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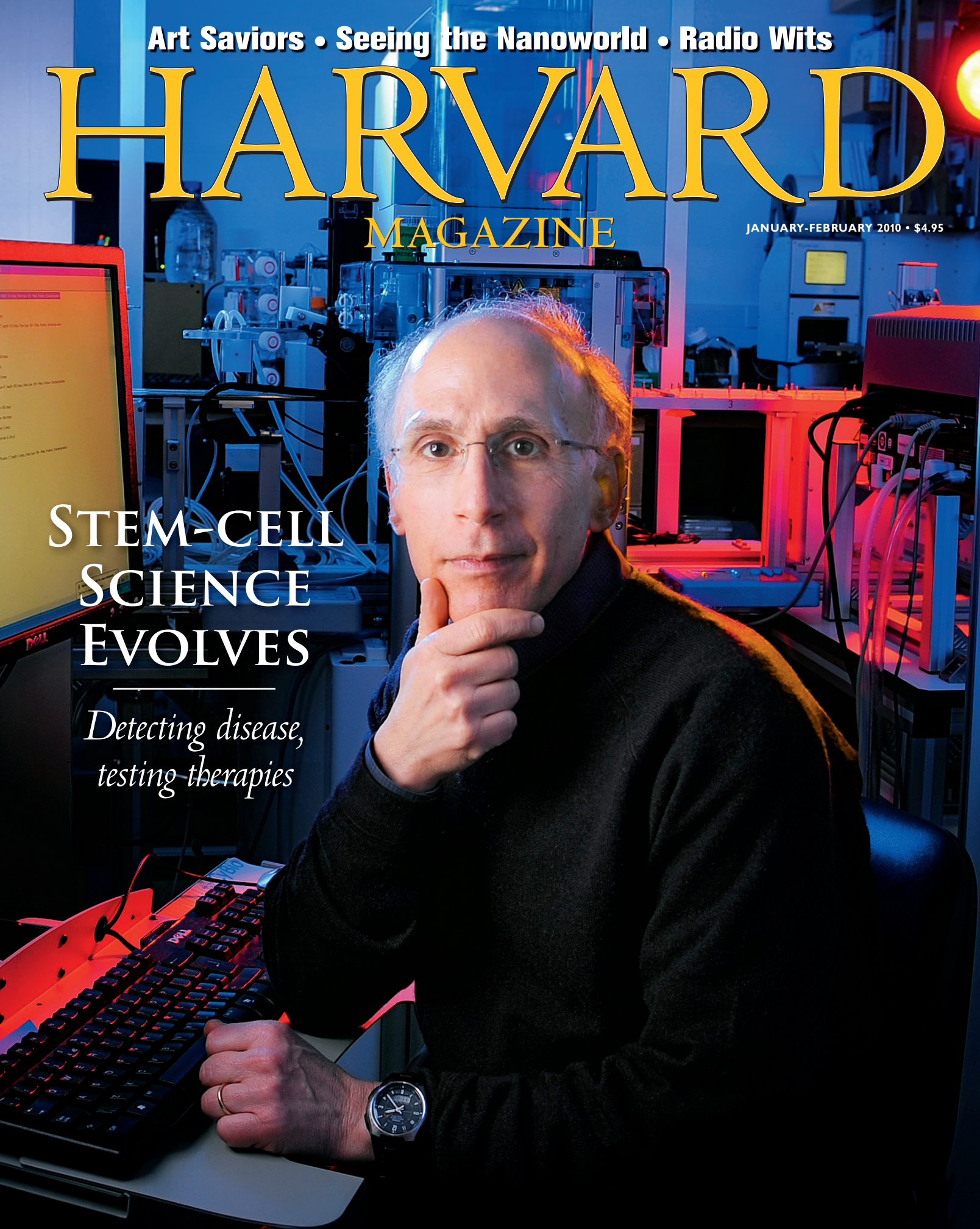
# HARVARD

## MAGAZINE

JANUARY-FEBRUARY 2010 • \$4.95

### STEM-CELL SCIENCE EVOLVES

*Detecting disease,  
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# SARDEGNA

*Almost a Continent*



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# SARDEGNA

## *Almost a Continent*

**Sardegna** is a magical and enchanted land that welcomes visitors, delivering sensations that few other places can give. The scents of myrtle, thyme, and a hundred other aromatic plants make visitors want to find out more about this fascinating island. The combination of some of the clearest waters in the Mediterranean Sea and hills and mountains dotted with holms, oaks and oleanders create truly unforgettable views. Its world class coastline is so exciting that picking a town or a stretch of coast to visit becomes a difficult task. It offers a wealth of unspoiled marine environments, crystal-clear waters and incredibly beautiful beaches and cliffs. The Phoenicians, Carthaginians, Romans, Arabs, Byzantines and Spanish all arrived in this splendid island; **Sardegna** assimilated and reinterpreted all of these different influences, integrated them into its own culture, but did not allow its heart, its own profound way of feeling, to be touched or changed.

There are a multitude of ways the visitor can enjoy, experience and understand the culture, traditions, beauty and lifestyle of this region. One of the most intriguing is the exploration of the most primitive part of **Sardegna**. With the **dolmen**, large prehistoric tombs, the impressive **ziquurat**, but most of all the thousand of **Nuraghi** that dots the region, these various attractions represent the most important and intriguing monuments of the island. These conical-shaped stone towers are the product of a civilization which spanned more than a thousand years, from the 19<sup>th</sup> to the 3<sup>rd</sup> century BC, and developed a society built over stable or semi nomadic sheep rearing and farming. The simplest Nuraghi were built in the shape of a truncated cone tower enclosing in a round chamber. Over time they became increasingly complex and were provided with steps and staircases, or, as in the case of the **Nuraghe di Santu Antine**, with more chambers built on top of each other. This architectonic evolution led to the joining of several towers linked by means of walls around the main building. There are around **7,000 Nuraghe** spread throughout the island and immersed into the beautiful Sardinian Landscape. There are several guided and personalized tours offered for the major ones such as the **Nuraghe Barumini, Nuraghe Losa and Nuraghe Orroli**.

**Sardegna** is also the perfect place to finally learn Italian with its numerous certified schools and courses designed for foreign students visiting the island throughout the year. It also goes without saying that **Sardegna** has one of the most prestigious sailing schools in the Mediterranean. Just try to picture yourself, immersed in the crystal clear water, sailing smoothly between the cliffs of the numerous little islands of the **Maddalena Archipelagos** while admiring a breathtaking sunset. **Sardegna** is a perfect place for extreme sports as well. You can admire the beauty of the island from the top of a cliff while paragliding or you can snorkel, scuba dive in the numerous marine parks spread throughout the over 1200 miles coastline.

The cultural identity of the people of **Sardegna** and the profound and intact traditions are also extraordinary assets of this Island. There are numerous folkloristic events that take place during the course of the year that represents a special opportunity for the visitor to learn more about this intriguing culture. Ancient pagan festivities are linked to the agricultural calendar and traditional carnival celebrations take place in historic towns such as **Mamoiada** and **Ottana** as well as in **Bosa**, a town 20 miles south of **Alghero**. In **Sardegna**, the beauty of nature, the incredibly diverse landscape, the hospitality of the people, and the authenticity of the local traditions open up a new and luscious world that no visitor can afford to miss

*For more information on Sardegna please go to*

**[www.sardegnaturismo.it](http://www.sardegnaturismo.it)**



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# HARVARD

## MAGAZINE



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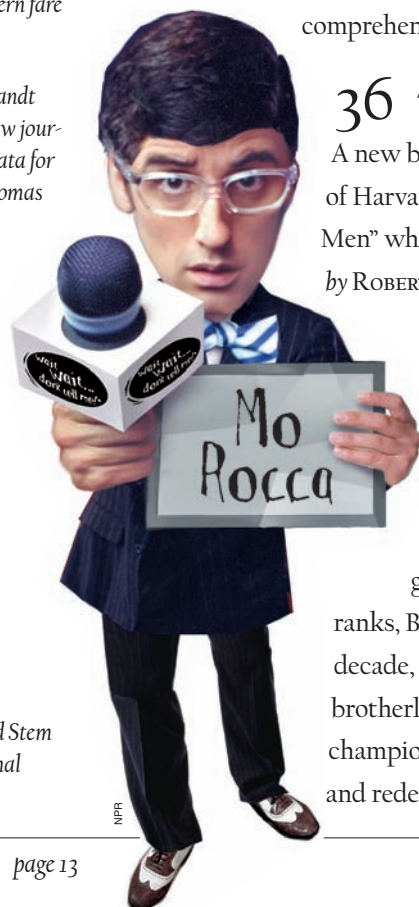
page 56

### DEPARTMENTS

- 4** Cambridge 02138  
*Communications from our readers*
- 7** Right Now  
*How cells stow DNA, work-family imbalance in finance, grabbing flu by the neck, the culture of farmstead cheeses*
- 12A** New England  
Regional Section  
*Seasonal events, testing tai chi for fitness and health, and homey Southern fare*
- 13** Montage  
*Rapid-fire radio wits, Rembrandt and biomedical research, a new journal's "intellectual bravery," data for detecting economic crises, Thomas Jefferson's passion for nature*
- 60** The Alumni  
*Plain-spoken bureaucrat, more Medal of Honor recipients, and a renewed online portal*
- 64** The College Pump  
*A Social Sciences giant and a writing master remembered*
- 76** Treasure  
*War and pieces: a Memorial Hall window*

### 65 Crimson Classifieds

*On the cover: Lee Rubin, the Harvard Stem Cell Institute's director of translational medicine. Photography by Fred Field*



NPR

page 13

### FEATURES

## 24 Tools and Tests

Stem-cell science evolves—with new research efforts focusing on the study of diseases and faster, more targeted development of therapies

by JONATHAN SHAW

## 30 Vita: Li Shizhen

Brief life of a pioneering naturalist: 1518-1593

by CARLA NAPPI

## 32 Conceptualizing Small

A photographer and a scientist collaborate to make the nanoscale world visible—and comprehensible

## 36 The Art Army

A new book unveils the crucial role of Harvardians among the “Monuments Men” who rescued the cultural treasures looted by the Nazis

by ROBERT M. EDSSEL and BRET WITTER

## 41 John Harvard's Journal

Libraries on the brink of sweeping change, online news briefs, “foodie” in the dining halls, women at WHRB, the University financial report discloses further large losses, the Faculty of Arts and Sciences pre- and post-crisis, growth and gradual diversification of the professorial ranks, Business School dean departs, Radcliffe Institute's first decade, the Undergraduate takes pleasure in unstructured learning, brotherly trio on ice, soccer stars, Crimson football's near-championship campaign, waves of glass at Weld Boat House, and redesigned helmets protect athletes' heads



FRED FIELD

page 24

# Cambridge 02138

*Ayn Rand, Ph.D. problems, images of Africa*

## MULTIMEDIA MATTERS

"PROFESSOR VIDEO," by Craig Lambert (November-December 2009, page 34) left me mildly depressed. Not because I teach here, but because my college-bound daughter is considering applying here. When she was in public school, her parents fought the history teacher who relied on Hollywood movies. Now she would get to watch Keira Knightley in a course on the eighteenth-century novel?

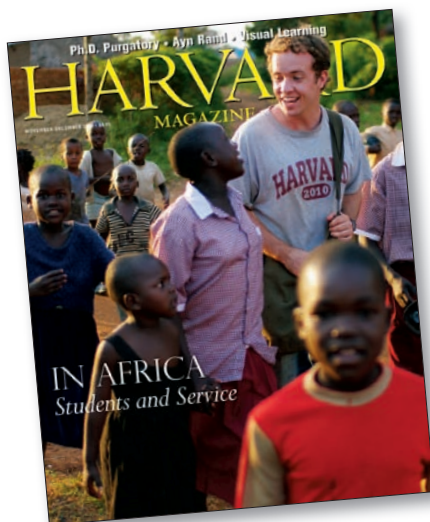
As regards the "most downloaded science animation in history," which lies closer to my field of expertise: There is a lively debate about whether such movies are helpful in teaching cell biology. In producing these full-color 3-D animations, many creative liberties are taken. For example, the motions of all the molecular players are portrayed as they might appear on the macroscopic scale. They bounce, fall, jiggle, and travel on straight paths toward their reaction partners. The laws of physics forbid any such behavior inside a cell. So the seductive familiarity of these animations makes them at once compelling and potentially misleading. This conflict does not arise when we draw the fundamental principles on the board with chalk.

More generally, what is the urgency to adopt the style of YouTube, just because our students spend their free time with it? I don't recall professors in the '60s adopting the comic book form because their students grew up with Marvel superheroes. What happened to the notion of stretching a student's mind by taking him out of the comfort zone?

MARKUS MEISTER

*Tarr professor of molecular and cellular biology  
Cambridge*

*Robert Lue, professor of the practice of molecular and cellular biology, responds: No animation*



can show everything, in the same way that no textbook or chalkboard diagram can ever do justice to the full complexity of a biological process. The decision not to show random molecular motion in a subset of our animations is based on the particular goals of those animations. The primary focus of *The Inner Life of the Cell* is not simply molecular motion; to include it would have obscured the cellular processes. We have found it more effective to portray molecular motion in other animations. Three years of student assessments indicate that unintended misconceptions on molecular motion arise less frequently from an animation like this one than they do from textbook diagrams.

VISUAL AND DIGITAL MEDIA are not just vehicles to teach with, not just window-dressing to gussy up one's teaching performance. They're texts that need to be questioned and analyzed like any other.

Reading about the latest efforts to use film, videos, images, audio, and interactive media took me back to 1993 and 1994, when I offered a summer professional development program, the Harvard Insti-

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tute in Media Education. K-12 and college teachers spent a week exploring instructional practices to help learners critically analyze images from mass media and popular culture. Then, the practice of media literacy education was in its infancy. The rich conversations generated by the event led to the formation of the National Association for Media Literacy Education.

Today, there is a growing body of scholarship and professional practice in the field. But just 15 years ago, the idea of using visual media, mass media, and popular culture to expand awareness and knowledge was a great novelty at Harvard. Hurrah for the digital revolution!

RENEE HOBBS, Ed.D. '85

Co-editor

Journal of Media Literacy Education

Professor, Temple University School of Communications and Theater  
Philadelphia

#### AYN RAND

JENNIFER BURNS WAS CORRECT that Ayn Rand's philosophy of Objectivism has become "part of the warp and woof of American political culture," but in more ways than most people know (Vita, November-December 2009, page 32). There are now at least 60 academic programs that involve reading Ayn Rand's works. There are at least 155 professors who teach and study Rand's works. The American Philosophical Association includes an Ayn Rand Society which will soon have its own journal. Both Cambridge University Press and Blackwell have published or have in press books or collections of essays on Rand's ideas. *Atlas Shrugged* has sold over seven million copies and has shown dramatic increases in sales in the last few years. Rand was a cultural pariah in the 1960s, but her ideas are now on the verge of changing the culture itself.

EDWIN A. LOCKE '60  
Westlake Village, Calif.

A PUFF-PIECE about Ayn Rand, a "philosopher" who deserves ever more ignoring? Absurd, especially with the full-scale economic and social experiment we're still enduring thanks to only an approximation of her glorification of selfishness. And touting Alan Greenspan as an example of the success of her principles? Spare me.

BARRY GOLDSTEIN '64, A.M. '69  
Newtonville, Mass.

I ATTENDED Ayn Rand's presentation at Harvard in October 1962. It was publicized in a quiet, almost embarrassed fashion and took place in an auditorium away from the center of things. One definitely got the sense that Harvard was not honoring Rand the philosopher so much as exhibiting her as a curious cultural phenomenon.

The hall was crowded. She gave her speech and then answered questions from the audience, which had been written down and passed in. She did not answer any question that directly challenged her assertions; her answers were mostly repetitions of what she had already said. Her exit, through the hall, was dramatic—a small, tender-eyed woman surrounded by a phalanx of young men in suits.

I had a hard time explaining Rand to a Harvard friend of the time, since putting her ideas into plain words, without the emotional drama of the novels, makes them sound idiotic, undeveloped, and cruel. Which they are, of course. Her talk, as I recall it, was little more than embroidery around her main theme, which is the justification of selfishness and the poisonous effects of societal obligations. That theme was not up for discussion.

She seemed to be there to get a little glow from the connection with Harvard. Most of us in the audience were there to see a star turn and, as in my case, to have her explain the difficulties with her theory. The star turn we definitely got; the explanation we definitely did not get. Whatever that night meant to her, I doubt that she considered it a success and certainly not, as Jennifer Burns called it, "a pinnacle in her career."

MICHEL CHOBAN '66  
Altadena, Calif.

#### PH.D. PROBLEMS APLENTY

I WRITE TO DISAGREE, respectfully, with my colleague Louis Menand ("The Ph.D. Problem," November-December 2009, page 27), who writes: "that it takes longer to get a Ph.D. in the humanities than it does in the social or natural sciences...seems anomalous, since normally a dissertation in the humanities does not require extensive archival, field, or laboratory work." What might be "normal" in his branch of the humanities is certainly not true in mine, the history of art, which, on account of the need to examine works of art in situ as well as to conduct related digging in



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often chaotic or uncatalogued collections, requires extensive archival and field work, often in widely scattered collections, and, if issues of conservation and restoration are involved, laboratory work as well. To this I would add the need to master many languages, often in premodern as well as their modern variants. The same is true of many other fields of humanistic inquiry as well. Other laborious skills that have to be mastered often include paleography (no longer taught as systematically as used to be the case, meaning that students must often go elsewhere seeking instruction).

If it is currently taking Ph.D. candidates longer to reach their degree, it is at least in part because, due to deficiencies in our educational system, they now often begin graduate study with less foreign-language proficiency than previously. This is another respect in which graduate study reflects the culture at large, and it is, unfortunately, yet another way in which, to paraphrase Menand, it would be a catastrophe were the university to become just an echo of the public culture.

In an age of speed and easy gratification, the university provides a place to slow down—and think. Graduate school is not simply a place to acquire another qualification on the road to success, it is a place to acquire the tools needed to become a competent scholar and, still more important, to acquire the intellectual capital that can sustain a career of teaching and scholarship. That, like many good things, takes time, and if we in the humanities are not willing to sustain such study, then the future of our fields really is in much worse shape than Menand suggests.

JEFFREY HAMBURGER

*Francke professor of German art and culture  
Cambridge*

MENAND IGNORES the institutional disincentives for reducing the numbers of Ph.D.s. He rightly observes that we are

cranking out too many these days. But if you are in the typical “publish or perish” institutions, you need postdocs and grad students to help with your research in many disciplines. If you opt to cut back on accepting Ph.D. candidates, then in your annual review, if you are tenured, you are informed there will be no salary increase. And other penalties are exacted unless you keep up with the current production rate.

DAVID BROWMAN, Ph.D. '70

*St. Louis*

MENAND IS CORRECT when he states that the universities are overproducing Ph.D.s in relation to the availability of academic positions, but he fails to mention an important factor that led to this imbalance. In 1986 the mandatory retirement age for most professions was lifted, but not for professors. At the time, it was widely heralded that by the year 2000 thousands of positions would open up due to the retirement of an aging professoriate. But that did not happen because the requirement was soon lifted for professors. Many of them continued in their tenured positions, often with lowered enrollment in classes, but at the top salary ranges, a condition that limited the available spots for newly minted Ph.D.s.

CAROL DELANEY, M.T.S. '76

*Providence, R.I.*

WHILE IT IS advisable to diminish time-to-degree whenever possible, eight years in graduate school does not necessarily leave one “seriously overtrained” for a tenure-track job, and being a professor is not merely teaching at the college/university level, as Menand implies. Those of us in the profession know that, as dedicated as we are to our teaching, our efforts are also devoted to research and publishing, which demand time, focus, and funding that began during those important years we developed in graduate school. Many of us also mentor doctoral students, an intense commitment of time and energy that necessitates being well-entrenched in our disciplines—which would be impossible with only three years of graduate training.

My chosen specialization in contemporary Chinese theatre practice required me to become fluent in written and spoken Chinese; know the history and literature of western as well as non-western theatre; study Chinese history, literature, and politics; and im-

*(please turn to page 73)*

# HARVARD

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# Right Now

The expanding Harvard universe

FORM AND FUNCTION

## Genomic Architecture

ONE OF THE enduring puzzles of biology is how our large, complex genomes function, let alone fit, inside the cramped compartment of a cell's nucleus. The total DNA in a human cell—roughly two meters in length—is somehow packed into an organelle just a hundredth of a millimeter in diameter. Even more impressive, the cell is able to locate, access, and transcribe genes within this dense bundle. Now a study published in *Science* describes how researchers at Harvard and the University of Massachusetts Memorial Medical Center used a new technique to create a three-dimensional map of the human genome, revealing how DNA pulls off this stunning feat of organization.

Erez Lieberman-Aiden, a Harvard graduate student and co-first author of the paper, says, “The challenge we face with the genome is that it occupies a nether region where a lot of our technologies don't work very well.” At the smallest scale, scientists know that human DNA forms a double helix, and that this helix is wound around proteins to form condensed bundles. On a larger scale,

we know that long stretches of bundled DNA are divided into individual chromosomes that are visible under a microscope only occasionally, when they compact into a classic X-like structure during cell division. The area between these

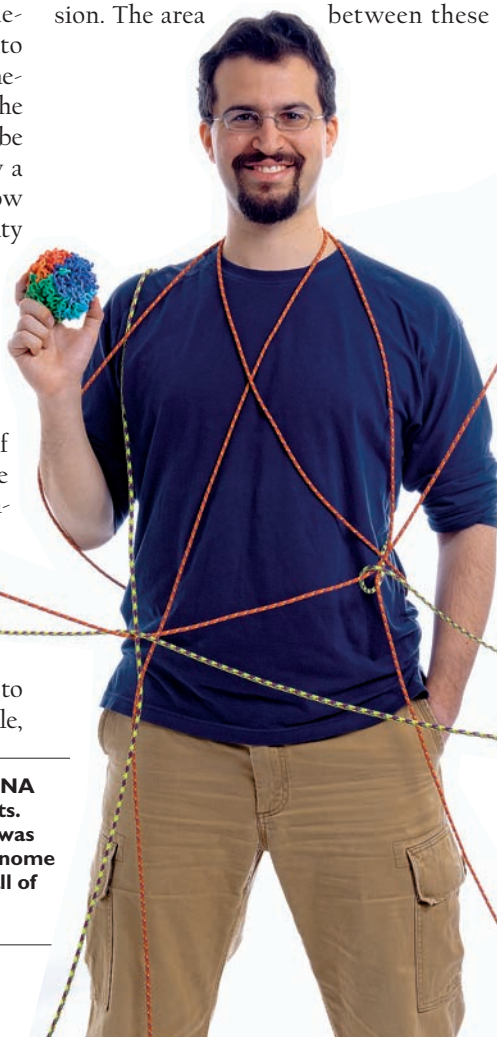
two scales has been difficult to study with existing techniques.

Eric Lander, professor of systems biology and director of the Broad Institute of Harvard and MIT, partnered with Job Dekker, associate professor of biochemistry and molecular pharmacology at UMass Medical School to solve the problem. Postdoctoral fellow and co-first author Nynke van Berkum of UMass led the development of a technique called Hi-C, adapted from technology previously developed in Dekker's lab. It uses formaldehyde to “freeze” the position of DNA in the nucleus by gluing together DNA strands that are near one another. The DNA is then broken into many pieces, which are then sequenced to reveal the identities of DNA sequences close to one another in space. The process is repeated for millions of cells and the results averaged to create a spatial, three-dimensional model of DNA in cells.

The researchers discovered a feature about the overall organization of DNA that helps explain how individual genes are accessed. DNA is grouped into two compartments in the nucleus: one, loosely packed, that contains active genes; another, densely packed, where inactive genes lie. It's been known that DNA unwinds

somewhat to make genes accessible, but the new study suggests that DNA actively snakes its way to different parts of the nucleus depending on whether genes are needed or not. Lieberman-Aiden compares the system to a work space: the genes that are active are like files loosely spread out on a desk; unneeded genes

**If it were not for an elegant design, your DNA might be a tangle of crossed lines and knots. Graduate student Erez Lieberman-Aiden was part of a team that discovered how the genome packs information accessibly into a tiny ball of hierarchical folds.**



are like files packed and stored in a file cabinet.

In addition, the team discovered how DNA manages to compact itself into the nucleus. Lieberman-Aiden was looking for a physical model that could explain

the group's data when he found the answer: in a 1988 physics paper predicting that a molecule similar to DNA could form a structure resembling a Peano curve—a fractal design discovered in 1890 by an Italian mathematician that allows a continuous curve to densely fill a space

without ever crossing itself (see the image above).

DNA, it turns out, crumples into a hierarchical series of folds that enable it to pack densely without forming knots or

tangles. The researchers call this structure a fractal globule. And Lieberman-Aiden says it makes perfect sense as a way to manage the information in the genome. "If I was trying to build a library, I'd want the volumes to be compact in one place,

I'd want them to be organized, and I'd want them to be accessible," he explains. A fractal globule allows the genome to follow these same principles.

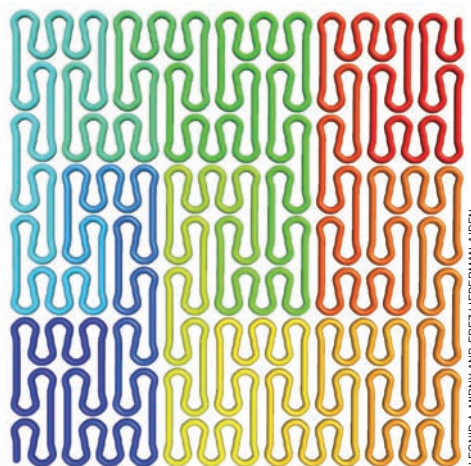
Although the current study provides a fundamental insight into genome organization, Dekker says the "resolution of

the current spatial map we've built is not high enough." Right now, the map is at the level of a single megabase, or one million base pairs—the equivalent of breaking the entire genome into 3,000 pieces. It will

require many more iterations of the technique to be able to resolve structure on a smaller level.

Lieberman-Aiden says other scientists "have realized that this type of approach to studying the three-dimensional structure of the genome is really quite transformative." An improved three-dimensional map of DNA's structure could help answer questions about how genes work that aren't apparent in the genome sequence—for instance, how genes are controlled by other DNA sequences in the genome called regulatory elements. These stretches of DNA often are not adjacent to their target genes in sequence, but they may turn out to be close together in physical space. The researchers also plan to study how the DNA map varies among cells from different species and among different cell types. The mapping technique could even offer new insights, they believe, into differences between cells that are healthy and those that are diseased. ~COURTNEY HUMPHRIES

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## A QUANT'S QUANDARY

# Family or Fortune

**T**HAT INVESTMENT BANKING isn't a relaxing career is perhaps obvious. But new research by Lee professor of economics Claudia Goldin and Allison professor of economics Lawrence Katz shows just *how* bad the quality of life is for financial-sector workers. The field stacks up as even more inflexible than other professions with a reputation for being demanding, such as medicine and law.

And their research shows the particularly high price paid by women who go into finance. In their Harvard and Beyond survey of 6,500 Harvard and Radcliffe graduates from various classes between those of 1969 and 1992, Goldin and Katz found that women who had gone on to earn an M.B.A. after graduating from Harvard were far less likely to be employed *and* have children at the time of their fifteenth reunion than were female respon-

dents holding M.D. degrees: less than half of the M.B.A.s reported both having children and working, versus two-thirds of the M.D.s. Among the M.B.A.s, only 30 percent worked full-time, year-round, and had children, whereas 45 percent of the M.D.s did.

Women have undoubtedly made gains in terms of access to business careers: the female component among entering M.B.A. classes nationwide has surpassed 40 percent, up from 10 percent in the 1970s. But in terms of being able to choose careers they want within those fields, as opposed to having to abandon professional goals for the sake of family, women still have far to go.

Goldin and Katz conclude that female M.B.A.s with children select professions with shorter hours, compared to their male peers with children and childless peers of both genders. Analysis of data from a dif-

ferent survey—this one of 2,500 male and female University of Chicago M.B.A.s from the graduating classes of 1990 through 2006, conducted by Goldin, Katz, and University of Chicago economist Mari-  
anne Bertrand, Ph.D. '98—showed that only 8 percent of respondents working in venture capital were women; among those in investment banking, only 15 percent were. But among those working in human resources, 71 percent were women; in advertising, that number was 59 percent.

The researchers also asked the M.B.A.s how many hours they worked per week; the occupations with the highest numbers of men also had the highest average number of hours worked (investment banking and consulting, at 74 and 61 hours per week, respectively). Conversely, those with the highest numbers of women had the shortest hours (human resources and advertising, at 51 and 52 hours a week, respectively).

A similar sorting occurs in medicine,



Did you consider work-life balance in choosing your first job? How have these concerns affected your career choices since? Share your story and see what other readers are saying at [harvardmag.com/extras](http://harvardmag.com/extras).

where specialties with shorter and more predictable hours tend to be more heavily female. Women now make up 41 percent of new M.D.s nationwide, but less than 30 percent of physicians under 35 practicing emergency medicine or general surgery. Meanwhile, 70 percent of gynecologists and nearly 60 percent of dermatologists in that same age bracket are women.

But in balancing work and family, women in finance make especially large sacrifices. In the Harvard and Beyond survey, Goldin and Katz found that female M.B.A.s took more time off after having a child than did their peers with other advanced degrees, and that even *after* correcting for the amount of time out of work, this group of women saw the largest pay decrease compared to peers who took no time off. Female M.B.A.s who took a year and a half off made 41 percent less than their counterparts who had worked continuously. For J.D.s who took time off, the pay gap was 29 percent. And for M.D.s, the gap (16 percent) was even less than the gap facing women with *no* graduate degree (25 percent).

People who opt out of investment bank-

ing for some other financial specialty (as women more commonly do) also forgo compensation. Nine years after graduating, the Chicago M.B.A.s working in investment banking (both male and female) were making, on average, \$700,000 a year (the median was \$470,000), compared to an average income for the entire survey pool of \$370,000, and a median income of \$190,000. There wasn't much difference between the incomes of male and female respondents in their first jobs after graduation, but the genders' incomes diverged further with each subsequent year, in part due to choosing different specialties.

Although the number of Harvard graduates pursuing financial careers has dropped, it is still substantial: last spring's

*Crimson* senior survey showed that, among College graduates entering the workforce, 20 percent were heading for finance and consulting—down from 47 percent in 2007 and 39 percent in 2008 (see “Flocking to Finance,” May-June 2008, page 18).

Goldin advises students considering those fields to go in with eyes open. For the most part, she says, “you choose a sector because of your passion, not because of work-life balance.” Within *any* sector, she adds, “people assume that they can find some choice and some accommodation.” But if the field they are considering is finance, they may want to weigh those issues more carefully. —ELIZABETH GUDRAIS

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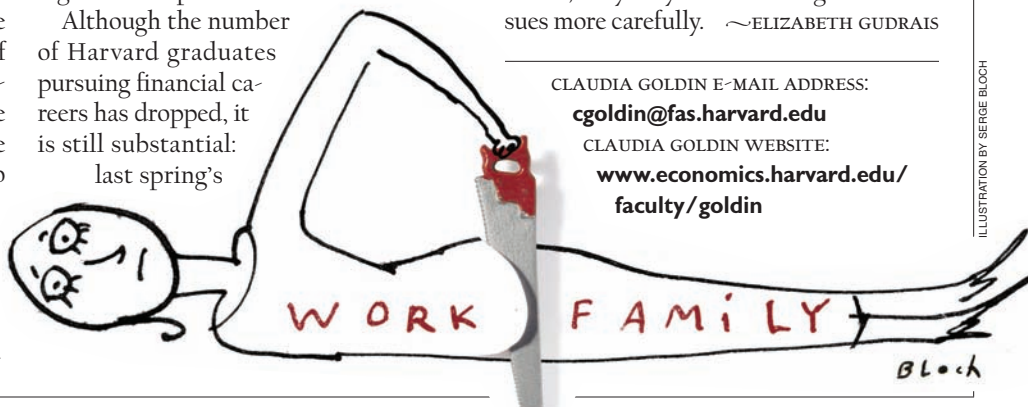


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## FUSION BLOCK

# Grabbing Flu by the Neck

SCIENTISTS MAY HAVE found the Achilles heel of flu viruses. Researchers including Wayne A. Marasco, an associate professor of medicine at Harvard Medical School, and colleagues from the Centers for Disease Control and Prevention and the Burnham Institute for Medical Research, have discovered an antibody that is active against many different strains of influenza, including the 1918 Spanish flu, the H5N1 bird flu, and the largest group of seasonal flus.

Influenza viruses are particularly difficult to combat because they mutate rapidly. Thus, to fight seasonal flu—which kills roughly 40,000 Americans each year—vaccine manufacturers must try to predict which strains will dominate the next season before they can begin to develop formulations to confer immunity. Anyone who wants protection must get an annual shot.

But the discovery by Marasco and his collaborators raises the possibility of a universal flu vaccine that he says would confer “durable immunity, much like a tetanus shot,” against a range of influenza strains. The antibody targets a stable part of the viral entry mechanism that doesn’t change from year to year and is nearly identical across genetically different families of flu.

“When you are vaccinated or mount an immune response naturally,” Marasco explains, the antibodies you produce target a “lollipop-shaped protein called hemag-

glutinin, which has a big, globular head on a narrow stalk. That globular head is like a decoy,” he says. “It changes every season.” But the stalk does not.

In influenza infection, the hemagglutinin proteins extending from the virus attach to cell surfaces in the respiratory

The pore then elongates to become a stable neck, allowing the viral RNA to enter the targeted cell. The virus then takes over the nucleus, hijacking the cell’s reproductive machinery to make copies of itself.

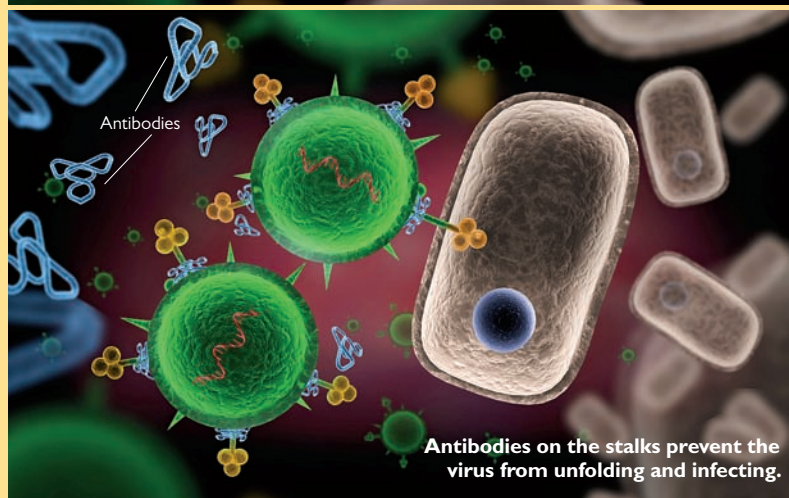
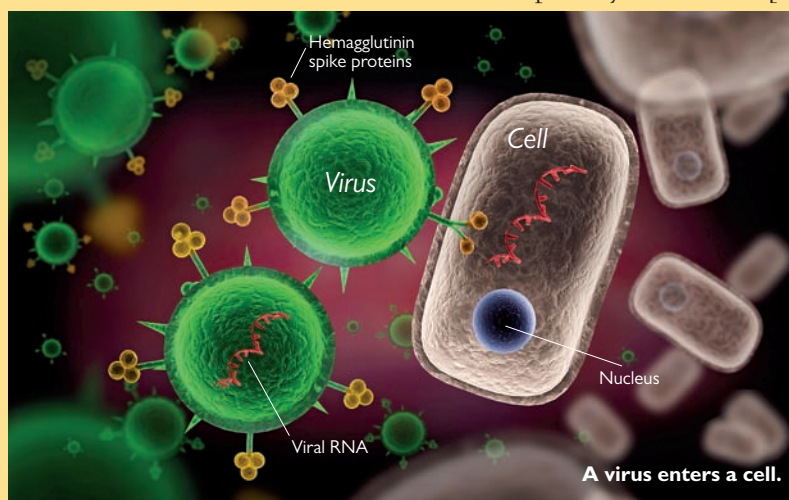
Marasco and colleagues “found a highly conserved [evolutionarily stable] region in the base of the ‘stalk’ where all the fusion machinery that the virus uses to enter the cell is located.” The naturally occurring, but rare, antibody they discovered binds to a pocket in the stalk, where its stranglehold prevents the virus from unfolding and injecting its genetic payload into another cell.

A vaccine able to prompt the human immune system to produce antibodies that would bind to this pocket would confer immunity to a broad range of flu viruses. “It is very rare that you get a chance to do this kind of really important translational work that has immediate impact,” Marasco notes. “It’s very rewarding.”

The current H1N1 swine flu pandemic already suggests that their approach will apply broadly. “The prediction would be that this uni-

versal pocket is conserved,” says Marasco—and in fact, the antibody turns out to be active against swine flu, too. The researchers are now focused on finding antibodies that will target the two other major classes of human influenza.

—JONATHAN SHAW



tract, then unfold to expose a harpoon-like fusion protein that spears the target cell membrane. The protein then twists into a hairpin formation that pulls the viral membrane and the cell membrane into tight contact.

Because the two membranes are both formed of lipids, they start to mix, and eventually a pore forms between them, as can happen between two soap bubbles.

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## ETHICAL ARTISANS

## American Cheese Cultures

**C**HANCES ARE, the last time you bought cheese, you didn't ponder the ethical implications of your purchase. But American artisanal cheesemakers, many of whom went into the business for their own ethical reasons, are prompting consumers to consider such concerns. Cowgirl Creamery, in Point Reyes Station, California, offers one typical message on its website: "In buying farmstead cheese rather than industrially produced cheese, you will support the fine art of farmstead cheesemaking,...help to ensure jobs in rural areas, and contribute to protecting farmlands from development."

This is one of the observations Heather Paxson, a fellow at the Radcliffe Institute for Advanced Study, intends to present in the book she is writing this year (tentatively titled "Cheese Cultures"). Paxson—

an associate professor of anthropology at MIT and the author of a 2004 book on Greek women's changing attitudes toward family planning—specializes in the anthropology of the everyday: how individuals connect themselves to a web of social norms through their actions, and how those actions, en masse, shape the norms. Her attention turned from Greece to cheese when she began noticing moralistic language on cheese labels. She spent five years researching the book, visiting 44 cheesemakers—mostly in Vermont, Wisconsin, and northern California. (The book's first chapter will be an ethnographic description of daily life at Vermont Shepherd Farm, where she spent two weeks living and working alongside proprietor David Major '83.)

American artisanal cheesemakers—defined by Paxson as those who use sensory

evaluation in their cheesemaking, such as running a finger through freshly set curd to decide if it's ready to cut—number just under 400. A handful of creameries have been making cheese for a century or more, passing down the knowledge through generations, but Paxson says artisanal cheesemaking in the United States began picking up speed in the 1980s, "as an offshoot of the back-to-the-land movement." These new cheesemakers looked to time-tested methods, visiting Europe or corresponding with farmers there to determine which types of cheese and which grazing animals did well in climates analogous to the locations of their own creameries.

American cheesemakers could not imitate European methods without considering the French concept of *terroir*: the notion that a product such as wine or cheese is more than its ingredient list—



KELSEY QUIGLEY, CLASS OF '09

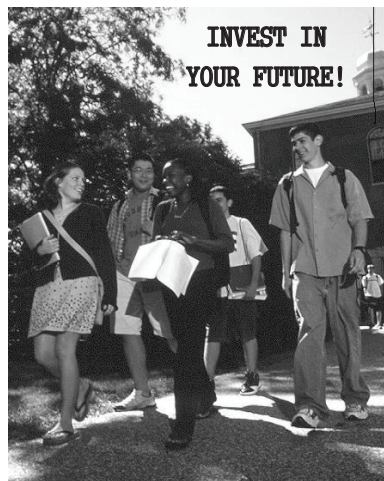
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that it contains some essence of the land, the place, and the methods that produced it. In observing how her research subjects spoke about *terroir*, Paxson determined that they are crafting their own uniquely American definition of the term.

For Europeans, continuity through history is a crucial ingredient of *terroir*. To make this point, Paxson quotes the website of the French cheese Comté, which notes that records of the farmers' cooperative that still produces the cheese date back to the thirteenth century. But in the relatively young United States—and in its even younger artisanal cheesemaking industry—*terroir* must rely on something else. As they start up their operations, American cheesemakers are inventing recipes, introducing grazing animals, and in some cases converting land previously used for intensive farming. And so in the United States, *terroir* becomes a matter of process. The result fits well with certain elements (some would say stereotypes) of the American character: the Puritan work ethic, the need for constant activity. “In its American incarnation, rooted in the Lockean virtue of improving society through improving the land,” says Paxson, “*terroir* isn’t something to *discover*; it’s something to *do*.”

Another feature of the European system is equally unpalatable to Americans: regulation and standardization. The European Union’s Protected Designation of Origin system, and individual countries’ older analogous systems (such as France’s *Appellation d’origine contrôlée*), dictate what breed of animal a

farmer must use, and what the animal can and cannot eat (with exact percentages), to sell cheese labeled Camembert de Normandie or Gruyère. (The feeding regulations for Parmigiano Reggiano dairy cows, to take one example from Italy, run nine pages.) “It’s difficult to imagine American entrepreneurs embracing this degree of bureaucracy,” says Paxson. Where European cheeses are standardized by region, encouraging uniformity, American artisanal cheesemakers’ stock in trade is individuality—another way in which the artisanal cheese world resembles a microcosm of the country itself. For instance, David Major’s description of Vermont Shepherd assures connoisseurs that every wheel of the cave-aged cheese, made from raw sheep’s milk, “is distinctive. The flavor is sweet, rich, and earthy, with hints of clover, wild mint, and thyme.”

Such an aesthetically focused description might sound like something written in France (where, Paxson notes, palate development is part of the national school curriculum). But on the Vermont Shepherd website, it appears within a rhapsody on how the cheese is made and who makes it. Paxson believes Americans are coming around to a sensory appreciation of food and drink, albeit via concerns of technique and ethics. In other words, in a way that is stubbornly American.

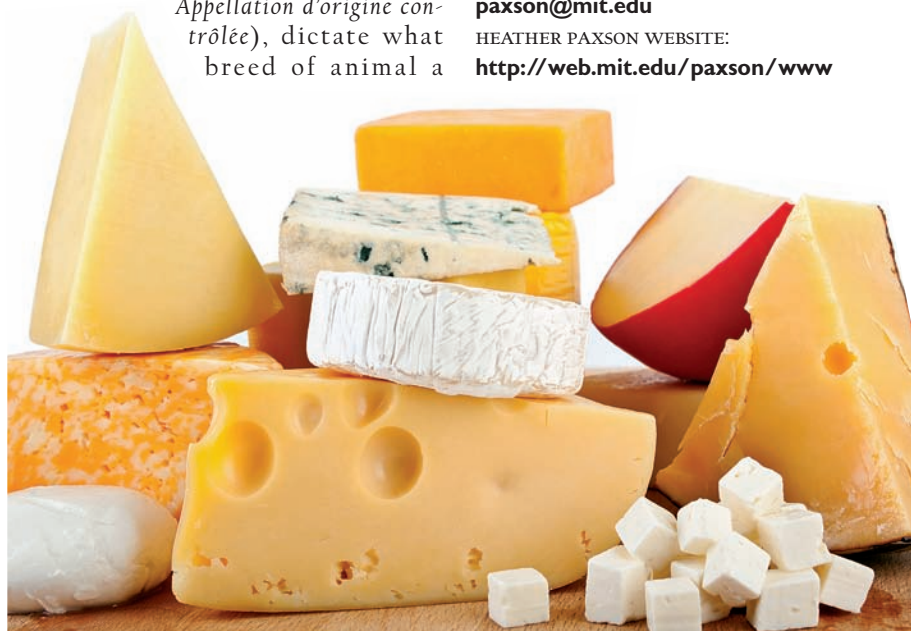
~ELIZABETH GUDRAIS

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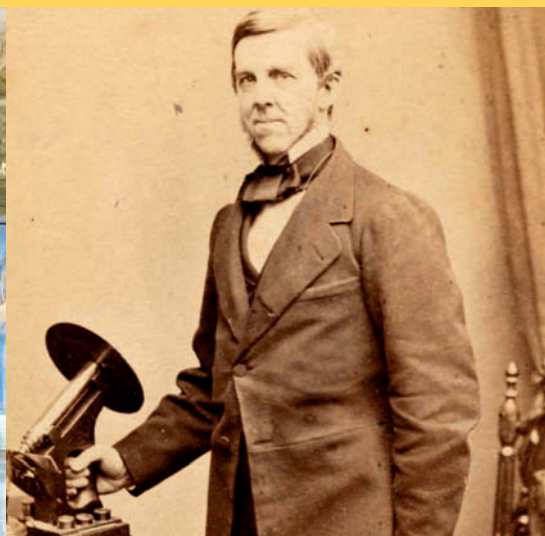
<http://web.mit.edu/paxson/www>



OLGA WATSKOVA/ISTOCKPHOTO

# New England

## REGIONAL SECTION



## Extracurriculars

### THEATER

[www.americanrepertorytheater.org](http://www.americanrepertorytheater.org)  
617-547-8300

- Through February 7

(see website for specific showtimes)

The six-hour ensemble production *Gatz* (divided in two by a dinner break) enacts every word of *The Great Gatsby*. Produced by Elevator Repair Service theater company of New York, and heralded as a radical commentary, *Gatz* is on tour for the first time.

### EXHIBITIONS

#### Harvard Art Museum—Sackler

[www.harvardartmuseum.org](http://www.harvardartmuseum.org)  
617-495-9400; 485 Broadway

- January 10 at 2 P.M.

*Daguerreotype Portraits*, a gallery talk by Michelle Lamunière, Robinson assistant curator of photography, examines two newly acquired portraits of African Americans.

- Continuing: *Re-View*. This survey of approximately 600 works from the Harvard Art Museum—the Fogg, the Busch-Reisinger, and the Arthur M. Sackler—is a unique installation of objects historically exhibited in separate facilities.

#### Peabody Museum of Archaeology and Ethnology

[www.peabody.harvard.edu](http://www.peabody.harvard.edu)  
617-496-1027

- Continuing: *Sacred Spaces: Reflections on a Sufi Path*. Mixed-media compositions record artist Samina Quraeshi's pilgrimages to Sufi sanctuaries in the Indus Valley.

- Continuing: *Wiyohpiyata: Lakota Images of the Contested West* highlights drawings by Plains Indian warriors recovered from the Little Big Horn battlefield.

#### Harvard Museum of Natural History

[www.hmn.harvard.edu](http://www.hmn.harvard.edu)  
617-495-3045

During its sesquicentennial, the museum is celebrating the newly renovated Great Mammal Hall, which fosters up-close experiences with wild animals—rare and common alike—from across the globe.

- Opening January 22

*Domesticated: Modern Dioramas of Our New Natural History*. These large-scale photographs and scenes by New York City-based artist Amy Stein investigate the tenuous relationship between animals

and humans as our built civilization increasingly encroaches upon nature.

#### The Semitic Museum

[www.fas.harvard.edu/~semitic](http://www.fas.harvard.edu/~semitic)  
617-495-4631

Continuing: *The Houses of Ancient Israel: Domestic, Royal, Divine* features a full-scale replica of an Iron Age (ca. 1200–586 B.C.E.) village abode. *Ancient Egypt: Magic and the Afterlife* shows visitors the Egyptian view of the hereafter.

### LIBRARIES

[www.hcl.harvard.edu/info/exhibitions](http://www.hcl.harvard.edu/info/exhibitions)

#### Houghton Library

617-495-2439

- Continuing: Thomas Shotter Boys's *London As It Is*, first published in 1842, is an artistic gem and important documentary of the Victorian-era city as seen through original sketches, lithographs, and hand-colored final images.

#### Pusey Library

617-495-2417/384-7938

- Continuing: *Roosevelt Reading: The Pigskin Library, 1909–1910*, celebrates the centennial of TR's post-presidential safari in British East Africa with his son, Kermit, by displaying the 55 pigskin-bound books taken to read during their journey.

A scene from *Gatz*, a staged reading of *The Great Gatsby*, opening at the ART on January 7; the newly renovated Great Mammal Hall at the Harvard Museum of Natural History; Renaissance (and Harvard) man Oliver Wendell Holmes is celebrated at Countway Library



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## NEW ENGLAND REGIONAL SECTION



**"Precipitating Rainfalls by Means of Explosives"** (from an 1880 copy of *Scientific American*), on view at Cabot Library

### Cabot Library

617-496-5534

• Through January 29

*Weather Control: Pluviculture, Cloud Seeding, and Climate Engineering* looks at historic attempts to harness and direct the weather, from native rituals and nineteenth-century "rainmaking" to Cold War research and current investigations into climate engineering.

### Countway Library Center for the History of Medicine

617-524-2170

[www.countway.harvard.edu/chom](http://www.countway.harvard.edu/chom)

*The Scalpel and the Pen: The Life and Work of Oliver Wendell Holmes, M.D.*, a year-long, wide-ranging exhibit, celebrates the bicentennial of the physician and author's birth with photographs, rare early works, letters, anatomical specimens, and personal items, such as one of his famous chambered nautilus shells and an ivory paper knife, inscribed with a poem, given to Holmes by a colleague, physician and novelist S. Weir Mitchell.

## NATURE AND SCIENCE

### The Arnold Arboretum

[www.arboretum.harvard.edu](http://www.arboretum.harvard.edu)

617-524-1718/384-5209

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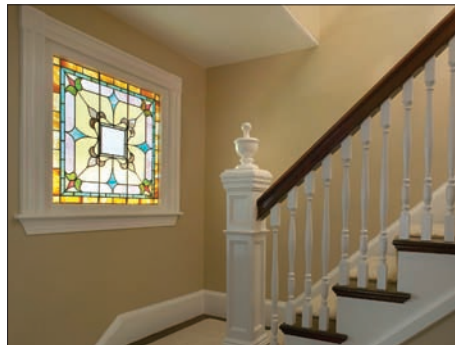
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This recently acquired daguerreotype will be discussed in a gallery talk at the Sackler.

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[www.cfa.harvard.edu/events](http://www.cfa.harvard.edu/events)

617-495-7461; 60 Garden Street

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## MUSIC

• February 19 at 8 P.M.

[www.harvardjazz.org](http://www.harvardjazz.org); 617-496-2263

[www.boxoffice.harvard.edu](http://www.boxoffice.harvard.edu) (for tickets)

The *Harvard Club of Boston Jazz Combo Festival* features student ensembles performing original compositions and standards, professional critiques, and cash awards. Free and open to the public at the Harvard club. [www.harvardclub.com](http://www.harvardclub.com).

## Sanders Theatre

[www.boxoffice.harvard.edu](http://www.boxoffice.harvard.edu)

617-496-2222

• January 16 at 7:30 P.M.

A *Joyful Noise Concert* honors the legacy of the Reverend Martin Luther King Jr. and features the Harlem Gospel Choir. Presented by the Cambridge Multicultural Arts Center.

Events listings also appear in the *University Gazette*, accessible via this magazine's website, [www.harvardmagazine.com](http://www.harvardmagazine.com).

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Hear the founding director of the Center on the Developing Child at Harvard University discuss how neurobiology can impact public policy.  
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# Easing Ills through Tai Chi

*Researchers study the benefits of this mind-body exercise • by Nell Porter Brown*



cal School (HMS) instructor who has practiced for 15 years. “I’m stronger in my legs, more alert, more focused, and more relaxed—it just puts me in a better mood all around.” Although she also practices sitting meditation and does a lot of walking, she says that the impact of tai chi on her mood were so noticeable—even after she was diagnosed with a chronic immune system cancer—that she has devoted her professional life to studying the effects of mind-body exercise on the brain at Harvard’s Osher Research Center.

Kerr is careful to note that tai chi is “not a magic cure-all,” and that Western scientific understanding of its possible physiological benefits is still very rudimentary. Yet her own experience and exposure to research have convinced her that its benefits are very real—especially for older people too frail to engage in robust aerobic conditioning and for those suffering from impaired balance, joint stiffness, or poor kinesthetic awareness.

For anyone who practices tai chi regularly, “brain plasticity arising from repeated training may be relevant, since we know that brain connections are ‘sculpted’ by daily experience and practice,” explains Kerr, who is investigating brain dynamics related to tai chi and mindfulness meditation at HMS. “Tai chi is a very interesting form of training because it combines a low-intensity aerobic exercise with a complex, learned, motor sequence. Meditation, motor learning, and attentional focus have all been shown in numerous studies to be associated with training-related changes—including, in some cases, changes in actual brain structure—in specific cortical regions.”

SCHOLARS SAY tai chi grew out of Chinese martial arts, although its exact history is not fully understood, according to one of Kerr’s colleagues, assistant professor of medicine Peter M. Wayne, who directs

**C**ATHERINE KERR has found an antidote for the hectic pace of laboratory life in the daily practice of tai chi. This centuries-old Chinese mind-body exercise, now gaining popularity in the United States, consists of

**Kerr practices outside to “feel the sensations of the sun and wind and the ground beneath my feet.”**

slow-flowing, choreographed meditative movements with poetic names like “wave hands like clouds,” “dragons stirring up the wind,” and “swallow skimming the pond” that evoke the natural world. It also focuses on basic components of overall fitness: muscle strength, flexibility, and balance.

“Doing tai chi makes me feel lighter on my feet,” says Kerr, a Harvard Medi-



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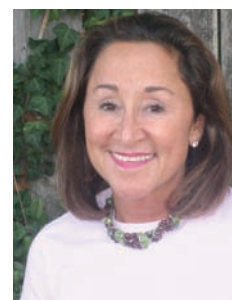
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## NEW ENGLAND REGIONAL SECTION

the tai chi and mind-body research program at the Osher Center. “Tai chi’s roots are also intertwined with traditional Chinese medicine and philosophy, especially Taoism, and with another healing mind-body exercise called *qigong*,” he explains. “Though these roots are thousands of years old, the formal name *tai chi chuan* was coined as recently as the seventeenth century as a new form of kung fu, which integrates mind-body principles into a martial art and exercise for health.”

*Tai chi chuan* is often translated as “supreme (grand) ultimate fist”: the first part (“tai chi”) refers to the ubiquitous dialectical interaction of complementary, creative forces in the universe (yin and yang); the second, the fist, is what Wayne describes as the “manifestation or integration of these philosophical concepts into the body.”

According to traditional Chinese medicine, when yin and yang come together they create a dynamic inner movement. “While practicing, tai chi moves the chi and the blood and the sinews in the body—purportedly correcting health imbalances,” adds Wayne, who has founded The Tree of Life Tai Chi Center, in Somerville, Massachusetts, where he also teaches. “One key principle of tai chi is analogous to the saying ‘A rolling stone gathers no moss,’—if you maintain inner mindful movement in the body, it may improve your health.”

Tai chi, considered a soft or internal form of martial art, has multiple long and short forms associated with the most popular styles taught: Wu, Yang, and Chen (named for their originators). Plenty of people practice the faster, more combative forms that appear to resemble kung fu, but the slower, meditative movements are what many in the United States—where the practice has gained ground during the last 25 years—commonly think of as tai chi.

*Qigong*, sometimes called the “grammar” of tai chi, comprises countless different smaller movements and breathing exercises that are often incorporated into a tai chi practice. “One reason tai chi is popular is that it is adaptable and safe for people of all ages and stages of health,” Wayne points out. “Recent tai chi forms have even been developed for individuals to practice in wheelchairs. And although

few formal medical-economic analyses have been conducted, tai chi appears to be relatively cost-effective.”

**SURVEYS**, including one by the National Center for Complementary and Alternative Medicine (<http://nccam.nih.gov/health/taichi>), have shown that between 2.3 million and 3 million people use tai chi in the United States, where a fledgling body of scientific research now exists: the center has supported studies on the effect of tai chi on cardiovascular disease, fall prevention, bone health, osteoporosis, osteoarthritis of the knee, rheumatoid arthritis, chronic heart failure, cancer survivors, depression in older people, and symptoms of fibromyalgia. One study on the immune response to varicella-zoster virus (which causes shingles) suggested in 2007 that tai chi may enhance the immune system and improve overall well-being in older adults. However, “in general, studies of tai chi have been small, or they have had design limitations that may limit their conclusions,” notes the center’s website. “The cumulative evidence suggests that additional research is warranted and needed before tai chi can be widely recommended as an effective therapy.”

Most recently, Wayne and his fellow researchers have focused on balance issues and on cardiovascular and bone health—areas where tai chi’s benefits have begun to be evaluated most rigorously. “We’ve conducted systematic reviews of the literature, and in older people there is sound evidence that suggests tai chi can improve balance and reduce risks for falls, which have significant consequences on public health, particularly given our aging population,” he reports.

Wayne points to a study by Fuzhong Li at the Oregon Research Institute (which carries out assessments of tai chi’s impact on health conditions, including a current project with Parkinson’s patients): it looked at 256 elderly people, from 70 to 92 years old, and compared how they benefited from tai chi and seated exercise, respectively. “They reported greater than a 40 percent reduction in the number of falls in the group that received tai chi,” Wayne reports. “This is a very significant finding. Older people with thinning bones are at

## NEW ENGLAND REGIONAL SECTION

very high risk for fractures; a fall related to hip fracture, for example, is associated with a 20 percent increase in mortality within one year and very high medical costs.”

Studies conducted in Asia have reported that tai chi may benefit women with thinning bones. This has led Wayne and his colleagues to pursue another current research project—a randomized controlled trial with post-menopausal women diagnosed with osteopenia that examines bone density markers as well as computerized motion analysis to quantify how tai chi affects weight-bearing in the skeleton.

In addition, clinical trials and basic research studies on patients with heart failure “suggest tai chi may be of benefit to patients in terms of greater exercise capacity and quality of life,” Wayne continues. “More definitive studies to confirm these observations are under way, as well as pilot studies with patients with chronic pulmonary disease.”

Yet from a Western scientific standpoint, it’s difficult to pinpoint why and how tai chi affects us. In typical drug trials, a well-defined chemical compound targets physiological systems, and outcomes can be measured against placebo controls. But tai chi is a multicomponent intervention, Wayne notes, with many active ingredients—movement, breathing, attention, visualization, and rich psychosocial interactions with teachers and other students. All of these can affect many physiological systems simultaneously. Moreover, many of the older study subjects also have complex chronic conditions, so identifying a logical control is challenging: it’s just not possible to have a placebo in a tai chi study. “For these reasons,” he says, “we need to be creative in designing tai chi trials, and cautious in interpreting the results.”

HMS INSTRUCTOR and pathologist Marie-Helene Jouvin, who has practiced tai chi for a decade and teaches at the Brookline Tai Chi school near Boston (<http://brooklinetaichi.org>), has noticed the large number of students who attend classes there for medical reasons—after surgery, or if they are suffering from chronic or autoimmune diseases. But tai chi and

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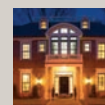
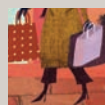
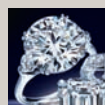
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## NEW ENGLAND REGIONAL SECTION

qigong are not limited to being done in a classroom with a teacher, she adds. "They can be done when you are sick, or lying in bed."

Indeed, Wayne, Jouvin, and Kerr all agree that the beauty and ease of tai chi offer multifold benefits as far as its daily practice: it is adaptable to numerous physical positions and requires no special equipment, expensive outfits, or specific athletic conditioning. "It's not a high-cardio workout, it's all about deepening the relaxation in the movement," Kerr says. "In aerobic exercise we're taught to tense the muscle and push hard. Tai chi is the opposite approach; it's about the flow of the whole body in the movement."

Like tai chi, qigong also accommodates busy schedules because it can be done incrementally—and sometimes involves only the smallest parts of the body. Jouvin, for example, sometimes performs an ultra-slow form of twiddling the thumbs under the table at meetings; she focuses on the minutest sensations—skin, heat, joint rotation, relationships among the clasped and moving fingers—and finds this tends to calm her down, especially during heated professional debates, she says with a smile. "These are things you can easily do to help yourself and focus," she adds.

Perhaps because of these multiple forms and its adaptability, tai chi looks easy to do. Yet in demonstrating to a novice the most basic short form of the Wu style, Jouvin painstakingly explains 18 precisely choreographed movements that flow together in a set order and take about four minutes to complete properly. "It's hard to assess if you are doing it correctly without having a trained teacher or practitioner helping you," she acknowledges. "It can look like people waving their arms and legs around."

At the Brookline school, this same Wu short form is taught during the course of 21 weeks of classes. "Most beginners will do the moves as if they were purely aerobic exercise," Jouvin says. "It will take a while for them to feel the exercise internally. There seems to be an internal logic to the movements. It's a form that was built over centuries and probably reflects how the body functions." ♡

# Pickles and Grits

...and other standout food at Tupelo



**T**HE FOOD at Tupelo is wonderful, my dinner companions and I would say, with just a quibble here and there. The mashed potatoes, the pickles, and the cheddar grits live in memory—no kidding—and I doubt you can get better fried oysters anywhere on earth.

The place is small, has dark-red-and-cream walls, and retains from Magnolia (its predecessor Southern restaurant in these confines) the colorful murals of New Orleans, the copper-topped tables, and the homely informality. Tupelo is deservedly popular. When it's full, it's very noisy and conversation becomes a chore. No reservations are taken for later than 6:30 P.M., and you may have to huddle by the bar with a beer or glass of wine to wait for a table. Tupelo may be a happier place for

**Above:** Tupelo chef Rembs Layman prepares satisfying fare: here, fried catfish.

the resilient young than for the chronologically challenged, who may prefer a more comfortable trough.

Things get off to a bad start when your friendly waiter plunks down on the table your water glass—a wide-mouthed, quart-size jar filled with water (but no ice). This touch, if intended to be down-home, misses its mark.

After ridiculous comes sublime. Those fried oysters (\$10), a starter, are crunchy on the outside and explode with briny flavor within. They come with a moderately nippy remoulade and slices of delicate, smoky, house-made pickled cucumbers and onions—a gastronomic high point. In season, the pickles give way to fried green tomatoes. Another starter is turkey meatballs (\$7) in a spicy sauce “with French bread for mopping up.” A third is

watercress salad with roasted pear, herbed goat cheese, and candied pecans (\$7).

A vegetarian might follow that with flavorful champagne crepes filled with ricotta cheese and fresh basil with a tomato vinaigrette (\$14).

The roasted half chicken (\$16) is bathed in a bourbon-maple barbecue sauce that its consumer in my group thought disguised the chicken overmuch. It comes with maple-flavored spaghetti squash, greens, and sweet onion pickle.

Cheddar grits of mild taste and pleasing granularity sing in delicious harmony with inherently bland but perfectly pan-fried catfish and accompanying tomatillos and piquant remoulade (\$16). Charleston's *Post and Courier* allegedly once proclaimed that “a man full of grits is a man of peace,” and so why is it that grits aren't gobbled up world round?

Rembs Layman, the maestro in the kitchen, orchestrates beef brisket (\$17), slow-cooked in red wine and fork tender, into a symphony of tastes and textures: a drizzle of horseradish cream, vinegary collard greens cooked just off wilting, and marvelous mashed potatoes. No secret ingredient; they are made with plenty of butter and cream and a touch of chives.

Don't overlook the tart key lime pie or the definitive pecan pie with ice cream (\$7 each) if you have room for dessert.

Tupelo's food is a bargain: four people, a bottle of wine, a couple of beers, and the tip, for less than \$200. Another option: call ahead and get all menu items to go home with you, although it would seem a shame to keep any of this food waiting.

Above the pass-through window to the kitchen hangs a drawing that is meant to depict Elvis Presley, and there's a bust of him in the kitchen. The King was born in Tupelo, Mississippi. I bet he would have enjoyed this place. ~C.R.

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Above: Front side panel of outer coffin of Djehutynakht (detail), Egyptian, Middle Kingdom, late Dynasty 11–early Dynasty 12, 2100–1961 BC. Cedar. Harvard University–Boston Museum of Fine Arts Expedition.

# Montage

Art, books, diverse creations



- 14 Open Book
- 15 Intellectual Entrepreneurs
- 18 What This Country Needs
- 20 Off the Shelf
- 22 Chapter and Verse

Roy Blount Jr., A.M. '64, and Mo Rocca '91—also bring a Harvard background to the radio salon.

Asked how he triggers the show's rapid-fire exchanges, Sagal shrugs, grins, and says, "We're just fast." Indeed, *Wait, Wait...* is no place for *l'esprit de l'escalier*, those clever ripostes one thinks of when it is too late to deliver them. Panelists need to be witty on the spot, though much of the mirth is contextual. "It's more anecdotal than

quippal," says Blount, characteristically neologizing. "You have to focus, and be more pushy in conversation than I'm used to. The audience helps keep you keyed up."

**Carl Kassel (left), announcer for National Public Radio's weekly *Wait, Wait...Don't Tell Me!* clowns with its host, Peter Sagal.**

## Radio Wits

*Joking about the news, at the speed of sound*

by CRAIG LAMBERT

**Y**OU'RE AT A dinner party with exceptionally witty guests, well versed on current events. Lots of laughs: the wisecracking atmosphere's slightly competitive, though it hums with conviviality. After a bit, someone famous drops by for some banter and good-natured ribbing. That's how the weekly radio show *Wait, Wait...Don't Tell Me!* on National Public Radio (NPR) feels: it's a comical quiz

show based on current news stories, both mainstream headlines and oddball dispatches like...well, like news that roughly 500 Britons are hospitalized annually from injuries caused by eating cookies—poking oneself in the eye with a biscuit, scalding oneself while dipping the treat in tea, being nipped by a sweet-toothed pet. Host Peter Sagal '87 presides and joins in the repartee; two of the 11 rotating panelists (three appear on each week's broadcast)—

An October show got off on a jag about a new line of "sexy" Halloween costumes for pets, prompting Sagal to declare, "I don't find cats or dogs particularly sexy, because *they belong to another species*." Rocca fired back, "I'm old-fashioned. I find cats sexier when they wear *more* clothing, and leave more to the imagination."

The program launched in 1998, with Sagal and Blount on the first show; Sagal was quickly promoted to host, even though, as he says, "I'm not a radio guy." In fact,

O P E N B O O K

# Anatomy as Entertainment

science (MIT, \$35), Gross uses a fragmentary art work to evoke an earlier society with different norms of biomedical research.

**R**embrandt van Rijn's striking painting of a human brain being dissected by a headless figure, *The Anatomy Lesson of Dr. Deijman* (1657), may be the most famous portrayal of a neuroscience procedure.... It represents a curious combination of two genres of European painting: the group portrait and the historical painting, in this case an account of a public dissection....

The great popularity of group portraits was a unique Dutch phenomenon. In sixteenth- and seventeenth-century Holland, there was no sovereign monarch or royal court and thus no royal patronage of the arts. Furthermore, due to the rise of Calvinism, the Church no longer supported the arts. Thus, the principal large commissions available to artists were group portraits of the members of trading associations, hunting clubs, and guilds or other civil institutions....

The spectacle of public dissections in front of large audiences of both medical professionals and laymen began in the early Renaissance medical schools of Italy and had become common throughout the continent by the middle of the sixteenth century. In Holland, they were an elaborately regulated public ritual in the major cities. Since each city usually authorized only one such public dissection each year, it became a major event in the Dutch social, educational, and entertainment calendar; it went on for three to five days following the execution.

The dissections were conducted by a leading surgeon in the community.... They were held in the winter to retard putrefaction of the bodies and were conducted in special anatomical theaters that held 200 to 500 spectators. The affairs were evening events, illuminated by scented candles and often accompanied by flute music.... Everyone was charged

**Charles G. Gross '57**, professor of psychology at Princeton, studies visual perception and learning. He also writes popularly. In a second collection of essays, *A Hole in the Head: More Tales in the History of Neuro-*

admission. The proceeds were used not only to pay the fee of the *praelector* but also for food, drink, and tobacco at the major banquet of the Guild of Surgeons....

The portrait is a more accurate account of the standard public dissection than Rembrandt's earlier painting [*The Anatomy Lesson of Dr. Nicolaes Tulp*, 1632]. The dissection of the viscera has been completed first and Deijman has re-



Rembrandt's *The Anatomy Lesson of Dr. Deijman* (surviving fragment) provides startling insight into an earlier era's approach to medicine and research.

moved the top of the skull (which his assistant is holding), has flapped back the dura, and is presumably about to start the usual next step, horizontal sections of the cerebrum....

The radically foreshortened body is particularly dramatic, leading the viewer's eye from the confronting feet, across the open viscera to the brain and the scalpel.... The eyes are just enough in shadow to stare directly at the viewer. The blackish toes and lips, the yellow skin tone, and the rigor mortis are all of a reality never before seen in an "anatomy lesson."

he came from a theater background—in college, he coauthored a Hasty Pudding show and directed a Loeb mainstage production, then spent several years as a playwright, screenwriter, director, theatrical literary manager, actor, and staff writer for a motorcycle magazine.

Until 2005, almost all the *Wait, Wait...* shows were produced from an NPR studio in its home base of Chicago, with panelists patched in from remote locations (Rocca from New York City, for example, and Blount from western Massachusetts).

A turning point arrived that April, when *Wait, Wait...* began recording every show before a live audience—they had done quite a few live shows since 2000—and became more of an "event." (Now it is also on the road 12 weeks per year.) Suddenly there was on-air laughter from an audience of hundreds or even thousands, and the radio listenership climbed, from 1.5 million in 2005 to nearly twice that today. In the

studio years, "I didn't know whom I was speaking to," Sagal says. "I like audiences—performing for people and watching their reaction."

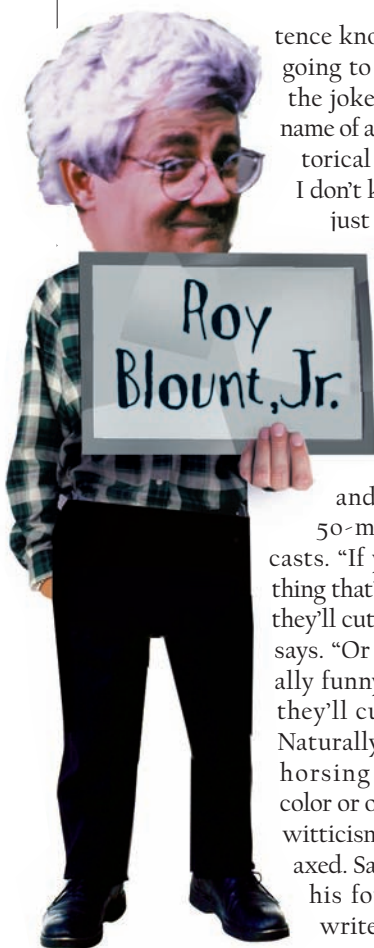
Yet the live audience of, say, 2,800 for a road show in Boston mustn't so seduce Sagal that he forgets the radio audience of three million who will hear *Wait, Wait...*

on the weekend after it has been recorded on a Thursday night and edited the next day. "The trick is: the show is not for the audience in front of you," he explains. "They are *part* of the show that you're doing for everybody listening on the radio. Garrison Keillor is really good at that: he comes out before *Prairie Home Companion* starts and *enlists* them in the enterprise."

At its best, the *Wait, Wait...* enterprise is very improvisational. "It's the most relaxing job I've ever had," Rocca says. "You can't prepare for it. You just show up and be funny off the cuff. If you prepare material ahead of time, it won't work. The audience can tell." Sagal explains that "when you're in the zone, there's this wonderful feeling of your mind racing ahead, and you're able to shape reactions and thoughts as they happen. When it's clicking, I can start a sen-

AMSTERDAMS HISTORISCH MUSEUM

**"If you prepare material ahead of time, it won't work. The audience can tell."**



tence knowing that I'm going to need to finish the joke with, say, the name of a movie or a historical reference that I don't know—but I'm just confident that when I get to the punch line, it'll be there."

Performances run for 90 minutes or more and are edited to 50-minute broadcasts. "If you say something that's really stupid, they'll cut it out," Blount says. "Or something really funny—sometimes they'll cut those, too." Naturally, there's some horsing around; off-color or overtly political witticisms will also get axed. Sagal, along with his four producers, writes the script of questions and set-

ups beforehand, with the panelists kept in the dark. "It's like basketball," Blount explains. "Peter brings the ball down the court and he will pass off to one of us—you can either take a shot, or dribble and pass it to someone else." The one segment that allows advance preparation is the "bluff," in which one panelist reads a genuine, if bizarre, news story and two others invent equally ridiculous fictional stories on the same topic and try to bluff a listener on the phone into thinking theirs is the genuine article. "The night before, they tell us the topic and who has the real story," says Blount.

Panelists can also prepare by boning up on the news in the week before their appearances. Sagal is a confessed news addict, Rocca grew up in Washington, D.C., "where you can't escape current events," and Blount says, "I'm a newspaper junkie. I thought the show would give me an excuse to read all the newspapers I read anyway. The one week a month when I'm on, I read even more than I want to."



Then, on Thursday nights, the audiences stream in, the recording devices roll, and the persiflage flies. It's much like a conversation among friends—the panelists all get along and like each other. "There's all

sorts of room for personality," Rocca says.

"The audience appreciates the individual quirks of the panelists. It's not always about a big joke. If you were just a joke-telling machine without personality, that wouldn't be as interesting." Sagal's wit is a sharp as any panelist's, but he recognizes that "it's not my job to be funny, but to make funny possible, and make sure everybody's having a good time." Blount

notes, "We're not trying to top each other. It's a cooperative effort, a team thing."

Afterward, cast and crew will typically unwind at a nearby bar over a drink and a nosh—and occasionally, perhaps, reflect on an axiom coined by radio personality and actor Harry Shearer: "Truth is funnier than anything you can make up."



Visit [harvardmag.com/extras](http://harvardmag.com/extras) to hear an excerpt from the author's interview with Peter Sagal.

## Intellectual Entrepreneurs

*A highbrow journal rises in an era of sound bites.*

by SUSAN HODARA

**D**ON'T BE MISLED: *n+1* is not a math quarterly. It's a twice-yearly literary magazine whose first issue declared, in 2004, "We are living in an era of demented self-censorship...a time when a magazine like *Lingua Franca* can't publish, but *Zagat* prospers." Seven issues later, at more than 200 pages apiece, the Brooklyn-based *n+1* continues to air trenchant views. "Pointed, closely argued, and often brilliantly original critiques of contemporary life and letters," wrote A.O. Scott in the *New York Times Mag-*

*azine*, describing *n+1*'s enterprise as "a generational struggle against laziness and cynicism." Even intellectuals in Europe have championed it: theater director Alessandro Cassin, in Milan's *Diario*, for example, cited *n+1*'s "brand of intellectual bravery that has its roots in magazines like T.S. Eliot's *Criterion* and the *Partisan Review*."

Three of the four founding editors—Keith Gessen '97, Mark Greif '97, and Benjamin Kunkel '96—honed their literary sensibilities at the *Harvard Advocate*. They're no lightweights: Gessen and

Kunkel have published novels, and Greif teaches at the New School in New York. (Executive editor Chad Harbach '97, another *Advocate* alumnus, recently completed a novel of his own.) The fourth founding editor, Columbia graduate Marco Roth, catalyzed the venture. "Now we had somebody from the 'outside,'" Gessen says. "It would have been embarrassing to have spent so much time *talking* about starting a magazine and not actually doing it."

Each issue follows a similar format, beginning with "The Intellectual Situation," a compilation of the editors' views on, for example, the undermining of neoliberalism, the psychology of global warming, or the gentrification of Park Slope, Brooklyn. Then comes "Politics," where one recent essay, "On Repressive Sentimentalism,"

considered the relationship between gay marriage and abortion rights.

Extended essays—they can run 10,000 to 15,000 words—occupy the bulk of the magazine, along with several fictional works and, occasionally, poetry. Topics range from the emergence of the “neuronovel,” the persecution of Armenians, and the impact of a brother’s suicide to the sundry ways

living writers, living musicians, actual TV shows,” says Gessen. “There’s a lot of pop culture in our magazine.”

Each issue concludes with reviews of books and sometimes other publications. Black-and-white illustrations and photographs introduce some articles, and advertisements for books, films, and music appear throughout. Each issue has

“There need to be organizations that are not as worried about offending people as you have to be if you have a million subscribers.”


food is viewed around the world. In “Jessica Biel’s Hand: The Cinematic Quagmire,” film critic A.S. Hamrah critiques dozens of recent movies about terrorism that he’d spent the summer watching. Greif’s “Mogadishu, Baghdad, Troy” explores the weapons deployed in Iraq through the lens of Homer’s *Iliad*. “We are interested in history and the connections between politics and literature,” Gessen explains. They also have a contemporary focus. “We deal with

a theme—e.g., “Correction,” “Negation,” “Reconstruction,” “Happiness”—that’s determined after the content is compiled. Author Francine Prose ’68 calls the magazine quirky. “I hate that word, ‘quirky,’” she says, “but [n+1] has a kind of heartening connection to things that are unique, eccentric, and individual.” Prose calls its content “accessible, original, and beautifully written. It’s very literary in the best sense of the word.”

The name *n+1*, conceived in a moment of frustration, comes from an algebraic expression. “Keith and I were talking,” Harbach recalls, “and he kept saying, ‘Why would we start a magazine when there are already so many out there?’ And I said, jokingly, ‘N+1’—whatever exists, there is always something vital that has to be added or we wouldn’t feel anything lacking in this world.” The founders did perceive a literary void: a dearth of cohesive philosophical ideas. Journals like *The Baffler* and *Hermenaut*, which critiqued contemporary culture and thrived in the 1990s, had disappeared; meanwhile, they saw an “institutionalization” of magazines like the *Nation*, the *New York Review of Books*, and the *New Yorker*. “There need to be organizations that are not as worried about offending people as you have to be if you have a million subscribers,” says Gessen.


Unlike many literary journals, *n+1* is, by design, distinct from academia. “Academia is the site of so much thinking in this country,” says Harbach. “Part of our project is to bridge that gap. We want all of the thoughtfulness and deep engage-

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## MONTAGE

Editors with their product. Left to right, Keith Gessen, Mark Greif, and Chad Harbach of *n+1* at their Brooklyn office, with a bookcase full of past issues.



ROBERT ADAM MAYER

ment that comes from the university, but we want it in a style that is portable and publicly accessible.” Regarding their predilection for long pieces, Greif says, “We are creating a long print archive in an era of the short sound bite.”

There is also a website ([nplusonemag.com](http://nplusonemag.com)), updated weekly with shorter, more topical pieces, plus a Small Book Series, whose latest product is *What Was the Hipster*, based on a New School seminar on the “hipster” persona that emerged—

briefly—at the turn of the twenty-first century. Other projects include the online book review *N+1*, and a spinoff, the arts journal *Paper Monument*. In 2010, HarperCollins will publish *Diary of a Very Bad Year*, Gessen’s interviews with an anonymous hedge-fund manager, first published on *n+1*’s website and in the magazine. “We’re a growing empire!” Greif says.

Nevertheless, after five years, there’s only one paid staff member. Half of *n+1*’s income comes from its 2,000 subscribers,

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a quarter from ads, and a quarter from bookstore sales. Last year they received \$40,000 from a benefactor, “about a third of our annual budget,” Gessen says.

N+1 has met with mixed response—accused of elitism and negativity and applauded for its passion and quality. Some have puzzled over the editors’ resolve

to publish print in a digital age teeming with blogs and social media sites. “If you still think a print magazine has value,” Gessen says, “its function has to be different.” The editors believe there are audiences for their products. Gessen describes conversations with supporters who say, “I think it’s great what you’re

doing, I think it’s really important—but you understand, nobody cares except me.”

“When you hear enough people talking like that,” he says, “you want to tell them, ‘If you would all just admit in public that you care about this stuff, then maybe we could get somewhere.’”

# What This Country Needs

*On detecting economic crises*

by DAVID WARSH

NEVER MIND the five-cent cigar. What this country needs is a good economic bull-detector program—along the lines of the faculty that Ernest Hemingway famously advised writers to develop—available in formats ranging from an iPhone application and giant SAP software to a free Linux version downloadable from the Web. Such a sensibility, put on a computer and run, would be especially useful with respect to those putative forms of non-fiction known as investment advice and

political persuasion. The power of money to amplify a message is surely very great: a press release, an analyst’s report, a favorable book, multiplied by many millions of dollars, can turn a plausible wish into a widely shared conviction. The power to structure or to disguise information, even to withhold it, is greater still.

But such mastery is far from absolute. If you can measure what is entailed by a proposition, if you can express it in numbers, you have a chance of knowing something about it. Lord Kelvin, shake hands

with Mr. Hemingway: empiricism, meet narrative. *This Time Is Different: Eight Centuries of Financial Folly*, by Carmen M. Reinhart and Kenneth S. Rogoff, Cabot professor of public policy, is an unusually powerful bull detector designed to protect investors and taxpayers alike—eventually, at least, and provided the spirit is willing.

At this time of global and domestic economic crises—with their concurrent political and diplomatic ramifications—all of which seemingly took policymakers, investors, and the public by surprise—any evidence that warning signs of such disasters can be analyzed in advance is to be warmly welcomed. And in fact, here it is, useful not only for the present circumstances but as a brisk reminder of the recurrence of human folly, or the willful ignorance that passes for it.

Seldom has a book arrived containing more moving parts between its covers. For instance, it is easy to mistake *This Time Is Different* for the many books that have appeared over the years about the history of international financial crises, long on story-telling flair but short on data. The most famous of these, Charles P. Kindleberger’s *Mania, Panics and Crashes*, is wonderful fun to read. There are, however, few yarns in Reinhart and Rogoff’s book. Instead, *This Time Is Different* is really about a massive database that the

Carmen M. Reinhart and Kenneth S. Rogoff, *This Time Is Different: Eight Centuries of Financial Folly* (Princeton, \$35)





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—Matt Simmons and John Rosenblum  
MBA 1967 and Farnsworth Art  
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Wick Skinner at the Farnsworth Art Museum 2008 Summer Gala; photograph by  
Linda Stevenson

# Off the Shelf

Recent books with Harvard connections

## **Taming the Beloved Beast: How Medical Technology Costs Are Destroying Our Health Care System,**

by Daniel Callahan, Ph. D. '65 (Princeton, \$29.95). A preeminent medical ethicist confronts the problem of life-saving and useful technologies—"the most visible and attractive feature of contemporary medicine"—the introduction or more intensive use of which account for fully half the annual increase in healthcare costs.

## **The Art Student's War,**

by Brad Leithauser '75, J.D. '79 (Knopf, \$28.95). The poet, essayist, and now six-time novelist channels his hometown (Detroit) and mother-in-law (who as a teenager drew portraits of hospitalized soldiers) in a lovingly detailed evocation of the 1940s, from the domestic scale to the sweep of World War II. It begins with an observation at a streetcar stop: "[T]he young soldier who climbs aboard with some difficulty—he looks new to his crutches—is surprisingly handsome."

## **On Rumors: How Falsehoods Spread, Why We Believe Them, What Can Be Done,**

by Cass R. Sunstein (Farrar, Straus and Giroux, \$18). A brief reflection by the Frankfurter professor of law, who got brutal first-hand experience in his subject during his protracted confirmation hearings to serve as President Obama's administrator of the Office of Information and Regulatory Affairs.

## **The Woman Who Named God: Abraham's Dilemma and the Birth of Three Faiths,**

by Charlotte Gordon '84 (Little, Brown, \$27.99). A close examination of the interwoven stories of Abraham, Sarah, Hagar, Isaac, Ishmael, and God, and *their* collective, equally interwoven and riven progeny: Judaism, Christianity, and Islam.

## **The Case for Books: Past, Present, and Future,**

by Robert Darnton, Pforzheimer University Professor and director

of the Harvard University Library (PublicAffairs, \$23.95). Collected essays (also available, incidentally, as an e-book and audiobook), ranging from sharp critiques of the Google Book Search monopoly back to

the author's initial case for making the history of books a distinct field of study.

## **Good Without God: What a Billion Nonreligious People Do Believe,**

by Greg M. Epstein, M.T.S. '07 (William Morrow, \$25.99). "It is not easy to live a good life or be a good person—with or without a god," writes the author, Harvard's Humanist chaplain. He is concerned with the "relevant and interesting" question of "*why* we can be good without God," and the "absolutely crucial" question of *how* to do so.

## **At Home in the Law: How the Domestic Violence Revolution Is Transforming Privacy,**

by Jeannie Suk, J.D. '02, assistant professor of law (Yale, \$55). The pursuit of the protection of women from abuse has had unintended consequences: shrinking the realm of privacy, and reducing women's autonomy relative to the power of the state.

## **Boulevard of Broken Dreams,**

by Josh Lerner, Schiff professor of investment banking (Princeton, \$27.95). As government bails out old enterprises (banks, General Motors), might it stimulate growth by encouraging entrepreneurship and venture capital? The Harvard Business School professor says there is a public role, but it requires a delicate touch, broad vision, and patience.

## **A Passion for Nature: Thomas Jefferson and Natural History,**

by Keith Thomson, Ph.D. '63 (University of North Carolina/Thomas Jefferson Foundation, \$14.95 paper). The author, professor of

natural history emeritus at Yale, documents the president's infatuation with nature, from his Albemarle County boyhood through his celebrated Garden Book to his instructions to Lewis and Clark. Profusely illustrated in black and white.

## **Using Visual Evidence,**

edited by Richard Howells '89 and Robert W. Matson (McGraw-Hill, \$47.95 paper). Howells, of King's College London, who studies media and creative industries, and Matson, of the University of Pittsburgh, curate essays



*Natural Bridge*, 1808 engraving by J.C. Stadler, after William Roberts, 1808. Naturalist Thomas Jefferson preserved the "sublime" site—by buying it.

on telling history through images, from painting and political cartoons to movies, advertising, and *Star Trek*.

## **Stubborn as a Mule,**

by Richard H. Fallon Jr., Tyler professor of constitutional law (Strategic, \$23.75). The legal scholar commits a *funny* novel, concerning Brewster College, its right-wing economist president, Peter MacTeague, and the undoing of his political aspirations when White, the mascot mule, is kidnapped.

H. ANDREW JOHNSON/THOMAS JEFFERSON FOUNDATION

authors have constructed, tracking debt (both external and internal), trade, national income, inflation, exchange rates, interest rates, real house prices, and commodity prices, encompassing virtually all the major financial turmoil reported since the thirteenth century. The book's most memorable passages—what the authors call its “core life”—are to be found not in colorful stories about long-ago personalities (such as fill Liaquat Ahamed's *Lords of Finance: The Bankers Who Broke the World*), but rather in its various tables and figures. They take some time to comprehend, but any responsible citizen can and ought to consider the evidence they present. It is overwhelming.

Then there's the portion of the book devoted to the analysis of the subprime meltdown and what the authors call “the second great contraction,” a 100-page section blandly labeled Part V. In fact, its message long ago made its way around the world, in the form of a pair of terse technical papers, each delivered (in consecutive years) to the annual meetings of the American Economic Association. The first of these, in January 2008, argued that what then seemed a “special” problem of the subprime meltdown was probably the beginning of an episode that would prove not very different from five other large-scale crises associated with long-lasting recessions (Spain, beginning in 1977; Norway, in 1987; Finland and Sweden, in 1991; and Japan, in 1992)—except that this event was happening in the United States, whence recession might be expected to spread around the world. There is nothing controversial about such a view today; but this prescient analysis appeared nine months *before* the recession began. The second paper, in January 2009, made the case for massive government stimulus around the world by showing that severe banking crises take a very long time to work out: asset markets collapse (real estate in particular); unemployment remains high; and, because tax receipts fall with declining output, government debt explodes. The simple statistical graphics from those two papers can be found today on the walls of most nations' central banks. The authors have demonstrated that with appropriate evidence, the problems we are suffering through *can* be foretold.

Lurking behind the book are a set of concerns that are implied but never addressed—perhaps a story for another



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## MONTAGE

day. What about the debts and currency of the United States? Might the country itself go the way of, say, the state of California—that is, become stuck in political deadlock—and, because the nation possesses the sovereign power that California lacks, begin to inflate away the burden of its debt? Or see the value of the dollar plummet in a classic currency crisis? Such collapses of confidence often have their roots in government's unwillingness to adopt consistent fiscal and monetary measures. Just how deep is the debt hole from which the United States must climb in the coming years, when off-balance-sheet liabilities including unfunded pension and medical liabilities are taken into account? Reinhart and Rogoff write, "[T]hat basic data on domestic debt are so opaque and difficult to obtain is proof that governments will go to great lengths to hide their books when things are going wrong, just

as financial institutions have done in the contemporary crisis." The price of stability is vigilance.

Reinhart and Rogoff began their collaboration at the International Monetary Fund: he was its chief economist from 2001 to 2003; she was his deputy. Both are well-qualified by temperament for the job of professional skeptic. Reinhart left Cuba with her parents in 1966, when she was 10, carrying what was permitted in those days: three changes of clothes, no more. Today, she is a professor at the University of Maryland, a veteran of many crises and probably the most widely cited woman in the profession. Rogoff, a son of liberal parents, attended high school in Rochester, New York, where the dropout rate was greater than 50 percent (and included him). A U.S. grandmaster in chess at 14, he moved to Europe after his sophomore year to compete in tournaments. At 18 he

## Chapter & Verse

Correspondence on not-so-famous lost words

**Marty Mazzone writes:** "My mother used to say, as fast as she could, 'The high uffum buffum and the compound presser and squeezer and the beeper dog trim.' At least, that's what we think she used to say. She would never repeat it for us on the spot. Can anyone identify the origin of this very strange, unGoogle-able phrase?"

**John Sundquist requests** the origin of the assertion, "Love is the determined caring for the good of another."

**Alejandro Jenkins writes:** "In his autobiography, *Witness*, Whittaker Chambers refers twice to a 'print [by] a nineteenth-century Italian painter' showing 'a hooded skeleton, beckoning to its embrace a line of proletarian figures with bundles—rather like a scene in an Ellis Island waiting room.' The caption was *Il Conforto—Death, the Comforter*. What is the work in question, and who made it?"

**"Love and war"** (November-December 2009). Paul Reid, coauthor with the late William Manchester of the forthcoming third volume of *The Last Lion: Defender of the Realm*, writes: "It is doubtful that

Churchill said this. The expression does not appear in Richard Langworth's definitive collection of Churchill quotations, *Churchill by Himself*, the index of which contains more than 60 entries under 'war' ('love' does not appear in the index, Churchill not being one to declaim on matters of the heart). Likewise, the expression is not to be found in Kay Halle's classic, *Irrepressible Churchill*. As well, a word-search of Churchill's speeches (edited by Robert Rhodes James) spanning 1935-1963 fails to yield the phrase. Nor is it mentioned by any of the numerous diarists who recorded Churchill's remarks, including Jock Colville, Anthony Eden, Alexander Cadogan, Harold Macmillan, Harold Nicolson, and Alan Brooke. A web search also yielded no results. I believe the quotation Mr. Ehrenreich seeks to verify cannot be traced to Churchill. It lacks the snap and crackle of Churchill's impromptu remarks (most of which were well rehearsed)."

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

returned to Yale, did his graduate work at MIT, and, after teaching at the University of Wisconsin, the University of California, Berkeley, and Princeton, came to Harvard in 1999 (see “Harvard Portrait,” January-February 2004, page 51). A registered Republican, he advised John McCain’s campaign in 2008.

The good news, then, is that *This Time Is Different* contains the beginning of just such a bull detector for international finance. Better instrumentation is required, much more data of the sort that the authors have assembled, including measures that take into account off-balance-sheet government borrowing and implicit debt guarantees. Better regulation, too, in the form of stringent capital ratios and greater transparency for banks—perhaps even a new international body designed to provide some support to national legisla-

**Reinhart and Rogoff help us understand how “a thundery atmosphere” becomes a financial rout.**

tors facing domestic political pressure, a beefed-up version of the Bank for International Settlements, which has performed a diluted version of the role as a shadowy club of central banks since the 1920s. Most fundamental of all is precisely the start that Reinhart and Rogoff provide, with their charts of crisis sequences and tables of the various early warning signs—a better understanding of the intricate pathways by which “a thundery atmosphere” one day can turn into a full-scale rout the next—or subside into business as usual. Banking crises may have been to this point “an equal opportunity menace,” as the authors maintain, afflicting rich and poor countries alike. But the hope is that at least the biggest nations will get wise to themselves by adopting the sort of system of disciplined international accounting that Reinhart and Rogoff propose. □

*David Warsh '66, author of Knowledge and the Wealth of Nations: A Story of Economic Discovery, is proprietor of the weekly online column economicprincipals.com.*

## What's New on the Web

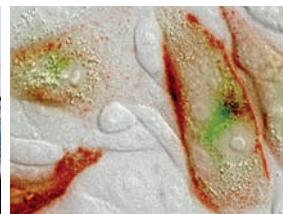
**HM** WITH THIS ISSUE we debut a new interactive feature: posing a question to readers, using an article from the issue as a starting point. As reported on page 8, Harvard economists Claudia Goldin and Lawrence Katz have found that financial-sector workers have a harder time than most balancing work and family.

Visit [harvardmag.com/extras](http://harvardmag.com/extras) to answer, and see what other readers have to say about, this question: *Did you consider work-life balance in choosing your first job? How have these concerns affected your career choices since?*

### Also at [harvardmag.com/extras...](http://harvardmag.com/extras...)



**HEAR AN EXCERPT**  
from our interview with the host of NPR’s witty current-events quiz show, *Wait, Wait... Don’t Tell Me!* (see page 13)



**READ ABOUT HOW**  
a photographer created the arresting nanoscience images that appear in the feature on page 32



**FOLLOW THE ROUTES**  
Harvard alumni traveled across Europe helping to save art treasures stolen by the Nazis (see page 36)

### Join the conversation...

Each article page at [harvardmagazine.com](http://harvardmagazine.com) invites your comments. Log on to find out what other readers are saying and to share your thoughts. From recent comments:

#### In response to “Harvard 14, Yale 10” (November 21, 2009)

Yale going for it on 4th & 22 with the lead & a couple of minutes to play makes one question whether they really are an Ivy League school. Fight fiercely Harvard! Go Crimson! ~Chuck Breaux '78

A notable example of Yale snatching defeat from the jaws of victory.

~John Wernette '64

#### In response to “The Ph.D. Problem,” by Louis Menand (November-December 2009)

This piece is so important for incoming Ph.D. students that it should be included in every application. ~Matt

So long as the principal funding mechanism for English grad students is teaching classes completely unrelated

to their own research, they will always take longer to finish their dissertations than students in the sciences who are paid to work in labs or on studies directly related to their dissertation topic. ~Shane in Utah

#### In response to “Ayn Rand: Brief life of an iconoclastic individualist” (November-December 2009)

What?!! You still take Ayn Rand seriously? You must be kidding!

~Eugene Ea

What?!! You don’t take Ayn Rand seriously? What other person has explained the world as it really is through an understandable philosophical system of metaphysics, epistemology, ethics, politics, and aesthetics?

~Steve McCarron



# TOOLS AND TESTS

## THE EVOLUTION OF STEM-CELL RESEARCH

BY JONATHAN SHAW

**Y**OUR MOTHER HAS had difficulty walking, and this morning she is slurring her words. Concerned that she might have had a stroke, you rush her to the hospital. Doctors there have a different theory: she might have ALS (amyotrophic lateral sclerosis), a disease of the nervous system, specifically of the motor neurons that control the muscles. Without treatment, she would have three to five years to live.

A nurse takes a biopsy to collect some of her skin cells. A laboratory technician quickly cultures some of them in a petri dish, then adds a chemical cocktail that directly reprograms the skin cells, turning them in a single step into motor neurons. These transformed cells, identical to your mother's motor neurons, can now be easily tested for the known defect associated with ALS.

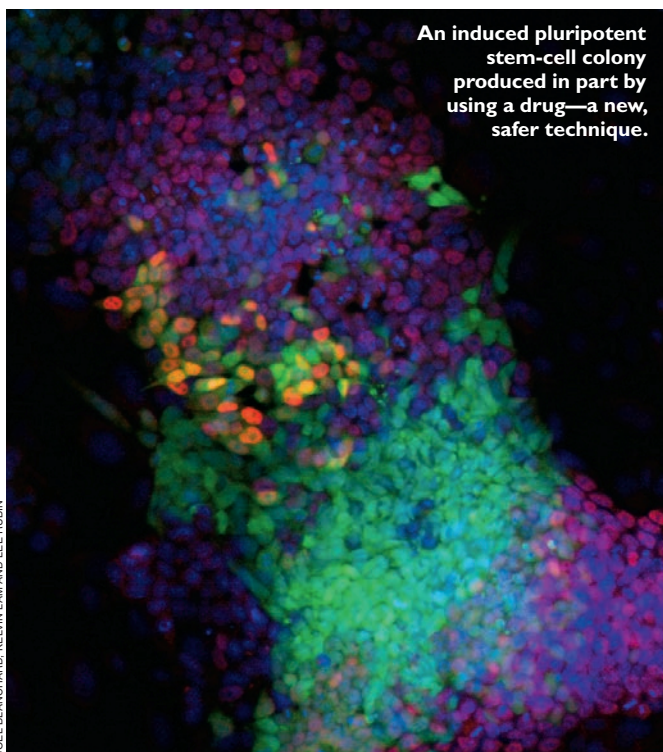
The test confirms the diagnosis. The doctors have a drug that will prevent or slow progression of the disease, but the treatment is toxic to the heart muscle in 20 percent of patients, so more tests are required. During the course of a week, using the same skin cells, physician-scientists use another chemical cocktail to create an induced pluripotent stem cell (iPS) that is capable of producing genetically perfect copies of every cell in your mother's body. Then, applying what science has learned about developmental biology, they use chemical signals to guide the iPS cell, in a series of divisions, to differentiate into cardiomyocytes (cells of the heart)—creating a thin layer of them that actually beats in a petri dish. Now they can test the drug for toxicity against your

mother's own heart cells. The cardiomyocytes keep beating, so she can safely take the drug. It is time to go home.

IN REALITY, deriving an iPS cell line takes as long as a year, and there is still no cure for ALS. But this scenario illustrates the tangible progress scientists have made in using stem cells as *tools*: to change the state of cells; to understand disease mechanisms; and to speed drug discovery. Many of the pathbreaking discoveries in the field—directly reprogramming defective motor neurons caused by ALS, drugs that halt or slow cellular degeneration in the lab, and the beating layer of heart muscle—are real, and were made by Harvard scientists. Stem-cell researchers are even beginning to learn how to harness the body's own repair mechanisms to promote healthy aging (see “A Hidden Youthfulness,” page 27).

Research on stem cells, once hailed primarily for the promise of cell-transplant therapies, is flourishing in new areas even as progress toward that initial goal continues (see “Stem-Cell Science,” July-August 2004, page 36). “We have not given up on the goal of transplanting cells back and repairing the body,” says Cabot professor of the natural sciences Douglas Melton, co-director of the Harvard Stem Cell Institute (HSCI; [www.hcsi.harvard.edu](http://www.hcsi.harvard.edu)), “but this new aspect of using stem cells as tools for drug discovery has got us really excited. And that could lead to the first products, using stem cells as tools to find...drugs that slow degeneration.”

Two HSCI “core facilities” in particular have turbocharged the pace of discovery. These specialized laboratories—one devoted to creating new disease-specific stem-cell lines,



An induced pluripotent stem-cell colony produced in part by using a drug—a new, safer technique.

JOEL BLANCHARD, KELVIN LAM AND LEE RUBIN



**Chad Cowan**

the other to screening chemicals in order to advance human therapies—act as centers of expertise for scientists throughout the University. Each is itself a scientific instrument, as well as a constant source of new tools.

## THE ETHICAL STEM CELL

*Reprogramming adult cells to become “pluripotent”*

CHAD COWAN, tall, laid-back, and lean, leads the iPS core facility. The first induced pluripotent stem cell, he explains, was created in 2006 when Shinya Yamanaka of Tokyo University demonstrated that it was possible to reset mouse skin cells to a “pluripotent” state—in which they could become any cell in the body. The advantages of transferring this approach to human beings were clear. First, the technique raised the possibility that the ethically complicated human embryonic stem cells (HESCs) harvested from days-old embryos might no longer be needed. (To date, this has not proven true.) And second, as HSCI scientists immediately recognized, the technique also made it possible to create stem-cell lines—an infinite source of cells—from individual patients with specific diseases. (HESCs are not as useful for studying disease, because the embryos from which they come are presumed healthy.)

Having a renewable source of diseased cells in a lab, says Cowan, an assistant professor of medicine and of stem-cell and regenerative biology, “is like having a little human in a dish. You can ask all the same questions about human biology and human dis-

ease that you could ask of an actual human patient, only better.”

George Daley was among the first scientists to report reprogramming *human* iPS cells, Cowan continues. An associate professor of biological chemistry and molecular pharmacology and of pediatrics at Harvard Medical School (HMS), Daley created cell lines representing 10 different kinds of illness, ranging from “bubble-boy” disease to Parkinson’s; today, he chairs the steering committee for the iPS core. Meanwhile, his colleague Kevin Egan, an assistant professor of stem cell and regenerative biology in the Faculty of Arts and Sciences (FAS), derived motor neurons from a patient with ALS. *Science* magazine called the reprogramming of cells the breakthrough of the year for 2008.

Even so, the derivation of pluripotent cells has not been perfected, Cowan explains. To create the first iPS cells from mice, Yamanaka used a combination of four retroviruses that became integrated into the genome of the cell, leaving it slightly different genetically from the original cell. Even worse, the technique involved cancer-causing oncogenes, which meant that anyone hoping to use the discovery in human therapies would need to develop a better approach. A subsequent technique developed by Konrad Hochedlinger, an HMS assistant professor of medicine and of stem-cell and regenerative biology, has eliminated the cancer-causing genes by substituting a different type of virus. “The new technologies are trying to get away from viruses,” says Cowan, “because they integrate into the host genome and could interrupt essential or important genes. The iPS core to date is still using a viral-based

system, but after you create the iPS cells you can remove it, leaving behind in essence an unmarked genome.”

Various labs, Cowan reports, are pushing further, working to replace the genes involved in the stem-cell reprogramming process with “chemical compounds that essentially do the same thing.” Eggan, working with HSCI director of translational medicine Lee Rubin, “has shown that it is possible to replace individual genes with chemical compounds,” Cowan explains.

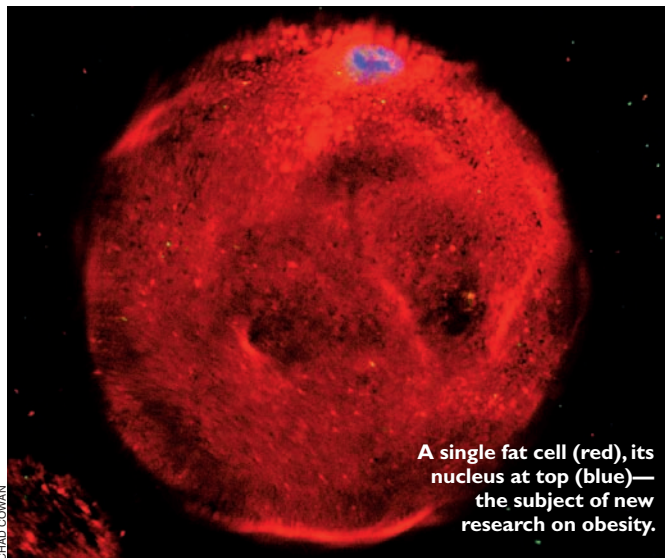
“Now it is just a matter of finding the right chemicals that work in combination with one another.” Adds Daley, who also directs the stem-cell transplantation program at Children’s Hospital, “Lots of people within HSCI are working on figuring out more efficient and more effective protocols for reprogramming.” Daley himself is developing new ways to make iPS cells from marrow and blood in addition to skin. “Chemicals are one cutting edge,” he says. “Identifying pathways”—the sequences in which cells convert one type of signal to another—“that contribute to or stand in the way of reprogramming is another.”

For now, the iPS core facility serves two goals. One is to culture, store, and distribute iPS cells already developed by HSCI to researchers worldwide. “We did it as a service for the community,” says Daley, “and I think it has been an important one. We have gotten hundreds of requests from labs to receive the lines.” (There are currently 14 lines available, with 10 more coming in early 2010.) The second objective is to assist Harvard clinicians and scientists who have unique patients afflicted with diseases they want to study using iPS cells. Generating such customized cells requires “a fair amount of expertise,” says Daley, “and the iPS core has it.”

“The great ambition, the dream” of the iPS core, says Cowan, would be to “make a stem cell for every patient who walked into a Harvard-affiliated hospital.” Daley, whose own work focuses on blood diseases, has a similar vision. The long-term goal of his lab is “to try to couple personalized stem-cell creation with blood regeneration and engraftment”: essentially, obviating the need for bone-marrow transplants by using the iPS platform to put healthy blood stem cells back into patients. This approach would eliminate the immune-rejection problems that come with marrow transplants, which often rely on multiple donors.

The challenge is that the patient’s own genes would still carry the genetic defect that caused the disease in the first place. But Daley has already demonstrated in mice the efficacy of doing gene repair in a petri dish. One of the advantages of this approach, he says, “is that you could precisely repair gene defects without disrupting other genes,” and prove it *before* generating specific cells, such as adult blood stem cells, that could be transplanted into a patient. Such a therapy would be “potentially curative—and safe.”

Although such personalized approaches are not yet practical, in part because creating and characterizing a new iPS cell line still takes from six to 12 months, that may not be true three to five years from now. In the meantime, with the technology still



A single fat cell (red), its nucleus at top (blue)—the subject of new research on obesity.

in its infancy, one of the steering committee’s challenges is prioritizing proposals for making new iPS cell lines. Study projects involving Huntington’s and Parkinson’s disease and schizophrenia were “among the most mature” proposals initially, says Cowan. Coming soon are new cell lines for polycystic kidney disease and type 1 diabetes.

Having iPS cell lines for various illnesses puts a powerful tool in the hands of researchers who may not know much about stem cells, but who are experts in par-

ticular types of disease, he says. For example, iPS cells will allow researchers to compare genetic and nongenetic forms of degenerative conditions, perhaps pointing to common pathways between the two forms of illness. Such pathways could become the target of drug therapies. And iPS cells also allow researchers to watch a given disease unfold. By the time many patients see a doctor, their illnesses are already full-blown, making it next to impossible to determine how they started. The iPS cells will allow researchers to watch, over and over, how diseases progress, so they can test ways to intervene. One day, iPS cells might even enable a full-scale clinical trial in a petri dish.

Cowan’s own research on adipocytes (fat cells) illustrates how iPS cells could accelerate research into the causes of obesity. He seeks to learn why, for example, some people can eat everything and remain rail-thin, while others gain weight on a modest diet. If there are genetic predispositions to obesity, clearly they interact with environmental and behavioral factors. Studying cells in a petri dish allows Cowan to control for those nongenetic variables. “You can just say, ‘Oh look, *this* fat cell doesn’t utilize lipids in the same way this normal fat cell does,’ and ‘Can we fix that by, say, giving it a chemical compound that will mimic the normal function?’”

Using iPS cells also lets him perform experiments at a scale that wouldn’t be possible if he had to rely on human subjects—liposuction patients, for example—for all the cells he needs. “We need to make thousands or even millions of fat cells if we want to screen chemical compounds for their effect on fat,” he explains, and iPS cells provide a “reliable, renewable source.”

Conditions like obesity and cardiovascular disease also involve multiple cell types signaling to each other: hypothalamic neurons communicating with fat cells in the case of obesity, or liver cells, fat, and vascular endothelial cells in the case of heart disease. To study complex interactions like these, Cowan needs *all* these cell types, all derived from the same iPS cell. Such combinations of human cells could then be studied in vitro or transplanted into mice so their interactions could be studied in a mammal model.

## THE ROAD TO TREATMENTS

*Chemical screening to find new tools, pathways, and drugs*

IN THE QUEST for new tools like iPS cells, says Douglas Melton, it is important not to lose sight of stem-cell science’s long-term goal: making cells to transplant into people. For that, the mam-

## A HIDDEN YOUTHFULNESS

WHAT IF THE STEM CELLS in our bodies live on, even as we age? What if they are just asleep, quiescent, like forgotten sentinels nodding off at remote outposts, waiting for orders? If only scientists could discover how to send them messages, could they be reawakened?

“When you’re little and fall off your bike,” says Cabot professor of the natural sciences Douglas Melton, “you barely remember it the next day and a week later you don’t remember it at all. I ride my bike all the time, and if I fall off now, I remember it for weeks.” Bruises last longer when you get older. But is the slowness of repair due to some deficiency that arises with age, that stops normal processes from working well? Or is it due to the absence of some youthful factor?

Amy Wagers, an associate professor of stem-cell and regenerative biology, has begun to answer this most provocative of questions—could we marshal the body’s own repair mechanisms to slow the process of aging?—with a simple experiment. Using mice that have been surgically joined so that their bloodstreams become shared, Wagers investigated whether the blood of a young animal might awaken the muscle stem cells in an old one and enhance muscle repair.

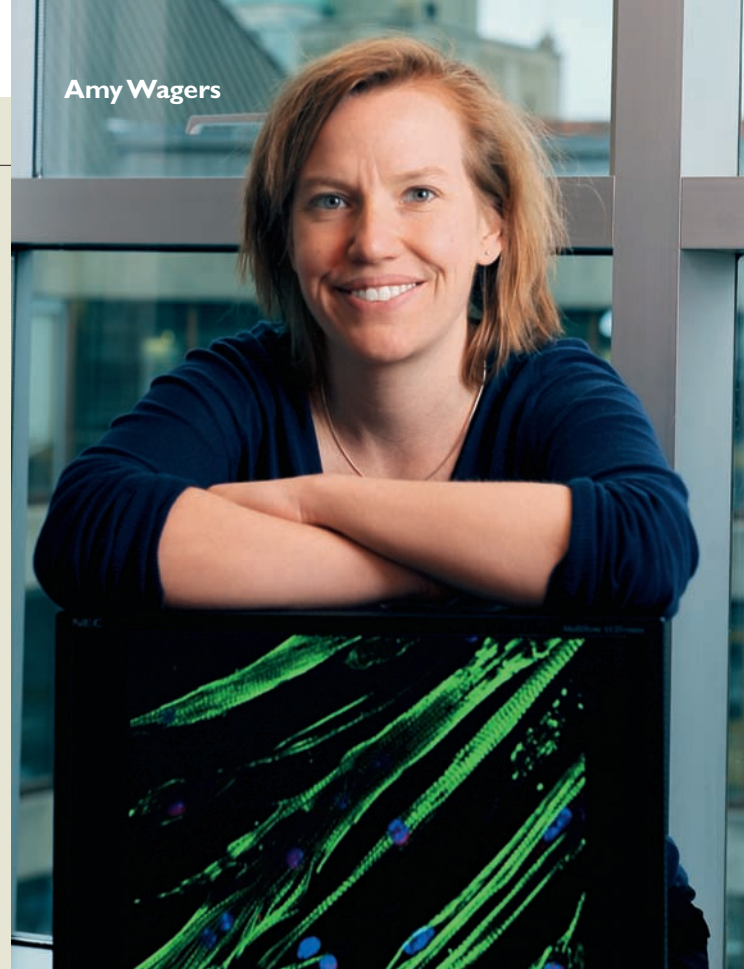
When Wagers and colleagues joined a young mouse to an old mouse, muscle damage in the young mouse still healed well, suggesting that the older animal did not introduce a defect. When two old mice were joined, as a control, the muscular repair was, as expected, very slow. “You get lots of inflammatory cells coming in, lots of fibrous tissue deposited,” Wagers explains, “and not very much new muscle.” But when a young and an old mouse were joined, and a leg of the old mouse was injured, the healing

was rapid: new muscle formed almost as well as in a young animal. *Something* from the young mouse—an unknown factor circulating in the blood—was reaching muscle stem cells in the old mouse and turning on the biological machinery of repair.

Wagers (already a recipient of numerous awards, like many of her junior colleagues in the same field at Harvard) has established that whatever the unknown factor is, it is not a cell. Recently she has discovered a “partial pathway,” previously undescribed in the blood system, that is involved in the process of repair. “The reason we thought the factor that awakens muscle stem cells might be in the blood,” she explains, “is that organ systems decline globally with age, which implies that any signal has to reach many different locations.” A good place to look for a universal signal such as that, she reasoned, is in the blood.

In fact, her work has already shown that exposing an old animal to the blood of a young animal restores function to progenitor cells in a variety of tissues, not only in skeletal muscle. She is now collaborating with other Harvard laboratories to study such effects in the pancreas, liver, brain, and heart. “This might be a more broadly applicable mechanism,” she says, “an inroad for discovering pathways that can enhance repair

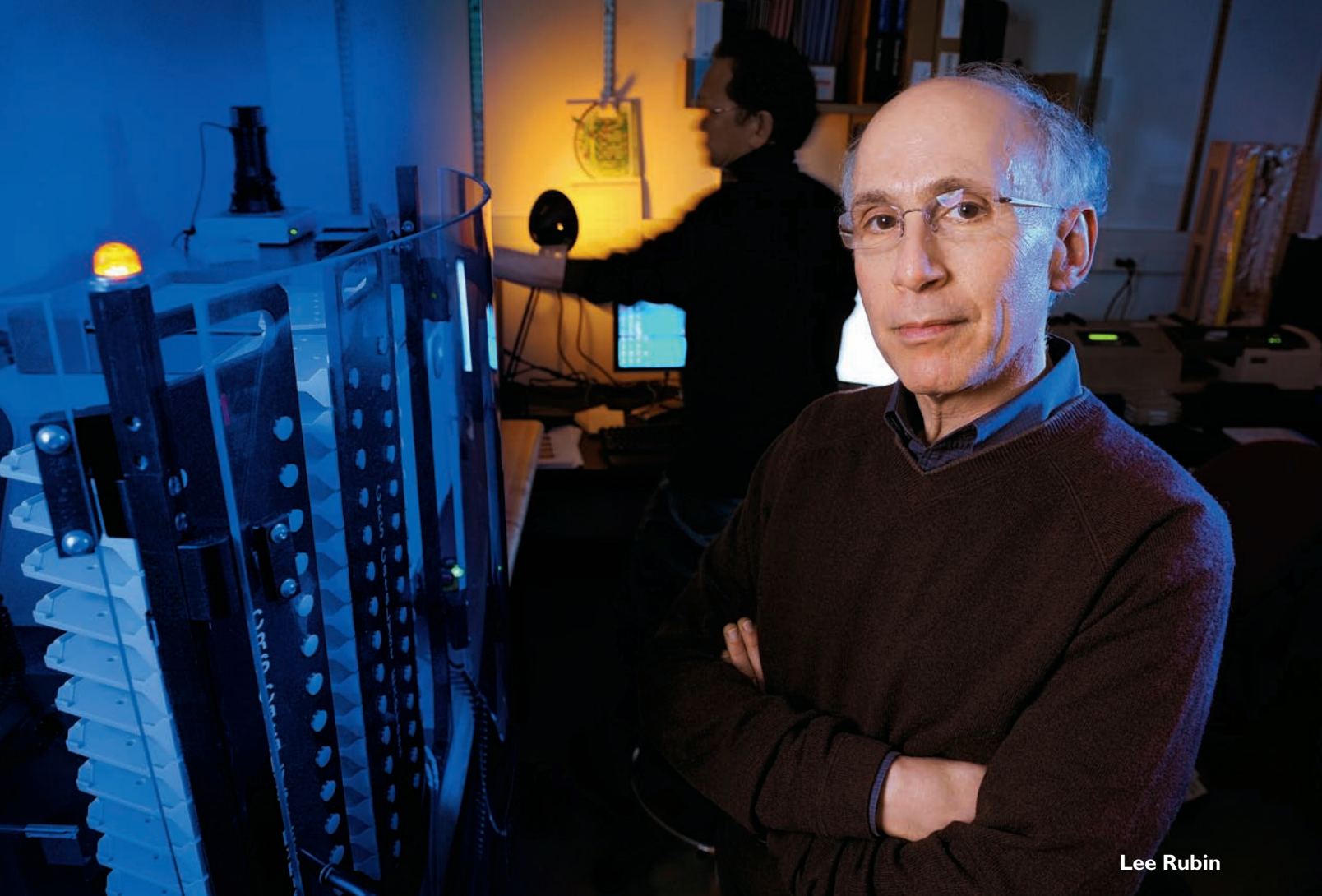
activity.” In some cases, Wagers thinks, induced repair mechanisms that fail with age might overlap with genetic disorders, so that studying these pathways could advance research on cures for certain diseases. At the very least, she suspects that the “kinds of molecules we discover that enhance endogenous repair activity” could someday play an important role in readying tissues for cell therapy, once that field is mature. Adds Melton, “This has gotten us thinking more about not just fixing the human body when it is broken, but about how to harness the natural activity of stem cells for homeostatic repair to keep us healthy. We’re not there yet, but I think that is where we are headed.”



malian embryonic stem (ES) cell is still key, he says, because it is the only one that has not been genetically modified. Thus, even as HSCI works to create a bank of iPS cells for global distribution, it continues to maintain the world’s largest bank of ES cells, created at great expense with private money during the years when the second Bush administration suspended federal funding for the study of such lines. After the Obama administration reversed that policy last March, scientists anticipated that the Harvard lines would be approved for use in such research. Only a few of them have been. Harvard continues to maintain separate labora-

tories for many of its embryonic stem-cell lines—at considerable expense—while the NIH [National Institutes of Health] reviews their eligibility for federal funding.

Beyond the political obstacles, scientists still haven’t solved the problem of how to direct the process of differentiation in either ES cells or iPS cells to make specific cell types. Recapitulating the normal development program in a petri dish has proven extremely complicated, Cowan agrees. A protein signal that has a certain effect at one stage of the process—guiding an ES cell to become, for example, one of the embryonic “germ layers” such as endoderm



Lee Rubin

(from which the gut, liver, and pancreas develop)—might have an entirely different effect at a later stage, or in a higher concentration, or within a different environmental niche in the body.

One way Melton has dealt with this problem is to do an end-run around the whole process. Instead of resetting a cell to a pluripotent state and then trying to control the ensuing cascade of cellular divisions to create a particular type of cell, he attempted to change one adult cell type directly into another—in a living animal. In 2008, using three transcription factors (a class of genes known to regulate cell fate during early development), he and postdoctoral fellow Qiao “Joe” Zhou succeeded in transforming a common type of pancreatic cell in mice into insulin-producing beta cells. This was a stunning achievement in what is now called direct reprogramming, the process of determining which genes are turned on and off in the cell. And because Melton derived the cells from a related cell type, only three transcription factors were required.

But to duplicate this feat in humans so that it might one day become useful in treating diabetes, Melton will need to identify a drug, or combination of drugs, that will do the same thing. That is where HSCI’s second major scientific instrument—the therapeutic screening center, run by Lee Rubin—comes into play.

In fact, Rubin is directly involved in many of HSCI’s most important “translational studies”—moving basic research findings toward implementation in medical practice. Finding chemical means for reprogramming and directed differentiation is just

one of his important roles. “He is a linchpin,” says Melton, “because without him, HSCI is, in a sense, just a basic-science department.” Rubin, Melton notes, is “an extraordinarily accomplished research scientist” who worked for a biotech company but has been brought back to the University to advance HSCI’s mission of curing disease. “All of the basic science we do here is going to lead either to our making cells that we can put back into people—and that *indirectly* involves Lee—or we are going to find drugs that block degeneration, or harness the body’s own mechanisms of repair by activating stem cells, and that leads *directly* back to Lee,” Melton explains. “We need to clone *him*.”

Rubin got his start in biotech working on a signaling molecule called “hedgehog,” a powerful reagent that scientists discovered caused certain cancers to grow more quickly. Rubin reasoned that seeking a countersignal that would reduce hedgehog signaling might stop or slow cancer, so he set up a screening system to find such an agent. His quest eventually led to the discovery of a promising drug that mimicked the body’s own mechanism for inhibiting hedgehog. The drug (now a Genentech property in phase II clinical trials) treats medulloblastoma, a childhood brain cancer, and basal-cell carcinoma.

As it turned out, another agent that promotes, rather than inhibits, hedgehog signaling was already widely used by stem-cell scientists as part of a “differentiation cocktail” that could turn ES cells into motor neurons. It occurred to Rubin that he could make billions of motor neurons from ES cells to study disease in vitro,

something that had never been done before. While he was still working in industry, a grant from the Spinal Muscular Atrophy Foundation enabled him to begin studying that disease and combine his newfound ability to make huge numbers of motor neurons with his screening system in order to find a therapeutic agent. “When pharmaceutical companies screen, they usually use cells that are easy to grow and easy to make in large numbers,” he explains. “Those are never neurons.” His research was the first to run a large screen using a neuron with disease characteristics: in other words, the first “disease relevant system” to identify therapeutics.

“In biotech,” says Rubin, a lively, fast-talking fellow, “the faster you can do things, the better it is.” While most stem-cell scientists remained focused on cell therapies, which can treat a small number of diseases, Rubin hit upon the notion of a real expansion of stem-cell use: to make cells involved in many different diseases. At the time, this involved the cumbersome technique of replacing a human ES cell’s nucleus with the nucleus of a cell from a diseased patient. Getting the embryos, the approvals, and the money to do this was not easy. The discovery of iPS “jet propelled” the idea by making the creation of disease-specific stem cells much easier. And it raised a significant possibility: that stem cells might be used to both speed up, and lower the cost of, drug discovery.

Developing a drug, including research and testing in human populations, typically takes five to seven years, and another six months to two years to secure regulatory approval. In the case of diseases affecting relatively small numbers of people, the costs can be prohibitive. “Suppose you want to study ALS,” Rubin says. You must test therapeutics for side effects, and “under the old system,” he points out, “to find an effect on a small population, you have to run a large trial. But if you have a disease like ALS where you don’t have that many patients, you can’t do many large trials.”

But by using iPS cells, that problem can be tackled from the other direction—by making iPS cells from hundreds or thousands of ALS patients over time, and then differentiating those cells to make motor neurons to identify patients for whom the drug might be effective, as well as cardiomyocytes and hepatocytes (liver cells), the two cell types most often involved in side effects from drugs. That way, potential therapeutics could be tested against a wider array of cells before anything goes into a person, Rubin says. “This offers at least the prospect of changing the way drugs are developed, in the sense that you would have better approaches for identifying drugs against particular diseases and for testing their safety. So that by the time you test it in a person, if all these things align, the clinical studies are smaller and more likely to be successful.”

This big idea—“It is really breathtaking”—might turn out to be true, Rubin says, though it will take years, and “actually finding better drugs that work in people,” to know.

Rubin’s therapeutic screen-

ing center allows him to screen more than 30,000 compounds and controls at a time. One of the ways he “adds value” to HSCI, as he puts it, is by screening for better drugs. “One of the things that stands between this big idea and reality,” however, is differentiating disease-specific iPS cells into particular cell types so that large-scale screens can be run against them. “We can make motor neurons, but we can’t make beta cells. There aren’t that many cells we *can* currently make right now.”

Rubin has therefore begun collaborations with numerous labs around Harvard to run screens for compounds involved in determining what tissue type the cell becomes. The center uses two approaches. The first employs previously identified factors present in normal development. The second proceeds blindly, saying, in effect, “We don’t know how to do it, but we can recognize it when it happens.” Robotic imaging devices allow center researchers to test, for example, for the presence of proteins known to be associated with various stages of cell differentiation. “Instead of one postdoc in Doug [Melton]’s lab testing a hundred things—whatever number is reasonable for a person to test,” Rubin points out, “we could test 30- or 40- or 50,000 variations of different kinds of molecules or combinations of molecules to see if any of them work at all.”

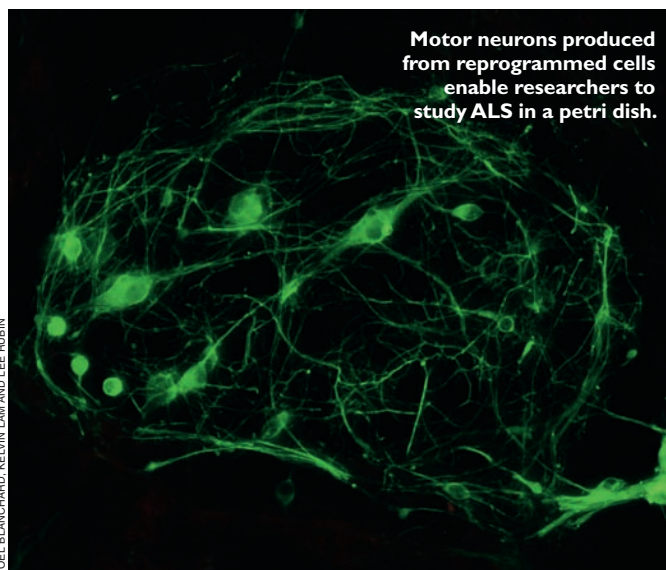
Rubin and Eggan just published a paper in which that kind of screening was used to find a drug to replace two of the genes traditionally used to make motor neurons. They might be able to replace all of the genes in the next year or two, Melton says. “Lee’s powerful new approach has been working spectacularly well.”

IN JANUARY, Cowan and the iPS core facility will move from a location near Massachusetts General Hospital to the Cambridge campus, right next door to Rubin’s therapeutic screening center in the Sherman-Fairchild Biochemistry building on Divinity Avenue. The synergies are obvious—and Cowan and Rubin already collaborate. Harvard is among the very few institutions with both this chemical-screening capability and expertise in induced pluripotent stem cells, says Cowan, “so putting the two together is enormously powerful. And then the last ingredient—what makes this the most delicious cake ever, scientifically—is that we have some of the finest research hospitals on the planet.

Their understanding of disease and patient phenotypes informs which stem cells we should make, and once we have them, what we should be doing to search for defects.” It is a triumvirate that Cowan believes will “give us the opportunity to make discoveries in human disease” that heretofore weren’t possible.

“Everything we thought stem cells would be good for, still is true,” says Melton. “Now we just have to get treatments into people.” ▢

Jonathan Shaw ’89 is managing editor of this magazine.



**Motor neurons produced from reprogrammed cells enable researchers to study ALS in a petri dish.**

JOEL BLANCHARD, KELVIN LAM AND LEE RUBIN

VITA

# Li Shizhen

*Brief life of a pioneering naturalist: 1518-1593*

by CARLA NAPPI

**T**HOUGH VIRTUALLY UNKNOWN in mainstream American culture, Li Shizhen (*lee sher-jen*) is virtually a household name in China. A kind of patron saint of Chinese herbal medicine, widely lauded by historians and practitioners of traditional Chinese medicine (TCM), he is widely represented in popular and scholarly media. Video stills of his work were shown during the 2008 Beijing Olympics opening ceremony. Movie star

Jet Li recently named him one of his personal heroes, and he has been the focus of comic books, popular songs, TV dramas, and films. This is all rather impressive for a sixteenth-century doctor who lived, worked, and died in south China in relative obscurity.

Li was born in an area now known as Qichun, in Hubei Province. His father had big plans for the boy, but young Shizhen was sickly and for various reasons kept failing the civil examinations



that would have brought him (and his family) a prestigious post in the state bureaucracy. Luckily, he had a backup: his grandfather had been a traveling doctor, his father was a doctor, and that appeared to be his career path as well. He studied the medical classics, apprenticed with his father, treated local townsfolk, and eventually became successful enough to secure some brief yet high-profile positions in the capital and to befriend a few influential scholars. He wrote several short medical treatises on everything from mugwort to pulse diagnosis, composed some poetry, and made a decent living for himself, his wife, and his sons.

But this is not what put Li's face on the walls of medical colleges or his name in the speeches of Mao Zedong. None of it would have mattered had he not spent the last half of his life researching and writing an enormous book that became his magnum opus, the *Bencao gangmu* (*ben-sow gong-moo*)—an encyclopedic work in the tradition of *bencao* (materia medica) literature, which

includes works explaining the qualities of the various substances used in making medical drugs: plants, animals, stones, clothing, household implements, and assorted other materials. One of the most ancient forms of medical writing in China, a *bencao* was often composed or revised at the behest (and with the financial backing) of an emperor. Instead, Li took it upon himself to spend decades traveling—interviewing hunters and fishermen and local healers—reading omnivorously, and trying various treatments for his own patients until he had compiled enough information to satisfy himself that it was time to sit down and compose an encyclopedia of his own. He spent 10 years writing his enormous book, and perished before it was published. Only due to the hard work, editing, and perseverance of his sons and grandsons was the *Bencao gangmu* finally printed in 1596, three years after his death.

But what an amazing book it was! The largest and most complete work on materia medica of its time, the *Bencao gangmu* contains 52 chapters of descriptions, stories, poems, histories, and recipes for how to use and understand everything from fire and mud to ginseng and artemisia, turtles and lions, and even human body parts as medical drugs. Li was a man obsessed: convinced that the only way to properly use something as a drug was to understand as much as possible about it, he stuffed everything he could find into his *bencao*, from as many different books as he could get his hands on. He experimented both on the creatures around him and on him-

剖過他  
部是一個  
不是食  
真蟻的  
有穿山  
蟻甲，  
在內，  
察看牠  
們的臟  
腑。他  
的解



**Above: Pages from a first edition of the *Bencao gangmu* illustrate insects (demonic and quotidian) and assorted dragons and their bones, all prescribed by Li for use in medicinal drugs. Left: Li prepares to dissect a pangolin, from a popular pamphlet, Li Shizhen: Great Scholar of Medical Drugs (1955).**



self, recording his experience getting “half-drunk” in local bars and trying out remedies on patients to test the

hypotheses of other doctors, poets, and scholars. In the pages of his book, one can find prescriptions for dragon bone, stories of corpse-eating demons and fire-pooing dogs, instructions for using magic mirrors, advice for getting rid of locusts, and recipes for excellent fish dinners.

Of course, we don't hear much about the dragons and demons anymore. As with most historical icons, Li's name and story have been resurrected many times since his death to serve many different purposes. In posters and films, he was recast in the image of a wandering people's doctor in the 1950s. As a result, most people today know of him as the father of Chinese pharmacy, a humble doctor who recorded the herbal knowledge of the people around him and preserved it for posterity. His image consecrates the walls of many TCM colleges in China, and scientists continue to test his recipes and translate his sixteenth-century pharmaceutical insights into the drugs and terminology of modern biomedicine. Modern authors often attempt to confirm Li's early medical use of plant, animal, and human-based medicines (from toads to ephedra), his clinical practices, and his prescriptions for drugs to treat epilepsy, gynecological diseases, and many other maladies.

Li might have been amused by such efforts to standardize and normalize his ideas and practices. There wasn't one correct remedy for an illness, as far as he was concerned, and he recorded his thoughts of ghosts, phoenixes, and miraculous transformations in the same pages as his recipes for ginseng and chamomile. As he reminded aspiring doctors, there are often no clear answers when attempting to understand nature. We can only keep trying, learn from our mistakes and observations, and be open to phenomena and stories we might initially consider strange or impossible. He ended his book with a statement to that effect, and to the end of his life he struggled to make the statement known. ▽

Carla Nappi '99 is assistant professor of history at the University of British Columbia and the author of *The Monkey and the Inkpot: Natural History and Its Transformations in Early Modern China* (Harvard).



# CONCEPTUALIZING SMALL

*A visual exploration of the nanoscale*

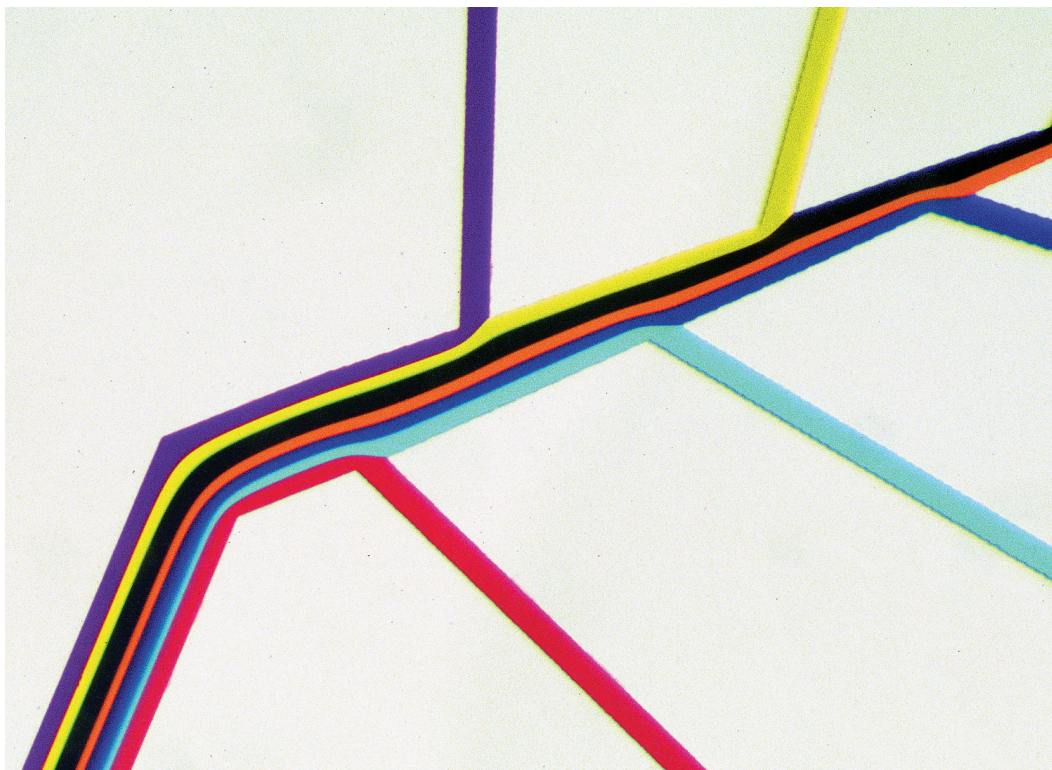
**T**HE NANOSCALE WORLD is the realm of the truly small. One nanometer is a billionth of a meter, about 100,000 times thinner than the sheet of paper on which these words are printed. If you could shrink to that height, atoms would be from ankle- to waist-high, and a single molecule would wiggle and jump as you watched an electron pass through. The ridges of an old 33-rpm vinyl recording would rise before you like mountain ranges (pictured on this page, several tracks from the Beatles' "Eleanor Rigby"). You would quickly realize that objects and forces from your new vantage point are not just quantitatively smaller, but qualitatively *different*. Matter at that scale sometimes defies classical, Newtonian physics. Light is seen to be both a wave and a particle. Caged electrons tunnel through atoms-thin walls, releasing energy as they escape confinement. Proportionally, surface area becomes vastly larger and more important than volume, leading to significant changes in physical properties.

But if we can't see these things, how can we understand them? *No Small Matter: Science on the Nanoscale* (Belknap/Harvard) illustrates in photographs and words the tools, concepts, and applications of nanoscience. The field is a thriving nexus of research (see "Thinking Small," January-February 2005, page 50); at Harvard, no fewer than three centers and two institutes study different aspects of the nanosphere, engaging chemists, physicists, biologists, engineers, and even medical-school clinicians.

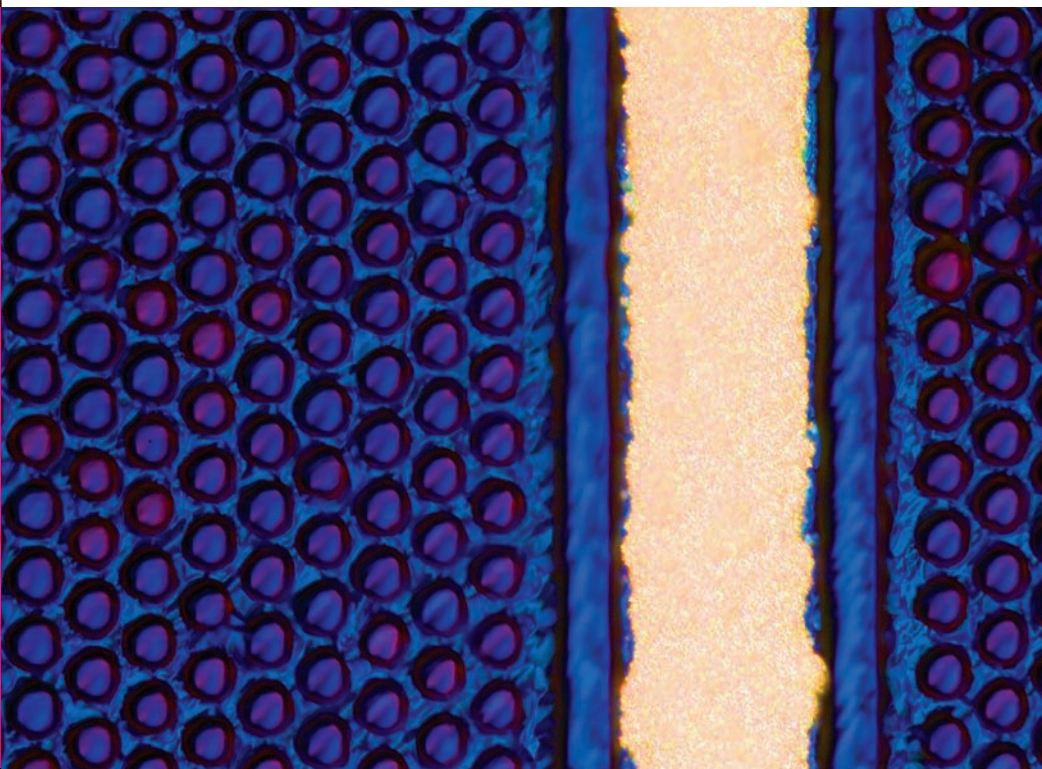
The new book—a sequel of sorts to *On the Surface of Things: Images of the Extraordinary in Science* (Chronicle Books, 1997; see "Phenomenal Surfaces," July-August 1997, page 41)—is the second collaboration between photographer and research fellow Felice C. Frankel, who chose the images, and Flowers University Professor George M. Whitesides, a scientist with a way for words. *Harvard Magazine* presents a selection of images and observations from the book on the following pages.

## LAMINAR FLOW

When confined to a tiny channel the width of a human hair, familiar fluids like water behave differently. If the flow is slow and the viscosity high, streams can meet, yet not mix. They maintain distinct layers, as if the fluids “were a sheet or slab rather than a liquid.” The inertia of the fluid itself, which at large scales leads to turbulence and mixing of streams, dwindles to unimportance, and the streams run parallel to each other. Blood in capillaries flows this way. “Arms of a glacier show the same behavior when they meet....Even people in narrow corridors move in an orderly stream; being close to a wall keeps everyone in line. If the corridor is wide, people meet, stop, chat, and swirl.” Microfluidic systems are “used in biotechnology to analyze blood and urine, to grow cells, and to crystallize proteins that are targets for new pharmaceuticals.”



P.J.A. KENIS ET AL., “MICROFABRICATION INSIDE CAPILLARIES USING MULTIPHASE LAMINAR FLOW PATTERNING,” *SCIENCE* 285 (1999): 83-85



## SOLAR CELLS

Solar cells, like this silicon wafer of light-absorbing hexagonal pits separated by a narrow metal conductor, generate electricity when particles of light (photons) knock electrons loose from a silicon layer. One photon bumps one electron, unless the photon is very energetic: then it might knock two electrons free. A solar cell is made of two silicon layers: one has extra, “free,” electrons; the other is missing electrons, known as “holes.” Sunlight hitting free electrons makes them take a one-way jump to the other layer—which they want to do anyway, to form an electron-hole pair—a match made in heaven, so to speak. “If everything works (and it usually doesn’t), the itinerant electron may return home by going through an external wire, and turning a motor or generating hydrogen along the way...,” notes Whitesides. But capturing energy from sunlight, even when it is abundantly available, is not cheap. “Solar electricity is a good idea, but not a good enough idea to save us from ourselves,” he says. “Either we have to find more energy elsewhere, or use less.”

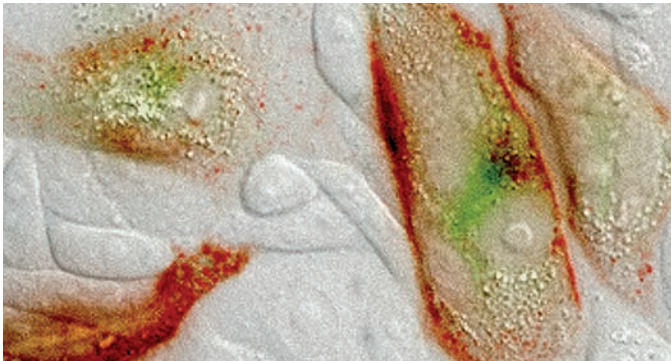


## THE QUANTUM APPLE

How can a glass apple cast a square shadow? The answer is simple: it cannot. Frankel has combined the shadow cast by a cube with that of the apple (for an explanation of how the photograph came to be, see the online extra, "Notes from the Photographer"). The image is a metaphor for the seeming contradictions common in quantum physics. The most familiar of these, that light is both a wave and a particle, appears as a concept several times in *No Small Matter*. When light is moving, it is a wave. When it hits something, it is a particle. "Even you and I are waves," writes Whitesides, "albeit waves with crest to crest distances of 10 to the minus 35 centimeters (a distance so small that it is unimaginable)."



Visit [harvardmag.com/extras](http://harvardmag.com/extras) to learn more about the making of the images in this article.



## QUANTUM DOTS

A quantum dot is like a cage for electrons. Scientists build the cage as a semiconductor sandwich, in layers: a conductive layer where the electrons live, pressed between two layers that act as insulators to prevent electrons from escaping. Then they snip away until only a dot of material is left. Quantum dots are so small that their size determines how many electrons they can hold. Because each electron has a fixed charge, a dot's energy is quantized—it changes only in whole steps (1,2,3...), according to the number of electrons it contains. Ultraviolet light excites the electrons in a quantum dot so that they emit visible light in a predictable way. Small dots with few electrons emit blue light, large ones emit red. In biology, quantum dots can be used like dyes. "In Thailand, at night," Whitesides recalls, "fireflies collect in particular trees, and their flashing—sometimes astonishingly synchronized—shows the shape of the tree and the structure of its branches." Here, quantum dots that have been superimposed on a microscopic image of cells, "like nanoscopic fireflies," illuminate the structures within.

## CAPILLARITY

Polymer tendrils one thousandth the width of a hair appear to cling to these small polymer spheres. Why? The explanation lies in the one thing missing from the photograph: water. The spheres once floated, suspended in the water, while the fronds waved below. "As the water evaporated, the spheres settled on the fingers, and capillarity—the tendency for the last thin film of water to form beads rather than to spread—pulled the fingers to the balls." Water molecules are attracted to each other more so than to other molecules, and so form beads because that is a shape that allows them to bond most efficiently.

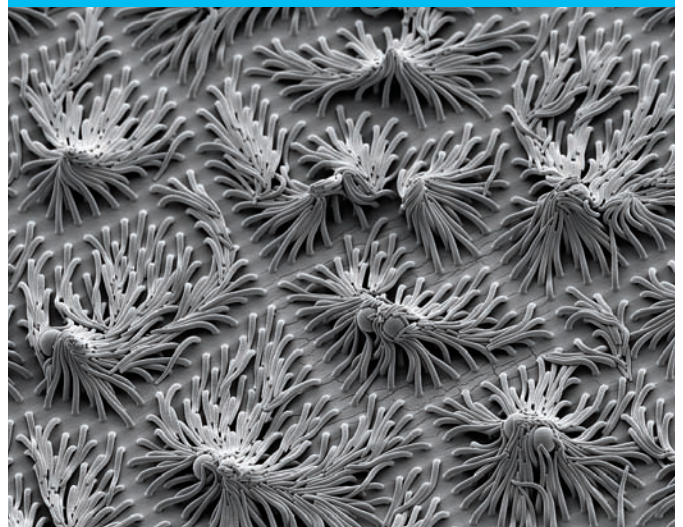


IMAGE BY JOANNA AIZENBERG, HARVARD UNIVERSITY; B. POKROY ET AL., "SELF-ORGANIZATION OF A MESOSCALE BRISTLE INTO ORDERED, HIERARCHICAL HELICAL ASSEMBLIES," *SCIENCE* 323 (2009): 237-240

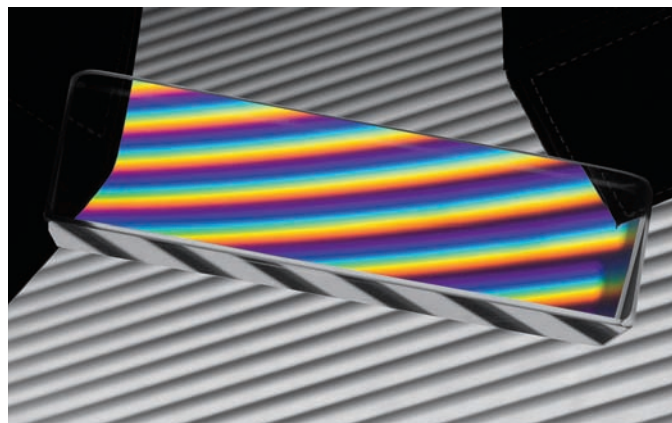
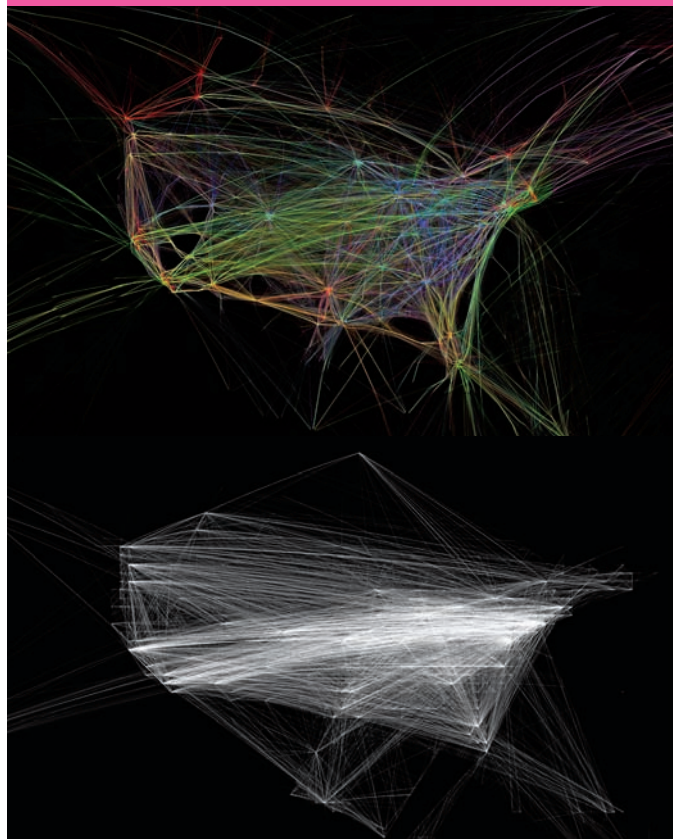


## THE INTERNET

Comparing maps of communication past and present reveals parallel patterns. The upper image shows the movement of passengers on airplanes across the United States; the lower one, the flow of bits across the Internet. "It is the largest thing we have ever built," says Whitesides, "and we have assembled it from transistors—the smallest things we know how to make. It is a chrysalis we are forming around the planet...a table where we sit to gossip, a *suq* where we buy and sell; a shadowy corner for planning mischief; a library holding the entire world's information; a friend, a game, a matchmaker, a psychiatrist, an erotic dream, a babysitter, a teacher, a spy.... The best and worst and most ordinary of us reflected—and perhaps distorted—in a silvery fog of bits."

## CRACKS

Over eons, lichens such as these can crack and reduce rock to rubble. But what is a crack? Following it to its terminus at the nanoscale, does a crack propagating in a piece of glass rend even molecules, breaking bonds between atoms? Sometimes, yes. Existing models of the way things crack postulate such an atomically sharp tip. But experiments suggest otherwise. Scientists use multiscale modeling to understand fractures across different scales of length and energy, but at the tip, and on the smallest scale, their models break down. "A crack smaller than an atom makes no sense," writes Whitesides, "but how matter progresses from two distinct pieces to one is not obvious at the atomic scale."



## PRISM

A prism reveals the wave-like nature of light. Visible light seems colorless until the prism reveals the rainbow of its constituent parts, with the colors corresponding to different wavelengths. The glass disrupts all the wavelengths, but not equally. When light enters a material, it changes speed according to the material's refractive index. But glass is a special material in which the refractive index changes based on the wavelength of the light. In glass, high-frequency violet light slows more than red light. When, in addition, a wavelength of light enters glass at an angle, the wave bends around the point that enters the glass first and slows first. Light that slows more—like violet—bends more, and consequently follows a different path through the prism and out of it. White light becomes "a spectral peacock's tail—red, yellow, green, blue, violet—as it bends through a prism."

# THE ART ARMY

## HARVARD'S MONUMENTS MEN AT WAR

*Among its crimes against humanity, Nazi Germany may have stolen more than five million cultural objects from the countries it conquered, including thousands of the world's greatest artistic masterpieces. As the American and British armies and their allies began pushing back onto the Continent, an unusual front-line military unit with too few men and too little equipment accompanied them—members of the Monuments, Fine Arts, and Archives section (MFAA). The Monuments Men: Allied Heroes, Nazi Thieves, and the Greatest Treasure Hunt in History, by Robert M. Edsel, with Bret Witter, narrates the background, actions, and achievements of these soldiers:*

Their initial responsibility was to mitigate combat damage, primarily to structures—churches, museums, and other important monuments. As the war progressed and the German border was breached, their focus shifted to locating movable works of art and other cultural items stolen or otherwise missing.

*Harvard alumni played important roles in creating and staffing the MFAA, among them Paul Sachs '00, director of the Fogg Art Museum, Mason Hammond '25 (future Pope professor of the Latin language and literature), Lincoln Kirstein '30 (future founder of the New York City Ballet), and James Rorimer '27 (future director of the Metropolitan Museum of Art). But the hero of this new work is George Stout, A.M. '29, formerly lecturer on design and conservator at the Fogg. These excerpts from throughout the book focus on his nearly forgotten role.*

**G**EORGE STOUT WAS NOT a typical museum official. Unlike many of his peers, who were the product of the eastern elite establishment, Stout was a blue-collar kid from the small town of Winterset, Iowa. From there, he went straight into the army, where he served during World War I as a private in a hospital unit in Europe. On a lark, he decided to study drawing after returning from war. Following his graduation from the University of Iowa, Stout spent five years in hand-to-mouth jobs, saving for the tour of the cultural centers of Europe that was the unspoken prerequisite of a career in the arts. By the time he arrived at Harvard to begin graduate studies in 1926, Stout was a 28-year-old husband with a pregnant wife and a stipend just large enough to stay “only a little above starvation level.”

In 1928, Stout joined the small art conservation department at the Fogg Art Museum as an unpaid graduate assistant. Conserva-

tion, the technical art of preserving older or damaged works, was the least popular field in the art history department, and Stout was probably its most diligent and self-effacing disciple. In fact, in a department based on braggadocio, where a student's prospects were often based on personal relationships with superstar professors like Paul Sachs, Stout was perhaps the most anonymous student. But he was also meticulous, a trait that carried over to his personal appearance: carefully swept-back hair, trim worsted suits, and a fine pencil mustache. Stout was dapper, debonair, and resolutely unflappable. But beneath his placid exterior was a brilliant and restless mind, capable of great leaps of understanding and far-reaching vision. He also possessed another essential quality: extraordinary patience.

Soon after joining the conservation department, Stout noticed an abandoned card catalogue from the university library. The rows of tiny drawers gave him an idea. The department contained an astonishing array of the raw materials of painting: pigments, stones, dried plants, oils, resins, gums, glues, and balsams. With the help of the department chemist, John Gettens, Stout placed samples in each of the card catalogue's drawers, added various chemicals, and observed the results. And took notes. And observed. And waited. For years. Five years later, using only piles of scraps and a discarded chest of drawers, Stout and Gettens had pioneered studies in three branches of the science of art conservation: rudiments (understanding raw materials), degradation (understanding the causes of deterioration), and reparations (stopping and then repairing damage).

The breakthrough led Stout—still known only to the handful of practitioners in his field—to a new mission. For centuries, conservation had been considered an art, the domain of restorers trained by masters in the techniques of repainting. If it was going to become a science, as Stout's experiments suggested, then it needed



From the book THE MONUMENTS MEN: Allied Heroes, Nazi Thieves, and the Greatest Treasure Hunt in History, by Robert M. Edsel. Copyright © 2009 by Robert M. Edsel. Reprinted by permission of Center Street, a division of Hachette Book Group, New York, N.Y. All rights reserved.

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At the Merkers salt mines in central Germany, American GIs admire Édouard Manet's *In the Conservatory*, one of the thousands of rare works and documents stored there by the Nazi regime late in World War II. Monument Man George Stout (see next page), a Fogg Museum conservator turned U.S. Army lieutenant, supervised the rescue of 40 tons of art from the site in April 1945.

a body of scientific knowledge. Throughout the 1930s, Stout corresponded regularly with the great conservators of the day, sharing information and slowly compiling a set of scientific principles for the evaluation and preservation of paintings and visual arts.

Things began to change in July 1936, when the Spanish Fascists plunged their country into a civil war. In the spring of 1937, Germany entered the conflict and unleashed, for the first time, its corps of tanks and airplanes, the foundation of its evolving doctrine of "lightning warfare."

The art world realized that Germany's powerful weapons, and especially its use of massive aerial bombardment, had suddenly made the bulk of the continent's great artistic masterpieces susceptible to destruction. The Europeans and British quickly began to develop plans for protection and evacuation, and George Stout began to slowly, letter by letter, reshape his storehouse of knowledge for a world at war. *An expert and a precisionist makes his analysis first, he always said, then his decision.*

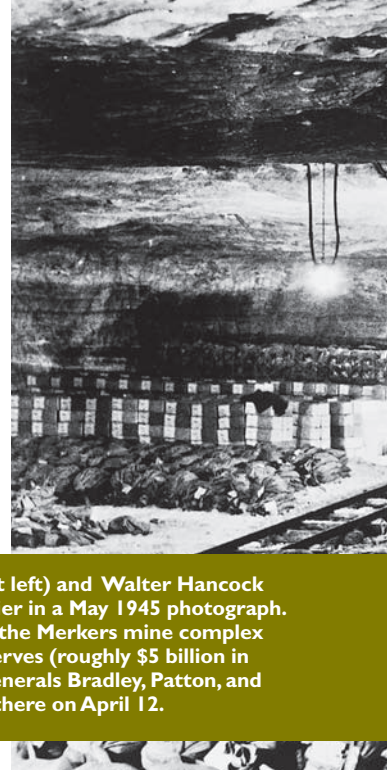
He spent most of 1942 training curators and pushing for a na-

tional conservation plan. But by that fall the unflappable Stout was discouraged. He had spent his entire career developing expertise in an obscure subset of art history, and suddenly world events had thrust that expertise to the forefront. This was *the* moment for art conservation—and nobody would listen to him. Instead, the war-time conservation movement was being controlled by the museum directors, the "sahibs" of the art world, as Stout called them. Stout was a workman, a toiler in the trenches, and he had the nuts-and-bolts technician's distaste for the manager's world of committees, conversations, and the cultivation of clients. He was convinced that only his dedicated corps of "special workmen," trained in art conservation and working through the army, could accomplish anything of lasting value in the coming war.

By January 1943, with the nation at war and in need of men, he had given up on the conservation program and applied for active duty in the navy, in which he had been a reservist since the end of World War I. "In these last months," he admitted in a letter home after his arrival at Patuxent River Naval Air Station in Maryland,



**Left: Monuments Men George Stout (at left) and Walter Hancock and Steven Kovalyak flank a fellow soldier in a May 1945 photograph. Center and right: Besides works of art, the Merkers mine complex held most of the Third Reich's gold reserves (roughly \$5 billion in today's dollars) and paper currency. Generals Bradley, Patton, and Eisenhower inspected some of the art there on April 12.**



"I have not felt worthy. I was failing to get done what in these times a man ought to do."

Although he couldn't tell his wife what he was doing because of the military censors—he was testing camouflage paint for airplanes—he assured her that he was happy. "[The job] has so much to it and so much responsibility that I am scared and pleased. If we can do what we hope to do, or any decent part of it, I'll have no doubt about what is called 'making a contribution.'"

Even when his transfer came through in January 1944, Stout remained unconvinced. "...If this were a civilian museum command, I'd ditch. [But] my associates will be military men, as I understand it. In the Army and the Navy, efficiency is the rule and plain honesty holds in relations with people. Bluff does not usually get very far. And so we'll see."

Stout underestimated the sahibs. It is doubtful the U.S. Army would have tolerated the MFAA if not for the prestige of the Roberts Commission [the American Commission for the Protection and Salvage of Artistic and Historic Monuments in Europe, chaired by Supreme Court Justice Owen Roberts], which had been formed with Roosevelt's explicit backing, and no one was better suited to assemble Stout's corps of "special workmen" than the men who ran America's cultural establishment. They were able to take the two primary lessons of North Africa and Sicily—that the army would listen to conservation officials, *as long as they were military officers*, and that those officers needed to arrive at the front lines during or immediately after the fighting, not weeks or even months later—and form from them the basis of a workable plan.

[But] there was no formal mission statement, or even set chain of command. Nobody seemed clear about how many men were needed for the job, how they would be distributed on the continent, even when or if more soldiers would arrive. Men simply showed up for duty with their transfer papers, seemingly at random. A general guidebook to conservation procedures had been culled from Stout's expertise and writings on the subject. But the Monuments Men had no formal training. Most of the effort was being put into basics like listing the protected monuments in the

various countries of Europe. As far as Stout could tell, there was no one even handling the military side of the operation, such as procuring weapons, jeeps, uniforms, or rations. To say the race to put together a conservation unit before the invasion of France had started slowly was an understatement.

STOUT WAS A SCIENTIST, a modernizer, but he never put his faith in machines. The skilled observer, not the machine, was the essence of conservation. That was the secret, he believed, to success in any endeavor: to be a careful, knowledgeable, and efficient observer of the world, and to act in accordance with what you saw. To be successful in the field, a Monuments officer would need not just knowledge; he would need passion, smarts, flexibility, an understanding of military culture: the way of the gun, the chain of command.

The military still wasn't confident this was a good idea. The Monuments Men were only advisors; they couldn't force any officer, of any rank, to act. They were allowed freedom of movement, but they would have no vehicles, no offices, no support staff, and no backup plan. The army had given them a boat, but not the motor.

By June 1, the MFAA had reached its battle-ready number. Fifteen men would be serving on the continent, excluding Italy: eight Americans and seven Britons. Seven of the men would serve at headquarters in a strictly organizational capacity. The other eight men were assigned to British and American armies...As impossible as it seems, it was the duty of these eight officers to inspect and preserve every important monument the Allied forces encountered between the English Channel and Berlin.

"Stout was a leader," Craig Hugh Smyth, a later arrival to the Monuments Men, once wrote of him, "quiet, unselfish, modest, yet very strong, very thoughtful and remarkably innovative. Whether speaking or writing, he was economical with words, precise, vivid. One believed what he said; one wanted to do what he proposed."

One of the first Monuments Men ashore, arriving in Normandy on July 4, Stout sought to identify problems and find ways to solve them.



Not enough “Off Limits” signs? The army had a printing press in Cherbourg they turned on at night. In the meantime, the rest of the men could make them in the field.

Soldiers and civilians tended to ignore handwritten signs? Stout had the solution for that one, too: use white engineering tape around important locations. No soldier would scavenge in a site clearly marked “DANGER: MINES!”

*The Monuments Men's ability to improvise in the field while tracking down, documenting, and protecting works of art faced special challenges once Allied armies entered Germany, where many of the Third Reich's treasures had been stored deep in mines, sometimes booby-trapped with explosives. On April 6, 1945, U.S. troops took possession of the Merkers mine complex in Thuringia. Robert Posey and Lincoln Kirstein, the Monuments Men serving with the Third Army, arrived two days later.*

SLOWLY, Posey and Kirstein began to realize just how much was hidden in the Merkers mines. Crated sculpture, hastily packed, with photographs clipped from museum catalogues to show what was inside. Ancient Egyptian papyri in metal cases, which the salt in the mine had reduced to the consistency of wet cardboard. There was no time to examine the priceless antiquities inside, for in other rooms there were ancient Greek and Roman decorative works, Byzantine mosaics, Islamic rugs, leather and buckram portfolio boxes. Hidden in an inconspicuous side room, they found the original woodcuts of Albrecht Dürer's famous Apocalypse series of 1498. And then more crates of paintings—a Rubens, a Goya, a Cranach packed together with minor works.

George Stout arrived at Merkers on April 11, 1945. It was crawling with Western Allied officers, German guides, and experts from all branches of Civil Affairs. As Kirstein wrote, “Due to the fact that the works of art...were discovered as an adjunct to the uncovering of the Reich's gold-reserve, the story was given unusual press treatment.”

The next morning, Stout met Dr. Paul Ortwin Rave, a German

*On May 26, 1944, just 11 days before the invasion of northern Europe, General Eisenhower, Supreme Commander of the Allied Expeditionary Forces, issued the following order:*

SHORTLY we will be fighting our way across the Continent of Europe in battles designed to preserve our civilization. Inevitably, in the path of our advance will be found historical monuments and cultural centers which symbolize to the world all that we are fighting to preserve.

It is the responsibility of every commander to protect and respect these symbols whenever possible.

In some circumstances the success of the military operation may be prejudiced in our reluctance to destroy these revered objects. Then, as at Cassino, where the enemy relied on our emotional attachments to shield his defense, the lives of our men are paramount. So, where military necessity dictates, commanders may order the required action even though it involves destruction to some honored site.

But there are many circumstances in which damage and destruction are not necessary and cannot be justified. In such cases, through the exercise of restraint and discipline, commanders will preserve centers and objects of historical and cultural significance. Civil Affairs Staffs at higher echelons will advise commanders of the locations of historical monuments of this type, both in advance of the frontlines and in occupied areas. This information, together with the necessary instruction, will be passed down through command channels to all echelons.

art expert who had been living on the premises since April 3. A dedicated and professional museum man, his career had been stymied by his refusal to join the Nazi Party. In 1943, Rave suggested evacuating collections from the Berlin area, which was beginning to come under Allied aerial bombardment. He was told this was dangerously defeatist thinking...perhaps fatally so. Nonetheless, he tried again the next year; he was again dismissed, and his life once again threatened. It wasn't until Soviet long-range ground ar-

tillery started battering the city that authorization was obtained to remove the artwork to Merkers. Rave estimated it would take eight weeks to move; he was given two. The final shipment arrived on March 31. Five days later, the U.S. Third Army overran the area.

"Two weeks to move this massive amount of art," Stout commented at the end of Rave's tale. "What a luxury. We've been given six days."

Going into a potassium mine—or a copper mine, or a salt mine, or any other type of German mine—was an uncomfortable experience. These were working mines, not tourist sites, and the passageways were rough, narrow, and cramped. Much of the equipment was old and, because the war had drawn away men and materials, poorly maintained. The Germans had chosen the safety of deep mines for their repositories, so the soldiers often traveled a quarter-mile into the ground, and another quarter-mile laterally at the bottom. To exist in perpetual darkness, far below the earth, without a map of the mine or assurance the next passageway wasn't booby-trapped or the next holding bay not full of dynamite, was a nerve-jangling experience. Even worse, most of the mines were in areas that had been bombed or shelled, knocking out their power supplies. They were dark, cold, and damp.

The Merkers complex included more than 35 miles of tunnels and a dozen entrances. There was no inventory of the works in the mines, but Dr. Rave had a list of the museums and collections from which they had come.

On the morning of April 13, Stout worked out the materials needed to pack all the artwork for shipment: boxes, crates, files, tape, thousands of feet of packing materials. His conclusion: "No chance of getting them."

In addition, Stout learned that instead of evacuating on April 17, they would be leaving on April 15. "A rash procedure," Stout noted in his diary, "and ascribed to military necessity." General Patton was charging ahead, and he didn't want to leave four battalions behind to guard a gold mine. Furthermore, Merkers, and all its treasures, were in the Russian zone of occupation.

Thirty minutes after midnight on April 15, Stout finished his plans for the evacuation of Merkers. Unable to secure packing materials, he had requisitioned from the Luftwaffe uniform depot Kirstein found in the Menzengraben mine a thousand sheepskin coats, the kind German officers used on the Russian front. Most of the 40 tons of artwork would be wrapped in the coats, reboxed with similar works, then organized into appropriate collections. ... The gold was too heavy to be loaded to the tops of the trucks, so crates of paintings would be mixed in to maximize the load. Loading would start in an hour, at 0200, 36 hours ahead of the original schedule. By 0430 the artwork already in crates or boxes

was brought to the surface and loaded. "No time to sleep," Stout wrote. He had to prepare invoices and detailed instructions for the unloading and storage of the artwork in Frankfurt.

At 0800, an hour before the first convoy left, Stout started on the uncrated paintings. He planned to move them to a building

above ground for temporary storage, but even with 25 men, the work proved impossible. By noon, the crew had reached 50, and Stout had decided to crate the paintings underground. Unfortunately, the large crates were awkward to handle, especially in the confusion of the mineshafts. Jeeps had been brought down to help transport the gold, blocking some passages. Their exhaust fouled the air, and the occasional backfire of an engine echoed ominously in the rocky corridors. The gold was being sprayed with water to remove the corrosive salt of the mine, and the main shaft to the elevator was ankle-deep with the runoff. Soldiers were scurrying in all directions, carrying stacks of money, bags of gold, and ancient art, and it was all Stout could do to keep his men from wandering off in the confusion and not returning to work.

At 0005, five minutes past midnight on April 16, Stout reported "all paintings on ground level, in 3 places. All print boxes on ground level in 2 places. Cased works below ground somewhat rearranged and piled in part ready to load at elevator shaft." The loading at Ransbach started at 0830; the loading at Merkers a half hour later with 75 men and five officers. At 1300, prisoners of war were brought in to assist the operation. By 2100 all the paintings were loaded. Stout went to the Dietlas mine, reached by an underground passage from the main shaft at Merkers, and found photographic equipment, modern paintings, and racks of archives. One set from Weimar was marked 933–1931, a thousand years of municipal history. "Inspection finished 2300," he wrote. "Returned Merkers, ate supper, reported."

The art convoy—32 10-ton trucks with a motorized infantry escort and air cover—left for Frankfurt at 0830. It arrived at 1400. Stout noted only "complicated unloading. L. Kirstein a great help. All handled by 105 PWs [prisoners of war] in poor health. Storage in temporary arrangement 8 rooms basement level, one large room underground." Stout's inventory listed 393 paintings (uncrated), 2,091 print boxes, 1,214 cases, and 140 textiles, representing most of the Prussian state art collection. "Job finished and area secured 2330."

"The last time I saw them," Lincoln Kirstein wrote in his account of the operation, "Lieutenant Stout was gravely whirling a swing aerometer in all corners of their new home, determining the humidity." He had been up for almost four straight days, but as always with Stout the job got done—and done right.

It had been a remarkable few weeks, but no Monuments Men were celebrating. If the Western Al-

(please turn to page 75)



Stout (center) and Steven Kovalyak (far left) supervise the removal of Michelangelo's *Bruges Madonna* from the salt mine at Altaussee, Austria.

NATIONAL GALLERY OF ART, WASHINGTON, D.C. GALLERY ARCHIVES



Visit [harvardmag.com/extras](http://harvardmag.com/extras) for an interactive map that tracks the Monuments Men on their routes through Europe.

# JOHN HARVARD'S JOURNAL



Outside the Caspersen Room at the Harvard Law School Library: Ess Librarian and professor of law John G. Palfrey VII with University Library director and Pforzheimer University Professor Robert Darnton.

## Libraries on the Edge

THROUGH CENTURIES, Harvard's libraries have amassed rich collections and unique holdings. But now budgetary pressures that have been building during the past decade, and intensified in the past year, threaten the ability of the world's largest private library to collect works as broadly as it has in the past.

In an interview, University Library director and Pforzheimer University Professor Robert Darnton called the situation "a crisis in acquisitions." As the number of books printed globally continues to

increase—now standing at more than a million titles a year—the number Harvard can afford to collect has for years remained flat. The share of the world's output of knowledge that Harvard acquires is there-

fore dwindling. (The library now holds 16.3 million volumes.) And even though technology has created new ways to store and present knowledge, such changes, at least for the time being, have merely added

## IN THIS ISSUE

- |    |                                  |    |                      |
|----|----------------------------------|----|----------------------|
| 42 | News from Our Website            | 49 | Brevia               |
| 43 | Harvard Portrait                 | 51 | Radcliffe's New Life |
| 44 | Yesterday's News                 | 52 | The Undergraduate    |
| 45 | Further Financial Fallout        | 54 | Sports               |
| 46 | "Two Radically Different Worlds" | 60 | Alumni               |
| 48 | Faculty Diversity Developments   | 64 | The College Pump     |

to the burden of libraries everywhere. A University report ([http://www.provost.harvard.edu/reports/Library\\_Task\\_Force\\_Report.pdf](http://www.provost.harvard.edu/reports/Library_Task_Force_Report.pdf)) released in November therefore calls for the administrative, financial, and technological restructuring of Harvard's library system, and for increased collaboration with other institutions.

"IN THE AGE of the electronic revolution," Provost Steven E. Hyman said in an interview, "and in an age when far more is being produced, in terms of printed resources... than any one [institution] could collect, store, or preserve, we have to move from *acquisition* as the primary and central goal to *access*." Critically, the access must be "in perpetuity, because we have not yet solved the problem of digital preservation."

Hyman, who in February 2009 appointed a task force to study the University's libraries, noted that some current challenges are shared by libraries everywhere, while others are unique to Harvard. Among the latter category, he points to the "excessively complex [administrative] structure of the libraries" (Harvard's 73 physically separate libraries are run by more than 50 different entities), and "difficulties of decision-making, and the inefficient use of resources resulting therefrom," as issues discussed in the recent report that had pre-

viously been raised among faculty members for a decade or more. The existing system—"library as labyrinth," he says—makes it difficult to know what Harvard's resources are, stands in the way of a rational collecting policy, and allows journal publishers to "exploit our divisions," leading the libraries to spend more money than they should. Grossly inefficient use of internal resources is another consequence of extreme decentralization: an example cited by the task-force report took place in 2009, when "negotiations with one major scientific publisher engaged representatives of 24 separate libraries, apparently eating up hours and days of staff time—which frankly," notes Hyman, "is a misallocation of Harvard's scarce resources."

"When you have a structure that is already at risk," says Hyman, "and then subject it to extraordinary financial pressures," as experienced in the past year, "you begin to see potentially real trouble."

Harvard's library, one of the four largest in the world and the only one that is not a deposit library (like the Library of Congress), is also unique among the four in that it collects in more than 350 languages and in all disciplines. "No one collects the way Harvard does," says Darnton. "If we don't do that collecting, who will?" He says the libraries' responsibility is first

and foremost to the students and faculty at Harvard, but "I think we have a national, even an international responsibility, to the whole world of learning. People look to Harvard to keep up a very high level of collecting the *record* of scholarship. So I view this responsibility as something that is haunting, really, because if we fail to keep up an adequate acquisitions rate, we are letting everyone down, not just the people at Harvard and not just this generation, but future generations as well."

At its simplest, the problem facing many libraries is that budgets have only kept pace with inflation, while the cost of printed materials rises 9 percent a year. The budget of the Harvard College Library, which includes Widener as well as Lamont and Cabot libraries for undergraduates, is under particular strain, in part because it collects across the broadest array of languages, sciences, and other disciplines. That subjects it to the further strains of a weakening dollar (as foreign-language acquisitions become relatively more expensive) and relatively higher costs for retaining expert bibliographers to search for and buy the books that will keep up the strength of the collections.

"We were faced with a stark choice," says Hyman. "If we subjected the whole system to across-the-board cuts, we would undoubtedly enfeeble the whole system." Hyman and library leaders instead saw an opportunity to effect a fundamental reorganization, "so that we could have confidence that resources were being used as wisely as possible, so that we were aggregating our buying power, so that our internal systems could talk to each other, and so that we could collaborate externally."

The task force report notes that Harvard's decentralized system faces particular challenges in an environment that includes tighter budgets, shifting boundaries among academic disciplines, and the destabilizing influence of the digital revolution. In response, the report makes five core recommendations: adoption of a shared administrative structure; improvement to information technology systems; changes to funding models and cost-sharing among the libraries; enhanced coordination of materials collection and especially of access to those collections; and increased collaboration with other institutions. The report called for the immediate formation of a new group, now chaired

## News from Our Website

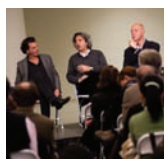
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### The Evolution of Natural History

For the 150th birthday of Harvard's Museum of Comparative Zoology, a look back at the history of the field.

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### A Laboratory for Mixing Art and Science

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### Orhan Pamuk's Theory of the Novel

"Being a novelist," according to Orhan Pamuk, winner of the 2006 Nobel Prize in literature, "is the art of being both naïve and sentimental at the same time." Read more about Pamuk's Norton Lectures at Harvard. [harvardmag.com/orhan-pamuk](http://harvardmag.com/orhan-pamuk)

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by Divinity School professor of philosophy and theology David Lamberth, that will implement these recommendations.

Lamberth said in an interview that although the implementation group will consider the full range of options for consolidating library administrative functions, “going from 50 to a much smaller number of administrative organizations is probably meaningful, but going down to one may well be cutting off your nose to spite your face. Local autonomy of the schools and distinctive libraries is quite valuable,” he continues, “because there are so many different modes of providing service, and also cultures of knowledge and different kinds of materials.”

The risk of losing the expert bibliographers who choose the books Harvard buys is already a major issue among faculty members, who raised concerns during discussion of the libraries at a meeting of the Faculty of Arts and Sciences prior to the release of the task-force report. (Subsequently, in the letter to senior administrators, 100 faculty members called for more money for acquisitions.)

“A crucial, guiding idea” of the report, says Lamberth, is that “maintaining local expertise where it delivers excellence and real value is something we want to continue.” Adds Hyman, “I think intellectual decisions *must* be local. A molecular biologist in the medical school really can’t know what a Sanskrit scholar needs.” Administrative functions, on the other hand, “should be unified and benefit from economies of scale,” Hyman continues. “That means once local intellectual decisions are made, and are agreeable to a local budget, then acquisition, subscription, procurement, unpacking of boxes, cataloging, identification of appropriate storage, and preservation should be a central, unified, highly efficient function.”

One of the principal expected changes in funding and cost-sharing affects the Harvard Depository, where 45 percent of Harvard’s volumes are stored. Whenever a patron requests a book, the Harvard library that owns it is charged a fee of more than \$2. The requesting library or school pays nothing. Libraries with large collections, such as the Harvard College Library, pay a lot under this system. A new system would distribute costs more equitably, and might even involve digitization of requested books upon their return to the depository.

## HARVARD PORTRAIT



### Theresa McCulla

**Walking in Paris** years ago, Theresa McCulla '04 suddenly came face-to-face with small *macarons* (sandwich cookies), displayed on velvet cloth and dramatically lit from above in the shop window of pastry chef Pierre Hermé. “They were presented like jewelry,” she recalls. Since 2007, McCulla, an admitted “foodie,” has brought her reverence for food—nurtured in her own family’s kitchen, in professional venues, and during her college semester at the Sorbonne—to her job: coordinating the Harvard University Dining Services’ Food Literacy Project (FLP), which began in 2005. The FLP aims to educate the Harvard populace about food preparation, nutrition, agriculture, and community: it runs a farmers’ market; encourages local, seasonal eating; and conducts special events like a vegan baking workshop, a field trip to cranberry bogs, and a chance for students to roll their own truffles from a 15-pound batch of ganache. In college, McCulla studied French, Spanish, and Italian: “Some semesters I had no classes in English!—which I loved.” Her polyglot talents led to a job with the Central Intelligence Agency, where for three years she translated and analyzed European media. Yet food beckoned: evenings, McCulla volunteered as a line cook at a steak house, worked for a pastry chef, and did research for a food writer—activities respectively “chaotic, precise, and academic.” She baked the wedding cake for her marriage to Brian Goldstein '04, a Harvard graduate student. They cook together nightly, and McCulla takes professional chef’s training at the Cambridge School of Culinary Arts. “My days and nights,” she says, “are filled with food.”

## Yesterday's News

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

**1935** The Business School announces 10 new courses on the business aspects of public administration for students who wish to prepare themselves for public service.

**1950** The Massachusetts Legislature again considers a bill to investigate Communist sympathizers on college campuses. President Conant assures state lawmakers that Harvard is anti-Communist and has nothing to hide; he deems the investigation unnecessary because it "is likely to expose loyal citizens to unfair insinuations and thus to cause serious injustice."

\* \* \*

Dunster House residents lament their reputation as the "neglected child of Harvard," assuring the *Bulletin* that they are no farther from the Yard than some other Houses, though they do "lie a goodly distance away from the pinball machines and hamburger heavens of Harvard Square."

**1960** The Admissions Office blanches at the prospect of 5,000 applicants to the class

of '64 as the "wartime 'baby bulge' [appears] a year ahead of schedule." [Applications for the class of 2013 hit 29,112.]

\* \* \*

The first women to complete a formal WHRB comp begin their stints on the air.

**1965** The Data and Mailing Services, a computer facility for handling biographical and statistical data on 161,000 alumni, faculty and staff members, and students, has opened, compressing information once stored on many separate stencils onto 16,800 feet of magnetic tape.

**1970** In his annual report, President Nathan M. Pusey laments "a dismal year," plagued by student uprisings of "would-be revolutionaries" as well as financial constraints; for the first time in many years, the Faculty of Arts and Sciences runs a deficit, and federal support to Harvard decreases by \$200,000.

**1980** President Derek C. Bok calls student careerism "a passing phase," predicting "a leveling in the number of future applicants to Harvard—though still far more than there are places available—and less anxiety over becoming a doctor or lawyer."

A key point of the report is that information systems will need to be standardized and improved. When the online HOLLIS circulation system was developed in the late 1980s, data requirements were set by individual libraries, so that data are "not consistent across the collection," says Lamberth. "That is an area that will have to be addressed, to allow us to more fully participate in outside consortial endeavors such as Borrow Direct," the inter-library loan system used by the rest of the Ivy League. John G. Palfrey VII, a professor and Ess Librarian at Harvard Law School, who chaired the task force's technology working group, says that new technologies "need to become a driver of collaboration across the University's many libraries and beyond," rather than an inhibitor of working together. Harvard's libraries, he says, faced with an historic moment of transformation, can serve researchers everywhere "more effectively and efficiently than we do today if we play our cards right with respect to technology integration and development."

Collaborations that don't require integration have begun already: for example, China's national library is paying to digitize some of the rarest holdings in the Harvard Yenching Library. And Harvard is reportedly far along in talks with MIT (already a Harvard Depository client) on how the two institutions' libraries could work together. (Cornell and Columbia's libraries have announced a Mellon Foundation-funded plan to try sharing collections and the cost of digitization, for example. But collection-sharing will require improvements to Harvard's library data systems.)

More students are using the libraries than ever, says Darnton, and not just from their rooms via computer: "their bodies are also present in the buildings." The future is digital, he says—"That much we know. Meanwhile, we occupy what I refer to as a transitional phase... in which printed works and digital works must coexist and be mutually reinforcing. The digital future is exhilarating, and will enable us to open up the Harvard libraries and share our intellectual wealth. Part of me says, 'Eureka!' because it is the most exciting thing imaginable for a library. But then the other side of me crashes into a reality determined by the budget," and the "distastrous last year" when acquisitions fell "precipitously."



Illustration by Mark Steele

## Further Financial Fallout

UNDERSTANDABLY, the *Harvard University Financial Report* for fiscal year 2009, published in mid October, is dominated by the plunge in value of the endowment (see “\$11 Billion Less,” November-December 2009, page 50). But it also documents previously undisclosed blows to the University’s fisc, notably including:

- \$1.8 billion of losses incurred in the “general operating account”—the principal cash funding mechanism for University operations—where assets, invested like the endowment’s, absorbed proportional declines in value; and

- additional losses, which may ultimately exceed \$1 billion, on Harvard’s interest-rate swaps associated with its borrowings.

The deflation in Harvard’s investments extended beyond the endowment (valued at \$26 billion this past June, down from \$36.9 billion at the end of fiscal 2008). The report draws attention to losses in the “University’s portfolio of pooled cash balances” or General Operating Account (GOA)—the funds used to pay the bills. This asset pool receives, manages, and disburses cash balances held by Harvard’s schools, academic centers, and the administration, but many of its assets have been invested alongside the endowment in what is called the General Investment Account—a step meant to generate returns far exceeding those of money-market instruments. In recent years of strong investment returns, that strategy benefited contributors and users of the funds. But during the past fiscal year, falling and illiquid markets produced losses of \$1.8 billion.

Changes in accounting and financial reporting make it difficult to ascertain the disposition of GOA funds over time—and more detailed explanations have not been forthcoming. But it appears that GOA net assets doubled during the decade, to about \$6.6 billion in fiscal 2008. During that time, the University sums reported as cash and short-term equivalents held roughly constant at between \$1 billion and \$2 billion in most years, while “funds functioning as endowment,” from all sources, more than doubled—peaking at about \$9 billion in fiscal 2008; GOA assets accounted for within “pooled general investment net assets” (as first reported for fiscal 2005) rose from \$3.4 billion then

to peak at about \$5.5 billion in fiscal 2008.

Although a decision was made during fiscal 2008 to “reduce the risk profile of the University’s pooled cash investments,” and implementation had begun, according to the financial report, the chaos that erupted in the fall of 2008 disrupted that transition and made it impossible to shield the GOA.

The decline in the value of investments, payments on swap losses and the infusion of the remaining proceeds from new debt offerings (see below), and other fund flows combined to reduce the GOA’s net asset balance to \$3.7 billion at the end of fiscal 2009 from the \$6.6 billion of a year earlier. The \$11-billion decline in the value of the endowment is thus only part of the story: the value of Harvard’s net assets *overall* declined from \$44.2 billion to \$30.1 billion. And the decline in the GOA, like the loss of endowment value, represents a further reduction in wealth and future income.

In an October 17 *Boston Globe* story headlined “Harvard admits to \$1.8b gaffe in cash holdings,” reporter Beth Healy quoted a statement from University treasurer James F. Rothenberg to the effect that responsibility for the investment decisions and resulting losses in the GOA did not “sit with a single individual: the Corporation plays a role, the University’s financial team, including the CFO, play a role, and I play a role as treasurer.” (Neither her article nor Steven Sayre’s October 20 *Globe* column, “More red than crimson,” on sound cash management, appeared in the daily electronic news links circulated within the University.)

In an interview with the Harvard news office posted October 16, Rothenberg said all the endowment, GOA, and swap losses “were a function of last year’s extraordinary market conditions.” Asked if “the University’s investment strategies square with its responsibility to steward endowment funds,” Daniel S. Shore, vice president for finance and chief financial officer, told the news office, “There does need to be a balance between investing for long-term returns and managing for near-term needs, and we are now more conscious than ever of that balance....”

Responding to a query about “the Corporation’s responsibility for those investment decisions,” Rothenberg said, “The President and Fellows have ultimate fiduciary responsibility for the University, including its finances. We take that respon-

sibility very seriously, and we devote quite a lot of our time, especially these days, to matters of financial strategy and planning, thinking about how to balance present and future needs.” Direct investment management, he noted, is conducted by Harvard Management Company (HMC), whose board he chairs. “There weren’t any reliable predictors of precisely when and how a global economic crisis would unfold,” he said, “and there were valid arguments for why the strategies in place made sense both when they were made and right up until last fall.” In the future, he said, “I think the likelihood is that the University will continue to invest portions of pooled cash alongside the endowment, but likely not to the same degree.”

Beyond the GOA losses, the report also refers delicately to “realized and unrealized losses on interest rate exchange agreements held by the University as part of the financing strategy for its capital program.” As previously reported (*Breaking News*, [harvardmagazine.com](http://harvardmagazine.com), December 19, 2008), the “notional” value of such swap agreements soared from \$1.4 billion to \$3.7 billion during fiscal 2005, when Harvard put in place forward interest-rate agreements to finance then-anticipated rapid campus development in Allston. The fair value the University would have paid to terminate those agreements, a volatile sum related to market interest rates, ballooned to \$330 million at the end of fiscal 2008.

During the chaotic financial conditions of late 2008, problems arose in refunding very short-term debt instruments, and central banks pushed interest rates to record lows. That put Harvard in a double bind of refinancing its borrowings and covering its rising obligations under the swap agreements. As the annual report notes, the “unprecedented” fall in interest rates caused the University’s swap agreements “to incur sudden and precipitous declines in value, which in turn led to significant increases in associated collateral pledged to counterparties, creating liquidity pressures on the University.”

In response, Harvard terminated such agreements with a notional value of \$1.138 billion during the year, buying its way out with cash payments of approximately \$500 million. But it also entered into new swap agreements with a notional value of \$764 million—structured to offset other, existing swap agreements—yielding unre-

alized losses of a further \$425 million. This is, in effect, a financing transaction, locking in losses which will have to be realized in the future, but immunizing Harvard today from still steeper losses should interest rates remain adverse relative to the assumptions underlying the original swaps. Finally, the University remains exposed to risks amounting to an *additional* \$250 million of swap-related losses, not hedged by offsetting transactions, as of last June 30.

Thus, during the year, Harvard realized and paid for a half-billion-dollars' worth of swap-related losses, and ended the year with about \$675 million of unrealized losses remaining (the fair value of the swap portfolio, with a notional value of \$3.14 billion): about \$425 million locked in by offsetting swaps, and \$250 million of remaining exposure subject to the market.

In the news office interview, Rothenberg said of Harvard's strategy, "Compared to most universities, our use of interest-rate swaps was certainly larger because the projected capital program that we were looking at was larger": the planned construction in Allston was "a major focus, and we were planning that expansion aggressively." He

did not respond to requests for further comment on the assumptions made earlier in the decade. At the time the financings were arranged, in December 2004, Allston plans had been outlined broadly, but there were no public, detailed programs even for the first science building (the architect was announced in February 2006) or the relocated education and public-health campuses proposed for resiting there. Design work and Boston's regulatory review and permitting would have followed. Even now, the Charlesview housing project in the center of the area seems unlikely to be relocated (to a Harvard-owned site farther west) for at least a few years. And the first, fast-tracked science complex—on which below-ground work has proceeded, but whose status and schedule are now under review (see "A New Economic Reality," May-June 2009, page 48)—would not have been occupied before 2011.

TURNING FROM these financial losses to the University's continuing operations, Shore and Rothenberg write in their annual letter, "Notwithstanding the challenges we have faced during fiscal 2009, Harvard's fi-

ancial foundation is strong and will continue to enable the University to deliver on its guiding purposes: to achieve excellence in research and education; to prepare students for leadership and for lives of meaning and value; to advance the course of knowledge and ideas; and to serve society" (see the full text at <http://vpf-web.harvard.edu/annualfinancial>). In a conversation, Shore said that once the challenges became clear, the University set about adapting to what the report calls "a new economic footing" after an adverse period in which, he said, Harvard "certainly lost significant wealth."

As evidence of that adaptation, in the fiscal year ended last June 30, the University achieved an operating surplus of \$71 million, up from a \$17-million surplus a year before. That result reflects both revenue growth budgeted before the financial crisis and ensuing recession and efforts to cut spending progressively as the extent of the problem became clearer.

Revenues grew a vigorous \$345 million, or nearly 10 percent, to \$3.83 billion—actually accelerating from the prior year. In both years, distributions from the endowment were the driving factor: in 2009,

## "Two Radically Different Worlds"

In his annual dean's report, released for the year's second Faculty of Arts and Sciences (FAS) meeting on October 27, Michael D. Smith necessarily found himself covering "a time that straddles two radically different worlds"—before and after the global financial crisis. The period under review, from early 2008 through the fiscal year ending on June 30, 2009, brought a "seismic change" in FAS's finances, Smith wrote, but not its goals: renewing the undergraduate experience; supporting "existing and emerging intellectual communities"; and strengthening teaching and learning. Aspirations to "reshape our physical environment" to support academic aims, he acknowledged, will perforce be slowed given the financial reality of Harvard's shrunken endowment. (He spelled out the financial prospects in a briefing on September 15; see "FAS's Progress—and Prognosis," November-December 2009, page 58.)

Smith used the report (available at [www.fas.harvard.edu](http://www.fas.harvard.edu)) to initiate much more detailed, and revealing, disclosure of FAS finances, discussed below; as is customary, he first reviewed accomplishments and goals—beginning with thorough changes in management meant to enhance information and better tie academic plans to budgets. Those changes, he emphasized, helped

FAS respond to the endowment losses and resulting drop in its own operating funds by \$50 million this year and still more next year.

On matters academic, Smith pointed to the launch of the undergraduate General Education curriculum. He also highlighted efforts to make pedagogy more active in both the arts and humanities and the social sciences, with art-making present in 25 courses, and "activity-based learning" tying classwork to extra-curricular work in anthropology, government, history of science, and sociology.

In the Graduate School of Arts and Sciences, he noted, new enrollments declined, as planned: 665 master's and doctoral candidates entered this fall, 15 percent fewer than in the prior year. Stipends were increased modestly, maintaining prior years' gains in support for graduate students. Meanwhile, the School of Engineering and Applied Sciences (SEAS), which has expanded its faculty rapidly, is now constrained by limited physical facilities—a problem worsened by slowed plans for Allston development and the resulting need to locate stem-cell researchers and part of a new bioengineering program in Cambridge. (For more on SEAS, see "Critical Mass, and World-Class," November-December 2009, page 62.)

Smith described the Harvard College Library (HCL) starkly, as suffering from the "increase in publishing output" and the pressures on purchasing given the "diminished strength of the dollar"—even before recent belt-tightening (see page 41). The major goal, he said "will be to rebuild HCL with a dramatically smaller base of resources," which will require "bold, innovative,

funds from the endowment distributed to support University operations increased \$241 million, or a robust 20 percent, to \$1.44 billion, thus accounting for nearly 38 percent of University operating revenue. That was four percentage points *more* than in the prior year. Every unit but the Graduate School of Education and the School of Engineering and Applied Sciences depended more heavily on endowment income in 2009 than in 2008.

Those trends will now reverse. In the current fiscal year, the operating distribution is forecast to decrease by 8 percent, or more than \$100 million; and in fiscal 2011, the distribution is likely to decrease a further 12 percent from the now-reduced level—an additional \$150 million or so.

Other sources of revenue were mixed. Support for sponsored research rose about 7 percent, to \$714 million. But revenue from students declined 1 percent, to \$678 million, as higher tuition and fees were more than offset by a 20 percent increase in scholarships applied against such income. Current-use giving rose 23 percent, to \$291 million (a huge bequest and another large gift to the Faculty of Arts and Sciences accounted for

Unfortunately, the stand-out expense item is rising sharply: the University incurred about \$58 million in increased interest costs. It appears that the interest expense will rise another \$50 million to \$60 million this year.

60 percent of the gain); but giving overall declined by \$93 million, to \$597 million, as gifts for endowment funds plunged \$142 million (42 percent).

Expenses grew \$291 million, or 8.4 percent, to \$3.76 billion. Salaries, wages, and benefits—49 percent of total expenses—increased 11 percent, to \$1.84 billion. But included in that total is \$59 million in one-time severance and benefit costs associated with the staff early-retirement-incentive program and layoffs, which together resulted in the departures of more than 800 employees last spring (see “Finding a New Footing,” September-October 2009, page 44). Adjusting for those costs, compensation expenses were still up more than 7 percent—perhaps in part for hiring associated with sponsored research. That growth un-

derscores the pressure to maintain controls on filling open positions, to restrain faculty appointments, and to consider whether to extend the salary freeze for faculty and non-union staff beyond the current year. (It also helps explain the early-retirement incentive offered to 180 tenured professors—see Breaking News, [harvardmagazine.com](http://harvardmagazine.com), December 2, 2009.) Meanwhile, Shore said, “We got a good, honest start” on reining in discretionary “other expenses” (purchased services—from consultants to janitors—as well as travel, publishing, postage, telephone, and so on).

Unfortunately, the stand-out expense item is rising sharply. According to the report, the University incurred about \$58 million in increased interest costs. That reflects the issuance of nearly \$1 billion of

and creative initiatives, rather than modest, incremental changes” and likely produce “a vastly different organization.”

**One visible fruit** of Smith’s efforts to improve management is an expanded discussion of FAS’s income and expenses. The published details usefully complement the broad financial trends sketched during his September 15 briefing.

Cost reductions and two nonrecurring items boosted the faculty’s flexible, unrestricted reserves by \$58.6 million during the past fiscal year, a valuable cushion for the future. First, FAS received two unrestricted gifts totaling \$32 million. Second, Smith disclosed that as part of a fiscal year 2008 “strategic” payout of endowment capital, FAS was able to spend \$20 million in fiscal 2009 to defray the increased costs of the financial-aid initiative for middle-income undergraduates unveiled in December 2007 (see “Boosting College Financial Aid,” March-April 2008, page 54). This year and in the future, those extra costs must be covered by FAS’s regular, unrestricted operating budget. (Undergraduate financial aid increased from \$106.8 million in fiscal 2008 to \$137.2 million last year; the cost is expected to rise some \$10 million more this year.)

A footnote partially discloses other uses of that special, \$95.3-million “decapitalization” from fiscal 2008—most of which was applied to the 2008 and 2009 budgets: part funded capital projects (the principal use of a similar, \$100-million decapitalization in fiscal year 2007, according to Smith’s May 2008 annual report) and one-time expenses. But part was applied “to fund the FAS core unrestricted deficit” (nei-

ther amounts nor affected fiscal years are specified).

FAS’s construction-related debt rose to \$994.5 million at the end of fiscal 2009, from \$938 million a year earlier. Debt service totaled \$86.4 million, up 28 percent from the prior year. In the future, given constraints on University debt issuance and on FAS’s ability to service its existing construction-related debt (in light of other expenses and constrained revenues), it is difficult to imagine sustaining comparable levels of capital investment.

Two final items illuminate the relationship between FAS—and by proxy, other Harvard schools and academic units—and the central administration. In fiscal 2009, FAS reported an endowment decapitalization of \$81.8 million for “central administrative overhead”—its share of the half-percent assessment for the “strategic infrastructure fund” (SIF) used to defray Allston-related development expenses (a total of \$176 million University-wide for the fiscal year). A separate footnote spells out FAS’s “University Assessment,” a levy of 2.6 percent on the faculty’s total operating expenses to pay for legal, accounting, information-technology, and other services provided by the central administration. That assessment, at the same rate for all schools, is based on their expenses of two years earlier; for fiscal 2009, FAS paid \$28.9 million.

From the central administration’s perspective, these formulas signal leaner years to come. The SIF distribution will fall sharply, reflecting the much-reduced value of the endowment; and the University Assessment may come under pressure to the extent that schools’ expenses flatten or decline in the future as their operating distributions from the endowment are reduced.

fixed-rate tax-exempt bonds during the year, with an effective annual interest rate of 5.4 percent (well above the cost of the short-term variable-rate notes paid off in part with the proceeds), and of \$1.5 billion of taxable bonds at a 5.8 percent rate. Because that debt was on the books for only about half of fiscal 2009, it appears that the added interest expense will rise by an *additional* amount of the same magnitude—another \$50 million to \$60 million—this year.

Capital spending and property acquisitions totaled \$644 million, up about \$50 million from fiscal 2008. Major projects included the Law School's Northwest Corner

complex; the prospective renovation and expansion of the Fogg Art Museum; and the Allston science complex. Shore said Harvard was "still in the process of planning and thinking about the options for all" major construction projects: design details, construction costs, and financing are still being reevaluated.

Unanticipated but significant projects are the renovation and relocation of Cambridge laboratories to accommodate stem-cell scientists, and similar work in the Longwood Medical Area for bioengineering researchers; both groups had been assigned to the Allston complex. These extra

costs will be covered by the Allston-related infrastructure fund (the half-percent annual administrative levy on endowment accounts yielded \$176 million in fiscal 2009).

No other significant work is in the pipeline. Instead, Shore noted, Harvard must identify appropriate interim uses for the Allston properties it has acquired but now will not occupy or redevelop soon. He said institutional uses, codevelopment options, and private use by other investors might be considered.

SHORE DID NOT FORECAST University expenses for the current fiscal year, nor

## Faculty Diversity Developments

The number of ladder faculty members at Harvard (professor, associate professor, assistant professor) rose by 96 (7 percent) from 2003-2004 to the current academic year: a period during which women made gains, but—among underrepresented minorities—black and Latino professors showed only slow progress. The data were published in November in the annual report of the Office of Faculty Development and Diversity (FD&D—[www.faculty.harvard.edu](http://www.faculty.harvard.edu)). Ironically, in the current economic climate, further progress may come principally from retirements by full professors, who constitute two-thirds of the faculty.

Women now hold 26 percent of Harvard's ladder-faculty po-

sitions (395 out of 1,507) and minorities 17 percent (258 positions) according to the report. Both groups are much more heavily represented in the junior ranks.

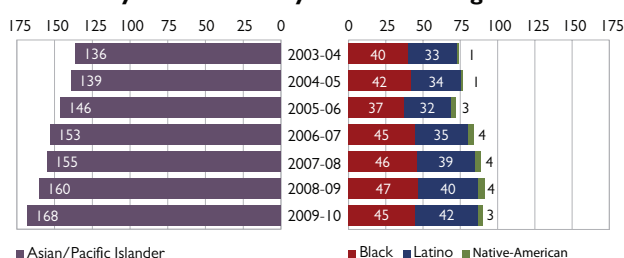
The data, published under the auspices of senior vice provost and FD&D director Judith D. Singer, show that within the Faculty of Arts and Sciences (FAS), women hold 22 percent of the senior professorships, but 37 percent of the junior appointments. Women hold 23 percent of the full professorships in social sciences, 32 percent in humanities, 12 percent in natural sciences, and 9 percent in engineering. It's a different story lower down the ladder: 46 percent of junior-faculty members in social sciences are women, 40 percent in humanities, 28 percent in natural sciences, and 22 percent in engineering. In the professional schools, the proportion of women in the full-professor ranks ranges from a low of 14 percent in the dental school and 16 percent in the medical school (excluding the faculty in the affiliated hospitals) to highs of 36 percent in divinity and 37 percent in education (where Singer herself is Conant professor of education).

The population of minority faculty members remains small, with Asian/Pacific Islanders accounting for 168 ladder positions (and for two-thirds of the growth in the past six years), and black, Latino, and Native American professors as a whole holding just 90 positions—respectively, 3 percent, 3 percent, and 0.2 percent of the faculty overall.

The number of women faculty members has risen by 55 (or 16 percent) during the past six years. The number of black faculty members has risen by just five since 2003-2004, to 45. From 2003-2004 to the current year, the share of junior-faculty appointments held by women has risen from 34 percent to 36 percent, while the proportion of senior-faculty appointments has risen by 3 points, to 21 percent.

Today—with new hiring slowed significantly in FAS, the largest faculty (about half the University total), and retirement incentives offered to 180 tenured professors (see [harvardmagazine.com](http://harvardmagazine.com), Breaking News, December 2, 2009)—the proportionally higher representation of women among junior professors would tend to increase diversity in the wake of senior-faculty retirements, all other factors held equal. Given the very small number of black, Latino, and Native American junior professors, the effect of retirements on further diversifying the faculty from among these underrepresented groups would be negligible.

Minority Ladder Faculty 2003-04 through 2009-10



Women Ladder Faculty 2003-04 through 2009-10



## Rhodes and Marshall Roster

Five Harvard students and recent graduates have been awarded Rhodes scholarships: Roxanne E. Bras '09, an economics concentrator from Celebration, Florida; Darryl W. Finkton '10, a neurobiology concentrator from Indianapolis; Jean A. Junior '08, a sociology concentrator from Troy, Michigan; Eva Z. Lam '10, a social studies concentrator from Milwaukee; and Grace Tiao '08, an English concentrator from Marietta, Georgia. Samuel Bjork '09 ('10), a chemistry concentrator from Minneapolis, was awarded a Marshall Scholarship; he served as one of this magazine's Berta Greenwald Leducky Undergraduate Fellows during the 2007-2008 academic year.

## Public Servants

The University celebrated "Public Service Week" (October 19-25), with events ranging from an Institute of Politics forum with David Axelrod (adviser to President Barack Obama, J.D. '91), a speech by Massachusetts governor Deval Patrick '78, J.D. '82, and a conversation between President Drew Faust and Secretary for Housing and Urban Development Shaun Donovan '87, M.Arch.-M.P.A. '95, to job-counseling and recruiting sessions in various professional schools. A new website, <http://service.harvard.edu>, gathers information on such activities.

## Where Rabbit Rests

Houghton Library has acquired the personal papers of literary polymath John Updike '54, Litt.D. '92, including manuscripts, books, photographs, correspondence, artwork, and other material. Separately, the National Library of China has agreed to help underwrite the digitization of the entire 51,500-volume collection of rare Chinese books housed in the Harvard-Yenching Library. The

# Brevia



**A DEAN'S DEPARTURE.** Jay O. Light, who was appointed interim dean of Harvard Business School (HBS) in August 2005 and dean the following April, announced on December 2 that he will step down from the post and retire from the faculty at the end of this academic year. Light, who is Baker professor of business administration, joined the faculty in 1969. As dean, he oversaw completion of HBS's \$600-million capital campaign, launched in 2002; it increased fellowships significantly, endowed the doctoral program, funded a new teaching and learning center, and enabled the school to overhaul and expand Baker Library, among other capital projects. HBS's global presence has extended to a research office in Mumbai (opened in 2006) and an HBS-University center in Shanghai (2008). Light led HBS through its centennial celebration in the fall of 2008, during the height of the world financial crisis; since then, faculty members have been making concerted efforts to adapt the school's curriculum and teaching to reflect new material on risk, financial regulation, and changes in the capital markets. A specialist in finance and asset management, Light is a director of Harvard Management Company, which invests the endowment; he will continue in that and other nonprofit roles. President Drew Faust hailed Light as "an exemplary leader in a school dedicated to the understanding and practice of leadership," and said she would move quickly to appoint a search committee to identify his successor.

six-year project will make their contents available to scholars worldwide,

while reducing wear and tear on the works themselves.

## Going Greener

The University has announced its intent to buy half of the electricity generated by the Stetson Wind II facility, to be developed in Danforth, Maine, by First Wind. The project, encompassing 17 turbines, each rated at 1.5-megawatt capacity, is scheduled to come on line in the middle of 2010. According to Harvard's announcement, the power from the contract, which runs for 15 years, equals more than 10 percent of the electricity consumed on the Cambridge and Allston campuses (247 million kilowatt hours in 2008).

## Changing of the (House) Guard

During the Thanksgiving break, the leaders of two undergraduate Houses announced that they would step down at the end of the academic year. Lino Perutile, Pescosolido professor of Romance languages and literatures and master of Eliot House, and Anna Bensted, a radio producer who is co-master, will conclude a decade of service. Jay M. Harris, Wolfson professor of Jewish studies and master of Cabot House, and co-master Cheryl L. Harris, a school psychologist, will step down, too, after seven years. Jay Harris is also dean for undergraduate education, in which capacity he oversees the introduction of the new General Education curriculum, a particularly heavy responsibility at present.

## On Other Campuses

As Harvard considers how to adapt its library system to digital demands and diminished resources (see pages 41 and 46), the Andrew W. Mellon Foundation has awarded \$385,000 to Columbia and Cornell to develop a potentially expansive collaboration between the

two universities' research libraries.... University of Chicago president Robert J. Zimmer has outlined plans for systematic, "gradual expansion of the faculty" during the next five years, and announced an 11-story, \$114-million arts complex, encompassing theaters, galleries, classrooms, and studios.... Amherst, in the midst of a capital campaign, received anonymous unrestricted gifts of \$100 million and \$25 million.... And Yale faculty members have begun to populate its new scientific "West Campus," establishing a microbial research institute at a 136-acre former pharmaceutical complex purchased in 2007. Cell biology, genomics, and small-molecule screening facilities were expected to be operating by the end of 2009.

### Public-Service Restructuring

Faced with soaring student demand and more constrained finances, Harvard Law School has revised its support for student public-service work. The Public Service Initiative, launched in 2008, which waived third-year tuition for students who committed to spending five years in public-service work, will cover current commitments but not be offered to students enrolling this fall. Summer public-interest support will be offered for eight weeks of work during 2010, down from 10 weeks in the past. Dean Martha Minow said that financial-aid spending overall would increase \$2.7 million. But limited offers of private employment, a surge of students pursuing public service, and a decline in endowment dis-

tributions have jointly forced the school to use its aid resources differently.

### Nota Bene

FOR OLD TIMES' SAKE? Graduates who returned to campus on October 23-24 for the Harvard Alumni Association's inaugural Harvard College Homecoming Weekend were invited to "enjoy a hot breakfast in their old House" (\$9 per capita). But this was not just a stroll down memory lane: although budget cuts have limited current students to cold breakfasts in House dining rooms during the week, Saturday breakfast and Sunday brunch are still hot meals.

CIOs TO GO. Dan Moriarty, Harvard's chief information officer since 1999, left



Dan Moriarty

the position at the end of October; executive vice president Katie Lapp and provost Steven E. Hyman will lead the search for a successor. The Faculty of Arts and Sciences is seeking a new CIO as well, so the positions will be coordinated as the University seeks ways to streamline its information-technology systems and to save costs.

A CENTURY...AND CHANGE. Harvard Extension School having attained a landmark age (see "Extension School Centennial," September-October 2009, page 47), it is about to change its name. The proposed new title, the Harvard School of Continuing and Professional Studies, would recognize its dual mission of providing both liberal-arts and career-oriented courses and degree programs. If the Faculty of Arts and Sciences approves, the school will confer degrees such as the "Bachelor of Liberal Arts" and the "Master of Liberal Arts" and "Master of Professional Studies," succeeding the current, but fusty, degrees "in extension studies."

MEDICAL HOMECOMING. Cardiologist Elizabeth G. Nabel, director of the National Heart, Lung, and Blood Institute, who was reportedly a candidate for the Harvard



NHLEI

Medical School dean - Elizabeth G. Nabel ship in 2007 (she declined for family reasons), has now been appointed president and CEO of Brigham and Women's Hospital, one of the school's major teaching affiliates effective January 1. Nabel did her internship and residency at the hospital; another resident was Gary J. Nabel '75, M.D. '79. Ph.D. '82—now her husband.

### DOOMED TO REPEAT OURSELVES.

In the spirit of the times, Baker Library Historical Collections at Harvard Business School has mounted an exhibition titled *Bubbles, Panics, & Crashes: A Century of Financial Crises, 1830s-1930s* (on display through May 3 and at [www.library.hbs.edu/hc/crises](http://www.library.hbs.edu/hc/crises)). "Run on 19th Ward Bank," undated, depicts a fate America has avoided in its latest panic, thanks to New Deal-era regulations and the current, massive infusions of federal funds to shore up financial institutions. But the fevered overdevelopment of housing and other real estate, particularly in Florida and the Southwest earlier in this decade, sadly has frequent precedents, as witness this September 14, 1925, *Florida News* "Real Estate Investors Guide"—documentation of the peak of that decade's delusional real-estate bubble.



the likely change from 2009. Harvard has set its endowment distribution to the various schools at a lower level, but other factors—sponsored research support, the volume of giving—will still affect revenues and expenses. Most schools have some reserves (for instance, see “FAS’s Progress—and Prognosis,” November–December 2009, page 58) to help buffer the budget cuts they would face otherwise.

Shore also pointed to longer-term opportunities for administrative savings, in functions ranging from procurement to the provision of human-resources expertise to information systems and technology. The goal, he said, is not simply to centralize, but to find the best performers and practices, adopt “different aggregations of activities,” and realize economies across the institution. Such savings, he said, are meant to support academic aims—preserving junior-faculty slots, for example: just one item among those at the core of Harvard’s mission.

From a financial manager’s perspective, Shore said, the new reality means maintaining a much more flexible posture toward plans and budgets, testing diverse scenarios at different revenue levels, and helping the whole community cope with heightened uncertainty by assuring that Harvard can be kept appropriately nimble. A Financial Management Committee (expanded to tap alumni and faculty expertise, and including both Rothenberg and HMC president and CEO Jane Mendillo) is better integrating University and endowment perspectives on risk, risk management, liquidity, and investment opportunities. It advises Shore himself, Katie Lapp (the new executive vice president), and through them, President Drew Faust and the Corporation, where financial policies and endowment distributions are finally vetted and approved.

In any event, Shore said, the critical balance remained the same: not cutting budgets so deeply now that essential activities were irreparably harmed, but not treading so lightly that cutting would have to extend many years into the future to restore distributions from the now-reduced endowment to a sustainable level. If the balance can be set properly, he said, once investment returns strengthen, Harvard will find itself sooner able to increase those distributions once again, to support essential academic work and innovations.



## Radcliffe’s New Life

TEN YEARS AGO, Radcliffe ceased to exist as a college. But reincarnated as the Radcliffe Institute for Advanced Study (RIAS), it has done anything but fade quietly into history. Where some saw the end of an era, those guiding Radcliffe forward saw the potential for a new kind of greatness. Both the trustees of Radcliffe College and those acting on Harvard’s behalf “really did want to create something not just constructive, but imaginative and powerful,” Neil L. Rudenstine, the University’s president at the time of the institute’s creation, recalled at a symposium held October 8 and 9 to mark its tenth birthday.

Those founders wanted “a refuge for scholars” that would also be “an active participant in advancing the University’s intellectual agenda,” the institute’s current dean, Barbara J. Grosz, said at the symposium. Grosz, who is also Higgins professor of natural sciences, joined the institute in 2001 as its first dean of science. (She became dean in 2008, after inaugural dean Drew Faust left for higher office.) In a November interview, Grosz said RIAS had met its major goals for its first decade: establishing an excellent fellowship program that draws scholars from a wide range of fields and advances thinking in culturally current areas such as stem-cell science and new media. The task for the next 10 years, she said, is rounding out the balance of RIAS’s offerings and integrating them more fully within Harvard.

That the fellowship program has blossomed is clear from the list of honors won by past fellows, including at least five Pulitzers, 14 Guggenheims, and one Mac-

**Panelists at the tenth-anniversary symposium discuss how their time as Radcliffe Fellows helped them bridge boundaries between genres. From left to right: English professor Leah Price, painter Beverly McIver, filmmaker Jeanne Jordan, composer Tarik O’Regan, filmmaker Anne Makepeace, and lawyer Hauwa Ibrahim.**

Arthur. In fact, Harvard Overseer Susan Wallach ’68, J.D. ’71, who was a member of the Radcliffe College Board of Trustees at the time of the merger, noted at the symposium, “It is harder to get a Radcliffe Fellowship than it is to get into Harvard College.” The program—which accepts 6 percent of applicants, compared to the College’s 7 percent—holds such strong appeal, Grosz said, because Radcliffe Fellows “don’t do their work isolated, on their own. They do it as part of a community of scholars, scientists, and artists.”

The program also enriches Harvard’s academic life through fellows’ talks and their participation in academic conferences, among other things. Radcliffe professorships also help the University recruit sought-after scholars with the prospect of spending two years (of their first five as Harvard faculty members) as Radcliffe Fellows.

The institute “plays an especially important role for undergraduates interested in pursuing academic careers” by enabling interaction with scholars from around the world, says Scott Duke Kominers ’09, who regularly attended fellows’ presentations, lectures, and teas at RIAS as an undergraduate—and continues to do so as a first-year student in the business-economics Ph.D. program offered through the Business School and the Graduate School of Arts and Sciences.

The fellows are, thus, not “individu-

als isolated from the life of the University," but "integral to the academic life of Harvard"—precisely what RIAS's framers envisioned, said symposium speaker Harvey V. Fineberg, who was University provost at the time of the merger. Today, says Grosz, "We need to more fully realize our role as an integral part of the University—one that fosters and enhances the academic work of Harvard faculty."

To that end, RIAS has launched a suite of Academic Engagement Programs (AEP), with six Harvard faculty members (two each in the arts and humanities, social sciences, and natural sciences) appointed as leaders. For one example, the directors for the social sciences—Aetna professor of public policy and corporate management Brigitte Madrian and Ford professor of the social sciences Robert J. Sampson—are leading a multidisciplinary group of scholars in designing the Boston-based "City as Social Science Laboratory" initiative, which will bring together academics, policymakers, and city leaders for policy and program development in areas such as crime, education, healthcare, and housing.

Meanwhile, without backing away from the heavy emphasis it placed on science programming in its first decade, RIAS is also aiming to bring the social sciences and the humanities to the forefront. Though the fellowship program always included a strong contingent of artists—reflected in a riveting panel on fiction writing and rich presentations of artworks during the anniversary symposium—the AEP leaders

are working with their Harvard faculty peers to solicit proposals for themed conferences (open to the public) and seminars (in which scholars from around the world, and often from different disciplines, assemble at RIAS to share their work with each other). The coming year's offerings include a conference on gender and space in April, and another, on the history and future of the book, in October.

SPEAKERS at the anniversary symposium used archival sources to illuminate not only how people saw Radcliffe—and what its leaders and its students wanted it to be—throughout its history, but also the changing role of women at Harvard. Reading from a *Crimson* article published her freshman year, journalist and cultural critic Susan Faludi '81, RF '09, demonstrated how differently women were seen on campus even then. Chronicling a meeting of the Harvard Dames, a group for graduate students' wives, the article quoted the club's president as saying it had been founded "to keep wives off their husbands' backs during exam time."

Much *has* changed, and Radcliffe's graduates and the College itself were instrumental in those changes. Even as its work cuts across all disciplines, the institute has held onto its Radcliffe heritage through programming on women and gender and by selecting fellows who focus on these issues. Speaking at the symposium via video from Paris, Mary Maples Dunn (the institute's interim dean in its earliest days,

before Faust's appointment) said, "While men aren't excluded, women are still at the center."

In some ways, status as an institute has added to Radcliffe's value as a resource for those who study women's issues. As an example, Dunn cited the expanded holdings of the Schlesinger Library on the History of Women in America: during the last decade, increased funding has enabled the library to acquire 23,400 printed volumes, some 8,700 audiovisual items, and 1,800 manuscripts. The library is also venturing into new media, devising ways to make personal archives in digital formats (e.g., e-mail) accessible to researchers; creating a website that showcases the contents of women's travel diaries from the library collections; and archiving blogs that feature underrepresented voices and topics.

Supporting scholars and artists; emphasizing interdisciplinary collaboration; working at the leading edge of science; forging ahead into new media: this list of the institute's top priorities matches closely the priorities of the University as a whole. This echo surely stems in part from the fact that in Faust, both entities have had a common leader. But RIAS, smaller and nimbler, has in some respects leapt ahead of the University. As Fineberg put it: "Harvard has been moving to become more like Radcliffe."

*Read a longer account of the tenth-anniversary symposium, with links to other relevant articles and websites, at [harvardmagazine.com/radcliffe-10th](http://harvardmagazine.com/radcliffe-10th).*

## THE UNDERGRADUATE

# January Reading

by SPENCER LENFIELD '12

THERE WILL BE no intersession at Harvard College this year. Instead, due to calendar reform and budget shortfalls, we will have nearly the entire month of January as part of our winter break, rather than elective academic options as originally planned. This drew a surprising amount

of criticism from undergraduates. Editorial upon ardent editorial ran in the *Crimson* lamenting the demise of "J-Term" and its promise of "structured programming." Some 1,400 students petitioned feverishly to be allowed to stay on campus in January anyway; nearly all are being allowed to do so, for reasons ranging from sports

to thesis research. Never have I heard so much opposition to an extended vacation.

The reality is that, no matter how much Harvard undergraduates complain about strictures and requirements in general, we actually tend to like being told what to do. We thrive on requirements, regulations, and "structured" programs of all sorts: after all, most of us got into Harvard by being very good at following them. It is consequently unsurprising that many students balked at having to occupy themselves for an entire month, preferring instead that the University take on that responsibility. Yet all is not lost. Most undergraduates also got in by having a strong self-motivated streak, and will figure out

something to do with January. Perhaps that will even involve a book.

THE “J-TERM” REACTION illuminates aspects of another absence from the “structured programming” at Harvard: a “Great Books” curriculum, whether mandatory, like Columbia’s Core, or elective, like Yale’s Directed Studies. The lack of such an option occasions much contention and exasperation among both students and faculty whenever it arises. Faculty members tend to regret the failure to provide a comprehensive, “foundational text”-based course of study for willing students, the loss of a common body of knowledge, and the consequent difficulty of fostering a shared academic discourse among undergraduates. Students mention all the same reasons, but usually only after something else: a sense of what one should read, but hasn’t.

“I’ve never read Zola,” I had to admit to a friend over dessert when she brought up the highly idiomatic nature of the French in *L’Assommoir*. If only the list stopped there. Among hundreds (thousands?) of other “great books,” I’ve also never read *Moby-Dick*, *Things Fall Apart*, *Middlemarch*, or anything by Hume, Hardy, Aquinas, or Mann. I like to think that I’m fairly well-read for a sophomore History and Literature concentrator, but the breadth of the “what one should read” is daunting enough to humble even the most self-consciously lettered undergraduate. No matter how much you’ve read, there will always be something that you haven’t quite gotten to yet.

It’s only natural for students to have developed different interests and read different books, and to take different courses with different reading lists while they’re at Harvard. As a result, conversations about

literature and ideas between undergraduates are often marked by a working-out of common ground. “Have you read...?” “No, I haven’t, but you might be interested in....” Consequently, you quickly acquire a massive reading list of recommendations from friends, professors, and your own curiosity. I doubt that having a great books program would change this much, nor should it: sharing idiosyncrasies as growing readers and thinkers is an essential part of that budding intellectual discourse. But in the absence of a more uniform curricular experience, these discussions constitute a crucial part of the construction of one’s education, rather than an auxiliary to it. They become the means by which we identify what we *should* read.

This sensation of vast bookshelves’ worth of unread masterpieces stretching onward drives most if not all of the students of literature and ideas at Harvard (as elsewhere) to study what they study. This urge combines great pleasure in reading these texts with a strong sense that not doing so is not only an aesthetic loss, but also a failure to educate oneself properly. It is not merely that there is always something left that you haven’t read, which is unremarkable in itself, but rather the notion that

there is always something left that you

*should* read, and that your education and your mind will be unfinished until the obligation presented by that unread text has been fulfilled.

This is the whole reason why anyone studies literature in college, though. For one thing, college *should* expose you to things you haven’t read before. Yet beyond that, it should teach you that you *can’t* read it all in just four years, or even in a lifetime. No one has ever succeeded in reading it all, even when “all” was a lot smaller and more clearly defined than it is now. Undergraduate literary studies should aim to create well-read students while simultaneously revealing “well-read” as a hollow epithet. There is no finish line after which you suddenly become well-read; instead, to be well-read is to constantly want to read more.

TOO OFTEN, the greatest contention about what to teach in great-books-type courses arises from the assumption that they will define once and for all what is “great,” and too often their advocates assume (implicitly, at least) that such courses will offer some permanent basis for the greatness, or at least importance, of certain ideas and art. Such a politically fraught discussion, among other reasons, makes it seem unlikely that a great-books sort of program would appear at Harvard anytime soon.

In the meantime, the students who would be most likely to follow such a curriculum manage to improvise some version thereof with the resources at hand. Certain classes are renowned for their sweeping, Great Books-ish approach. During shopping period this fall, it seemed as though every other person I knew was taking Social Studies 10, the survey covering social theory from, roughly, Hobbes to Marx. The classes that tackle 2,000 pages of reading in a semester, spanning centu-



ries and continents—those are what students take in place of a more clearly delineated course of study.

If we have such courses, though, what is ultimately missing? I brought this up with two friends who'd taken a popular freshman seminar in Hellenic literature, "Foundation Texts of the West," last year. They both told me, "It helps to have a professor say, 'Look, we don't have time to read the entire Western canon, so I'm going to choose these salient examples, and we'll learn these.'" I agree—mostly. It is important to have a good professor who can help lead you through key works, using them to teach you how to think and read more deeply.

But it is equally important to keep those "salient examples" in perspective. Outside the debate over what should be taught, the goal of a great-books program should be to urge students to keep reading *beyond* the program, and to teach them how to do so. It should acknowledge its own incompleteness, urging students to take it as merely introductory, rather than as some comprehensive experience. "Great Books," suggesting a monolithic but coherent undertaking, is an unfortunate name; per-

haps a better title would be "Some Great Books." And the goal of a Some Great Books curriculum should be, metaphorically if not literally, to teach students what to do with their January off.

Classes are marvelous things; professors are terrific people; classmates always manage to make one think harder. But the goal of coursework is not to teach students how to *learn* solely in a classroom, any more than it is to teach them how to *think* solely in a classroom. A good class teaches students how to learn independently of "structured programming," and to realize that simply following the rules and earning accolades does not constitute learning at all. A great-books education in particular—and a liberal-arts education in general—should teach students how to use their time, liberty, and independence creatively and intelligently. (Isn't that what "liberal arts" originally meant?) It should emphasize that reading in class is only training for the reading done outside class; it should show how to begin to develop and progress along a personal reading list in a mature and meaningful way. It should teach students to value a January off infinitely more than a January in a

program, to see free time not as enforced boredom but irreplaceable opportunity.

To be fair, I can understand how students, especially in the sciences, would love, or may need, to be able to use Harvard's research resources for a month. The general point remains the same, though, and a great-books program in particular should give its students only one reason why they'd want to come back to Harvard in January: to use the library.

The initial planning for "J-Term"—with talk of instituting month-long elective classes or study trips abroad—is gone for now. Perhaps, when the College is feeling a bit more secure financially, it will resurrect those plans. Personally, though, I like to think that Harvard students by then will have become so used to spending January on their own terms that no one will want to come back. January will become the time when one can finally tackle *Hard Times* or *Das Kapital*, and the clearest sign that a Harvard education is working will be an empty, snowy Yard. ▽

Berta Greenwald Ledecy Undergraduate Fellow  
Spencer Lenfield '12 expects to spend his January finishing *War and Peace*.

## SPORTS

# Fraternal Forechecking

*The brothers Biega planned it this way: all three are skating for the Crimson.*

SIBLING RIVALRY can inspire, but sibling unanimity has some impressive virtues, too. Consider the brothers Biega—Alex '10, Michael '11, and Danny '13—of Harvard's ice hockey team. All hail from Montreal, Canada, and have been playing sports together most of their lives: ice hockey, soccer, and rowing, for example, at Salisbury School, a small, all-male private school in Connecticut with some formidable athletic teams. The Biega triumvirate all played on New England championship hockey teams there—Michael's goal off a rebound from Alex's shot won the school's first title—with Alex and Danny chosen as captains and

Alex and Michael successively honored as Salisbury's athlete of the year. All three hope to play professionally in the National Hockey League (NHL). Yet the brethren aren't clones: Alex and Danny are defensemen, and Michael's a forward.

Danny's new to Cambridge, but his older sibs have done damage on the intercollegiate ice for years now. Alex, this year's Harvard captain, was named Harvard's most valuable player last year, when he made the New England All-Star Team and the all-Ivy first team. With four goals and 16 assists, his 20 points were second on the squad, no mean feat for a defenseman. "With my stature," he explains, laugh-

ing—at five feet 11 and 195 pounds, Alex is small for a defender—"you have to be an offense-minded defenseman." He is the first defenseman in more than 20 years to lead Harvard in assists. (Three years ago, the Buffalo Sabres of the NHL drafted him in the fifth round; he'll join that organization after college.)

As a freshman, Michael notched a hat trick against Yale, and last year, with six goals and 11 assists for 17 points, was right behind Alex as the team's third-leading scorer. (Forward Doug Rogers '10, at 8-13-21, led the Crimson.) Michael and Alex joined forces on a power-play unit that was best in the Eastern College Athletic Con-



**Hard-skating brothers Danny, Alex, and Michael Biega (left to right) spray ice chips at Bright Hockey Center.**

ference (ECAC) with 19.2 percent effectiveness, scoring 24 times in 125 chances.

The Biegas have nurtured their skills since the two eldest were seven and six years of age and their mother jolted them from their video games by announcing that she had signed them up for hockey lessons. They'd play all day long on the lake behind their house: the classic two-on-two game would pit the two middle sibs against the oldest and youngest: Michael and Danny against Alex and their fourth brother, Marc, a forward, now 15. "That's how we fell in love with it," says Michael. "Our friends would stop by to play." "It got pretty competitive, too," adds Danny. "The only reason the games would end was because there was a fight. It wasn't because we were tired or didn't want to play any more. Our parents would yell at us and break us apart—that's what ended the game."

Only one other trio of brothers has skated for Harvard: the Moores of Toronto—Mark '00, Steve '01, and Dominic '03 in 1999-2000 (see "Gimme Some Moore," March-April 2000, page 88). Like the Moores, fraternal bonds pay dividends for the Biegas. "We're all kind of like best friends," says Michael. "So if we're having a rough practice, or something's wrong, you can easily talk to them." When playing defense in practices, "If I have a one-on-one

with Mike, I think I have the advantage because I know exactly what he's going to do," says Danny. Michael agrees: "Whenever we drill one-on-ones, I hate when I go against them—they love to stop me."

This year, the Biegas will apply their skills amid some fine company. The Crimson's top seven scorers have returned, along with Kyle Richter, who led all ECAC goaltenders in 2007-2008 with a 1.82 goals-against average and .935 save percentage. Eight freshmen have arrived whom Alex calls "immediate impact players." He adds that the "team chemistry is great. In my four years here, I've never seen the team this tight before." This year's revised academic calendar, which places exam period *before* the Christmas break, should also help Harvard with its January and February hockey schedule—including the annual Beanpot tournament, which tough competition and January exams have made into an elusive prize.

Last year's Beanpot had a Biega Moment when Harvard trailed Boston University, 4-3, with only seconds left in the first game. Danny was watching on TV at Salisbury. "Harvard called a time-out," he recalls, "and I see Alex and Mike. All I can see on the camera is M. BIEGA and A. BIEGA—they're talking to each other. You could tell they were working up some kind of plan, some kind of play. The puck

dropped, Alex passed to Mike, Mike passed back to Alex—and he scored! I was in my dorm room with 15 or 16 other kids, who all know Alex and Mike, and the room just erupted." As it turned out, the game clock had ticked down to 0:00 just before the goal, so it did not count and BU went on to win the Beanpot (and, later, the national championship). But the moment was electric.

The Biegas planned it this way: this year, for the first time, all three have a chance to play for the same squad. Danny Biega accelerated his graduation from Salisbury (where Dan Donato, brother of Harvard coach Ted Donato '91, coached the two elder Biegas) with summer

study and a six-course load so that he'd be able to join his brethren on the Harvard squad for one season: this one. As he says, "It's just like we're playing on that pond again."

—CRAIG LAMBERT

## Soccer Champs

**The men's soccer squad** (14-4-1, 5-1-1 Ivy) ended their season as Ivy League champions, ranked tenth in the nation. They reached the third round of the NCAA tournament after a bye and a 3-0 win over Monmouth before falling, 2-0, to Maryland, the defending national champions. Andre Akpan '10 was named Ivy League Player of the Year and is Harvard's all-time leading scorer with 127 points (47 goals, 33 assists); those 47 goals tie him with Chris Ohiri '64 for a Harvard record. Brian Rogers '13 was Ivy Rookie of the Year.

The women booters (9-7-1, 6-1 Ivy) also captured an outright Ivy championship after sharing it in 2008. Boston College ousted Harvard, 1-0, in the first round of the NCAA tournament. Leading scorer (21 points) Katherine Sheeleigh '11 was a First Team all-Ivy selection.

## Stinging the Blues

*Yale saved its best for last. So did Harvard.*

THE BULLDOG got stung again in the final minutes of The Game. To football-loving Old Blues, these acts of Harvard waspishness must seem to repeat themselves like a recurring dream.

The archetype is the 1968 game, when Harvard scored 16 points in the last 42 seconds to gain the famous 29-29 tie. In 1974, a 95-yard drive gave the Crimson a 21-16 win with 15 seconds remaining. A year later, with 93 seconds to play, a wobbly field goal won it for Harvard, 10-7. In 1995, Harvard marched downfield in four plays to snatch a 22-21 victory with 29 seconds on the clock. Fast-forward to 2005, when Yale led at halftime, 21-3, only to have Harvard tie the game in the last three minutes and then win it, 30-24, in triple overtime.

Harvard's 14-10 victory in the 2009 game was another one for the books. Not since 1954 had a Crimson team come back to win The Game after being shut out for three periods.

Yale entered the game as the decided underdog. The Blue had won only two Ivy League games, hadn't beaten a team with a winning record, and had the league's poorest rushing statistics. Harvard had lost to Pennsylvania the previous weekend, but had defeated all other Ivy comers and was leading the league in rushing and scoring.

Yet the Eli played like champions for most of the game. On a balmy November day at Yale Bowl, the Blue jumped off to an early 10-0 lead, scoring a 26-yard field goal and a short-yardage touchdown on its first two possessions. Front-line blocking opened hole after hole for sophomore back Alex Thomas, who carried nine times on Yale's first two drives and finished the game with 124 yards on 26 carries.

"We didn't think they were going to run on us," Harvard captain Carl Ehrlich, a defensive tackle, would say after the game. "They came right at us, with a lot of inside runs, and just kept running the ball. They ran hard and blocked hard. They had us on our heels for a long time. We needed

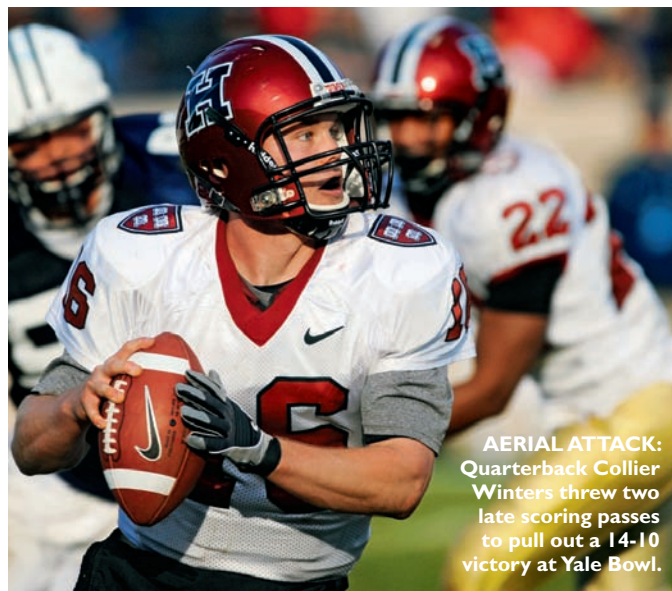
to do a lot of regrouping."

Mixing rushing and passing plays, Harvard's offense moved the ball well, but couldn't get into the end zone. Its first drive expired at midfield when junior quarterback Collier Winters fumbled after a 10-yard scramble. A second-period drive ended when Harvard faked a field goal and had an attempted pass batted down by Yale safety Larry Abare. At the start of the second half, a 79-yard drive brought the ball to Yale's one-yard line, with three chances to punch it in. But a resolute goal-line stand kept Yale's lead intact.

The Blue had the upper hand until midway through the final period, when Winters handed off to tailback Gino Gordon '11 on a fourth-and-four at the Harvard 30-yard line. Yale cornerback Adam Money appeared to have Gordon trapped at the line of scrimmage, but he spun away for a 19-yard gain. Gordon's breakaway changed the flow of the game. Two plays later, Winters threw a high, arching pass to receiver Matt Luft '10 for a 41-yard touchdown. With less than seven minutes to play, senior Patrick Long's extra-point kick cut the Eli lead to 10-7.

On Yale's next series, a holding penalty and a quarterback sack by linemen Ehrlich and John Lyon '12 forced the Blue into a fourth-and-22 at their own 25-yard line. From punt formation, Yale audaciously tried a trick play, with freshman defensive back John Powers taking the ball on a reverse and sprinting for the sideline behind three blockers. Defenders Collin Zych '11, Dan Minamide '12, and Anthony Spadafino '11 broke through the interference and stopped Powers seven yards short of the first-down marker.

Taking over on Yale's 40-yard line, the Crimson offense needed only three plays to score



**AERIAL ATTACK:** Quarterback Collier Winters threw two late scoring passes to pull out a 14-10 victory at Yale Bowl.

again. This time receiver Chris Lorditch raced to the goal line and cosseted a perfectly thrown pass from Winters. The play covered 32 yards and gave Harvard the lead.

The Yale stands, noisily exuberant for most of the game, were now silent.

With 1:32 on the clock, Yale still had time to score. The Blue drove to midfield on a pair of passes by quarterback Patrick Witt, but a third attempt was intercepted by senior linebacker Jon Takamura.

Harvard had no timeouts left, and with half a minute to play Yale got the ball again at its own eight-yard line. But the Crimson's swarming defense kept the Bulldog at bay.

Head coach Tim Murphy said after the game that he'd given his team a "character check" at halftime. "We were fortunate today," said Murphy. "But you do get a little more fortunate if you play hard all the time."

MURPHY'S TEAM HAD been less fortunate at the Stadium a week earlier, when Harvard and Penn contested for Ivy League supremacy. "We take it for granted," Murphy had said at a preseason press conference, "that the road to the Ivy championship will go through Penn." In recent years there's been no alternate route.

If football were geopolitics, Penn and Harvard would be the league's superpowers. Since the 2000 season, each has won four Ivy titles, and in each of those years the winner of the Harvard-Penn game went on to win the league. Over the last decade, the superpowers have split their match-ups, 5-5, while posting a combined won-lost record of 99-21 against the six other Ivy teams.

### Game by Game

at Holy Cross	L	20-27
Brown	W	24-21
at Lehigh	W	28-14
at Cornell	W	28-10
Lafayette	L	18-35
Princeton	W	37-3
Dartmouth	W	42-21
at Columbia	W	34-14
Penn	L	7-17
at Yale	W	14-10



**Left: The ball that broke the Bulldog's back. With a minute and a half to play, Chris Lorditch beat Yale defender Adam Money on a 32-yard pass that gave Harvard the game-winning touchdown. Below: Coach Murphy got a Powerade shower as time expired.**

### Final Ivy League Standings

	Ivy and overall records		Points for/against	
Penn	7-0	8-2	214	95
Harvard	6-1	7-3	252	172
Brown	4-3	6-4	241	197
Columbia	3-4	3-6	225	220
Princeton	3-4	4-6	129	265
Yale	2-5	4-6	173	166
Dartmouth	2-5	2-8	161	282
Cornell	1-6	2-8	171	268

Harvard won the Ivy championship outright in 2007, shared it with Brown in 2008, and had hopes of a fourth consecutive title in 2009. For the fourth time since 2000, both Harvard and Penn had league records of 5-0 when they met on November 14. In a driving rainstorm, the Quakers scored on a 51-yard pass play three minutes into the game, built a 17-0 halftime lead, and emerged with a 17-7 victory.

Road closed.

Penn's top-ranked defense, which had allowed just 11 points per game, proved superior to a league-leading Harvard offense that had averaged 28 points a game. The lone Harvard score came in the third period, on a 45-yard pass from Winters to Chris Lorditch. With less than three minutes to play, a last Crimson drive put the ball inside Penn's one-yard line. Winters tried twice to take it in for a score, but the Quaker defense was unyielding. Harvard hadn't had been held to a single touchdown since the Penn game of 2002 (Penn 44, Harvard 9).

Penn's win was its first at the Stadium since 2003. The Quakers captured this year's Ivy title outright with a 34-0 shut-

out of Cornell one week later. Harvard finished in second place, with Yale settling into a sixth-place tie with Dartmouth.

Harvard has won eight of the last nine meetings with Yale, and has taken five straight at Yale Bowl. That means the Crimson now leads the Blue, 29-24-1, in games played since Ivy League competition was formalized in 1956. Yale still leads the all-time series, 65-53-8.

**TIDBITS:** Tom Williams, Yale's first-year coach, defended the risky fake-punt call that gave Harvard a short field with two and a half minutes of playing time. "We're playing to win the football game," Williams said afterward. "We've done it all year. Our whole idea was to keep our foot on the pedal and not play scared." He noted that Yale had converted two fake punts in earlier games, including one for a touchdown. The real game-changer, said Williams, was Gino Gordon's 19-yard gain on Harvard's previous series: "If we make that play, we win."...A former Stanford linebacker and captain, Williams was an assistant coach for the Jacksonville Jaguars before coming to Yale. At his introductory press conference a year ago, he said his first priority would be to reclaim the Ivy title, which Yale had shared in 2006. "And secondly," declared Williams, "we're going to beat Harvard. We've got to turn The Game back into a rivalry. It's been a little one-sided."

Big leg: Yale's Tom Mante, the league's best kicker, punted three times during the game, averaging 51.3 yards per kick and booting a 69-yarder into the end zone at the start of the second quarter....Mante attempted a 62-yard field goal late in the quarter, but his kick went wide.

Still a few seats left: Attendance at The Game was announced as 52,692. The current capacity of Yale Bowl is 61,446.

Top gun: Junior Collier Winters, in his debut season as a starting quarterback, passed for 15 touchdowns and had the Ivy League's best passing-efficiency rating, as well as the fewest interceptions (seven) among quarterbacks playing 10 games. In the Yale game Winters completed 19 of 26 passes for 211 yards and two touchdowns, while rushing for 51 yards. For his play at Yale, he was named Ivy League player of the week....The 77-yard touchdown pass from Winters to Chris Lorditch in Harvard's 37-3 win over Princeton was the fifth-longest scoring pass in Crimson annals.

Pitch, catch: Lorditch was the team's premier receiver, with 30 catches for 545 yards and five touchdowns....Senior Matt Luft wound up his college career with a per-catch average of 16.3 yards, a Harvard record. In 2008, Luft caught 53 passes for 875 yards and five touchdowns. Tightly covered this season, he was held to 17 catches for 214 yards and two touchdowns.

Picks: Linebacker Jon Takamura's late-



## Strokes in Glass

**This new sculpture, *Endurance***, which hangs near the roof of Weld Boathouse, depicts part of the trail behind a single scull: the shell's wake in the center and puddles from successive oar catches at the sides. Rendered from four-foot-long rods of flameworked borosilicate glass, the piece was commissioned by the Friends of Harvard Rowing for Weld's centennial in 2006. There was a party then, but the Friends felt that a more lasting memento was also appropriate; the work took three years from conception to completion. Sculptor Ellen Kennelly '85, M.Div. '90, rowed at Radcliffe and is an elite masters sculler who has won the Head of the Charles 10 times in the single scull. Many types of boats are launched from Weld's docks, but Kennelly says the larger shells create an unaesthetic turbulence in the water. "The single," she asserts, "is the only one that leaves behind something pretty."

~C.L.



game, as both rusher and receiver....Freshman Treavor Scales, alternating with Gordon at tailback, rushed for 120 yards and two touchdowns against Dartmouth. Not since 1999 had two Crimson backs rushed for 100 yards or more in the same game.

All-Ivies: Gordon, a second-team all-Ivy selection in 2008, made

the first team in 2009, as did offensive tackle James Williams '10, guard Ben Sessions '10, and defensive backs Collin Zych and Derrick Barker '10. Williams was also a first-team selection in 2007 and 2008. Fourteen other team members, including Ehrlich, Long, Lorditch, Scales, Takamura, and Winters, earned second-team or honorable mention citations. Scales was also named Ivy rookie of the year....Zych, of Plano, Texas, and Kirkland House, will captain the 2010 team. The winner of this year's Crocker Award as the team's most valuable player, Zych made a team-high 73 tackles and led the Ivy League with 12 pass breakups and 14 passes defended. He helped force the decisive tackle on Yale's pivotal fake punt in the fourth quarter of The Game.

Streaking: Crimson teams have now won seven or more games in each of the past nine seasons—an Ivy League record, and Harvard's best nine-year run since the seasons of 1902–1910.

~"CLEAT"

game interception against Yale was his fourth of the season. He'd previously made a key interception in Harvard's 24-21 victory over Brown, and had scored on a 60-yard interception return in the 28-14 win at Lehigh.

Team player: Senior Cheng Ho came to the United States from Taiwan at 12, not speaking English and unfamiliar with football. Harvard's leading rusher in 2007, he was injured for parts of the 2008 season and was used sparingly this fall. But Ho made the most of his playing time. He rushed for a career-high 132 yards and two touchdowns at Lehigh, and had 73 yards

and a touchdown in the final period of the Princeton game. When sidelined, Ho was the team's most spirited cheerleader. "We could not have won back-to-back championships in 2007 and 2008 without Cheng," said coach Murphy.

Grind it out: Gino Gordon was the team's most productive running back, averaging 5.5 yards per carry and leading the league in yardage (632) and touchdowns (eight)....In Harvard's 42-21 win over Dartmouth, Gordon rushed for 119 yards and three touchdowns, and caught four passes for 103 yards. No Crimson player had ever broken the century mark twice in one

## Hits, Heads, Helmets

"I CAN THINK OF TWO HITS in particular I took at Harvard that would qualify as concussive episodes, although I didn't say anything to anyone," says Vin Ferrara '95, who quarterbacked the 1994 and 1995 Crimson varsities. "So of course they weren't diagnosed." Ferrara, who earned an M.D. and M.B.A. from Columbia in 2004, founded a company, Xenith, that year to manufacture a new type of football helmet: one that could help insulate the brain from the sudden movements of the head during impact that result in concussions. In the last few years, the sports world seems to have caught up with his product.

In October, the issue of football-induced concussions and related brain trauma reached Congress, where former players and neuropathologists testified before a House committee and legislators took National Football League (NFL) commissioner Roger Goodell to task on the matter. "In the last three years, there's been an explosion of awareness of how severe concussions and even sub-concussive trauma truly are," says *New York Times* reporter Alan Schwarz, who was nominated for a 2007 Pulitzer Prize for his articles on football concussions, a topic he continues to cover. "It used to be considered just a rite of the game. Now we're finding out that getting 'dings' or concussions is in-

credibly dangerous and can even be fatal."

Among those testifying before Congress was former Harvard defensive tackle Chris Nowinski '00, whose 2006 book *Head Games: Football's Concussion Crisis* described his own traumatic experiences and spotlighted the issue. Nowinski wasn't diagnosed with a concussion on the gridiron, but he took blows to the head in his subsequent career as a pro wrestler. ("The difference between a real kick and a 'pro wrestling' kick can be three inches," he explains. "Sometimes they land for real.") He blacked out at times in the ring, and says his last concussion left him with five years of "post-concussive syndrome." Only in the last year have Nowinski's head-

aches come under control, and he no longer needs medication for the sleepwalking that developed as a sequela.

Nowinski co-founded the Sports Legacy Institute (sportslegacy.org) with Dr. Robert Cantu of Boston University School of Medicine to encourage the study of chronic traumatic encephalopathy, or CTE, a degenerative brain disease caused by repeated head trauma. (Xenith helps support the institute, and also conducts its own education program for athletes, coaches, and officials on risk reduction in sports.) “We are 11 for 11 in finding CTE in ex-college and pro players,” Nowinski says, referring to autopsy data that identified the abnormal protein tau, a marker of CTE that cannot be imaged and so depends on post-mortem diagnosis. (More than 200 athletes to date have volunteered to donate their brains for research via the institute.) The diagnosis “punch drunk,” or *dementia pugilistica*, first made in the case of a boxer in 1928, is an earlier name for CTE; its symptoms include memory loss, confusion, impaired judgment, paranoia, impulse control problems, aggression, depression, and eventually, progressive dementia.

Concussions are poorly understood, widely under-reported, and often not diagnosed at all. “Most people think of concussions in terms of energy force and shock,” Ferrara says. The popular concept is of a local “bruise to the brain” caused by the impact of tissue slamming into the skull. In fact, concussions result from shearing forces that violent movement imparts to the brain’s nerve cells, and affect a large, diffuse area of the brain, not a single location. One useful image compares the head to an egg: the shell may not break, but the yolk inside still undergoes a violent displacement.

Football players, historically, have referred to being “dinged” or having one’s “bell rung” for moments of dizziness, confusion, or grogginess that can follow a blow to the head. These terms are “classic slang expressions for concussion,” says Ferrara, who prefers the term “concussive episodes.” Loss of consciousness and amnesia, the

traditional diagnostic criteria, are actually quite rare. Symptoms can range from three seconds of blurred vision to unconsciousness and prolonged headaches or cognitive dysfunction. A working paper from Xenith asserts that concussive episodes affect from 45 percent to 75 percent of football players in the course of a single season, and that most players will suffer multiple episodes. The primary cause is head-first contact, especially helmet-to-helmet impact, though many kinds of hits, like a blind-side slam into a receiver’s gut that snaps his head suddenly forward or back, can cause the injury.

The Xenith helmet’s design tries to minimize any sudden head movement during impact by using air cells that act as shock absorbers, much the way automobile air bags protect bodies in a crash. Where standard football helmets are lined with dense padding, Xenith headgear has “air

cells that collapse and vent air to dissipate the energy of impact,” Ferrara explains. “They act like a bicycle pump—the harder the impact, the more pressure they resist with. The key is the adaptive response...a more optimized compression so that the head moves more gradually upon impact, and the brain should move less inside the skull. The real goal is to address the chronic effects of repeated impacts by managing each impact better and educating people to reduce the number of these impacts in the first place.”

At \$350 for an adult model, Ferrara’s helmets are only marginally more expensive than standard helmets priced at \$200 to \$300. Close to 15,000 of them have been used during the five fall and spring football seasons since 2007, at levels from youth football to the NFL. (The vast majority of the five million U.S. football players compete at the youth and high-school level.) Research on the helmets’ effectiveness cannot use placebos, as players know what kind of gear they are wearing, but the firm’s small 2008 survey of 65 players on 10 teams showed a significantly reduced risk of headaches (a key symptom) and reduced perception of impact. “The data suggest,” says a Xenith summary document, that the helmet “may reduce the risk of concussive episodes in football players by 50 percent or more.”

In any case, the product is catching on with Crimson athletes: 17 of the current 114 Harvard varsity footballers wear Xeniths. Last year’s standout quarterback, Chris Pizzotti ’08 (’09), wore one, as does current Buffalo Bills quarterback Ryan Fitzpatrick ’05. Two-time all-Pro center Matt Birk ’98 of the Baltimore Ravens (who played two Harvard seasons with Ferrara) is using a Xenith this year. “Safety is a big thing with me, and with all players,” Birk said at midseason. “I’ve been really happy with the Xenith. On the football field, you get what’s called a ding—you might feel a little foggy after a hit. I haven’t had any of these with the new helmet. Normally, I would expect it by now, and probably more than once.”

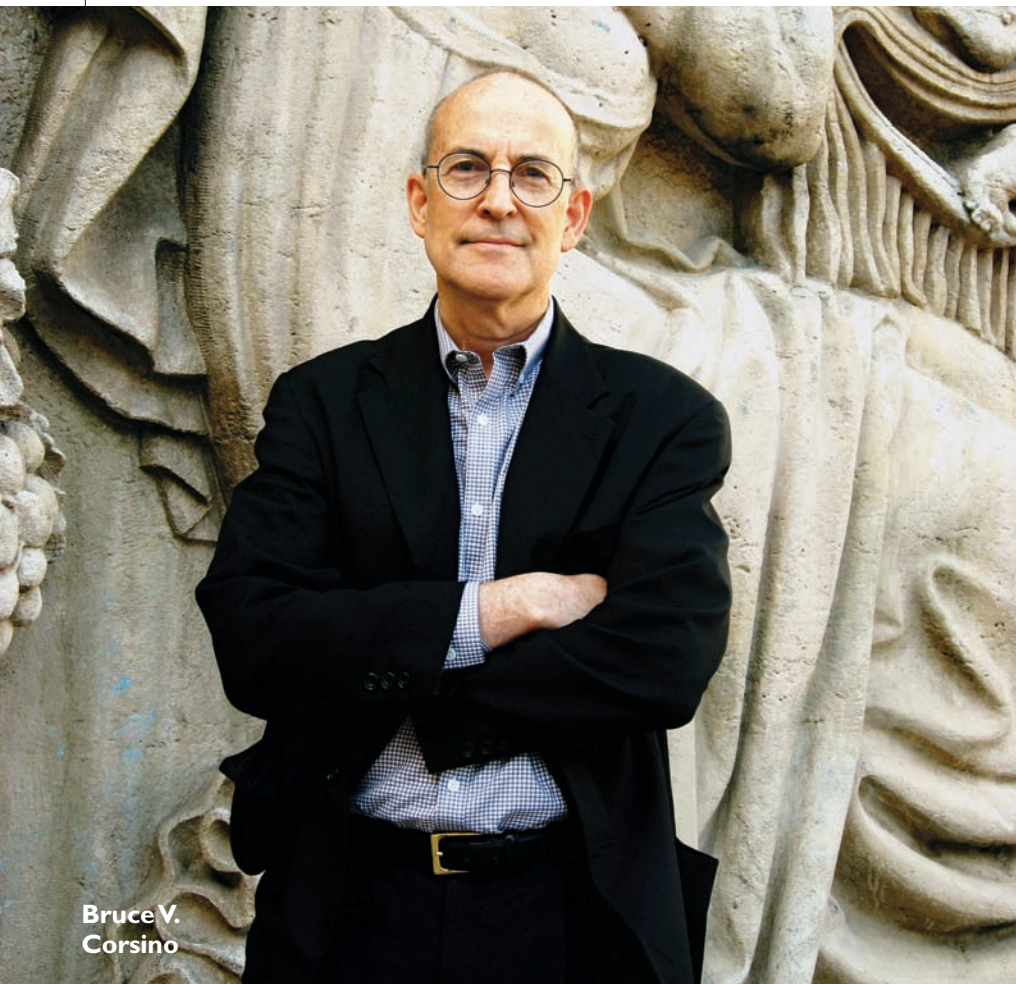
—CRAIG LAMBERT



**Two views of the Xenith football helmet show the disc-shaped shock absorbers that adapt to the magnitude and direction of the hit, adjusting the helmet’s compression accordingly.**

# Plain Speaker

*Bruce Corsino promotes “usable, efficient, and transparent” writing inside government and out.*



Bruce V.  
Corsino

**I**MAGINE *understanding* your tax form instructions the first time you read them. What if all federal rules, safety warnings, and applications were clearly spelled out? While we're at it, why not extend that efficiency to the texts in car manuals, mortgage applications, banking terms and conditions, shareholder policies, utility bills, food and drug labels—and even legal contracts? Such dreams can come true, maintains Bruce V. Corsino, M.Ed. '80, through the adoption of “Plain Language.”

As head of the Plain Language Program at the Federal Aviation Administration

(FAA), Corsino pushes for “usable, efficient, and transparent” writing throughout the government so readers can more quickly find, digest, and act on essential information. “There is no greater daily frustration for the American people than dealing with legalese and hard-to-read financial terminology,” he asserts. “One ripe and fertile example is how the mortgage industry helped create the current financial crisis by creating forms and documents that were not easy for borrowers to understand.” Plain language, he reports, is gaining popularity across the country because it makes sense: it boosts compli-

ance, safety, *and* customer satisfaction. It also reduces costs and time associated with confusion and miscommunication.

This approach first gained momentum in the late 1990s when President Clinton directed agency and executive leaders to use clear language in all new documents and Vice President Al Gore '69, LL.D. '94, who monitored this initiative, created the “No Gobbledygook” Award. Plain language has since come to embody a social and consumerist movement that also has wide pragmatic allure for businesses and legal professionals intent on efficiency. In fact, some 36 states have passed plain language legislation, and now a federal law is a possibility.

Corsino, a trained psychologist and medical ethicist and retired colonel in the U.S. Army medical department, points also to what he sees as the larger context: plain language as a critical means of increasing access to fairness and justice. “It’s the civil-rights aspect of this that appeals to the militant in me,” he says. “If we don’t use plain language techniques to improve and clarify such things as jury and electronic voting-booth instructions, then the rights of defendants and voters are put at risk. These are but a few of many plain language civil-rights issues worth fighting for.”

Several court cases have borne this out. One involving Medicare communications and another related to customs and immigration forms (deemed too difficult to understand), have focused attention on plain language as a national issue. In 2008, the House passed a proposed federal Plain Language Act requiring each executive agency to use it in any new public document. Barack Obama, J.D. '91, and Hillary Clinton were among the bill’s Senate co-sponsors, but a scheduled vote was put on hold, partly because of the economic crisis. Similar acts, introduced early in 2009 in both chambers, are now under consideration.

Whenever the law is enacted, Corsino

plans to dash down the street from FAA headquarters to the U.S. Department of Education to promote plain language as “an essential required skill that should be a viable part of every English curriculum across the United States, a language skill that human beings learn along with writing poetry and prose. We’ve already got state laws,” he says, “but a federal law is a nice thing to have when I start marching around.”

IT WAS WHILE WALKING through hospital wards practicing life-support management in intensive-care units in Virginia that Corsino fully recognized the deep, emotional power of plain language—and important linguistic nuances. Many treatment teams, he reports, approached distraught relatives of comatose, terminally ill patients with a question phrased like this: “We’ve done all we can. Knowing that, would you please describe how you’d like us to manage the breathing machines for your loved one?” That sounds clear and compassionate, but Corsino says the wording is wrong and potentially harmful: it can make families feel as if *they’re* responsible for the patient’s death. “An entirely different emotional reaction develops,” he explains, “when we say to families, ‘Please tell us what you know about what your loved one would have wanted.’”

While working as a psychologist and training interns and residents to conduct suicide evaluations, he’d have them ask, “How often do you have thoughts of harming yourself?” That’s better than the more typical, “Do you have thoughts of harming yourself?” he says, because the latter “stigmatizes the patient for thoughts of self-harm, and—because it is likely to be answered with a yes or a no—it does little to elicit any further response from the patient. In my world, every word counts, perhaps to a fault.”

Building on his experience with patients’ families, Corsino helped write federal health-ethics laws and wrote guidebooks about informed consent and advance directives published by the National Center for Clinical Ethics (part of the Department of Veterans Affairs). And when he decided to make a career change from medical ethicist to self-described “plain language militant,” he focused on his passion for language: he became a speechwriter at the Pentagon before join-

# Rockefeller

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TURN TO PAGE 69**

**HARVARD**  
MAGAZINE

# A Special Notice Regarding Commencement Exercises

Thursday, May 27, 2010  
Morning Exercises

To accommodate the increasing number of those wishing to attend Harvard's Commencement Exercises, the following guidelines are proposed to facilitate admission into Tercentenary Theatre on Commencement Morning:

- Degree candidates will receive a limited number of tickets to Commencement. Parents and guests of degree candidates must have tickets, which they will be required to show at the gates in order to enter Tercentenary Theatre. Seating capacity is limited, however there is standing room on the Widener steps and at the rear and sides of the Theatre for viewing the exercises.

*Note:* A ticket allows admission into the Theatre, but does not guarantee a seat. Seats can not be reserved. The sale of Commencement tickets is prohibited.

- Alumni/ae attending their major reunions (25th, 35th, 50th) will receive tickets at their reunions. Alumni/ae in classes beyond the 50th may obtain tickets from the Classes and Reunions Office, 124 Mt. Auburn Street, sixth floor, Cambridge 02138.

- Alumni/ae from non-major reunion years and their spouses are requested to view the Morning Exercises over large-screen televisions in the Science Center, and at designated locations in most of the undergraduate Houses and graduate and professional Schools. These locations provide ample seating, and tickets are not required.

- A very 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, 124 Mt. Auburn Street, sixth floor, Cambridge 02138.

## Afternoon Exercises

The Annual Business Meeting of the Harvard Alumni Association convenes in Tercentenary Theatre on Commencement afternoon. All alumni and alumnae, faculty, students, parents, and guests are invited to attend and hear Harvard's President and featured Commencement Speaker deliver their addresses. Tickets for the afternoon ceremony will be available through the Harvard Alumni Association, 124 Mt. Auburn Street, sixth floor, Cambridge, 02138.

—Jacqueline A. O'Neill, University Marshal

they did on their summer vacation—that's an essential training experience to help young people become functional, fluent citizens. The problem is, students later on have almost no chance to consider if and when six words might actually be *better* than six sentences." He counts himself lucky that at Harvard (where his program at the school of education let him take courses in psychology and at the medical school) he had professors who insisted on parsimonious use of words: "Their sense that clear thinking precedes clear writing moved me to impose a discipline

and self-consciousness on my work."

Corsino is an active member of The Plain Language Action and Information Network, a group of federal employees who have met for more than a decade. Its website ([www.plainlanguage.gov](http://www.plainlanguage.gov)) is run from his office, and offers information, resources, news articles, useful contacts, and dozens of authentic "before and after" writing examples, some of which are quite funny in a Kurt Vonnegut Jr. sort of way.

Some critics might accuse plain language of playing a role in an overall decline in language use in American society, and in the "dumbing down" of texts. But Corsino is careful to say that plain language has very specific applications: it is not an effort to quash creativity, literary wit and elegance, or artistic expression. "We're not saying, 'Get rid of poetry, get rid of rhetoric!' There's a place for all of these things. Plain language is a very narrow skill for a unique purpose—when you need to be clear about something that people really need to understand."

He is also clear about what he can accomplish in government, and in one six-hour course. "I know that nobody wants to go home after they've had a hard day at work and start thinking about past participles," he says, "so I have to create an experience that's short and effective."

His final message to students? "Ineffec-

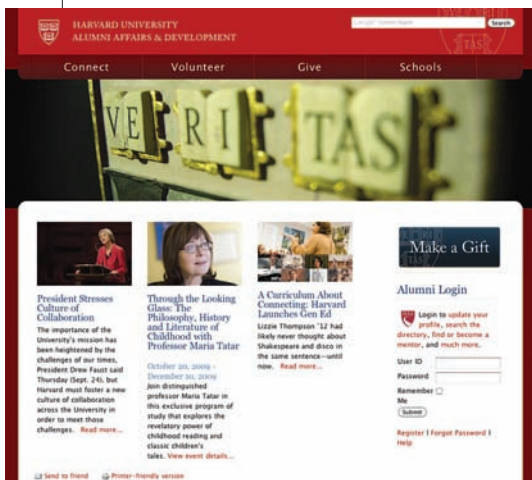
ing the FAA (one of the first agencies to adopt plain language as official policy, beginning in 1999).

Corsino's predecessor, Annetta Cheek, started the plain language effort—critical to an agency in charge of aviation safety, which largely depends on people understanding and following written policies, instructions, and emergency procedures—and went on to promote it throughout the federal government. During the last two years, Corsino has worked to greatly expand the program, building on the connection between clinical ethics and plain language. "In ethics, we speak of the beneficence as a virtue and principle of 'Do good' for patients," he says. "I borrow that idea to solidify in all writers their ethical

covenant with, and responsibility to care for, readers."

Among his accomplishments to date, Corsino has led plain language revisions of at least 10 major FAA documents, on topics ranging from privacy and security to air-traffic control, and has helped the European Aviation Safety Agency build its own plain language program. He will lead a presentation on plain language ethics at the international plain language conference in Lisbon later this year. More than 500 writers, engineers, attorneys, and other staff members have taken a course he created in which students learn both specific techniques—replacing "promulgate," "utilize," and "due to the fact" with "issue," "use," and "because," for example—and general principles, such as "More is not necessarily *better*." "In grade school," Corsino explains, "we need kids to write six paragraphs, not six words, about what

**BRAND-NEW.** Harvard's alumni website has a fresh look, user-oriented navigation, and a new home at [alumni.harvard.edu](http://alumni.harvard.edu). (Alumni [post.harvard.edu](mailto:post.harvard.edu) e-mail addresses have *not* changed, but links to [post.harvard.edu](http://post.harvard.edu) should be updated.) The new site offers tools for contacting fellow alumni and all parts of the University; ways to participate in the alumni community through Harvard Alumni Association activities; information on Harvard club events (such as faculty talks) and travel opportunities; and more.



tive government writing is characterized by two qualities: the absence of pronouns and the overuse of passive-voice sentence constructions. If you can change those two things, your work will be vastly improved and America will be a better place.” In the end, Corsino says, he is a realist, “content to create cultural change—even if it’s only one paragraph at a time.”

—KRYSTEN A. KECHES and NELL PORTER BROWN

## Harvard Serves

DURING APRIL, the extended University community—in Greater Boston and around the globe alike—are invited to participate in the Harvard Alumni Association’s public service initiative, “Harvard Serves.” Inspired by President Drew

Faust’s exhortation to apply “our knowledge to help advance the well-being of people in the world beyond our walls,” the HAA hopes to mobilize all 300,000 alumni worldwide, as well as faculty and staff members and students, to volunteer time and efforts in their own communities.

Events will be organized through local Harvard clubs, Shared Interest Groups, and individual classes; organizers will choose one or more dates during the month of April for their service opportunity. Anyone with suggestions about local community organizations in need of volunteers, or eager to get involved with planning these events, should e-mail [harvardseves@post.harvard.edu](mailto:harvardseves@post.harvard.edu). A full list of service opportunities and specific dates of projects and their locations will be available at [alumni.harvard.edu](http://alumni.harvard.edu) on March 1.

## Veterans Day Salute

serving or training to serve in the armed forces (close to 150 veterans of Afghanistan and Iraq are now enrolled); and in particular the 16 alumni who earned the nation’s highest military award, the Medal of Honor, for actions “above and beyond the call of duty.” As part of the service, a plaque commemorating the medal’s recipients, installed near the altar, was unveiled, dedicated, and presented to the University by the Harvard Veterans Alumni Organization (HVAO; [www.harvardveterans.org](http://www.harvardveterans.org)). At present, the plaque bears only 10 names, but news of its imminent dedication (see “Above and Beyond,” November-December 2009, page 69) prompted relatives of six more alumni recipients to contact HVAO, enabling ceremony organizers to distribute information about all 16 men at the service and to announce that the additional names will be added to the plaque by Veterans Day 2010.

The newly discovered recipients are: Charles E. Phelps, Law School 1852-53, and Horace Porter, Lawrence Scientific School 1854-55, LL.D. 1910, who rallied Union troops at the battles of Spotsylvania and Chickamauga, respectively; Henry S. Huidekoper, A.B. 1862, A.M. ’72, for his leadership at Gettysburg; Claud A. Jones, Graduate School of Applied Science 1912-13, for rescuing fellow crew members trapped in the “fire rooms” of their ship after the boilers exploded during a hurricane; Pierrepont M. Hamilton ’20, A.M. ’46, for persuading an enemy garrison in North Africa to surrender during World War II; and Robert C. Murray, of the M.B.A. class of 1970, who threw himself on a grenade in Vietnam to save the lives of his men. More information about all 16 recipients appears at [www.advocates-forrotc.org/harvard/honor.html](http://www.advocates-forrotc.org/harvard/honor.html); for more about the service, visit [www.harvardmag.com/veterans-day-salute](http://www.harvardmag.com/veterans-day-salute).

**In Memorial Church, General George W. Casey Jr. views the plaque commemorating the Harvard dead of the Vietnam War, among them his father, George W. Casey ’45.**



**On November 11**, during a solemn service in Memorial Church at which both President Drew Faust and General George W. Casey Jr., Chief of Staff of the U.S. Army, spoke, Harvard honored its military veterans (approximately 1,200 alumni have died in war); its students

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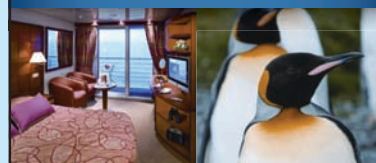
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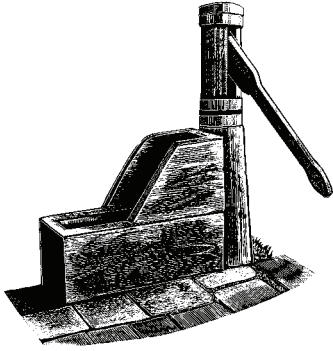
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# Two Masters



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

“WHAT WAS most striking about Sam as a teacher was his lack of egotism,” said Melvin Richter ’43, Ph.D. ’53, at a memorial service in October for Samuel Hutchinson Beer, Ph.D. ’43, LL.D. ’98, the late Eaton professor of the science of government emeritus. “In every discussion, he sought not to display or defend the superiority of his own views, but to develop something different from and superior to them.”

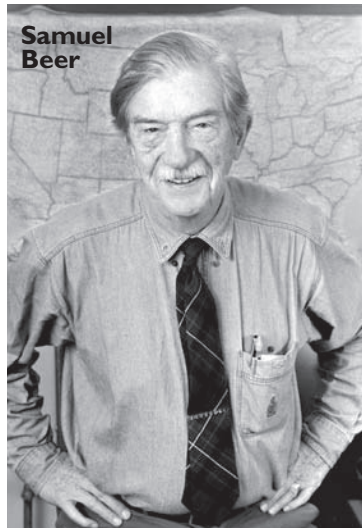
Richter spoke specifically about Social Sciences 2, the course that Beer invented and then taught for three decades. More than 10,000 students took it, and some 150 graduate students served as his teaching fellows. Richter was one of those TFs; he is now professor of political science at the City University of New York Graduate Center and Hunter College.

The course, said Richter, “was Sam’s synthesis of his education as historian and political theorist when a Rhodes Scholar at Oxford, and his evolution after 1945

into a social scientist and leading analyst of British and comparative politics. When invited to create one of the original General Education courses, he devised a strikingly original format. In my day, students in each of their six papers were asked to choose between two alternative general theories that might explain a historical case, such as Marx and Max Weber on the origins of capitalism. Students learned about the facts of each case from reading documents written during the period being studied. The first case was the conflict between Henry II and Thomas à Becket; the last, the rise of the Nazis and the horrors of their regime.

“Every week,” said Richter, “Sam gave two formal lectures setting out the alternative theories being considered. Sam’s presentations, first of one theorist and then the other, were so powerful and convincing that students were in turn persuaded by each of them. Sam’s own preferences never entered into his exposition, which first stressed the power of the argument in question, and then challenged the evidence supporting it, and the rigor of its reasoning...For Sam, the point of research and analysis was to provide good reasons for choosing between plausible alternatives, rather than seeking the one correct choice.”

May we each hope to think so sensibly—and our leaders in Washington, as well.



SAY WHAT: A deft hand with the written word is a priceless asset for a fundraiser. A pioneer in the eleemosynary line was Robert F. Duncan, A.B. 1912, a founder with John Price Jones ’08 of the first professional fundraising firm, the John Price Jones Corporation, which helped Harvard hold its hand out in the early 1920s. Duncan’s son Donald C. ’49, for 47 years a math teacher at Milton Academy and now retired in Southport, Maine, is writing reminiscences of his father. One concerns a bit of sage advice dispensed a century ago that no doubt sharpened the incipient fundraiser’s persuasive skills:

“Dad used to tell of what he felt was the best advice he ever had on good writing. One of his professors was the legendary Charles Townsend Copeland, A.B. 1882, Boylston professor of rhetoric and oratory. Copeland didn’t collect themes and grade them. Rather, he made an appointment with each student to come to his quarters in Hollis Hall to read his theme and receive comments from the Master. Dad arrived as scheduled one evening and was ushered to a chair at a small table with a gooseneck lamp in the middle of the room. Copeland turned on the lamp, turned off the other lights in the room, and prowled unseen in the darkness. After a long silence he said, ‘Mr. Duncan, you may begin.’

“Dad started to read his offering and heard occasional groans and sighs of anguish from various locations in the darkness. Finally, Copeland said in pained tones, ‘Stop, Mr. Duncan, stop.’ Dad stopped. After several seconds of deep silence, Copeland asked, ‘Mr. Duncan, what are you trying to say?’ Dad explained what he was trying to say. Said Copeland, ‘Why didn’t you write it down?’” ~PRIMUS V

















## LETTERS

(continued from page 6)

merse myself in discourses of literary theory, dramatic theory, performance studies theory, and theories of race, ethnicity, and gender...not to mention long periods of field work in China. My decade of graduate school from entering my master's program at Harvard to exiting my doctoral program at Cornell prepared me for the interdisciplinary teaching and scholarly career I have established since. In my subsequent decade of mentoring graduate students, I have found it untrue that "a dissertation in the humanities does not require extensive archival, field, or laboratory work." Menand's findings may reflect the reality of some students in some English programs at some universities, but they do not reflect the complexity of disciplines in the humanities more broadly.

CLAIRE CONCEISON, A.M. 1992, Ph.D.

Duke University  
Durham, N.C.

A COROLLARY TO Louis Menand's observation that the academic world tends to favor specialization and conformity is that, for all the talk about interdisciplinary studies, it shuns the scholar who is also a professional. Neither academia nor the outside world provides a job category for such hybrids as the physician-philosopher, the architect-sociologist, or (as in my case) the lawyer-historian. Professionals seem to look askance at the colleague with a Ph.D., academics with distrust upon the scholar with professional credentials. Consequently, much potential for creative interdisciplinary work is wasted. In fact, in terms of employment opportunities, the sum of a professional degree and a Ph.D. may prove to be less than either of its parts.

ANDREW SOROKOWSKI, A.M. '75  
Rockville, Md.

## AFRICA IMAGE

GLAD TO LEARN ABOUT undergraduates "Immersed in Africa" (November-December

2009, page 43), but surely the cover image is a gaffe: the adoring African woman looking up at the white guy a head taller than the surrounding blacks—and there were several other White Man's Burden condescending touches.

TOM BLANDY '54, M.Arch. '60  
Troy, N.Y.

## PRE-MED POSSIBILITIES

IN RESPONSE to Melanie Long's "Post Pre-Med" (November-December 2009, page 63), I object to her characterization that "being pre-med is more than a set of course requirements: it's a lifestyle."

As an almost-graduate bound for medical school next fall, I think Long caricatures a pre-med student. Her generalization that a pre-med "should take a leadership position in organizations such as the Harvard Cancer Society or the Community Health Initiative, you should volunteer at a hospital or a nursing home, and you should work in a research lab" reinforces the stereotype of the pre-meds who do things because they have to: getting an A in class, starting their own community-service project, or working in a lab. It ignores the fact that many pre-med students at Harvard have a lot of freedom in their academic and extracurricular activities. I have pre-med friends whose main passions are economics, health policy, and music. I concentrated in social studies and took a semester off to live and work in another country. I definitely did not feel constrained, and can still say that I did just fine (I hope!). Have hope, future pre-meds: life is not so bad.

LYDIA LO '10  
Cambridge

I WONDER IF Menand has heard this?

Roy Bailey, a British professor emeritus of sociology and a folksinger, sang this at his own retirement party. I sang it at a party a friend of mine threw to celebrate the completion of her Ph.D. If she had it to do again, I wonder if she would bother.

ELIZABETH BLOCK '65  
Toronto

### Their Way

(Words © 1970 by Bob Blue; "My Way" music © 1969 by Paul Anka)

I came, bought all my books, lived in the dorms, followed directions.  
I worked, I studied hard, met lots of folks who had connections.  
I crammed. They gave me grades, and may I say, not in a fair way.  
But more, much more than this, I did it their way.

I learned all sorts of things, although I know I'll never use them.  
The courses that I took were all required. I didn't choose them.  
You'll find that to survive, it's best to act the doctrinaire way,  
And so I buckled down and did it their way.

Yes, there were times I wondered why I had to crawl when I could fly.  
I had my doubts, but after all, I clipped my wings, and learned to crawl.  
I learned to bend, and in the end, I did it their way.

And so, my fine young friends, now that I am a full professor,  
Where once I was oppressed, I've now become the cruel oppressor.  
With me, you'll learn to cope. You'll learn to climb life's golden stairway.  
Like me, you'll see the light, and do it their way.

For what can I do? What can I do? Take out your books. Read chapter two.  
And if to you it seems routine, don't speak to me: Go see the dean.  
As long as they give me my pay, I'll do it their way.

## DON'T ASK, DON'T TELL

WITHOUT COMMENTING on the ultimate merits of the issue, the assertion in the letter from Ted Gideonse '96 that the "Don't Ask, Don't Tell" policy is written into the Uniform Code of Military Justice is incorrect (November-December 2009, page 6). The statute setting out the policy, 10 U.S.C. 654, is contained in Chapter 37 of Title 10 of the United States Code, entitled "General Service Requirements," and carries no criminal penalties. The Uniform Code is Chapter 47. The sodomy statute, 10 U.S.C. 925, which is Article 125 of the Uniform Code, is sexually neutral on its face, applying to both heterosexual and homosexual conduct. In 2005, the Bush admin-

istration requested that Congress amend Article 125 to limit its reach to forcible sodomy and sodomy with children under 16. Congress did not act on that request.

SCOTT W. STUCKY, J.D. '73  
Judge, U.S. Court of Appeals for the Armed Forces  
Washington, D.C.

CEREBRUM AND COLON

IN REFERENCE to “Evolution by Fire” (Right Now, by Jonathan Shaw, November-December 2009, page 9): Our colons have evolved over the same time period as our brains and have been subjected to the same raw, unprocessed food mixed with leaves, grass, twigs, etc. Over time, our diet has consisted of more cooked foods, allowing for bigger, calorie-hungry brains. This has culminated in the explosion of processed food that has dominated the last 60 to 80 years. We have evolved so far from our original colonic Eden that it is nearly impossible today to find a diet that consists of anything other than pure protein, pure fat, and pure carbohydrate.

Our colons initially processed large amounts of material that the small bowel

could not absorb, thus presenting a large “fiber” load that kept the colon exercised. But pure protein, pure fat, and pure carbohydrate are all nearly 100 percent absorbed by the small bowel, leaving very little residual to be presented to the colon. This has not allowed our colons to adjust over evolutionary time to the very decreased amount of roughage, resulting in many of the contemporary diseases of the colon and rectum.

Unfortunately, we cannot afford to wait for natural evolution and assume that our digestive system will evolve to accommodate the diet we are currently consuming. We need to focus on the benefits of adequate fiber even though it is very difficult to find in any of our foods today.

C. JOHN SNYDER, M.D. '63  
Vail, Colo.

AMPLIFICATIONS: MEDALS OF HONOR, CLASS COLORS, ALIVE

JAMES B. HOBBS '52 writes in reference to “Above and Beyond” (November-December 2009, page 69): “It is called the ‘Congressional’ Medal of Honor erroneously. It

is the Medal of Honor, which incidentally is approved by Congress.”

According to the website of the Congressional Medal of Honor Society, “The Medal of Honor is the highest award for valor in action against an enemy force.... Generally presented to its recipient by the President...in the name of Congress, it is often called the Congressional Medal of Honor.” For information on additional Harvard honorands, see page 63.

In last issue’s College Pump (“Curious Colors,” November-December 2009, page 72), we inadvertently forgot to identify the late Bertram K. Little ’23 as the owner of the tie on display. His class colors were orange and black. His son Warren M. “Renny” Little ’55 writes further that “the seniors’ desire to wear buttons with their class colors was not only to identify themselves to other classmates, but also to distinguish their status as seniors until they put on their academic robes on the first of May.”

Richard E. Sanderson ’58 was mistakenly reported as deceased in the November-December 2009 list of *Harvard Magazine* donors. We apologize for our error.



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I certify that the information above is true and complete.  
Catherine A. Chute, Publisher

lied forces could stumble on Merkers, they could easily stumble on something just as extraordinary and unexpected.... And still out there, somewhere in Nazi hands, were known to be two great treasure troves of looted European art: the cream of the French artistic patrimony, reportedly stored in the castle at Neuschwanstein; and Hitler's treasure chamber deep at Altaussee, in the Austrian Alps, which contained many of the greatest works of art in the world.

WHEN GEORGE STOUT left Europe in August 1945 after little more than 13 months, he had discovered, analyzed, and packed tens of thousands of pieces of artwork, including 80 truckloads from Altaussee alone. He had organized the MFAA field officers at Normandy, pushed command headquarters to expand and support the monuments effort, mentored the other Monuments Men across France and Germany, interrogated many of the important Nazi art officials, and inspected most of the Nazi repositories south of Berlin and east of the Rhine. It would be no exaggeration to guess he put 50,000 miles on his old captured VW and visited nearly every area of action in U.S. Twelfth Army Group territory. And during his entire tour of duty on the continent, he had taken exactly one and a half days off.

He then requested and received a transfer to the Pacific theater, arriving in Japan in October and serving as chief of the Arts and Monuments Division at Headquarters of the Supreme Command for the Allied Powers, Tokyo, until mid 1946. For his years of service, Stout received the Bronze Star and Army Commendation Medal.

After his tour in Japan, Stout returned briefly to Harvard's Fogg Museum. In 1947, he became director of the Worcester Art Museum in Massachusetts, where he served until becoming director of the Isabella Stewart Gardner Museum in Boston.

By the time he retired in 1970, he was considered one of the giants in the field of art conservation.

His service in World War II, meanwhile, remained almost completely unknown. One major reason was that Stout rarely discussed it.

Those who knew him, though, were unequivocal about the significance of his contribution to the MFAA and the preserva-

## HARVARD ART ALLIES

*Harvard men struggling to protect artistic and historical treasures in World War II included:*

MASON HAMMOND '25, LITT.D. '94

In 1943, Hammond—later Pope professor of the Latin language and literature and unofficial Harvard historian—was appointed the first adviser on Fine Arts and Monuments to the U.S. Army. He served in North Africa, Italy, England, and Germany.

WALTER J. HUCHTHAUSEN, M.ARCH. '30

Huchthausen, an architect and professor at the University of Minnesota before the war, was attached to the Ninth Army. Stationed mainly in Aachen and responsible for much of northwest Germany, he was killed during a mission in April 1945.

LINCOLN KIRSTEIN '30

Kirstein had founded the School of American Ballet before the war and would found the New York City Ballet Company after it. He joined the army as a private at the age of 36 and eventually gained assignment to the Third Army's Monuments unit.

CHARLES L. KUHN, PH.D. '29

As director of the Busch-Reisinger Museum, Kuhn sought even before the war to acquire and preserve works of modern art the Nazis deemed "degenerate." He spent most of his Monuments service pursuing stolen and lost art in Germany and Austria.

JAMES J. RORIMER '27

Rorimer, who'd helped create The Cloisters to house the Metropolitan Museum of Art's medieval collections, was attached to the Seventh Army; he helped discover some of the greatest Nazi repositories, including those at Neuschwanstein and the Heilbronn mines. He would become director of the Metropolitan Museum in 1955.

PAUL SACHS '00, AR.D. '42

As director of the Fogg Art Museum and a member of the Roberts Commission, Sachs recruited many of his former students to serve as Monuments Men.

GEORGE STOUT, A.M. '29

One of the first Monuments Men, Stout served with the Twelfth Army Group.

LANGDON WARNER '03

Curator of Oriental art at the Fogg Museum, Warner was an expert consultant to the military and is credited with saving the cities of Kyoto and Nara from bombing.

OTTO WITTMANN JR. '33

Wittmann, later director of the Toledo Museum of Art, served with the Office of Strategic Services and investigated Nazi art thefts, particularly from French Jews.

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*To learn more, or share data about the Monuments Men, go to [www.monumentsmenfoundation.org](http://www.monumentsmenfoundation.org).*

tion of European culture....Lincoln Kirstein put it best because he put it most bluntly. "[George Stout] was the greatest war hero of all time—he actually saved all the art that everybody else talked about."

Nonetheless, it is not surprising that George Stout's contribution to the MFAA was never truly appreciated because, in the decades following the war, the MFAA section and its work was itself lost in the fog of history. Part of this was circumstance.

The Monuments Men were typical of "the Greatest Generation" and tended to downplay their roles in the war. Since they did not serve as a unit, there was no official history.

Perhaps because of this, the army essentially forgot about the monuments conservation effort. There was no dedicated unit equivalent to the Monuments, Fine Arts, and Archives section in the Korean War, and there hasn't been one in any war since. ♥

# War and Peace

*A stained-glass window in Harvard's Memorial Hall*

THE TOUR GUIDE will tell you that more *secular* stained glass may be seen in Memorial Hall than in any other building in the world. No image of Christ gazes down from these 22 gorgeous windows. Instead, more or less life-size, here are such worthies as Dante and Chaucer, Charlemagne and Sir Thomas More, Pericles and Leonardo, and Hector parting from Andromache. Inscriptions in Latin evoke virtues desirable in the academy—*Disciplina*, *Patientia*, and *Fortitudo*. All this is meant to refer somehow to the young Harvard scholars-turned-soldiers who perished in the American Civil War fighting for the Union, to whom the building stands as a memorial. The figural windows went up from 1879 through 1904. The one shown here, *Peace and Honor*, done in 1900, shines with 18 others on freshmen at their meals in the part of the edifice now called Annenberg Hall.

A striding young man with spear and shield goes off to war, at left, and returns, a survivor, to give thanks. The allegorical figures Honor and Peace suggest Hera or Athena, familiar char-

acters in a classical undergraduate education, according to art historian Virginia Raguin, writing in the *Harvard Library Bulletin*. The tableau is the work of Sarah Wyman Whitman (1842-1904), who also created the largest, most complex window on site, in the south wall of the transept.

She joined many other leading stained-glass artists employing varied techniques

to adorn these walls, among them John La Farge and Louis Comfort Tiffany, two who developed the new opalescent style of stained glass at which Whitman excelled. “The *Peace and Honor* window is one of the most successful opalescent designs of its time,” Raguin writes. It is “legendary for its brilliance.”

Traditional stained-glass windows use glass of clear, uniform colors—so-called pot metal colors—modeled with vitreous paint, which contains ground glass. Whitman used that and more or less milky glass of variegated colors and a pearly surface sheen, of varying thickness and texture, to achieve opalescent effects. She also layered several glass segments in a technique called plating, which gave her windows a sculptured look.

These are painterly windows, and indeed Whitman was a painter in oils. For more about her, see “Vita,” January-February 2008, page 32. For more about Memorial Hall’s stained glass, go to <http://harvardmag.com/war-and-peace>. For more about war, read a newspaper. For more about peace, be hopeful. ~ C.R.





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