starting a family. But we also know how to critique Sheryl Sand-

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

berg's book: that her claims about how women should assert themselves in the home and in the workplace are mostly applicable to a narrow subset of the population—women with lots of education, lots of money, and lots of privilege.

It was hard for me the first time I realized that, when I graduate from Harvard, I will certainly fall into two of these categories, even if I'm never rich. I couldn't—and still can't—help feeling sometimes like I'm betraying a part of myself, no matter how much I know that I sent off my application to Harvard with every hope of receiving a letter in the mail that would set me free from spending the rest of my life in Covington, Louisiana.

At home, well, things are not like they are here. My friends and I made a list, the week of high-school commencement, of the 10 mothers who would graduate with us the next day. As if some great water had broken, baby and wedding announcements have continued pouring into my Facebook news feed since then. But now, even some of us who went to college are getting engaged and—or—pregnant.

I'm at lunch with my family at a café in town during winter break, and I notice a table of women across the room. They're done with their meal, and one of the women, a redhead, gets up and hugs the other two goodbye. She picks up the plastic baby-carrying device that sits next to the table and walks out of the restaurant, and that's when I realize she graduated from high school with me.

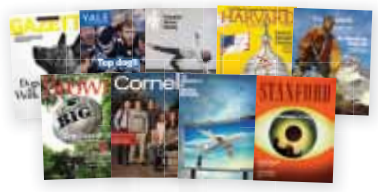
The week of high-school commencement, my friends and I made a list of the 10 mothers who would graduate with us the next day.

She sort of looks like a grown-up, but I remember her birthday was after mine and I certainly don't feel like a grown-up. I am almost incensed, because I remember all the gossip that went on in high school about the girls who got pregnant. My initial response is admittedly unkind: This is even worse! I think. My old classmates who are having children now are no longer just products of bad sex education, low expectations from teachers and parents, and teenage rebellion! They think they can have stable relationships and children at 21 and 22, before they have a degree or a job! My head fills with exclamation points.

Later that day, as I browse Facebook to avoid writing my thesis, three engagement announcements pop up on my news feed. I inspect them all with an interest that I suspect I couldn't sustain if I weren't supposed to be analyzing my primary sources. Suddenly, another former classmate posts a link to a blog entry entitled "23 Things to Do Instead of Getting Married at 23."

Shots have been fired. I watch the combative comments pour in before I return to the article I was reading. "Really? Eating a whole jar of Nutella is better than being married at 23?" one of the comments begins, referencing number 17 on the list.

IVY IS... ACCESS



Give your brand exclusive access to the power of **1.2 MILLION** fellow Ivy alumni—the ***most influential, discerning*** and ***active audience*** available anywhere in the world.

For more information about advertising in the nine award-winning publications of the Ivy League Magazine Network, contact ***rossgarnick@ivymags.com.***

Ivy League Magazine Network

THE IVY LEAGUE MAGAZINE NETWORK, THE SMART ADVERTISING CHOICE.

Ohana Family Camp

Create lifetime memories for your family this summer on peaceful Lake Fairlee in Vermont. Cozy cabins with fireplaces. Farm-fresh meals. Swimming, sailing, canoeing, kayaking, fishing, hiking, biking, tennis, crafts, and more. Delighting generations of families since 1905. Imagine your family right here.

www.OhanaCamp.org

Destination ITALY

TURN TO PAGE 67

for great places to stay in Italy!

It's not too late to become a doctor

Bryn Mawr College's prestigious Postbaccalaureate Premedical Program will help you realize your dreams.

- *For women and men changing career direction*
- *Over 98 percent acceptance rate into medical school*
- *Early acceptance programs at a large selection of medical schools*
- *Supportive, individual academic and premedical advising*

Bryn Mawr College
Canwyll House | Bryn Mawr, PA 19010
610-526-7350
postbac@brynmawr.edu
www.brynmawr.edu/postbac/

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

"Spare me."

The commenter has a point. I'm currently writing 70-plus pages that probably five people in the world—six, I guess, if my mom makes it through my whole thesis—will ever read, so I suppose I should understand what it means to have different priorities.

Still, there are some aspects of baby madness I can't abide. One day over break, my older sister is getting ready to meet a good friend from high school, who has just come from his best friend's baby shower. This one had a twist, though. It was a "gender reveal" party—a trend I'd never heard of before—in which the happy couple presents their guests with a cake, the outside covered in white frosting. But when the knife is brought down and the first slice produced for the waiting crowd—like magic!—the icing holding the layers together is pink or blue. Everyone celebrates the impending arrival of the baby boy or girl.

My sister and I talk about how annoying it is to prescribe gender expectations to your children even before they are born. We discuss it in the kitchen for a couple of minutes, before our mom provides the last word: "That is one of the stupidest things I've ever heard. I was just so happy to be having my children at all!"

I wonder about having a child, whether it means you'll be happy. Especially when you're so, so young. The girls at home—a lot of their Facebook statuses include the same worries and sadnesses. While they're pregnant, the morning sickness—and the apprehension—are unbearable. When they finally have their kids, the vomiting stops but the anxiety doesn't. They write that they never get enough sleep. That the bills are getting higher, that it's tough to figure out how to fill out insurance forms or find the right daycare. That they're sick of people judging them for having kids when they're young.

Mostly, though, what they post is pictures: of their babies, of themselves with their children, of kids with their fathers, of family trips with young grandparents on the weekend. As for the few good friends I've had who are now mothers—who mostly stopped being good friends, because I never knew how to talk to them about it, really—I've been paying attention for a couple of years now, and it's actually amazing how fast they grow—the children, I think at first, but my old classmates, too—how quickly things change. In photographs, at least, everyone is all smiles. They look truly happy, at least for the moment caught in the frame.

I wonder if my roommates will ever actually see me toting a child through Harvard Yard. Maybe one day, I think. Maybe not. Certainly not now. After all, I haven't finished my thesis, gotten a job, met someone I'd ever consider spending my life with, or even read *Lean In* yet. But when I go home after graduation, I want to meet my friends' kids and pat them awkwardly on the head. By God, though, if someone invites me to a gender-reveal party I will—

Make some comment about loving your child no matter what, grit my teeth, and show up to the party, gender role-subverting baby gift in hand. Eating the cake, I suspect—whether pink or blue—will be hard to avoid.

Berta Greenwald Ledecky Undergraduate Fellow Jessica Salley '14 is likely still procrastinating in writing her thesis. After graduation, she hopes to enter a career in anything but childcare.

SPORTS

Thicker than Water

Flying down Ivy lanes with the brothers Satterthwaite

In mid November, at a swim meet among Harvard, Cornell, and Dartmouth at Hanover, spectators witnessed a rarity in college aquatics: three brothers racing in the same competition. Crimson co-captain Chris Satterthwaite '14 and sibling Sean '17 swam for Harvard, while middle brother Tim, a Cornell junior, raced for the Big Red. To make things even more interesting, all three swim the

Illustration by Caroline Attia

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

same events: the 50-, 100-, and 200-yard freestyle. In the anchor leg of the 4 x 100-yard freestyle relay, Chris and Tim went head-to-head: Harvard took first, Cornell third.

Harvard also won the meet, garnering 13 wins in 16 events. "They blew us out of the water," says Tim, "but the trash talking was all there, the joking around." He informed Chris that with another five yards, he probably would have caught him, and told Sean, the slimmest of three, "That Harvard weight room hasn't put any weight on *you*."

The trio's parents flew in from Minnesota for the meet. "You end up rooting for the kids to do well rather than to beat each other," says Ann (MacKenzie) Satterthwaite '84, who managed the women's swim team in college. A former investment banker, she married Tony Satterthwaite, a Cornell-educated businessman. They started a family in England and in equatorial Singapore, where the kids all hit the pool. ("It was so *hot* there," Chris recalls. "From very, very young ages we were in the water a lot.") The youngest, daughter Katie, now a high-school junior, also swims competitively. "The only one who doesn't swim is the dog," Ann says. The family settled in Edina, Minnesota, in 2003.

"Tim is and always was super-competitive. He likes beating the other guy. He loved playing rugby in England—he would like swimming even more if he could *hit* people," Ann explains. "Chris likes the grace and solitude, and challenging himself to do better. Sean has good stamina and is also competitive. All three were Eagle Scouts."

So far, Chris has made the biggest splash in Ivy League pools. His best times for the 50 free (19.67 seconds), 100 free (42.99), 200 free (1:35.00), and even the 100 backstroke (49.92) all rank in the top 10 ever recorded by a Harvard athlete, and the 100-free time is a College record. He also swam on the 200- and 400-freestyle and 400-medley relay teams that hold Harvard records, with the 400-free relay also setting an Ivy record. Years of training and practice underlie his success, but it doesn't hurt that at six feet, five inches, and 185 pounds, he slices through the water with a long, narrow silhouette. A longer body and arms translate into fewer, but lengthier, strokes to cover a given distance, and extra reach increases both water speed and the ability

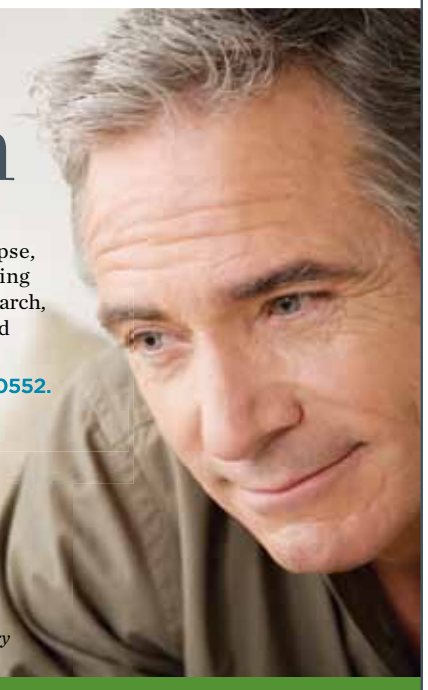
RIVERWATCH

VIRGINIA • 56 Acre Riverfront Estate • 7,237 Finished Sq. Ft. • Spectacular James River Views • 30 Minutes to Charlottesville • Gracious Rooms • Owned by an HBS '66 Alum • $2,400,000

STEVENS & COMPANY REALTORS • Charlottesville • (434) 296-6104
www.stevensandcompany.net

McLean *Fernside*
HARVARD MEDICAL SCHOOL AFFILIATE

Answers *for* ADDICTION



Fernside helps break the cycle of relapse, treating addiction and any accompanying illnesses. Blending compassion and research, this Harvard Medical School-affiliated program is unparalleled.

Let us help you today. Call 855.707.0552.

BEST HOSPITALS U.S.News NATIONAL RANKINGS 2013-14
America's #1 Hospital for Psychiatry

Boston, Mass. www.mcleanhospital.org

PARTNERS HEALTHCARE

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Sean and Chris Satterthwaite

to touch the wall sooner at the finish. Sean and Tim are built on a similar model, though three and six inches shorter, respectively, than their brother. (Male Olympic swimmers typically stand between six feet, two inches, and six feet, four inches, and weigh from 180 to 190 pounds.)

Aerodynamics count. "It is about efficiency, minimizing water resistance," says head swimming coach Kevin Tyrrell. "There aren't many fish designed like a barge." Chris explains, "The wider I am, the more drag, the more water I have to displace to move forward." In freestyle, streamlining means rotating from side to side through an arc of nearly 180 degrees with each stroke, maximizing the time spent sideways in the water: a body perpendicular to the pool's bottom offers less resistance than one parallel to it. "You want that rotation to look smooth," Chris says. "Graceful and easy."

Freestylers usually breathe every three or four strokes, but in the 50-yard sprint, lasting only about 20 seconds, he swims the whole race on one breath. In addition to sound technique, fitness is the key to winning races; the swimmer in better shape slows down less in the final lap. There are also intangible talents like having "a feel for the water," says Chris: that means having a good kinesthetic sense of where your body is and how it reacts to water. And there's a huge mental component that includes the ability to stare at a black line on the bottom of the pool for five hours a day, or 20 hours a week, of practice. In addition, "Some people are very, very competitive," Sean notes. "They may do less work in practice, but have a racing mentality: as soon as that guy steps onto the blocks, he's a racer." It helps to reach as far out as possible on every stroke, especially the last one, where "out-touching" an opponent at the wall often decides a race. "As a kid, I used to picture a great white shark chasing me," Sean recalls. "You will go pretty fast."

Swimmers go even faster in relay races, in which four teammates each swim a leg; relays score more points than individual events. In an individual race, a typical reaction time to the starter's electronic "beep" is 0.7 seconds, but in a relay race that can drop to 0.03 or 0.04 seconds, and such tiny differences can be decisive. Furthermore, the first swimmer in the race dives in from the blocks, but the other three "can take two steps and almost get a running start," Tyrrell explains. As the previous swimmer finishes his leg, "you judge how fast he is coming in and predict when he will touch the wall," Chris says. (Diving in too soon disqualifies the team, but it's a legal exchange as long as a swimmer's toes are in contact with the block as his teammate hits the touch pad on the wall; electronic sensors flag violations.) The group effort seems to energize the athletes: "No one wants to have the slowest split time," Chris explains.

"I used to picture a great white shark chasing me," Sean recalls. "You will go pretty fast."

Technically, the two Harvard brothers are walk-ons; neither received a "likely letter" prior to admission, as recruits generally do. They'd played cricket and rugby in England. ("Swimmers are very uncoordinated on land," says Chris, who once broke a foot playing beach football on a team trip to Puerto Rico. "You want to keep them away from any activity where they might hurt themselves." Sean adds, "Chris stuck with swimming because he was good at it. I stuck with it because I was awful at everything else.") All three brothers had distinguished, state-championship careers at Edina High School under coach Art Downey, who has just completed his fifty-seventh year there. "Swimming for him," Sean says, "was an experience you wanted to have at all costs."

History suggests that Chris and Sean are more likely than Tim to leave college as Ivy League champions. Since 1994, only Harvard and Princeton have won Ivy titles—nine for the Crimson, 12 for Princeton, including the last five. Cornell's lone championship came in a four-way tie in 1984. This year's winner gets decided at the season-ending Ivy meet, held at Harvard's Blodgett Pool from February 27 through March 1. Regardless of the outcome, it's a foregone conclusion that three of the athletes having the most fun, rooting for each other, and swimming some of the best times, will be named Satterthwaite.

—CRAIG LAMBERT

HM

Visit harvardmag.com/extras to view a video of the Satterthwaites training to increase their speed.

Photograph by Jim Harrison

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

HARVARD
ADVANCED LEADERSHIP INITIATIVE

Seeking 31 great leaders...

motivated to tackle big challenges facing
communities around the world

with a successful track record of 20-25 years
of accomplishments in their primary career

recognizing the value of re-engaging with Harvard
to prepare for their next phase of life's work

The Advanced Leadership Initiative is a year of education, reflection, and student mentoring led by a unique collaboration of award-winning Harvard faculty from across professional schools. The program is dedicated to educating and deploying a new force of experienced, innovative leaders who want to address challenging global and national problems. Inquire now for 2015.

Visit the website to be inspired by the possibilities:
advancedleadership.harvard.edu
or email the fellowship director: **john_kendzior@harvard.edu**

Why "Big Data" Is a Big Deal

Information science promises to change the world.

by Jonathan Shaw

Data now stream from daily life: from phones and credit cards and televisions and computers; from the infrastructure of cities; from sensor-equipped buildings, trains, buses, planes, bridges, and factories. The data flow so fast that the total accumulation of the past two years—a zettabyte—dwarfs the prior record of human civilization. "There is a big data revolution," says Weatherhead University Professor Gary King. But it is not the *quantity* of data that is revolutionary. "The big data revolution is that now we can *do* something with the data."

The revolution lies in improved statistical and computational methods, not in the exponential growth of storage or even computational capacity, King explains. The doubling of computing power every 18 months (Moore's Law) "is nothing compared to a big algorithm"—a set of rules that can be used to solve a problem a thousand times faster than conventional computational methods could. One colleague, faced with a mountain of data, figured out that he would need a $2-million computer to analyze it. Instead, King and his graduate students came up with an algorithm within two hours that would do the same thing in 20 minutes—on a laptop: a simple example, but illustrative.

New ways of *linking* datasets have played a large role in generating new insights. And creative approaches to *visualizing* data—humans are far better than computers at seeing patterns—frequently prove integral to the process of creating knowledge. Many of the tools now being developed can be used across disciplines as seemingly disparate as astronomy and medicine. Among students, there is a huge appetite for the new field. A Harvard course in data science last fall attracted 400 students, from the schools of law, business, government, design, and medicine, as well from the College, the School of Engineering and Applied Sciences (SEAS), and even MIT. Faculty members have taken note: the Harvard School of Public Health (HSPH) will introduce a new master's program in computational biology and quantitative genetics next year, likely a precursor to a Ph.D. program. In SEAS, there is talk of organizing a master's in data science.

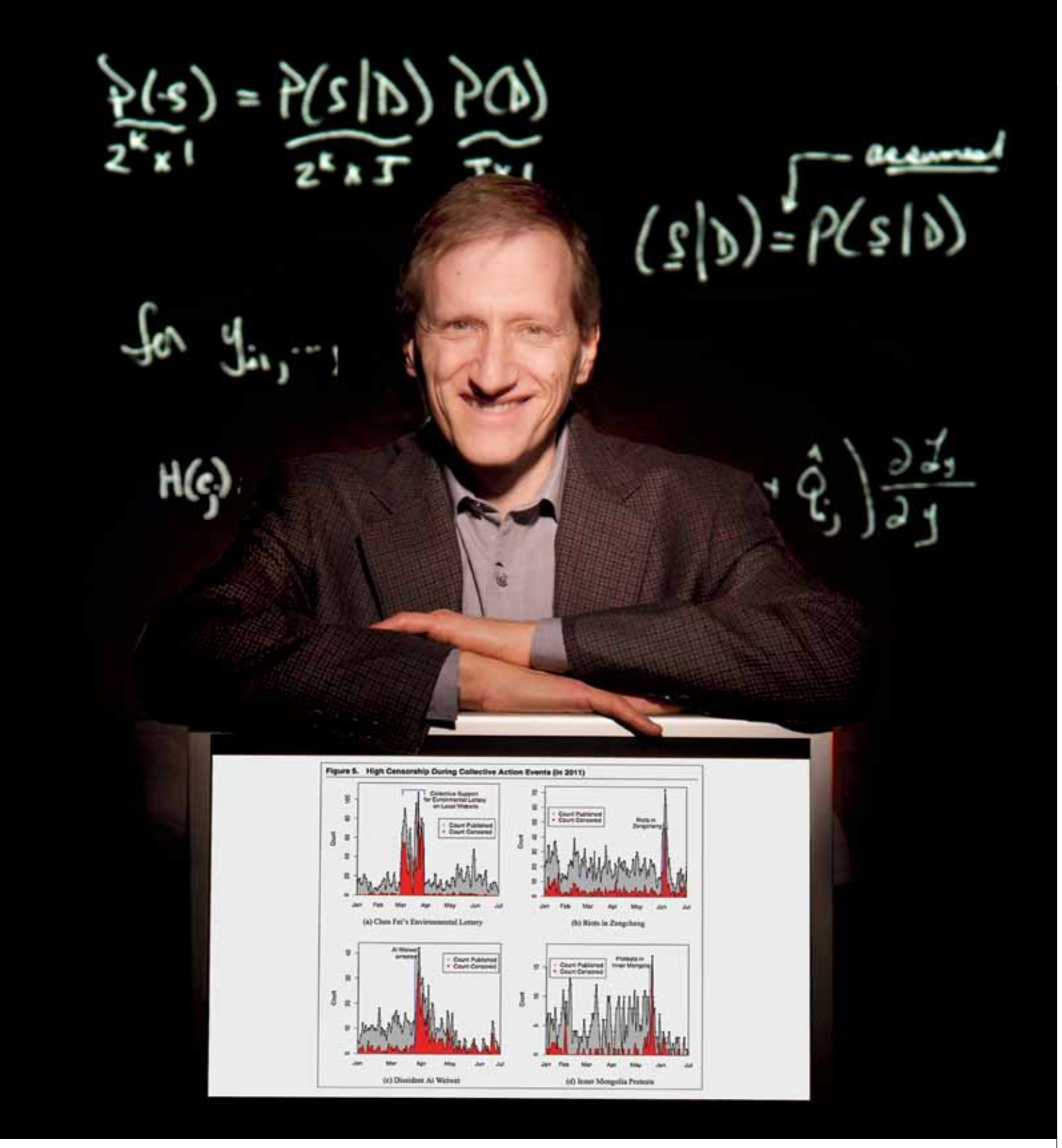
"There is a movement of quantification rumbling across fields in academia and science, industry and government and nonprofits," says King, who directs Harvard's Institute for Quantitative Social Science (IQSS), a hub of expertise for interdisciplinary projects aimed at solving problems in human society. Among faculty colleagues, he reports, "Half the members of the government department are doing some type of data analysis, along with much of the sociology department and a good fraction of economics, more than half of the School of Public Health, and a lot in the Medical School." Even law has been seized by the movement to empirical research—"which is social science," he says. "It is hard to find an area that hasn't been affected."

The story follows a similar pattern in every field, King asserts. The leaders are qualitative experts in their field. Then a statistical researcher who doesn't know the details of the field comes in and, using modern data analysis, adds tremendous insight and value. As an example, he describes how Kevin Quinn, formerly an assistant professor of government at Harvard, ran a contest comparing his statistical model to the qualitative judgments of 87 law professors to see which could best predict the outcome of all the Supreme Court cases in a year. "The law professors knew the jurisprudence and what each of the justices had decided in previous cases, they knew the case law and all the arguments," King recalls. "Quinn and his collaborator, Andrew Martin [then an associate professor of political science at Washington University], collected six crude variables on a whole lot of previous cases and did an analysis." King pauses a moment. "I think you know how this is going to end. It was no contest." Whenever sufficient information can be quantified, modern statistical methods will outperform an individual or small group of people every time.

In marketing, familiar uses of big data include "recommendation engines" like those used by companies such as Netflix and Amazon to make purchase suggestions based on the prior interests of one customer as compared to millions of others. Target famously (or infamously) used an algorithm to detect when women were pregnant by tracking purchases of items such as unscented lotions—and

Photographs by Stu Rosner

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

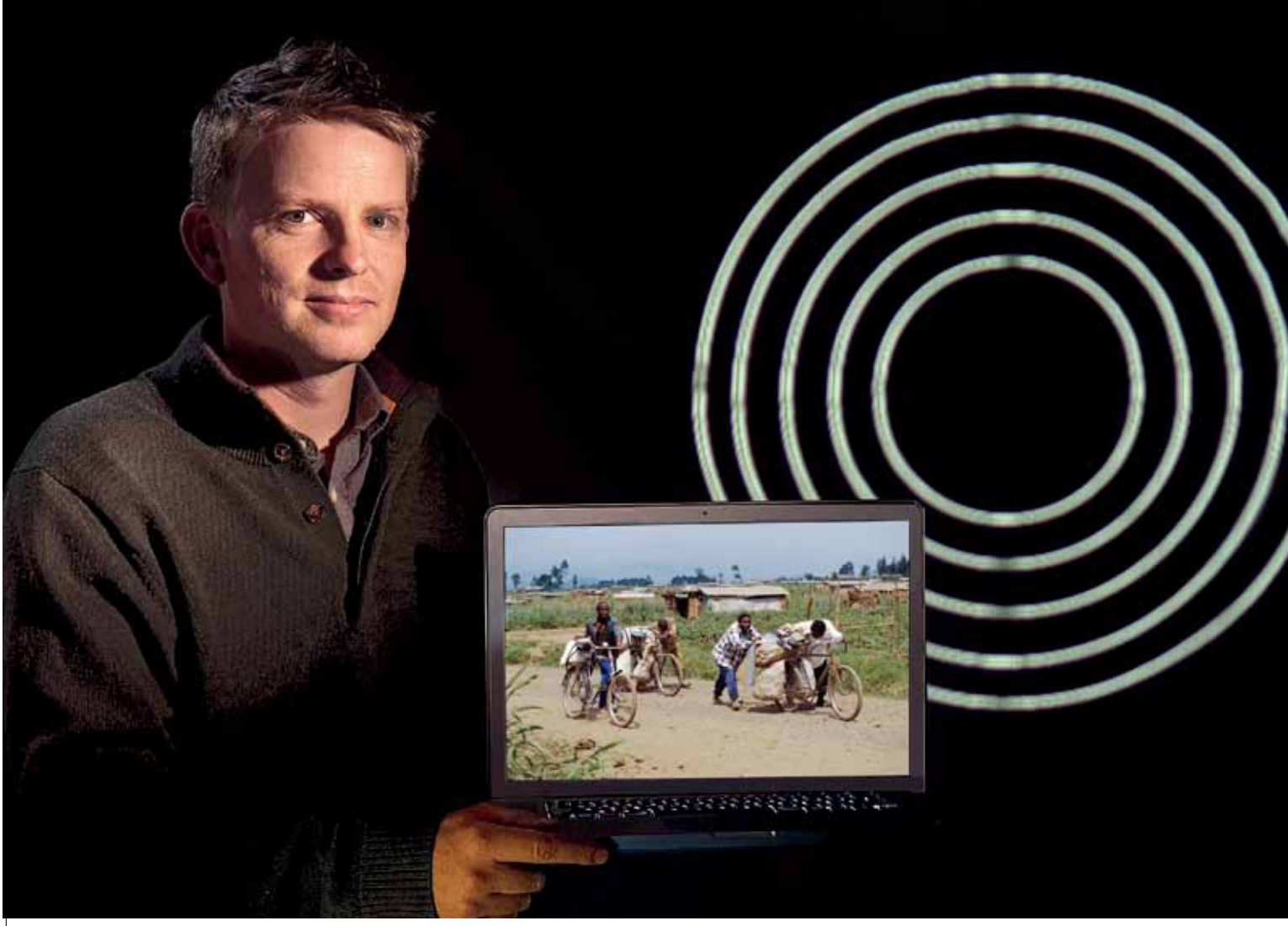


Gary King's study of social media uncovered massive government censorship in China.

offered special discounts and coupons to those valuable patrons. Credit-card companies have found unusual associations in the course of mining data to evaluate the risk of default: people who buy anti-scuff pads for their furniture, for example, are highly likely to make their payments.

In the public realm, there are all kinds of applications: allocating police resources by predicting where and when crimes are most likely to occur; finding associations between air quality and health; or using genomic analysis to speed the breeding of crops like rice for drought resistance. In more specialized research, to take one example, creating tools to analyze huge datasets in the biological sciences enabled associate professor of organismic and evolutionary biology Pardis Sabeti, studying the human genome's billions of base pairs, to identify genes that rose to prominence quickly in the course of human evolution, deter-

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746



In Africa, Nathan Eagle learned a valuable lesson when he used cell-phone data showing people's movement patterns to predict outbreaks of infectious disease.

mining traits such as the ability to digest cow's milk, or resistance to diseases like malaria.

King himself recently developed a tool for analyzing social media texts. "There are now a billion social-media posts every two days...which represent the largest increase in the capacity of the human race to express itself at any time in the history of the world," he says. No single person can make sense of what a billion other people are saying. But statistical methods developed by King and his students, who tested his tool on Chinese-language posts, now make that possible. (To learn what he accidentally uncovered about Chinese government censorship practices, see **http://harvardmag.com/censorship**.)

King also designed and implemented "what has been called the largest single experimental design to evaluate a social program in the world, ever," reports Julio Frenk, dean of HSPH. "My entire career has been guided by the fundamental belief that scientifically derived evidence is the most powerful instrument we have to design enlightened policy and produce a positive social transformation," says Frenk, who was at the time minister of health for Mexico. When he took office in 2000, more than half that nation's health expenditures were being paid out of pocket—and each year, four million families were being ruined by catastrophic healthcare expenses. Frenk led a healthcare reform that created, implemented, and then evaluated a new public insurance scheme, Seguro Popular. A requirement to evaluate the program (which he says was projected to cost 1 percent of the GDP of the twelfth-largest economy in the world) was built into the law. So Frenk (with no inkling he would ever come to Harvard), hired "the top person in the world" to conduct the evaluation, Gary King.

Given the complications of running an experiment while the program was in progress, King had to invent new methods for analyzing it. Frenk calls it "great academic work. Seguro Popular has been studied and emulated in dozens of countries around the world thanks to a large extent to the fact that it had this very rigorous research with big data behind it." King crafted "an incredibly original design," Frenk explains. Because King compared communities that received public insurance in the first stage (the rollout lasted seven years) to demographically similar communities that hadn't, the results were "very strong," Frenk says: any observed effect would be attributable to the program. After just 10 months, King's study showed that Seguro Popular successfully protected families from catastrophic expenditures due to serious illness, and his work provided guidance for needed improvements, such as public outreach to promote the use of preventive care.

King himself says big data's potential benefits to society go far beyond what has been accomplished so far. Google has analyzed clusters of search terms by region in the United States to predict flu outbreaks faster than was possible using hospital admission records. "That was a nice demonstration project," says King, "but it is a tiny fraction of what could be done" if it were possible for

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

academic researchers to access the information held by companies. (Businesses now possess more social-science data than academics do, he notes—a shift from the recent past, when just the opposite was true.) If social scientists could use that material, he says, "We could solve all kinds of problems." But even in academia, King reports, data are not being shared in many fields. "There are even studies at this university in which you can't analyze the data unless you make the original collectors of the data co-authors."

The potential for doing good is perhaps nowhere greater than in public health and medicine, fields in which, King says, "People are literally dying every day" simply because data are not being shared.

Bridges to Business

Nathan Eagle, an adjunct assistant professor at HSPH, was one of the first people to mine unstructured data from businesses with an eye to improving public health in the world's poorest nations. A self-described engineer and "not much of an academic" (despite having held professorships at numerous institutions including MIT), much of his work has focused on innovative uses of cell-phone data. Drawn by the explosive growth of the mobile market in Africa, he moved in 2007 to a rural village on the Kenyan coast and began searching for ways to improve the lives of the people there. Within months, realizing that he would be more effective sharing his skills with others, he began teaching mobile-application development to students in the University of Nairobi's computer-science department.

While there, he began working with the Kenyan ministry of health on a blood-bank monitoring system. The plan was to recruit nurses across the country to text the current blood-supply levels in their local hospitals to a central database. "We built this beautiful visualization to let the guys at the centralized blood banks in Kenya see in real time what the blood levels were in these rural hospitals," he explains, "and more importantly, where the blood was needed." In the first week, it was a giant success, as the nurses texted in the data and central monitors logged in every hour to see where they should replenish the blood supply. "But in the second week, half the nurses stopped texting in the data, and within about a month virtually no nurses were participating anymore."

"People are literally dying every day" simply because data are not being shared.

Eagle shares this tale of failure because the episode was a valuable learning experience. "The technical implementation was bulletproof," he says. "It failed because of a fundamental lack of insight on my part...that had to do with the price of a text message. What I failed to appreciate was that an SMS represents a fairly substantial fraction of a rural nurse's day wage. By asking them to send that text message we were asking them to essentially take a pay cut."

Fortunately, Eagle was in a position to save the program. Because he was already working with most of the mobile operators in East Africa, he had access to their billing systems. The addition of a simple script let him credit the rural nurses with a small denomination of prepaid air time, about 10 cents' worth—enough to cover the cost of the SMS "plus about a penny to say thank you in exchange for a properly formatted text message. Virtually every rural nurse reengaged," he reports, and the program became a "relatively successful endeavor"—leading him to believe that cell phones could "really make an impact" on public health in developing nations, where there is a dearth of data and almost no capacity for disease surveillance.

Eagle's next project, based in Rwanda, was more ambitious, and it also provided a lesson in one of the pitfalls of working with big data: that it is possible to find *correlations* in very large linked datasets without understanding *causation*. Working with mobile-phone records (which include the time and location of every call), he began creating models of people's daily and weekly commuting patterns, termed their "radius of generation." He began to notice patterns. Abruptly, people in a particular village would stop moving as much; he hypothesized that these patterns might indicate the onset of a communicable disease like the flu. Working with the Rwandan ministry of health, he compared the data on cholera outbreaks to his radius of generation data. Once linked, the two datasets proved startlingly powerful; the radius of generation in a village dropped two full weeks before a cholera outbreak. "We could even predict the magnitude of the outbreak based on the amount of decrease in the radius of generation," he recalls. "I had built something that was performing in this unbelievable way."

And in fact it *was* unbelievable. He tells this story as a "good example of why engineers like myself shouldn't be doing epidemiology in isolation—and why I ended up joining the School of Public Health rather than staying within a physical-science department." The model was not predicting cholera outbreaks, but pinpointing floods. "When a village floods and roads wash away, suddenly the radius of generation decreases," he explains. "And it also makes the village more susceptible in the short term to a cholera outbreak. Ultimately, all this analysis with supercomputers was identifying where there was flooding—data that, frankly, you can get in a lot of other ways."

Despite this setback, Eagle saw what was missing. If he could couple the data he had from the ministry of health and the mobile operators with on-the-ground reports of what was happening, then he would have a powerful tool for remote disease surveillance. "It opened my eyes to the fact that big data alone can't solve this type of problem. We had petabytes* of data and yet we were building models that were fundamentally flawed because we didn't have real insight about what was happening" in remote villages. Eagle has now built a platform that enables him to survey individuals in such countries by paying them small denominations of airtime (as with the Kenyan nurses) in exchange for answering questions: are they experiencing flu-like symptoms, sleeping under bednets, or taking anti-malarials? This ability to gather and link self-reported information to larger datasets has proven a powerful tool—and the survey technology has become a successful commercial entity named Jana, of which Eagle is co-founder and CEO.

New Paradigms—and Pitfalls

Willy Shih, Cizik professor of management practice at Harvard Business School, says that one of the most important changes wrought by big data is that their use involves a "fundamentally

*A *petabyte* is the equivalent of 1,000 terabytes, or a quadrillion bytes. One *terabyte* is a thousand gigabytes. One *gigabyte* is made up of a thousand *megabytes*. There are a thousand thousand—i.e., a million—petabytes in a *zettabyte*.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

different way of doing experimental design." Historically, social scientists would plan an experiment, decide what data to collect, and analyze the data. Now the low cost of storage ("The price of storing a bit of information has dropped 60 percent a year for six decades," says Shih) has caused a rethinking, as people "collect everything and then search for significant patterns in the data."

"This approach has risks," Shih points out. One of the most prominent is data dredging, which involves searching for patterns in huge datasets. A traditional social-science study might assert that the results are significant with 95 percent confidence. That means, Shih points out, "that in one out of 20 instances" when dredging for results, "you will get results that are statistically significant purely by chance. So you have to remember that." Although this is true for any statistical finding, the enormous *number* of potential correlations in very large datasets substantially magnifies the risk of finding spurious correlations.

Eagle agrees that "you don't get good scientific output from throwing everything against the wall and seeing what sticks." No matter how much data exists, researchers still need to ask the right questions to create a hypothesis, design a test, and use the data to determine whether that hypothesis is true. He sees two looming challenges in data science. First, there aren't enough people comfortable dealing with petabytes of data. "These skill sets need to get out of the computer-science departments and into public health, social science, and public policy," he says. "Big data is having a transformative impact across virtually all academic disciplines—it is time for data science to be integrated into the foundational courses for all undergraduates."

Safeguarding data is his other major concern, because "the privacy implications are profound." Typically, the owners of huge datasets are very nervous about sharing even anonymized, population-level information like the call records Eagle uses. For the companies that hold it, he says, "There is a lot of downside to making this data open to researchers. We need to figure out ways to mitigate that concern and craft data-usage policies in ways that make these large organizations more comfortable with sharing these data, which ultimately could improve the lives of the millions of people who are generating it—and the societies in which they are living."

> "We built this beautiful visualization to let the guys at the centralized blood banks in Kenya see in real time what the blood levels were in these rural hospitals, and more importantly, where the blood was needed."

John Quackenbush, an HSPH professor of computational biology and bioinformatics, shares Eagle's twin concerns. But in some realms of biomedical big data, he says, the privacy problem is not easily addressed. "As soon as you touch genomic data, that information is fundamentally identifiable," he explains. "I can erase your address and Social Security number and every other identifier, but I can't anonymize your genome without wiping out the information that I need to analyze." Privacy in such cases is achieved not through anonymity but by consent paired with data security: granting access only to authorized researchers. Quackenbush is currently collaborating with a dozen investigators—from HSPH, the Dana-Farber Cancer Institute, and a group from MIT's Lincoln Labs expert in security—to develop methods to address a wide range of biomedical research problems using big data, including privacy.

He is also leading the development of HSPH's new master's program in computational biology and quantitative genetics, which is designed to address the extraordinary complexity of biomedical data. As Quackenbush puts it, "You are not just *you*. You have all this associated health and exposure information that I need in order to interpret your genomic information."

A primary goal, therefore, is to give students practical skills in the collection, management, analysis, and interpretation of genomic data *in the context* of all this other health information: electronic medical records, public-health records, Medicare information, and comprehensive-disease data. The program is a joint venture between biostatistics and the department of epidemiology.

Really Big Data

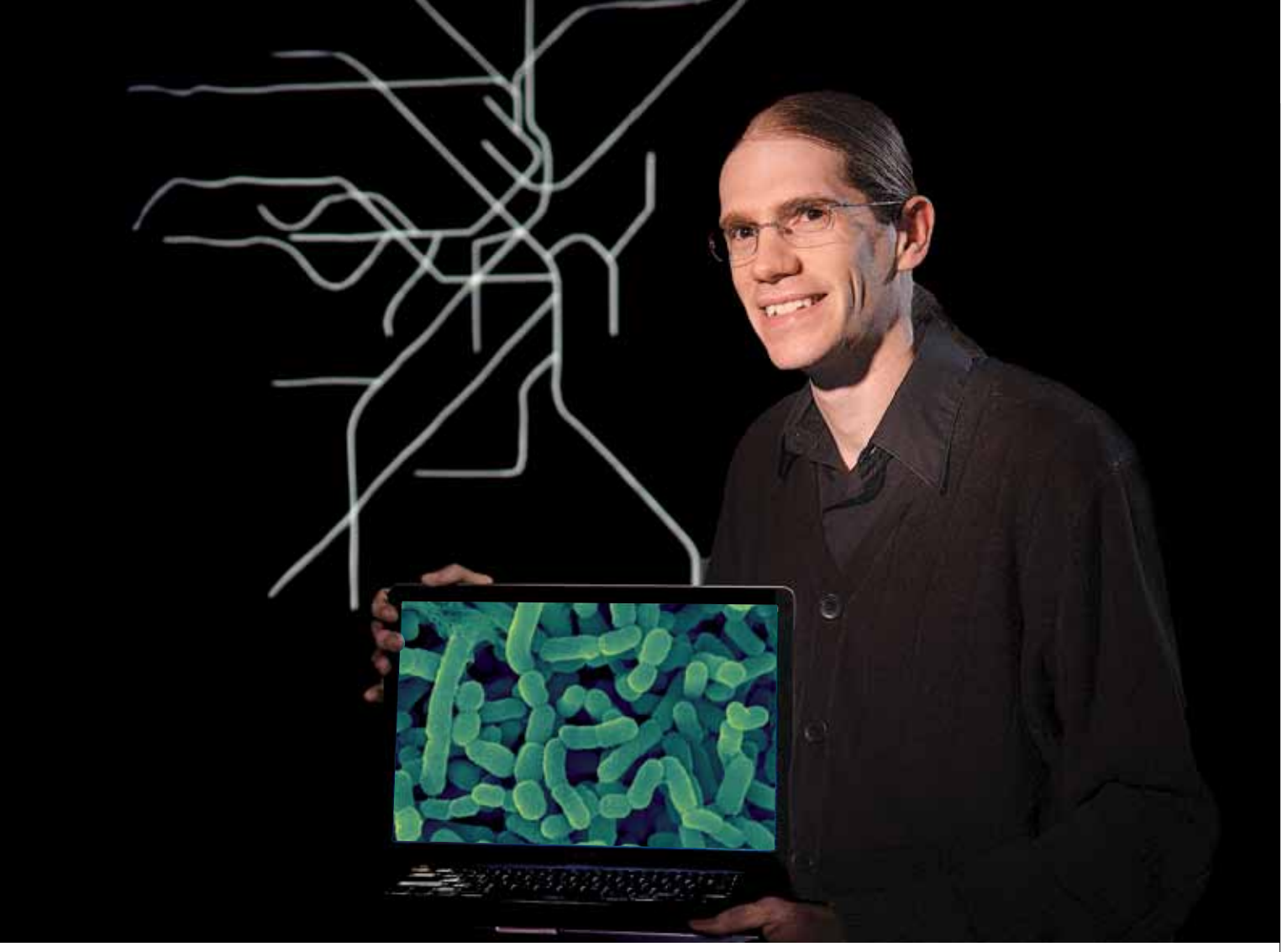
Like eagle, Quackenbush came to public health from another discipline—in his case, theoretical and high-energy experimental physics. He first began working outside his doctoral field in 1992, when biologists for the Human Genome Project realized they needed people accustomed to collecting, analyzing, managing, and interpreting huge datasets. Physicists have been good at that for a long time.

The first full human genome sequence took five to 15 years to complete, and cost $1 billion to $3 billion ("Depending on whom you ask," notes Quackenbush). By 2009, eight years later, the cost had dropped to $100,000 and took a year. At that point, says Quackenbush, "if my wife had a rare, difficult cancer, I would have mortgaged our house to sequence her genome." Now a genome sequence takes a little more than 24 hours and costs about $1,000—the point at which it can be paid for "on a credit card. That simple statement alone," he says, "underscores why the biomedical sciences have become so data-driven.

"We each carry two copies of the human genome—one from our mother and one from our father—that together comprise 6 billion base pairs," Quackenbush continues, "a number equivalent to all the seconds in 190 years." But knowledge of what all the genes encoded in the genome do and how they interact to influence health and disease remains woefully incomplete. To discover that, scientists will have to take genomic data and "put it in the context of your health. And we'll have to take you and put you in the context of the population in which you live, the environmental factors you are exposed to, and the people you come in contact with—so as we look at the vast amount of data we can generate *on* you, the only way we can effectively interpret it is to put it in the context of the vast amount of data we can generate on almost everything *related* to you, your environment, and your health. We are moving from a big data problem to a *really big* data problem."

Curtis Huttenhower, an HSPH associate professor of computational biology and bioinformatics, is one of Quackenbush's *really big data* collaborators. He studies the function of the hu-

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746



Curtis Huttenhower studied microbes in Boston's public-transit system to understand how the bugs that live on and in us—for better or worse—move from one person to another.

man microbiome, the bacteria that live in and on humans, principally in the gut, helping people extract energy from food and maintaining health. "There are 100 times more genes in the bugs than in a human's genome," he reports, and "it's not unusual for someone to share 50 percent or less of their microbes with other people. Because no one has precisely the same combination of gut bacteria, researchers are still learning how those bacteria distinguish us from each other; meanwhile both human and microbial genetic privacy must be maintained." Not only do microbiome studies confront 100 times more information per human subject than genome studies, that 100 is *different* from person to person and changes slowly over time with age—and rapidly, as well, in response to factors like diet or antiobiotics. Deep sequencing of 100 people during the human microbiome project, Huttenhower reports, yielded a thousand human genomes' worth of sequencing data—"and we could have gotten more. But there is still no comprehensive catalog of what affects the microbiome," says Huttenhower. "We are still learning."

Recently, he has been studying microbes in the built environment: from the hangstraps of Boston's transit system to touchscreen machines and human skin. The Sloan Foundation, which funded the project, wants to know what microbes are there and how they got there. Huttenhower is interested in the dynamics of how entire communities of bugs are transferred from one person to another and at what speed. "Everyone tends to have a slightly different version of *Helicobacter pylori*, a bacterium that can cause gastric cancer and is transmitted vertically from parents to children," he says. "But what other portions of the microbiome are mostly inherited, rather than acquired from our surroundings? We don't know yet." As researchers learn more about how the human genome and the microbiome interact, it might become possible to administer probiotics or more targeted antibiotics to treat or prevent disease. That would represent a tremendous advance in clinical practice because right now, when someone takes a broad spectrum antibiotic, it is "like setting off a nuke," say Huttenhower. "They instantly change the shape of the microbiome for a few weeks to months." Exactly how the microbiome recovers is not known.

A major question in microbiome studies involves the dynamics of coevolution: how the bugs evolved in humans over hundreds of thousands of years, and whether changes in the microbiome might be linked to ailments that have become more prevalent recently, such as irritable bowel disease, allergies, and metabolic syndrome (a precursor to diabetes). Because of the timescale of the change in the patterns of these ailments, the causes can't be genomic, says Huttenhower. "They could be environmental, but the timescale is also right for the kinds of ecological *(please turn to page 74)*

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Henry A. Murray

Brief life of a personality psychologist: 1893-1988

by MARSHALL J. GETZ

"THE SPONTANEOUS PROPULSION of [my] thoughts by the sanguine surplus…"—so Henry A. Murray '15 described his intellectual process in "The Case of Murr," an autobiographical chapter published in 1967. "Sanguine surplus," or raw exuberance for knowledge, became his creed. (This vitality extended beyond academic enterprises; although married, he had a lengthy affair with his closest collaborator, Christiana Morgan.) He became one of psychology's original voices, but is sometimes overlooked today: in part, perhaps, because his personality led him into unnecessary battles with fellow psychologists over what could be considered valid research, and because he enthusiastically began projects that he obviously cared about, yet never completed.

Murray sought the origins of life, a quest that led him to study history at Harvard and earn an M.D. and a master's at Columbia and a Ph.D. in biochemistry from Cambridge. (By his own admission, this varsity crew captain became a dedicated student only in medical school; his relatively easy educational progress may have seeded his frustration with some of his later endeavors.) Embryology brought him closer to life's beginnings, but a larger mystery loomed. He found his calling at 30, when he read Carl Jung's *Psychological Types*. After private sessions with Jung in 1925, he eventually left biomedical research to pursue psychology, a field he approached as "deep diving." Physiologist Lawrence J. Henderson, his mentor, encouraged the head of the Harvard Psychological Clinic (HPC) to hire Murray as his assistant; he started there in 1927.

At the HPC during the 1930s, Murray and lay researcher Christiana Morgan developed the Thematic Apperception Test (TAT), a set of picture cards, still used, that challenge subjects to invent a story, a process that often reveals more about their psychological states than responses to direct questions do. In an era when many other academics disdained psychology as "unscientific" and impossible to research, Murray disagreed, having worked out protocols for interpreting nontraditional data. He applied empirical methods—standardized data collection and interpretation—and pioneered the longitudinal study, in which investigators follow their subjects to determine whether initial results are stable or changing.

But he was also developing his own branch of psychology. Having studied Jung, he incorporated biology, sociology, culture, and literature into his research. (He promoted the works of Herman Melville—believing the *Pequod*'s crew illustrated every psychological type—when the novelist was largely ignored by the academy.) He dubbed his approach "personology"; its tenets include studying individual life histories to find the main themes, internal drives, and outside factors that influence personality formation.

When some in the field suggested this work lacked rigor, Murray—who rose to any challenge, including his own crossed eyes and a stammer—began to speak about the pointlessness of academic psychologists attempting to apply the principles of science to something as complicated as the mind. They "are looking critically at the wrong things," he wrote in 1935, while psychoanalysts (who had accessed the origins of personality, but lacked the scientist's discipline and the opportunity to share and refine what they learned) "are looking with reeling brains at the right things."

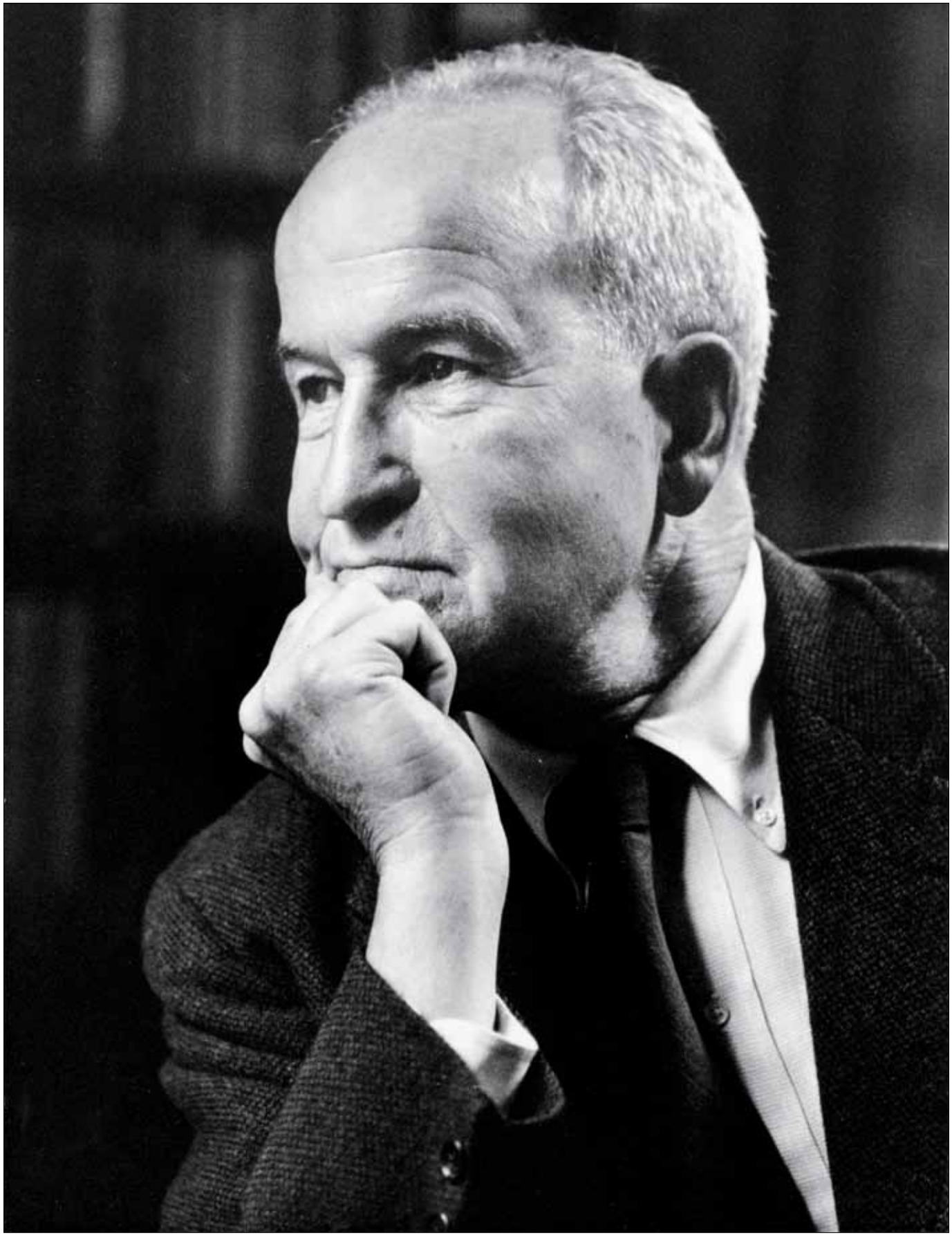
Appreciation came with *Explorations in Personality* (1938), a journey into the mental worlds of 50 young men who volunteered as subjects. He shared authorship with the HPC staff, though a student, Robert R. Holt, Ph.D. '44, has said Murray did most of the writing. The book electrified many psychologists and their students, showing there could be far more depth to their research than the quantitative data on reflexes or perceptions most experimental psychologists reported. Murray found such studies unspeakably dull.

He guided research at the HPC with a view that psychology, informed by psychoanalysis, could address human problems; during World War II, he devised testing to help the Office of Strategic Services choose intelligence officers scientifically. In 1946, President James B. Conant offered him a full professorship in the new interdisciplinary department of social relations, a grouping of social, developmental, and personality psychology with sociology and social anthropology. Soc Rel fit beautifully with Murray's goals—outside the psychology department, he would be free to pursue personology. But he rejected the offer, to focus on research and writing.

Nevertheless, he became professor of clinical psychology in 1951 and contributed to Soc Rel's development until retiring in 1962. His willingness to teach women and support their research when many of his colleagues refused was honored in 1976 when Radcliffe College opened the Murray Research Center, dedicated to longitudinal research, particularly on women. (Its archives are now housed at Harvard's Institute for Quantitative Social Science.) Meanwhile, writing projects attracted and bedeviled him: a multivolume study of Melville, a book on hubris, and a memoir, coauthored with Morgan, about their love affair. Yet by 1967, he had acknowledged "the fading of the mental energies" on which he had been counting to deal with some of his half-finished books, "residual products of [my] sanguine surplus." Those who carry on his work today follow the charge he used on a medal that he and Morgan designed to honor the HPC in 1937: "Let Not Him Who Seeks Cease Until He Finds, And When He Finds He Shall Be Astonished."

Marshall J. Getz is an independent scholar in Houston. The author of a biography of Subhas Chandra Bose, he is now writing a biography of Murray.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746



Murray in 1962. Courtesy of the Harvard University Archives

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Advancing Leadership

"Third-stage" learners using a novel Harvard curriculum engage social challenges.

DURING 2013, Michael J. Bush audited Professor Joseph P. Newhouse's course on the economics of healthcare policy and worked with Richard Frank, Morris professor of healthcare policy, to better understand a specific social problem: how to cover the costs for people who suffer severe bodily harm—brain trauma, spinal-cord injuries, debilitating burns, catastrophic amputations—and survive, often to require extensive, expensive lifelong care. Amid national debate over routine health coverage, the subject might seem esoteric. But for the tens of thousands afflicted and their families, the issue may be even more disastrous than sudden death. The costs of support services often are not covered by traditional medical and disability insurance, long-term care coverage, or workers' compensation. In many cases, the victims and their loved ones are mostly on their own.

And so on the Thursday before Thanksgiving, Bush briefly outlined for a supportive but challenging audience his mathematically precise, actuarially sound proposal for "catastrophic injury life-care annuities," developed during his year on campus. He concluded that private insurers could affordably provide adequate coverage, and that people would sign up for it—addressing a social problem while creating a tremendous business opportunity. He said he planned to work with disability advocates around the country to persuade the industry to begin offering this mutual solution.

Bush's presence at Harvard and the forum where he presented his work reflected both a distinctive program and a unique personal passion. The program is the Advanced Leadership Initiative (ALI): an opportunity for a cohort of a few dozen midcareer leaders from diverse professions to come to Harvard from around the world to explore how to address vexing social issues, drawing on skills and resources beyond their fields. Bush, for example, has three decades of experience as a senior retailing executive, turnaround manager, and business investor.

The passions vary by fellow, but in Bush's case, could not be more immediate. As his paper matter-of-factly notes, "I am acutely aware of these issues because my brother was severely brain injured while working a summer job on an oil rig in Texas. It happened 60 days after his eighteenth birthday and 25 days after his high-school graduation." Two years of coma ensued, followed by prolonged rehabilitation; today, 33 years after the rig accident, Bush's brother, though conscious, "cannot walk, cannot talk, has use of only one of his arms, suffers from occasional seizures," and is maintained by "constant supportive living care from an attendant staff"—available only because he has "adequate resources."

A few days after his remarks, Bush flew to Galveston, where the family holds Thanksgiving with his brother, before continuing home to California.

by John S. Rosenberg • Portraits by Stu Rosner

"Plan for Influence and Impact"

Other fellows' motivations and projects bear different emotional weights, but all have benefited from a bundle of educational innovations, now in their sixth year of evolution, that have proven anything but characteristic of Harvard. The visitors, neither regular students nor executive-education enrollees, participate as "fellows" in the Initiative. They spend spring and fall semesters at Harvard, initially taking a course together on "Challenges and Opportunities in Advanced Leadership" (COAL) and auditing other classes relevant to their interests and nascent projects. The initiative, originating in Harvard Business School (HBS), also draws professors from the schools of education, government, law, medicine, and public health, plus the Faculty of Arts and Sciences. ALI's curriculum and pedagogy—including multiday "think tanks" (immersions in the issues of fields such as education or healthcare) and a midyear travel-study experience (last June, a week in Shanghai)—break the bounds of conventional courses of study. And the fellows' colleagues, by design, include not only peers from prior ALI cohorts (extending back to the first, in 2009) but also their own spouses (during the semesters in residence) and (on excursions) even older children.

The path to Bush's November 21 presentation, and those by the other 2013 ALI fellows, can be traced precisely to an October 2005 paper titled "Moving Higher Education to Its Next Stage." The three HBS authors—Rosabeth Moss Kanter, Arbuckle professor of business administration; Rakesh Khurana, then associate professor, now Bower professor of leadership development, master of Cabot House, and College dean-designate (see page 23); and Nitin Nohria, then Chapman professor of business administration and now dean—were, revealingly, from the school's general-management and organizational-behavior units (as opposed to finance, technology-management, entrepreneurship, or other fields).

Their paper is a brisk mash-up of higher-education history (the evolution of universities, graduate education, and beyond); obdurate challenges (global poverty, health, education reform, and environmental degradation); and demographics (increasing longevity, the potential for "third-stage" education for professionals—beyond college and graduate school—who have talent, energy, skills, and active post-career time *before* retirement). From these vantage points, the authors proposed a new role for teaching and learning in "advanced leadership"—beyond extant options in executive education, retraining or vocational retooling, or leisure learning in retirement.

Perhaps most important, in a University that valorizes educating leaders, they defined the term, and their aims, with unusual precision. The advanced leader-learners, they determined, would have to be prepared to address problems that are both technical *and* political: seemingly intractable issues where known solutions (cures for diseases, food aid) are "mal-distributed," embedded in complex systems crossing institutional and professional boundaries, and involving diverse stakeholders. For many such problems, research "tends to be oriented toward the technical side, toward specialists' content, and not toward action or system-change processes that draw on knowledge from special disciplines." In other

Michael J. Bush

words, "[W]e often know more about *what* than *how* and *who*."

Ameliorating "controversial and systemic" problems, they wrote, depends on "new action models…that involve cross-sector collaboration based on cross-profession expertise." The best chance to build effective collaborations, in turn, lay in "a new field of practice…particularly well suited to the capabilities and desires of experienced leaders" who have already proven their capacity to shape organizations and effect change in at least one realm and are now eager to develop "solutions to significant societal and global problems."

To that end, the "students" would be exposed to ways of examining problems and solutions from multiple disciplinary perspectives. They would learn how to assess the legal and political context, the better to define a course of action embracing nonprofit, for-profit, and public enterprises as warranted, and involving multiple partners and participants. And they would learn to read and use public opinion. The candidates would have to be free from other career obligations, able to plunge into "a school for action," not merely for intellectual discourse. They would, as a cohort, help each other, and they would focus on a practical project: "the detailed plan for influence and impact" on their chosen problem.

"What is the obligation of the university to society?" Rakesh Khurana asked himself. "When are universities seen as most legitimate and thriving?"

As Khurana put it in conversation, he was motivated by a large question: "What is the obligation of the university to society? When are universities seen as most legitimate and thriving?" His answer: when they adapt and renew their mission of creating knowledge and transferring it to new generations. With a generation of accomplished leaders eager for new challenges that give meaning to their lives, the program he and his colleagues envisioned could strengthen universities and societies at the same time.

In 2005, Kanter, Khurana, and Nohria envisioned this paradigm as the prospectus for a new School for Advanced Institutional Leadership. For now, their vision has come to life in the inventive pedagogy and energetic engagements of Harvard's ALI.

"It Sounds Incredibly Ambitious"

Where Michael Bush's effort to stimulate a new market for life-care insurance stems from personal experience, Mark Feinberg's focus—establishing a partnership to develop HIV treatments to meet the needs of low-income countries heavily affected by AIDS—is rooted in his career in academic medicine (working since 1984 on basic and clinical research and as a physician caring for HIV-infected individuals); the public sector (the National Institutes of Health, the Institute of Medicine, and service on boards including the Scientific Advisory Board for the President's Emergency Plan for AIDS Relief—PEPFAR); and the pharmaceutical industry (most recently as vice president and chief public health and science officer for Merck Vaccines). He seeks to bridge "untapped opportunities to promote alignment and collaboration" among those sectors toward an urgent end. When he joined the 2012 ALI fellows' cohort, he had this project in mind; as it progressed, he remained affiliated as a senior fellow during 2013—one of a handful who devote a second year to pursuing their goals.

Feinberg hopes to "significantly" improve the prospects for "people living in low-income countries heavily affected by AIDS to have access to treatments that would be of greatest benefit to them." That carefully phrased, even bland, description epitomizes his deliberately low-key rhetoric, his desire to serve as a facilitator in fraught terrain.

In affluent countries, sophisticated drug "cocktails" of highly efficacious antiretroviral medications in single, often once-a-day, "fixed-dose combinations"—complemented by multiple options for those who develop drug resistance to their initial treatments—are making HIV a manageable, chronic condition. PEPFAR and other programs finance therapies for needy nations, but many of these treatments are not widely available in low-income countries. Aid efforts aimed at treating the maximum number of HIV patients there have made tremendous progress, Feinberg says, but much more must be done to make the most effective, convenient combination treatments the routine standard of care for as many infected people as possible—and to significantly in-

Mark Feinberg

crease access to options for those who fail initial therapy. Those patients also need treatment options designed to be most effectively dispensed where healthcare systems are inadequate, and to address the needs of specific HIV-infected populations disproportionally common in many low-income countries: pregnant women, infants, and children; individuals co-infected with tuberculosis. Because these circumstances are rare in wealthier countries, typical market forces that foster development of new drug formulations don't yield treatments optimized to meet these special circumstances of the low-income countries where most of HIV-infected people live. In other words, this is a classic situation requiring advanced leadership, as ALI's founders define it.

Feinberg says the innovator companies in fact want to solve the challenges that slow access to optimal antiretroviral regimens for these unmet needs, but cannot do so individually. But they might collaborate, mixing and matching the most effective compounds, and providing access to their intellectual property to low-cost generic manufacturers to help make the drugs cheaply and at large scale. Global health agencies and experts on AIDS treatment would help inform the priority products on which pharmaceutical companies would focus their collaborations. Donors, foundations, and governments could subsidize development and deployment of the best therapies.

Feinberg, experienced across these sectors, has been working in concert with pharmaceutical industry colleagues, global health authorities, public-sector AIDS treatment experts, and AIDS treatment advocates to explore new models for addressing these interconnected issues. Scores of participants—with different technological, political, and historical perspectives—have met in diverse forums to see if they can agree on this longer-term direction for HIV therapy. Each party would need to engage with others more deeply than has previously been comfortable, or feasible. "It sounds incredibly ambitious," Feinberg concedes—but success would be hugely positive for maximizing the reach, impact, and sustainable benefits of HIV therapy in low-income countries and perhaps, he hopes "for other important diseases, and maybe even other development challenges, of global relevance."

Despite decades of preparation for his current efforts, Feinberg says, it was important to "have the time and encouraging context to work on this" as an ALI fellow. "Themes important to the ALI curriculum—how one effects change, getting stakeholders to work together, difficult challenges needing new synthetic approaches"—all resonate. And, he continues, so does a lesson that Kanter drives home for every fledgling fellow (it's known as "Kanter's Law"): the middle of any project—after the exciting flush of defining the idea and achieving promising early results, but before compelling evidence of success is secure—is the hardest part.

Rosabeth Moss Kanter

"The Box Isn't Big Enough"

Introducing the ALI final symposium on November 21, before the 2013 fellows summarized their projects and solicited comments and support, Kanter (speaking as the initiative's chair and director) reminded them of the difference between *great* and *advanced* leadership—a theme she had sounded throughout the year. "You don't just manage a single organization or network of organizations to success," she said. "Advanced leaders take on messy problems that cannot be contained by one profession, one field, one business, one organization." Those "messy" goals may be ill-defined (how to improve education?) or even conflicting, posing the problem of which paths to pursue—a strategic challenge far harder than most businesses face. "*You* have to figure out what to do" as a result, she said, aligning "multiple stakeholders, often disorganized, who don't report to you"—and who may not welcome newcomers to their affairs. Because existing institutions fall short, she said, advanced leadership puts a premium on innovation and changing rigid establishments.

"Think outside the *building*," Kanter exhorted the fellows. "The box isn't big enough." Resorting to a useful metaphor, she concluded, "The difference between great leaders and advanced leaders is the difference between Fred Astaire and Ginger Rogers. Fred Astaire led, and was beautiful to watch. But Ginger Rogers was the advanced leader, because she had to do everything he did backwards and in high heels."

Kanter's remarks may not sound like an intellectual prospectus, but they are a fair proxy for the fellows' common learning adventure: the challenges and opportunities course,

COAL. It is meant to equip people who have been accustomed to success in defined roles—running companies, managing law firms, investing assets, leading part of the United Nations—to take on daunting ventures backwards, in high heels.

Thus, although the form is familiar (weekly discussions based on case studies and other readings), COAL's contents, cases, and faculty members are radically heterogeneous when compared to an HBS class or its analog at any of the other professional schools. Three "modules" cover "sectors and institutional strategies," "behavioral strategies and skills," and "moving into action"—the latter, on turning a passion into a practical project.

In the initial unit, Kanter, Khurana, and guest faculty members cover leadership; the distinct roles of government, businesses, and nonprofit enterprises (with illustrations ranging from a case study on water supply to a *New Yorker* article on conflicts over privatizing the supply in Bolivia); and law, social movements, and social change (with ALI faculty member Charles J. Ogletree Jr., Climenko professor of law, and readings from *All Deliberate Speed*, his book on *Brown v. Board of Education*, paired with Kanter's writing on Nelson Mandela). A class on health systems involves Barry R. Bloom, former dean of the School of Public Health, and sessions touching on education rely on joint HBS-Graduate School of Education cases on school systems.

During the behavior and skills classes, fellows encounter varieties of power (hard, soft, smart) with former dean Joseph S. Nye and lecturer in public policy Peter B. Zimmerman of the Kennedy School. Among other guest teachers, Flom professor of law and business Guhan Subramanian, of the law and business schools, and Kennedy School academic dean Iris Bohnet join Kanter and Khurana to probe complex negotiations and nudges to influence. Professor of management practice William W. George—former chief executive of Medtronic, and member of several boards of directors—reviews authentic leadership and its personal costs. The fellows learn about scaling up social enterprises.

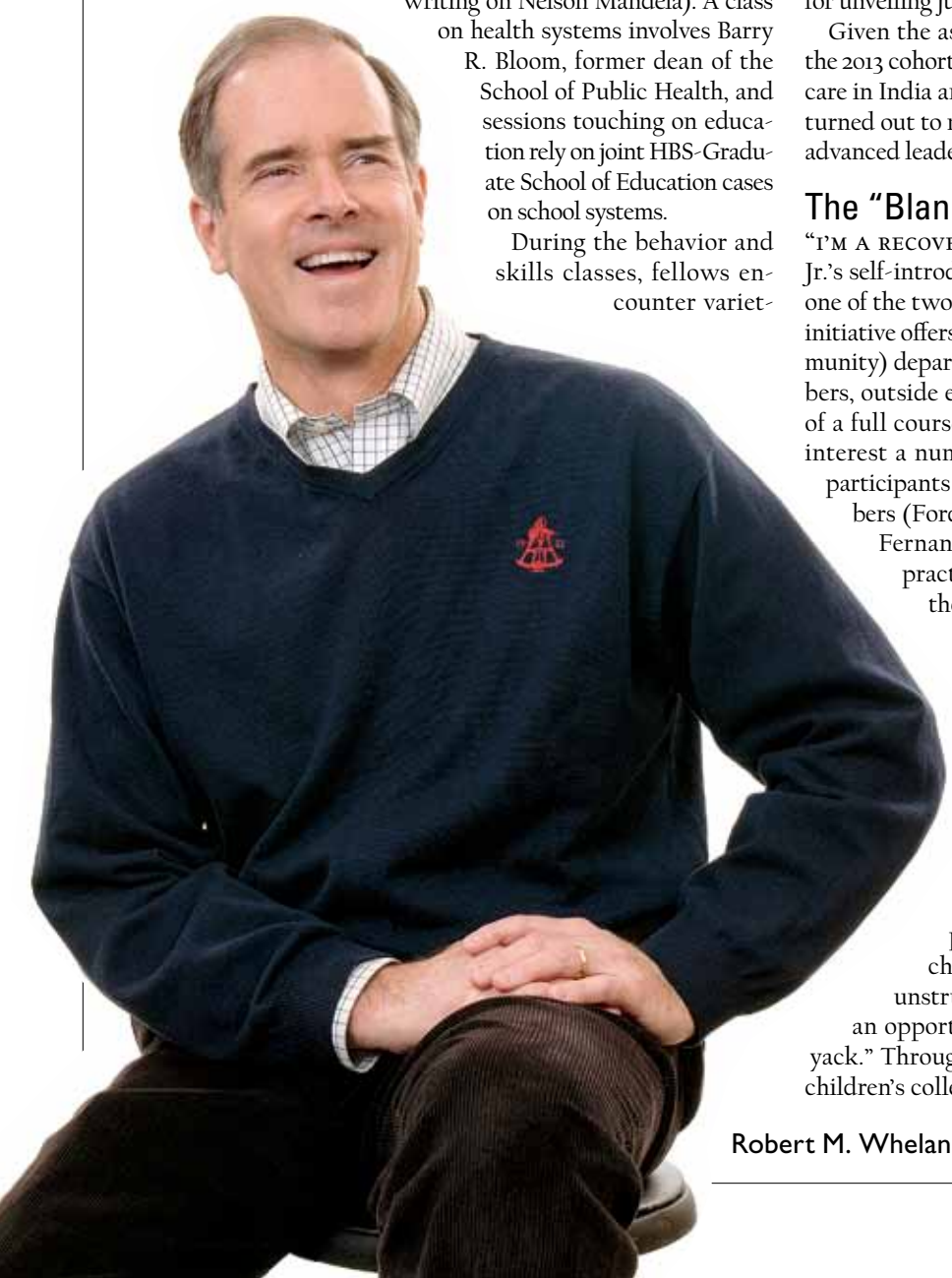
Finally, they receive practical instruction in defining a project and developing its "public narrative" to mobilize resources and support. Then, drawing on their multidisciplinary faculty and peers (including ALIers from earlier cohorts), the fellows channel everything they have learned and the contacts they have made with diverse instructors from audited classes, aiming to articulate the ideas they hope to enact. Following their summer work on their projects, a two-day autumn workshop on mobilizing stakeholders and leading change acts as a lever to focus their projects for unveiling just before Thanksgiving.

Given the aspirational nature of their proposals, Kanter told the 2013 cohort in November, the COAL cases they read on healthcare in India and American civil rights, on law and education, all turned out to matter: "Familiarity with *all* of them is essential for advanced leadership, even if you're not *expert* in every one."

The "Blank-Napkin Stage"

"I'M A RECOVERING investment banker" was Robert M. Whelan Jr.'s self-introduction last April at ALI's education think tank—one of the two or three "deep dives" into substantive matters the initiative offers each year. The sessions (open to the Harvard community) depart from the semester model: panels of faculty members, outside experts, and others provide, in effect, the content of a full course during a couple of days, typically in fields that interest a number of fellows (school reform, healthcare). The participants last April ranged from ALI-affiliated faculty members (Ford Foundation professor of international education Fernando M. Reimers, Kanter, Ogletree, and others), to practitioners (John S. Wilson Jr., M.T.S. '81, Ed.D. '85, then president-designate of Morehouse College; see "Morehouse Man, Redux," November-December 2013, page 72), to Whelan himself, an ALI alumnus. His project, on financing students' college attendance, had made him a "revolutionary" on the subject, he said.

After a career financing start-up companies "from the blank-napkin stage," Whelan was attracted to ALI, itself a start-up enterprise, and became a fellow in the initial class of 2009. "The beauty of this program is that it gives people the opportunity to figure out what their next chapter is, in a fairly structured way, but within an unstructured environment," he recalled last spring. "It's an opportunity to think the big thought and yack the big yack." Through service on private-school boards, and his own children's college bills, he had become increasingly aware of rising tuition and "who gets pushed off the edge" as a result. He also reflected that



Robert M. Whelan Jr.

Whelan's experience serves as an example for successor fellows, suggesting how far their missions can take them—and cautioning about the difficulty of their new work.

as a first-generation college student, he had been able to attend Dartmouth debt-free "because of my parents' big sacrifices." (He later earned an M.B.A. at Stanford.)

As he took courses on managing nonprofit institutions and discussed education with a "highly numerate" former business colleague, Whelan said, a truly blank-napkin idea emerged. Focusing on low-income learners from low-wealth families (net worths of $5,000 to $10,000), he found troubling circumstances: many first-generation students who lack role models, many for whom English is a second language, some who are undocumented and so cannot access funds. These students, frequently older than typical undergraduates, must often shoulder work and family obligations, too. ("Dealing with so many things unrelated to education it's a wonder they even *want* to get an education," he said.) All these students "have a pilot light" waiting to be lit, Whelan said. But he discovered a toxic combination in a shaky job market: pervasive financial illiteracy and onerous levels of college debt (approaching $30,000 on average), even among students enrolled principally at community colleges, vocational-technical institutions, and small liberal-arts or church-affiliated institutions.

Atop all the other odds such students face, the financing system is stacked against them. Student loans are a profitable, trillion-dollar business. Institutions without aid resources have a strong incentive to enroll people—and little reason even to counsel them about the postgraduate burden of making fixed debt-service payments. There are, in other words, powerful stakeholders supporting a status quo in which students bear all the risk.

So Whelan aims at nothing less than "*very* systemic change." After several years of work modeling the finances, devising a legally workable "human-capital contract," and beginning a public discussion on education as an *investment* to be financed by its *returns*, his initiative,13th Avenue Funding, aims to jettison the student-debt paradigm. Instead, it would draw on philanthropic or institutional capital; make grants to students; and replenish those funds from their future earnings—in a pilot, 5 percent of annual income above $18,000, for a set number of years. That is the way Australians finance college; it has been debated in the Oregon legislature (which has not yet appropriated the billions needed to fund a program up front); and economists across the spectrum support the rationale.

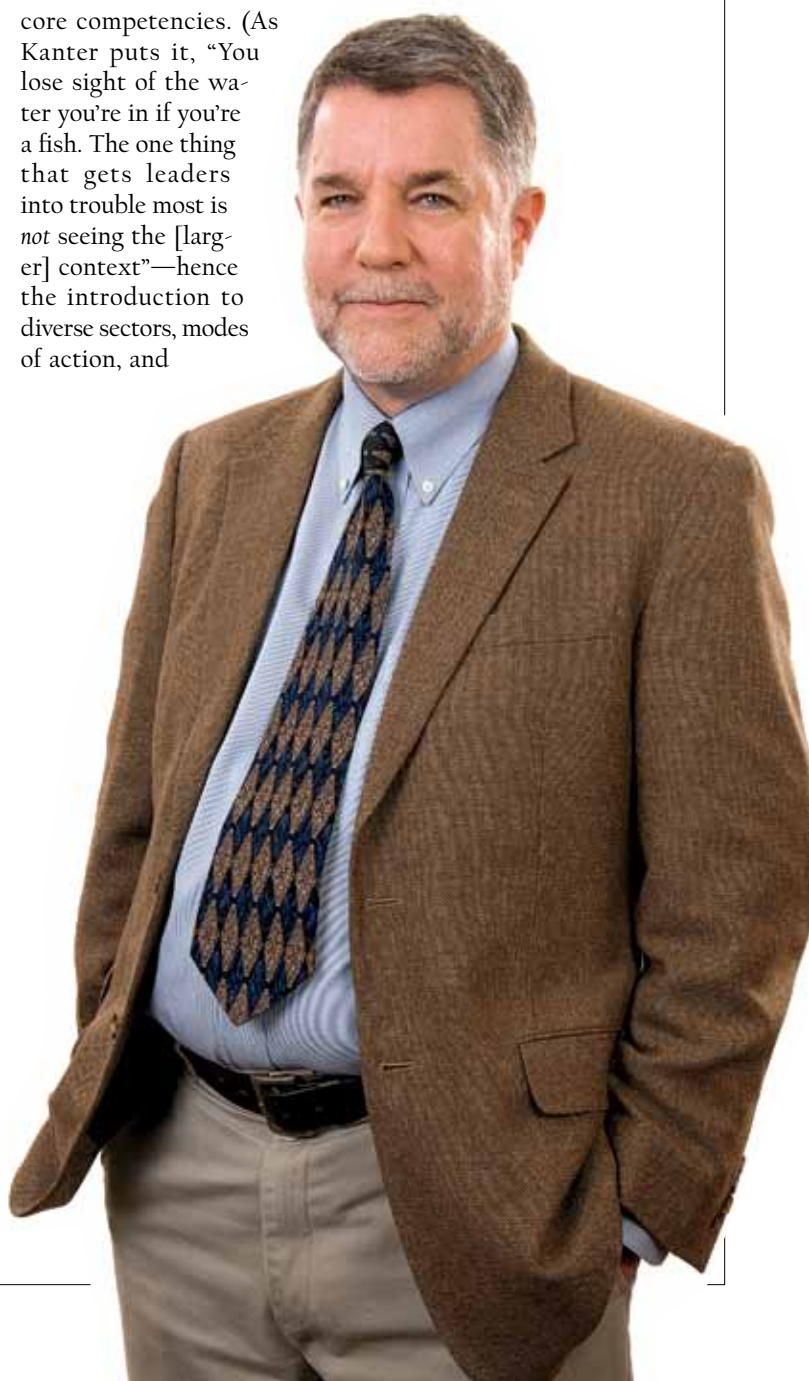
Though no longer a blank napkin, Whelan's enterprise remains experimental. Foundations have been wary about advancing capital. The schools where the need is greatest lack resources. So he and his partners have secured private funds to pilot the program with small groups of students. In the future, 13th Avenue Funding may well be seen as the seed of a major advance over the present system. But for now, the organization is somewhere under the sway of Kanter's Law, at the midpoint between germination and operating at scale.

Nonetheless, Whelan has found the next chapter in his life's work. He and his partners proselytize actively about their idea's clear superiority to the debt and defaults that today stand in the way of many seeking higher education—precisely the sort of problem ALI hopes its fellows will address anew. And his experience serves as an example for successor fellows, suggesting how far their missions can take them, and cautioning about the difficulty of their new work.

James P. Honan

"Moments of Truth"

Whelan's teaching role at ALI's education think tank points in a small way to the most distinctive feature of its pedagogy: its *omnidirectional* nature. It does have an intellectual architecture, derived from HBS and Kennedy School research on leadership and managing change, and embedded in the COAL course on core competencies. (As Kanter puts it, "You lose sight of the water you're in if you're a fish. The one thing that gets leaders into trouble most is *not* seeing the [larger] context"—hence the introduction to diverse sectors, modes of action, and



stakeholders through COAL and the think tanks.)

But in practice, ALI is a multifaceted and -tentacled entity. In duration, it is like an academic year (although scheduled during a calendar year, to fit participants' lives), but it is not connected to any degree studies. The fellows often resemble registrants in executive-education classes, but those typically last only a week or two, and focus on a specific skill or subject. A better analogy for the ALI fellows auditing classes around Harvard might be the Nieman Fellows, journalists taking a year of courses they choose to assemble.

The educational result is unlike anything else on campus—far beyond other interdisciplinary research collaborations. Khurana, a junior professor when the fellowship was conceived, had no idea then that he would be a House master, bridging the freeform lives of undergraduates and the more controlled studies of M.B.A. candidates and their famously planned, vetted HBS case curriculum—or that he would have ALI fellows living in Cabot House and interacting with its residents. The fellows "are phenomenal role models," he said, giving "clever" College students direct access to "wise" adults whose perspectives provide "moments of truth." In a word, he said, "It is what the House was meant for."

The interactions extend to classes, where the intersections of undergraduates, graduate students, and auditing adult fellows amount to a new kind of diversity "on a dimension of life experiences," Khurana continued. In these teaching moments, "The fellows *are* the content." (Pforzheimer professor of teaching and learning Richard J. Light, who is *not* affiliated with ALI, reports that when 2013 fellow William A. Plapinger audited a course on higher education, he became an invaluable resource for its master's degree students; Plapinger, who led Sullivan & Cromwell's European legal practice, chairs Vassar's board of trustees, and could provide vivid insights into the decisions trustees face.) The fellows also teach each other, in part by sharing ideas or even col-

Fellows' Travels

The Advanced Leadership Initiative (ALI) fellows' courses of action range widely: from raising awareness of sex trafficking in Boston to deploying a mobile app for real-time evaluation of food's nutritonal value; from moderating environmental impacts by improving grazing practices for beef cattle to combating childhood obesity by creating rewards programs for lower-calorie meals; from building online resources to help families coordinate autism care to accelerating global certification of "B Corporations" that pursue economic gains *and* social benefits. Here are snapshots of a few recent fellows' projects.

Training Internet-era apprentices. Having watched his father and others invest in and advise entrepreneurs on growing nascent companies, Miguel Rey, M.B.A. '83 (a native of Bogotá, Colombia, now living in South Florida), emphasizes "the *enormous* value of mentorship." As vice chair of a computer-networking company in Rhode Island (a state suffering very high unemployment), Rey became involved in its mentoring and apprenticeship program. With technologically proficient people scarce, the company began training its own workforce, while offering full pay and benefits for a year; the apprentices acquire technical proficiency and receive guidance on a competitive work ethic and the "soft" skills needed to succeed. Trainees (ranging from a track-and-field coach to a construction worker, and including the unemployed) all found placements at the company or with customers, enlarging the computer ecosystem—and typically nearly doubled their income.

This is precisely the kind of investment recommended by the experts involved in Harvard Business School's U.S. Competitiveness Project (see "Can America Compete?" September-October 2012, page 26). Rey aims to expand it to biotechnology and other industries in Rhode Island, and to develop a curriculum for such training. The result, he said, is that "Human beings will be able to do more because they *are* more."

Elevating logistics in China. Drawing on decades of experience as a lawyer and trade-association executive involved in international logistics, and representing China's national shipping line, Richard D. Gluck, based in Washington, D.C., launched a Sino-American logistics council to help the swiftly urbanizing People's Republic promptly cut tremendous waste in food transportation, reduce energy-wasting return trips of empty freight trucks, and accelerate rail shipping of trailers and freight containers.

Making writing exciting. David Weinstein, a 2011 fellow and 2012 senior fellow, worked with "really smart people" at Fidelity Investments, where he was chief of administration. But he found their written communications, especially across disciplines, subject to misinterpretation and "often filled with jargon." Teaching at Boston College Law School, he saw a similar need to improve students' writing. As an ALI fellow, he explored with Harvard Graduate School of Education (HGSE) experts how students learn to write effectively. With HGSE students, he evolved an online platform, Write the World (www.writetheworld.com), that engages high-school pupils in writing in an interactive tutorial setting: they submit work in response to a prompt, and then receive comments from trained reviewers—a rarity in the school context, where teachers are hard-pressed for time.

The low-cost platform challenges students and enables them to build a portfolio of their work. Weinstein and his team are expanding distribution by partnering with nonprofit groups, like Zoo New England, that encourage writing for subject-matter competitions, as a way of demonstrating the value of the program to school systems.

Managing mental health. As governments have deinstitutionalized care, people with severe mental illness and their families have had to navigate uncoordinated programs and services; for many mentally ill Americans, "care" is treatment in the emergency room or a cell, punctuating periods of homelessness. Ronald A. Lauderdale, a former vice president and assistant general counsel at IBM, and his wife, Valerie Lauderdale, participating as an ALI partner, probed Connecticut's program to coordinate mental healthcare for this population. Their analysis points to-

laborating on their projects: Plapinger and Cristián Shea, an investment executive from Chile, combined forces to work on financial aid for international students enrolling in U.S. colleges and universities.

They also teach their *teachers*. Khurana said it had been revealing to observe at close hand the different approaches and "habits of mind" of fellows who are lawyers (focused on the "cleanliness of the idea," and able to advocate either side), physicians (struggling to reconcile professional norms, patient care, and the health bureaucracy), and business people (pragmatists who focus on "the workability of the idea, not necessarily its elegance"). He came away with a central lesson for ALI itself: "Being problem-driven, it doesn't really matter where the tools are coming from so long as they help us illuminate something" requiring action. Given the initiative's distinctive aims, Kanter has even drawn upon fellows' work to craft nine and counting HBS teaching cases, used in autumn sessions where the current cohort refine their projects.

Undergraduates, graduate students, and auditing adult fellows intersect in classes, creating a new kind of diversity "on a dimension of life experiences." In these teaching moments, "The fellows *are* the content."

Outside the class setting, Khurana cited examples of fellows who have mentored graduate students, enlisted undergraduates in executing their projects, or—in the case of a former food-retailing executive—made contacts for M.B.A. students seeking work in the sustainable-foods industry.

What makes all this possible, of course, is the fellows themselves. They are highly accomplished—and highly motivated to be at Harvard (most pay their own way, the equivalent of a full year at the College, plus living and travel expenses during the year).

Still, these elements constitute a *lot* of energies and intentions to tie together in one program. And there, in assembling ALI by working her contacts, Kanter made her own luck. Although he had not been involved in early planning for the initiative, she asked senior lecturer on education James P. Honan to sit in on a conversation, to draw on his teaching and research in nonprofit management, in measurement of organizations' performance, and in higher education (in both degree programs and executive-education courses). With that, she attracted one of Harvard's classroom masters—a teacher who melds diverse people and interests, making connections that lead to cooperative learning.

Honan, now an ALI co-chair and senior associate director, teaches extensively in COAL—he said he found the fellows arrive with "a lot of professional and personal experiences," making them deep, broad, quick learners whose expertise he aims to "honor." He is heavily involved each May in helping them prepare brief project proposals (a statement of the problem, who is working on it, the gaps they see, the stakeholders, how to proceed), and then convene in small work groups to refine their statements.

A week later, in what may be ALI's most defining pedagogical moment, Honan runs the annual "cross-cohort exchange." The fellows hang up their "shingles" (visual representations of their projects) and solicit comment, share their written proposals, and wait nervously for peers and alumni fellows to sign on, using that highest of high-tech devices, the Post-it®. The notes indicate that another person wants to

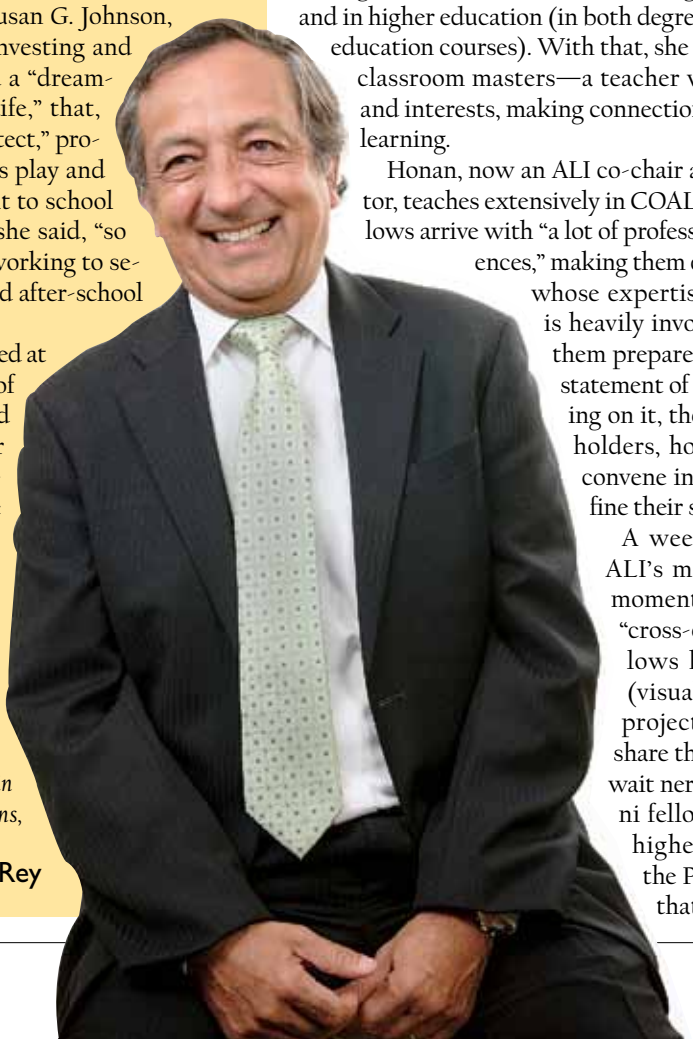
ward business initiatives—fee-for-service care in more affluent areas; continuing-education programs for health professionals; and after-care services that save hospitals money compared to readmission of indigent patients—that could strengthen the program's finances and enable it to fulfill unmet needs.

Helping children think big. How can children in impoverished households imagine the sort of better future (becoming an engineer or a Supreme Court justice) that is routine for those in more fortunate environments—and then tie that vision to their education? Floridian Susan G. Johnson, who has been principal of a private investing and management company, has developed a "dream-big" learning tool, "Lead a Brilliant Life," that, for example, ties the letter "a" to "architect," provides an illustrative role model, invites play and storytelling about the role, and links it to school lessons. "Kids live what they know," she said, "so let's be sure they know more." She is working to secure distribution in daycare centers and after-school programs.

Re-humanizing medical care. Alarmed at the loss of "the physician as the healer of ills, not just the fixer of problems," and doctors' pervasive discontent with their profession, Vincent de Luise, a Connecticut ophthalmologist, devised "The Course in Compassion," intended to reform medical-school curriculums by introducing instruction in art, observation, narrative, mindfulness, and empathy training—all grounded in humanism and humanities disciplines.

Nina J. Lahoud '78, a 2013 ALI fellow and 2014 senior fellow, who is a principal officer in the United Nations' peacekeeping operations, will be profiled in a forthcoming issue of Harvard Magazine.

Miguel Rey



learn more about a project, or can help advance it, or both. Honan, somehow, calls on people from throughout the room, bringing to bear on a 2013 fellow's proposal for climate-change action or education reform the expertise of a 2009 fellow and the experiences of someone from the 2011 cohort, and grouping them by interest and affinity for concentrated brainstorming sessions—all in real time. At the fellows' moment of maximum vulnerability, he connects them with others who have been there, makes their projects real, sets them up for a summer of focused work on developing their ideas. In so doing, he makes the ALI enterprise a continuous, multiyear community of learners and doers. For all the informal connections that arise during the year, Honan said, the cross-cohort exchange is the formal way ALI "deploys the cadre of advanced leaders over a period of time," in a way degree programs and executive-education classes cannot.

When the fellows reconvene in the fall, it is Honan who leads them in sharpening their projects, and then directs the November capstone experience where they present the refined plans. "Not all of them," he said, "but many of them will make that transition and get engaged" in solving large social problems.

Along the way, Khurana said, the intergenerational experiences the fellows bring to, and model for, Harvard contribute to a new kind of diversity, "on a dimension of life experiences," that might well be built into much of what the College and professional schools do. The fellows he has met, he said, are idealistic about pursuing new ventures, and understand that the University context is an ideal setting for the proverbial spreading of wings—exactly the attitude a teacher might hope for in *any* learner. "I'm excited to see the fellows make that transition," he said, "and get engaged in trying to develop solutions to large social problems."

Party secretary Guan, the ur-capitalist present, extolled Kunshan as "a place where dreams can be realized"—a future "paradise for entrepreneurs" to rival Cupertino, headquarters for Apple Inc.

"A Place Where Dreams Can Be Realized"

Early each summer, ALI fellows have the option of joining a learning experience with faculty members off campus—sometimes internationally, to broaden their project perspectives and reflect the international homes and interests of many of their peers themselves. Last June, during an immersion week in Shanghai, several dozen fellows, from various cohorts (many accompanied by family members), learned about Chinese business and the country's energy and environmental challenges. They took in panels on local intellectual-property law (led by Charles Ogletree), enterprises and entrepreneurship (directed by Rosabeth Kanter), and health and a promising experiment with patient-focused electronic medical records (led by Barry Bloom).

The highlight of the trip—a midweek day outing to Kunshan, a city of some two million people between Shanghai and Suzhou—combined substance with a subtext applicable to the fellows' own aspirations. Thirty years ago, the area was farmland: mulberry trees. But in 2011, among myriad other products, workers in Kunshan factories assembled 89 million laptop computers, 40 percent of the world's supply. Even by the standards of the burgeoning Yangtze River delta, the city is an extraordinary economic success, a showcase for China's oxymoronic Communist Party-led, market-style growth. That status is captured in an HBS case, "Kunshan, Incorporated: The Making of China's Richest Town," jointly written by William C. Kirby, Chang professor of China studies and Spangler Family professor of business administration, and Nora Bynum, vice provost for Duke Kunshan University (DKU)—the institution Duke and its Chinese partner, Wuhan University, will open for students this autumn.

A principal in the case is Guan Aiguo, the local Party secretary, who directs his city's continuing evolution from simple manufacturing to high-tech assembly now and toward a future of value-added, knowledge-based industry, symbolized by the new 200-acre DKU campus the government is funding. During an afternoon briefing in a conference room at the Tsinghua Science Park, accompanied by a panel of six local CEOs (he called them "my partners"), Guan rose to address the delegation of Crimson visitors, capitalists all. He promptly established himself as the ur-capitalist present, extolling Kunshan as "a place where dreams can be realized" and sketching a vision of trained workers, efficient financial markets, and infrastructure that would "create a paradise for entrepreneurs" to rival Cupertino—headquarters for Apple Inc., in Silicon Valley.

Kirby's case study describes Guan, working within the world's vastest hierarchy, as an "entrepreneurial bureaucrat." Kunshan's leader might well recognize ALI's Harvard leaders as kindred spirits.

Then, in an exercise that would astonish an American local-government official struggling to fund her city's pension plan or sort out demands for, say, new street lights, Guan propounded a sweeping strategy—buttressed by management consultants and backed with data—for his town's future progress. It envisions investing in DKU and other internationally oriented institutions of higher education; raising community health standards; providing home care for retirees; building cultural and leisure facilities, and greener transportation; and relentlessly raising the townspeople's skills, preparing them for higher-value employment and thus raising incomes many-fold in the years to come. Keeping himself firmly grounded, Guan invited critiques of the plan by e-mail, and referred to the HBS case study as a source for sharpening Kunshan's vision. It's been a *long* time since the era of Mao's Little Red Book.

For more information on ALI, see its website: http://advancedleadership.harvard.edu.

Guan surely works with resources—power, finances—far beyond those explored in the different "sectors" in ALI's curriculum. But the propulsive force of the strategy he laid out, its results to date, and its momentum made Michael Bush's plan for post-catastrophe life care, or Mark Feinberg's emerging HIV-therapy collaborative, or Robert Whelan's idea for upending student financing seem not so far over the horizon after all.

John S. Rosenberg is editor of Harvard Magazine.

Nuclear Weapons *or* Democracy

"Out of ratio" weapons are essentially ungovernable.

by Craig Lambert

THE MOST FATEFUL OBJECT yet to appear on this planet could be the "nuclear briefcase," or "nuclear football," a 40-pound titanium case containing top-secret information and tools that enable the president of the United States to launch a nuclear strike. The president carries authentication codes to assure recipients that the source of any nuclear orders is actually the Commander in Chief. When the president is away from the White House, a military officer with the nation's highest security clearance ("Yankee White") always remains nearby with this doomsday device, at times cabled to his wrist.

Due to the extraordinary secretiveness surrounding nuclear matters, Americans have no idea how many times presidents may have opened the nuclear briefcase or its equivalent. We do know that Eisenhower considered using nuclear weapons twice, during the Taiwan Straits crisis of 1954 and a flare-up over Berlin in 1959; Ike also delegated the power to launch a strike to certain military commanders if he were unavailable. Former secretary of defense Robert McNamara, M.B.A. '39, LL.D. '62, said, late in his life, that John F. Kennedy '40, LL.D. '56, came "within a hairbreadth of nuclear catastrophe" three times—this in a presidency lasting only 34 months. Lyndon Johnson contemplated deploying nuclear arms to prevent China from building them. Richard Nixon considered using them three times—other than in Vietnam—including one case in which North Korea shot down a U.S. reconnaissance plane in 1969.

"The crucial point is that there's an interval of *30 or 40 years* between those incidents and our learning about them," says Elaine Scarry, Cabot professor of aesthetics and the general theory of value. "We wrongly assume that the Cuban missile crisis is the model: 'when the world is at risk, we know it.' Well, we *don't*

© BETTMANN/CORBIS

Mushroom cloud from U.S. nuclear test, Eniwetok Atoll, Marshall Islands, 1951

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Elaine Scarry

know it. In eight of these nine cases, we didn't have a clue. Do we want to simply *guess* about something like this, where millions of people stand to be killed? We assume there would have to be a huge problem for us to contemplate such a thing. Like, for example, shooting down a reconnaissance plane?

"It's widely acknowledged that nuclear weapons are incredibly susceptible to accidental use or to seizure by a non-state actor or terrorist," Scarry continues. "But what has been insufficiently recognized is the biggest danger of all: the belief that there is some 'legitimate' possession of these weapons, that we are safe as long as there's government oversight of them. In fact, they are utterly incompatible with governance."

In her new book, *Thermonuclear Monarchy: Choosing Between Democracy and Doom* (W.W. Norton), Scarry argues that the very existence of nuclear arsenals is irreconcilable with the U.S. Constitution and in fact betrays the basic purpose of the social contract that governs any civil society: forestalling injurious behavior. "Nuclear weapons undo governments, and undo anything that could be meant by democracy," she says. "They put the population completely outside the realm of overseeing our entry into war—or having a say in their own survival or destruction. We have to choose between nuclear weapons and democracy."

In her book, Scarry asserts that the United States, "...a country formerly dependent on its population, its legislature, and its executive acting in concert for any act of defense—has now largely eliminated its population and its legislature from the sphere of defense, and relies exclusively on its executive."

Nuclear weapons are monarchic. Along with other weapons of mass destruction, they are what Scarry calls "out-of-ratio" weapons: ones that give a very small number of people the power to annihilate very large numbers of people. "An out-of-ratio weapon makes the presence of the population at the authorization end [of an attack] a structural impossibility," she writes. "New weapons inevitably change the nature of warfare," she says, "but out-of-ratio weapons have changed the nature of government."

In a practical sense, the speed and scale of an incoming nuclear attack make the notion of congressional authorization of war ridiculous; such arms are fundamentally beyond democratic control. "We had a choice: get rid of nuclear weapons or get rid of Congress and the citizens," Scarry explains. "We got rid of Congress and the citizens."

Since the bombings of Hiroshima and Nagasaki in 1945, American presidents have been well aware that having a finger on the nuclear trigger gives them monstrous power that dwarfs the pet-

Photograph by Jim Harrison

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

"We had a choice: get rid of nuclear weapons, or get rid of Congress and the citizens," Scarry says. "We got rid of Congress and the citizens."

ty squabbles of day-to-day political life. During the 1974 impeachment proceedings of Richard Nixon, he told the press, "I can go into my office and pick up the telephone, and in 25 minutes 70 million people will be dead."

The concentration of such outsized violent force in the hands of the American president (and of the leaders of the other eight nuclear powers) has, Scarry argues, largely undermined the three-part design of government that the framers of the Constitution created to separate legislative, judicial, and executive power. Instead, Washington has become like a three-handed poker game in which one player holds all the high cards and billions of chips.

In Article I, Section 8:11, the Constitution insists on a congressional declaration for war to take place, Scarry says, yet, "since the invention of atomic weapons, there has not been a formal congressional declaration of war." (The closest case was Congress's conditional declaration for the Gulf War.) *Thermonuclear Monarchy* describes the five cases of declared war in American history: the War of 1812, the Mexican War of 1846, the Spanish-American War, and the two World Wars. Scarry remarks on "how majestic Congress was in those cases."

The awesome power that nuclear weapons invest in the executive branch essentially disables the legislative one, she writes. "[O]nce Congress was stripped of its responsibility for overseeing war—as happened the moment atomic weapons were invented—it was, in effect, infantilized....Now, six decades later, book after book has appeared describing Congress as 'dysfunctional' or 'dead.' Once Congress regains its authority over war, however, there is every reason to believe it will travel back along the reverse path, reacquiring the stature, intelligence, eloquence, and commitment to the population it once had."

Civic stature and military stature are intimately linked. Scarry points to the passage of the Fifteenth Amendment, which enfranchised African-American men. It came on the heels of the Civil War, in which 180,000 black soldiers fought; given this, blacks could hardly be denied the right to vote. Similarly, the Twenty-Sixth Amendment, lowering the voting age from 21 to 18, was ratified after many teenaged soldiers had fought and died in the Vietnam War.

"It is tempting to think that a country with monarchic arrangements in the realm of nuclear war can maintain a more attractive form of government throughout the rest of its civil fabric," she writes. "That would be a mistake. A country *is* its arrangements for national defense...."

The Constitution and, more generally, the social contract, purposely make it difficult to go to war. Scarry's book makes clear that the social contract arises from the need to prevent the injuries that people living in groups so often cause one another. The solution involves putting brakes on the concentration of power. "The only way you can civilize force is to distribute it: give everyone a small share," she says, adding that the Second Amendment's insistence on the citizens' right to bear arms underlines this principle. Urging that military powers be held within the social contract, John Locke similarly warned, she notes, that anyone is "in a much worse condition, who is exposed to the arbitrary power of one man, who has the command of 100,000, than he that is exposed to the arbitrary power of 100,000 single men." Nuclear weapons eliminate individual soldiers; they condense the injuring power that formerly depended on thousands of soldiers into a single weapon, and place it at the disposal of a solitary leader.

"Actions that cause major injury, like going to war, require collective decisionmaking—which gives a great braking power," she says. "You don't want to put impediments in the way of the good things in life—things like liberty, lovemaking, party-going, studying, helping others. The social contract puts impediments in the way of *one thing:* injury."

War surely causes more injury and death than any other action arising from human intentions, and the Constitution (written in the wake of the Revolutionary War) puts a double brake on warfare. War must pass through two gates to become a reality. One is Congress, with its responsibility (now shirked) to declare war. The second brake is the general population. "The mere fact that you required the citizens to fight meant that the citizenry could say yes or no," she explains. "A war doesn't get fought if the population doesn't want it fought.

"People like to say, 'Soldiers obey—they do what they're told,'" she continues. "It's not true. Soldiers do what they are told, but they do it thoughtfully—and sometimes they *don't.* The War of 1812 ended when it did because the population, including soldiers and sailors, did not feel strong support for it. There were soldier strikes all over England and Canada at the

Injury and Beauty

This spring, Elaine Scarry is teaching two courses: a purely literary class on the three Brontë sisters, and "The Problem of Consent," drawing examples from literature, medicine, political philosophy, and the law, and enrolling students from the Law School as well as the College. Though her home base is Harvard's English department, Scarry has never limited her scholarship to literature.

From the beginning, she says, her work has focused on two areas: "the problem of injury, and why it is so hard to get people to care about it;" and "the great pleasure of beauty and creation." The first of Scarry's 10 books, *The Body In Pain* (1985), offered a searching exploration of physical pain in medical, military, legal, scientific, and literary contexts. *Dreaming by the Book* (1999) inquired into how poets get readers to form vivid mental images. *On Beauty and Being Just* (1999) argued that encounters with beauty "call us either to educate ourselves, or to try to repair the injuries of the world." Since 1987, she has been researching the issues involving consent to war expounded in *Thermonuclear Monarchy;* in recent years she has lectured on its themes at law schools and humanities forums.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

© WALLY MCNAMEE/CORBIS

A military aide to President George H.W. Bush carries the "nuclear briefcase," cabled to his wrist, in 1991.

end of World War I; Winston Churchill wrote to Lloyd George saying he wanted to go into Russia to support the Whites against the Reds, 'but the soldiers won't let me.' A big reason the South lost the Civil War was that 250,000 soldiers deserted; every time Robert E. Lee looked over his shoulder, he saw a smaller army. Soldiers ratify a war."

The secrecy that cloaks nuclear policy and the technical aspects of nuclear arms—what happens in the private huddles between a president and his advisers, for example—keeps these policies insulated from any genuine, searching critique, she believes. Even the weapons themselves remain sequestered in deep-sea waters, high in the sky, or at remote land locations in Wyoming, Montana, or North Dakota, for example. It can be difficult even to communicate with the military personnel trusted to oversee them.

The USS *Rhode Island* is one of 18 Ohio class submarines armed with nuclear ballistic or guided missiles that patrol the world's waters. Its armaments can destroy all human, animal, and plant life on a continent. When deeply submerged, as in wartime or any moment of high political tension, Scarry writes,"...it can o-n-l-y-r-e-c-e-i-v-e-t-i-n-y-a-m-o-u-n-t-s-o-f-i-n-f-o-r-m-a-t-i-o-n-v-e-r-y-v-e-r-y-s-l-o-w-l-y. In fact, the first three letters of the hyphenated message would have taken fifteen minutes to arrive, and the submarine would have had no way to confirm its receipt of the letters." The information gets conveyed, she explains, "... in Extremely Low Frequency (or ELF) waves, giant radio waves each 2500 miles in length that can (unlike any other band of the electromagnetic spectrum) penetrate the ocean depths. Until 2004, ELF waves were launched by a giant antenna in Michigan and Wisconsin that is eighteen acres in size." (The Navy has not disclosed the successor to ELF.)

The nuclear-armed submarine, then, is an obscenely powerful engine of destruction and death that, at the most critical moments, seems all but incommunicado. *Thermonuclear Monarchy* builds on this: "...to say nuclear weapons are 'ungovernable' is to say that they are unreachable by the human will, the populations of the earth can have no access to them.... The membrane that separates us from their lethal corridors is one-directional: the weapons may suddenly unzip the barrier, erupt into our world, eliminate us; but we cannot, standing on the other side, unzip the barrier, step into their world, and eliminate them." She elaborates: "People say, 'Once something is invented it can't be un-invented.' What are we talking about? These things we've invented can kill and destroy the whole earth, but *we* can't get rid of *them*? Of course we can."

The Ohio class submarines nicely epitomize the furtiveness of the nuclear world. Eight new ones were launched between 1989 and 1997, during the years of the so-called "peace dividend." *Each* of these subs carries nuclear weapons with eight times the total blast power expended by all Allied and Axis countries in World War II. The 14 Trident II SSBNs (ballistic-missile launching submarines) have, among them, the firepower to kill all life on 14 continents. "There are only seven continents," Scarry dryly remarks. Even so, news reports did not cover the launching, christening, and commissioning of any of these submarines, even in the states whose names they bore.

The shroud of secrecy keeps the general citizenry ignorant of basic facts about the nation's nuclear arrangements. Most Americans do not realize that the country has a first-use policy. A 2004 poll found that the majority estimated that the United States has 200 nuclear weapons; the actual current figure is 7,700. Meanwhile, 73 percent of Americans say they want the total elimination of nuclear weapons, as do similar proportions of Russians and Canadians.

The United States and Russia are now reducing their stockpiles of nuclear warheads in accordance with negotiated agreements. This is a positive step, Scarry says, though she cautions that the reductions in forces "may simply be a way to retire obsolete weapons to make way for newer ones." (Twelve more Ohio class submarines are slated for construction between 2019 and 2035.)

Recent scientific work on the "nuclear winter" (the hypothetical climate change following a nuclear exchange), Scarry reports, indicates that any country launching a nuclear attack would be committing suicide—rendering the weapons, in effect, unusable. An exchange that exploded as little as 0.015 percent of the world's nuclear arsenal—say, between lesser nuclear powers like India and Pakistan—could leave 44 million dead immediately—and one billion more people likely to perish in the following month, given the effect on food supplies and the disruption of agriculture.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

"People say, 'Once something is invented, it can't be uninvented.' What are we talking about? These things we've invented can kill and destroy the whole earth, but *we* can't get rid of *them?* Of course we can."

During the Cuban missile crisis, President John F. Kennedy stated that the United States had no quarrel with the Cuban *people* or the Soviet *people.* But, Scarry says, "These weapons are not designed for a showdown of political leaders. They are going to massacre the *citizens.* No weapon ever invented has remained unused. Does anyone think that in the next 100 years, one of these governments that has them, won't use them?"

In a 2005 *Foreign Policy* essay, "Apocalypse Soon," Robert McNamara bluntly declared, "U.S. nuclear weapons policy [is] immoral, illegal, militarily unnecessary and dreadfully dangerous." Scarry agrees, and declares, "Nuclear weapons have to be gotten rid of, worldwide. But this cannot be done if the United States is just sitting there with this huge arsenal, which dwarfs what any other nation has. We worry about Iran and North Korea and the huge existential threat if these countries get nuclear weapons. What is mysterious, though, is that we fail to see the huge existential threat that *we* pose to the world with what is by far the most powerful nuclear arsenal anywhere."

In 1995, 78 countries asked the International Court of Justice to declare nuclear arms illegal. In response, the U.S. Departments of Defense and State jointly argued that using, and even making first use of, nuclear weapons does not violate any treaty regarding human rights or the environment. Nor would the death of millions via a nuclear attack violate the 1948 UN convention on genocide; they asserted that "genocide" applies only to the annihilation of national, ethnic, racial, or religious groups.

Scarry instead suggests that the United States act in concert with other nuclear nations, all using their constitutions, to dismantle and permanently eliminate these weapons. The first step, she says, is "reanimating our awareness that we are responsible—we are in control, or should be in control, of our self-defense." Restoring the military draft would help return responsibility for decisions about war to the whole population, and make political leaders far more accountable to the citizenry. "Little by little, the importance of the Constitution has been obscured," she states. "We should require Congress to oversee our entry into war. A president who does not get a congressional declaration should no longer be president. That is absolutely an impeachable offense. The population has to see how important this provision is." Furthermore, in negotiations for nuclear disarmament, "if those who are negotiating know that the population is *insisting* that these weapons be eliminated—rather than just leaving it up to a handful of negotiators—that will help them as negotiators.

"There is no transparency if you're waiting 30 or 40 years to get the information," she continues. "Presidents ought to report about close calls, for example. Maybe each year in the State of the Union address, the president should have to say how many times a nuclear option was considered in the past year. And we ought to feel that it is our responsibility to *ask* about these things. History has to show that we tried."

In an earlier book, Scarry analyzed the events of 9/11, showing how the citizens on Flight 93 were able to act effectively to disrupt the terrorists' planned mission. "They deliberated, they actually *voted*, and they acted to bring down that plane," she says. "Whereas the Pentagon could not even defend the Pentagon, let alone the rest of the country: their habits and training were all directed toward this idea of war with a foreign country. The fighter jets at first flew off away from the coast, in the wrong direction. But terrorists like the shoe bomber—undone by fellow passengers. The so-called Christmas bomber in Detroit—undone by passengers. The Times Square car bomb—an ordinary vendor noticed something wrong."

Perhaps millions of citizens will find something wrong with a far greater bomb threat, and defuse it. Scarry ends the first chapter of *Thermonuclear Monarchy* with a challenge. "The two artifacts, the social contract and the nuclear array, are mutually exclusive," she writes. "To exist each requires that the other be destroyed. Which one will it be?"

Craig A. Lambert '69, Ph.D. '78, is deputy editor of this magazine.

KIMBERLY CLIFFORD/U.S. NAVY

The USS *Wyoming*, an Ohio-class nuclear ballistic-missile armed submarine, transits the Intracoastal Waterway in 2009.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Montage

Art, books, diverse creations

Styled Blue Yonder

Jessica Ambats's spectacular air-to-air photographs

by CRAIG LAMBERT

THE IMAGES have so much *air* in them: high above the ground, planes cavort in open space, seemingly at play. They fly astonishingly close to the viewer, at times only 20 feet away from the camera lens. Backdrops—bridges, cities, deserts, rivers, forests—fall away majestically, far below. This is air-to-air photography, pictures that only someone flying in another plane could take. Many have appeared in *Plane & Pilot* magazine; its editor, Jessica Ambats '95, belongs to the small cadre of those who make such pictures. Her airborne shoots typically last about an hour, with specially trained pilots maneuvering the planes. "Every detail is planned," she says. "Usually we end up flying in circles for the whole hour."

What's tricky about such pictures is that both camera and subject are in motion (typical airspeeds are around 150 knots, or about 172 miles per hour), so there's not much wiggle room on timing the shutter release. Another element is the setting. "I work very hard on backgrounds," Ambats explains. "I'm choosy—I want clean, uncluttered backgrounds, no roads or telephone poles." She also tries to match a background with the featured aircraft: she might position a private jet that flies to business meetings over a city skyline, or place an older aircraft like an open-cockpit biplane above sand dunes.

Ambats (www.jessicaambats.com) is a trained pilot herself, with instrument, multi-engine, and seaplane ratings. As a 12-year-old, she flew in a private plane with a family friend, and "during the flight, she let me make left and right turns with the yoke," Ambats recalls. "It was my first exposure to the idea that regular people can fly airplanes—I'd thought it was only for the military." After college, she went up with a flight-instructor friend, spending the afternoon hopping around small airports in the New York and New Jersey area and discovering "general aviation," the term for non-commercial civilian flying. (*Plane & Pilot* is one of the three biggest general-aviation magazines.) Ambats began flying lessons at Andover Flight Academy in Andover, New Jersey, and finished in California, having moved to Los Angeles in 2004 to work for *Pilot Getaways* magazine, where she took up air-to-air photography. Today she likes to fly a Cirrus single-engine propeller plane for

Photographs by Jessica Ambats

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Left to right: An Aero L-39 Albatros (foreground) and Dassault Falcon 2000 over the Golden Gate Bridge; a World War II-era North American P-51 Mustang over New York City; an Oracle Challenger (red) and Wolfpitts (yellow); Ambats shooting from a Beechcraft A36 Bonanza photoship

PHOTOGRAPH BY DAVID FARR

pleasure. (She rents these craft, which cost around $480,000 each; private jets fall in the $3-million to $10-million range.)

For shoots, she hires only "formation pilots," specialists trained to fly in close formation with other planes: some are former Blue Angels or Thunderbirds. With exposures from ranges as close as 20 to 150 feet, this kind of expertise is essential or it's "too risky," she says. "It takes finesse to move an airplane exactly 10 feet." During the shoot, she constantly feeds both pilots directions to line up the planes properly with each other and the background: "Biplane, 15 feet higher." Even such a small change can drastically alter the composition.

Ambats usually works from a Beechcraft Bonanza with the rear doors removed. (She does not shoot through glass.) A harness holds her securely in place. Working with a handheld high-end digital camera, she exposes several hundred images per flight. Lenses with image stabilization can help, and at times she deploys a gyroscopic camera stabilizer, "if it's a bumpy flight."

Midlife Leading Man

Breaking Bad's *Dean Norris, a prime-time stalwart*

Dean Norris '85 is headed home by limousine after finishing a photo shoot with—he kids—"a few underlings from the network": CBS Entertainment president Nina Tassler and CBS Television Studios president David Stapf. The 50-year-old actor seems to be taking the media attention he's receiving in stride.

"*Under the Dome* turned out to be a huge summer success," he explains matter-of-factly. "And it was profitable from day one, so it was a big game changer from a business standpoint." A rare summer triumph for network television, CBS's *Dome*, based on a Stephen King science fiction novel, was anchored by Norris as "Big Jim" Rennie, a power-hungry local politician in a town suddenly cut off from the world by an invisible barrier. Season two will begin production in March.

URSULA COYOTE/AMC

Dean Norris, at right, in the television series *Breaking Bad* with Bryan Cranston

But Norris is perhaps best known for playing Drug Enforcement Administration agent Hank Schrader on AMC's cable series *Breaking Bad*, which won 10 Emmy Awards during its seven-year run, including Outstanding Drama Series in 2013.

In an industry often criticized for emphasizing youth and good looks over talent, Norris's leap to leading man in middle age sounds improbable. Yet his stardom

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Off the Shelf

Recent books with Harvard connections

The Princeton Guide to Evolution, editor in chief Jonathan B. Losos, Lehner professor for the study of Latin America and professor of organismic and evolutionary biology (Princeton, $99). A massive reference guide to what Losos, the Museum of Comparative Zoology's curator in herpetology (a lizards guy), describes as "a golden era of evolutionary study." Too much to spend for the Intelligent Design proponents on your birthday list.

Jonathan Swift: His Life and His World, by Leo Damrosch, Bernbaum research professor of literature (Yale, $35). A big, but brisk, new biography, with nearly 100 illustrations, exploring what is known, and what remains mysterious, about Gulliver's creator. Damrosch has previously written, to acclaim, about Rousseau and Tocqueville.

The Call of Character: Living a Life Worth Living, by Mari Ruti, Ph.D. '00 (Columbia University Press, $25). The University of Toronto professor of critical theory addresses "what makes each of us a unique and idiosyncratic character" without succumbing to New Age sloganeering, resorting to "deliberately lucid prose" that she terms "my little act of defiance."

The Problem of Slavery in the Age of Emancipation, by David Brion Davis, Ph.D. '56 (Knopf, $30). The concluding volume in the magisterial trilogy on slavery in Western culture by the Sterling Professor of history emeritus at Yale. Davis published the first installment in the 1960s; it and the second volume between them won a Pulitzer Prize, National Book Award, and Bancroft Prize, and set the parameters for studying slavery across the academy.

FROM THE BOOK

Light and Dark, by Natsue Soseki, translated by John Nathan '61, JF '70, Ph.D. '74 (Columbia, $35). A meticulous version of the unfinished last work by Soseki, who "endured the transformation of Japan" during his lifetime (1867-1916), according to Nathan, and so created the modern Japanese novel. Nathan, a biographer of Yukio Mishima and now Takashima professor of Japanese cultural studies at the University of California, Santa Barbara, says the "minutely observed and unsparing" work is a "landmark" in Japanese fiction.

Blasket Island home: The National School (left, upper image) and the Carneys' home (middle structure), with father Seán Tom Ó Ceárna outside. Below, Michael Carney (standing left) with friends, and (seated) brothers Tom, Martin, and Paddy.

Old Fields: Photography, Glamour, and Fantasy Landscape, by John R. Stilgoe, Orchard professor in the history of landscape (University of Virginia Press, $34.95). In another of his wide-ranging explorations—here, from *I Dream of Jeannie* to voodoo—the author (profiled in "Safari on a City Street," January-February 1996, page 36) examines portrayals of glamour through photography, among other queries.

Making the American Body, by Jonathan Black '65 (University of Nebraska, $27.95). Glamour, of a different sort: the icons of the fitness biz, from Atlas (Charles) to Schwarzenegger, by a former managing editor of *Playboy*. Complete with a Harvard Medical School anecdote on the "Roxbury Hercules."

The Heathen School: A Story of Hope and Betrayal in the Age of the Early Republic, by John P. Demos '59, G '68, RI '07 (Knopf, $30). Another in a series of highly original works on early America—this time, about a Cornwall, Connecticut, school to "civilize" young "heathens" from around the world—by the Knight professor of history emeritus at Yale.

Romania's Abandoned Children, by Charles A. Nelson III, professor of pediatrics, Nathan A. Fox, Ed.D. '75, and Charles H. Zeanah (Harvard, $29.95). Nelson and colleagues from the University of Maryland and Tulane report—with scientific rigor and dismaying detail—on the devastating effects institutionalized children suffered, intellectually and emotionally, compared to peers in foster and home care.

From the Great Blasket to America, by Michael Carney with Gerald Hayes, Ed.M. '70 (Collins Press, $22.95 paper). Aided by his son-in-law, the oldest living native of the Blasket Islands (off Ireland's Dingle Peninsula) recalls how its people were resettled to the mainland, and, from the vantage of his present home in America, his memories of island life before World War II, and his life since.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

is well earned, especially considering his many credits for performing smaller film and television roles as a character actor in the past quarter-century, in shows from *The Equalizer* and *NYPD Blue* to *CSI* and *The Mentalist*. "I was slotted into [parts playing] cops and military and CIA," he recalls. "There was always plenty of that out there, so I was able to make a good living just going from show to show and movie to movie."

Norris grew up in South Bend, Indiana. "It was the Rust Belt," he says. His grandparents were Hungarian and Polish immigrants who worked in the factories that fed Detroit auto plants and, luckily, retired before the oil embargo of the early 1970s changed the industrial landscape. His father, who owned a furniture store, played in a band on weekends, like many of his other relatives. By the age of nine, Dean was sitting in on guitar and getting a taste for performing. "When I got older," he remembers, "I realized I wasn't good enough as a musician to make any money."

His first performance was in *Richard III*; at age five, he played a young prince in a Notre Dame University production. There were other roles at the university and as a high-school student, but Norris says it was his Harvard experience that truly prepared him for the career that lay ahead. "I remember one day when I literally had three plays in my head at the same time," he recalls. Typically the social-studies concentrator acted in five or six plays a year: on the Loeb main stage, in the Loeb Ex's black-box theater, and in House productions. The professional American Repertory Theater was freshly arrived in Cambridge from Yale, so he also got the chance to understudy or take on small roles there—superb training for the demands he later faced.

"You have to be able to get into different characters quickly," Norris says of his job. "Because if you're guest-starring on a show, you get one or two takes and that's it. And for me, so much of that came from doing theater, where you don't *have* takes."

After attending the Royal Academy of Dramatic Art in London, Norris moved to Los Angeles in 1988. "I always knew that I'd be a middle-aged actor," he says. "Even at 25, I was playing 35. It wasn't until 35 or 40 that I grew into my age."

But television has evolved to his benefit. Norris credits *NYPD Blue* and actor Dennis Franz in particular for bringing more grit and intensity—not to mention better acting—to the small screen. The show welcomed actors he calls "real-looking people." And today's cable shows have further exploded the strictures once imposed by the networks because, as Norris says, "all of this talent moved [to cable television] from independent movies, which are very difficult to make any more." Norris likens film to the short story and serialized cable to the American novel. "With *Breaking Bad*, for example, it's like you have 62 chapters that tell this long and complicated story—and to then think I'm going to do a movie? It's like a moment in time."

As for being a "character actor" in the future, Norris asserts, "I think if you act, you act," adding, "Those lines have blurred. That's a term left over from when you had good-looking Hollywood guys and everybody else." —LARA PELLEGRINELLI

Calling All Harvard Authors!

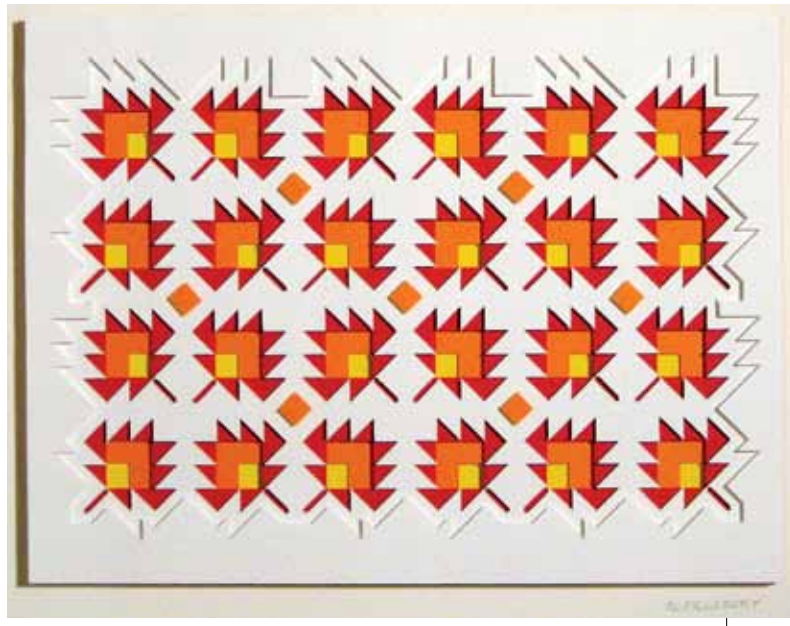
Showcase *your* book or writing/editing services in *Harvard Magazine* and reach 245,000 Harvard alumni, faculty, and staff.

The July-August 2014 *Harvard Magazine* will feature the Harvard Authors' Bookshelf—a special advertising section for authors (in Montage, adjacent to coverage of books and the arts). Call Gretchen Bostrom at 617-496-6686 or e-mail classifieds@harvard.edu to find out about the special listing package that includes: a full-color book jacket or photo, book title or company name, and a description of up to 25 words—plus online coverage.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Design in Layers

Robert Pillsbury's imaginative stacks of paper



Autumn

ROBERT PILLSBURY

During his 40-plus years as an architect, Robert Pillsbury '61, M.Arch. '65, devoted himself to the pleasures of creation and construction, often in the form of large-scale industrial water and sewer systems he helped design. Now retired, his materials of choice have shifted to the lighter medium of paper. Inspired by everything from the natural world and the elegant geometry of quilt patterns and chair caning to Italian abstract artists such as Enrico Castellani and Piero Dorazio, Pillsbury employs an architectural process and aesthetic to create cut-paper compositions that communicate a simultaneous sense of delicate intricacy and substantive dimension.

Pillsbury studied art at Harvard with painter and photographer T. Lux Feininger and dabbled in different projects over the years, at one point creating a series of life-sized birds of prey from discarded cork sheets. It wasn't until 2009, however, that he started to devote more time to his artwork. "I always felt that you need to have something to retire *to*—I couldn't just retire," says Pillsbury, who reports to his home studio in Warren, Rhode Island, at 8 A.M. every weekday, breaking for lunch and a bike ride before returning for a few more hours of work in the afternoon.

It takes him about 40 hours to craft a piece from start to finish. First, he drafts a design concept on paper freehand before using a software program (SketchUp) to create and manipulate a measured, hardline drawing to print out as a template. Pillsbury places that template over a sheet of

Chapter & Verse

Correspondence on not-so-famous lost words

"the commonest form of stupidity" (January-February). Joseph Marcus responded: "1. I plugged the Nietzsche quotation into Google Scholar, which returns gazillions of citations. One occurs in Kenneth Hart Green's *Leo Strauss and the Rediscovery of Maimonides* (chapter 4, note 2). Green cites the Marion Faber-Stephen Lehmann translation of Nietzsche's *Human, All Too Human: A Book for Free Spirits*, specifically the second supplement, 'The Wanderer and His Shadow,' aphorism 206: http://books.google.com/books?id=exAg0DL6n3IC&pg=PA186&lpg=PA186&dq=to+forget+one's+purpose+is+the+commonest+form+of+stupidity&source=bl&ots=aYif_r_ZfX&sig=5YxHQORP7Excu4-s_aAAxgeCq3I&hl=en&sa=X&ei=Ve7bUuj9NbOgsATRxoDACw&ved=0CEwQ6AEwBjgo#v=onepage&q=to%20forget%20one's%20purpose%20is%20the%20commonest%20form%20of%20stupidity&f=false.

2. Next, using Google Books, I located this translation (unfortunately there's no internal search option): http://books.google.com/books?id=QhWsEiQFH_gC&dq=marion+faber+human,+all+too+human&hl=en&sa=X&ei=S_vbUsbtE-fJsQSHI4GgBQ&ved=0CDQQ6AEwAg.

3. You can also find this book as a 1994 Penguin Classic (again, there's no 'Look Inside ...' feature) at Amazon: http://www.amazon.com/Human-All-Too-Paperback-Common/dp/B00FFBG1BG/ref=sr_1_3?s=books&ie=UTF8&qid=1390145718&sr=1-3&keywords=marion+faber+stephen. And as a 1996 Bison Books re-publication [ISBN-13: 978-0803283688]: http://www.amazon.com/Human-All-Too-Spirits-Revised/dp/0803283687.

4. Additional publishers have issued the translation in various editions. (Be careful with the format of your citation, though; some versions only credit Faber as the translator, with Lehmann as editor, etc.)

5. Finally, it's interesting to compare other translations, which phrase the aphorism slightly differently—just one reason that it's so difficult to unearth. For instance, R.J. Hollingdale's version of *Human, All Too Human* (Cambridge University Press, 1996; ISBN 0-521567041) translates it on page 360 this way: '206. Forgetting our objectives. – During the journey we commonly forget its goal. Almost every profession is chosen and commenced as a means to an end but continued as an end in itself. *Forgetting our objectives is the most frequent of all acts of stupidity.*' [My emphasis.]"

Separately, Kenneth Winston wrote: "I have in front of me the German text of *Menschliches, Allzumenschliches: Ein Buch fur freie Geister* [Leipzig: Verlag von E.W. Fritzsch, 1886], Zweiter Band). On page 118, paragraph 206 ends with the sentence: *Das Vergessen der Absichten ist die haufigste Dummheit, die gemacht wird.* What's curious is that the English translation in my possession does not include this paragraph. Indeed it renumbers the paragraphs, so that #206 is totally different. So, perhaps the German version went through different editions and the one used by translators does not include this paragraph."

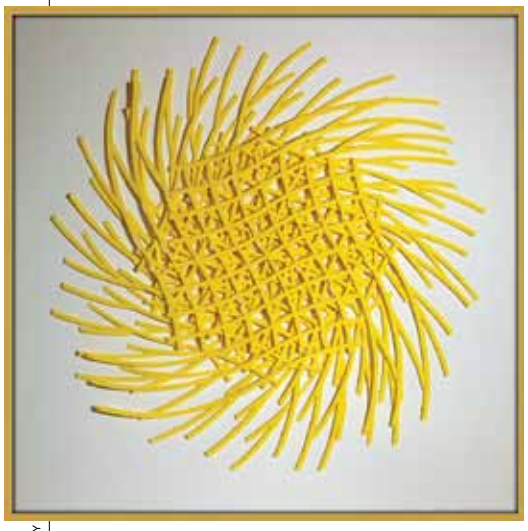
• • •

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

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

heavy, textured paper (typically 80-pound stock) before using a pin to prick each point of the design. He then cuts from pinprick to pinprick with an X-Acto knife, producing one tier of a work that he may build up to have four or five layers. Next, he rotates each layer slightly and separates them with surgically placed, adhesive foam spacers (tweezers come into play here). When viewed head-on, the spacers are virtually invisible, creating a vortex-like, three-dimensional effect that pulls the viewer in for a closer look. Some works are monochromatic; others add a second or third color as a compositional element (see www.rpillsburycutpaperartist.com).

"The order and craftsmanship of the forms are important to me," says Pillsbury, whose work has been featured in a number of juried shows in the past few years. "I enjoy the physical construction of the pieces—it goes back to my early years as



ROBERT PILLSBURY

Sun Swirls

an architect. One of my first projects was building a model of the new Boston City Hall." Although his primary medium is paper, he has also experimented with thin strips of wood veneer to good effect and is intrigued by the semi-translucent potential of polypropylene.

Pillsbury is interested in moving into larger-scale commissions in mediums other than paper, although he enjoys the (relatively) immediate gratification and independence of his current work when compared to the years-long timeline for industrial projects involving numerous parties. "I should be good for a while," he says, "as long as my eyesight holds out."

—JULIA HANNA

OPEN BOOK

"A Fighting Faith"

The late Arthur M. Schlesinger Jr. '38, JF '43, LL.D. '01—historian, presidential adviser, Democratic Party leader—wrote a lot (President Neil L. Rudenstine said he covered "a cast of characters as capacious as *Aida*'s without the elephants"). It is no surprise that he was a prolific correspondent. Sons Andrew '70 and Stephen '64, LL.B. '68, have now edited *The Letters of Arthur Schlesinger Jr.* (Random House, $35). From their introduction about this "inveterate letter writer" and his myriad correspondents:

For the most part, what brought him together with these individuals were his political beliefs. The abiding theme of his correspondence over a 60-year period is his preoccupation with liberalism and its prospects. He was always in some way promoting and advancing the liberal agenda; it was his mission, purpose, and justification.

What did the liberal credo mean to Schlesinger? As he wrote in his much acclaimed book, *The Vital Center*, published in 1949: "The job of liberalism [is] to devote itself to the maintenance of individual liberties and to the democratic control of economic life—and to brook no compromise, at home or abroad, on either of these two central tenets." For him, liberalism was "a fighting faith." In *The Cycles of American History* (1986) he noted that liberals do not see the unfettered marketplace as an "infinitely sensitive, frictionless, impartial, self-equilibrating mechanism." Instead, he wrote, "The liberal believes that the mitigation of [economic] problems will require a renewal of affirmative government to redress the market's distortion and compensate for its failures—but affirmative government chastened and reformed, one must hope, by stringent review of the excesses and errors of [past] centuries."

On September 14, 1960, Senator John F. Kennedy, accepting the New York Liberal Party's presidential nomination, proclaimed his liberalism in words Schlesinger helped craft, saying: "If, by a 'Liberal' they mean someone who looks ahead and not behind, someone who welcomes new ideas without rigid reactions, someone who cares about the welfare of the people—their health, their housing, their schools, their jobs, their civil rights, and their civil liberties—someone who believes we can break through the stalemate and suspicions that grip us in our policies abroad, if that is what they mean by a 'Liberal,' then I am proud to say I'm a 'Liberal.'"

This is what liberalism meant to Schlesinger.

©GEORGE TAMES/*THE NEW YORK TIMES*/REDUX

On familiar ground: AMS Jr. at the White House, 1965

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

ALUMNI

Shades of Justice

"Evil is not all on one side."

Growing up in Washington, D.C., Avis E. Buchanan, J.D. '81, read an article about two black women who claimed they were fired from jobs at the post office because of discrimination. Her father, who had also worked there, was sympathetic. "He was what people used to refer to as a 'race man,'" she says. "He could turn any conversation into one about racial politics: at home, that was our dessert, and appetizer—and entrée." So Buchanan wrote a letter to the postmaster protesting the termination. "I got a note back, which surprised me," she recalls. "But, of course, he was justifying his actions."

That inherited "indignation, a pushing back against authority," she acknowledges, is now a core job requirement. The former trial attorney and civil-rights litigator leads the District of Columbia's Public Defender Service (PDS), which represents adults and juveniles in the most serious, complex felony cases.

The organization is widely considered by legal advocates to be among the best of its kind in the country. With a current $40.6-million annual budget, PDS's 214-member staff includes a roster of pugnacious, disciplined Ivy League lawyers and an appellate team that averages better than a 25 percent reversal rate. "They are not shy, they have a lot of ego and are used to being the best," Buchanan asserts, "and it takes a certain personality go across the street and fight back against judges and prosecutors and police officers every day."

The plate-glass windows in Buchanan's downtown Washington, D.C., office neatly frame the U.S. Archives building. "I get to see that building every single day," she says. "It's the repository of our Constitution. The Sixth Amendment gives us our existence and we use the Fourth and Fifth and Sixth in our fight on behalf of our clients every day."

The award-winning PDS has seven legal units and, uncommonly, pulls from those to create practice groups that focus, for example, on forensics and mental health, two chief aspects of defense and sentence-mitigation work. Specialists not only assist in individual cases but push for reforms of federal and state policies and legislation nationwide; they also run training programs for lawyers, social workers, investigators,and others working on the front lines of American justice. The pioneering forensic unit has helped expose deficiencies in techniques and procedures routinely relied on to obtain convictions. Notably, new DNA testing of hair and other biological evidence conducted by PDS has led to three exonerations, with a fourth case pending in which the government

Photograph by Brooks Kraft

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

in January conceded flaws in its case that were revealed by DNA testing, and agreed to dismiss charges. In an effort to ensure more neutral analysis, PDS was also instrumental in establishing the District's Department of Forensic Sciences in 2011, which took over the "functions, authority, personnel, and funds" related to evidence from the Metropolitan Police Department.

Such rare clout is due, in part, to PDS's structure as a federally funded, independent organization governed by a board of trustees. It was created by an act of Congress in 1960 as an inspirational model for top-quality, "conscientious legal assistance"—even before the landmark 1963 case *Gideon vs. Wainwright* guaranteed poor people the right to counsel when facing criminal charges.

For Buchanan, PDS feels like home. "People here are offended by the government's overuse or arbitrary use of power," she says. "Just because you say I should go to jail, just because you say I did something wrong and have the capacity to deprive me of my freedom," she adds, "doesn't mean you're right." Her views are also influenced by her sense of fairness and faith as a Seventh-Day Adventist. "We are often a client's last friend, the only one standing in his or her corner. This work is important because we help address the imbalance of resources for poor people versus rich people."

Despite *Gideon*, indigent-defense systems are inconsistent across the nation, with many in a state of crisis. According to Nancy Bennett, deputy chief counsel for the private counsel division of Massachusetts's Committee for Public Counsel Services, "Most states provide so little funding that even those that are well-organized have attorneys with more than 500 to 600 cases a year." In a 2012 speech at the American Bar Association's National Summit on Indigent Defense, U.S. Attorney General Eric H. Holder Jr. noted, "Millions of Americans still struggle to access the legal services they need and deserve—and to which they are constitutionally entitled. And far too many public-defender systems lack the basic tools they need to function properly." In New Orleans, the public-defender office at one point had more than 2,000 cases per lawyer per year, reports Bennett, who works with Buchanan on national policy and advocacy. "If you do the calculations, that means lawyers could not even allocate one hour to a case," she adds. "Never mind investigations into facts, researching the law, litigating pre-trial motions, or anything like that. All they could do is meet them and plead them."

Unlike many peer organizations, PDS has strict internal controls. "The court doesn't dictate our caseload, we do," Buchanan says. Targets vary by practice level, work load, and experience, she adds, but even "25 to 30 pre-trial cases on a general felony attorney at PDS, for example, is on the high side." Whatever court-appointed cases the office cannot absorb are assigned to private defense attorneys or law students, who work pro bono, or are paid through the district's Criminal Justice Act.

Qualitatively, PDS is also the envied exception. The office has historically fostered a "culture of excellence" that emphasizes collaboration, according to former staff attorney Julia Leighton, who is now PDS's general counsel. "We have high standards and are most critical of ourselves," she adds. "But if you are smart, creative, listen to your colleagues, and are willing not to take no for an answer—and if you work 12 hours a day, six days a week (or seven 14-hour days, when in trial), then you can, with case-load controls and resources, provide top-notch representation."

> Many people who don't know Buchanan well seem to find her ethereal, regal presence intimidating.

PDS engages in near-constant battles with the powers that be: distrust and emotions run high both ways. The system is stacked against them, Leighton says of the staff, "and you're often dumped on by *everyone* because of the side you're on." This winter, for example, PDS represented Albrecht Muth, the "German eccentric" charged with strangling his wife, socialite and journalist Viola Drath, who, at 91, was more than 40 years his senior. The sensational case took two and a half years to go to trial because of competency issues and hunger strikes that left Muth medically unable to attend his own trial. In court, even though the defense emphasized the absence of DNA evidence, eyewitnesses, and a motive linking Muth to the killing, a jury convicted him after only three hours of deliberation.

Buchanan won't discuss that case, or any others, because of attorney-client privilege. Some of its themes, she does allow, are typical for PDS—"high profile, complex, mental-health issues." But middle-aged, white, German-born criminal defendants are not. Racial disparity in the courts is an acknowledged fact at PDS. "On any given day, more than 90 percent of the people who come through the system are black. And close to that percentage are male and many are young," according to Buchanan. "Whether there is an influx of immigrants, whether there is gentrification, you will still see the same population in the cell block in the courthouse. That has not changed since the 1980s when I was practicing."

Buchanan has always been fascinated by criminal justice, which she studied, along with Spanish, at Michigan State University. During school vacations, she sat in on D.C. trials, and in 1979, after her first year at Harvard, she spent the summer as a PDS investigative intern, having been recruited by Climenko professor of law Charles J. Ogletree Jr. He was then a PDS trial attorney—and has been Buchanan's mentor since.

After graduation, she clerked for Theodore J. McMillian, the first black judge on the U.S. Court of Appeals for the Eighth Circuit (in St. Louis), but returned to PDS as a staff trial attorney in 1982. (Except for her schooling and clerkship, Buchanan has always lived within a three-mile radius of her current home, and been affiliated with Dupont Park Seventh-Day Adventist Church in southeast D.C., where she was baptized in high school.)

Buchanan represented children, then adults, until 1989, during the escalating crack epidemic. "We went from having one murder going through the court system a day to three or four a day," she says of those early years. "It felt oppressive, not just professionally, but personally. You just felt this was our city, our community, our people. Watching the results of that carnage was frustrating, sad, discouraging."

She left the office in the midst of that chaos to work for the next 13 years at what is now the Washington Lawyers' Committee for Civil Rights and Urban Affairs, first as a staff attorney, later as director of its equal employment opportunity project, and

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

then of litigation. There, she won awards, and even found herself on the team that represented a class in a lawsuit that alleged discriminatory promotion practices at the Library of Congress (ultimately settled), in which her mother, Anna Mae Buchanan, was a class member. She also learned that her father, Herbert C. Buchanan Sr., who passed away in 1998, had been party to a separate case represented by the office.

Buchanan's conceptions of evil and wickedness stem from her parents' values—essentially, "The world does not just consist of you; don't forget about the people less fortunate"—and from her Adventist faith. "Evil is not all on one side, in the sense that if you are charged you must be guilty," she asserts. "Evilness can be someone who hates our client so much, they are willing to lie and go to all kinds of lengths to harm our client wrongfully or disproportionately to what he or she has done. It's evil to put someone in jail, *at least* for reasons that are wrong." Has she witnessed evil in action? "Yes. I've seen the evil of people doing decades in jail for crimes they were not guilty of."

Ideals are deeply attractive to her. Even as a kindergartener at the all-black Dupont Park Adventist School, Buchanan (whose parents were not then Adventists or particularly religious), was impressed by the "sense of this thing greater than you are that calls you to be more than what you are," and the "logic" of Adventist teachings that the Scriptures are the sole source of Protestant faith and practice. "The Bible says Christ rose on the first day of the week, Easter is on Sunday, so the seventh day is Saturday," she says. "The Jews don't have any confusion about that. So why would you get rid of the fourth commandment—remember the Sabbath Day and keep it holy—but follow the other nine—you still can't kill, you can't worship false idols, and cannot bear false witness?"

She sits on her church's board of trustees, her former school's board, and on the board that runs the local Adventist Health Care system. She says she has never smoked or drunk caffeine or alcohol, but later adds, for "full disclosure...technically I had a sip of beer once as a child, with my parents' permission, to see what all the fuss was about." But she is not a full vegetarian, as the church urges. "The irony," she says, is that Adventists "like to run a truck through" their otherwise healthy diet restrictions. "You will see enormous plates of desserts, and I am not sure all the meat substitutes are all that healthy," reports Buchanan, who loves to eat—especially "bad food: French fries. Pound cake.

Reardon to Retire

John P. "Jack" Reardon '60, executive director of the Harvard Alumni Association (HAA)—known for diplomacy, warmth, humor, and dedication throughout his long University career—will step down at the end of June. Hired in 1965 by another renowned Harvard veteran administrator, Fred L. Glimp '50, Ph.D. '64, Reardon had earned an M.B.A. at Penn and was working at the Boston Redevelopment Authority when, he reports, "Fred offered me [a College admissions] job for $9,000. And I have not been unhappy at Harvard for a minute since." In return, he has been respected and even beloved by undergraduates, alumni, and administrators across four presidencies.

Reardon rose to become associate dean of admissions and financial aid before moving across the river in 1978 to become Harvard's athletics director. The wholesale turnaround he managed included expanding the women's programs; his tenure also saw the men's heavyweight crew win the Grand Challenge Cup at Henley in 1985 and the men's ice-hockey team beat Minnesota for the national championship in 1989. His skills in building relationships with alumni and other supporters were readily apparent, and in 1990, Glimp and President Derek Bok persuaded him to become executive director of the HAA.

"Alumni are so different from one another, and have different ideas, and it seems to me my job has been to figure out how to bring all of them together, and closer to the University," says Reardon. "That's been interesting work—and not that easy! But I've always just loved this place. And there is a lot of stuff going well and good people in place. I'm 75 years old and there comes a point where I'd rather be doing things on my own terms." He plans to continue applying his institutional memory and people skills on Harvard's behalf—working on fundraising, Ivy League athletic matters, with the Board of Overseers, and projects tied to alumni relations. And he remains a Harvard Magazine Inc. board member.

John P. "Jack" Reardon

Photograph by Jon Chase/Harvard Public Affairs and Communications

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Ice cream. Cinnamon doughnuts." On her office desk is a container of candy: Good & Plenty, Jolly Ranchers, and Pixy Stix. "I don't eat that, but I like to look at it," she says. "They're colorful and they remind me of the fun of my childhood." She *does* consume Nerds, those rocky nubs of sugar crystals often dressed in pink.

She also loves roller skating, reading, obsessively playing Scrabble on her iPad, and the adventurous treats she allows herself on birthdays: a white-water rafting trip, helicopter rides, lessons in skydiving and trapeze tricks. "I did a flip off the bar and a catch," she says, "I like being in the air."

She takes scary physical risks, but never emotional ones: "No way." Even in the courtroom, with the pressure of a client's fate "riding on me," she says, she would get headaches from concentrating so hard, but never become emotional or agitated. "Avis emanates serenity," says Nancy Bennett. "She is an amazing facilitator. She listens to everyone, and keeps people on track, redirecting them in a very polite but very effective way, and getting them to stop shouting at each other at meetings!" In short, as Julia Leighton admits: "Avis gets people like me to stop interrupting, shut up—and listen."

Although one has to listen hard to hear Buchanan speak, many people who don't know her well seem to find her ethereal, regal presence intimidating. "I just naturally stay calm," she reports. "Maybe it's part of my control-freak tendencies. I need to control myself as well as whatever I can in my environment." Legal documents, for example, are scrutinized: "When people cut and paste things and the apostrophe is in a different font from the rest of the text, I feel like I can't let it out of the office until I change it."

> "This work is important because we help address the imbalance of resources for poor people versus rich people."

It's almost as if, in operating in the nuanced, gray-zoned business of criminal law, Buchanan has found power in preserving her own innocence. She has spent most of her career grappling with the fickle, often enraging, and bureaucratic legal system, while working for alleged murderers, thieves, and drug addicts and dealers—those most of society loves to hate. Yet she seems to refuse to allow herself to become jaded.

Beyond the exhilaration of winning a trial, the best public defenders, those most innately dedicated to the ideal of equal justice, find intrinsic rewards. Leighton recalls a client who was sentenced to life in prison "in a case in which nobody was even physically hurt," she says. "We had lost the trial, lost the motion for a new trial, and lost the appeal. The only possible claim that could be raised at that juncture was that PDS had failed at trial or on appeal to provide him with effective assistance of counsel," she explains. "And he turned and looked at me and said, 'I can't do that, you all have worked too hard for me.'" In every

[e-mail]

Curated content delivered to your doorstep.

- Editor's Highlights
- This Week
- Harvard Headlines
- Football
- Arts
- Science
- Classifieds

SIGN UP
harvardmag.com/email

Support *Harvard Magazine*

As a special thank-you for a donation of $100 or more to *Harvard Magazine*, you can receive our new iPad case with a beautiful drawing of the John Weeks Memorial Footbridge by artist Mark Steele.

To donate please visit: **harvardmagazine.com/donate**

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Alumni Learning, Online

Graduates who crave continued access to teaching and faculty members will have a new channel to (virtual) classrooms through HarvardX for Alumni, a spring experiment with the University's online learning partnership. Beginning on March 22, seven units will be released, one every two weeks, enabling alumni individually, or through gatherings at Harvard clubs or elsewhere, to sample courses on the edX platform:

• *Poetry in America*, with Elisa New, Cabot professor of American literature;

• *The Ancient Greek Hero*, with Gregory Nagy, Jones professor of classical Greek literature and professor of comparative literature;

• *Computer Science*, with David Malan, senior lecturer on computer science;

• *Chinese History*, with Peter Bol, Carswell professor of East Asian languages and civilizations and vice provost for advances in learning (who oversees Harvard X and the Harvard Initiative for Learning and Teaching);

• *Neuroscience*, with David Cox, assistant professor of molecular and cellular biology and of computer science; and two forthcoming courses:

• *The Einstein Revolution*, with Peter Galison, Pellegrino University Professor, an historian of science; and

• *Tangible Things*, with Laurel Ulrich, 300th Anniversary University Professor, an American historian who focuses on material culture.

"Access to intellectual content, continuing to learn, ranks very high in what's important" to alumni, according to the Harvard Alumni Association's research, said Philip Lovejoy, deputy executive director. Alumni have already made use of HarvardX courses through the edX platform, and of online versions of Bass professor of government Michael Sandel's "Justice." (Earlier, before the technological advances that enabled the enriched teaching tools embedded in edX, harvard@home **[www.athome.harvard.edu]** made recordings of lecture courses and campus events available; it is instructive to compare those versions of the Nagy, Sandel, and Ulrich classes with current online learning experiences.)

This spring's experiment consists of hour-long segments combining new material with content from full-length courses. Each includes an introductory discussion between the professor and Robert Lue, faculty director of HarvardX and of the Bok Center for Teaching and Learning; a 5- to 15-minute activity or exercise from the online course; and an online discussion forum prompted by a question derived from the contents. HAA's hope is that this brief format will efficiently update alumni about work on campus to improve pedagogy, while whetting their appetite for continuing engagement with their Harvard education—however far, in time and distance, they may be from campus. The response will guide the HAA's future online learning programs.

Registration information is available at **alumni.harvard.edu/x**. Alumni learners of the world, log on.

COURTESY HARVARD X

In production: from the making of Elisa New's "Poetry in America" online course

case, Leighton says, is a moment that "sustains PDS lawyers, when we see all that is good in a client and the right moral compass that exists in everyone."

Buchanan knows that intimate connection well. The work comes down to "finding something in common with a client, some insight into who they are as a person. Then they let their guard down and trust you and know you are really there to help," she says quietly. "If you don't have that, you're just going through the assembly line—and you don't really care. That's when you know it's time to leave."

~NELL PORTER BROWN

Overseer and HAA Director Candidates

THIS SPRING, alumni can vote for five new Harvard Overseers and six new elected directors of the Harvard Alumni Association (HAA).

Ballots, mailed out by April 1, must be received back in Cambridge by noon on May 23 to be counted. Election results will be announced at the HAA's annual meeting on May 29, on the afternoon of Commencement day. All holders of Harvard degrees, except Corporation members and officers of instruction and government, are entitled to vote for Overseer candidates. The election for HAA directors is open to all Harvard degree-holders.

Candidates for Overseer may also be nominated by petition by obtaining a prescribed number of signatures from eligible degree holders. (The deadline for all petitions was February 3.)

For Overseer (six-year term):

Nicole S. Arnaboldi '80, M.B.A.-J.D. '84, New York City. Vice chairman, Credit Suisse Asset Management.

Michael Brown '83, J.D. '88, Boston. CEO and co-founder, City Year.

James E. K. Hildreth '79, Davis, California. Dean, College of Biological Sciences, University of California, Davis.

David W. Leebron '77, J.D. '79. Houston. President, Rice University.

Jane Lubchenco, Ph.D. '75, Corvallis, Oregon. Valley professor of marine biology and Distinguished Professor of zoology, Oregon State University.

Michael M. Lynton '82, M.B.A. '87, Los Angeles. CEO, Sony Entertainment.

Sunshik Min, D.B.A. '89, Seoul, Korea.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

President, YBM, Inc.

Lesley Friedman Rosenthal '86, J.D. '89, New York City. Vice president, general counsel and secretary, Lincoln Center for the Performing Arts.

For elected director (three-year term):

Henry Parkman Biggs '86, Saint Louis, Missouri. Associate director, McDonnell International Academy, Washington University in St. Louis.

Raphael W. Bostic '87, Los Angeles. Bedrosian chair in governance and the public enterprise; director, Bedrosian Center on Governance, Price School of Public Policy, University of Southern California.

Peter Andrew Boyce II '13, New York City. Associate, General Catalyst Partners; co-founder, Rough Draft Ventures.

Margaret Jay Braatz, Ed.M. '93, Ed.D. '99, Chicago. Vice president for planning and presidential administration, DePaul University.

Leea Nash Bridgeman '02, M.B.A. '05. Louisville, Kentucky. Executive director and trustee, Bridgeman Family Foundation.

Jessica Gelman '97, M.B.A. '02, Wellesley, Massachusetts. Vice president, customer marketing and strategy, The Kraft Sports Group (New England Patriots); co-founder, MIT Sloan Sports Analytics Conference.

Jay H. Hebert, J.D. '86, Fort Worth, Texas. General counsel, Keystone Group L.P.

Vanessa W. Liu '96, J.D. '03, New York City. COO, Trigger Media Group.

Alvaro Rodriguez-Arregui, M.B.A. '95, Mexico City. Co-founder and managing partner, IGNIA Partners, LLC; board vice chairman, Banco Compartamos.

HAA Clubs and SIGs Awards

The HAA Clubs and SIGs (Shared Interest Groups) Committee Awards honor both individuals who provide exemplary service to those groups, and groups that have themselves organized exceptional programming. The following recipients were to be honored at the HAA Board of Directors' winter meeting on February 6.

Rowena S. Frazer '76, of Hoover, Alabama. Officially the program chair of the **Harvard Club of Birmingham,** Frazer is also known as "Bulldog" or "The Big Thinker" for transforming the club into a vibrant social, educational, and philanthropic outlet for alumni. She created the E.O. Wilson Distinguished Lecture Series to bring faculty members to Birmingham; raised money to enable an inner-city high school to compete at a Harvard tournament; and established the club's Summer Community Service Fellowship, a largely alumni-funded program that helps undergraduates work in the public-interest sector.

Thomas P. Reardon '68, of Plymouth, Massachusetts. Reardon founded the **Harvard Veterans Alumni Organization** SIG in 2007, and since then has, almost single-handedly, ensured its success by creating a board of directors, attracting more than 800 members, organizing social events, such as football tailgate parties, and raising the Harvard community's awareness of veterans' contributions. The SIG partnered with the Harvard Club of Washington, D.C., to establish the Memorial Church plaque dedicated to Harvard's Medal of Honor recipients. Reardon has also spent hours readying HVAO's AlumniMagnet website to ensure that the group has a strong and welcoming online presence.

Founded in 1886, the **Harvard Club of Indiana** has been revitalized within the past year under a new board of directors that has increased membership, updated the club's website, and restored the budget. Moreover, a series of diverse events, such as a private tour of the Indiana Museum of Art, has drawn alumni from every decade since the 1950s, and club leaders have strengthened members' ties to the University through hosting HAA-sponsored Global Networking Night events, sponsoring dinners for Harvard's swim-team members when they were in town, and welcoming newly admitted regional students at a dinner and information session.

The Harvard Club of Japan holds nearly 40 events a year, ranging from lectures on international topics, to wine tastings, to monthly Zen meditation sessions. Its treasury has doubled to $60,000 within the last five years, and it has also successfully connected with other local alumni groups and clubs from graduate and professional schools across the University. The club hosted a historic dinner for President Drew Faust in Tokyo in 2010, and the HAA Asia-Pacific Club Leaders' meeting in 2011. Club members have also rallied in providing aid to the Fukushima community.

Guidelines for Commencement Day

Thursday, May 29, 2014

Morning Exercises

Degree candidates will receive a set number of tickets. Parents and guests *must* have tickets to enter Tercentenary Theatre. **Seating is limited,** not guaranteed, and cannot be reserved; there is standing room on the Widener steps and at the rear and sides of the Theatre. **The sale of Commencement tickets is prohibited.** For details, visit http://commencement.harvard.edu.

- A limited supply of tickets will be made available to all other alumni/ae on a first-come, first-served basis through the Harvard Alumni Association (HAA) at http://alumni.harvard.edu/annualmeeting.
- Alumni/ae and guests are urged to view the Morning Exercises on large-screen televisions in the Science Center and at most of the undergraduate Houses and professional schools. These locations have ample seating, and tickets are *not* required.
- Alumni/ae attending their College reunions (25th, 35th, 50th) will receive tickets at their reunions. Alumni/ae in classes beyond the 50th may obtain tickets from the HAA by calling 617-496-7001, or through the annual Tree Spread mailing sent out in March (RSVP by April 15).

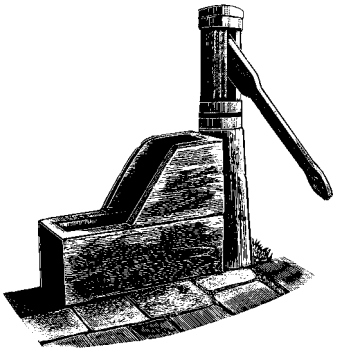
Afternoon Program

The HAA's Annual Meeting, which includes remarks by the president of the HAA, Overseer and HAA election results, the presentation of the Harvard Medals, and remarks by President Drew Gilpin Faust and the Commencement speaker, convenes in Tercentenary Theatre on Commencement afternoon at 2:30 p.m. For tickets (which are required, but free), visit http://alumni.harvard.edu/annualmeeting, or call 617-496-7001.

~The Commencement Office

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Skull Walking



"Your wooden arm you hold outstretched to shake with passers-by."

If you happened to be outdoors on the Harvard Medical School campus last November, you might have noticed this 78-inch-tall model of a bisected human skull making its way down Shattuck Street by Gordon Hall to a staging area in the basement of the Francis A. Countway Library of Medicine. It was accompanied by a 48-inch-long skeleton of a foot.

Both were commissioned by Thomas Dwight, A.B. 1866, M.D. 1867, when he became Parkman professor of anatomy at the medical school in 1883. Succeeding Oliver Wendell Holmes, A.B. 1829, M.D. 1836, he had big shoes to fill.

JAKE MILLER/HARVARD MEDICAL SCHOOL

Both skull and foot have been retired from classroom use, but a second giant noggin, built in 1892 and sliced in half horizontally rather than vertically, is still being used to teach would-be physicians something of what goes on in there.

The recently perambulating skull and foot have been loaned to the Collection of Historical Scientific Instruments, in the Science Center on the Cambridge side of the Harvard establishment, where they will be part of *Body of Knowledge: A History of Anatomy (in Three Parts)*, on view from March 6 to December 5, 2014. The exhibit will explore the roles of human anatomy "in scientific discovery, public spectacle, and medical education," says co-organizer David S. Jones, Ackerman professor of the culture of medicine at Harvard. Items displayed will include astonishing illustrated texts created by anatomist Andreas Vesalius in the Renaissance, wax-injected limbs from nineteenth-century dissection labs, and digital atlases of today.

THOMAS EARLE/HARVARD PUBLIC AFFAIRS AND COMMUNICATIONS

Down the hall in the Science Center, incidentally, one can examine a recent primitive thinking machine, the all-electronic Harvard Mark IV computer. And out the east door is a monument of sorts to a wise fellow, Winnie-the-Pooh. He, and occasionally some of his associates, were in residence there for many years in a tree (later its stump) and environs (see "In Pooh's Neighborhood," September-October 1997, page 77). Pooh left town for a quieter part of the wood some months ago, when Harvard and the City of Cambridge undertook the disruptive but successful construction of the Plaza, just outside the Science Center. Now Pooh has returned—triumphantly, may we suggest. For more about this, you have only to Google "winnie the pooh house harvard."

—PRIMUS V

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Harvard Magazine **is dedicated to protecting our readers' security and safety. As a reminder, here are some good tips to keep in mind when responding to a classified or personal ad:**

Never share financial information with people you don't know.
- credit card number
- bank information
- Social Security number

Don't reveal personal information on first contact.
- home address
- personal e-mail address
- phone number

Be especially alert if any of the following things happen:
- you notice many spelling/grammatical errors in correspondence
- you are asked to receive/forward packages
- it sounds too good to be true

When placing an ad or responding to an ad, create a separate e-mail account that does not have your name associated with it. You can get an e-mail account for free from services like Gmail and Yahoo. *Harvard Magazine* offers (snail mail) HM Boxes to our clients for a fee of $25. For details, contact 617-496-6686.

If someone has asked you for personal or financial information, please notify *Harvard Magazine's* Classifieds Department immediately at 617-496-6686.

Place your classified ad in our May-June 2014 issue.

View our rate information at:
harvardmagazine.com/classifieds/pricing-and-rates

To place your ad, please visit:
classifieds.harvardmagazine.com
E-mail: classifieds@harvard.edu
Call: 617-496-6686 or Skype: hmagclassifieds

Deadline: March 17, 2014

LETTERS

(continued from page 6)

graduate, "Goodbye, L.A.," January-February, page 31), I take issue with serving reheated leftovers; namely, the dusty portrayal of Los Angeles as an intellectual and cultural wasteland full of illiterates is troubling. As a native Angeleno, I find that my fellow citizens do in fact read books and engage in the world of ideas. This may come as a shock to many of your readers who base their judgments, as the writer does, on mid-twentieth-century stereotypes of this fine metropolis, but I ask my fellow alums to take a leap of faith. Surely the rocket scientists at CalTech and Jet Propulsion Laboratory, or the folks at RAND, read books from time to time, perhaps even doing so without moving their lips.

Specifically, portraying Los Angeles as "only a refraction of America brought gently down to Earth" is a curious choice. While undoubtedly not the author's intent, marking a multiethnic city and specifically the heavily Jewish entertainment industry as ignorant and un-American, an unreal, diminutive Other in our nation's midst, is upsetting for obvious reasons. Los Angeles is a wonderful, challenging city with a rich cultural and intellectual life; I submit that it is the tip of the spear of American culture, not some foreign outpost.

Russell Schmidt '01
Los Angeles

I almost choked on my gluten-free cronut when I read that yet another intellect had defected to Harvard College from our Left Coast. And not because of the traditional reasons—poor public transportation, no seasons, general lotus-eating—but because too few people read. Though Pisner seems to have absorbed a great deal about this "terrifying" place during his year at USC and through the writings of Nick Hornby, I can assure your readers that many of us, filmmakers included, do indeed read books. At least the successful ones do; a lot of the others drop out of film school and we never really hear from them again. But, happily, they do visit us on vacation.

Daniel Steven Cooper '95
Oak Park, Calif

A writer who acknowledges feelings of "inadequacy" at not being admitted to Harvard College on his first at-bat, while expressing jealous resentment of a "snotty-nosed harp prodigy who had gotten [sic] into Yale"—and losing no opportunity to disdain another top-notch university from which he had transferred—may expect to be referred to as a "Harvard twit."

Some years ago, my LA-born wife (B.A. in history with Phi Beta Kappa at UCLA and J.D. with Fulbright at UC, Berkeley) was lecturing at the Kennedy School. On a visit to WHRB we met a young announcer, who told us that she was at Harvard because she had not been admitted to Berkeley.

Terry Murphy '59, J.D.
Bethesda, Md.

SKIING CELEBRATED

"cross-country by ski" (New England Regional Section, November-December 2013, page 16F) wonderfully shares the joys of Nordic ski racing and Harvard's role in the sport. To its account of cross-country skiing at Harvard, I would like to add the contributions of Graham Taylor '49. After captaining the Harvard Nordic ski team as an undergraduate, Taylor returned as its head coach for several years in the fifties before devoting his life to coaching high-school skiers in the Boston suburbs—a task he continues to this day. Taylor's dedication

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

to the sport resonates in Harvard circles and beyond, and he ranks among the legends of New England ski coaches.

Chris Stock '14
Captain, Harvard Nordic Ski Team

FISCAL FACTS OF LIFE

Regarding the "Fiscal Portrait" (January-February, page 28): As I read of Harvard's "wider deficit of $34 million" in fiscal 2013, and its loss of $1.255 billion, resulting from speculative interest-rate swaps, "following the fiscal crisis in 2008," my stomach is queasy. I contemplate my strategy for convincing a classmate to part with a hundred bucks or so for the Harvard College Fund. Invariably, my list contains several prospects with less-than-stellar records of contributing.

Unlike the feds, Harvard can't simply turn on the printing presses. We cannot be all things to all people all the time. Of course, it's exciting to create the frontiers of learning and teaching, our role since 1636. But how about a little fiscal restraint? After all, we still owe $5.7 billion (per that fiscal report). A billion here, a billion there. Pretty soon, it adds up.

Steve Susman '57, J.D. '60
Denver

CLOSE-READING DEPARTMENT

In Adam Kirsch's wonderful story about Robert Frost ("Extracting the Woodchuck," January-February, page 44) there is a small error that has been known to inflame the passions of poets and proofreaders alike. The final stanza of "Stopping by Woods on a Snowy Evening" (written on a hot June morning) contains an insidious, incorrect serial comma. The first line of that stanza should read: "The woods are lovely, dark and deep." The Oxford comma was introduced posthumously in 1969 by Edward Connery Lathem. Frost—who meticulously edited his own proofs—never intended it; Lathem added it without justification even though it alters both the sound and the sense of the line.

Donald Hall ['51]—who discusses this topic brilliantly and at length in *The Atlantic Monthly* ("Robert Frost Corrupted," reprinted at www.pnreview.co.uk/cgi-bin/scribe?item_id=6740)—gets at the root of why the error proliferates: "But Lathem's corrupted text of Robert Frost is increasingly taken as the true text. When a critic or anthologist writes Holt for permission now, permission is granted to reprint from Lathem's edition." Hall concludes by suggesting that a variorum edition of Frost's poems be commissioned that would reinstate the poet's original intent before we all become so accustomed to the altered poems that Frost's own punctuation strikes us as a typo. Which is what compelled me to write you a letter at three in the morning about a topic some might view as picayune.

You can see a beautiful handwritten copy of the poem at www.loc.gov/exhibits/british/images/vc195c.jpg.

Alethea Black '91
Pawling, N.Y.

Editor's note: Another correspondent observes that the 1923 Willa Cather novel cited in the article is titled *A Lost Lady.*

KEYSTONE, CONTINUED

For those who want to ignore reality, the Keystone pipeline is a bad thing (Letters, January-February, page 4, commenting on "Forum: The Keystone XL Pipeline," November-December 2013, page 37). For the rest of us, it just represents one of many options.

Prohibition did not result in eliminating drinking. Making alcohol, marijuana, opium, heroin, cocaine, speed, and other drugs illegal did not prevent their sale. It just forced buyers and sellers to alternative and more expensive (and dangerous) choices.

What will happen if the pipeline is prevented is the following:

1. The oil will travel by rail to the Gulf ports. It will cost three or four times as much to ship it by rail. The likelihood of environmental damage from spills will be higher.

2. A Canadian pipeline, in Canada, run by Canadians, will ship the oil to the Great Lakes, where it will travel to whatever point is appropriate.

3. Canadians may decide it is better for them long term to build a pipeline network to the west coast, aimed at selling to the Chinese. They might decide that shipping to the east coast of Canada might be better, because they can get higher Brent Crude prices, instead of WestTexas Intermediate prices. This would be environmentally positive, especially if the Chinese burn less coal and use the Canadian crude instead.

At present, the Keystone pipeline is the best economic choice. I do not think that forcing people to use inefficient economic choices will help anyone—and the Canadian crude will still get to market.

Nolan Perreira, M.B.A. '81
Chapel Hill, N.C.

Professor McElroy's essay was disappointing because of its narrow focus on whether this pipeline would "significantly exacerbate the problem of carbon pollution." When the question is put in this manner, it is analogous to asking whether a particular straw broke the camel's back. The answer is a foregone conclusion. We cannot attribute significant carbon pollution to this pipeline any more than we can say that global warming produced typhoon Hayian.

The more relevant context for evaluating this pipeline arises from, as George W. Bush put it, our addiction to oil. As any enlightened addict would put it, one more fix is one more step deeper into the mire of addiction. What we need to do is reduce carbon pollution without waiting for the last drop of oil to be wrung from the earth. When do we kick the habit?

The XL pipeline has received a lot of attention because, among other matters, hydro-fracking has the appearance of polluting groundwater, and shale oil is particularly nasty. Ironically, while these features draw attention to this project, they obscure the question of whether to extract more oil, regardless of immediate negative consequences, or start making the transition to carbon-free energy. Resources that are put into the XL pipeline are lost opportunity costs; we could devote those resources to reducing our dependence on fossil fuels, sequestering carbon, developing renewable sources of energy, and undertaking other projects not yet invented. We have perhaps 250 more years of coal in the ground. Should we burn it all up and then shift to carbon-free energy?

James L. Weeks, S.D. '80
Potomac, Md.

ERRATUM

At page 72P, the January-February issue contains an obituary of David Hubel, Enders University Professor emeritus. He was my Ph.D. mentor at Harvard Medical School. The obituary erroneously states that "he joined the Harvard Medical School faculty in 1954." In fact, it was 1959.

Jonathan C. Horton, M.D. '80, Ph.D. '84
University of California, San Francisco

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

(continued from page 35)

changes that would be needed in microbial communities," which can change on scales ranging from days to decades.

"Just think about the number of things that have changed in the past 50 years that affect microbes," he continues. Commercial antibiotics didn't exist until about 50 years ago; our locations have changed; and over a longer period, we have gone from 75 percent of the population working in agriculture to 2 percent; our exposure to animals has changed; our exposure to the environment; our use of agricultural antibiotics has changed; what we eat has changed; the availability of drugs has changed. There are so many things that are different over that timescale that would specifically affect microbes. That is why there is some weight given to the microbiome link to the hygiene hypothesis"—the theory that lack of early childhood exposure to a diverse microbiota has led to widespread problems in the establishment of healthy immune systems.

Understanding the links between all these effects will involve data analysis that will dwarf the human genome project and become the work of decades. Like Gary King, Huttenhower favors a good algorithm over a big computer when tackling such problems. "We prefer to build models or methods that are efficient enough to run on a[n entry-level] server. But even when you are efficient, when you scale up to populations of hundreds, thousands, or tens of thousands of people," massive computational capability is needed.

Recently, having realized that large populations of people will need to be studied to advance microbiome science, Huttenhower has begun exploring how to deploy and run his models to Amazon's cloud—thousands of linked computers running in parallel. Amazon has teamed with the National Institutes of Health to donate server time for such studies. Says Huttenhower, "It's an important way for getting manageable big data democratized throughout the research community."

Discerning Patterns in Complexity

Making sense of the relationships between distinct kinds of information is another challenge facing researchers. What insights can be gleaned from connecting gene sequences, health records, and environmental influences? And how can humans understand the results?

One of the most powerful tools for facilitating understanding of vast datasets is visualization. Hanspeter Pfister, Wang professor of computer science and director of the Institute for Applied Computational Science, works with scientists in genomics and systems biology to help them visualize what are called high-dimensional data sets (with multiple categories of data being compared). For example, members of his group have created a visualization for use by oncologists that connects gene sequence and activation data with cancer types and stages, treatments, and clinical outcomes. That allows the data to be viewed in a way that shows which particular gene expression pattern is associated with high mortality regardless of cancer type, for example, giving an important, actionable insight for how to devise new treatments.

Pfister teaches students how to turn data into visualizations in Computer Science 109, "Data Science," which he coteaches with Joseph K. Blitzstein, professor of the practice in statistics. "It is very important to make sure that what we will be presenting to the user is understandable, which means we cannot show it *all*," says Pfister. "Aggregation, filtering, and clustering are hugely important for us to reduce the data so that it makes sense for a person to look at." This is a different method of scientific inquiry that ultimately aims to create systems that let *humans* combine what they are good at—asking the right questions and interpreting the results—with what *machines* are good at: computation, analysis, and statistics using large datasets. Student projects have run the gamut from the evolution of the American presidency and the distribution of tweets for competitive product analysis, to predicting the stock market and analyzing the performance of NHL hockey teams.

> Changes in the microbiome might be linked to ailments that have become more prevalent recently, such as irritable bowel disease, allergies, and metabolic syndrome (a precursor to diabetes).

Pfister's advanced students and postdoctoral fellows work with scientists who lack the data science skills they now need to conduct their research. "Every collaboration pushes us into some new, unknown territory in computer science," he says.

The flip side of Pfister's work in creating visualizations is the automated analysis of images. For example, he works with Knowles professor of molecular and cellular biology Jeff Lichtman, who is also Ramon y Cajal professor of arts and sciences, to reconstruct and visualize neural connections in the brain. Lichtman and his team slice brain tissue very thinly, providing Pfister's group with stacks of high-resolution images. "Our system then automatically identifies individual cells and labels them consistently," such that each neuron can be traced through a three-dimensional stack of images, Pfister reports. Even working with only a few hundred neurons involves tens of thousands of connections. One cubic millimeter of mouse brain represents a thousand terabytes (a petabyte) of image data.

Pfister has also worked with radioastronomers. The head teaching fellow in his data science course, astronomer Chris Beaumont, has developed software (Glue) for linking and visualizing large telescope datasets. Beaumont's former doctoral adviser (for whom he now works as senior software developer on Glue), professor of astronomy Alyssa Goodman, teaches her own course in visualization (Empirical and Mathematical Reasoning 19, "The Art of Numbers"). Goodman uses visualization as an exploratory technique in her efforts to understand interstellar gas—the stuff of which stars are born. "The data volume is not a concern," she says; even though a big telescope can capture a petabyte of data in a night, astronomers have a long history of dealing with large quantities of data. The trick, she says, is making sense of it all. Data visualizations can lead to new insights, she says, because "humans are much better at pattern recognition" than computers. In a recent presentation, she showed how a

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

three-dimensional visualization of a cloud of gas in interstellar space had led to the discovery of a previously unknown cloud structure. She will often work by moving from a visualization back to math, and then back to another visualization.

Many of the visualization tools that have been created for medical imaging and analysis can be adapted for use in astronomy, she says. A former undergraduate advisee of Goodman's, Michelle Borkin '06, now a doctoral candidate in SEAS (Goodman and Pfister are her co-advisers), has explored cross-disciplinary uses of data-visualization techniques, and conducted usability studies of these visualizations. In a particularly successful example, she showed how different ways of displaying blood-flow could dramatically change a cardiac physician's ability to diagnose heart disease. Collaborating with doctors and simulators in a project to model blood flow called "Multiscale Hemodynamics," Borkin first tested a color-coded visual representation of blood flow in branched arteries built from billions of blood cells and millions of fluid points. Physicians were able to locate and successfully diagnose arterial blockages only 39 percent of the time. Using Borkin's novel visualization—akin to a linear side-view of the patient's arteries—improved the rate of successful diagnosis to 62 percent. Then, simply by changing the colors based on an understanding of the way the human visual cortex works, Borkin found she could raise the rate of successful diagnosis to 91 percent.

Physicians were able to locate and successfully diagnose arterial blockages only 39 percent of the time. Using Borkin's novel visualization—akin to a linear side-view of the patient's arteries—improved the rate of successful diagnosis to 62 percent.

Visualization tools even have application in the study of collections, says Pfister. Professor of romance language and literatures Jeffrey Schnapp, faculty director of Harvard's metaLAB, is currently at work on a system for translating collections metadata into readily comprehensible, information-rich visualizations. Starting with a dataset of 17,000 photographs—trivial by big data standards—from the missing paintings of the Italian Renaissance collection assembled by Bernard Berenson (works that were photographed but have subsequently disappeared), Schnapp and colleagues have created a way to explore the collection by means of the existing descriptions of objects, classifications, provenance data, media, materials, and subject tags.

The traditional use of such inventory data was to locate and track individual objects, he continues. "We are instead creating a platform that you can use to make arguments, and to study collections as aggregates from multiple angles. I can't look at everything in the Fogg Museum's collections even if I am Tom Lentz [Cabot director of the Harvard Art Museums], because there are 250,000 objects. Even if I could assemble them all in a single room," Schnapp says, "I couldn't possibly see them all." But with a well-structured dataset, "We can tell stories: about place, time, distribution of media, shifting themes through history and on and on." In the case of the Berenson photo collection, one might ask, "What sorts of stories does the collection tell us about the market for Renaissance paintings during Berenson's lifetime? Where are the originals now? Do they still exist? Who took the photographs and why? How did the photo formats evolve with progress in photographic techniques?"

This type of little "big data" project makes the incomprehensible navigable and potentially understandable. "Finding imaginative, innovative solutions for creating *qualitative* experiences of collections is the key to making them count," Schnapp says. Millions of photographs in the collections of institutions such as the Smithsonian, for example, will probably never be catalogued, even though they represent the richest, most complete record of life in America. It might take an archivist half a day just to research a single one, Schnapp points out. But the photographs *are* being digitized, and as they come on line, ordinary citizens with local information and experience can contribute to making them intelligible in ways that add value to the collection as an aggregate. The Berenson photographs are mostly of secondary works of art, and therefore not necessarily as interesting individually as they are as a collection. They perhaps tell stories about how works were produced in studios, or how they circulated. Visualizations of the collection grouped by subject are telling, if not surprising. Jesus represents the largest portion, then Mary, and so on down to tiny outliers, such as a portrait of a woman holding a book, that raise rich questions for the humanities, even though a computer scientist might regard them as problems to fix. "We're on the culture side of the divide," Schnapp says, "so we sometimes view big data from a slightly different angle, in that we are interested in the ability to zoom between the micro level of analysis (an individual object), the macro level (a collection), and the massively macro (multiple collections) to see what new knowledge allows you to expose, and the stories it lets you tell."

• • •

Data, in the final analysis, are evidence. The forward edge of science, whether it drives a business or marketing decision, provides an insight into Renaissance painting, or leads to a medical breakthrough, is increasingly being driven by quantities of information that humans can understand only with the help of math and machines. Those who possess the skills to parse this ever-growing trove of information sense that they are making history in many realms of inquiry. "The data themselves, unless they are actionable, aren't relevant or interesting," is Nathan Eagle's view. "What *is* interesting," he says, "is what we can now do with them to make people's lives better." John Quackenbush says simply: "From Copernicus using Tycho Brahe's data to build a heliocentric model of the solar system, to the birth of statistical quantum mechanics, to Darwin's theory of evolution, to the modern theory of the gene, every major scientific revolution has been driven by one thing, and that is data." ▽

Jonathan Shaw '89 is managing editor of this magazine.

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

Boundary Issues

A library loan—with latitude

The Canada-United States border, the longest shared by two countries (5,525 miles, including Alaska), is uniquely calm. But establishing it was a protracted, unpeaceful pursuit, ultimately aided by one of the longest Harvard library loans on record.

The Treaty of Paris (1783), recognizing U.S. independence, defined the boundary ambiguously: "From the North West Angle of Nova Scotia, viz., That Angle which is formed by a Line drawn due North from the Source of the St. Croix River to the Highlands," and so on, as the Map Collection's Joseph Garver, librarian for research services and collection development, helpfully points out. But what was that angle? Where were the highlands? Did the Atlantic Ocean include the Bay of Fundy? Surveying availed little; the issues were political.

In 1828, the two countries submitted their claims to an arbiter, King William of the Netherlands. As evidence, the U.S. negotiators borrowed 22 maps and books from Harvard, more from the Boston Athenaeum and Massachusetts Historical Society, and shipped them off to The Hague.

Each Harvard document bore an exhibit number and was inscribed with the terms of the loan (see the inset from the Peter Bell map of 1772). The British, seeking access to the interior via a military road from the Maritimes to Montréal, favored a southerly division, explains Garver, who has curated a 2012 exhibition of and lectured about the maps. The Americans imagined a line far north and east, close to the St. Lawrence (see Carington Bowles's "new pocket map" of 1784, left, with its many other boundary eccentricities, to the modern eye). The king's 1831 compromise dissatisfied the young (1820) state of Maine and its parent, Massachusetts (which still had vast landholdings there). The United States withheld assent.

After repeated threats of renewed belligerence, Secretary of State Daniel Webster, LL.D. 1824, and Lord Ashburton, facing the District of Columbia's wilting summer heat, negotiated a resolution in 1842. (The rhetoric had also become hot: a British surveyor denounced an American's work as "the most inflated humbug that ever flourished in the region of bombast.")

HMD Visit harvardmag.com/extras to see other maps from the collection.

In 1843, President Josiah Quincy wrote Webster for the loaned maps; nine were returned. President Edward Everett inquired again in 1848, and nine more reappeared, including Bell's. President Jared Sparks secured the rest, after U.S. president Millard Fillmore ordered a search of the State Department files (Everett was then secretary)—in 1853, a quarter-century after they were checked out. —J.S.R.

Maps courtesy of the Harvard Map Collection

Reprinted from Harvard Magazine. For more information, contact Harvard Magazine, Inc. at 617-495-5746

MEET RAJA GHAWI, HARVARD INNOVATOR

HARVARD
University Planned Giving

RAJA GHAWI '15, an engineering sciences concentrator from Syria, attends Harvard College with the support of financial aid. He recently helped design a machine that streamlines the production of stem cells used in the treatment of cancer patients. After graduation, Raja hopes to attend law school to focus on science policy, intellectual property, and ethics.

YOU CAN SUPPORT outstanding students like Raja and receive lifetime income from Harvard by making a planned gift.

BENEFITS FROM YOUR GIFT INCLUDE:

- Annual income to you
- Income, capital gain, and estate tax savings
- Harvard Management Company services at no fee

Let's make a difference together.

To learn more, email pgo@harvard.edu or call 800-446-1277.

ALUMNI.HARVARD.EDU/PGO/HM

Move forward. With confidence.

As the world's largest consulting firm, we help clients take decisive action and achieve sustainable results. No matter how complex the business question, we have the capabilities and experience to deliver the answers you need to move forward.
www.deloitte.com/confidence

Deloitte.
Consulting

Copyright © 2014 Deloitte Development LLC. All rights reserved.