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FOR PEOPLE WHO DO NOT GO WITH THE TIMES.

HARVARD

MAGAZINE



page 57

JIM HARRISON

DEPARTMENTS

- 4** Cambridge 02138
Communications from our readers
- 11** Right Now
Decoding “junk” DNA, ancient urbanism, aging dims cerebral connections, oceans absorb greenhouse gases, flocking to finance
- 21** Montage
A screenwriter’s sleuth novel, remembering childhood and baseball, orchestral milestone, underground art, a biography of free speech, sundial sculptor
- 32A** Commencement and Reunion Guide
Face-to-face reunions in a virtual age, graduates’ career choices, brunch best bets, a calendar of events, and more
- 78** The Alumni
Pursuing fossil fish with links to land, Boston club centennial, Overseer and Alumni Association candidates, and more
- 84** The College Pump
The Lowell House bells head home
- 96** Treasure
Sea creatures, scrubbed up
- 85** Crimson Classifieds

On the cover: “Brainbow” neurons.
Image courtesy of Jeff Lichtman

FEATURES

34 Forum: Making Credit Safer

The case for regulating financial products and services—on consumers’ behalf, and industry’s

by ELIZABETH WARREN

38 Vita: George Bancroft

Brief life of a public historian: 1800-1891

by YONATAN EYAL

40 Shedding Light on Life

Using new optical microscopes, scientists probe molecular and cellular processes as they occur

by COURTNEY HUMPHRIES



page 34

DAVID PLUNKERT



page 65

MARK STEELE

48 Home of the Humanities

Dumbarton Oaks thrives as a cross-disciplinary center for Byzantine, pre-Columbian, and landscape studies—and invites the public to explore its treasures

by ELIZABETH GUDRAIS

57 John Harvard’s Journal

High-flying athlete, Harvard Medical International’s new partner, photographer with a scientific bent, art museums’ reconstruction renderings, opening worldwide access to faculty research, the new College dean, genetic perspectives




page 48

DUMBARTON OAKS

on race, medical-area musicians, colorful Square characters, interdisciplinary social science, China contradictions and Crimson connections, taking action on greenhouse-gas emissions, the “Undergraduate” moves uneasily between Harvard and home, questions about basketball recruiting, and a summary of strong hockey seasons



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Cambridge 02138

Green energy options, foreign policy, medical errors, military jurist

LAKSHMINARAYANAN MAHADEVAN

RE "The Physics of the Familiar" (by Jonathan Shaw, March-April, page 46):

Mountains, valleys are wrinkled earth.
Glossy grapes shrink into raisins.
Maps of life illustrate old faces—
Because skin folds to fit.
Neurons bend toward memories.
He thinks, therefore we learn.

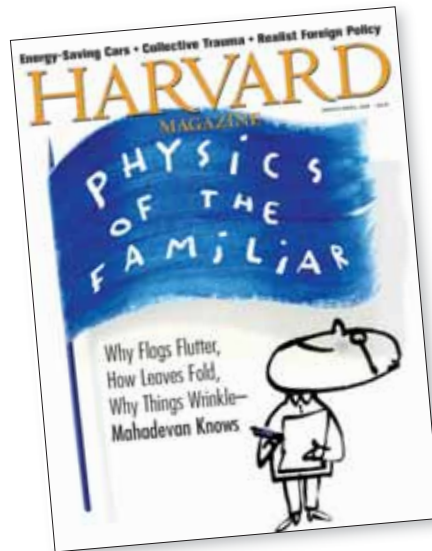
E. JAMES LIEBERMAN, M.P.H. '63
Potomac, Md.

COLLECTIVE TRAUMA

I AM WRITING regarding "Trail of Tears, and Hope" (by Craig Lambert, March-April, page 39). I applaud the magazine for focusing on this important issue and for highlighting the promising work of Sousan Abadian. All too often the hardships imposed upon indigenous people, in the United States and in other countries, are overlooked or seen as ancient history, and this article does a great job of calling attention to the present consequences of the often shameful treatment of Native peoples since contact.

Yet one aspect of the article that I think deserves clarification is its implicit idea that the wrongs indigenous peoples have suffered are purely historical. As a telling example, the main countries discussed in the article, the United States and Canada, together with Australia and New Zealand, are the only countries that recently voted against the United Nations Declaration on the Rights of Indigenous Peoples. The collective trauma of many Native peoples is made worse by the harms that continue to this day.

EZRA ROSSER, J.D. '03
Assistant professor of law
Washington College of Law, American University
Washington, D.C.



MY OWN EXPERIENCE with Northern Plains and Saskatchewan First Nations leads me to emphasize the paternalistic policies that destroyed a large number of First Nations communities a century ago: by allotting parcels of land in severalty to break up communal holdings and, after World War II, by moving families to tract housing in agency towns, purportedly to facilitate access to schools. There are no places in these tightly clustered subdivisions for children to roam and play, so they sit watching television (in English, losing their own languages). Unemployment is high because the reservations were deliberately placed away from transportation to "protect" the Indians from exploitation by incoming whites. Indians have not been able to develop businesses because they have no collateral for loans, their lands being in trust or highly divided among multiple heirs. On Northern Plains reservations, most of the economically viable land has been leased in large sections to white ranching families, some with five generations on these leased

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CONTRIBUTING EDITORS

John T. Bethell, John de Cuevas, Adam Goodheart, Jim Harrison, Harbour Fraser Hodder, Christopher S. Johnson, Adam Kirsch, Colleen Lannon, Christopher Reed, Deborah Smullyan, Mark Steele, Janet Tassel

EDITORIAL AND BUSINESS OFFICE

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properties. Because of these intractable governmental policies, Indian people quite rightly feel helpless.

May I urge you to do another article that forgoes the feel-good New Age healing jargon and instead...[focuses on] why "healing" will come with economic development created by First Nations themselves, from which will come political freedom from stifling imposed practices.

Alice B. Kehoe, Ph.D. '64
Professor of anthropology emerita
Marquette University
Milwaukee

FINANCIAL-AID FOCUS

I WAS GRATIFIED to see the progress made in making [the situation of] Harvard undergrads essentially tuition-free, and that Ph.D. students are also doing well ("Boosting College Financial Aid" and "Gains for Graduate Students," March-April, pages 54 and 58).

But there was not a word about the

ON LINE: COMMENCEMENT, WEB EXTRAS, PUZZLES REDUX

THE MAGAZINE'S website, www.harvardmagazine.com, will again feature real-time coverage of Commencement week, including breaking news reports, audiovisual recordings of the principal events, and speech texts, beginning June 2. Our annual *Commencement and Reunion Guide*, with a comprehensive calendar of happenings, is available on the website now.

As noted in the March-April issue, the "HM Extra" icon in magazine articles indicates the presence of complementary multimedia content on the website. In this issue, look for such features accompanying an account of new archaeological discoveries (page 12); introductions to the Harvard-Radcliffe and Longwood Symphony Orchestras (pages 23 and 65); and the visually stunning exploration of biomedical imaging (page 40).

Finally, it is a great pleasure to announce that the clever creations of puzzlemaker John de Cuevas '52, a contributing editor, are returning; you can now download archival puzzles and a new Harvard Puzzle from harvardmag.com/puzzles

shameful situation at the Graduate School of Education (GSE), where the typical master's student graduates \$45,000 in debt. Do they then go on to \$200,000 jobs as do the Business School and Law School alumni? Of course not. They go into the lowest-paying—but most important to society—jobs of teaching our youth, at salaries below what your plumber makes.

President Faust: Wake up! This is a priority. Every student at the GSE should be tuition-free.

Charles Resnick '48, LL.B. '50
Longboat Key, Fla.

HYBRID CARS AND WIND POWER

PROFESSOR Michael B. McElroy brings a welcome dash of realism to the national discussion on energy sources for future transportation in the United States ("Saving Money, Oil, and the Climate," March-April, page 30). He is certainly right that electricity is the key, and that plug-in hybrid vehicles provide the technological bridge to reduced fossil-fuel dependence. Here, "plug-in" is the vital feature that is perennially limited by lagging energy-storage (battery) technology. I feel he was optimistic in emphasizing the 60-mile-range dream for automobiles on battery alone. Has he examined the cost to the buyer of such a vehicle? I suspect it will be within the economic range primarily of full professors of environmentalism.

Concerning the air-pollutionless attainment of the needed electricity, I was less pleased by his exposition. The two available routes are wind and nuclear. Possibly because of his own research interests, he seems biased toward wind turbines. I find it somewhat appalling that an environmentalist would unreservedly endorse these monstrous, flailing bird-killers—huge mechanical contrivances with all their associated aesthetic and maintenance penalties. My impression is that, like ethanol, which he rightly recognizes as a scam, wind power would not get off the ground without taxpayer subsidies.

In contrast, with an easing of the fear-mongering campaign against all things "nuclear," the latter power source would unquestionably have the potential to meet all national electric power needs indefinitely, without killing one bird or offending one aesthete, and without subsidies. I have no doubt that hundreds of

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our citizens, if not thousands, have died to give us coal power, while exactly zero have died to give us nuclear power. Yet what is the national image of the relative "safety" of these two power sources? Surely it is the job of professional environmentalists, if they wish to be judged kindly by history, to restore some balance.

Our government has given nuclear power nothing but a hard time. No help has come, only an endless series of safety regulations that have indeed pushed costs through the sky. Environmentalists have played their part in this. Is it not time for a change of heart? Must fear govern everything we do? Should national policy be dictated by worst-case scenarios?

THOMAS E. PHIPPS JR. '46, Ph.D. '51
Urbana, Ill.

McELROY'S ARTICLE on using non-fossil energy for our vehicles reminded me of my efforts to move in that direction. About six months ago I hoped to get rid of my gasoline car (about 28 mpg) and get an all-electric, plug-in car. I had hoped to use the electric for driving around the city, and to rent a car for the occasional longer-distance trip. I discovered to my dismay that it is impossible to get auto insurance for such a car unless it is one's second vehicle. I checked with four major insurers and they all had the same restriction. Perhaps McElroy and others with more clout than a single consumer can make the insurance companies help reduce our carbon footprint by encouraging the use of electric and hybrid electric vehicles (HEVs).

DAVID BARNHOUSE '49
Santa Barbara, Calif.

McELROY'S ARTICLE made the claim that energy savings could be made by utilizing plug-in rather than standard HEVs. This is not sustainable from an engineering point of view, and is suicidal from an ecological point of view.

This is the initial impetus for the hybrid vehicle: If the energy dissipated in slowing down can be recovered and reintroduced during acceleration, overall energy consumption can be decreased. Initial and steady-state energy consumption take a hit due to the added weight of the electric motors and energy storage devices (currently NiMH batteries). If enough energy is recovered during deceleration and fed back during acceleration,

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there is a net decrease in energy consumption. As usual, this is a complex engineering trade-off. You want minimal battery weight to minimize energy consumption in steady state and accelerating conditions and sufficient battery capacity to recover an optimum amount of energy. Different companies decide on different optimization strategies, but it appears that the maximum amount of energy that can be recovered by coasting down a long hill and stopping is the method utilized to establish the battery capacity.

Because the battery is a very inefficient method of storing energy, especially when compared with gasoline, sizing the battery in excess of expected recovery requirements leads to excess energy consumption overall. But some people are enamored of the concept of electric-vehicle operation. The usual idea is to add battery capacity to allow for pure electric operation for around 40 miles or 60 kilometers. In round figures, the additional batteries needed to provide this capacity add roughly 20 percent to the vehicle weight. At lower speeds, this leads to an increase in energy consumption (whether from gasoline burned by the engine or the kilowatt hours consumed from the electric grid) of roughly 20 percent also, with this percentage decreasing as the speeds increase.

Proponents of plug-ins trumpet gasoline mileage figures of 80 mpg, 120 mpg, even 150 and more mpg. Incredible! They are going to save the world! However, they neglect to take into account the energy consumed in generating the electricity consumed in the battery. The real [mileage] figure is much less.

There are even more substantial problems using grid electricity. The electric industry is not only capacity-limited at times, but is converting as quickly as possible from highly polluting forms of generating electricity such as coal and nuclear to less polluting forms such as solar, wind, geothermal, tide, or other potential forms. Thus we can assume any kilowatt hours used by plug-ins come from the most highly polluting forms of energy generation. Thus a plug-in exports pollution from its source (where the car is driving) downstream, beyond the area where the electricity is generated (where the population and environment have no voice in the pollution generated).

DAVID W. HARRALSON
Hollywood, Calif.

I WAS SURPRISED that there was no mention of the concept of "CO₂-to-algae-to-biofuels." My own patent-pending technology, as well as those of my competitors in this field, enables this process to happen economically and profitably in the southern half of the country where there is sufficient sunlight and warmth.

Given the ease and low cost of converting our existing fuel-distribution infrastructure for biofuels, and also the extra radiation risks of increasing our use of electricity to power vehicles, it is unfortunate that the concept of using photosynthetic algae to sequester CO₂ and then produce biofuels like ethanol and biodiesel seems to get less media attention—not to mention academic focus—than other technologies like the hybrid engines being promoted by McElroy. Is this yet another case of "liberal media bias" in the Northeast, or simply an honest oversight???

JONATHAN L. GAL '89
President, Texas Clean Fuels
Royse City, Tex.

I APPLAUD McElroy's initiative, but at the risk of nitpicking, I have to complain, "Why the obsession with wind?" As a 27-year veteran of the international power-generation industry, my ardor for climate-change solutions is governed by hard-earned experience and an appreciation for efficient solutions. McElroy is headed in the right direction—plug-in hybrid cars charged with electricity made from renewable energy. And he's correct that the greenhouse-gas problem in the electricity sector cannot be addressed without taking coal head-on. But wind is not the answer. Most people look reflexively to wind because the technology is commercially available and we've been led to believe that it is competitive, or nearly so, with conventional forms of electricity. Yet wind's intermittency and its very poor average utilization rate (a national fleet of wind turbines of the scale proposed would operate on average at less than 30 percent capacity) make it woefully incapable of replacing coal-fired generation. The almost flip suggestion that we need to get to work building transmission to interconnect all of these wind farms to the grid highlights the other problem, but also points to the solution.

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the countryside with wind turbines, stringing thousands of new transmission lines in order to connect them to the grid, and building hundreds of new nuclear, gas- or (God forbid) coal-fired plants to stabilize the production of so much intermittent wind, should we not ask if there are any less draconian and more economically attractive alternatives? A promising one is solar thermal with thermal storage. We could accomplish with fewer than 10,000 square miles in the desert Southwest (about 9 percent of the federal lands in Nevada) what would take literally millions of wind turbines to produce, even if you could somehow site them. And rather than thousands of new transmission lines, perhaps a dozen large high-voltage direct current corridors running to existing major transmission hubs would be sufficient to interconnect the capacity to the national grid. Perhaps the technology is few years away, but it makes far more sense than rushing headlong to invest in a technology that is accessible and feasible at the margins, but quite clearly not appropriate to the larger task proposed by McElroy.

MICHAEL HOGAN, M.B.A. '88
Boston

FIXING FOREIGN POLICY

READING Joseph Nye's essay (“Toward a Liberal Realist Foreign Policy,” March-April, page 36), I do not see the fresh departure from our failed unilateralist, neo-conservative foreign policy that your readership is awaiting. Indeed, this apple has not fallen very far from the tree—somewhere within the Beltway.

Nye has limited his objectives to “how.” All he is saying is that he can ensure U.S. hegemony better than the neocons. He is not their intellectual opponent, questioning the framing of the questions. In his priorities, and most particularly the identified major threats we face—terrorism and political (please turn to page 93)

Right Now

The expanding Harvard universe

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Treasure in the Genome's Trash

THE BROAD INSTITUTE of MIT and Harvard often grabs headlines for its discoveries about the genetics underlying such diseases as cancer, heart problems, autism, and diabetes. But alongside this high-profile medical research, the institute also funds a team that is working steadily to sequence the genomes of mammals large and small, from the African elephant to the tree shrew. "It's very easy to think that [this project] doesn't matter because it's not purely biomedical," says Kirsten Lindblad-Toh, who leads the Mammalian Genome Project. In fact, she explains, the genomes of other animals hold a wealth of information about how our own evolved.

The Broad team was first to sequence the genome

of a marsupial: the short-tailed opossum, *Monodelphis domestica* (the findings were detailed last year in *Nature*).

Marsupial babies, unlike the young of placental mammals, develop primarily in a maternal pouch, rather than in a womb. The DNA of this small mammal has given scientists a window into evolutionary history since the time, around 180 million years ago, when placental mammals split from marsupials—and has provided a surprising new view of the role of so-called junk DNA in evolution.

Lindblad-Toh explains that just 5 percent of the DNA in mammalian genomes is thought to be functional, and of that fraction, less than half actually serves as a blueprint to make proteins. The rest of the 5 percent consists of regulatory elements: DNA sequences that turn genes on and off. That appeared to leave the vast majority of the genome as junk DNA, with no known function. Now the comparative biology made possible by the opossum genome sequence suggests otherwise.

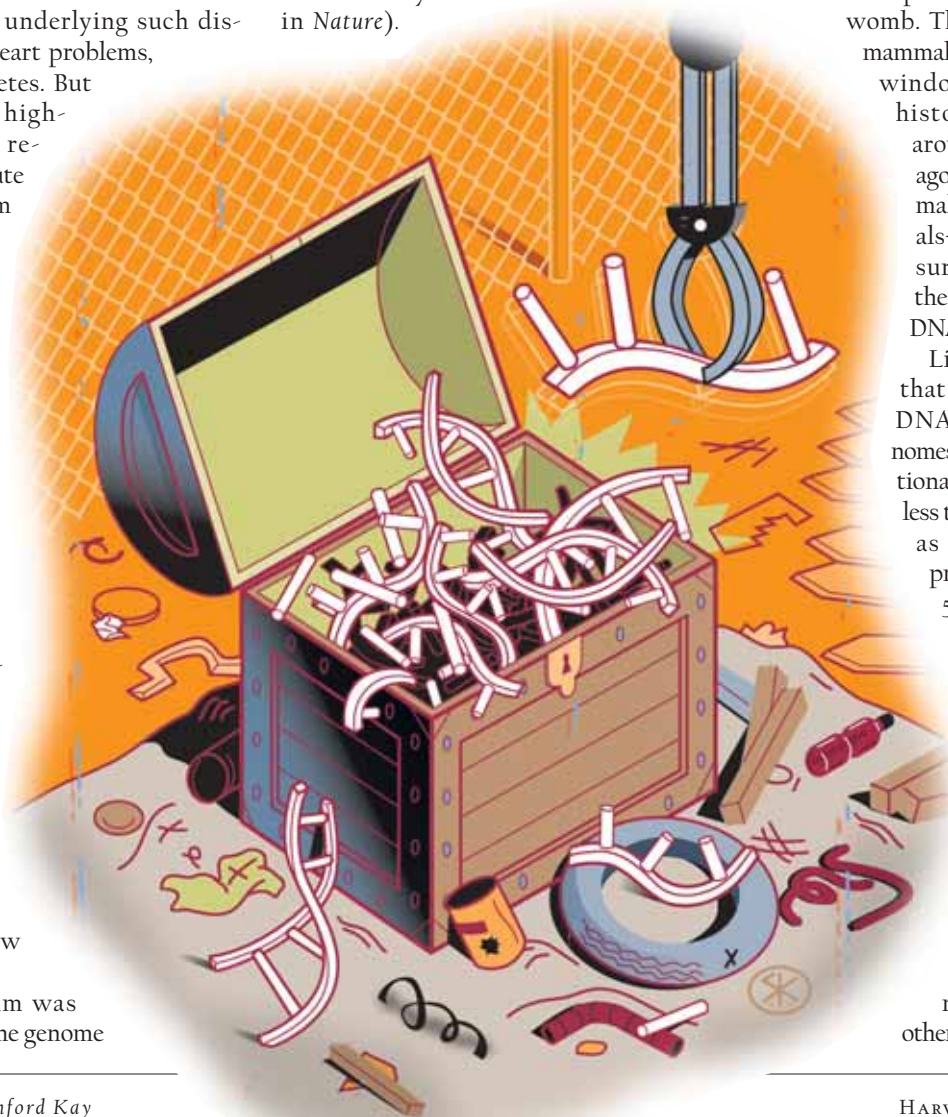


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To compare genomes of human beings and other mammals, scientists rely on an ancient common ancestor as a reference point—and previously, our nearest sequenced ancestral relative was the chicken. Tarjei Mikkelsen, a graduate student at the Broad and the paper's first author, notes that it's difficult to compare genomes of mammals with those of birds or reptiles: the sequences have changed so much that similar areas of the genome are unrecognizable. Marsupials, on the other hand, fill a gap in the evolutionary tree. "What the opossum genome allowed," he says, "was a look at a midpoint" between mammals and their more distant ancestors.

The genes of marsupial and placental mammals turn out to be surprisingly similar. Most of the evolutionary changes that have occurred between the two

groups are found in the regulatory sequences. In fact, 20 percent of the regulatory elements in the genomes of placental mammals are recent innovations that took place after the split from marsupials.

Even more surprising is the source of this novelty. Many of the changes in regulatory controls seem to have their origin in repetitive sequences of junk DNA. Lindblad-Toh explains that most junk DNA is composed of "transposons," small pieces of DNA that can move from place to place and propagate themselves inside the genome, similar to the way that a virus or parasite behaves. The study suggests that this seemingly selfish behavior might actually have an important function in the genome, because when transposons move or copy themselves, they introduce new variations that may be beneficial to their host. "It's a bit of sym-

biosis," she suggests. "[Transposons] are allowed to move around and propagate," while their host gains an engine of innovation that may help it evolve.

Mikkelsen says that junk DNA might be less a wasteland and more like a junkyard of old parts: DNA sequences that can be reused and recycled to generate innovation. In this sense, the sequencing of the genome is broadening scientists' entire view of what genetic material is and how it functions—revealing a much more complex and scientifically interesting view of DNA, genes, and cell regulation than prevailed only a few years ago. In Mikkelsen's words, "Junk DNA seems to be a very good substrate for creating new things."

~COURTNEY HUMPHRIES

MAMMALIAN GENOME PROJECT WEB PAGE:

www.broad.mit.edu/mammals

IN SHERDS, A TELL

Outside-In Ur-banism

THE MOST FASCINATING thing about the suburbanites living around the ancient Mesopotamian settlement of Tell Brak isn't who they were, according to archaeologist Jason Ur, but how they joined the city.

While studying the site in what is today northeastern Syria, a few hundred miles north of Gilgamesh's Uruk (Tell Brak's most celebrated contemporary), the assistant professor of anthropology discovered something surprising: instead of growing from the inside out, Tell Brak

apparently expanded when settlements outside its borders slowly grew into it. "Near Eastern archaeologists have this idea that the origins of cities are based on the power of a single man, or centralized political power," says Ur. But around Tell Brak, the immigrants (which is what Ur believes they were) kept "some autonomy from the preexisting community. Which is not the prevailing model."

Archaeologists including Max Malowan (better known as the husband of mystery writer Agatha Christie) have

been digging up Tell Brak's secrets since the 1930s. Thousands of years of human history lie buried under the artificial mound that protrudes some 40 meters—roughly 10 stories—into the air from the center of the otherwise flat 2-by-1.5 kilometer site. ("Tell" derives from *tall*, Arabic for "hillock.") A group of Cambridge University scholars began excavating the mound in the late 1970s, burrowing down



Above: Jason Ur in Turkey. Left: The high central mound of Tell Brak, formed by generations of mud structures built on top of one another, rises out of the alluvial plain.



through the strata of the third and fourth, and finally the fifth, millennium B.C.

Ur—whose colleagues jokingly accuse him of using a stage name—joined the Cambridge team in 2002. Besides digging, the excavation project was also surveying the wider region for distant neighbors, but Ur proposed to study the area right around the mound. After gaining the local landowners' permission, he spent three seasons (which last from May to September) doubled over, walking back and forth across the site. He began each day as soon as it was light enough to see, took a siesta in the afternoon when the temperature crept above 100 degrees, and continued in the early evening while the sun went down. It wasn't always fun "walking through farmers' fields and being chased by the dogs and kicking sheep dung off the surface, looking for tiny potsherds."

Potsherds are the ancient debris of daily life, bits of earthen storage vessels and cooking pots that litter the ground—Ur estimates there may be something like 10 million pieces on the site. Every year the farmers' plows turn up more. Simply by looking at their characteristics, such as decorative patterns or coloration (which varies according to kiln heat), Ur can date them. (He likens it to dating cars by their fins, hand cranks, or hybrid engines.) For example, in the early fourth millennium B.C., Mesopotamians tempered their clay with sand. Later, they replaced the sand with vegetable matter, such as ground-up chaff, impressions of which remained on the finished pottery after firing.

Ur found small, concentrated pockets of sherds from the late fifth millennium some 1,000 meters to the southwest and 500 meters to the north and east of the central mound. Around these three areas he found much larger numbers of sherds that date from the middle of the fourth millennium. He concluded that satellite communities had sprung up and ex-



Clockwise from the top: the farmland around Tell Brak's high central mound, ceramic sherds collected for study, and sherds as they turn up on the ground.

panded naturally, a finding he published in an August 2007 issue of *Science* magazine. "This pattern," he wrote, "suggests a greater role for non-centralized processes in the initial growth of Brak and lesser importance for centralized authority." Perhaps the immigrants couldn't forcibly integrate themselves into the city—or possibly the city-dwellers lacked the strength to kick them out altogether. In either case, Ur says, there was a balance, rather than a monopoly, of power: a distinct contrast to the older hypothesis based on the famous king of Uruk who, according to the *Epic of Gilgamesh*, had the literal and political muscle to build a wall around the city and stood alone as a "mighty net, protector of his people."

For nearly 20 years, the political situation in Iraq has made it next to impossible to study the ancient cities of south-

ern Mesopotamia. The assumption is that the dozen or so settlements in Iraq follow the Gilgamesh model: a strong central leader. But whenever archaeologists return to these sites, Ur suspects they may find something more complicated. "I shouldn't say that what we find at Brak disproves this inward-outward growth model," he says. "But it certainly suggests, at the minimum, that there were multiple paths to urbanism."

—PAUL GLEASON

JASON UR E-MAIL ADDRESS:
jasonur@fas.harvard.edu



Visit harvard-mag.com/extras to hear Jason Ur discuss Tell Brak as it was then and is today.

The Aging Brain

NEUROSCIENTISTS have long used damaged brains as a way to understand normal brain functions. But doing the opposite also works. A group of researchers at Harvard recently looked at the effects of aging on healthy people's brains and found that as we get older, communication between different brain regions breaks down. This discovery could eventually help scientists better characterize and detect neurodegenerative diseases, including Alzheimer's, which affects more than 5 million Americans.

Until recently, most scientists looking at the aging brain focused on individual regions, especially those in the frontal lobe, which may shrink or lose activity even in the absence of disease, says Jessica Andrews-Hanna, a doctoral student in psychology at Harvard's Center for Brain Science and the lead author on the group's paper (published last December

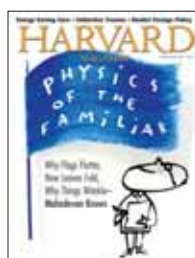
in the journal *Neuron*). Though other investigators had hypothesized that disconnections might occur in the ebb and flow of signals between regions, it wasn't easy to measure this until the introduction in the early 1990s of functional magnetic resonance imaging (fMRI), a scanning technique that measures blood flow.

Andrews-Hanna and her colleagues looked at data collected by researchers at Washington University in St. Louis who studied 93 healthy adults between the ages of 18 and 93. (All were prescreened for Alzheimer's and other neurological diseases.) While lying in an fMRI scanner, the subjects classified single words on a screen as referring either to living or non-living objects. Andrews-Hanna then looked at neural activity during the task in two large-scale networks that span the brain: the default network, used when we're worrying, thinking of the past and future, or imagining people in our lives;

and the attention network, used when we're focusing on a specific task, such as word processing or math problems.

The scientists found that among young people (in this case, those under 35), the brain regions that make up each distinct network were largely in sync with one another—when one region was activated by the task, the other was, too. But among adults over 60, the brain scans revealed a lot of variation. Some participants' scans showed almost the same level of synchrony as those of their younger counterparts, but others' had dropped to zero. When the researchers then used a more direct test to measure communication between regions, they found that those older adults whose brain networks were out of sync also showed a degradation in their white matter, the nerve tissue insulating the brain circuits that support communication. In particular, they noticed, communication lines between the front and back of the brain within the default network (which we also use to day-dream) degrade more in older adults than those in the attention network.

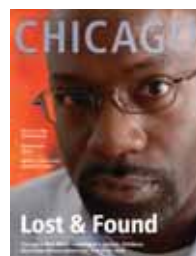
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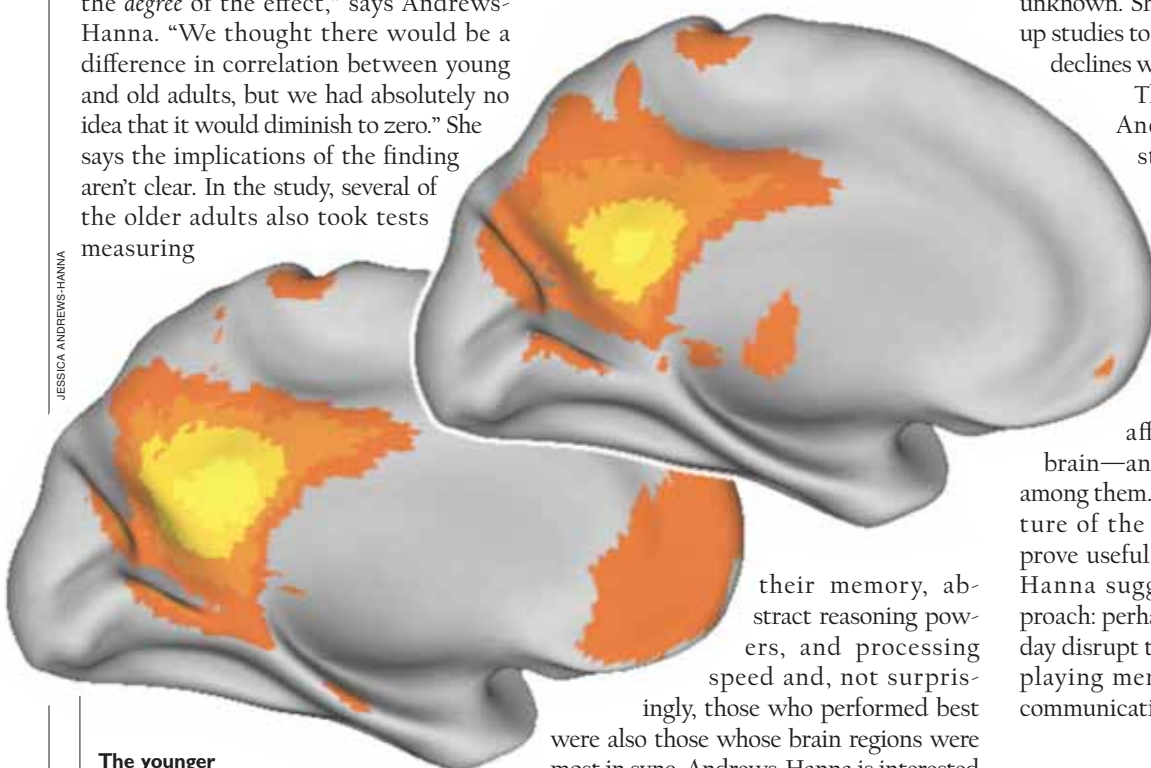
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the degree of the effect,” says Andrews-Hanna. “We thought there would be a difference in correlation between young and old adults, but we had absolutely no idea that it would diminish to zero.” She says the implications of the finding aren’t clear. In the study, several of the older adults also took tests measuring

JESSICA ANDREWS-HANNA



unknown. She’s also hoping to do follow-up studies to look at whether daydreaming declines with age.

The correlation approach that Andrews-Hanna used for the study could also be used to explore how Alzheimer’s affects different brain regions, she says. Scientists have typically focused on one region, the hippocampus, but as technology improves, they’re discovering that the disease affects many parts of the

brain—and perhaps the relationships among them. Certainly, having a clear picture of the normal aging brain could prove useful for its own sake. Andrews-Hanna suggests a rehabilitation approach: perhaps, she says, we could someday disrupt the effects of natural aging by playing mental games that encourage communication between brain regions.

—KATHARINE DUNN

JESSICA ANDREWS-HANNA E-MAIL ADDRESS:
jandrews@nmr.mgh.harvard.edu

The younger brain, below, shows more synchronized activity than the older brain, above.

their memory, abstract reasoning powers, and processing speed and, not surprisingly, those who performed best were also those whose brain regions were most in sync. Andrews-Hanna is interested in further exploring the default network, whose functions she says are still largely

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Climate Change Solutions?

THANKS IN PART to photographs of shrinking glaciers, news reports on the devastation caused by fierce storms, and the Nobel Committee, most Americans now accept the alarming possibility of global climate change caused by rising levels of carbon dioxide. Given the seeming improbability of reining in worldwide fossil-fuel consumption, scientists have begun proposing novel engineering solutions to the problem, like the one devised by geochemistry doctoral student Kurt Zenz House.

In a paper published last fall in *Environmental Science and Technology*, House and his coauthors—including McKay professor of materials science Michael Aziz and Daniel Schrag, professor of earth and planetary sciences and of environmental science and engineering, who directs Harvard's Center for the Environment—suggest a new CO₂ mitigation strategy modeled on Earth's natural ability to absorb carbon dioxide. Rainwater and rivers collect CO₂ from the atmosphere, creating a weak acid that gradually dissolves any silicate rock it washes over. This produces a carbon-

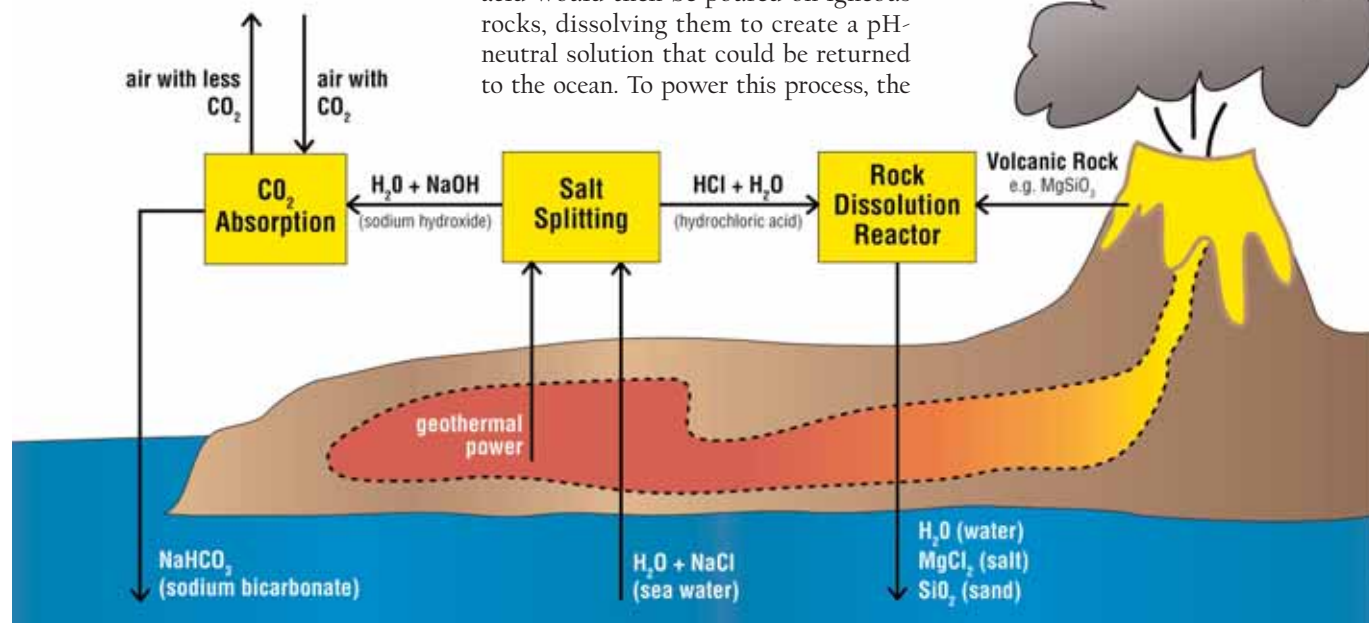
bearing alkaline solution that eventually flows into the ocean, which functions as a vast "carbon sink." Unfortunately, this natural cycle, known as "weathering," is very slow—and the rate at which carbon moves from the atmosphere to the ocean is being overwhelmed by human CO₂ emissions. (The atmosphere now holds an estimated 380 parts per million [ppm] of CO₂, compared to 280 ppm in the pre-industrial age, and that figure is increasing by about 2 ppm of CO₂ a year.)

House proposes using a much stronger acid to speed up the weathering cycle and enhance the ocean's carbon-absorbing capacity. The goal is to make the ocean more alkaline, increasing its ability to suck CO₂ from the air. Such a process, eventually, could soak up an additional 3.7 billion tons of CO₂ a year, about 10 percent of total annual emissions, Aziz says. In one scenario, this would involve 100 industrial plants—each comparable in water-handling capacity to a large urban sewage-treatment facility—where electric current would be used to remove hydrochloric acid from seawater. The acid would then be poured on igneous rocks, dissolving them to create a pH-neutral solution that could be returned to the ocean. To power this process, the

researchers imagine building the plants at geothermally active coastal sites remote from human population centers. "We don't want to release any CO₂, because that defeats the purpose," House explains. "Geothermal energy from volcanoes is very cheap and clean [and available], since we don't build cities on volcanoes." The surrounding volcanic rock also provides the right material to neutralize the hydrochloric acid.

Previous researchers considered adding alkaline material to the ocean directly to boost CO₂ absorption, but a large supply of such substances is hard to find. While jogging along the Charles River in the winter of 2006, House suddenly realized that it would be simpler to *remove acid* from the ocean. At a conference a few months later, he discussed the idea with his brother Christopher, a geology professor at Pennsylvania State University: "I told him what I was thinking and we started doodling on napkins." (Christopher eventually served as a coauthor of the paper.)

Part of the idea's appeal is that it addresses all sources of CO₂, not just power plants. It might also, in theory, benefit coral reefs. The rise in CO₂ levels has made the oceans more acidic, a condition that harms the reefs and



Electrochemical weathering involves four steps. First, an electric current is applied to seawater, causing it to separate into an acidic solution—primarily hydrochloric acid (HCl)—and a basic solution—primarily sodium hydroxide (NaOH): a process called "salt splitting." Second, the separated NaOH is used to capture carbon dioxide (CO₂) from the atmosphere. That can occur either in a spray tower or in the surface ocean. Either way, the NaOH reacts with CO₂ to form sodium

bicarbonate (NaHCO₃)—commonly known as baking soda. Third, the HCl must be neutralized. One way to neutralize the acid is to cause it to react with volcanic rock—thereby triggering the formation of salt, sand, and water, all of which can then be returned to the ocean. The final step involves the CO₂ that has been added to the ocean. Over time, that CO₂ will react with calcium in the ocean and precipitate as calcium carbonate—commonly known as limestone.



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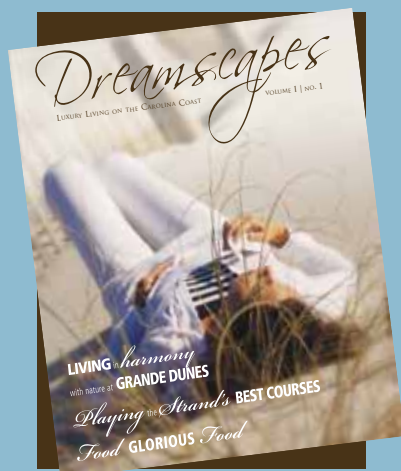
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organisms with shells. Controlling ocean pH with this process might help.

House is used to thinking in innovative ways about the CO₂ problem: he previously collaborated with his adviser, Schrag, on a plan to capture CO₂ directly from power plants and bury it deep in the

about mucking with ocean chemistry," House says. The process mirrors a natural phenomenon, but accelerating it so drastically is "almost certain to cause some damage." (He adds, however, that rising CO₂ levels mean "we're already mucking with ocean chemistry. We're

"If everything works out, this process could possibly deal with 10 percent of the carbon problem, maximum. And even that's optimistic."

earth or in sediments at the bottom of the ocean. But when this latest paper appeared, and news outlets around the world reported its potential benefits, the coverage made House and his coauthors uneasy; they warn against seeing their proposal as a silver bullet for global warming. "If everything works out, this process could possibly deal with 10 percent of the carbon problem, maximum," Aziz says. "And even that's optimistic."

Part of the problem is expense. It's hard to arrive at accurate figures without further study, House says, but rough calculations suggest that the process would cost at least \$100 per ton of CO₂ removed, compared with \$50 to \$60 per ton in other CO₂ sequestration techniques. Schrag is also concerned that increasing the alkalinity of seawater could trigger the precipitation of carbon as calcium carbonate; he believes this would return half the carbon dioxide to the atmosphere, making the process twice as expensive.

Another potential drawback is the possible harm to marine life created by the highly alkaline solution that would exist in seawater around the plants. "We should be very clear that we're talking

just doing it in a less conscious way.") Furthermore, some of the technologies required to drive the process, including machines to electrolyze seawater, and a hydrogen-chlorine fuel cell, are insufficiently developed. Aziz believes a pilot plant could be five years off, even in the best circumstances.

Schrag, less optimistic, believes the idea is impressively clever, but faces "serious challenges that may prove insurmountable. The scale of the experiment we're doing on the atmosphere by burning so much fossil fuel is enormous," he says, "so trying to engineer a solution by accelerating natural processes turns out to be extremely challenging. But we have to keep thinking of ideas like this one in case there is a good solution." ~ERIN O'DONNELL

MICHAEL AZIZ WEB PAGE:

seas.harvard.edu/matsci/people/aziz/aziz.html

KURT ZENZ HOUSE WEB PAGE:

www.people.fas.harvard.edu/~khouse/home.htm

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MERCEDES RULE

Flocking to Finance

RECENT GRADUATES may take for granted the migration of one-fifth of their classmates into finance-sector jobs, but things haven't always been this way. In a survey of 6,500 Harvard graduates from selected classes between 1969 and 1992, Claudia Goldin and

Lawrence F. Katz—Lee professor of economics and Allison professor of economics, respectively—found that the percentage of graduates who choose to work in finance has increased drastically over time.

Among those who graduated around 1970, 22 percent of the men were in finance

or management 15 years later. Among those who graduated around 1990, the figure was 38 percent. The proportion of male graduates working in finance alone increased from 5 percent to 15 percent during the same period. And a *Harvard Crimson* survey last year found that among graduating seniors heading straight to work—roughly three-quarters of the class of 2007—58 percent of the men were headed for finance or consulting, and more than 20 percent of all men for investment banks.

Similar changes were apparent for women, but in smaller numbers. It was these gender differences that Katz and Goldin set out to study with their survey, dubbed “Harvard and Beyond,” conducted in 2006 and 2007. Men still command higher salaries, on average, than women with the same educational attainment, and even in some cases with the same type of job; this appears to be due to women’s preference for family-friendly jobs and employers (see “Girl Power: What’s Changed for Women and What Hasn’t,” January-February, page 34). Goldin is the author of *Understanding the Gender Gap: An Economic History of American Women*, and the two previously collaborated on a study of the role of the birth-control pill vis-à-vis women’s decisions regarding career and marriage.

But the new survey also turned up plenty of other things, including the size of the shift into finance, and the reason for that shift. For the entire respondent pool, across all occupations, the median income for men was \$162,000, and for women \$90,000; graduates working in finance earned nearly three times that median, in a pool of people already paid far more than average. (Among the general U.S. population in 2006, men’s median income was just over \$42,000, and women’s was under \$33,000.)

Finance’s extremely high compensation has lured Harvard graduates who might otherwise have pursued law or medicine: the prevalence of those fields, combined, declined from 39 percent to 30

percent between the two cohorts. Although some of those employed in finance have M.B.A.s, many of the jobs, unlike those in law and medicine, require no advanced degree.

This pattern among Harvard graduates reflects a similar pattern in the wider society. The finance sector’s contribution to the U.S. gross domestic product swelled from 4.4 percent in 1977 to 7.7 percent, or roughly \$950 billion, in 2005, according to a report on the survey by *Wall Street Journal* columnist David Wessel. One of every 13 dollars of employee compensation in the United States today goes to people working in finance, the column noted, and in 2004, the combined income of the top 25 hedge-fund managers exceeded the combined income of the CEOs of all Standard & Poor’s 500 companies.

Wessel concluded that the astronomical rise in finance-sector salaries has fueled income inequality in the United States. He also diagnosed a finance-sector salary bubble, akin to the tech-stock bubble and the housing-price bubble. Bubbles, of course, inevitably burst.

Katz and Goldin are less certain about a correction. The field cannot sustain the rate of growth it’s experienced in the last three decades, but neither is it going to return to its 1980 state, Katz says. He says the growth was, in part, a consequence of

economic trends—such as the opening of world markets—so the fields won’t shrink unless those trends reverse themselves.

Goldin says this is a familiar story being repeated with a new set of characters. “If we were discussing this 100 years ago,” she says, “we would be talking about the relative decline of the clergy, and we would be lamenting the fact that our best students weren’t going into it. After all, this institution was founded on preparing men for the clergy. We would be throwing names like Carnegie and Rockefeller around, and we would be saying, ‘This is a world of greed! Where’s the salvation?’”

More remarkable than the growth of finance, Katz and Goldin say, is the fact that Harvard graduates, with all the options open to them, still decide to pursue careers in the arts, the nonprofit sector, and academia. “We can only infer,” says Katz, “that lots of people, by making the choice not to do one thing, even though that thing has a very high pecuniary return, put enormous value on something else.”

~ELIZABETH GUDRAIS

LAWRENCE KATZ E-MAIL ADDRESS:

lkatz@harvard.edu

CLAUDIA GOLDIN E-MAIL ADDRESS:

cgoldin@harvard.edu

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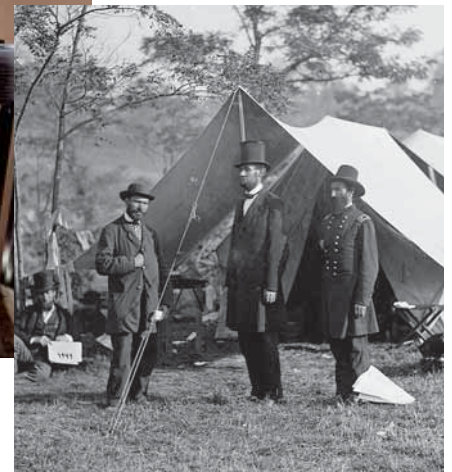
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Sleuths in Love

Screenwriter turned novelist Eric Lerner finds his voice.

by CRAIG LAMBERT

FATTENED BY A COLD in 1998, Eric Lerner '71, then a Hollywood screenwriter, picked up a biography of Allan Pinkerton, founder of the first detective agency in the United States. Three men were already working for Pinkerton in Chicago in 1856 when he hired Kate Warne as perhaps the first-ever female private eye. "The biographer dismissed rumors of a romantic relationship between Warne and Pinkerton," says Lerner. "I literally dropped the book and laughed out loud—are you kidding

me? She spends two years with him in Washington, D.C., while he is away from his family. He is at her bedside when she dies, and she is buried next to him. *Rumors?*"

Within two days, Lerner was proposing a movie about Pinkerton and Warne to a studio. "They bought it on a phone pitch," he says. He got paid to write the screenplay, but, in one of Hollywood's familiar patterns, "Before I finished the first draft, everyone was fired. It sat in a drawer for seven years before the rights reverted to me. By that time I didn't want to write a screen-

In *Pinkerton's Secret*, author Lerner creates a romantic backstory for the famous detective (above, at left).

play ever again." Screenplays, he reports, "are enormously confining; the story is there,

but there is no voice in a movie. As a writer, I missed my own voice. I always loved the voice in a novel, the storyteller."

So Lerner decided to "clear the decks, close the blinds, and start writing a novel." He took the Pinkerton material, did prodigious historical research—ranging from Warne's logbooks to details of Abraham Lincoln's childhood—and wrote *Pinkerton's Secret*, his first novel, published by Henry Holt this spring. It's styled as a memoir by Pinkerton, set in the period

OPEN BOOK

A Scatter of Acorns

Dawidoff '85, describes a childhood of privation shadowed by his parents' divorce and his father's mental illness. The spare opening chapter sets the scene.

I grew up in a city of dying elms called the Elm City, on a street with no willows named Willow Street. Uncelebrated trees shaded our part of the road, sturdy oaks and mature maples, their branches so thick with leaves that they created a blind curve just before the intersection where the street straightened past our house and made its hard line for the highway. Cars traveled at a clip down Willow Street, especially at night, and because of the curve it was impossible to see them until they'd nearly reached the streetlight glowing out beyond my bedroom window. Yet lying awake under the covers I could hear those cars coming, and never more distinctly than on rainy fall evenings when the wind had blown a scatter of acorns across the pavement. I'd be tensed against my pillow, listening to the whoosh of tires closing fast over wet asphalt, and then, an instant later, a brief, vivid flurry of noise, the rapid, popping eruptions of a dozen flattened acorns, before the whoosh receded into traceless silence as someone else hurried out of town. Long before I knew that I came from a place people wanted to leave, I saw how eager they were to get away.

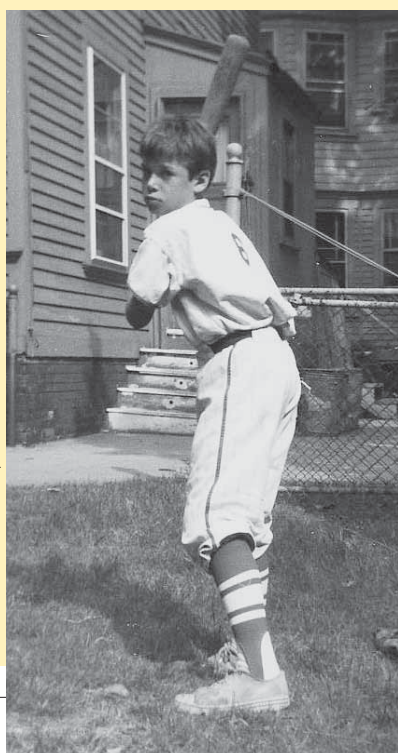
Every so often a car wouldn't make it to the highway. From my bed I'd hear the

Nicholas Dawidoff, in uniform here with bat at the ready at the age of 11, describes his devotion to the Red Sox in a new memoir.

familiar swelling murmur of onrushing rubber—it was like nearing a riverbank through parted woods—and...the night detonated in a cry of brakes and tremendous thudding impact....I'd tug the blankets over my face as my bedroom filled with the hiss of punctured radiators and revolving flashes of hot red light....My room felt remote, bigger than usual, and every shadow playing along the ceiling terrified me. By morning, when I went outside for a look, all remnants of the accident would have been swept away so that I might have doubted that anything had truly happened were it not for the chips of headlight glass or the laciniated chunk of engine grille that I'd find in the gutter with the acorns.

But before any of those investigations, there were hours of the night still to go, and as I tried to calm myself with less upsetting thoughts, invariably my mind turned to my favorite baseball team, the Boston Red Sox. There in the dark I evaluated the feats and virtues of the players

I liked best. This was the early and mid-1970s.... We had no television, did not subscribe to the newspaper, and my bedtime was not long after the evening broadcasts of games began on the radio, so I knew very little about the Red Sox.... Yet my desire for familiarity with them was intense, and I arrived at strong impressions, most of which placed peculiar emphasis on the players' own boyhoods.



COURTESY OF NICHOLAS DAWIDOFF

around the Civil War, and narrates the detective's work with the Underground Railroad and John Brown's radical anti-slavery crusade. At the heart of the story is the clandestine love affair between Pinkerton, a married family man, and Warne; in one climactic moment, the detective-lovers save Abraham Lincoln's life.

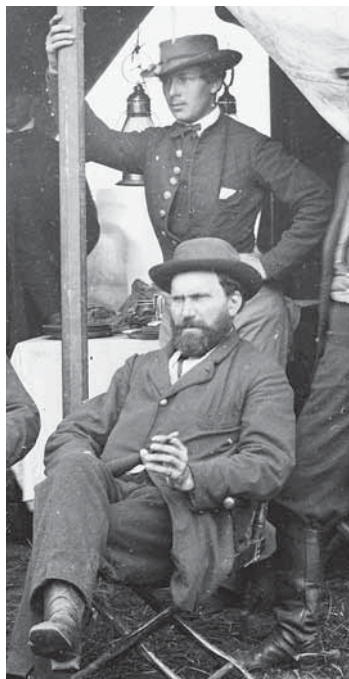
Lerner has always loved history, and all the major events in his story are historically accurate. But the narrator's voice in *Pinkerton's Secret* did not immediately declare itself. After drafting a few chapters of a third-person narrative, "I looked at the stuff and said, 'You're writing a screenplay—there's no voice,'" Lerner says. Shortly thereafter, one night at 3 A.M., he "sat bolt upright in bed and heard this voice, *Pinkerton's* voice, speaking as an older man; late in his career, he suffered a stroke and was paralyzed. 'Most people think being paralyzed doesn't hurt because when they stick pins in you, you can't feel anything,' the voice said. 'But as I've made abundantly clear, most people are goddamn morons.' Pinkerton was a combative lunatic. He kept talking to me: the voice didn't go away. Once I let him tell the story, it started rolling."

Holt editor Jack Macrae III '54 ("One of the few guys left in publishing who considers himself a real *text* editor," Lerner says) pushed the author through multiple drafts. "I felt like I was writing with invisible ink when I worked in Hollywood, because before the words were dry on the page they would be changed—by me, at the request and direction of others," Lerner says. "When I moved to novels, I hoped to live much more fully in an imaginative realm of my own, where I could plummet to a depth that I knew existed. Ironically, my manuscript wound up in the hands of the first genuine *editor* I had ever met, and it was my Hollywood training that enabled me to work so closely with him."

Today, Lerner views his two decades in screenwriting as a detour of sorts, albeit a lucrative one, from his original literary calling. At 16 he was writing fiction and plays in high school in White Plains, New York, and as a Harvard freshman, he saw one of his dramas produced in the Loeb Experimental Theatre. Academically, he changed his concentration from History and Literature to Sanskrit and Indian studies following a year of travel in India, Burma, and Nepal; after graduation, he spent several more years traveling and living in Buddhist

monasteries in Asia and America: his 1976 book, *Journey of Insight Meditation*, describes these experiences.

In 1978, he moved to the Mount Baldy Zen Center, located 8,000 feet above sea level on Mount San Antonio in the San Gabriel Mountains outside Los Angeles. "It was as rigorous as you could get in the United States, like a nineteenth-century monastery, a real boot camp," he recalls. "But I'm a writer, I'm used to austere conditions." And he never stopped writing; in L.A., he edited the Buddhist journal *Zero*. One afternoon, after meeting a prospective contributor, Lerner bumped into a high-school friend, Linda Obst, who had become a Hollywood producer. "I dis-



Some researchers suggest that the figure standing behind Pinkerton in this image is Kate Warne.

covered that I was in possession of the key piece of currency for a Hollywood screenwriter: the ability to quickly imagine a full-blown story with a beginning, middle, and end," he says. "I went to Southern California to live in a Zen monastery and stayed to write screenplays."

By 1983, Lerner had begun a career as a screenwriter that kept him continuously employed for the next two decades. His biggest hit was the 1990 romantic comedy *Bird on a Wire*, starring Goldie Hawn and

Mel Gibson. Yet, as Lerner notes, "I spent the next decade trying to explain to people what I wrote, and what was dumped on top of what I wrote. Maybe my time in the monastery helped me develop the cast-iron stomach to deal with working conditions in Hollywood. Walking barefoot through snow at three in the morning was nothing compared to a story meeting at Paramount."

Today, Lerner says he's quite content with the semi-solitary working routine of "an old-fashioned novelist." At his Boston home, he starts writing each day at 5 A.M. The voice of his second novel is that of Livia, wife of Augustus Caesar, who seeks after 2,000 years to clear her name of the charges—from Tacitus to Robert Graves—that she was a scheming poisoner. "I've finally embarked on the life in fiction I was looking for at age 19," he says, "when I walked into a bookstore on Mount Auburn Street and bought my copy of *Ulysses*."

Two Centuries of Sound

Celebrating a fabled orchestra's origins

by RICHARD DYER

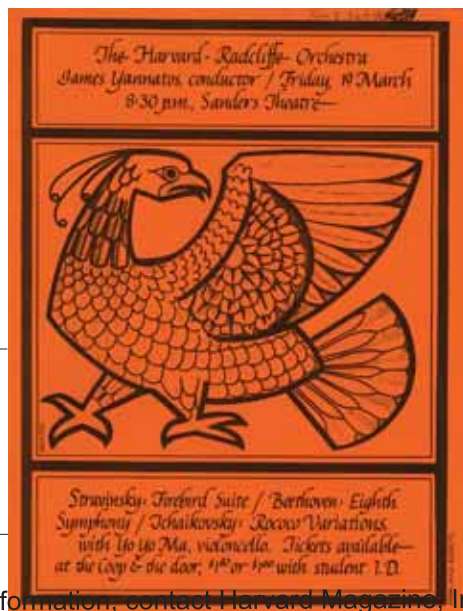
ON MARCH 6, 1808, six men of Harvard formed the Pierian Sodality: the direct ancestor of the Harvard-Radcliffe Orchestra, which this season celebrates its two-hundredth anniversary.

Whether this makes the HRO the oldest orchestra in America, as it proudly claims, may be subject to debate, because that 1808 fellowship of admirers of the Muses wasn't an orchestra—it was a convivial association built around liquor, cigars, "performing music for the enjoyment of others," and "serenading young women in the square." The sodality went through good years and bad patches. In 1832, Henry Gassett was its only member; he kept it alive by paying dues to himself, holding meetings, and playing flute solos, thereby becoming a hero to subsequent generations of Pierians. By the 1870s, however, the organization had indeed become an orchestra; its mission to advance music had led to the creation of the Harvard Glee Club, the Harvard music department, the Harvard Musical Association, and even the Boston Symphony Orchestra.

Certainly the sodality was the first *university* symphony orchestra in America, and for a long time the largest. It began to tour in 1908 and, starting in the 1960s, traveled to Europe, South America, or Asia at least once in every student generation. In 1936, women from Radcliffe College were invited to participate as guest performers, and in 1942 the ensemble formally became the Harvard-Radcliffe Orchestra.

Its alumni have included doctors, lawyers, academics, a Speaker of the U.S. House of Representatives, the new music director of the New York Philharmonic, and many players active in major orchestras.

This early 1970s poster for an HRO concert advertises a guest appearance by a young cellist named Yo-Yo Ma.



Boston Symphony Orchestra assistant principal cellist (and Boston Pops principal) Martha Babcock '70 played in the orchestra in 1966-'67 before joining the Montreal Symphony. "The HRO experience opened a whole new world for me and raised my standards," she says. "Some of the pieces we played, like Stravinsky's *Petrushka*, I had never heard before. I didn't really have a distinct career path yet, but this turned out to be the prelude to a satisfying musical life."

SENIOR LECTURER ON MUSIC James Yannatos—known to generations of students as "Dr. Y"—became the orchestra's music director in 1964. His 44-season tenure has seen many fluctuations and changes: in the

late 1960s, for example, some musicians felt the orchestra represented "the establishment" and left for other ensembles; some years have seen no vacancies for certain instruments, while an entire section may graduate in others; meanwhile, the players themselves reflect Harvard's increasing diversity.

GALLERY

Underground Party

Commuters making their way through the underground corridors of the sprawling Times Square subway station in Manhattan now have some extraordinary companions, with the completion in March of *New Year's Eve Revelers*, a permanent mosaic mural adorning the pedestrian passageways between the Port Authority Bus Terminal and Times Square.

New York City artist Jane Dickson '75 created *Revelers*, which consists of 70 life-size partygoers of all ages and backgrounds, each composed of hundreds of pieces of Venetian *smalti*. (Often used in mosaics, *smalti* comes from a glass paste or glaze of silica melted with sodium or potassium carbonate to produce brightly colored translucent glass that is then broken into small pieces.) Some of these figures, scattered along the walls of the walkways below 41st Street, make their way toward the celebration. In the lower Seventh Avenue mezzanine, multicolored merry-makers wearing party hats and waving blowers kiss, jump, and dance to cheer in the New Year. Up the stairs stands a stationary, solitary man—gray-haired Father Time, checking his watch.

Such festivity represents a departure from Dickson's previous work, examples of which belong to the collections of the Metropolitan Museum of Art, the Museum of Modern Art, the Whitney Museum of American Art, and the Victoria and Albert Museum in London. Many of her paintings depict the emptiness of the American landscape, from nighttime highways and deserted rest stops to the garishness of suburbia. Urban life also informs Dickson's art: throughout the 1980s, she painted nocturnal views of Times Square, where she lived between 1978 and 1993, and still keeps a studio. Her new *Revelers*, commissioned by the Metropolitan Transportation Authority (MTA) Arts for Transit program, are cousins of a similar series she painted in the 1990s. "They were monochromatic," she says of the earlier work. "Much darker."

Too dark, she realized, for the Times Square setting. Dickson designed *Revelers* in the wake of the 2005 London subway bombings, and determined to imbue it with hope and humanity. To execute her sketches, she hired Miotto Mosaics, a Carmel, New York-based mosaic-building company that in turn hired artisans in Spilimbergo, a small town in the Friuli region north of Venice, to assemble the figures using techniques whose roots go



Jane Dickson's *New Year's Eve Revelers*—of all ages—now decorate the walls of the Times Square subway station in Manhattan.

back to Pompeii. Dickson describes the mural as "luminescent glass, often backed with silver and gold leaf."

The *Revelers* now inhabit the site beneath the world-famous New Year's Eve celebration that climaxes with the illuminated ball dropping at One Times Square. The figures appear "in a maze of passages

where everyone is hurrying by, hoping to catch the next train," Dickson says. "The images are meant to be enjoyed at a glance—the figures' animation enhanced by the viewers' rush."

Dickson came

to Harvard after a year at the École des Beaux-Arts in Paris. A graduate seminar with John Coolidge, former director of the Fogg Art Museum, "gave me an incredible insight into the professional art world," she says. She focused on painting at Harvard and later spent two years at the School of the Museum of Fine Arts in Boston. "I paint to examine the uncanny," she wrote in 2001, "defined by Freud as 'the familiar grown strange.'"

The familiar grew enduringly strange on September 11, 2001; the attackers struck close to the Tribeca home where Dickson lives with her husband, the filmmaker Charlie Ahearn, and their two now-college-age children. Since then, "The whole world has become uncanny, especially the city," she says, "and even more so, the subway. We don't need to be reminded not to be complacent anymore. I feel the challenge now is to be as affirming as possible, to assert the continuity of life in this anxiety-charged locale."

—SUSAN HODARA

Susan Hodara '75 is a freelance journalist whose articles have appeared in the *New York Times* and other publications.

On May 22-24, at the Times Square subway station, the Metropolitan Transportation Authority celebrates the completion of Jane Dickson's mural.



The orchestra rehearses six hours each week, on Tuesday and Thursday nights, in Sanders Theatre. Even as a concert approaches, Yannatos keeps the atmosphere light without compromising the necessary painstaking attention to detail; the players work hard but seem to be having fun.

Co-concertmaster Julia Glenn '11 has been in orchestras since sixth grade. "My goal has always been to be a professional violinist," she says, "but even if that changes, I know music is always going to play a big part in my life. With other orchestras I've already played a specialized repertoire, but this season the HRO is playing standard pieces I should have covered already, but never had the chance to. I also love the social aspect. There is not a competitive, cut-throat atmosphere...I am with people who bring their problem sets to rehearsal and work on them during the break. This gives the experience a totally different feel. They are more excited about being there, not just doing the things that a musician does as a matter of course."

Clarinetist Giancarlo Garcia '08 may go on in music or pursue mechanical engineering. "I haven't fully decided," he says, "but music at Harvard and the HRO have been a huge influence in my life, and music and engineering have advocated for each other. The discipline of going to rehearsals, of playing together and in tune with 100 other people—that's really important."

In his early years, Yannatos balanced standard works with repertory few student orchestras were playing: Mahler's *Das Lied von der Erde*, for example, or Bartók's Concerto for Orchestra, which was on the program of the very first HRO concert he led (the virtuoso piece was only 21 years old). That unpredictability continues: programs today range from classics to works by talented Harvard students. And while celebrated performers may appear as guests, most often the soloists are outstanding Harvard musicians, some of whom, like cellist Yo-Yo Ma '76, D.Mus. '91, later become celebrities.

On March 7, a day after the actual bicentennial, Yannatos provided another surprising program that sandwiched Mahler's *Songs of a Wayfarer* between Gershwin's *An American in Paris* and Bernstein's *Symphonic Dances* from *West Side Story*. The reason: assis-



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tant conductor John Kapusta '09, who opened the concert by leading a fiery performance of Brahms's *Tragic Overture*, is also a baritone who had won the orchestra's annual concerto competition by singing the Mahler songs. For this unprecedented double-header, Kapusta got a night off from his usual duties in the trumpet section—although he did write his own program note, urging the audience not to read program notes. Before and after both performances, audience and orchestra members greeted him like a rock star with whoops, whistles, cheers, and the stomping of feet.

"I want to focus on singing," says Kapusta, "but in an ideal future I would like to both sing and conduct. Singers are al-

ways being told to 'Sing this like a violin'—and violinists are told you have to play like a singer. I am trying to take advantage of this opportunity to experience music from every side. To learn how an orchestra works, what to expect, is an informative, fulfilling, and invaluable experience."

Many alumni agree, demonstrating their affection through the Harvard Pierian Foundation—which came into being in 1962 when the orchestra was stranded while on tour in Mexico and turned to alumni for help. Former bassoonist Mary Ellen Moir '79, who now works in the software industry, has spent more than 20 years on the foundation's board. "We meet regularly and support the orchestra both monetarily and with good advice," she says. "I wish I could say that I played the bassoon more than once or twice a year," she adds. "But if you play music, you can enjoy it all the more when you listen to it. There are so many things a life-long love of music can do for you."

Knafel professor of music Thomas Forrest Kelly, an ex officio member of the foundation, emphasizes the HRO's importance not only to individual players and alumni, but also to the University and the commu-

nity that surrounds it.

"There are several orchestras and many other musical organizations at Harvard that exist at different levels and for different reasons," he says. "What the HRO does is stand at the top of the pyramid, because of its history, its size, and the commitment it requires of its members. No matter how talented they are, [its] members are willing to...invest an enormous amount of time working together to achieve a high technical and artistic level; the orchestra inserts the students into something beyond themselves. The result is that the HRO has developed a substantial following at Harvard and in the community....It represents a major way that Harvard greets and serves the community. And that's a great thing."

Richard Dyer, A.M. '64, wrote about classical music for the *Boston Globe* for 33 years.

The Harvard-Radcliffe Orchestra formally celebrates its bicentennial locally during Arts First weekend, joining the Harvard-Radcliffe Chorus for a performance of Brahms's German Requiem on May 2, and overseas with a "200th Anniversary Season Tour to Korea" on June 12-19 (see www.hcs.harvard.edu/~hro).



An HRO rehearsal in the early 1950s

HARVARD UNIVERSITY ARCHIVES

Off the Shelf

Recent books with Harvard connections

Yeltsin: A Life, by Timothy J. Colton, Feldberg professor of government and Russian studies (Basic Books, \$35). A monumental biography of the flawed, but democratic, Russian president.

Mean and Lowly Things: Snakes, Science, and Survival in the Congo, by Kate Jackson, Ph.D. '02 (Harvard, \$27.95). A journal from an amphibian- and reptile-collecting expedition in swamp forests, sans antivenom (no refrigeration). The author was profiled in this magazine's March-April 2006 issue.

Life in the Balance, by Thomas Graboys, clinical professor of medicine, and Peter

only in dreams.

Richard Rorty: The Making of an American Philosopher, by Neil Gross, assistant professor of sociology (University of Chicago, \$32.50). An academic life and analysis of the controversial public philosopher, whose final illness last year kept him from receiving an honorary degree at the 2007 Commencement.

Zheutlin (Union Square Press, \$19.95). Graboys, a cardiologist, recounts his life with Parkinson's disease and dementia—when the "rush of feeling able-bodied" comes

tucky, offers an "unordained memoir of a preacher's daughter," complete with 25-cent baptism stands and "cleansings" of "the Sinful, the Embarrassing, the Tacky, and the Used-Up" (yard sales).

Music, Language, and the Brain, by Aniruddh D. Patel, Ph.D. '96 (Oxford, \$59.95). Patel, a neuroscientist, argues that instrumental music and language are processed similarly in the brain, offering common paths to discoveries about human cognition.

Who Owns Antiquity? Museums and the Battle over Our Ancient Heritage, by James Cuno, Ph.D. '85 (Princeton, \$24.95, paper). Amid controversies over repatriation, the president of the Art Institute of Chicago, formerly director of the Harvard University Art Museums, addresses "the question of unprovenanced antiquities" and the issue of access to evidence of "the world's common ancient heritage."

The Dismal Science, by Stephen A. Marglin, Barker professor of economics (Har-

Trespassers Will Be Baptized, by Elizabeth Hancock '00 (Center Street/Hachette, \$21.99). Hancock, who grew up Baptist in eastern Ken-

Elizabeth Hancock hoped to be an Acteen Queen like her mom (left, at right).



Freeing Speech

How judge-made law gave meaning to the First Amendment

by RICHARD H. FALLON

ANTHONY LEWIS'S *Freedom for the Thought That We Hate: A Biography of the First Amendment* offers a lucid and engaging overview of American free-speech law. The former *Nie-*man Fellow has twice won the Pulitzer Prize, and this volume puts the skills that earned him those accolades much on display. Again and again, he brings to life the *dramatis personae* in leading cases, plucks out moving or telling quotations, and explains who won and who lost in order to provide a clear introduction to First Amendment doctrine.

Anthony Lewis '48, NF '57, *Freedom for the Thought That We Hate: A Biography of the First Amendment* (Basic Books, \$25)

Lewis '48, NF '57, styles the book "a biography." In fact, it is more nearly a history in which unfolding

events are presented as teaching by example—sometimes positive and sometimes negative example. He begins by sketching the hated traditions of British censorship against which the American ideals of free speech developed. By the late eighteenth century, various state constitutions included guarantees of freedom of the press. When the Constitution of the United States that emerged from the Philadelphia Convention contained no bill of rights, there was widespread sentiment that the omission needed to be rectified.



Eugene V. Debs delivers an antiwar speech in Canton, Ohio, in June 1918. He would soon be imprisoned.

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The first Congress thus drafted and the states ratified a Bill of Rights, the First Amendment of which guarantees that "Congress shall make no law...abridging the freedom of speech, or of the press."

Interestingly, however, there is considerable uncertainty about what the Framers and ratifiers of the First Amendment understood it to protect. Accordingly, in *Freedom for the Thought That We Hate*, Lewis scrupulously avoids claiming that the "original understanding" of the First

vard, \$35). The author teaches Social Analysis 72, "Economics: A Critical Approach," an alternative to the mainstream Ec (now Social Analysis) 10. Here he explores, as the subtitle says, "how thinking like an economist undermines community."

Riding the Waves: A Life in Sound, Science, and Industry, by Leo Beranek, S.D. '40, AMP '65 (MIT, \$24.95). The acoustical scientist and entrepreneur was involved in telephony, the Tanglewood Music Shed, and the precursor to the Internet.

The Fall and Rise of the Islamic State, by Noah Feldman, professor of law (Princeton, \$22.95). After long reflection on constitutional change in the Islamic world, Feldman observes that "the Islamists continue to promise justice and the rule of law"—and that trying to deny them power will likely backfire.

Reagan's Disciple, by Lou Cannon and Carl M. Cannon, a 2007 spring fellow at the Institute of Politics (Public Affairs,

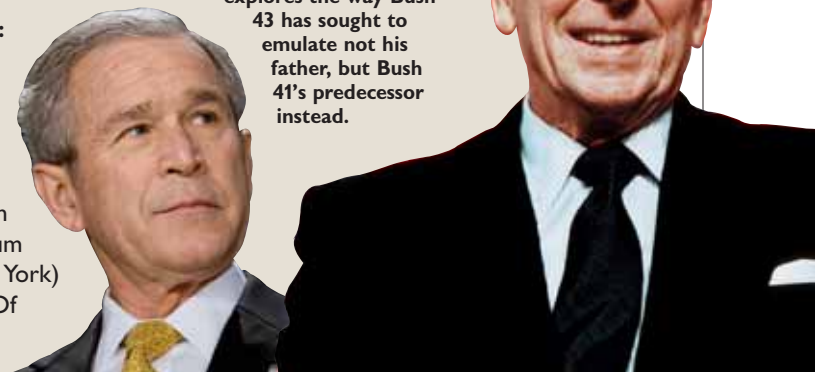
\$27.95). A pair of political journalists, biographers of Ronald Reagan and Karl Rove, respectively, put the "troubled quest" of George W. Bush, M.B.A. '75, "for a presidential legacy" in perspective. Reagan, they find, "was practical, in ways that George Bush was not."

Resurrection: The Power of God for Christians and Jews, by Kevin J. Madigan, professor of the history of Christianity, and Jon D. Levenson, List professor of Jewish studies (Yale, \$30). An examination of the belief in life after death in the two religious traditions.

The Greatest Game: The Yankees, the Red Sox, and the Playoff of '78, by Richard Bradley, A.M. '90 (Free Press, \$25). Some 257 pages, plus notes, on the moment of maximum baseball ecstasy (New York) and agony (Boston). Of course, that was then.

Santiago's Children: What I Learned about Life at an Orphanage in Chile, by Steve Reifenberg (University of Texas, \$55 hardcover, \$24.95 paperback). The director of the Chile office of Harvard's David Rockefeller Center for Latin American Studies recalls his life-changing work in an underclass orphanage during the political and economic traumas of the Pinochet dictatorship. Presley professor of social medicine Paul Farmer contributed the foreword.

In Reagan's Disciple, a father-son team explores the way Bush 43 has sought to emulate not his father, but Bush 41's predecessor instead.



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MONTAGE

Amendment's reach resolves contested cases that have come before the Supreme Court. First Amendment law, Lewis emphasizes, is almost exclusively judge-made law, nearly all fashioned in the past 90 years.

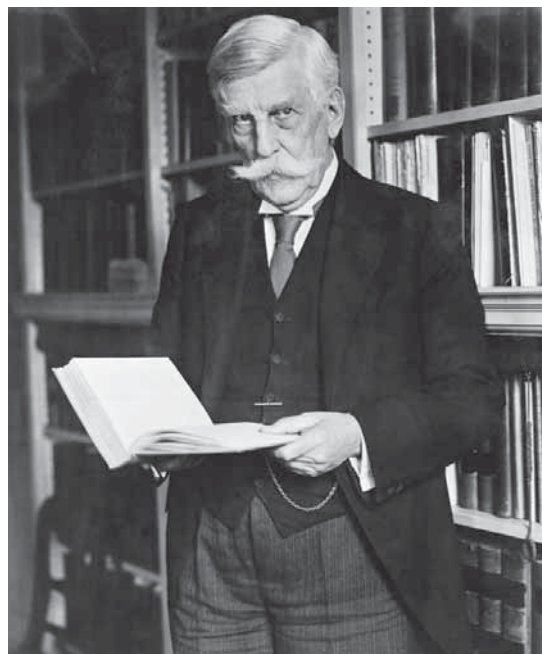
Because early Congresses seldom passed laws attempting to punish speech, the Supreme Court never decided a case invoking the Free Speech clause before World War I. But once the country had entered the conflict, Congress enacted an Espionage Act that banned speech tending to cause resistance to the draft or to military authority. Startlingly, from a modern perspective, the Supreme Court upheld the convictions of dissident speakers in all the Espionage Act cases that came before it. In the first of those cases, in the majority opinion by Justice Oliver Wendell Holmes Jr., A.B. 1861, LL.B. '66, LL.D. '95, the Court began by establishing that the First Amendment could not possibly protect *all* speech. "The most stringent protection of free speech would not protect a man in falsely shouting fire in a crowded theater and causing a panic," Holmes wrote. With absolute protection for all speech thus untenable, the Court held in 1919 that speech would receive no protection under the First Amendment if it posed a "clear and present danger" of instigating serious harms.

Although the "clear and present danger" test sounds as if it might have conferred substantial protections on critics of the United States's involvement in World War I, early cases required almost no evidence concerning what danger the defendants' utterances posed. In one notorious case, the well-known radical political leader and former presidential candidate Eugene V. Debs was sent to jail based on a political speech that he gave to a Socialist convention on a Sunday afternoon. Given that Debs's audience might have been persuaded by his denunciations of war, the Court reasoned that his speech's "natural and intended effect would be to obstruct recruiting."

Had this approach prevailed, the kinds of criticisms that ultimately helped turn the public against the Vietnam War might

never have occurred, nor might much contemporary discussion of the Iraq War. But the Court's easy tolerance for the repression of speech proved short-lived.

The foundations for modern doctrine—under which Americans are, in Lewis's words, "freer...to say what we think than any other people, and freer today than in the past"—began to take shape only when Justice Holmes, who



Free-speech law in the United States owes much to a change of heart by Justice Oliver Wendell Holmes Jr.

wrote the opinion upholding Debs's conviction, appears to have had an almost immediate change of heart. Although he claimed that his position was consistent throughout,

after the Court's 1919 summer recess he abandoned his prior emphasis on "the natural and intended effect" of radical protests in provoking resistance to government policies and emphasized instead, in a dissenting opinion in the fall, that "Congress certainly cannot forbid all effort to change the mind of the country." He continued,

Persecution for the expression of opinions seems to me perfectly logical. If you have no doubt of your premises or your power and want a certain result with all your heart you naturally express your wishes in law and sweep away all opposition....But when men have realized that time has upset many fighting faiths, they may come to believe even more than they believe the very foundations of their own conduct that the ultimate

good desired is better reached by free trade in ideas—that the best test of truth is the power of the thought to get itself accepted in the competition of the market....That at any rate is the theory of our Constitution. It is an experiment, as all life is an experiment.

During the next decade, he and his colleague Louis Brandeis, LL.B. 1877—writing mostly in dissenting or concurring opinions—provided vital intellectual and rhetorical foundations for contemporary First Amendment doctrine, which provides more “freedom for the thought that we hate” than the law of any other nation in the world. For example, almost every other western democracy has signed international treaties that call for signatories to prohibit and punish speech that incites racial hatred. In the United States, by stark contrast, most if not all speech preaching racial hatred is protected by the First Amendment. “Freedom for the thought that we hate” is freedom for Nazis brandishing swastikas to march in Jewish neighborhoods—indeed, in the famous *Skokie* case, to march through a village populated largely by Holocaust survivors—and for members of the Ku Klux Klan to use vicious epithets in advocating the suppression of African Americans.

The Supreme Court has also held that cigarette companies have a right under the First Amendment to place advertising billboards in close proximity to schools and playgrounds—even though tobacco is an addictive product on which most smokers become hooked while still of school age. A large pornography industry also thrives under the First Amendment. Although the Supreme Court has held that “obscenity” enjoys no constitutional protection, it has defined obscenity so narrowly that “adult” films, magazines, and pictures are a staple of contemporary American culture.

IS THIS STATE OF AFFAIRS an occasion for American pride in protecting free speech, or is it “freedom for the thought that we hate” run riot? And what framework should we use in answering this and similar questions?

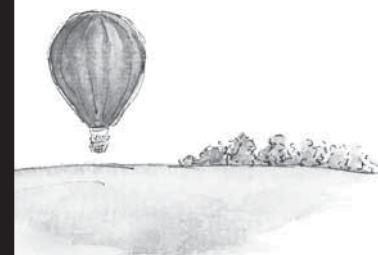
These questions have enduring currency because, although freedom of speech in the United States is very broad, even today no one thinks that absolutely *all* speech should be protected. Going beyond false cries of fire in crowded theaters, most peo-

ple do not think the First Amendment does or should protect blatantly false advertising (even if it protects billboards advertising cigarettes), or verbal threats, or speech offering bribes. The Supreme Court has also allowed the Federal Communications Commission to ban “indecent” speech on the radio and in broadcast (rather than cable) television—as illustrated by the steep fine that followed Janet Jackson’s “wardrobe malfunction” during her halftime performance at the 2004 Super Bowl. Whatever one may think about these examples, the Supreme Court clearly needs to draw lines. But where?

To provide a general theory indicating where lines between protected and unprotected speech should be drawn is a central ambition of academic theorists who write about the First Amendment. Some of their writing is brilliantly provocative. Some is turgid nearly beyond belief. Lewis quotes a few of the best theorists, but only very briefly, near the end of his book. Otherwise, he avoids theory—or the effort to provide general principles explaining which kinds of speech should be protected and which should not—almost entirely.

Instead, what his book does well, even superbly, is to explain how the law has developed historically in a number of doctrinal areas, including those governing the rights of radical protesters, of disseminators of sexually explicit speech, and of media outlets that want to disclose facts that intrude on people’s privacy. Like most biographers or historians, Lewis drops in his own opinions, but he does not identify the theory, if any, that underlies them.

As a former reporter and columnist for the *New York Times*, Lewis has especially interesting opinions about Supreme Court decisions involving the press. He lavishes perhaps his highest praise on *New York Times v. Sullivan* (the subject of his 1991 book, *Make No Law*), which holds that the press cannot be sued for criticizing public officials, even when reporters and editors make factual mistakes that damage officials’ reputations, unless the reporters and editors acted with “reckless disregard” for the truth. And although it is hardly news when a journalist praises a decision expanding journalists’ rights, Lewis is impressively evenhanded in assessing the protections that the First Amendment should give to the press. For example, he debunks claims that the First



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FRENCH COUNTRY WATERWAYS

Amendment should be read to create a “reporters’ privilege” that would invariably shield journalists from having to reveal the identity of their sources to juries and grand juries.

For the most part, Lewis’s style of offering opinionated commentary without laying out any systematic framework for thinking about First Amendment issues serves his readers well. Occasionally, however, the comments in one part of the book seem hard to square with the critical observations in another. For example, he criticizes Supreme Court decisions upholding the punishment of radical dissenters from past eras who preached the desirability of law-breaking and even violence as a tool of political change: Bolsheviks during World War I, criminal syndicalists in the 1920s, and Communists in the McCarthy era. Moving to the present, however, Lewis criticizes a 1969 Supreme Court decision that he thinks could protect a devotee of radical Islam who advocated terrorist violence unless the speech was likely to trigger “imminent lawless action.” He writes, “I think we should be able to punish speech that urges terrorist violence to an audience some of whose members are ready to act on the urging.”

But how, I wonder, is the case of terrorists’ speech today any different in principle from cases involving past advocacy of lawless violence in the 1920s or the 1950s? It is true, of course, that both the public and the judiciaries of those eras overestimated the threat that violence would actually occur. And the danger that speech will actually spur violent action may be greater now than it was before. But we cannot know today how great the threat actually is—nor could those of earlier eras know with certainty how the future would unfold. Thus the questions: Is there really a difference of principle among the cases? And if so, what is the governing principle?

Perhaps self-evidently, these are the questions of a law professor who craves a general theory that would explain why some kinds of speech should be on the protected and others on the unprotected side of the First Amendment line. Given this craving, I can-



American Nazi Frank Collin reports the cancellation of a planned march in Skokie, Illinois, in June 1978 because his group has won the right to demonstrate in Chicago's Marquette Park.

not help observing that *Freedom for the Thought That We Hate* makes scant effort to answer such questions, or a number of similar questions that arise when Lewis says that the press should have some protections but not others.

But I can guess quite confidently how Lewis might respond to this gently barbed observation. He would, I imagine, recall some well-known words of Justice Holmes, whose pithy observations he repeatedly quotes with clear approbation. Holmes famously wrote that “[g]eneral principles do not decide concrete cases” and that “[t]he life

of the law has not been logic; it has been experience.”

History and experience lie at the center of Lewis’s narrative, and he makes them come vividly alive in *Freedom for the Thought That We Hate*. After picking up the book on a winter afternoon, I read on into the evening, not wanting to put it down. ▽

Richard H. Fallon, who joined the Harvard Law School faculty in 1982, is Tyler professor in constitutional law. He is the author of The Dynamic Constitution: An Introduction to American Constitutional Law (2004).

Editor's note: Anthony Lewis is an incorporator and former director of Harvard Magazine Inc.

Solar Sculptor

Michael Kapetan's sundials don't do "clock time."

by CARA FEINBERG

ON THE FRONT LAWN of the U.S. vice-presidential residence in Washington, D.C., less than 150 yards from the nation’s most precise clock, sits another type of timepiece. Its measurements are approximate, its hour hands are absent, its polished granite time markers are useless when the sky is overcast. It can’t tick off nanoseconds like the atomic Master Clock at the neighboring U.S. Naval Observatory; the sundial’s hour hand appears only as a shadow cast toward the crescent

of red granite markers 10 feet from its central stone.

But for designer Michael R. Kapetan ’69, a sculptor and teacher at the University of Michigan School of Art and Design, keeping exact time has little to do with his art. “We are all too caught up in clock time,” he says from his converted one-car-garage studio in Ann Arbor, Michigan. “I coined the term ‘solar sculpture’ to get away from the traditional garden artifacts that mark the hours, and get to a broader idea of art that addresses the sun, the seasons, and time.”

MONTAGE

Hewn in stone, steel, and concrete, Kapetan's solar sculptures are original artistic visions, he says, "arranged according to the laws of nature." Carefully aligned by solar observations to the rotational axis of the earth, or "true north," and precisely calibrated for latitude (the vice-presidential sundial's alignment was confirmed by a naval officer and an astronomer brought in by Kapetan), his creations keep accurate solar time by measuring, in shadows, the apparent motion of the sun. (With no adjustments for longitude, however, his dials can depart from standard 24-hour clock time by an hour on a daily basis, or as many as two during daylight savings time, depending on the sculptures' locations.)

His solar structures have twice taken the form of unconventional giant



This seasonal sundial at the Emerson School in Ann Arbor, Michigan, works only at high noon on a solstice or equinox.

sundials like the vice president's, where a person standing on the flat central stone, not the work it-

self, becomes the "gnomon," or shadow caster. But Kapetan has also explored other timepiece formats. For more than two decades, at an elementary school in Michigan, students have gathered around his nearly seven-foot-tall, stainless-steel, I-beam-like sculpture on the solstices and equinoxes to witness the fleeting moment when a ray of sunlight shines through one of its three elliptical apertures and appears on the appropri-

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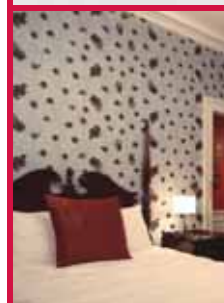
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ate ground target as a bright white disk.

Kapetan's sundial fascination began, he says, with a television special he watched as a teenager about the prehistoric site Stonehenge, in England. "It wasn't a sculpture, temple, or observatory, yet it was a strange combination of all three," he explains, still reverent as he describes the early timepiece decades later. "I am struck by the beauty of scientific instruments, and preoccupied with the connections among science, art, and spirituality."

The son of a precision grinder in the aerospace industry, Kapetan grew up tinkering in his dad's workshop in Wayne, Michigan, and after earning an art history degree from Harvard and an M.F.A. from

The vice-presidential, analemmatic sundial above requires a human gnomon to work. Kapetan calls the equatorial sundial at right his most traditional.

the University of Michigan in 1978, he pursued a career creating both abstract and liturgical sculpture. Although his solar timepieces are among his most impressive works, his commissions for them are sparse in comparison to his liturgical carvings. To date, he's completed four sundials in two states, with a fifth and



sixth in progress; his wood and stone liturgical work—a 10-foot-wide tree of life carved in relief on a synagogue wall, a child's-height chiseled sculpture of Saint Thomas à Becket in a Catholic church, two nine-foot-wide altar doors adorned with sheaves of wheat and life-size doves in an Eastern Orthodox sanctuary—are among 40 commissions displayed in 34 churches and synagogues across the country, including the National Cathedral in Washington, D.C.

In 1994, Kapetan spent a year as the cathedral's artist in residence and, as luck would have it, he worked around the corner from the vice-presidential residence, then occupied by his former college roommate, Albert Gore Jr. '69, LL.D. '94. On a visit to the residence, Kapetan and the Gores discussed the idea of a front-lawn sundial; three years later Kapetan installed the work.

"Without a person in it, the [vice-presidential] sundial reverts to being an alluring concatenation of form—an intrinsically beautiful arrangement that can hold its own alongside any man-made object," Kapetan says, describing the sculpture's arc of

hour markers. "However, when one steps into its embrace, it comes alive like no other kind of sculpture and tells you not only where, but when, you stand." ▢

Cara Feinberg is the senior writer for Boston College Magazine.

Michael Comenetz asks if the phrase "Galloping Gordon," sometimes applied to British prime minister Gordon Brown, originated with the line from a 1950s advertising jingle for Cheerios: "Galloping Gordon sets the pace."

Nat Kuhn would like to know who said or wrote, "The task of the Christian is to hold opposites in the heart until the Third Thing comes." He recalls hearing the statement in the early 1980s, when it was attributed to a female theologian.

David Keyes asks for the source of "Mathematics is the music of the mind. Music is the mathematics of the soul."

Chapter & Verse

Correspondence on not-so-famous lost words

Daniel Greenfield requests a source for "carving nature at her joints"—referring to accurate scientific understanding of the mechanism of normal and abnormal biological events and the anatomy and structure of biological entities.

Michelle Coughlin seeks the author of a short poem beginning "Wentworth, sure/t'was some stranger" and ending "Scorched by a fever/he refined his breath,/and paid that stated/homage unto death."

"...where were you?" (March-April). Neil Averitt cited Job 38:4 ("Where wast thou when I laid the foundations of the earth?"). But half-remembered poems can trick the memory. The query's reference to Mark van Doren prompted M.J.

Porter to send in "Farewell and Thanksgiving," a brief van Doren work in which the fourth line of 10 reads, "You were always there..." Porter characterized the suggestion as "Close, but no cigar," but it turned out to be the poem our reader sought.

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

HARVARD MAGAZINE'S Commencement & Reunion

GUIDE 2008



- On the Career Carousel
- “All the world’s a school...”
- Sunday Indulgences
- Commencement Calendar

A Reunion of One’s Own

Connecting in the digital age • by Ellen Reeves

WHEN I ARRIVED at Harvard in 1979, one of the campus wonders was the Science Center, shaped, according to legend, like a Polaroid Land camera. Imagine: a camera that produced pictures on the spot—memories captured instantly, in *color* even! In the basement lived the Main Frame and its terminals; techno-geeks trekked across campus to use them, while the rest of us wrote our term papers on typewriters. There were

no cell phones or voice mail; “text” was still something you read, not something you did.

Fast-forward 29 years. The Science Center still stands, but its innards have innovated; now it is wireless, as are all the dorms and Houses. Freshmen enter with laptops, cell phones, and an *fas.harvard* address; many sport iPhones and Blackberrys. There is no need to wait for the *Freshman Register*: most students have connected virtually even before they arrive,

checking each other out on MySpace.com or hi5.com. They are already “friends” with their roommates and their roommates’ “friends” on facebook.com—a “social utility” in the terminology of today’s technology. Once on campus, they can use H-Link, a Web application that connects their courses and classmates with their Facebook accounts. Thanks to Facebook’s inventor, Mark Zuckerberg (who might have commenced with his class of 2006 mates had he not followed in Bill Gates’s



Ellen Reeves, secretary of the class of 1983, paid a pre-twenty-fifth-reunion visit to the Yard in March.

footsteps and dropped out), Harvard students these days are all connected—at least technologically—for life.

By my fifteenth and twentieth reunions, technology had caught up with our class: we had a reunion website and e-mail had replaced “snail mail.” But in this, our twenty-fifth-reunion year, we underwent a technological makeover. Class-report entries could be submitted on line; we had our own blog. When a Class of 1983 Reunion Facebook group sprang up, within 24 hours I had dozens of “friends” and began catching up with people I hadn’t talked to for years. I saw pictures of them, their partners, and their pets. I found out that one of my roommates was divorced, one had gone blonde, another gray. I knew what they were reading, where they were traveling, what music they liked now. People I hadn’t thought about since graduation found me on line and said hello. I was having a reunion, and it was only February.

I began to wonder: in the digital age, do we need real reunions? Why bother coming back to Cambridge at all? You can watch Commencement on screen, without suffering in the blazing sun or pouring

rain, without being trampled by parents desperate for a glimpse of their child’s \$180,000 head. You can tour the campus virtually—even using the Wikipedia link to discover all the people who ever lived in your freshman room—and impress your family without buying a lot of expensive plane tickets. Camped in front of your computer, it doesn’t matter what you wear, where you sit, or with whom. You can avoid the trophy wives, the genius children, and the humble Pulitzer and Nobel Prize winners. You will not risk being remembered for things you aren’t anymore. When you think about it that way, who would ever go back?

I would. I have never missed a reunion. But I should admit that I am the class secretary, the one who, for some reason, believed as a senior that I wanted to help connect classmates to each other and to Harvard for life. Since graduation, I have served on every reunion committee, all of my local Harvard Club boards, and countless Harvard and Radcliffe Alumni Association committees. I helped form a Radcliffe Shared Interest Group when the Radcliffe Alumnae Association disappeared along with Radcliffe College. I

understand this behavior to be atypical; my sister Caroline ’84 is more representative. I had to sign her up for her own fifth reunion, which she had no intention of attending. I paid for her registration, I ordered her sweatshirt, and I even made her fly back from China. She had a surprisingly good time, and went on to serve on her own twentieth-reunion committee.

But for those who can’t or won’t leave home for Cambridge, the virtues of the vir-

tual are many. Harvard at Home (www.at-home.harvard.edu) “brings the best of Harvard to you”; courses like Michael Sandel’s celebrated “Justice” are now being offered on line; Crimson Compass (<http://post.harvard.edu/alumni/html/crimsoncompass.shtml>) is Harvard’s on-line career networking service. Without waiting five years for a reunion, you can connect immediately with like-minded alumni, thanks to the Harvard Alumni Association’s Shared Interest Groups (SIGs), class websites, and list servers (www.haa.harvard.edu). You can reach out with ease across classes and Houses, geographical barriers and time zones.

The emotional obligations of on-line friendships are fewer; it’s a circumscribed relationship. “Reunions used to be an event but now they’re an environment,” notes writer R.D. Rosen ’71. “You don’t just parachute in and it’s over. You can almost not show up and have a better time. There’s a tacit understanding that you’re not strangers but you’re not friends. You don’t have to feel rude or regret that you have to tear yourself away from a conversation: with e-mail you just stop; no hard feelings.”

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COMMENCEMENT & REUNION GUIDE

Most of us return to reconnect—to be together, and to rewrite or reconfirm our internal narratives.

life is a narrative, subject to analysis. Revisiting your life through the people who once populated it, who may see

do thousands of alumni still flock back to campus each year? Some return enthusiastically, others reluctantly, convinced only by a close friend willing to be a security blanket. They come to wear lobster bibs, to shake hands with the president, to recapture the intellectual exhilaration of old times. Some come to spouse- or job-hunt, or to show off their new or well-preserved physiques, Rogaine manes, burgeoning bank accounts, and offspring. This year, some may be drawn, no doubt, by the presence of J.K. Rowling, who has created a universe at least as compelling as cyberspace.

But most of us return to reconnect—to be together, the way we used to be, and to rewrite or reconfirm our internal narratives. Rosen, who coined the term *psychobabble*, considers it “a moral imperative” to connect with his former self and to interact with “witnesses” to his past. “I feel—maybe because I’m a writer—that your

you more clearly than members of your own family, is a privilege. At a recent reunion, several classmates told me things they remembered about me—and I didn’t recall any of them. The story of my life became a little clearer to me.”

While the wonders of the Web abound, there is simply no substitute for partaking in person of the best the University has to offer as it struts its stuff for you on a glorious June day. “Facebook and other social networking sites have revolutionized the notion of ‘connecting,’” affirms Nancy Sinsabaugh ’76, M.B.A. ’78, chair of the HAA’s Classes and Reunions Committee. “But nothing will ever replace the thrill of walking into the Yard, running into a classmate you haven’t seen in decades, and giving them a hug and feeling the years melt away so that you feel, once again, like a student at Harvard.”

Physical reunions have spawned socially productive encounters in all senses of the

Crimson Digital

Alumni associations everywhere are jumping on the virtual bandwagon. A recent “webinar” on “Understanding the On-Line Social Medium” for development professionals bears this out: the agenda included overviews of how Facebook, MySpace, Flickr, YouTube, LinkedIn, Wiki, blogs, and other social-networking and media-sharing websites can enhance the alumni experience. “Without technology, personal and professional alumni networking would not have taken off so dramatically nor spanned the globe so effectively as we see today,” says Sally Williams-Allen, M.A.T. ’65, a Harvard Alumni Association (HAA) adviser and the former director of alumni relations at the international business school INSEAD, who is now a global consultant in alumni engagement and international community-building. And virtual connection becomes increasingly important as Harvard’s student and alumni bodies become more international.

Philip Lovejoy, deputy executive director of the HAA, says the redesigned post.harvard.edu site, to be rolled out in 2009, “takes the best features of the best social-networking sites and applies them to the alumni experience... so you can interact with and connect to the Harvard communities you choose: a class, SIG [shared interest group], Club, region, graduate school. What’s radically different is that you’ll be able to customize the way you relate to your classmates, fellow alumni, and the University.” Alumni can have personalized home pages with a calendar of local Harvard events, their alumni contacts, and their choice of photographs. Reunion sites will be revamped; instead of static lists of who’s coming and who’s waffling, alumni will be able to click on names and pictures and convince old friends to come back.

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COMMENCEMENT & REUNION GUIDE

word. When Dan Rothstein '77 spoke at a twenty-fifth-reunion symposium about the idea of microdemocracy—bringing more low-income citizens into the democratic mainstream and into the voting booth—several audience members took action. Melissa Berman, of Rockefeller Philanthropy Advisors, put him in touch with an interested funder, and other classmates hosted events to spread the idea. At our fifteenth reunion, when I thought to introduce two doctor friends—an en-

Reunions are a place of possibility, where the rules of daily interaction are temporarily suspended...

docrinologist and a neurobiologist—they discovered overlapping research interests and ended up writing a paper together. (They were the only two guys I knew who worked with transgenic mice.)

Romantic connections are also com-

mon: on our reunion committee alone, Marianne Delpo Kulow met her husband, David Kulow, at our fifteenth reunion, and cochair Tony Hollenberg met *his* wife, Judy Levenfeld, serving on our fifth-reunion committee. "I am happy to say that I would have not met my wife via Facebook. I would not have stood up to the two-dimensional scrutiny," quips Hollenberg. "The technology connections are great at providing a good opening act for a reunion, but let's hope we are still inter-

esting enough to make the real reunions the place to be."

Would Tony and Judy have met on a conference call? I think not. I feel reunions exist in a sacred space like Delphi, as classics professor Gregory Nagy would say, where mystical and important things happen if only you make the journey and the sacrifice. Reunions

are a place of possibility, where the rules of daily interaction are temporarily suspended, where the unpredictable and unexpected reign. There are brief yet intense encounters with people you may never see again: the depth and immediacy of the bond arising from knowing each other over time and place a long time ago, an instant intimacy created out of context.

Cyberspace is an interesting place, but I remain a fan of the pheromone, thanks to E.O. Wilson. I want to come back to campus and dance with the guys I danced with, and those I didn't. I want to be at Pinocchio's with friends, telling the truth to each other late into the night. This time I will bring my digital camera, but I also want the immediate gratification of moments captured and developed on the spot—in *color* even. ▽

Ellen Gordon Reeves '83, Ed.M '86, is a teacher, writer, and editor based on the East Coast and in Paris.

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On the Career Carousel

College students prepare for life after graduation • by Paul Gleason



Mary Ellen Stebbins sits under the lights in the New College Theatre.

MARY ELLEN STEBBINS '08 studied classics and linguistics for four years in college, but what she enjoyed most was designing lighting for plays. In her senior year she decided to turn that hobby into a career, and applied for an internship at Harvard's American Repertory Theatre, and to the master's program in lighting design at Boston University (BU). But, she hastens to add, eventually she plans to pursue a doctoral degree in archaeology. And oh, she'd also like to work with kids. "I'm not the kind of person who doesn't know what she wants to do," she protests. "I just happen to want to do too many things."

The good news for Stebbins and other Harvard seniors is that she will have ample opportunities to explore, regard-

less of her chosen field. According to Philip Gardner, director of the Collegiate Employment Research Institute at Michigan State University, the job market for new college graduates, which dipped alarmingly after the dot-com bust in 2001, has grown steadily since. Even this year, amid fears of a recession, Gardner's annual survey found that companies were planning to hire 7 percent more new graduates this year than last. "The real thing that's keeping the college labor market above water is retirement," he says. Companies are scrambling to hire and train new workers before the baby boomers exit the workforce. Firms with more than 3,900 employees are doing the bulk of the hiring, with plans to take on 9 percent more bachelor's-degree-holders in 2008. Firms with fewer than 100 em-

ployees are also eager to land newly minted graduates: their hiring rose by 12 percent.

In general, most Harvard seniors (55 to 65 percent) during the last decade have expected to work at a job soon after leaving the College, although a quarter of the class enrolls in graduate or professional schools instead, according to annual surveys conducted by the Faculty of Arts and Sciences. The balance of young alumni report that they plan to do volunteer work, travel, join the military—or

admit they don't quite know what's next.

Last year, the *Crimson* probed more deeply, asking the class of 2007 *where* they would work. Fifty-five percent of seniors responded. Of those, 58 percent of the men, and 43 percent of the women, reported plans to enter the financial world, gravitating toward high-paying jobs with investment banks or consulting firms. (The respondents based their answers on plans, not definite work offers.)

Undergraduates seeking those jobs don't have to travel very far; the Office of Career Services (OCS) orchestrates the visits of around 250 companies to Cambridge each year. Although the recruiters represent a total of 25 industries, the majority are from financial giants like Bank of America and consulting firms like McKinsey & Company. The big-name

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COMMENCEMENT & REUNION GUIDE

firms line up to woo seniors as early as the first day of classes.

"The whole recruiting process started the moment we stepped on campus this year," says Josh Reilly '08. His interest in finance began at an early age, and at Harvard he joined radio station WHRB's sales and business teams, becoming the head of both departments by the end of his sophomore year. He has spent the last two years selling on-air advertising to Boston musical groups and preparing financial statements for the station's board of trustees. OCS's recruiting program was the next logical step. Employers gave presentations early in September and held meet-and-greets. Reilly then applied for jobs at the firms of his choice through an on-line intermediary, experience.com. (Had he wished, he could have entered the recruitment program during his junior or even sophomore year; banks frequently take on scores of summer interns, many of whom they eventually hire.)


The whole process moved quickly. By the middle of October he was sitting in a small room in Harvard Square waiting, along with a dozen of his classmates, for his interviews. "There were people stuffed in there like a fish tank," he recalls. "It's a little nerve-racking." The next week, three companies bought him plane tickets to New York City, and a fourth flew him to Chicago. Each New York firm put him through four additional interviews. At William Blair & Company, the Chicago investment bank, he endured eight interviews in a single morning. "That was brutal," he says. "That was intense. I remember doing the first four and feeling like I'd got through it, then remembering I had to do it all over again."

The grueling effort paid off, though, when the company offered him a job as a corporate financial analyst in early November. He took the offer because he believed that William Blair, as a smaller firm, would entrust him with more responsibility and offer more chances to work directly with clients than the larger banks in New York. His quick decision made his senior year easier. "It took a lot of the pressure off," he admits. "I got to relax a bit. I've been able to think about what kind of apartment I want to get."



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Avon Hill - Charming 1 bed condo in a classic brick building with fireplace, glass front cabinets & dining area with built-ins is overlooking the Cooper-Frost-Austin house (the oldest house in Cambridge). Near the Law School, Harvard & Porter Squares, shops, "T" & restaurants. \$328,000



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Lisa Bloomberg combined her love of literature and medicine in a thesis on Henry James.

In other popular fields, the *Crimson* survey found, more women than men (14 percent to 8 percent) planned to work in education, and the proportion was even more skewed between women and men (9 percent to 3 percent) planning to work in government or public service.

WHATEVER Harvard seniors want to do, OCS aims to help them. Director Bill Wright-Swadel notes that there are 16 staff members who provide some form of career counseling, along with workshops throughout the year on résumé writing and interviewing skills. They schedule around 500 half-hour appointments a month, and the counselors with special expertise in such areas as business, medicine, and public service hold weekly drop-in hours to advise students interested in those fields. OCS also e-mails student subscribers a biweekly newsletter with information on forthcoming events, and reminders about recruiting and fellowship deadlines.

The office actively promotes the Harvard Alumni Association's *Crimson Compass*, a University-wide networking system with a database of around 15,000 alumni profiles; undergraduates looking for a mentor can search by state, city, job title, employer, specialty, or industry. Some of the HAA's "shared interest groups" (SIGs; alumni organizations based on affinities, rather than graduating class, geographic proximity, or Harvard club membership) can also be used as career networks. Harvardwood (harvardwood.com), for example, a group of alumni with jobs in the entertainment industry, offers summer internships and workshops, career counseling, and job and

news postings to undergraduates as well as members.

OCS doesn't have to go out in search of suitors from the financial world. "They find us," reports Wright-Swadel. Goldman Sachs, for example, is one of the top recruiters on campus, measured by the number of students it eventually hires.

More interesting, perhaps, is that the nonprofit Teach for America is also among the most successful recruiters on campus. It, too, has a recruiting engine: teachers return to campuses across the country to meet and enlist new members. Unfortunately, most of "the public-service world doesn't work that way at all," says Wright-Swadel. "They hire people at point of need." But because his office hosts so many financial firms, he says he constantly battles the perception that OCS is "too corporate."

To counteract this, he tries to offer students a more diverse array of options through 15 specialized e-mail lists—covering the arts, international opportunities, education, and media, among other fields—that detail everything from job postings to conferences. OCS also partnered with the student-run group STOP (Students Taking on Poverty) to host a conference on Diversity in Career Aware-

ness (DICA) in February. STOP member Dhaval Chadha '08 and others were initially skeptical that OCS would want to help them, but were happily surprised. "In some ways they saved the event during the last weeks," Chadha says: OCS provided funding, staff, advertising, and even helped corral a few last-minute panelists when some of the confirmed participants backed out. The event included discussions on education, media and the arts, science and technology, government, and public health. There was also an informal career fair, where students could hear about how to break into fields without obvious career paths. "DICA is trying to reach out and say, 'Hey! This is what it takes in these sectors. No one's going to come and chase you,'" explains Chadha. Guests included representatives from the Boston Medical Center, the William J. Clinton Foundation's HIV/AIDS Initiative, and Project Hip-Hop, a civil-rights group.

AMONG THOSE SENIORS who choose to continue their schooling, the *Crimson* survey revealed that medical school was the most popular option, claiming 21 percent of respondents. Another 20 percent planned to pursue doctoral programs; master's programs and law school came next, with 18 percent and 17 percent, respectively. Bringing up the rear was business school, which attracted 4 percent of graduate school-bound seniors. (Business schools typically expect candidates to have a few years of real-world experience before applying.)

Uncertainty about life after graduation



Josh Reilly takes a breather from selling ads and preparing financial statements for WHRB.

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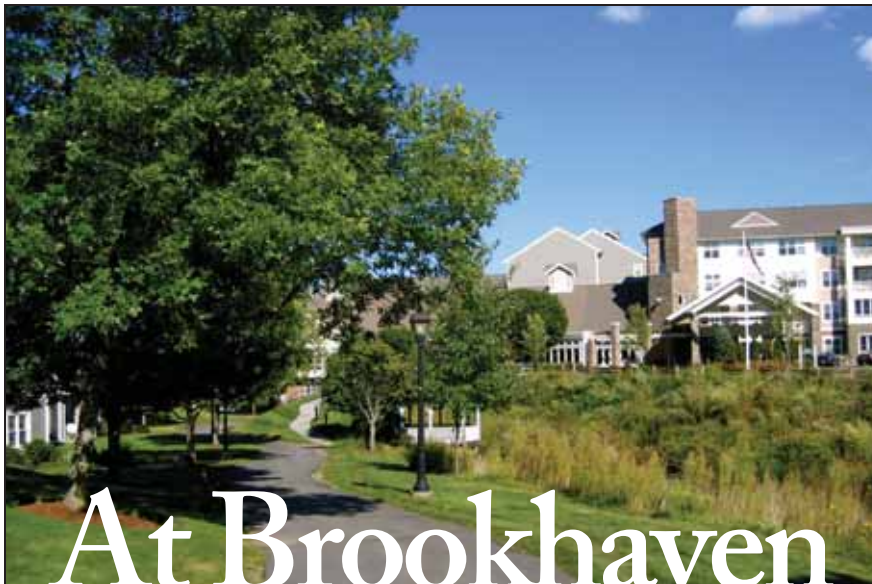
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Pictured from left to right: 1–John D. Spengler, Akira Yamaguchi Professor of Environmental Health and Human Habitation at the Harvard School of Public Health, Extension School faculty member and Director of the Environmental Management Program; 2–Betsey A. Robinson, Extension School graduate, Harvard College graduate, Assistant Professor of the Classics and of History of Art and Architecture at Harvard University; 3–Harry R. Lewis, former Dean of Harvard College, Harvard College Professor, Gordon McKay Professor of Computer Science, Extension School faculty member; 4–Grace Rubenstein, Extension School journalism student, 2003 Pulitzer Prize winner; 5–Dan Elias, Extension School museum studies graduate, director of the Peabody Essex Museum's ECHO Program.

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can continue into the second senior semester. In late February, Lisa Bloomberg '08 still didn't know which medical school she'd be attending in the fall, even though she had begun the application process—sending out her transcripts, test scores, and personal statements to 16 schools—last August.

Bloomberg knew throughout her college career that she would eventually wind up in medicine, but she decided to concentrate in English. “These are the two things I want to be doing,” she says. “It’s been restrictive, but not in a frustrating way.” She even briefly considered shelving medical school and doing academic research instead. “But the more I thought about it, the more I wanted an active career,” she explains. “I’m more interested in people, specifically, than in abstract research.” She ultimately found ways to marry these potentially distant fields: her thesis focused on sick women, nurses, and doctors in Henry James’s mammoth late novel *The Wings of the Dove*. Its due date (March 14) inconveniently fell during the same week she had interviews with medical schools at the University of Minnesota and the University of Chicago-Illinois.

Of the 2007 graduates who planned to work right after school, half did not have a job at the time of the *Crimson*’s early June survey. That may be fairly typical, but for Mary Ellen Stebbins, waiting to hear from graduate programs, it was hard to keep that fact in mind. “Even though it feels like everyone around me has already decided—it feels like I’m the only one on the non-plan plan—it’s not really true,” she says.

She’ll have plenty of company if she ends up at BU or the American Repertory Theatre: some 21 percent of last year’s seniors said they planned to stay in the Boston area, according to the *Crimson* survey. New York City was the intended destination of more than a quarter of the class; Washington, D.C., was also a big draw—and 8 percent of the respondents said they were heading west to San Francisco.

For Lisa Bloomberg, who was waiting to hear from Harvard Medical School, staying put in Cambridge wouldn’t be a bad option, either. “Much like undergrad,” she says, “if Harvard decided to say yes to me, it would be hard to say no.” ♥

This Blessed Plot, This Earth, This Realm, This Harvard ~Part Three

All the world's a school,
And all the men and women merely students;
They have their passes and their failures, too.
And one mind in its time takes many classes,
Its concentrations being seven. Literature
Comes first, a storybook upon a mother's lap.
Then Mathematics, measuring the day,
Numbering friends and adding up the inches.
Chemistry next comes, with love reactions
And drugs that speed the heart. Then Social Studies,
Where Economics, History, Anthropology,
And Government combine to make adults.
Next is Biology, when reproduction
Might make us kids and parents both, between,
And, oh, the bodies change. The sixth, not chosen,
Instead is a requirement for us.

It's Earth and Planetary Sciences,
And whether we shall save our global home,
This borrowed wonder. The last field of all,
That ends this strange eventful course of study:
Philosophy, or Folklore and Mythology,
When final graduation brings reunion.
The janitor comes in, turns out the lights,
Ends dreams, ends tests, ends thoughts, ends everything.

~ALISON CAREY

For her twenty-fifth reunion last year, playwright Alison Carey '82 devised this variant of the famous speech from act ii, scene 7, of As You Like It as part of a trilogy of Harvard-specific adaptations of Shakespearean excerpts. Classmate Courtney B. Vance performed the entire work at the Class of 1982 Entertainment Night, on the evening of Commencement day.

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Sunday Indulgences

Brunch, as you like it

PERHAPS what you require on a Sunday morning is dim light and hushed voices, but you'll get over it. If what you want instead is a sense of gaiety, festivity, and well-being, go to an establishment whose stated mission is to provide these things, and which does so amply: go to brunch at **UpStairs on the Square** (91 Winthrop Street, Cambridge; 617-864-1933; www.upstairsonthesquare.com; 10 A.M.-3 P.M.). You order off the menu: perhaps that standby of brunches, eggs Benedict, here with pancetta and tarragon hollandaise (\$14), perhaps tagliatelle with "crab fondue," tomatoes, brioche, and hollandaise (\$18). And by all means, have a mimosa. That will help.

Formerly UpStairs at the Pudding, this cheerful enterprise now occupies what was once the Pi Eta, an all-male social club. The restaurant's décor is exuberantly whimsical, and many patrons get a charge out of the look of the place, but you can eat your brunch alfresco if you prefer and nature smiles. Winthrop Street has recently been given to pedestrians and sidewalk diners during most hours of the day.

"We always have the Harvard Krokidoes come around 1 P.M. to sing to our brunch guests, and we have done so for 26 years," says co-owner Mary-Catherine Diebel. "In fact, it was fun to have all of them come to brunch at their sixtieth anniversary two years ago. They're always

fixed in my mind at age 19, so how interesting to see them at 45!"

If you or yours have stomachs of the bottomless-pit variety, you could do no better than to go to **Henrietta's Table** (One Bennett Street, Cambridge, in the Charles Hotel; 617-661-5005; www.henriettas-table.com; noon-3 P.M.) for an all-you-can-eat buffet (\$42 per adult). *Boston Magazine* designated Henrietta's as "Best of Boston"

in 2006 for brunch "with a rambunctious brood," noting that "your kids will find plenty of pint-sized company at this brunch extravaganza, where children under five eat free and the six-to-twelve set gets half off."

A larger-than-life sculpture of Henrietta herself—a jolly pig—greeted you at the entrance. You'll find oysters on the half shell and shrimp; salmon and other smoked fishes; cheeses, pâtés, and terrines; a roast meat of the day; hot fish, meat, and poultry entrées with side dishes; omelettes; waffles; and various desserts.

The restaurant bustles. You may alternatively take your nourishment outdoors, in the hotel courtyard under umbrellas on Henrietta's Porch.

Lauded as well for "best brunch" in recent years by several protectors of the public tastebuds is that longtime solid citizen of local dining, **Harvest** (44 Brattle Street, Cambridge; 617-868-2255; www.harvestcambridge.com; 11:30 A.M.-2:30 P.M.). "The brunch spot of choice for Cambridge cognoscenti," declared *Travel & Leisure*.

The interior of the restaurant is done in earth tones with pastoral art, soothing and elegant on a Sunday morning. The Garden Terrace outdoors, shaded by linden trees, is agreeable on a fine day. The menu is a three-course, prix-fixe affair at \$33. Among the appetizers is a tasty goat-cheese tart. Entrées range from poached eggs and corned-beef hash to a grilled shrimp BLT club. For



Outside at UpStairs on the Square

COMMENCEMENT & REUNION GUIDE

dessert, have a Key lime *semifreddo* (a word you know; you are a cognoscente), or perhaps a fruit cobbler. A brunch very worth your while.

Ah, but you are visiting Cambridge from an interior homeland and crave New England seafood from a noted source. Go back to the Charles Hotel courtyard and find a branch of **Legal Sea Foods** (20 University Road, Cambridge; 617-491-9400; www.legalseafoods.com;

11 A.M.-2:30 P.M.) for a lobster, goat cheese, and chive omelette (\$17.95), washed down with a “Legal Red Tide,” a bloody mary made with tequila and a cocktail shrimp (\$7.75). You may eat outdoors and wave at the folks on Henrietta’s Porch across the courtyard.

Casablanca (40 Brattle Street, Cambridge; 617-876-0999; www.casablanca-restaurant.com; 11 A.M.-2:30 P.M.) plays on and on, with its Humphrey Bogart & Co. eponymous décor and very good food, often of a Mediterranean persuasion. How about scrambled eggs with the flavorful cured meat called *basturma* (\$11)? Or flat bread with roast pears and blue cheese (\$11)? Or grilled shrimp and fried plantains (\$13)? Or duck hash (\$13)?

For an improvisational brunch, step around the corner to **FiRE+iCE** (50 Church Street, Cambridge; 617-547-9007; www.fire-ice.com; 10 A.M.-2 P.M.). The modus operandi here is to go to the restaurant’s “market,” select ingredients you desire, and take them to a large,

round grill, where the grill master cooks them for you. At brunch, management augments the usual market with breakfast items to go into oversized omelettes or gigantic pancakes. The process has entertainment value, and if the result of your selections disappoints you, you have mostly yourself to blame. How could you have thought to put shrimp and blueberries into a pancake? The price is right: \$13.95 for unlimited trips to the grill.

VENTURING outside the halo of Harvard Square, you might choose **Changsho** (1712 Massachusetts Avenue, Cambridge, a bit beyond the Law School; 617-547-6565; www.lotuscuisine.com; 11 A.M.-2:30 P.M.) for a popular buffet featuring dim sum (all you can eat for \$17.95). Changsho is large and attractive, and the TV show *Phantom Gourmet* has designated it “incredibly clean”—in fact, brags Changsho, “the cleanest restaurant in Massachusetts.” If you crave dim sum in vast variety, involving steamed chicken feet, head to Boston’s



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Chinatown, to the **China Pearl Restaurant** (9 Tyler Street, Boston; 617-426-4338) and expect crowds, a long wait, noise, communal tables, and satisfaction.

If you seek good food and affordability in simple surroundings, go for longtime favorite **S & S Restaurant** in Inman Square, less than a mile from Harvard Square (1334 Cambridge Street, Cambridge; 617-354-0777; www.sandsrestaurant.com; both Saturday and Sunday, 8 A.M.-4 P.M.). The extensive brunch menu lets you comfort yourself with a deli specialty (matzo ball soup, \$4.95), or put on the dog (petit filet mignon with poached eggs on potato pancakes topped with hollandaise, with fresh fruit, a bagel, and cream cheese, \$12.95), washed down with a spot of Veuve Clicquot (\$47.95 a bottle). There's a takeout menu as well. S&S has been in business for almost 90 years—by doing plenty right and being friendly about it.

Many of the items on the S&S menu are also available at jazz club **Ryles** (212 Hampshire Street, Cambridge; 617-876-9330; www.rylesjazz.com; 10 A.M.-2:30 P.M.). Under S&S ownership, Ryles serves brunch and live jazz for those who like their quiche Lorraine (\$9.95) with tunes.

You can jazz up your tastebuds with a raw oyster swimming in a bloody-mary shot at the nearby **East Coast Grill and Raw Bar** (1271 Cambridge Street, Cambridge; 617-491-6568; www.eastcoast-grill.net; 11 A.M.-2:30 P.M.), co-owned by chef and cookbook writer Chris Schlesinger. The place takes Inman Square south of the border. "Amilcar's" omelette comes packed with avocado, black beans, cheese, and salsa (\$8.75), and even the French toast is cornbread crusted (\$8.75). Watch out for the banana stuffed with smoked pork and homemade "Inner Beauty Hot Sauce" (\$6). *Muy caliente!!!* Do not give to unsupervised children.

For a first-rate buffet at **The Blue Room** (One Kendall Square, Cambridge; 617-494-9034; www.theblueroom.net), you must book either the 11 A.M. or 1 P.M. seating. The tab is \$23 for anyone over 12, \$12 for others. The fare ranges from eggs to octopus salad. You could feast on the desserts alone.

At **Restaurant Dante** (in the Sonesta Hotel, 40 Edwin H. Land Boulevard, Cambridge; 617-497-4200; www.restaurantdante.com; 11 A.M.-2 P.M.), you will

find, of course, the "Inferno," a combustible bloody mary, as well as a three-course prix-fixe menu (\$20). The hotel is on the Charles River, and Dante's patio affords pleasant views of the Boston skyline.

Of the multitude of brunch spots across the river in Boston, here are two to consider. At **Tremont 647** (647 Tremont Street, in Boston's playful South End; 617-266-4600; www.tremont647.com; 10:30 A.M.-3 P.M.), management encourages patrons to come in their pajamas. (Other garb is permitted.) Brunch is à la carte, with such delicacies as "Too Stinky Cheeses" (\$12), with black-truffle honey, jams and jellies, and toast.

The Bristol (200 Boylston Street, in the Four Seasons Hotel, Boston; 617-338-4400;

Henrietta's Table awaits.

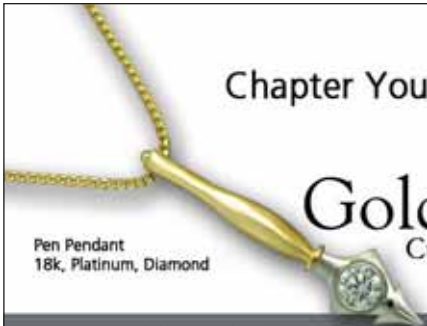


HENRIETTA'S TABLE

www.fourseasons.com; 10 A.M.-1:30 P.M.) serves a breakfast buffet that costs \$38 for adults and \$19 for children 3 to 12. You'll find eggs and bacon certainly, as well as smoked seafood, salads, fresh fruit, and cheeses. A luncheon menu of light fare is also available. The clam chowder is a

delicious indictment of most chowders dished up in New England, which are library paste. Both you and your stomach will feel very well treated in this gracious place. The big ground-floor windows look out on the verdant Public Garden and, at its edge, a statue of the patrician Wendell Phillips, A.B. 1831, LL.B. 1834, the great orator, abolitionist, and temperance fighter. He might not have had a mimosa with his brunch. ~C.R.

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The Events of the Week



Kennedy School Class Day Awards Ceremony, 1-4. Kennedy Forum.

Senior Class Family Dinner and Party, at 6. Reservations and tickets required. Next to the Palmer Dixon Courts.

Harvard Extension School Alumni Banquet, cocktail reception at 6; dinner and program at 7. Reservations required. Quincy House.

WEDNESDAY, JUNE 4

50th Reunion Memorial Service, 9:30 in Memorial Church, followed by class picture, at 11:15, Widener steps.

ROTC Commissioning Ceremony, at 11. Speaker to be announced. Tercentenary Theatre.

Senior Class Day Luncheon, at noon. Res-

ervations required. The Old Yard.

Divinity School Luncheon, 12-1:30, with keynote address by Dean William A. Graham. Andover Lawn.

50th Reunion Symposiums. At 1:30, "Journalism and the Public Interest"; at 3:15, "Educating Physicians, Educating Patients." Sanders Theatre.

Senior Class Day Exercises, at 2, with the Harvard and Ivy Orations and a guest speaker to be announced. Tercentenary Theatre.

Kennedy School Commencement Address, at 2, by Liberian president Ellen Johnson Sirleaf, M.P.A. '71. Kennedy Forum.

Law School Class Day, 2:30, with speaker Cory Booker, mayor of Newark, New Jersey. Holmes Field.

THE MANY RITUALS of graduation peak on Commencement day, which this year includes addresses by President Drew Faust and by Harry Potter's creator, J.K. Rowling. For details and updates, visit www.harvardmagazine.com or www.commencementoffice.harvard.edu.

MONDAY, JUNE 2

50th Reunion Symposiums. At 1:30, "Undergraduate Life"; at 3:15, "University Governance." Sanders Theatre.

50th Reunion Dinner, at 6, with remarks by President Drew Faust and dean of the Faculty of Arts and Sciences Michael D. Smith. Murr Center.

Harvard Kennedy School Class of 2008 Picnic, 4-7. HKS courtyard.

TUESDAY, JUNE 3

50th Reunion Symposiums. At 10, "Allston Initiative and Harvard Architecture"; at 1:30, "Societal Change and Climate Change"; at 3:15, "The Longest Revolution: The Girls We Left Behind and the Women We Became—Lessons for Our Granddaughters." Science Center B.

Phi Beta Kappa Literary Exercises, at 11, with physicist and Nobel laureate Steven Weinberg as orator, and poet Carl Phillips. Sanders Theatre.

50th Reunion Lunch, at noon. Science Center tent.

Baccalaureate Service for the Class of 2008 and their families, at 2. Tercentenary Theatre, followed by senior class picture, at 4, Widener steps.

COMMENCEMENT & REUNION GUIDE

Business School Class Day Ceremony, 2:30, with speaker Ann S. Moore, M.B.A. '78, chairman and CEO of Time Inc., followed by a reception at 4. Baker Lawn.

Masters' Receptions (time varies by House) for members of the senior class and guests. The Undergraduate Houses.

Graduate School of Design Class Day Speaker, at 4, reception to follow. Speaker to be announced. Gund Hall.



JIM HARRISON

50th Reunion Cocktails and Dinner, 6:15. Beren Tennis Center.

35th Reunion Welcome Cocktails and Dinner, 6:30. Winthrop House Courtyard.

25th Reunion Welcome Pub Night, at 7. Cambridge Queen's Head Pub.

Harvard University Band, Harvard Glee Club, and Radcliffe Choral Society Concert, at 8. Free and open to the public. Tercentenary Theatre.

THURSDAY, JUNE 5 COMMENCEMENT DAY

Yard Gates open at 6:45.

Law School Breakfast, at 7. Jarvis Field tent.

Graduate School of Arts and Sciences Breakfast, at 7. Lawn behind Perkins Hall.

Senior Chapel Service, at 8. Memorial Church.

Academic and Alumni Procession, 8:30. The Old Yard.

Medical School Faculty Symposiums, 9-4:30. "Neurodegenerative Disease: New Developments and New Hopes." Registra-

tion required. Tosteson Medical Education Center.

Medical School Class of 1983 Reunion Symposium, 9-noon. "Twenty-five Years—Medicine and Service: Then and Now." Tosteson Medical Center.

The 357th Commencement Exercises, 9:45. Tercentenary Theatre.

Divinity School Diploma Ceremonies at noon. Memorial Church. Lunch at 1, Andover Lawn.

Business School Luncheon, 11:30, for graduates and their guests. Tickets required. Shad Auditorium and tent.

Senior Luncheon and Diploma Ceremonies, 11:30. The Undergraduate Houses.

The General Alumni Spread, 11:30. Tickets required. The Old Yard.

The Tree Spread, for College classes of 1918-1957, 11:30. Alumni are guests of the College; all others must reserve a ticket. Holden Quadrangle.

Law School Luncheon and Diploma Ceremony, 11:30. Holmes Field.

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Ph.D. Diploma Ceremony, 11:45, in Sanders Theatre, followed by champagne reception and luncheon on the lawn behind Perkins Hall.

Kennedy School Diploma Ceremony, at 12:15, followed by luncheon. By ticket only. JFK Park.

Graduate School of Design Diploma Ceremony, at noon. A luncheon follows. Gund Hall.

Graduate School of Education Diploma Ceremony, 12:30-2. Radcliffe Yard.

Business School Diploma Ceremony, 12:30. Baker Lawn.

Extension School Diploma Ceremony at noon. Loeb Drama Center.

Graduate School of Arts and Sciences Master's Diploma Ceremony, 1:15, Science Center Lecture Hall C, followed by champagne reception and luncheon on the lawn behind Perkins Hall.

Alumni Parade, 1:45. The Old Yard, in front of Harvard Hall.

The Annual Meeting of the Harvard Alumni Association, 2:30, with speeches by President Drew Faust and J.K. Rowling. Tercentenary Theatre.

Business School Reception for graduates and guests, 3-4:30. Shad Auditorium tent.

School of Public Health Diploma Ceremony, 2:30. Academic procession, followed by an address by Harvey V. Fineberg, president of the Institute of Medicine. Kresge Courtyard.



Medical and Dental Schools Class Day Ceremony, at 2, with speaker Jeffrey Flier, dean of the Faculty of Medicine. HMS Quadrangle.

Harvard Gay & Lesbian Caucus Annual Commencement Dinner. Cocktails at 5, followed by dinner and guest speaker Brian Graden, M.B.A. '89, president of Entertainment, MTV Networks Music Group, and Logo, MTV's LGBT network. Lowell House. Reservations required for the dinner. For further details, visit <http://hgcl.com/dinner.html>.

FRIDAY, JUNE 6

35th Reunion Symposiums. At 8:30, "Game Theory"; at 10:15, "Health: How to



Congratulations Seniors!

BENJAMIN EISLER

**Congratulations, Benny,
on your graduation from Harvard!**

We are so very proud of you! You bring sunshine and joy to all of those around you. Keep following your heart and may all your dreams come true.

Love, Mom, Dad, Kim, Anya, Lucci,
and Grandmas and Grandpas.

MEGAN MERRITT

Congratulations!

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Love,
Mom, Dad, Kelly, Christopher, and Katie

JENNIFER Q. WONG

**Congratulations,
on your graduation from Harvard!**

We are proud of your successful achievement!
We wish you a wonderful life!

Love and Happiness,
Mom, Dad, and Grandparents

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Congratulations, Britt!

Passion, motivation, hard work.
With these, you accomplished your dream.
Now you will help others achieve theirs.
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Love always,
Mom, Dad, & Krista

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25th Reunion Symposiums, at 9. "Saving the Earth by Our Thirtieth Reunion: What We Must Do To Stop Global Warming"; "News and Entertainment: Drawing the Line"; "Searching for Wellness: Exploring the Frontiers of Physical and Personal Well-Being in the 21st Century." Science Center.

Radcliffe Commemorative Service, at 9. Karen Klein '58 leads the service; Ellen Gordon Reeves '83, Ed.M. '85, is the speaker. Memorial Church.

Medical School Alumni Day, 9-12. The HMS Alumni Association's annual meeting is followed by a presentation on "Practical Issues in Medical Ethics." HMS Quadrangle.

Radcliffe Awards Symposium, 10:15-12:30. "What Are the Challenges, Risks, and Obligations for Women in 2008 and Beyond?" with alumnae panelists. With presentation of Distinguished Service Awards, Alumnae Recognition Awards, the Graduate Society Medal, and the Jane Rainie Opel '50 Young Alumna Award. Loeb Drama Center.

Radcliffe Institute Annual Luncheon, 12:45, with an address by Donna E. Shalala, president of the University of Miami, former U.S. Secretary of Health and Human Services, and winner of the 2008 Radcliffe Institute Medal. Registration required. Radcliffe Yard.

Second Annual Harvardwood Reunion Mixer, 2-5. Alumni, faculty, and staff in arts, media, and entertainment are invited to mingle at Tommy Doyle's, Cambridge. To R.S.V.P., call 617-864-0655 or visit www.harvardwood.org.

25th Reunion Symposiums and Life Dialogues, at 2. "Protecting Our Future: Changing the Lives of a Generation at Risk." Science Center.

35th Reunion Memorial Service, 2:30, in Memorial Church, followed by the class picture, at 4, Widener steps.

Dental School Celebration Dinner, 6:30. With speaker Jack Silversin, D.M.D. '72,

D.P.H. '75, president of Amicus Inc. Harvard Dental School.

SATURDAY, JUNE 7

Dental School Alumni Weekend Symposium, Luncheon, and Awards Ceremony, 11:30. "Tooth and Bone—Gone Today, Here Again Tomorrow." Harvard Dental School.

25th Reunion Memorial Service, at 11, in Memorial Church, followed by class picture, at noon, Widener steps.

For updates on Harvard reunions and events for graduating seniors, contact the Harvard Alumni Association, 124 Mount Auburn Street, 6th floor, Cambridge 02138, at 617-495-2555; haa@harvard.edu; or www.haa.harvard.edu.

For information on Radcliffe reunions, visit www.radcliffe.edu/alumnae/45.aspx, call the HAA at 617-496-5301; or e-mail radalum@radcliffe.edu.

For Medical Area symposiums and other events, visit www.hms.harvard.edu/alumni/events_week.html, or contact Anne Benware at 617-384-8519/20 or Anne_Benware@hms.harvard.edu.

The **Harvard Information Center**, Holyoke Center, is open every day but Sunday, 9 to 5. Telephone: 617-495-1573.

A Special Notice Regarding Commencement Exercises

Thursday, June 5, 2008

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. 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 Mount Auburn Street, sixth floor, Cambridge.

- For alumni/ae from non-major reunion years and their spouses, there is televised viewing of the Morning Exercises in the Science Center, and at designated locations in most of the undergraduate Houses 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 Mount Auburn Street, sixth floor, Cambridge 02138.

Afternoon Exercises

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

—Jacqueline A. O'Neill, University Marshal

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Wellesley, MA Babson College, Sorenson Center for the Arts		West Hartford, CT Saint Joseph College, Bruyette Athenaeum	
Sunday, April 13		Saturday, April 26	
Political Science: Why You Shouldn't Believe Public Opinion Polls Jennifer Lawless - <i>Brown</i>		International Affairs: Iraq, Iran, and the Future of the Middle East Paul Bracken - <i>Yale</i>	
American Studies: Our War on Drugs—A Cultural History Mark C. Smith - <i>University of Texas</i>		Natural History: Where Do We Come From? From Creation Myths to the Big Bang Marcelo Gleiser - <i>Dartmouth</i>	
Philosophy: The Philosophy of Happiness Peter Kreeft - <i>Boston College</i>		Music: The Musical Genius of George Gershwin Orin Grossman - <i>Fairfield</i>	
Earth Science: Global Warming—What We Know and What We Don't Know David Helfand - <i>Columbia</i>		History: The Untold History of Resistance in Nazi Germany Anne Nelson - <i>Columbia</i>	
Saturday, May 31		Sunday, June 8	
Positive Psychology: The Science of Human Potential Shawn Achor - <i>Harvard</i>		Political Science: The 2008 Presidential Election, the Most Important in Decades Wendy Schiller - <i>Brown</i>	
Political Science: The 2008 Presidential Election, the Most Important in Decades Wendy Schiller - <i>Brown</i>		Positive Psychology: The Science of Human Potential Shawn Achor - <i>Harvard</i>	
Communications: Is the First Amendment Under Attack? 9/11 and Freedom of the Press David Rubin - <i>Syracuse (Newhouse School)</i>		History: The Century of Immigration and the Transformation of America Hasia Diner - <i>NYU</i>	
Natural History: Where Do We Come From? From Creation Myths to the Big Bang Marcelo Gleiser - <i>Dartmouth</i>		American Studies: Re-educating Europe—How America Tried to Export its Culture After WW II Joseph McVeigh - <i>Smith</i>	

Classes are also available in Fairfield, CT June 1st.

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Site Seeing

What's up, what's down, and what's under construction



SPACE. The final frontiers—the last major developable parcels owned by Harvard in Cambridge—will soon have new buildings on them with all manner of space for faculty and staff members and students. Soon Harvard will look to a future in Allston. Site work has already begun across the river for the largest building Harvard has ever put up. What follows is a guide to the construction underway on frontiers old and new.

In Cambridge, if you ask to see the Northwest Building, you may be directed to one of two projects. If you query a legal eagle outside Langdell Hall, he will tell you about a vast new edifice rising at the intersection of Massachusetts Avenue and Everett Street, at the northwesterly

corner of the Law School campus. But if you ask a biophysicist waiting eagerly for the completion of her wet lab space, she will reply that the Northwest Building lies on Hammond Street at the intersection of Oxford Street, in the block just north of the Harvard Museum of Natural History.

Both your well-meaning guides would be right. To distinguish between the two, explains a helpful philologist on his way to Widener Library, you must be specific: the Northwest Corner Building is at the Law School; the other is called the Northwest Science Building. (Perhaps generous donors will lend them more distinctive

The Northwest Science Building was designed to foster interdisciplinary collaboration among 30 researchers, their laboratories, and staffs.

names in time.) Which has a fairer claim to the current name? The science building was begun first, and is by far the larger. But technically, the Law School's entry is farther northwest. In an argument, the legal eagle could best you on a technicality like that. Best not to argue with a lawyer.

The Northwest Science Building, with about 210,000 square feet of above-ground space (and another 260,000 square feet below, plus additional room for a deep parking garage) contains academic space for 30 faculty scientists and their laboratories, technicians, students, post-doctoral fellows, and administrative staffs. Not including faculty and students, there will be about 320 other people working there.

The space was designed by an experienced hand, Craig Hartman of Skidmore, Owings and Merrill-San Francisco, who consulted on the plans with neighbors on Hammond Street and to the north to ensure that the transition from campus to residential streetscapes would be a pleasing one for all concerned. In fact, the original design included low structures that ran parallel to Hammond Street, forming an enclosed courtyard.

The neighbors understood, but said, "Open the space to us, so we don't feel walled out." Hartman turned and reconfigured the building. Lighted walkways now connect the neighborhood to what will become a green open space designed by Michael Van Valkenburgh Associates, the noted landscape architecture firm that guided the replanting of Harvard Yard more than a decade ago. Soon neighbors and occupants alike will traverse

COMMENCEMENT & REUNION GUIDE



open spaces that once were bounded by a high metal fence topped with barbed wire, a legacy of the Cold War era when Harvard's cyclotron represented cutting-edge atomic physics.

In addition to laboratories, some configured especially for teaching, the Northwest Science Building will have classrooms and seminar rooms and collection space. No single department will move there. The interior space is designed to en-

courage the formation of interdisciplinary clusters of related research groups. Neuroscientists like Joshua Sanes and Jeff Lichtman are expected to move in; but there will also be astro- and particle- and biophysicists—the place will fairly fizz with them. Engineers and applied physicists will work with molecular and cellular biologists on problems in areas such as tissue engineering, biological imaging (see page 40), and biomechanical devices.

Below grade, the place will hum with activity of a different sort. An electrical substation will be located there, and a chilled-water plant will provide cooling capability to surrounding buildings.

In early April, the temporary yet imposingly tall fences that had been erected

The brick-and-glass Northwest Science Building wends its way among existing structures along Hammond and Oxford streets.

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Left: Pre-work has begun for the science complex in Allston, where the Harvard Stem Cell Institute will eventually be housed.

three years ago to mitigate the effects of construction on the neighborhood began to come down. Trees appeared. Inside, workmen put the final interior touches in place, installing lights, applying paint, and laying floors. Windows were being

washed. Signs of growth and renewal were everywhere.

But what of the other northwest building? There, north of the law school's Pound Hall, cranes dominate the landscape, placing massive load-bearing ele-

ments into position prior to construction above grade. Last year's demolition of the Everett Street parking garage was accomplished with elegant precision. Jets of water had arced across the site, directed at the dust that would otherwise have choked the scene. From a huge, crawling machine emerged a boom tipped with an enormous metal pick. One couldn't help but be reminded of a bad day at the dentist as it pecked discerningly at the dripping tangle of exposed rebar and concrete.

Now the site is level and clear, the pain in the jaw has passed, and one may erect in the mind's eye a building that will be as venerable as it is fresh from the day it opens. That is a specialty of the architect Robert A. M. Stern, who also designed the Business School's Spangler Student Center. This one, at 250,000 square feet in size, will have classrooms as well as space for student activity and recreation, and a cen-

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Two views of the Kyu Sung Woo-designed graduate student housing now rising on Memorial Drive

ter for clinical legal programs, the fertile educational ground where theory and practice meet.

Meanwhile, down by the Charles River, 300 units of new housing (with 500 beds), primarily for graduate students, are nearing completion.

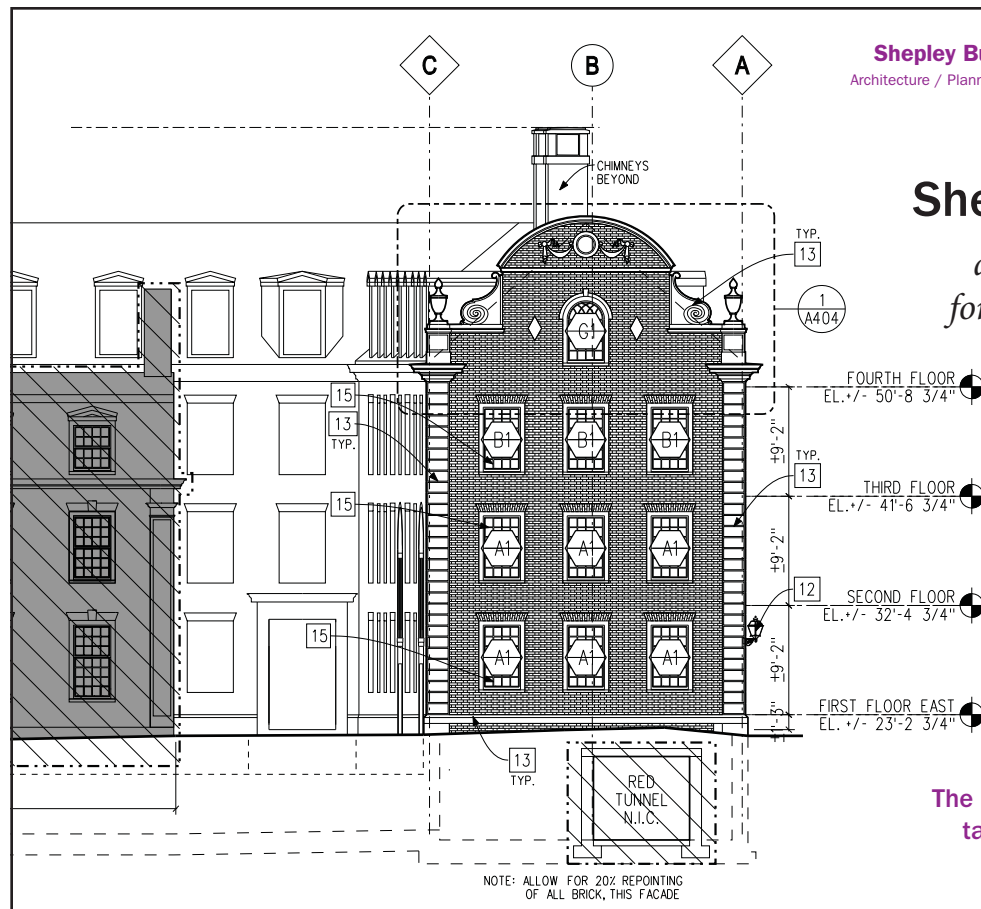
COMMENCEMENT & REUNION GUIDE

The largest of the many buildings that make up the project, clad in red brick and glass, was designed by Kyu Sung Woo Architects, and overlooks Memorial Drive and the river. Here again, Michael Van Valkenburgh Associates are providing landscape design. An adjacent park, once leased to a garden center, came about as the result of negotiations with neighbors, who valued the open space at that location. Three smaller, wood-frame buildings were designed by Elkus/Manfredi Architects, LTD. They are also the designers of six wood-frame buildings on Grant Street, and one on Cowperthwaite, built to de-emphasize the scale of an adjacent brick-and-glass apartment house that went up on the site of a surface parking lot. Now the parking is underground. Increasingly

there is nowhere left to go but down when building in Cambridge.

That is true of Allston, too, where a new science complex of four buildings is about

Cranes dominate the future site of the Law School's Northwest Corner Building.



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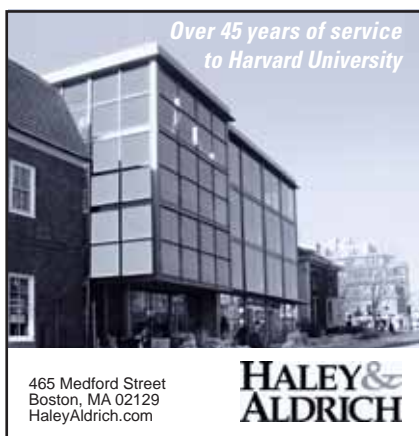
to rise above an underground parking garage with perhaps 600 or more spaces. The building, designed by Behnisch Architects, and a million square feet in all, will be green—not in hue, but in terms of energy consumption and waste (see “An Allston Metamorphosis?” November-December 2006, page 66). Planners have considered all kinds of modern engineering to make it as energy efficient as possible: a black, solar chimney to suck warm air from the building on sunny days in summer, and an all-season geothermal heating and cooling system.

On one site
across the Charles,
a geothermal well
designed for fresh
water served up
brine.



Harvard engineers have found that the geology of the area is not so well understood as they once thought. On one site across the Charles, a geothermal well more than 600 feet deep, designed for fresh water, served up brine. Not a happy outcome from the standpoint of corrosion, but valuable information that Allston planners will no doubt put to use many times in the decades ahead as they build a new campus—perhaps 10 million square feet, and counting.

A new wood-frame building on Cowperthwaite Street softens the profile of a six-story brick-and-glass apartment complex.



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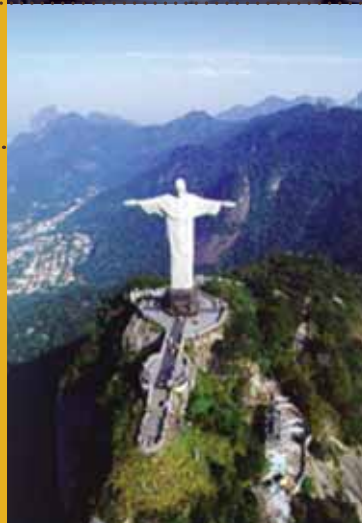


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Making Credit Safer

The case for regulation

IT IS IMPOSSIBLE to buy a toaster that has a one-in-five chance of bursting into flames and burning down your house. But it is possible to refinance your home with a mortgage that has the same one-in-five chance of putting your family out on the street—and the mortgage won't even carry a disclosure of that fact. Similarly, it's impossible for the seller to change the price on a toaster once you have purchased it. But long after the credit-card slip has been signed, your credit-card company can triple the price of the credit you used to finance your purchase, even if you meet all the credit terms. Why are consumers safe when they purchase tangible products with cash, but left at the mercy of their creditors when they sign up for routine financial products like mortgages and credit cards?

The difference between the two markets is regulation. Although considered

an epithet in Washington since Ronald Reagan's presidency, the "R-word" supports a booming market in tangible consumer goods. Nearly every product sold in America has passed basic safety regulations well in advance of being put on store shelves—but credit products are regulated by a tattered patchwork of federal and state laws that have failed to adapt to changing markets. Moreover, thanks to effective regulation, innovation in the market for physical products has led to more safety and cutting-edge features—but innovation in financial products has produced incomprehensible terms and sharp practices that have left families at the mercy of those who write the contracts.

Sometimes consumer trust in a creditor is well placed. Credit has provided real value for millions of households, permitting the purchase of homes that can add to family wealth accumulation and cars that

by ELIZABETH WARREN

can expand job opportunities. Credit can also provide a critical safety net, a chance for a family to borrow against a better tomorrow when they confront layoffs or medical problems today. Life insurance and annuities also can greatly enhance a family's security. Consumers may not spend hours poring over the details of their credit-card terms or understand every paper they sign at a real-estate closing, but many of those financial products are offered on fair terms that benefit both seller and customer.

But for a growing number of families steered into over-priced credit products and misleading insurance plans, trust in a creditor proves costly. And for families tangled up with truly dangerous financial products, the result can be wiped-out savings, lost homes, costlier car insurance, job rejections, troubled marriages, bleak retirements, and broken lives.

Consumers entering the market to buy financial products should enjoy the same protection as those buying household appliances. Just as the Consumer Product Safety Commission (CPSC) protects buyers of goods and supports a competitive market, a new regulatory agency is needed to protect consumers who use financial products. The time has come to recognize that regulation can often support and advance efficient and more dynamic markets.

AN EPIDEMIC OF CREDIT PROBLEMS

AMERICANS ARE DROWNING IN DEBT. One in every four families reports worries about how to pay credit-card bills this month. Nearly half of all credit-card holders missed payments in 2006 (the latest year for which data are available), and an additional 2.1 million families missed at least one mortgage payment. In 2006, a then-record 1.3 million families received foreclosure notices, followed by another 2.2 million families who were in foreclosure in 2007.

Families' troubles are compounded by substantial changes in the credit market that have made debt far riskier for consumers today than a generation ago. The effective deregulation of interest rates, coupled with innovations in credit charges—including teaser rates, negative amortization, increased use of fees, cross-default clauses, and penalty interest rates—have turned ordinary credit transactions into devilishly complex undertakings. Aggressive marketing compounds the difficulty, shaping consumer demand in unexpected and costly directions. Yet consumers' time and expertise have not expanded to meet the demands of a changing credit marketplace. Instead, consumers sign on to credit products with only a vague understanding of the terms.

Credit cards offer a glimpse at the costs imposed by a rapidly growing credit industry. In 2006, for example, Americans turned over \$89 billion in fees, interest payments, added costs on purchases, and other charges associated with their credit cards. That is \$89 billion out of the pockets of ordinary middle-class families, people with jobs, kids in school, and groceries to buy. That is also \$89 billion that didn't go to new cars, new shoes, or any other goods or services. To be sure, the money kept plenty of bank employees working full time, and it helped make debt collection one of the fastest-growing occupations in the economy.

Not all costs associated with debt are measured in dollars. Anxiety and shame have become constant companions for Americans struggling with debt. Since 2000, families have filed nearly 10 million petitions for bankruptcy. Today about one in every seven families is dealing with a debt collector. Mortgage foreclosures and credit defaults sweep in millions more families. How do they

feel about their inability to pay their bills? In 2005, the National Opinion Research Council asked families about negative life events: the death of a child and being forced to live on the street or in a shelter topped the list, but filing for bankruptcy ranked close behind, more serious than the death of a close friend or separating from a spouse. Of those who file for bankruptcy, 85 percent struggle to hide the fact from families, friends, or neighbors.

Why do people get into debt in the first place? People know that credit cards are dangerous, all the more so if they carry a balance. Any consumer who signed mortgage papers without reading carefully or seeking legal assistance should not be surprised if terms come to light later that are unfavorable to the consumer. Payday lenders have a bad reputation for taking advantage of people; no one should expect to be well treated by them. Car lenders, check-cashing outlets, overdraft protection—the point can be repeated again and again: Financial products are dangerous, and any consumer who is not careful is inviting trouble. And yet, dangerous or not, millions of Americans engage in billions of credit transactions adding up to trillions of dollars every year.

SETTING THE SNARE

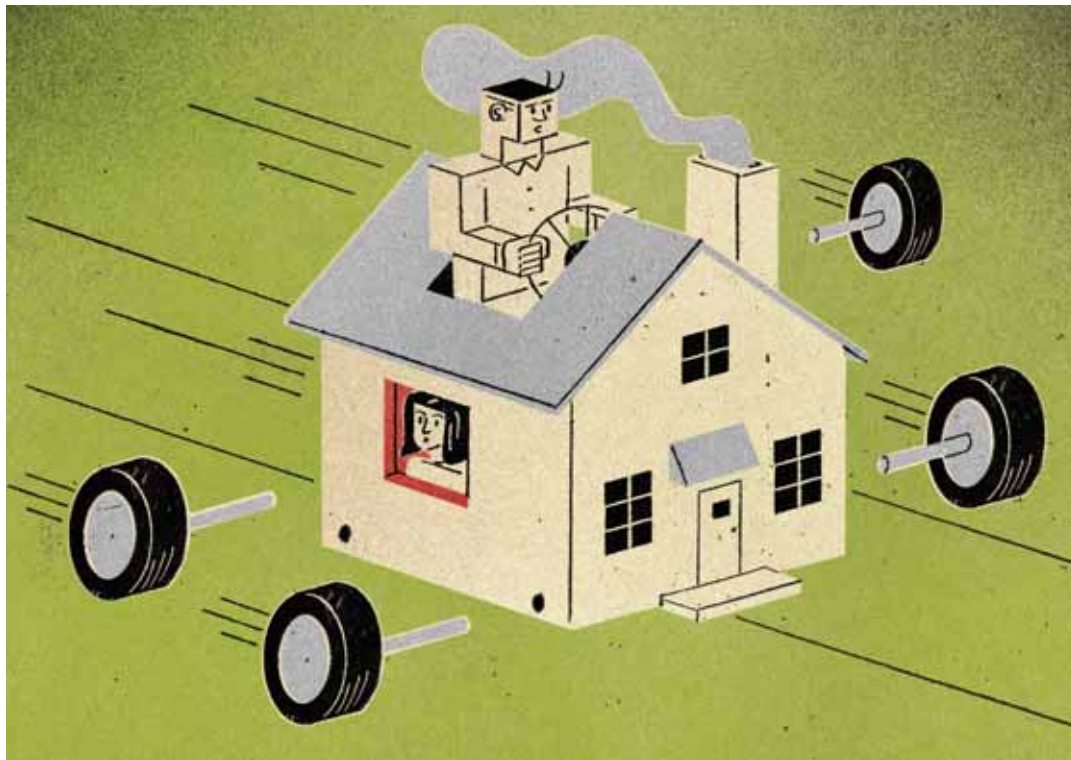
SOME AMERICANS CLAIM that their neighbors are drowning in debt because they are heedless of the risk—and there can be no doubt that some portion of the credit crisis is the result of foolishness and profligacy. But that is not the whole story. Lenders have deliberately built tricks and traps into some credit products so they can ensnare families in a cycle of high-cost debt.

Creating safer marketplaces is about making certain that the products themselves don't become the source of trouble. This means that terms hidden in the fine print or obscured with incomprehensible language, reservation of all power to the seller with nothing left for the buyer, and similar tricks have no place in a well-functioning market.

How did financial products get so dangerous? Part of the problem is that disclosure has become a way to obfuscate rather than to inform. In the early 1980s, the typical credit-card contract was a page long; by the early 2000s, that contract had grown to more than 30 pages of incomprehensible text. The additional language was designed in large part to add unexpected—and unreadable—language that favors the card companies. Mortgage-loan documents, payday-loan papers, car-loan terms, and other lending products are often equally incomprehensible. And this is not the subjective claim of consumer advocates. In a recent memo aimed at bank executives, the vice president of the consulting firm Booz Allen Hamilton observed that most bank products are “too complex for the average consumer to understand.”

Creditors sometimes explain away their long contracts with the claim that they need to protect themselves from litigation. This ignores the fact that creditors have found many other effective ways to insulate themselves from liability. Arbitration clauses, for example, may look benign to the customer, but their point is often to permit the lender to escape the reach of class-action lawsuits. This means the lender can break the law, but if the amounts at stake are small, few customers would ever bother to sue.

Legal protection is only a small part of the proliferating verbiage. For those willing to wade through terms like “LIBOR” and “Cash Equivalent Transactions,” lenders have built in enough surprises in some credit contracts that even successful efforts to understand and assess risk will still be erased. For example, after



47 lines of text explaining how interest rates will be calculated, one prominent credit-card company concludes, “We reserve the right to change the terms at any time for any reason.” Evidently, all that convoluted language was there only to obscure the bottom line: The company will charge whatever it wants. In effect, lenders won’t be bound by any term or price that becomes inconvenient for them, but they will expect their customers to be bound by whatever terms the lenders want to enforce—and to have the courts back them up.

Even worse, consumers wary of creditor tricks may look for help, only to rush headlong into the waiting arms of someone else who will fleece them—and then hand them over to the creditors for further fleecing. For example, consumers may respond to advertisements for “a friend to help you find the best possible mortgage,” “someone on your side,” and “access to thousands of mortgages with a single phone call—do all your comparison shopping here.” When they call a mortgage broker, they may believe he or she will provide wise advice to guide them through a dangerous thicket—and some brokers do just that. But consumers are just as likely to encounter brokers who are working only for themselves, taking what amounts to a bribe from a mortgage company to steer a family into a high-cost teaser-rate mortgage, for example, rather than a 6.5 percent fixed-rate, 30-year mortgage—because the broker can pocket a fee (a “yield service premium,” or YSP) from the company to place the higher-priced loan. High YSPs helped drive the wild selling that led to the meltdown in the subprime mortgage market.

Despite the characterization of YSPs by one Fannie Mae Foundation vice president as “lender kickbacks,” Congress and the regulatory agencies have generally approved of these fees under pressure from the mortgage-broker industry. In fact, mortgage brokers face few regulatory restrictions—a critical problem given that they originate more than half of all mortgage loans, particularly at the low end of the credit market. (YSPs are present in 85 percent to 90 percent of subprime mortgages, implying that brokers needlessly push clients into more expensive products.) The costs are staggering: Fannie Mae estimates that fully 50 percent of

those who were sold ruinous subprime mortgages would have qualified for prime-rate loans. A study by the Department of Housing and Urban Development revealed that one in nine middle-income families (and one in 14 upper-income families) who refinanced a mortgage ended up with a high-fee, high-interest, subprime loan. Of course, YSPs are not confined to subprime mortgages. Pushing a family that qualifies for a 6.5 percent loan into a higher-cost loan and pocketing the difference will cost the family tens of thousands of dollars—but it will not show up in anyone’s statistics on subprime lending.

Other creditors have their own techniques for fleecing borrowers. Payday lenders offer consumers a friendly hand when they are short of cash. But buried back in a page of dis-

closures for one lender (rather than on the fee page, where the customer might expect to see it) was the note that the interest rate on the loan was 485.450 percent. In transactions recently documented by the Center on Responsible Lending, a \$300 loan cost one family \$2,700, while another borrowed \$400, paid back \$3,000, and was being hounded by the payday lender for \$1,200 per month when they gave up and filed for bankruptcy. In total, the cost to American families of payday lending is estimated to be \$4.2 billion a year. The Department of Defense identified payday lending as such a serious problem for those in military service that it noted that the industry “impaired military readiness.” Congress has now banned all companies from charging military people more than 36 percent interest, while leaving all other families subject to the same predatory practices.

For some, Shakespeare’s injunction “Neither a borrower nor a lender be” seems to be good policy. But no one advocates that people who don’t want their homes burned down should stay away from toasters, or that those who don’t want their fingers and toes cut off should give up mowing the lawn. To say that credit markets should follow a *caveat emptor* model is to ignore the success of the consumer-goods market—and the pain inflicted by dangerous credit products.

Indeed, the pain imposed by a dangerous credit product is even more insidious than that inflicted by a malfunctioning kitchen appliance. Wealthy families can ignore the traps associated with credit-card debt: their savings will protect them from medical expenses that exceed their insurance coverage or the effects of an unexpected car repair. Working- and middle-class families are far less insulated. For those closer to the economic margin, a credit card with an interest rate that unexpectedly escalates to 29.99 percent or misplaced trust in a broker who recommends a high-priced mortgage can trigger a downward economic spiral from which a family may never recover.

INSUFFICIENT REMEDIES

CREDIT TRANSACTIONS have in fact been regulated by statute or common law since the founding of the Republic. Traditionally

states bore the primary responsibility for protecting their citizens from unscrupulous lenders, imposing usury caps and other credit regulations on all companies doing business locally. Although states still play some role, particularly in the regulation of real-estate transactions, their primary tool—interest-rate regulation—has been effectively destroyed by federal legislation. Today, any lender that gets a federal bank charter can locate its operations in a state with high usury rates (e.g., South Dakota or Delaware) and then export that state's interest-rate caps (or no caps at all) to customers located all over the country. As a result, and with no public debate, interest rates have been effectively deregulated across the country. In April 2007, the Supreme Court took another step in the same direction in *Watters v. Wachovia*, giv-

Today, experts estimate that fraud and deception stripped \$9.1 billion in equity from homeowners even before the subprime crisis got into full swing.

ing federal regulators the power to shut down state efforts to regulate mortgage lenders—without providing effective federal regulation in turn.

Local laws suffer from another problem. As lenders have consolidated and credit markets have become national, a plethora of state regulations drives up costs for lenders, forcing them to include repetitive disclosures and meaningless exceptions even as it also leaves regulatory gaps. During the 1970s and early 1980s, for example, Congress moved the regulation of some aspects of consumer credit from the state to the federal level through a series of landmark bills that included Truth-in-Lending (TIL), Fair Credit Reporting, and anti-discrimination regulations. These statutes tend to be highly specific: TIL specifies the information that must be revealed in a credit transaction, including the size of the typeface that must be used and how interest rates must be stated. But the specificity of these laws works against their effectiveness, inhibiting some beneficial innovations (e.g., new ways of informing consumers) while failing to regulate dangerous innovations (e.g., no discussion of negative amortization). What's more, these generation-old regulations completely miss most of the new features of credit products such as universal default (increasing interest rates even when customers are meeting all the terms of their credit agreements) and double-cycle billing (charging interest on money that was repaid).

Any effort to increase or reform regulation of financial products is met by a powerful industry lobby that is not balanced by an equally effective consumer lobby, so even

the most basic efforts are blocked from becoming law. A decade ago, for example, mortgage-lender abuses were rare. Today, experts estimate that fraud and deception stripped \$9.1 billion in equity from homeowners, particularly from elderly and working-class families, even before the subprime crisis got into full swing. A few hardy souls have repeatedly introduced legislation to halt such practices, but those bills never make it out of committee. Even after a change in control of Congress in 2006, efforts to rein in lenders have made little headway.

Beyond Congress, some regulation of financial products occurs indirectly through the Federal Reserve Board, the Office of the Comptroller of the Currency, and the Office of Thrift Supervision—each of which has some power to control certain forms of predatory lending. But their main mission is to protect the stability of banks and other financial institutions, not to protect consumers. As a result, they focus intently on bank profitability, and far less on the financial impact on customers of many of the products the banks sell.

The regulatory jumble creates another problem: consumer financial products are regulated based principally on the *identity of the issuer*, not on the *nature of the product*. The subprime-mortgage market provides a stunning example of the resulting fractured oversight. In 2006, for example, 23 percent of such mortgages were issued by regulated thrifts and banks, and another 25 percent by bank holding companies (subject to different federal oversight)—but 52 percent originated with companies with no federal supervision at all, primarily stand-alone mortgage brokers and finance companies. This division also triggers a kind of regulatory arbitrage. Regulators are acutely aware that if they push financial institutions too hard, those firms will simply reincorporate in another form under the umbrella of a different regulatory agency—or none at all. Indeed, in recent years a number of credit unions have dissolved and reincorporated as state or national banks, precisely to fit under a regulatory

(please turn to page 94)





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VITA

George Bancroft

Brief life of a public historian: 1800-1891

by YONATAN EYAL

IN MID-NINETEENTH-CENTURY America, George Bancroft's was a household name in polite, middle-class society. Generations of families purchased his multivolume *History of the United States* to understand the origins and trajectory of their young republic. With his flair for grand, triumphalist storytelling, Bancroft, A.B. 1817, A.M. 1818, aided his fellow citizens' nation-building by providing a comforting, usable narrative. Yet his own estrangement from Boston and his alma mater gave him as well a lifelong outsider's perspective on both past and contemporary politics.

The farmer's son from Worcester, Massachusetts, joined the regional elite by graduating from Phillips Exeter Academy and entering Harvard College at 13. There he came under the influence of President John Thornton Kirkland, who encouraged him to continue his studies abroad. At Kirkland's behest, he sailed for Germany in 1818 to obtain a doctorate in philology.

The university at Göttingen opened his eyes to a world of research scholarship then rarely seen in Anglophone institutions, especially in America, and once back in Boston, in 1822, he felt his novel degree entitled him to privileged treatment. During a two-week visit to Cambridge, he lectured both Kirkland and senior professors on German-style college reform and his right to a faculty position. His insulted mentors, virtually none of whom held doctorates themselves, offered him only a temporary lectureship.

He soon resigned—Harvard was “a sick and wearisome place”—and co-founded a progressive primary school in Northampton. In 1827, his marriage to the wealthy Sarah Dwight enabled him to pursue an independent intellectual life, and in 1834 he released the first volume of his monumental *History*. Financial freedom also left time for political involvement. Though courted by both Democrats and Whigs, Bancroft eventually allied himself with the former, writing in his *History* that “our government...is necessarily identified with the interests of the people.” Like most Democrats, he hailed “the masses of mankind themselves awakening to the knowledge and the care of their own interests.” Early campaign failures did little to dampen his enthusiasm for politics or his scholarly belief in popular sovereignty as the fount of American uniqueness in the world. Neither did the opprobrium of his native Whig-dominated New England, which considered his Democratic political loyalties a wounding betrayal.

Bancroft entered national politics in 1844, canvassing vigorously for Democratic presidential candidate James K. Polk. In aligning himself with the “young Democracy” theme of that campaign, he also entered the “Young America” circle, a cluster of expansionist Democrats who wished to “liberate” North America and republicanize Old Europe. Later, as Polk's new secretary of the navy, he

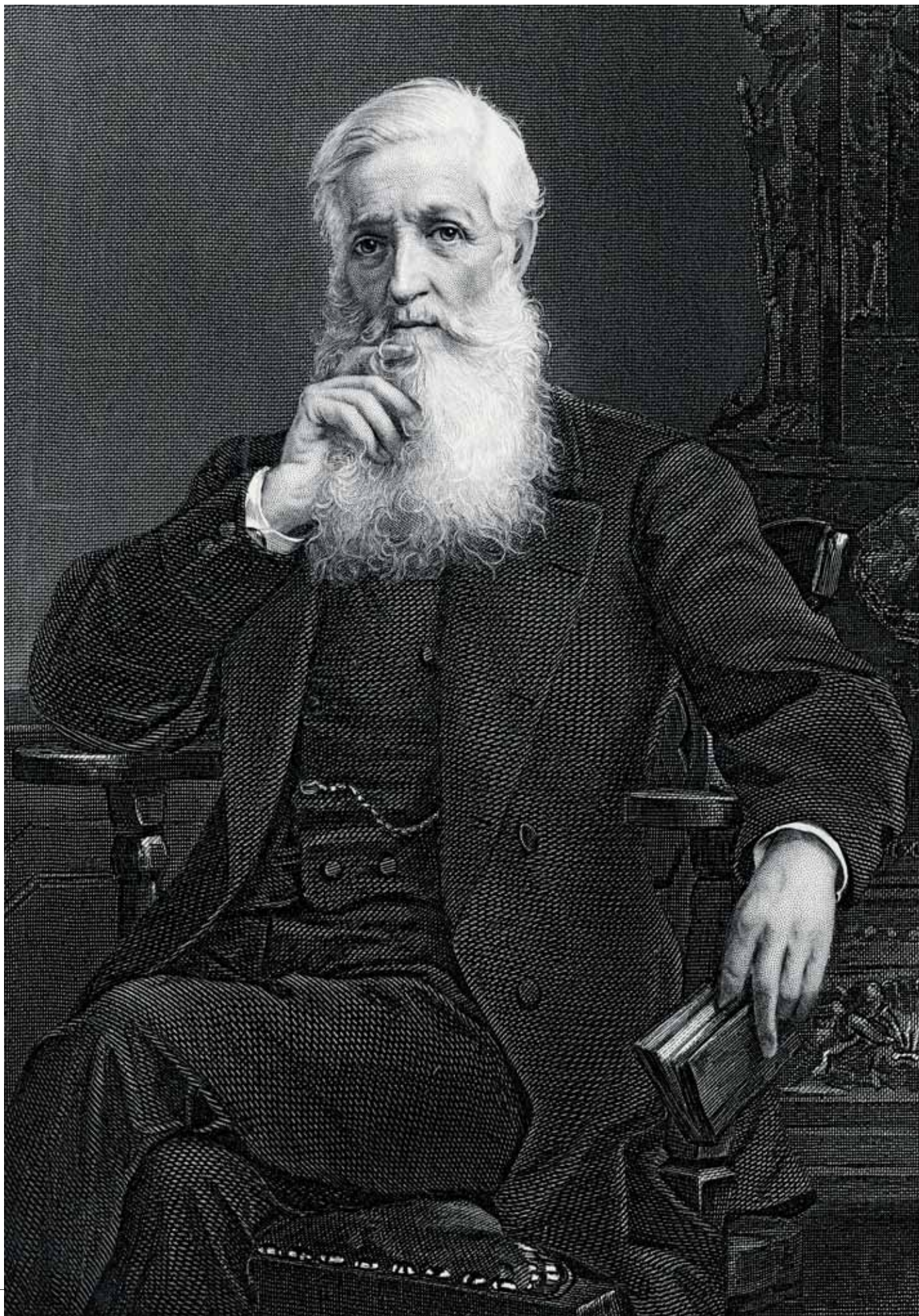
ordered American forces ashore to capture California during the Mexican War, thus “taking possession of the wilderness.” Although “we have got into a little war,” he euphemized, western soil naturally belonged to the United States. (He also established what became the U.S. naval academy, to make sailors “as distinguished for culture as they have been for gallant conduct.”)

Meanwhile, liberal unrest in Europe vied for his attention along with domestic affairs. As he wrote several years later, “Has the echo of American Democracy which you now hear from France, & Austria & Prussia & all Old Germany, no power to stir up the hearts of the American people to new achievements?” He gladly accepted Polk's offer of the ambassadorship to England and, during his three years in London, secured mutual free-trade agreements, collected documents for future volumes of his *History*, and cheered attempts to dethrone Continental monarchies in favor of republican forms of government. In 1847 he visited Paris and met “citizen king” Louis Philippe, who shrugged off signs of an impending revolution; after the 1848 uprising, Bancroft reported, “If France succeeds, there will not be a crown left in Europe in twenty years, except in Russia.” People were not meant to be “the slaves of a dynasty,” and the United States held the moral obligation to democratize the world by both deed and example. “Let the young aspirant after glory scatter the seeds of truth,” he urged.

When the Whig administration of Zachary Taylor turned him out of office in 1849, Bancroft settled in New York and Washington and focused primarily on historical research and writing. Out of power, he watched with horror as his subject, the United States, disintegrated. His argument that God had uniquely guided America away from turmoil and toward increasing glory suffered a major setback with the onset of the Civil War, and he hoped that “our little domestic strife is no more than a momentary disturbance.” Though he supported Lincoln's energetic prosecution of a war for the Union (and later against slavery), he grew disillusioned with northern factionalism and southern intransigence alike.

Stubbornly, his optimism survived both the crisis of the Union and the corruptions of the Gilded Age. Since affliction stood as the “instrument of Divine providence,” strengthening the nation by testing it, America's growing pains served merely as preludes to the success he still believed forthcoming. One need only “follow the steps by which a favoring Providence...has conducted the country to its present happiness and glory.”

Yonatan Eyal, Ph.D. '05, is the author of *The Young America Movement and the Transformation of the Democratic Party, 1828-1861* (Cambridge University Press, 2007), in which Bancroft figures.



Shedding Light on Life

Advances in optical microscopy reveal biological processes as they unfold.

by Courtney Humphries

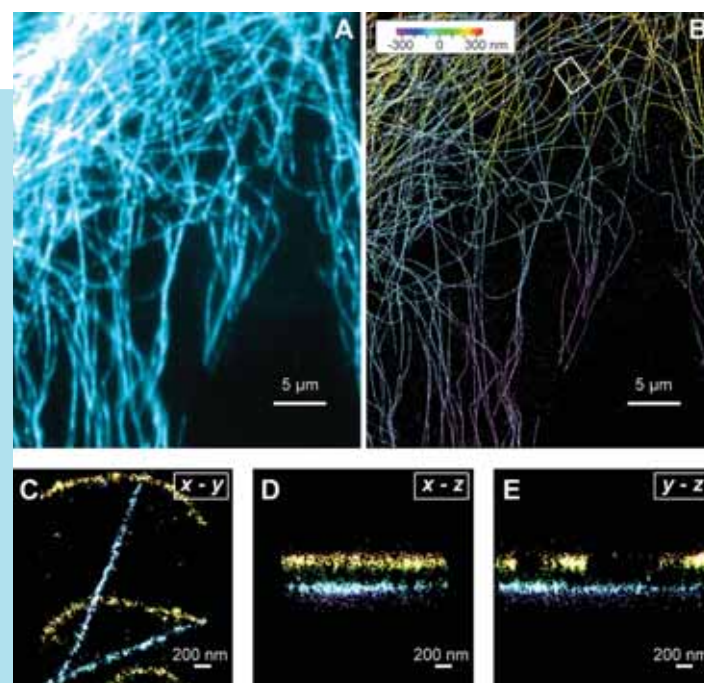
THE SCENES ARE FAMILIAR from biology textbooks. A long string of DNA is copied to form a matching strand. A virus infects a cell by stealing through its membrane. Two white blood cells meet and confer before launching an immune attack.

In textbooks, all these processes that are so fundamental to the lives of cells are typically depicted in drawings or static snapshots captured by powerful electron microscopes. But that's changing. A growing revolution in imaging is making it possible for biologists to watch small-scale events as they unfold in living cells and tissues.

"The human brain is vision-focused," says professor of molecular and cellular biology Jeff Lichtman. "If we see things, then we think we know what they mean." To be able finally to see events that were known only in theory is incredibly satisfying for scientists. Even more important, this revolution also opens up the possibility of learning things about life that could never be studied before.

Ironically, the technology enabling much of this change is the same one that launched the study of modern biology centuries ago: the light or optical microscope. A congruence of factors has shuttled these instruments back into the forefront of biology in recent years, after almost a half-century during which they were overshadowed by more powerful techniques such as electron microscopy and x-ray crystallography, which are able to create images on the level of single molecules.

New technologies—more sophisticated imaging techniques, fluorescent molecules that act as beacons of light in the cell, and the computing power to gather and stitch together multiple images and create videos from high-powered microscopes—make it possible to harness one of light's key advantages: gentleness. Unlike higher-resolution techniques, light microscopes can image biological structures without killing them or chemically fixing them. At Harvard, the resurgence of light microscopy is making it



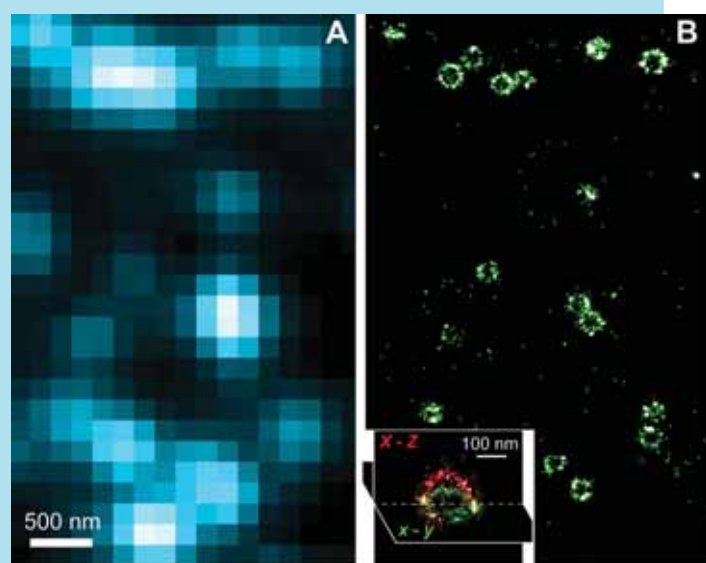
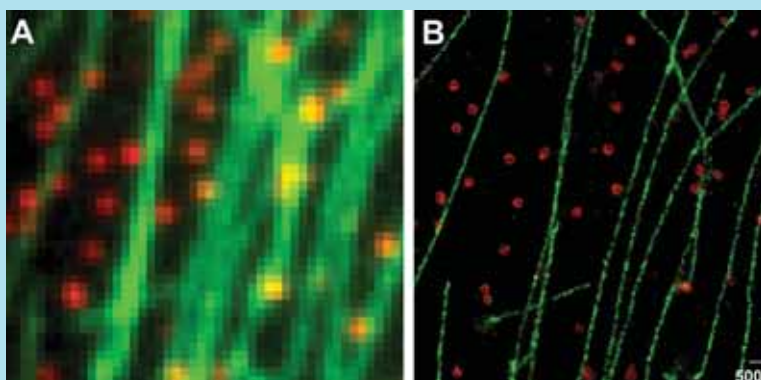
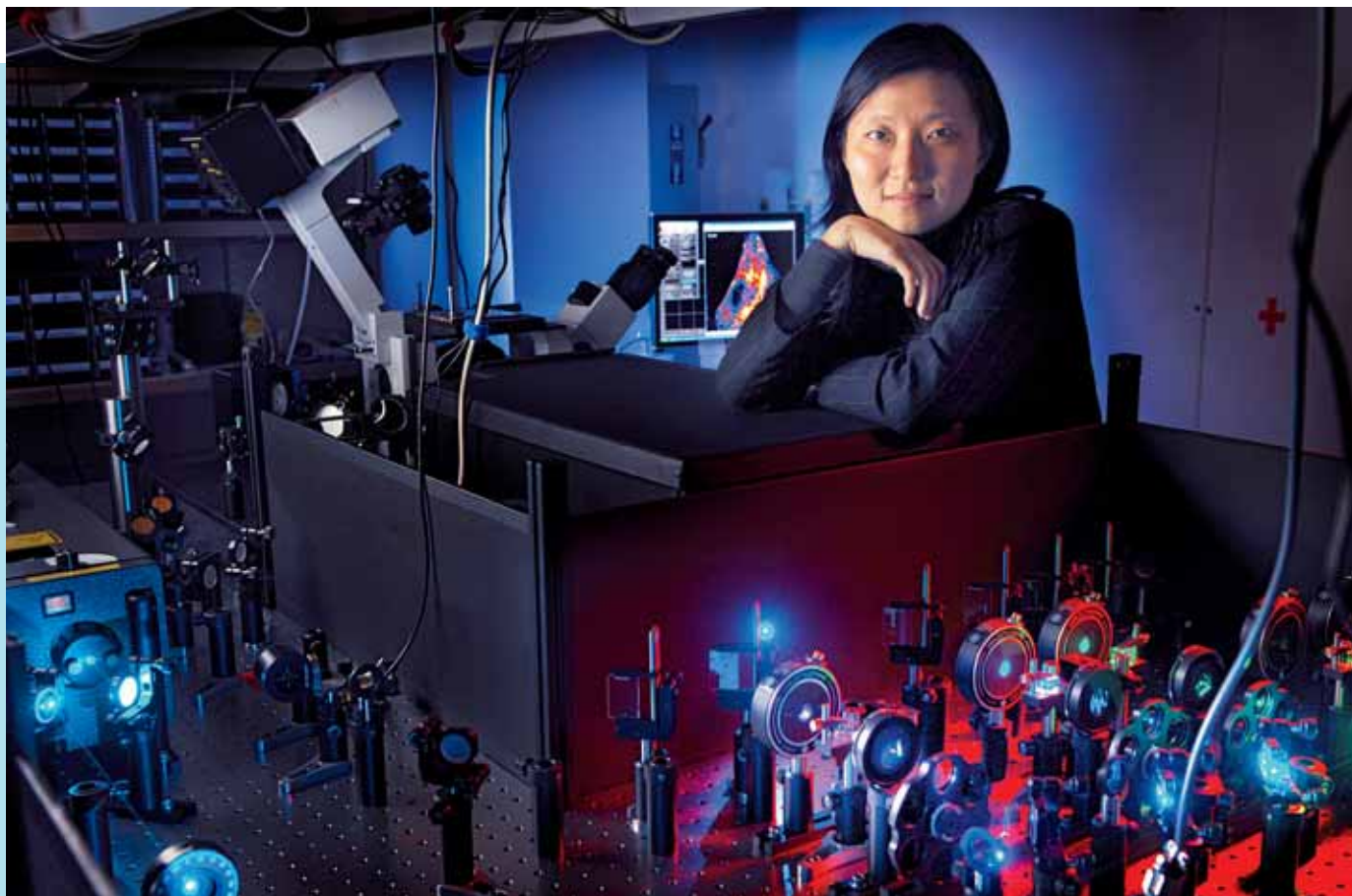
possible to see structures and events that have never before been seen in the context of living cells and organisms. New discoveries are emerging at many scales of life, from the activation of a single gene in DNA to the development of disease in an organ.

PUSHING MICROSCOPES FURTHER

AT THE MOLECULAR SCALE, Xiaowei Zhuang, professor of chemistry and chemical biology and of physics, is pushing the boundaries of what light microscopes can capture. A typical light microscope can easily image a single cell and some internal structures, but most other objects—viruses, clusters of proteins, DNA—cannot be seen in great detail. That's because these smaller details lie within light's diffraction limit—the point at which light waves begin to interfere with one another, blurring the image. The question of how individual molecules in cells interact is fundamental in biology, but for the most part these interactions lie beyond the reach of light microscopes. Zhuang's lab has been working on a new "super-resolution" optical imaging method that uses clever tricks to image objects a tenth the size possible using normal light microscopy.

Like many new optical imaging techniques, Zhuang's takes advantage of small fluorescent molecules called fluorophores to create an image. Scientists can determine the location of a single fluorophore under a microscope with great precision, even though it is much tinier than a microscope's resolution. Light emitted from the molecule will produce a blurry image, but the center of this blur indicates where the actual molecule resides.

The problem, Zhuang says, is that in most biological contexts a scientist would not be imaging a lone fluorophore but many at once, and if these tiny lights are too close together, resolving them is impossible. Her solution is a technique called STORM (stochastic reconstruction optical microscopy), first reported in 2006, which involves switching on only a small number of fluorophores

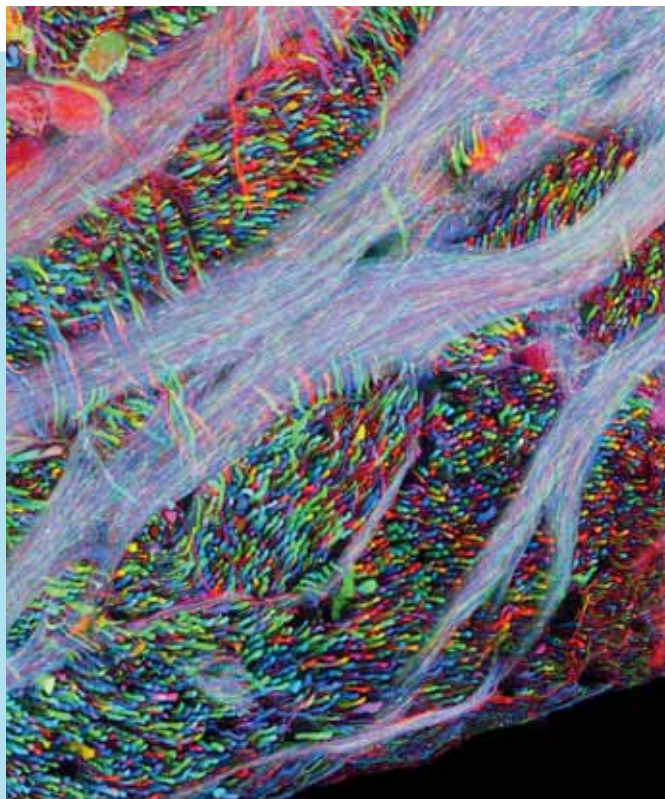


Xiaowei Zhuang with a STORM microscope setup she and her team recently built. On this page and opposite, conventional immunofluorescence images (labeled A) are paired with three-dimensional STORM images (labeled B) of different intracellular structures. Opposite page: A pairing of microtubules, with details (C,D, and E) showing three different cross-sections of the boxed area in image B. Above: Microtubules (green) and clathrin-coated pits (red). The pits are indentations in a cell's surface that mediate certain extracellular interactions. Right: Clathrin-coated pits are much clearer using the STORM technique (B). And by combining two STORM cross-sections, a single pit (B inset), can be seen in three dimensions, revealing its half-spherical, cage-like structure.

at a time, then iterating the process until the position of each spot has been separately determined. Last August, her team was able to use the technique to produce multi-colored images, making it possible to view several different types of molecules in the cell and watch how they interact. More recently, her team was able to use STORM to produce three-dimensional images—essential for knowing the exact location of a molecule. “We don’t live in a two-dimensional world,” she says. “If we want to see how molecules interact unambiguously, we have to have the third dimension.”

So far, Zhuang’s team has imaged static structures such as a

piece of DNA or part of the cell’s inner skeleton; she says it will take some work to make STORM broadly applicable for imaging more dynamic events. “The method doesn’t just give you high resolution for free—what is sacrificed is speed,” she explains. STORM uses the dimension of time to isolate different parts of an image and then stitch them together. Currently the technique takes tens of seconds to capture a high-resolution image, whereas many cellular processes occur within seconds or fractions of seconds. But Zhuang’s technique, despite its limitations, has generated excitement, and she has been overwhelmed with requests

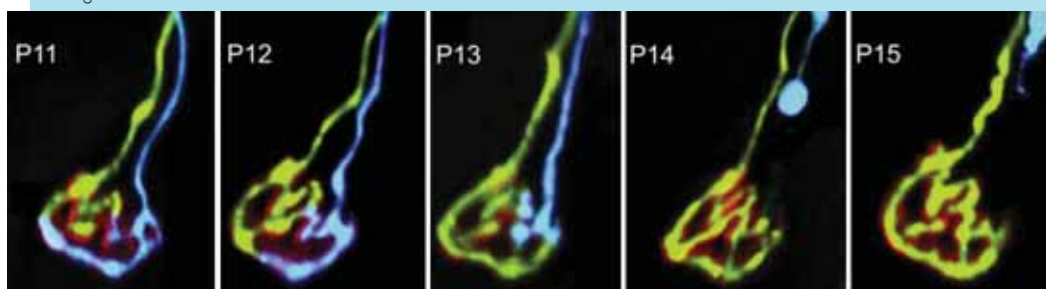


for collaborations. For instance, in collaboration with Catherine Dulac's lab (in the department of molecular and cellular biology), her team is beginning a project to look at chemical communication that takes place in the synapses between nerve cells. "The synapse itself is just about the size of a diffraction-limited spot," Zhuang says. A closer look "really calls for higher resolution."

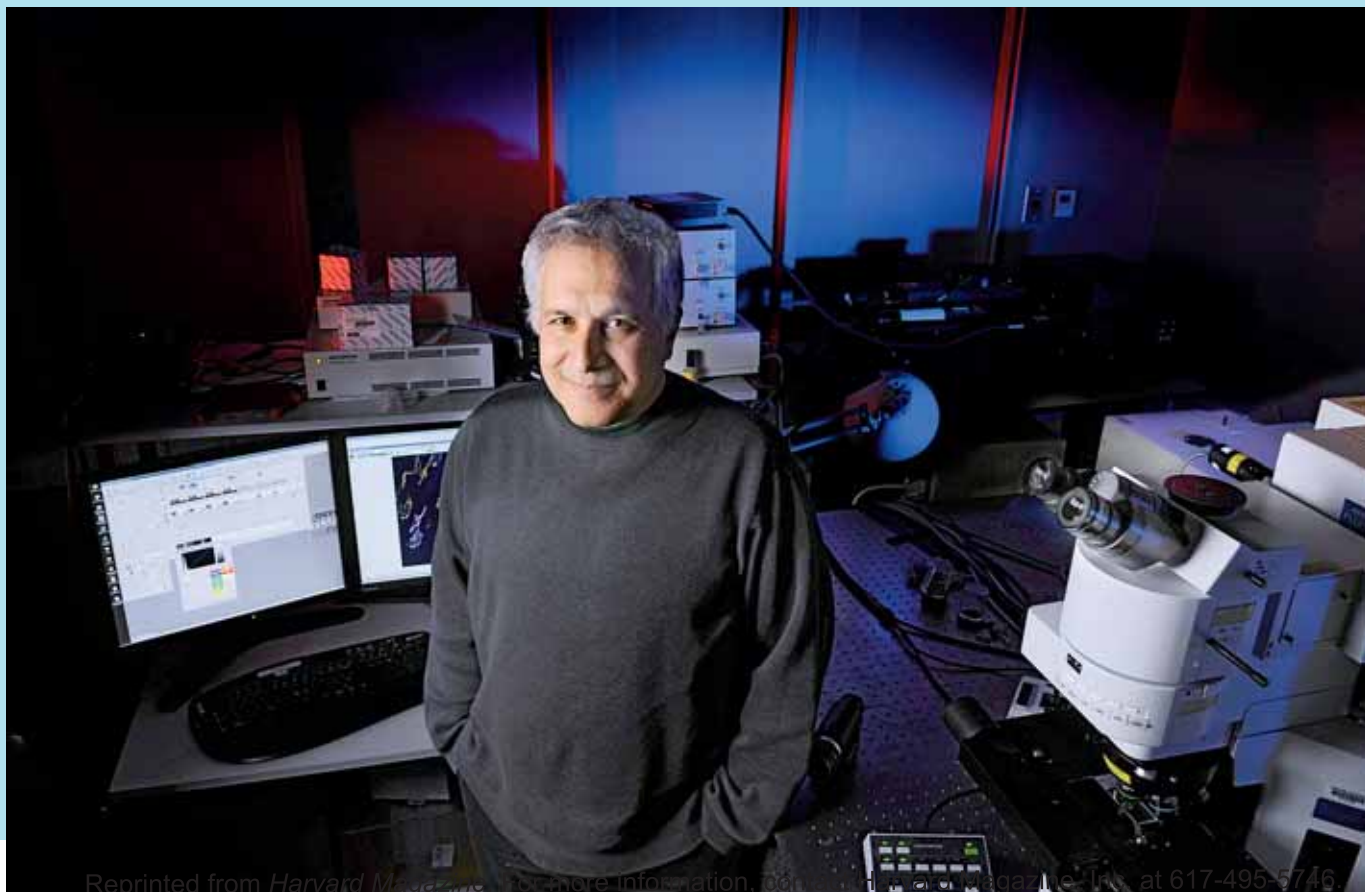
ONE MOLECULE AT A TIME

ZHUANG TACKLES the resolution problem by switching on fluorophores one at a time, but professor of chemistry and chemical biology X. Sunney Xie focuses on molecules that are naturally isolated from others of their kind. He says that many questions in biology can be answered only on the level of single molecules. An example is the process of gene expression—how the DNA template of a gene is turned into messenger RNA and then into proteins. A given cell may contain only one or two copies of a given gene, and only a few copies of the messenger RNAs created from each gene. Because imaging is the best way to study singular events, it serves as the cornerstone of a growing field of "single-molecule" studies, which investigate how individual molecules and groups of molecules behave and interact.

The unique features of DNA molecules are ideal for a strategy



Above: Color-coded neural circuits in the brains of mice allow Jeff Lichtman (below, in his lab) to trace the fate of individual nerve cells over time and across distances. **Left:** Neurons compete for territory and connections. In this five-day sequence, begun on an 11-day-old mouse, yellow and blue axons compete for a red target area. Over several days, the yellow axons take over the blue axons' territory, and the latter retract.



that Xie developed called “detection by localization.” If a fluorescent molecule appears only in one place, it can easily be detected over the strong background of fluorescence that cells naturally emit, especially if the molecule is attached to a relatively stationary structure such as DNA or the cell’s outer membrane. Because different pieces of DNA have unique sequences, Xie’s group creates fluorescent molecules that appear only at a single spot on the genome. Isolated, these fluorophores can be located more precisely.

Previous single-molecule experiments relied on molecules taken out of cells, but Xie’s group has been imaging events related to gene expression in live bacterial cells. For instance, his group has been able to visualize the behavior of a type of protein called a repressor, which regulates gene expression. The transcription factor itself is kept inactive by a protein called a repressor. By labeling a repressor with fluorescence, the team could observe it binding to a unique target among vast stretches of DNA. But when they added a chemical signal that prevents such proteins from binding to DNA, they quickly dispersed into the cell. When the signal was removed, the repressor found its target again in about a minute through a process of trial and error. After proving they could use these tools to study singular events in the cell, Xie’s group is applying the technique to investigate other steps in gene expression, as well as DNA replication and the repair of mutations in the genetic code.

MOLECULES IN MOTION

HIGH-RESOLUTION MICROSCOPES are enabling scientists who have long studied cellular processes to put static pictures of cellular structures into motion. Tomas Kirchhausen, professor of cell biology at Harvard Medical School (HMS), has for decades studied how things get in and out of cells, from viruses and bacteria to small molecules and hormones. This cargo, whether intruders or simply chemical signals from surrounding cells, is captured and taken into the cell by capsules called vesicles.

Kirchhausen’s lab has performed a great deal of work to understand the precise structure and function of clathrin, a protein that helps deform the cell membrane as it forms the outer coat of vesicles. Other imaging methods yielded detailed pictures of clathrin and the lattice-like coats it forms, but these were only snapshots, he says, whereas “light microscopy allows you to figure out how things are happening.” In the past few years, his team has begun to capture movies of vesicles as they form at the cell membrane and capture incoming cargo, then break off from the membrane and dance into the cell interior.

When they first began collecting images, Kirchhausen and his colleagues could capture only one frame every few seconds; now

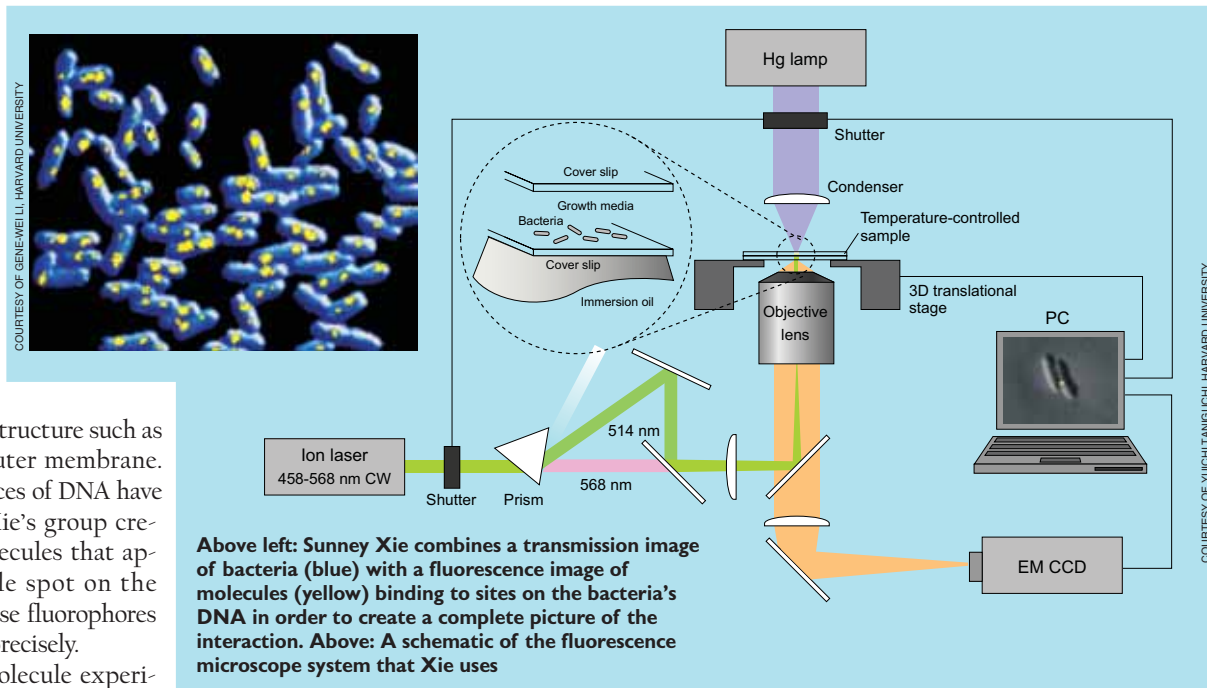
they can collect images in milliseconds, creating real-time movies. Although vesicles are smaller than the resolution of the microscopes he uses, Kirchhausen says it’s enough to be able to detect the presence of each one when it is lit up with fluorescent molecules: “We cannot see the actual shape of the object, but we can see its properties—where it is, where it goes, when it forms, and when it disappears.” By pairing the dynamic nature of light microscopy with the detail of higher-resolution methods, his team can now answer questions that confounded them in the past, such as how different chemicals or genetic alterations affect vesicle traffic. The movement of cellular cargo is fundamental for a cell’s survival and communication, but it also underlies viral infections, cancer, and neurological diseases.

CELLS IN CONTEXT

ZOOMING OUT to the scale of cells, new imaging techniques are helping scientists see how these building blocks behave in their natural context—within tissues in the living body. This is particularly important in the brain, where billions of neurons gather together in an intricately connected web. It is impossible to know how the brain works by studying neurons in a culture dish; their relationship to neighboring cells in the brain dictates their function.

Jeff Lichtman’s laboratory has developed techniques for observing the web of connections in the living brain and watching how they change over time. Lichtman studies how connections among neurons form in early life. In humans and other mammals, neurons send out many branches to other cells early in the nervous system’s development, but then, Lichtman says, “a lot of the connections that were made are pruned away.” He likens the process to a massive competition for territory and connections among individual nerve cells. “When you have this pruning going on,” he says, “many branches from different nerve cells connect to the same target, and then they compete with each other.”

If every nerve cell emits the same color of fluorescence, he notes, “you’re kind of lost. You can’t trace them all back.” In partnership with the lab of professor of molecular and cellular biology



Joshua Sanes, Lichtman's team was able to engineer mice with neurons that glow with an array of different fluorescent colors. A genetic technique randomly shuffles different combinations of fluorescent proteins in red, green, and blue to give each cell a unique hue. The approach is akin to color-coding electrical wires, so each one is identifiable in a tangle. With these "Brainbow" mice, Lichtman and his team can trace the fate of a single nerve cell over time and across distances. Lichtman's goal is to use these mice along with higher-resolution electron microscopy to trace the development of entire networks of neurons, beginning with the relatively simple peripheral nerves that project to muscles in the neck.

How do networks of interconnected neurons work once they're in place? In the past, neuroscientists studied the activity of neurons in the brain by measuring their electrical activity. R. Clay Reid, professor of neurobiology at HMS, who studies the brain's visual system, said that until five years ago, imaging was not even a major part of his work. "We used to put tiny wires into living brains to eavesdrop on one or two or maybe 10 living cells," he says. When cells were active, they "fired" an electrical signal that could be measured.

It was through this sort of painstaking measurement that neuroscientists mapped out the function of different areas of the

Light Makes a Comeback

TODAY'S HIGH-POWERED LIGHT MICROSCOPES bear little resemblance to the iconic instruments of high-school biology labs. This revolution began in the 1950s with the development of confocal microscopes. Rather than flooding an object with light and viewing its surface, confocal microscopes use a highly focused laser beam to quickly scan an object in one plane. By collecting information only from a single "slice" of a sample at a time, confocal microscopes reduce the effect of surrounding visual noise. Scientists can gather many of these slices at different depths to give a three-dimensional picture.

Equally important to the new wave of microscopy are the fluorophores that tag molecules and cells with different colors. A green fluorescent protein (GFP) was first introduced in labs in the early 1990s. Since then, fluorescence imaging has become a ubiquitous technology in biology, and species from fish to pigs are genetically engineered with cells and proteins that glow green. In addition to genetically engineering fluorescence into animals, scientists can attach fluorescent molecules to "probes" that stick to a protein of interest. Ralph Weissleder says that scientists are constantly uncovering new probes that emit light in a rainbow of colors. Many come from newly-discovered species in the ocean, while others are synthesized in the lab.

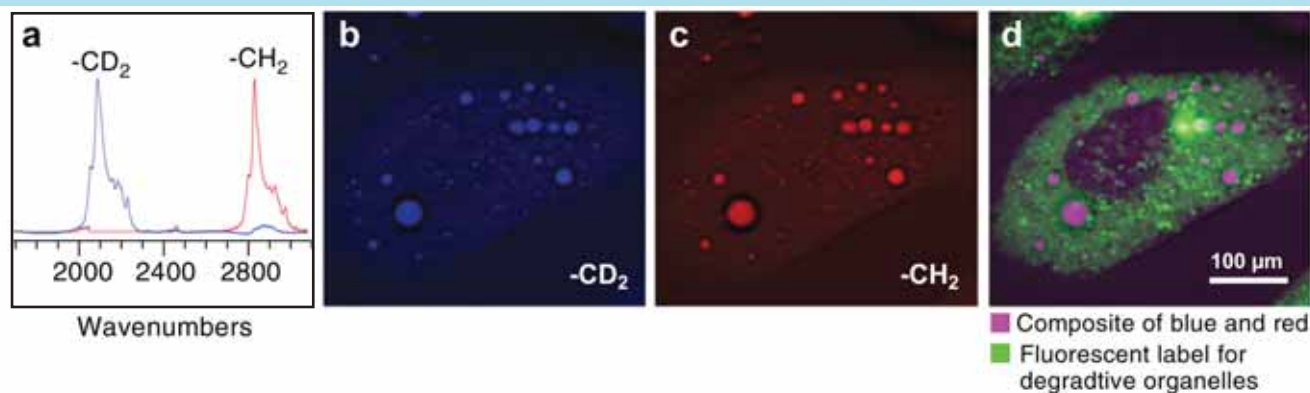
Sunney Xie and his team use CARS microscopy to show how omega-3 fatty acids in liver cells help break down fat. In A, fat labeled with deuterium (blue) is shown to vibrate at a lower frequency than an omega-3 fatty acid (red). This allows the Xie group to create distinct images of the two kinds of fat in images B (deuterated fat) and C (omega-3 fatty acid). The final, composite image (D) shows that the blue and red fats are "digested" together (purple) within organelles (labeled in fluorescent green) that break down fat.

Most fluorescent molecules require blue light to excite them, but blue light is easily scattered by tissue and can damage cells. Multiphoton microscopes get around the problem with a trick: when two photons from lower-energy light hit the same fluorophore nearly simultaneously, they cause it to fluoresce as it would in response to a single beam of light that had double the energy. These microscopes therefore use red or near infrared light in brief, intense pulses focused on a small point at a time. The light is not as damaging to tissues and can travel deeper—about 500 hundred microns deep, which is just the width of five human hairs but represents dozens of layers of cells into a tissue.

The third factor that has made dynamic, live imaging possible is computing power. The colorful images produced by these techniques result from collecting and interpreting large amounts of data, which was not possible until recently.

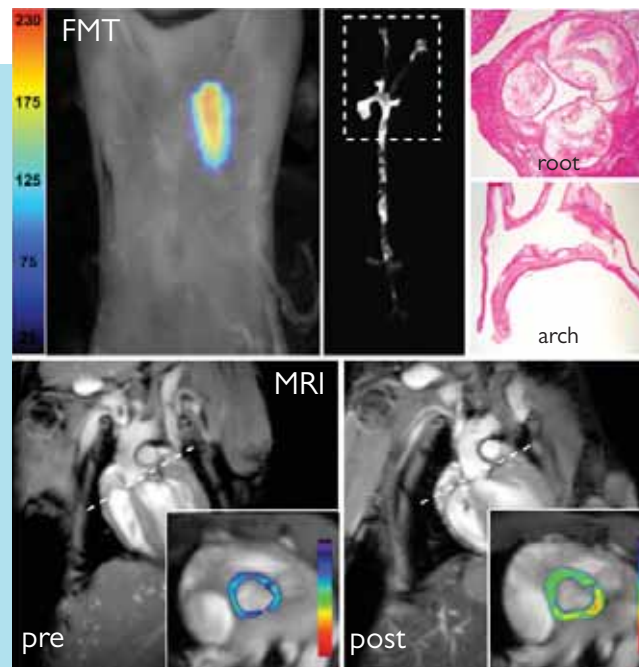
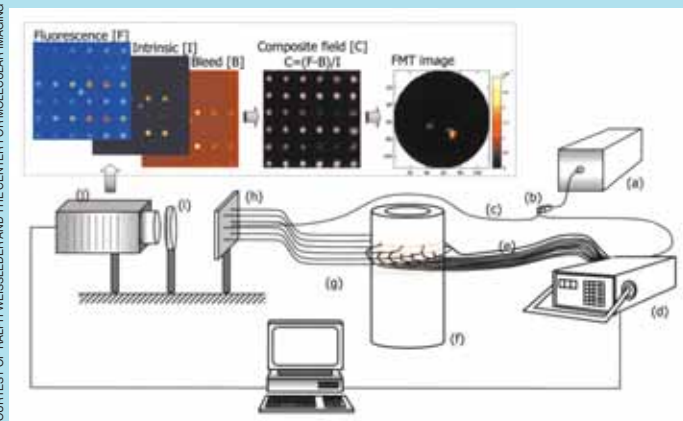
Scientists are also working on new imaging techniques that do not rely on fluorescence, since the use of fluorescent molecules in humans raises logistical and safety concerns (no human will ever be genetically engineered to fluoresce, and fluorescent probes are making their way into the clinic but may not be practical for many applications). Sunney Xie's group, for example, has developed a technique called CARS (coherent anti-Stokes Raman scattering) microscopy that can image specific molecules in living cells and organisms based on their ability to vibrate at unique frequencies. CARS has so far been useful for visualizing the distribution of drugs

in tissues and fats in cells—a recent study, for instance, showed in vibrant color how the presence of omega-3 fatty acids in liver cells helps them to break down fats. Ideally, different imaging technologies can be used in parallel to gather many kinds of information at once.



COURTESY OF WEI YANG, HARVARD UNIVERSITY

Right: In order to make images of nanoparticles that cause inflammatory atherosclerosis, Ralph Weissleder uses both FMT and MRI (upper grouping). A fluorescent imaging molecule turned on by enzymatic activity enables FMT imaging of inflamed carotid artery plaques (lower grouping). Below: A schematic of the FMT imager

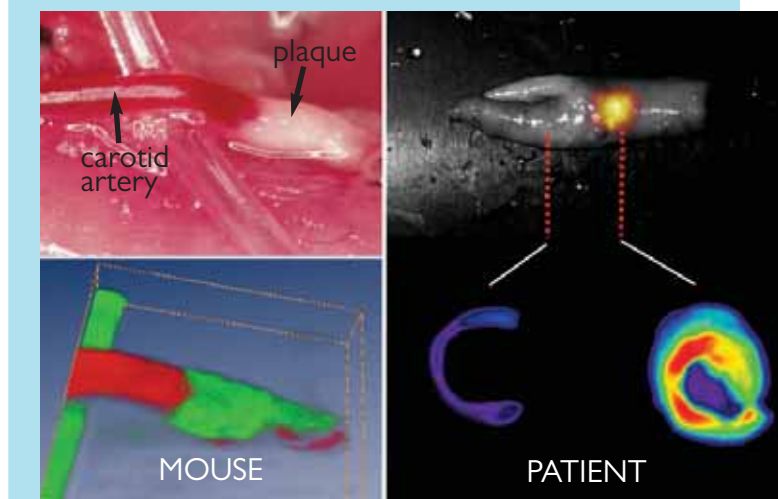


brain's cortex. Reid explains that in the 1980s, for instance, Margaret Livingstone, a professor of neurobiology at HMS, worked with Nobel laureate David Hubel, now Enders professor of neurobiology emeritus, to discover that certain regions in the visual cortex are important for color vision. But during the past few years, light microscopy techniques have made it possible to monitor the activity of the individual brain cells within an entire region of the brain simultaneously. "Now we can actually see all of the cells," Reid says. "It's really exciting."

The key is calcium: when a neuron "fires," calcium molecules rush into the cell. Using a fluorescent reporter that lights up with this calcium influx, scientists have a visible proxy for the brain's electrical activity. Reid and the members of his laboratory can now watch the activity of thousands of cells at once, and they can also determine a single cell's function with astounding precision. Two neighboring neurons may have branches that are tangled together, and yet respond to completely different visual signals. Reid's team can isolate which cells, for instance, respond when an animal views lines oriented in one direction versus another. He believes it will be possible someday to have a detailed map of the entire circuitry of the visual system, and his group is teaming with Lichtman's lab to explore ways to chart networks in large regions of the brain.

CELLS ON THE MOVE

LIGHT MICROSCOPES are particularly useful in capturing dynamic events, and perhaps no cells are as dynamic as blood cells. Ulrich von Andrian has been tracking their behavior in the past several years, focusing in particular on the 500 billion T cells of the immune system. Von Andrian, the Mallinckrodt professor of immunopathology at HMS, specializes in "intravital" microscopy, which images events in living animals. The techniques help track how these "immune cells" migrate throughout the blood and lymph vessels of mice, and how they collect at peripheral sites in the body—whether beneficially, in response to an injury or infection, or pathologically, as in the case of autoimmune diseases. To capture very fast events such as the movements of these blood cells, team members record videos under a stroboscope, just as photographers use strobe lights to capture the tra-



jectory of a bullet. For slower events, they use high-resolution two-photon microscopes that capture several frames per minute, which are then speeded up to make a time-lapse video.

These techniques let von Andrian's team understand immune-cell behavior better: for instance, how T cells are activated in response to a foreign particle or antigen. The vast majority of T cells circulating throughout the body are inactive, or "naïve"; they rouse into action only when they meet a very specific foreign antigen presented on the surface of another immune cell. As von Andrian explains, this process was thought to be fairly static—when the T cell met the right antigen, it would bind to the antigen-presenting cell for a number of hours, and eventually become active. In fact, his group found that T cells rove from one cell to another in a fashion he compares to bees moving from flower to flower, rather than staying on the first cell they find.

A recent study offers a possible explanation. T cells, he and his colleagues found, actually seem to sense how much of a particular antigen is present. The cell is "collecting information, and it somehow remembers what it has seen in the previous hours," von Andrian explains. Activation requires "a cumulative signal from many different encounters," and not just a single match.

Such nuances would be difficult to determine without seeing

them directly. But von Andrian emphasizes that research does not end when a video is captured. “One danger of imaging is that you just sort of stand in awe in front of the pretty pictures and the beauty of it all,” he says. “It’s easy to forget about the mechanism and the ‘why’ of it all.” Von Andrian pairs imaging techniques with the classic approach of a biologist: to come up with a hypothesis and test it, often through genetic or chemical manipulations. Imaging lets scientists see how any change—a genetic defect, a drug, an infection, or a wound—affects the immune system at the level of its individual cells.

IMAGING THE BODY

FLUORESCENCE MICROSCOPY offers the opportunity not only to track specific molecules in cells, but to see how those cells behave in an entire organ or part of the body. Charles Lin, a member of the Center for Systems Biology (CSB) and the Wellman Center for Photomedicine at Massachusetts General Hospital (MGH), develops novel methods and imaging equipment to follow cells that move throughout the body. “The holy grail is if you could follow a single cell through the entire body, and its interaction with the environment,” he says.

His work, which he says was inspired by von Andrian’s intravital techniques, includes studying aspects of the immune system, cancer, and stem cells, and how they intersect. Why, for instance, do tumor cells begin to metastasize and migrate throughout the body? “If you figure out how cancer cells spread, and interfere with the signals of spreading, then you can reduce metastasis,” Lin explains. Unlike most labs at the medical school, which rely on ready-made equipment to pursue research, his group focuses on developing new imaging devices for specific applications—to access a certain part of the body, for instance, or to find very rare cells such as blood stem cells after a bone marrow transplant.

Lin says that, as a technology-focused group within a hospital, the center can help adapt new microscopic techniques, increasingly making microscopes—those hallmarks of the laboratory—

more useful for the clinic. There, most imaging methods, such as MRI, CT, PET, and ultrasound, detect physical properties of tissues in order to create images (see glossary below). But to track and study specific molecules, light microscopy has the advantage, says Ralph Weissleder, professor of systems biology and radiology at HMS. Weissleder oversees the CSB and the Center for Molecular Imaging Research at MGH. “What we hope to do at the end of the day,” he says, “is to understand biology as it unfolds *in vivo* rather than in snapshots.”

His group works on developing new probes that have the ability to fit, like a key into a lock, into a pocket on the surface of a protein. A fluorescent molecule attached to the probe acts as a “reporter” that lights up proteins for the microscope. Weissleder says that the newest probes are constructed to fluoresce only when they have reached their targets, which results in a more distinct signal.

Using this technique, scientists can study and monitor the course of diseases in living animals. With cardiovascular disease, for instance, arteries become inflamed, which can eventually lead to a blood clot and a stroke. A probe specific for inflammatory enzymes can light up areas where the risk of clotting is greatest. These imaging tools could help scientists and clinicians monitor a disease and track whether a medication or other treatment is working.

Most microscopic techniques are limited by depth; looking deeper into the body usually requires a surgical incision to gain access because it’s impossible, at this point, to image fluorescence in the entire body at once. But a recent technology developed at MGH makes it possible to do just that—at least in small animals like mice. The technique, called fluorescence molecular tomography (FMT), creates a three-dimensional image of fluorescent proteins inside a living animal. The technique uses light itself to gather information about the tissue and reconstruct an image, similar to the way hospital CT scanners use x-rays. An animal with a fluorescently marked object inside it, such as a tumor, is exposed to beams of focused light at varying angles. At the other side, a sensitive cam-

G L O S S A R Y

CARS microscopy: a technique for visualizing specific molecules in cells based on their unique patterns of vibration when exposed to beams of laser light at specific frequencies.

Computed (axial) tomography (CT, or CAT, scan): an imaging technique that uses x-rays at many angles to generate cross-sections of the body, which a computer then stitches together into a three-dimensional image.

Diffraction limit: a limit to a microscope’s resolution imposed by the wavelength of the light used to illuminate a specimen. At distances smaller than about half the light’s wavelength, the light waves interfere with one another.

Electron microscopy: a technique that uses electrons rather than visible light to produce an image at up to a thousand times the magnification of light microscopes.

Fluorophore: a molecule that is able to fluoresce, i.e., to become excited by a particular wavelength of light and then emit light at a longer wavelength as it returns to its normal state.

Fluorescence molecular tomography (FMT): an emerging technique that uses beams of light similar to x-rays in

CAT scans to create a three-dimensional image of fluorescent molecules in the body.

Green Fluorescent Protein (GFP): a protein originally found in jellyfish that fluoresces green when exposed to blue light.

Magnetic resonance imaging (MRI): a diagnostic technique that uses a powerful magnetic field and radio waves to generate detailed cross-sectional images of tissues in the body.

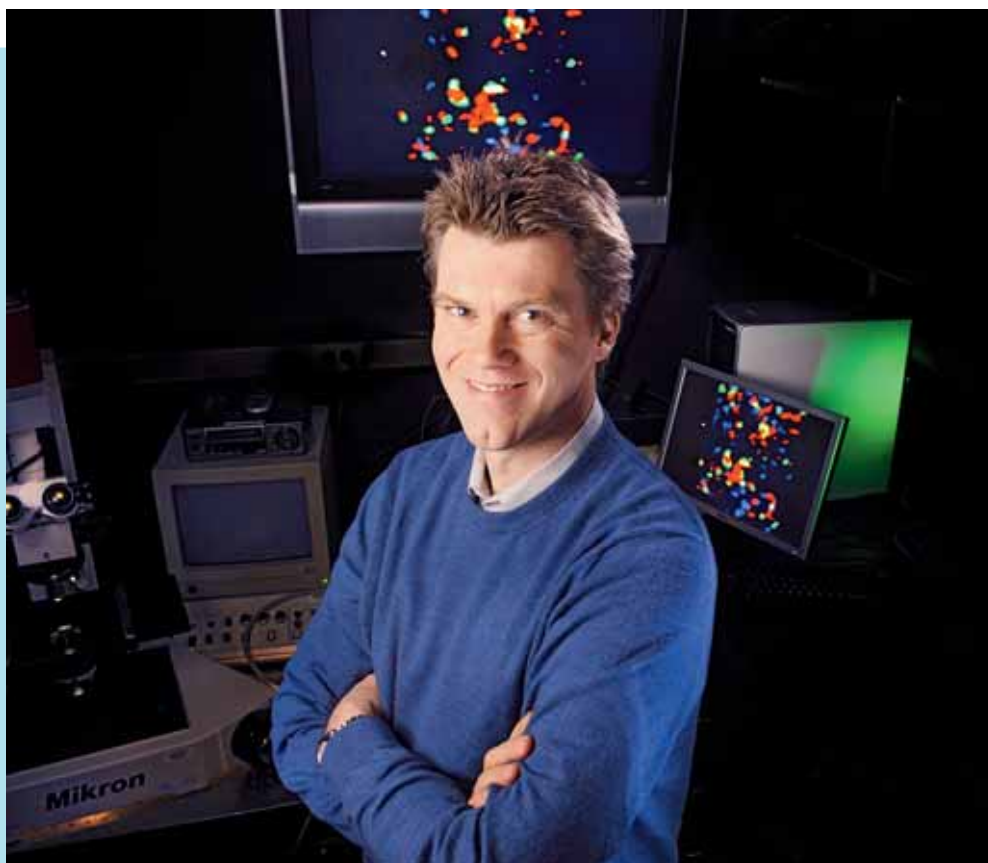
Positron emission tomography (PET): a technique for detecting functional activity in tissues by introducing a small dose of radioactive chemical into the body and using a computer to transform the resulting gamma radiation signals into three-dimensional images.

Optical or light microscopy: the use of visible light transmitted through or reflected from a sample and then passed through lenses to provide a magnified view.

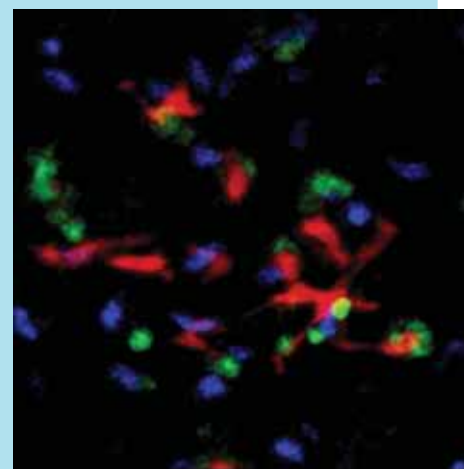
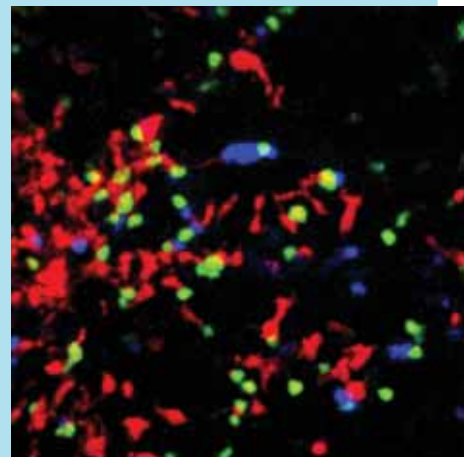
Resolution: the minimum distance between two points that a microscope can distinguish.

Ultrasound: a diagnostic tool that uses reflected high-frequency sound waves to examine internal body structures.

X-ray crystallography: a method to determine the structure of molecules by aiming a beam of x-rays at a crystallized molecule and measuring how the rays scatter.



Ulrich von Andrian uses “intravital” microscopes that can be placed inside the body to create images of immune-system T cells (green and blue) interacting with dendritic cells (red) that help trigger the immune response.



era records both the transmitted light and fluorescence from inside the body. A computer can use information about how the light beams are scattered by tissue to calculate the depth and degree of the fluorescent signals.

While there may never be a “whole-body” microscope that can scan a patient’s insides the way an MRI can, Weissleder believes that techniques like FMT and fiber-optic microscopy will prove useful for specific applications. Thus FMT is being developed for clinical use to visualize inflammation in the carotid artery in patients with atherosclerosis. Weissleder says that the key barrier to bringing FMT and other microscopy techniques to the clinic is getting the probes approved for use in humans, but he notes that probes are beginning to enter clinical trials. His group is also investigating nanoparticles that can be detected by different types of imaging techniques, such as MRI and PET, as well as optical microscopy. He believes that optical methods won’t replace these standard techniques, which still offer the best way to see inside the entire body, but says they can add molecular information to that obtained from existing technologies.

SEEING SINGLE CELLS, COUNTING MASSES

THE RESURGENCE IN IMAGING excites biologists for two reasons: it allows them to see individuals, and it allows them to count the masses. Being able to watch and track a single molecule, cell, or process offers a much more complete picture of how life works. Traditionally, many processes were studied using large numbers of molecules or cells to get an average result. But Sunney Xie points out that in events like gene expression, “you cannot synchronize the activities of each cell. It’s stochastic.” Stochastic events involve an element of chance—no two cells will be exactly the same. Xie points to a photograph of his twin

daughters to illustrate the idea; they have identical genes, but distinct personalities.

Being able to view singular events also gives scientists a new point of view. In the Brainbow mice, for instance, it’s easier to visualize how each cell competes with others. “Each cell is an individual and each is trying to make a living,” Jeff Lichtman says.

While the view of the singular is thrilling, scientists are equally excited by the ability to quantify many objects and events at once. Cells and molecules labeled with fluorescence can be counted, which means that scientists can see whether their numbers wax and wane as events unfold. Charles Lin explains that when studying whether a particular treatment keeps tumors from metastasizing, it’s important to be able to count the number of cells traveling to other areas of the body to know if a therapy is working. The ability to put numbers on results is a long-sought goal of biology, which has often been seen as a descriptive science.

Tom Kirchhausen predicts that in the next few years, scientists will use imaging to better understand complex processes such as cell division and the paths that viruses take to cause infection. Like many of the biologists involved in imaging, he is enraptured with what he’s been able to see in recent years. “Someone in the lab had a good result yesterday, and I had trouble sleeping,” he admits. “It’s so exciting.”



Visit harvard-mag.com/extras to see video of “in vivo” imaging.

Courtney Humphries is a freelance science writer.

Home of the Humanities

At a serene Harvard outpost, scholars find fertile ground for Byzantine, pre-Columbian, and landscape studies.

by ELIZABETH GUDRAIS

ON A WINTRY Wednesday evening, Maria Mavroudi is delivering a lecture on Byzantine science. Using evidence from texts and artifacts, she sketches an alternate history, one that competes with the common account that the Byzantine empire's inhabitants were less advanced than their contemporaries in their use and understanding of the sciences.

Mavroudi reports that Ptolemy's *Geography*, which was produced in Roman Egypt in the second century A.D. and describes a system of coordinates similar to modern latitude and longitude, survives in 54 Greek manuscripts. She argues that the typical explanation of why the text was reproduced—merely to preserve it for future generations—is wrong, and makes a case that the real purpose was to produce a manual for contemporary use. She cites texts that describe the richness of Constantinople's libraries, and others that mention wooden astrolabes; time and the elements, she says, may have erased the evidence of Byzantium's use of scientific instruments made from this perishable material. Byzantine science, she says, has gone unacknowledged not because it did not exist, but because studying it requires such diverse expertise: knowledge of languages, of Byzantine history, of the history of science.

This research requires a particular breed of scholar. Mavroudi, Ph.D. '98, who holds faculty appointments at Berkeley and Princeton, is one of them. She was the first person to earn a doctorate in



Byzantine studies, per se, from Harvard; four different departments—history, classics, art history, and Near Eastern studies—were involved. And the setting for her lecture is the world's foremost center of Byzantine scholarship: Dumbarton Oaks, an estate in Washington, D.C., which Harvard has owned since 1940, when Robert Woods Bliss, A.B. 1900, and his wife, Mildred Barnes Bliss, donated their Georgetown property to the University.

But it is not just in Byzantine studies that Dumbarton Oaks



Scenes from
Dumbarton Oaks:
a garden
wall (opposite),
the main house
(above)

excels. It also has fellowship programs in pre-Columbian studies—focused on Latin America before Europeans arrived—and in garden and landscape studies.

The scholarly institute, with its research library, museum, and public gardens, encompasses such disparate academic pursuits by design. In the preamble to her last will and testament, Mildred Bliss wrote that the estate was to be preserved as a “home of the Humanities, not a mere aggregation of books and objects of art.” The place manages to incorporate the natural environment and the built environment; concepts of art and religion; cultural studies; and considerations of conquest and empire. It is a window into the past, but it reflects on the present.

THESE THREE SEEMINGLY UNRELATED FIELDS do not just coexist at Dumbarton Oaks; they coalesce. Fellows toil in solitude in their offices, but they also emerge to discuss their projects with other fellows, and they discover parallels between fields. One past symposium investigated Byzantine garden culture; several current fellows’ projects have benefited from such cross-pollination.

For example, one of this year’s pre-Columbian fellows, University College London archaeologist Elizabeth Graham, is writing about the encounter between Europeans and the Maya, using evidence from excavations of the sites of two churches from the sixteenth and early seventeenth centuries, both in modern-day Belize. In conversations with Byzantine fellows, she has been struck by the similarities between early Christianity and the Maya version of Catholicism. “There’s no question that pre-Christian ideas have been incorporated into Catholicism,” says Graham. “It seems to me the Maya are just doing what all the European Christians did—they incorporate local culture with Christian sacred space.”

But to the disapproving Europeans, unaware that their own brand of religion was the product of a similar process, the pagan elements of Maya Catholicism looked foreign. “It’s interesting how, whenever there’s this meeting of two worlds, the one that becomes more powerful depicts the other one in a very simplified fashion,” Graham says. “I don’t think most of us realize that when we look at early records. We take them literally.” She sees parallels to this egotistical simplification of other cultures in various periods throughout history, including the contemporary world.

The project of another pre-Columbian fellow, Timothy Beach—a Georgetown University professor who teaches courses on climatology, hydrology, soils, geomorphology, and geoarchaeology—incorporates garden and landscape studies: he is investigating Maya agriculture and its impact on the environment. Beach earned his Ph.D. at the University of Minnesota, and says the changes caused there by early European settlers are not unlike the effects of Maya agriculture: German farmers weren’t used to the steeper inclines and fast, hard rainstorms of their new home, and they took no precautions against erosion. In both central Minnesota and Guatemala, entire towns were buried under layers of eroded sediment.

Inquiries like these, in a sense, simply couldn’t take place without Dumbarton Oaks. The Renaissance brought a renewed interest in the Classical period; for a time, the millennia in between were forgotten, ignored. By bringing the Byzantine period to the forefront, the Bliss family created a place for the study of all the periods, and of the major themes of human history.



This jade figurine from the Olmec culture, which flourished from about 1200 B.C. to 400 B.C. along the Gulf Coast of Mexico, was the first pre-Columbian object Robert Bliss acquired. It appears in an exhibit about the Bliss family that was installed for the museums’ grand reopening in April.

By bringing the Byzantine period to the forefront, the Blisses created a place for the study of *all* the periods, and of the major themes of human history.



The Blisses spent just seven years at Dumbarton Oaks after Robert Bliss retired from the Foreign Service in 1933; they gave their estate to Harvard in 1940. This photograph shows them in 1938 in the music room, which they designed as a setting for chamber-music performances and spared no expense in decorating—the sixteenth-century mantelpiece of carved limestone came from a chateau in France's Dordogne region. Today, the room is the setting for a monthly concert series presented in accordance with the Blisses' wishes.

CORNELIA HORN, a professor in the theological studies department at St. Louis University and a current Byzantine fellow, is trying to trace the transmission history of apocryphal Christian texts during the seventh century. The nativity story appears not only in the Bible, but also in the Koran and in other texts that were not ultimately incorporated into these holy books. Horn's project compares details in the different versions of the story in an attempt to get at which versions circulated when, where, and how widely. It is a study of a specific story's evolution, but also of how Christianity and Islam influenced one another.

Geographically, the Byzantine empire was ideally situated to illuminate concerns that remain relevant today: interactions between world powers, for instance, or between religious traditions. A former Dumbarton Oaks director, medievalist Giles Constable, once said a stint there should be mandatory for all U.S. ambassadors sent to the Mediterranean and the Middle East.

The Blisses were prescient in realizing the importance of Byzantine studies.

An openwork silver lamp, one of many items in the Byzantine collection from the "Sion Treasure," liturgical objects and church furnishings from a sixth-century church site found in Turkey



ies. Dumbarton Oaks welcomed its first Byzantine fellows in 1941, well before the field was widely recognized as a worthy academic pursuit. Alice-Mary Talbot '60, who directs the Byzantine studies program, says that when she was studying classics in college, focusing on the medieval period "would have been unthinkable." Today, she notes, the chair of the Harvard classics department is a Byzantinist; the previous chair, and current Dumbarton Oaks director, Jan M. Ziolkowski, also studies the medieval period. Talbot notes, with delight, that Maria Mavroudi won a MacArthur fellowship in 2005—a sign that the field has truly arrived.

The list of former fellows reads like a "who's who" of Byzantine studies, and people tend not to come just once—Dumbarton Oaks keeps beckoning them back. Mavroudi's first visit was in 1995, as a junior fellow, someone still working on a Ph.D. Her project was analyzing a Byzantine Greek book on dream interpretation and that book's Arabic sources. In 2001, she returned to research bilingualism in Greek and Arabic in the Middle Ages. Mavroudi says these stints "proved formative for everything I did afterwards."

Talbot, too, has kept coming back. She first fell in love with Byzantium during a fellowship in Greece, and a Ph.D. program in Byzantine history at Columbia brought her to Dumbarton Oaks for the first time, for a symposium in 1963. She spent a year there on a fellowship in 1966, and returned in 1984 to help edit the *Oxford Dictionary of Byzantium*, a project whose editorial home base was Dumbarton Oaks. When that project concluded, then-Dumbarton Oaks director Angeliki Laiou, whose professorship in Byzantine history at Harvard was endowed by the Blisses, appointed Talbot director of Byzantine studies.

Today, Talbot's office is in one of the Blisses' guest bedrooms; the walls are lined with titles such as *The Crusades from the Perspective of Byzantium and the Muslim World*; *Byzantine Court Culture*; *Consent and Coercion to Sex and Marriage in Ancient and Medieval Societies*; and *Byzantine Magic*. All were published by Dumbarton Oaks; the in-house press

has helped shape Byzantine studies by issuing important texts and by supporting the writing of others with its fellowships. Dumbarton Oaks commissioned the translation of 19 hagiographies, never before translated into a modern Western language, and is publishing them as a series. Ziolkowski says he would like to see the press create a series of English translations of Byzantine texts, with the original Greek on facing pages, similar to the Loeb Classical Library and the Villa I Tatti Renaissance Library—both

published by Harvard University Press, which produces, markets, and distributes Dumbarton Oaks publications.

Several current fellows are working on projects that will become resources for future scholars. Nadezhda Kavrus-Hoffmann, an independent scholar from New York who was a fellow last fall, is creating the very first catalog of Greek manuscripts from the Byzantine period in the United States: traveling among the libraries that hold the manuscripts and in some cases discovering texts whose existence had escaped notice. Current fellow Yuri Pyatnitsky, senior curator for the Byzantine icon collection

at the Hermitage, in St. Petersburg, is creating a comprehensive catalog of that collection, incorporating information from recent analysis of the icons using new technical methods.

Dumbarton Oaks also underwrites the development of Byzantine scholarship directly. Eustratios Papaioannou, another former fellow now translating the letters of Byzantine historian and philosopher Michael Psellos, is Dumbarton Oaks assistant professor of Byzantine studies in the classics department at Brown University. The appointment is jointly funded by the two entities, enabling Papaioannou to spend two years teaching at Brown and

Visionary Donors

ROBERT BLISS DIED IN 1962, Mildred Bliss in 1969, but the benefactors of Dumbarton Oaks still cast a long shadow over their former home. It's not just that the Blissés left behind their home and all their belongings. The estate's later caretakers have inscribed their words on plaques; staff members mention their names frequently; and people occasionally report seeing Mrs. Bliss walking about in the gardens. Indeed, the estate's very name comes from the Blissés, who combined its first recorded name—taken from the Rock of Dumbarton in Scotland, the homeland of early owner Ninian Beall—and a name from a later period, when it was called simply “The Oaks.”

Robert Woods Bliss, A.B. 1900, a career diplomat, and Mildred Barnes Bliss, heiress to a laxative fortune and the niece of Edith Wharton, had spent two decades overseas during his postings to Venice, St. Petersburg, Brussels, Buenos Aires, Paris, and the Hague. In 1920, they were looking for a home base in Washington, but they also had grand aspirations for their estate. They envisioned a place for scholarly studies and musical performances, and a home for the fine art and ancient artifacts they had assiduously collected. And they had notions of eventually giving all of it to Harvard.

A history of Dumbarton Oaks records Robert Bliss's words upon seeing the property for the first time: “though it had no particular charm and the grounds were unkempt and in places much overgrown, the beautiful trees gave promise of possibilities to a gardener.” Beall's Georgetown estate had been divided up and

sold to different owners over the years; the Blissés reassembled several parcels into their own 53-acre plot.

They made their gift to Harvard sooner than they had originally planned. In 1940, as World War II consumed Europe and threatened to draw in the United States, they turned over to the University 16 acres, including the main house, gardens, and their collections and library. “Dumbarton Oaks is now ready to increase its contribution to the intellectual life of the nation,” Robert Bliss told the *Washington Times-Herald*. They also gave 27 acres to the National Park Service, which made the land into Dumbarton Oaks Park, and sold 10 acres to the Danish government for an embassy complex. They had lived at the estate only since 1933, and for just 10 years in all, having bought it while Robert Bliss was on a domestic posting, before being sent to Sweden and Argentina.

With the gift, Harvard received 1,200 Byzantine objects, as well as 17,000 Byzantine coins and 800 pieces of pre-Columbian art. The Blissés “had no aspiration to be scholars, but they had quite good taste,” says Dumbarton Oaks director

Jan M. Ziolkowski. “Collecting was a serious business for them.”

Many have noted similarities to I Tatti, the estate near Florence that was left to Harvard in 1959 by Bernard Berenson, A.B. 1887, as a center for Renaissance studies. Besides a research library, that estate offers artworks, gardens, and olive groves—a set of resources for well-rounded scholars of the humanities. The I Tatti gardens feature pebble mosaics; Mildred Bliss converted a former tennis court at Dumbarton Oaks into a pebble mosaic in 1961. And just as the Blissés' ashes are interred in the Dumbarton Oaks gardens, Berenson and his wife are buried in a chapel at I Tatti. The similarities are not coincidental: the Blissés and the Berensons were friends.



Robert and Mildred Bliss, during his diplomatic posting to Sweden in the 1920s

Although savoring his role as director, Ziolkowski admits he “wasn’t prepared for just how active the place is.”



This watercolor gives an aerial view of the 53 acres the Blisses assembled to house art, scholarship, and memorable gardens. For many years, it hung over the fireplace in the music room. A copy hangs there now; the original is in storage to protect it from light—and other—damage. The painting was smudged, the story goes, when someone wiped a sponge down one side to clean it, not realizing that the colors would smear. Close observers will notice that, despite restoration, part of the left side of the image is less finely detailed than the rest.

two years at Dumbarton Oaks conducting research. The Blisses’ gift has provided seed money for 11 tenure-track positions in Byzantine studies at nine U.S. universities during the past three decades. Dumbarton Oaks has also provided financial support for excavations and for the restoration of frescoes in a church in Cyprus. And it was at Dumbarton Oaks that the key to dating Byzantine coins was discovered.

PORTER PROFESSOR of medieval Latin Jan Ziolkowski began his tenure as director in September. Like the institute itself, he has diverse interests. His publications

in the last two years include a book on the medieval precursors to fairy tales; one on the musical notation printed alongside the text of some medieval Latin poems; translations of a ribald story from the thirteenth century and of letters by the medieval French philosopher Peter Abélard, best known for his legendary love affair with Héloïse;

A bust of the Maya maize god, from the late seventh or early eighth century, appears in a display about Maya religion in the pre-Columbian wing.

and an 1,128-page volume titled *The Virgilian Tradition: The First Fifteen Hundred Years*.

“I like to think of myself as being a humanist who likes to work on the Mid-



dle Ages and on literature, but who has other interests,” says Ziolkowski. Medieval Latin texts are the starting point, but, he says, “I try to connect them in as many ways as I can to other literatures within Europe, and to other areas of study.” He has also chaired several interdisciplinary entities within the Faculty of Arts and Sciences, including the Committee on Medieval Studies and the Committee on Degrees in Folklore and Mythology. “A large part of my agenda in the first 25 years of my career,” he says, “was to try to figure out how to intersect with the work of as many colleagues as possible.”

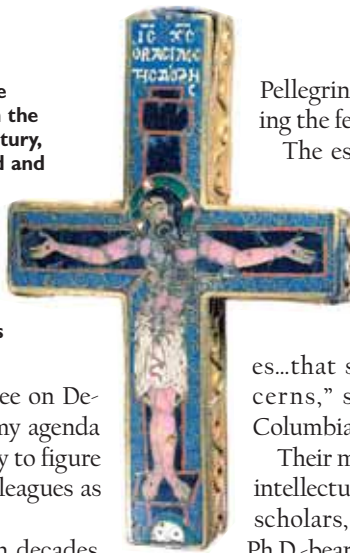
Ziolkowski is only the seventh director in seven decades. (The appointment, which lasts for five years, is renewable.) Because directors are expected to spend one day a week in Cambridge, and to teach one class a semester, he is in a cab to the airport by 6 a.m. every Tuesday.

Over lunch in December, he confessed he was “running on vapors.” Although savoring his new role, he said, “I wasn’t prepared for just how active the place is.” Already that week, there had been a research report by a garden and landscape fellow on Monday afternoon; a concert on Monday night; a Byzantine seminar presentation by Papaioannou on Tuesday afternoon; coffee hour for the pre-Columbian fellows on Wednesday afternoon; and Mavroudi’s lecture on Wednesday evening. On Thursday evening, Ziolkowski was scheduled to give a talk himself on “The Juggler of Notre Dame,” a medieval folk tale about an entertainer who grows weary of his life, enters a monastery, and develops a juggling routine to perform before a statue of the Virgin because he doesn’t know how else to express his devotion. The tale—in which the juggler is scorned by his fellow monks-in-training, dies from the exertion of performing his routine, and ascends to heaven after a fight between the devils representing his tawdry past and the angels of his pious end—has found its way, in various forms, into nineteenth-century short-story collections, a W.H. Auden poem, and a short film narrated by Boris Karloff. A painting depicting the juggler, belonging to Ziolkowski, hangs in the director’s residence.

The estate owns that residence, a house across the street from the main campus that once belonged to Elizabeth Taylor. It has more bathrooms than Taylor has had husbands (nine and seven, respectively) and its extensive basement includes a film screening room, a minibar, and a children’s playroom decked out in zebra print. (There are also safes, which one would need if one planned on storing the 33-carat Krupp diamond and the 69-carat Taylor-Burton diamond.)

Ziolkowski hosted a dinner there for the fellows last fall, two days after he moved in. He thought it would be nice to do something casual, maybe pizza in the backyard. But tradition called for something grander, so Ziolkowski assented to a starched-tablecloth, waiters-in-tails affair, in keeping with the general ambiance of Dumbarton Oaks—teacups and tea are always in close proximity, and

This Byzantine reliquary from the thirteenth century, crafted of gold and cloisonné, was made to hold a fragment of wood from the cross on which Jesus was crucified.



Pellegrino water and Amontillado sherry are served during the fellows’ Monday-afternoon research reports.

The estate also owns an apartment building 10 minutes from the campus, where the fellows live, and the campus includes a refectory where they can eat breakfast and lunch daily, on china that may have belonged to the Blisses, underneath a watchful portrait of Mrs. Bliss herself. “It was very important to the Blisses...that scholars be unencumbered by practical concerns,” says Joanne Pillsbury, director of the pre-Columbian studies program.

Their mission, broadly conceived, was “to bring together intellectuals,” Ziolkowski says. “Their focus was mainly on scholars, but they didn’t use that term to mean solely Ph.D.-bearing researchers...They wanted them to come together in a context that would be beautiful, that would be aesthetically satisfying. They wanted people literally to step outside and smell the roses.”

*I*N THE NINE DECADES since the Blisses first contemplated making their gift to Harvard, Dumbarton Oaks has gone from a building to a campus with a staff of close



**Dumbarton Oaks director
Jan M. Ziolkowski**

to 100. The Blisses' endowment has enabled this to happen without any fundraising; their original \$5-million gift had grown to nearly \$500 million in 2001, the last time it was separately reported in University financial statements.

The Blisses had the foresight to realize they could not predict every eventuality, and they wrote the gift documents to give their estate's future custodians discretion. This has allowed the institute to sell, over the years, all but the most precious holdings from the "house collection"—art the Blisses collected that fits into neither the Byzantine nor the pre-Columbian category—and plow the proceeds back into programs, publications, salaries, and library acquisitions.

The Dumbarton Oaks library, originally assembled to make sense of the Blisses' collections and their gardens, has grown into a staple of scholarship for all three research fields. Their 10,000

volumes in Byzantine studies have grown to 150,000, plus half a million images of various sizes and formats. The pre-Columbian collection now numbers 32,000 volumes, up from the 2,000 collected by Robert Bliss. And the garden and landscape library, first curated by Mildred Bliss, grew from 5,000 volumes at the time of the Blisses' conveyance to 27,000 today. The holdings of the library as a whole grow by 3,000 to 4,000 volumes a year.

Its home, a new building that opened in 2005, is a dramatic improvement: previously, books were kept in the main house, "literally shelved in closets and under stairs," says library director Sheila Klos. "Every time the fire marshal came through, he said, 'You shouldn't have books here.' We said, 'Just a little longer.'... We were shelved on eight different levels, four of which had no elevator or book-lift access, so everything was carried."

The library holds many rare and important resources, includ-



Garden Refuge

THE DUMBARTON OAKS GARDENS—formal gardens in the European tradition, but with a distinctively American flavor that acknowledges their setting—are laid out as a series of “garden rooms,” with walls formed by trees in some cases, by terraces in others, with the result that something new lurks around each twist of the winding paths.

One has the constant feeling of going where one isn't supposed to go—a place this beautiful just can't be open to the public.

But it is. The 10-acre garden opens from 2 P.M. to 5 P.M. in the winter, and 2 to 6 in the summer. Admission during the morning and early afternoon is restricted to the fellows to give them a chance to “rest their eyes, expand their vision, and ponder the subjects they're working on,” in the words of Joanne Pillsbury, director of the pre-Columbian studies program.

These are gardens rich with references. A stone plaque in the wisteria arbor bears an Italian inscription: *Quelli chanticamente*

ing the Princeton Index of Iconographic Art, one of only five copies of this card catalog in the world. Brandeis University anthropologist Charles Golden, a pre-Columbian fellow this year, says the library's excavation reports have been particularly useful for his effort to understand why the Maya destroyed a royal palace after a sixth-century military defeat and rebuilt it, in different form, on the same site half a century later. The project requires "a shovelful-by-shovelful description of what came out of the ground and how it came out of the ground," says Golden. "The only place to find that is the original excavation reports. Not all libraries are willing to buy them for the use of just a few scholars, but Dumbarton Oaks has them."

And the fellows find that the library's small size and ease of navigation make for productive research. "At Widener," says Mavroudi, "you have to walk several minutes—sometimes half

an hour!—within the building to go from one book to the next. If you are playing with an idea in your mind, maybe the idea is not the same by the time you reach the book. At Dumbarton Oaks, it's just one floor up. It's an immediate satisfaction of curiosity that allows one's mind to work faster."

WHILE MANY ARE UNAWARE of Dumbarton Oaks' existence, even fewer know of the breadth of its offerings. Klos recalls a recent conversation with a book dealer who said, "Oh, Dumbarton Oaks, you do pre-Columbian." Klos's reply: "No, no, there's so much more!"

To members of the general public, the estate's name may be familiar in the context of international relations: late in World War II, representatives of the United States, Great Britain, the Soviet Union, and nationalist China gathered there to hammer

The Dumbarton Oaks gardens were influenced by the Arts and Crafts Movement and by earlier garden styles from France and Italy. They are closed to the public in the morning to allow the fellows exclusive use, but in the afternoon, anyone may enter for a small fee—and from November to mid March, for free. The pebble terrace, left, was created in 1962 from a former tennis court. Its designer was Ruth Havey, rather than Beatrix Farrand, who designed most of the gardens' elements. The wheat-sheaf motif visible at lower right in the image forms part of both the Woods and the Bliss coats of arms. The terrace was meant to be covered by a thin sheet of water; though subterranean mortar problems interfere at present, it will one day regain its original appearance.

poetaro leta dell oro/ & suo stat felice forse in parnaso esto loco sognaro, a quotation from Dante's *Purgatorio*, translated by Charles Eliot Norton, A.B. 1846, as "Those who in old time sang of the Golden Age, and of its happy state, perchance, upon Parnassus, dreamed of this place." In the "star garden," with its zodiac-signs motif, the pavement is inscribed with a passage from Chaucer's translation of *Consolation of Philosophy*, by the sixth-century philosopher Boethius (who was executed by a Roman emperor for allegedly conspiring with the Byzantine empire): "O Thou Maker of the Whele that Bereth the Sterres, and tornest the Hevene with a ravissing sweigh." The crypt in the rose garden, containing the ashes of donors Robert Woods Bliss and Mildred Barnes Bliss, is marked by a plaque bearing only their names, dates of birth and death, and the Latin maxim *Quod severis metes*—As you sow, so shall you reap.

The Blisses commissioned Beatrix Farrand in 1921 to design the gardens as a setting for humanistic inquiry and reflection. Thus began an intense process that spanned four decades and involved full-size mock-ups of many elements as well as a vigorous back-and-forth recorded in correspondence between Farrand and Mildred Bliss.

Mrs. Bliss took inspiration from the gardens she'd seen in France and Italy. Farrand had also toured European gardens extensively, but she was known for her love of endemic, rather than exotic, plants, and she designed with an eye toward adapting the garden to its natural setting, not the



other way around. She structured the gardens to "devolve" from formal and structured to progressively less so as one moves downhill from the main house. As one enters the "wild," less landscaped portion, stone paths trail off abruptly into dirt or lawn. In *Dumbarton Oaks: Garden into Art*, historian Susan Tamulevich judges the result successful: "The garden," she writes, "feels as if it had always been there—born, not made."

Objects' settings in the museum suggest their original uses. A mosaic from a Roman bathhouse floor adorns the entrance lobby, even though the constant foot traffic is a nightmare from a preservation standpoint.



Alice-Mary Talbot,
director of the
Byzantine studies
program

out the details of the United Nations. Washington, D.C., residents may know the gardens (unlisted in many guidebooks), but even they often don't realize that the museums are open to the public. (For visiting information, see www.doaks.org.)

Both Ziolkowski and museum director Gudrun Bühl are eager to increase the estate's public profile. Bühl edited *Dumbarton Oaks: The Collections*, a 380-page book being published this spring under the Dumbarton Oaks imprint. With photographs of, and descriptive essays about, more than 170 objects from the Byzantine, pre-Columbian, and house collections, it is the first attempt to represent the holdings, in color, in all their breadth. (Among the smattering of previous books, some focused on the estate's history,

**An ivory triptych
from late-tenth-century
Constantinople**



some on the gardens, some on one museum collection, often with images in black and white or no illustrations at all.)

A recent wave of renovations will also help. The new library building cost \$18 million and comprises 43,000 square feet. The museums, closed for renovations since December 2005, were scheduled to reopen in April. And renovations to the Blisses' former residence—which their sundry additions expanded to an awe-inspiring 77,000 square feet—were completed last year. (The building comprises offices for staff and fellows, rooms for concerts and lectures, the museum galleries and storage, the publications department, and a rare book room that was the only part of the library to stay behind after the new building's construction. The holdings, all from the Blisses' collection, include a first edition of *Uncle Tom's Cabin*, a signed copy of *Leaves of Grass*, and a fifteenth-century illustrated manual of medicinal plants.)

The new museum galleries—the first update since initial installation in the 1960s—attempt to integrate the collections and make them more user-friendly: for example, by adding new labels and educational display formats. One case holds a map of the Byzantine Empire, which serves to educate viewers but also to display Byzantine coins, arranged according to where they were minted.

The exhibits aim to be succinct, not exhaustive. "If you want the person to stop and look closer, then you have to cut back on the number of objects in one case," says Bühl. But, she says, "It hurts. You want to show what you have." Objects will rotate in and out of displays, while a new study space in the basement allows scholars to view objects from storage by appointment.

Bühl tries to use objects' settings to suggest their original uses. "Most of these objects were never meant to be independent pieces of art," she says. Floor mosaics, for example, were walked on—and so a mosaic from a Roman bathhouse floor adorns the museum's entrance lobby, even though the constant foot traffic is a nightmare from a preservation standpoint.

But the displays stop short of wholesale reconstruction. One case contains early Byzantine liturgical instruments, including a reconstructed altar with a tabletop, chalices, a flabellum (a fan used during services to keep flies away from the communion host), and a liturgical book cover. It is significant, says Bühl, that this altar diorama appears inside a case, rather than in a full-scale reproduction of a chapel: "People should always know that these objects are lost to the original context."

The pre-Columbian collection resides in a distinctive honeycomb-shaped structure, designed by the architect Philip Johnson '27, B.Arch. '43, that was added as a wing of the main house in 1963. The holdings focus on Mexico and areas south. The post-renovation orientation of the displays is geographic, and each gallery also has a theme. One—featuring objects (please turn to page 95)

JOHN HARVARD'S JOURNAL



Junior Becky Christensen—all-American, winner of the indoor Heptagonal Championships—redefines altitude. Beginning on page 75, she explains the art of jumping high.

IN THIS ISSUE

- | | | | |
|----|-------------------------|----|------------------------------|
| 59 | Harvard Portrait | 66 | Scanning the Social Sciences |
| 60 | Art of the Future? | 67 | Connecting with China |
| 61 | Open Access | 69 | Brevia |
| 62 | University People | 73 | The Undergraduate |
| 62 | Race in a Genetic World | 75 | Sports |
| 65 | Prescription: Music | 78 | Alumni |
| 65 | Yesterday's News | 84 | The College Pump |

Good-bye to HMI

THERE IS a revolution afoot in international healthcare. Wealthy foreigners still come to the United States—to the Mayo Clinic, say, or to Harvard-affiliated hospitals in Boston—and pay full freight to be treated by the world's top doctors. But changes in U.S. visa policy, in light of September 11 and the Iraq war, have made such



trips more difficult; consequently, these patients increasingly seek world-class healthcare closer to home.

Harvard has had a booming business advising in the creation of such hospitals. Harvard Medical International (HMI), created in 1994 to generate revenue for Harvard Medical School (HMS), has projects in 20 countries on five continents. But just as demand is heating up, the University is pulling back. In February, it announced a provisional agreement to transfer HMI to Partners Healthcare, the parent organization for two of the largest Harvard-affiliated teaching hospitals.

The announcement allows HMI to come out of a holding pattern, freeing it to enter new contracts. But Andrew A. Jeon, M.B.A. '89, HMI's president and CEO since December 2007, says leaving Harvard is beneficial for other reasons. As University administrators also note, Partners operates hospitals, while HMS does not. And as HMI has grown, it has found itself in a Catch-22: the better it did at making money, the more questioning of its worth it faced in some quarters.

Through HMI, Harvard professors are advising the design and operation of hospitals and specialty clinics in India, Greece, Turkey, Thailand, and China; guiding the creation and reform of medical-school curricula in Germany, Japan, Hong Kong, India, Egypt, Saudi Arabia, Kuwait, Lebanon, and the Dominican Republic; and advising and staffing continuing-education programs for physicians around the globe. Roughly 250 faculty members—mostly from HMS, but also from the Harvard School of Public Health (HSPH), the Harvard Business School, and the Faculty of Arts and Sci-



HARVARD MEDICAL INTERNATIONAL

ences—engage in contract work each year for HMI, whose 2007 operating budget was \$21 million. (See hmi.hms.harvard.edu for more information.)

The 4-million-square-foot Dubai Healthcare City (www.dhcc.ae), the largest and in some ways the flagship project, will include hospitals, facilities for clinical and commercial research, and a medical school. The goal is to draw patients from India, North Africa, Moscow, and much of Europe—all within easy flying distance. Although other partners in the project include the Mayo Clinic, Boston University, AstraZeneca, Novartis, and Wyeth, HMI is listed as the “key strategic collaborator.” Its contributions include strategic planning and helping to develop the system of licensing and regulating doctors and healthcare facilities within the complex—and potentially beyond. (HMS will continue to operate the Harvard Medical School Dubai Center, which deals with postgraduate and continuing medical education, and the Dubai Harvard Foundation for Medical Research, which announced its first research awards, for two postdoctoral fellows from the Middle East, last year.)



WOCKHARDT HOSPITALS

SOME CRITICS of HMI complained that it was unfocused, responding to client requests rather than setting its own agenda. Others said it looked bad for Harvard to make a profit in countries where the vast majority of people have no access to the healthcare system. In the view of Jorge I. Domínguez, the University's vice provost

for international affairs, HMI never should have been part of Harvard in the first place. “It is a consulting company, under the Harvard name and under the Harvard tax exemption,” he says. “It doesn't belong at an institution whose core mission is research and education.”

On entering some HMI-affiliated hospitals, adds Domínguez, “You get the feeling you just walked into a department of the Harvard Medical School—the seal of the school broadly displayed, ‘Harvard’ sometimes in bigger type and more prominent than the name of the local client.” Although allowed within the contracts HMI signed, these uses are not consistent with broader University policy and principles, says Provost Steven E. Hyman: “There's nothing more precious to us than the Harvard name and what it stands for....We're not looking for brand extension.”

Dissatisfaction reached critical mass in



Top left: The Ibn Sina building in Dubai Healthcare City houses clinic space and medical and administrative offices. Top right: an artist's rendering of the university hospital that will be part of the same complex; Harvard Medical International (HMI) advised in designing the 400-bed facility, projected to be completed in 2011. Below: HMI affiliates from the Wockhardt Hospitals system in India include (left) a facility in Mumbai with a planned addition (in an artist's rendering), and another (above) in Bangalore.

2006, as HMI was losing its champions within the University: HMS dean Joseph B. Martin announced plans to step down in October of that year, and the presidency of Lawrence H. Summers, an ardent supporter of the Dubai project in particular, came to an early end. Interim president Derek Bok brought to Massachusetts Hall a skeptical view of Harvard's involvement in commercial enterprises—his books include *Universities in the Marketplace: The Commercialization of Higher Education*, which warns against allowing the profit motive to compromise universities' academic mission.

And in the wake of huge federal fines against the Harvard Institute for International Development (another Harvard-run provider of international consulting services) following alleged misconduct by leaders of its economic advising work in Russia, and the institute's dissolution, University leaders reviewed controls over all overseas projects. Harvard vowed to evaluate all its freestanding "centers" on a regular basis and convened a task force that considered the University's international priorities; Domínguez, Madero professor of Mexican and Latin American politics and economics, chaired this task force in 2004 and 2005.

In July 2006, Domínguez joined the provost's office, and a report on HMI from an external review committee—comprising people from outside HMS, appointed by Martin—landed on his desk. The report judged HMI's activities insufficiently academic, citing a number of factors including, says Domínguez, the finding that HMI work did not count in promotion and tenure considerations for HMS. (Not everyone agrees with this assessment. Robert K. Crone, who was HMI's president and CEO from 1994 until 2007 and now works in the higher-education practice of the Huron Consulting Group in Boston, says work for HMI has factored into two promotions to full professor at HMS in the past year alone.) The external review committee's findings led Harvard to commission McKinsey & Company to recommend "options" for HMI's future, says Domínguez. The McKinsey report, he says, provided additional justification for severing ties with HMI: it found that three-quarters of

HARVARD PORTRAIT



John Chervinsky

Like many people, John Chervinsky takes his work home. But what this lab engineer takes home may one day end up in a museum. In his second career, as a still-life photographer, he places scientific bric-a-brac (a magnet, a tuning fork) alongside other objects (a candle, a lily), aiming to ask a question or illustrate a problem. "The creative side of good science comes from the same place in the mind as the creative side of making art," he says, "yet scientists and artists don't interact with each other as much as they should." His own propensity to tinker, whether with photographs or lab equipment, comes from his father, who was a machinist and factory foreman in Niagara Falls. In 1984, after earning a degree in electrical engineering, Chervinsky moved to Boston, where in time he got a job as a lab technician with Rumsford professor of physics and McKay professor of applied physics Jene Golovchenko, and also began experimenting with photography. (He still works with Golovchenko, now as the laboratory engineer for the Harvard Nanopore Group; see "A Personal Genome Machine?" March-April 2007, page 11.) When, all within a few weeks in 2001, his wife, Kirsten, became seriously ill, the World Trade Center was attacked, and his friend and fellow photographer Guy Pollard died unexpectedly, Chervinsky found himself retreating often to his attic studio. Photography, no longer merely a hobby, helped him deal with a life that then was "just falling apart." The work he did impressed the local arts community, and in 2005 the Griffin Museum of Photography mounted his first solo exhibition. Since then, he's shared his scientific still-lives with gallery-goers from Santa Fe to New York City.

HMI's work could be classified as consulting, not educational, activities.

By all accounts, when Walker professor of medicine Jeffrey S. Flier became HMS dean last September, HMI's fate had already been decided. (Flier declined to comment for this story, deferring to Hyman.) And so, if the agreement becomes official—as both parties said was imminent at press time—HMI's 60 employees will become Partners employees, and the new organization will be known as Partners-Harvard Medical International (PHMI), for the purpose of new contracts, for the first five years. (Administrators from the University and Partners give different answers regarding whether Partners will have the option to negotiate using the Harvard name beyond that initial period.) PHMI would honor all existing contracts under their original terms, and employees who have HMS affiliations—such as Jeon, who is an instructor in anaesthesia—would keep them.

AS HARVARD LEAVES this market, other universities are rushing in. Johns Hopkins has a robust international consulting

presence; Cornell has even opened a branch campus of its medical school in Qatar—students receive M.D. degrees from the university, just as they would if they attended the main campus in Manhattan. The difference, Domínguez and other administrators say, is that Harvard does not own its teaching hospitals, and so is not in a position to advise anyone on how to operate hospitals.

Much discussion has focused on whether HMI loses or gains from the transition, but this tabulation is missing a factor, says Henry Rosovsky, Geyser University Professor emeritus and former dean of the Faculty of Arts and Sciences, who held an *ex officio* seat on the HMI board of directors for 10 years as a member of the Harvard Corporation. “The question may also be, does Harvard lose anything?” HMI “improved the quality of medicine in many parts of the world,” says Rosovsky (who is president of the *Harvard Magazine* board of directors).

“That doesn't seem to me to be such a bad activity for the Harvard Medical School or for the University to engage in.” Facilitating the delivery of top-notch healthcare, even to the relatively wealthy, he says, raises the standard of care for everyone in a given region, directly or indirectly, through improving the quality of facilities available and the education level of local doctors.

What's more, the model that says medical advances develop in the United States and ripple out to the rest of the world may be outdated. Those who have worked on HMI projects are apt to say they gained as much knowledge as they imparted. This was the case for Thomas H. Lee Jr.—a Partners executive who holds teaching appointments in medicine and health policy at HMS and HSPH—when HMI sent him to Japan to speak to doctors about aspirin and heart disease. American physicians recommend that people at risk for heart disease take as-

Art of the Future?

The Fogg and Busch-Reisinger Museums at 32 Quincy Street will close their doors on June 30 for five years (see “Art Museum Two-Step,” January-February, page 62). But before they do, the Harvard University Art Museums (HUAM) will preview the plans for renovation in a small exhibition hinting at the design approach unfolding in the offices of project architect Renzo Piano. All but the original 1927 Fogg building will be torn down as part of the massive project.

Although the design is still evolving as HUAM consults with the Cambridge Historical Commission, the Massachusetts Historical Commission, the Harvard Corporation, and Cambridge neighbors, the exhibition, opening May 18, is expected to include a large model as well as sketch renderings of Piano's plan. Anchoring the first-floor space will be the distinctive central courtyard, with four separate galleries at the building's corners. The second floor will contain more gallery space, and the third will include galleries as well an entrance to the study centers where



Architect Renzo Piano is noted for “spaces that defer to art” and has a gift for combining controlled natural light with artificial light, says Thomas W. Lentz, director of the Art Museums. Lentz says the architect's buildings “always keep works of art front and center,” whether as a result of his “sense of proportion in gallery spaces,” or his “deep interest in materials and how they ‘live’ and interact.” Above, a gallery at the Nasher Sculpture Center, Dallas.

professors can use objects from the collections for teaching. What will be most apparent from the outside, emphasizes Cabot director of the museums Thomas W. Lentz, is that there will no longer be front and back sides to the building: “We are adding [a formal] entrance to the building on Prescott Street.”

pirin daily, but the Japanese doctors Lee met protested that clogged arteries were much less common in their patients than were hemorrhagic strokes caused by ruptured blood vessels—a condition that aspirin makes more likely.

During a summer internship with HMI last year, HMS student Eric Twerdahl researched the impact of HMI projects in

Dubai and India on healthcare in their respective regions. Twerdahl met a vascular surgeon in Bangalore who has revised operating room practice—for example, sterilizing and reusing equipment, instead of using disposable items—to cut the cost per procedure. He met a cardiac surgeon in Mumbai who has pioneered open-heart surgery without general anaesthe-

sia, using instead an epidural administered above the level of the heart. These innovations sharply increase access to care, but were unlikely to develop in the United States, where the healthcare system is much less responsive to cost. In this sense, says Twerdahl, “the days of U.S. medicine thinking that it’s at the top of the pile are numbered.”

Open Access

IN AN HISTORIC VOTE, the Faculty of Arts and Sciences (FAS) moved to make the articles that its members publish in scholarly journals freely available to anyone, “disseminating the fruits of its research and scholarship as widely as possible.” The action acknowledged that the intellectual wealth of the world increasingly lies at our fingertips.

The Internet has made this possible, but there is a disturbing countertrend: even as some kinds of information become more readily available (public-domain books in Harvard’s libraries, for instance, through collaborations with such projects as Google Books), other kinds of information are becoming more difficult to obtain. In particular, scholarly articles conveying the latest breakthroughs in technology, science, and medicine—the kind of information those afflicted with a rare disease might wish to access, and, as taxpayers, might even have funded—are locked up in expensive journals (an institutional subscription to *Brain Research*, to cite an extreme example, is more than \$22,000 a year), or are otherwise not easily accessible.

The motion considered at the FAS meeting on February 12 at first seemed a minor sortie into copyright law. A “yes” vote would grant the University a non-exclusive, nonprofit license to faculty members’ scholarly articles, and require them to deposit a copy in an “open access” repository. But the motion, which passed unanimously, was, in fact, an important milestone in a much larger “open access” movement that aims to make all scientific and scholarly material, particularly articles published in peer-reviewed journals, freely available over the Internet. “The goal of university research is the creation, dissemination, and preservation of knowl-

edge,” said University provost Steven E. Hyman in a public statement. “At Harvard, where so much of our research is of global significance, we have an essential responsibility to distribute the fruits of our scholarship as widely as possible.”

Open access (OA) is generally achieved in two ways, through OA archives or OA publishing. The latter, in which articles are peer-reviewed and vetted as usual but distributed freely over the Internet, has had some success: of the roughly 20,000 scholarly journals published today, about 3,000 are OA.

Harvard’s new policy takes the archiving approach, by creating a searchable online repository. “Faculty members still retain copyright to scholarly articles they write, but any transfer of copyright they make to a publisher will be subject to the nonexclusive license to Harvard, which will retain its right to distribute the article freely and openly,” explains Welch professor of computer science Stuart Shieber, chair of the provost’s committee on scholarly publishing that drafted and presented

the new policy. Professors can make the articles available to students in class, and readers worldwide can download copies.

Peter Suber, principal drafter of the first major international statement on OA, the Budapest Open Access Initiative of 2001, has described Harvard’s new policy as the first university mandate for open access by default in the United States, and the first to be adopted by a faculty, rather than implemented by administrative fiat. Harvard’s policy is a “default,” rather than a true mandate, because it includes an opt-out provision, or waiver—for instance, if the paper of a junior faculty member is accepted at a major journal that doesn’t allow OA archiving. Either way, compliance is expected to be much higher at Harvard than at institutions where OA archiving is optional, and where participation rates rarely exceed 15 percent, Suber says. His research also indicates that articles available through OA enjoy increased visibility, retrievability, usage, and citation impact—and aren’t incompatible with for-profit publishing.



Photograph by Stu Rosner

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University People

College Dean Designated

Rosenkrantz professor of the history of science and of African and African American studies Evelyn M. Hammonds, Ph.D. '93, will become dean of Harvard College on June 1, succeeding Ford professor of human evolution David Pilbeam, who has served on an interim basis. Since 2005, Hammonds has been senior vice provost for faculty development and diversity, gaining a University-wide perspective on faculty recruiting and support for faculty, graduate students, and postdocs struggling to balance work and family obligations. "Those issues will always be a focus for me," she says. "I just won't be doing them for central administration." Her new job has two major projects teed up: renewing the undergraduate Houses (see Brevia, page 69) and launching a new general-education curriculum to replace the Core. She also wants to enrich the College's arts offerings—curricular and otherwise—and undergraduates' science education and research opportunities.

Engineering Deanship Ends

School of Engineering and Applied Sciences (SEAS) dean Venkatesh Narayanamurti announced on February 15 that he would relinquish the post in September, concluding a decade of service. He had intended to step down in 2006, but stayed on during transitions in University and Faculty of Arts and Sciences leadership to oversee the elevation of his unit's status from a division to a school (see "First Day of School" for Engineering, November-December 2007, page 74). SEAS faculty ranks increased by 50 percent during his tenure; graduate-student enrollment surged. Narayanamurti will return to teaching after a

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Venkatesh Narayanamurti

sabbatical; an advisory committee is being formed to assist in the decanal search.

Overseer Leaders

Roger W. Ferguson Jr. '73, J.D. '79, Ph.D. '81, former vice chairman of the Federal Reserve Board of Governors, will preside over the Board of Overseers for the 2008-2009 academic year. He succeeds former Vassar president Frances D. Fergusson, Ph.D. '73. Pauline Yu '71, president of the American Council of Learned Societies, becomes vice chair of the Overseers' executive committee, succeeding attorney William F. Lee '72.



Evelyn M. Hammonds

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Development(s)

Paul Keenan '85 has been appointed senior associate dean and director of development for the Faculty of Arts and Sciences (FAS). He succeeds Scott Abell '72, dean for FAS development, who is retiring at the end of the academic year. Linda Fates becomes associate dean for resource development for the School of Engineering and Applied Sciences. And a quartet of senior development officers has been formed into a new high-level University Principal Gifts Team: Roger Cheever '67, M.L.A. '77, associate vice president; Charles Collier, M.T.S. '73, senior philanthropic adviser; Joe Donovan '72, director; and Shirley Peppers, director.

Currier Captains

An expert on primate behavior and human evolution, Richard Wrangham, Moore professor of anthropology, and Elizabeth Ross have been appointed master and co-master, respectively, of Currier House, effective July 1. The couple, who have three children, have worked extensively in Uganda, where Wrangham founded the Kibale Chimpanzee Project and Ross is executive director of the Kasiisi Project, which supports primary schooling.



Elizabeth Ross and Richard Wrangham

COURTESY OF RICHARD WRANGHAM

Just a month before FAS acted, the National Institutes of Health (NIH) announced that it would become the first major research *funder* with an OA mandate. Its previous voluntary policy led to participation rates that hovered "between 4 and 7 percent," explains Alexa McCray, deputy director of Harvard Medical School's Countway Library. (Because the NIH doesn't make grants to individuals except through their institutions, the institutions will be responsible for tracking authors' compliance with the new policy.) That policy requires that publicly funded papers be placed in PubMedCentral, an OA repository of full-text articles, says McCray. She adds that pending legislation would require all federal funding agencies with grant budgets in excess of \$100 million to adopt a policy similar to NIH's—making the Harvard move seem prescient indeed.

The director of MIT's library, Anne Wolpert, calls the FAS open-access policy "bold and visionary"—a collective action that "allows Harvard to support its faculty." Under the current system of scholarly publishing, she says, faculty members' intellectual content is "freely donated to private ownership."

Race in a Genetic World

"I AM AN African American," says Duana Fullwiley, "but in Africa, I am white." To do fieldwork as a medical anthropologist in Senegal, she says, "I take a plane to France, a seven- to eight-hour ride. My race changes as I cross the Atlantic. There, I say, '*Je suis noire*,' and they say, 'Oh, okay—*métisse*—you are mixed.' Then I fly another six to seven hours to Senegal, and I am white. In the space of a day, I can change from African American, to *métisse*, to *tubaab* [Wolof for "white/European"]. This is not a joke, or something to laugh at, or to take lightly. It is the kind of social recognition that even two-year-olds who can barely speak understand. '*Tubaab*,' they say when they greet me."

Is race, then, purely a social construct? The fact that racial categories change from one society to another might suggest it is.

But now, says Fullwiley, assistant professor of anthropology and of African and African American studies, genetic methods, with their precision and implied accuracy, are being used in the same way that physical appearance has historically been used: “to build—to literally *construct*—certain ideas about why race matters.”

Genetic science has revolutionized biology and medicine, and even rewritten our understanding of human history. But the fact that human beings are 99.9 percent identical genetically, as Francis Collins and Craig Venter jointly announced at the White House on June 26, 2000, when the rough draft of the human genome was released, risks being lost, some scholars fear, in an emphasis on human genetic difference. Both in federally funded scientific research and in increasingly popular practice—such as ancestry testing, which often purports to prove or disprove membership in a particular race, group, or tribe—genetic testing has appeared to lend scientific credence to the idea that there is a biological basis for racial categories.

In fact, “There is no genetic basis for race,” says Fullwiley, who has studied the ethical, legal, and social implications of the human genome project with sociologist Troy Duster at UC, Berkeley. She sometimes quotes Richard Lewontin, now professor of biology and Agassiz professor of zoology emeritus, who said much the same thing in 1972, when he discovered that of all human genetic variation (which we now know to be just 0.1 percent of all genetic material), 85 percent occurs *within* geographically distinct groups, while 15 percent or less occurs *between* them. The issue today, Fullwiley says, is that many scientists are mining that 15 percent in search of human differences by continent.

Last October, Fullwiley and colleagues from 14 academic institutions around the country articulated some of their concerns about ancestry testing in *Science* magazine. More than half a million people have paid between \$100 and \$900 for such tests, and for some—those seeking to establish membership in a Native American tribe poised to open a lucrative casino, for example—the stakes can be high. Unfortunately, the *Science* authors noted, the tests have serious limitations.

Most tests focus on just two types of

DNA: the paternally inherited Y sex chromosome that only men carry, and mitochondrial DNA, which is passed exclusively from mothers to their children. Scientists favor these markers with good reason: because only one parent can pass them to offspring, they are not subject to recombination, the reshuffling of genetic data that normally occurs in each generation. But they represent less than 1 percent of a subject’s DNA, and each tells about only one ancestor per generation. Two generations back, a customer might learn about one of four grandparents; three generations back, about one of eight great-grandparents; and by 10 generations back (roughly 250 years ago), such genetic tests reference just one of the 1,024 ancestors in that generation. It doesn’t take long to reach the point when, mathematically, a person’s ancestors start to outnumber the sum total of all people who have ever lived.

Nor can genetic tests verify a person’s race or ethnicity. Genes that affect skin pigmentation or blood proteins involved in malarial resistance, the authors note, may not measure direct and unique ancestry (for example, a founder effect), but reflect instead an evolutionary response to “shared environmental exposures.” Furthermore, the tests are based on comparisons to databases of DNA from living populations, and are therefore vulnerable to “systematic bias” because of “incomplete geographic sampling” or the fact that “present-day patterns of residence are rarely identical to what existed in the past.” One testing company even uses an underlying model that “reinforces the archaic racial view that four discrete ‘parental’ populations (Africans, Europeans, East Asians, and Native Americans) existed in the past” even though “there is little evidence that four biologically discrete groups of humans ever existed....”

Recently, Fullwiley’s concerns have centered on a new kind of genetic testing. For a substantial fee, companies such as 23andMe will “tell you what your propensity is for hypertension, schizophrenia, breast cancer, lactose intolerance, and high or low IQ,” she says. But the studies that have established links between genes and these outcomes are probabilistic, she says, and convey, like ancestry tests, what might be called a false precision. Except

for known Mendelian traits or conditions (such as Huntington’s disease) only a fraction of people with a gene variant linked to a disease actually become ill.

Lost in the discussion about genes, she fears, are “epigenetic” influences: factors that affect gene expression but are not part of one’s genetic code, such as prenatal nutrition (which may influence rates of heart disease late in life). Such biosocial factors—environmental, cultural, and economic—can sometimes be more influential than genes. Fullwiley questions, for exam-

Duana Fullwiley



ple, if the prevalence of diabetes among Native Americans on reservations, or of asthma among U.S. Latinos, is only genetic. Her research in Senegal has reinforced that doubt. Scientists have long searched for a genetic difference that would explain why many Senegalese experience a relatively mild form of sickle cell disease. Fullwiley’s work suggests that many of them may instead be mitigating their symptoms with a widespread cultural practice: phytotherapy—the ingestion of roots from a plant that, preliminary studies suggest, triggers production of fetal hemoglobin, a blood-cell type that doesn’t sickle. “When environmental history, or evolu-



tionary history, gets reduced to racial or ethnic difference," she says, "that's a big mistake."

NOT ALL genetics projects are so potentially divisive, however. In February, Spencer Wells, Ph.D. '94, a former Lewontin student, came to Harvard to tell a story of human connectedness. Wells, who heads the joint National Geographic Society-IBM nonprofit Genographic Project, spent an afternoon with student members of the Harvard Foundation, which represents 72 student organizations "from the Albanian Society to the Vietnamese Society," says director S. Allen Counter. Wells had previously invited the students to participate in the Genographic Project by sending in cheek swabs with their DNA for analysis. "The idea," says Counter, "was to show a diverse group of students how they connect to the rest of humanity."

Wells has created a human family tree that traces "the journey of man" (as he titled his 2002 book) in populating the entire planet from a homeland in Africa. The project has used linguistic and genetic studies to guide its sampling of indigenous populations from around the globe—many of them isolated and remote—and now has the world's largest and most representative anthropological database of human DNA.

At Harvard, a Pakistani-American student whose family had always told her they were originally from an area near the Arabian Sea had this confirmed by her DNA result. "Your family was part of the first mi-

Spencer Wells tells student volunteers of the Harvard Foundation about their deep ancestors' ancient migrations.

gration out of Africa," noted Wells. "You share that with the Australian aborigines." An African-American student with ancestors from East Africa carried a genetic signature characteristic of that region. But an Asian-American student was surprised to find that she carried almost the same genetic markers as a Mexican-American student. Wells explained, "There is only one change, but you are fairly different because your lines diverged a long time ago. Still, you are part of the same branch of the tree": the Native Americans who populated the Western Hemisphere originally came from Asia.

The Genographic Project aims to tell people "where their ancestors were living as indigenous people" at different points in time, but can't, for example, tell most African Americans precisely where in Africa they are from because, Wells explains, "the database isn't quite there yet." Echoing Fullwiley's reservations about all such tests, he says he's "a bit concerned

about some of the African-American DNA testing companies purporting to trace you back to your ancient tribe." Ancestry is actually *more* complex for the average African American, he says, not only because people in West Africa (where most of the slave trade occurred) have moved around a lot in the last 500 years, but also because "group composition within Africa has changed over time." Furthermore, because only a small number of humans survived the journey out of Africa some 50,000 years ago (and the slave trade on that continent was relatively localized), "there is more diversity in the average African village," Wells notes, "than there is outside of Africa combined."

WHEN ASKED about the question of race, Wells's answer was unequivocal. "Racism is not only socially divisive, but also scientifically incorrect. We are all descendants of people who lived in Africa recently," he says. "We are all Africans under the skin." The kinds of differences that people notice, such as skin pigmentation, limb length, or other adaptations are "basically surface features that have been selected for in the environment. When you peer beneath the surface at the underlying level of genetic variation, we are all much more similar than we appear to be. There are no clear, sharp delineations."

Markers, Male and Female

GENETIC TESTS HAVE LIMITS, even as tools for tracing ancient migrations. Because men don't move around as much as women do in patriarchal societies—contrary to popular belief, says Spencer Wells, Ph.D. '94, who heads the joint National Geographic Society-IBM Genographic Project—the Y chromosome is the best marker for charting migration patterns until it dead-ends about 60,000 to 90,000 years ago in one man who lived in Africa. To trace earlier migrations, scientists use mitochondrial DNA, which passes exclusively from mother to child. That trail leads back 200,000 years to one woman. The striking difference in the time frame, Wells notes, reflects the fact that, historically, "most women have an opportunity to reproduce, but only a few men do"—and thus a more diverse sampling of the earliest female human lineages has survived.

Wells says genetic evidence "tells us something about the who, the where, the when. But to make sense of the how and the why (which is the fun part), you have to draw in archaeology, anthropology, paleoclimatology, linguistics—all these other fields." Climate shifts have been an important factor, though not the only one: he's recently turned up a genetic impact of the Crusades on the gene pool of the Middle East. "We can actually trace Christian lineages in Lebanon back to source populations in Europe," he says. "That sort of resolution has never been possible before because we didn't have a large enough sample size."

Fullwiley's own ethnographic research among genetic scientists suggests that much of current medical genetics may reinforce ideas of racial difference. Because certain diseases occur at higher frequencies in some populations (sickle cell anemia in blacks, Tay-Sachs disease in Jews of eastern European ancestry), they have become linked to the idea of race, even when the disease does not result from common ancestry. Sickle cell trait, for example, has arisen independently in several populations as an evolutionary response to malaria. The genetic change appeared first in India and then in Africa; it is also found in Greeks and Italians. But in the United States, Fullwiley says, sickle cell trait is very much linked to African-American racial identity through the history of medicine.

She says the potential for racialization of medical genetics has been institutionalized because "you can't get a grant from the NIH unless you recruit in racial groups, label people by census category, and then report back the data in terms of outcomes by racial type." The original intent—to counter the widespread use of the white male body as the working research norm—is "fine and good," she says, but there "ought to be some flexibility to these race categories, and some thinking about what they mean. This new construction of race...is socially inflected—but it is not *solely* a social construct because biology is front and center."

Prescription: Music

NOWADAYS, no one from Faulkner Hospital bothers Stephen Wright '64 on Thursday nights. But when he joined the Longwood Symphony Orchestra (LSO) in 1993—before he became Faulkner's chief of medicine and could pick his hours—he kept a pager on his belt during rehearsals. If it went off, he had to put down his bassoon and take the call. Sometimes, after the three-hour rehearsal, he went back to the hospital instead of going home. "I maintain that you make time for what you want to do," he says. "And I really want to do this."

Wright wasn't the only one to bring a pager to rehearsals. A group of

Yesterday's News

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

1928 Following Harvard's first spring reading period, the College Library reports about 650 more visitors than in the previous year.

1933 In response to a *New Yorker* article which "describes the lamentable decrease of hurdy-gurdies licensed by the city of New York," the *Bulletin's* editors cite the welcome increase in street performers and the variety of street music in Cambridge.

1938 After noting that Harvard appears to be the first institution of higher learning to enter into a contract with a national labor union, the *Bulletin* reports that nine employees' units have participated in perhaps the first official election to determine the bargaining agent between a university and its workers.

1958 Upon the recommendation of the chairman of the University's Board of Preachers, the Harvard Corporation has voted to permit Memorial Church to be used on certain occasions for private, non-Christian

ceremonies that are conducted by officials of other religions.

1963 What begins in the Winthrop House courtyard as a prank by 20 or so Radcliffe students "hotly perpetrating the first Great B.V.D. Raid in Harvard history" (according to the *Bulletin's* undergraduate column) escalates into a riotous event involving close to 2,000 undergraduates and onlookers by the time the action reaches Harvard Square. The shouting, chanting masses finally disperse at the Radcliffe Quad. No Radcliffe women are officially penalized, but five Harvard men spend the night in jail.

1983 Student activists have set up "E for D," the Endowment for Divestiture, and are urging seniors and alumni to send their class-gift contributions to its escrow account rather than to Harvard until the University adopts a policy of complete divestiture of its South African holdings or until the UN lifts its economic sanctions against that country's apartheid regime.

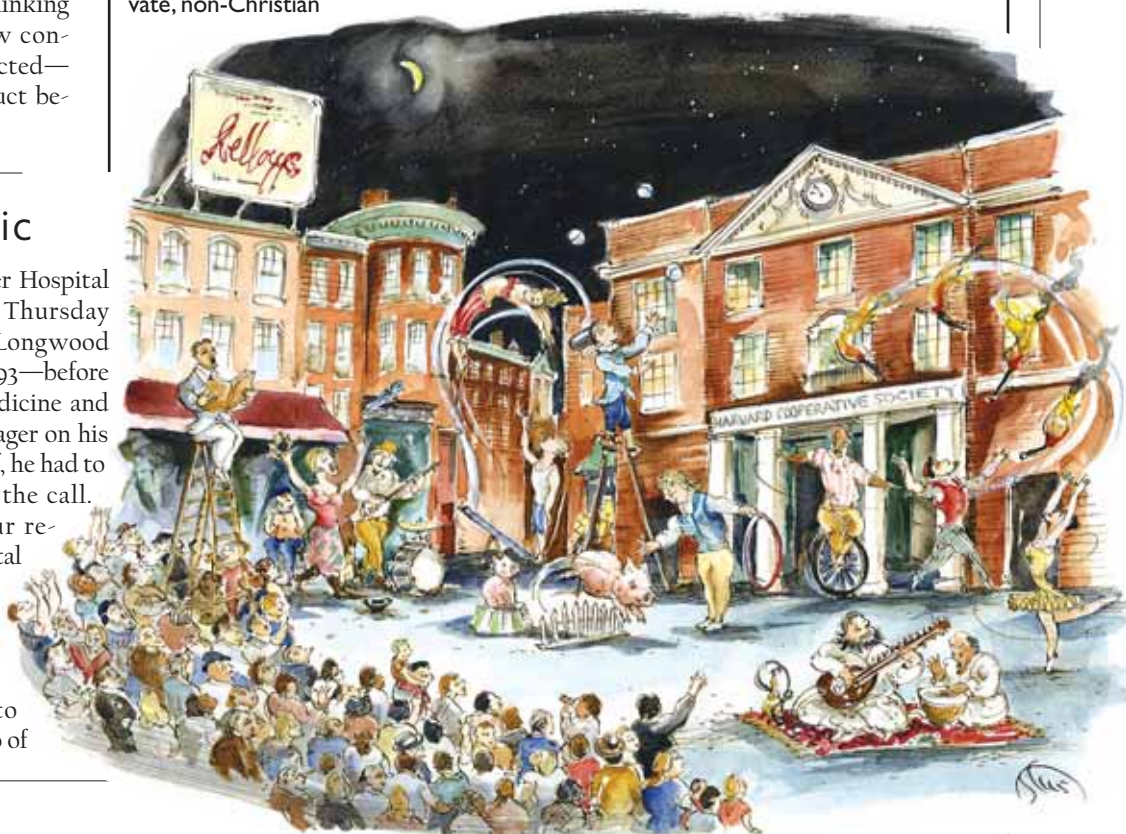


Illustration by Mark Steele

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Scanning the Social Sciences

Letters have gone out inviting senior faculty members from across the University, nominated by the deans of their respective schools, to participate in planning for a broad review of the way Harvard handles the social sciences. The list of participants is not yet final, but a recent conversation with University provost Steven E. Hyman offers a preview of the committee's purpose and the work that lies ahead.

The review will proceed along lines similar to those followed in the natural sciences, where a review that began in 2006 is now moving from goal-setting to implementation (see "For Science and Engineering, New Life," March-April 2007, page 65). But Hyman, a neurobiologist, warns that this isn't as easy as mapping the previous process onto the social sciences. "Frankly," he says, "the natural sciences are simpler. It's really four schools—arts and sciences, engineering, medicine, and public health. The social sciences are far more complex. Every school at Harvard, arguably, is engaged in the social sciences."

In the natural sciences, Hyman adds, independent developments such as the biotech boom and stem-cell research have driven collaboration across disciplines. The social sciences, absent such forces, have not gone so far down that path. It also hasn't helped, he says, that social-science methodologies "differ enormously from the qualitative and ethnographic to highly quantitative."

But crossing these boundaries is both inevitable and necessary, says Eckstein professor of applied economics David M. Cutler, dean for the social sciences in the Faculty of Arts and Sciences (FAS), who has already signed on to the nascent working group. For most social scientists, says Cutler, a deep understanding of a single field no longer suffices. In his own case, he has had to learn about aspects of medicine and public policy in order to study the economics of healthcare. In his course on health policy, he uses readings from the *New England Journal of Medicine* or, he says, "from whatever discipline happens to have someone who wrote a nice paper."

Yet Cutler suspects that if he showed his research to economists trained 40 years ago, "they would look at it and say, 'I have no idea what this person is doing.'" The configuration of academic departments—in some cases, set up more than 100 years ago—does not reflect the new reality, he explains. The departments are still important, but a structure for coordinating between them is also necessary.

Harvard's historic decentralization can hold back interdisciplinary connection, says Cutler. For instance, it would make sense for him to teach at Harvard Medical School (HMS), and for HMS health-policy scholars to teach or co-teach courses offered through FAS, the Harvard School of Public Health (HSPH), or the Harvard Kennedy School (HKS). But because each professor's paycheck comes from his or her specific faculty, he says, "we're not very well set up to deal with that at the moment."

Facilitating boundary crossing is a high priority for President Drew Faust. In a letter to the Harvard community at the start of the academic year, she wrote of her wish for Harvard to become "a university known more for bridges and less for walls." In this vein, the provost's office has become the nerve center for University-wide initiatives in the natural sciences, the arts, and now, the social sciences.

As a model of successful coordination, Hyman cites the interfaculty initiative in health policy. That initiative encompasses a Ph.D. program within FAS, with joint programs through HMS and Harvard Law School (HLS); a secondary concentration for undergraduates; a postdoctoral program; and a program that aims to use Harvard scholars' knowledge to improve the quality of healthcare in eastern Massachusetts. The initiative gets funding from six faculties; its director, Joseph P. Newhouse, holds appointments at HMS, HKS, and HSPH.

And as an example of what should *not* happen under the new approach, Hyman points to the field of human rights, where HSPH has the François-Xavier Bagnoud Center for Health and Human Rights; HKS has the Carr Center for Human Rights Policy; and HLS has its own Human Rights Program. As executive director of the University Committee on Human Rights Studies—"an awkward overlying planning committee," in Hyman's words—Jacqueline Bhabha "has done a brilliant job," he says, "but it's exhausting."

With a University capital campaign on the horizon, creating a wish list for fundraising will be a primary goal for the review. But the eventual recommendations may not all require money. Cutler, for one, believes Harvard already possesses many of the resources needed to increase effectiveness in the social sciences. "If you've got butter and sugar and flour and eggs," he says, "I think you ought to bake a cake."



Steven E. Hyman

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David M. Cutler

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The Longwood Symphony Orchestra performs at Jordan Hall.



music lovers at the Longwood Medical Area (ranging from students to doctors to chaplains) founded the group in 1982, and about 85 percent of the orchestra's members still work in healthcare. That doesn't surprise its president, Lisa Wong '79, who used to play her violin in both the Harvard-Radcliffe and Bach Society Orchestras. "The kind of dedication and precise training you need to get as a musician," she says, "translates well into the dedication and precise thinking you do as a medical professional."

Wong joined the group shortly after its inception, but by 1991 she and a number of other members felt that simply showing up once a week to play music "didn't seem to be enough." The LSO therefore decided to organize a symposium with the Boston-based Albert Schweitzer Fellowship, which was launching a program to send medical students to underserved areas of the United States. The two-day event included panel discussions on HIV/AIDS and domestic violence, and culminated in a concert featuring the LSO and cellist Yo-Yo Ma '76, D.Mus. '91. For further guidance the group turned to Jonathan McPhee, a sometime guest conductor who was then music director for the Boston Ballet. "When I first came into contact with them, they were just a bunch of doctors playing together for fun," he remembers. "But whenever you've got that many Type-A people in a room, you're going to have growth."

The orchestra now partners with non-profit medical organizations for each of its four yearly concerts. (The nonprofit groups buy discounted tickets and then sell them to earn the difference; concertgoers also can, and do, make larger donations.) To date, the LSO has raised hundreds of thousands of dollars for more than 25 organizations, including the March of

Dimes, St. Jude Children's Research Hospital, and the Boston Health Care for the Homeless Program.

In 2004 McPhee agreed to become the LSO's conductor (in addition to his Boston Ballet job). "When I took the group on,"

he says, "it was really because I believe in the good work they do in the community and I felt I could help them continue to build their model." The American Symphony Orchestra League recently took note, too, and gave the LSO the 2007

MetLife Award for Excellence in Community Engagement.

This summer, about a third of the group's 125 members will tour in England, and Wong dreams of someday taking the orchestra to a developing country where the doctors and therapists could practice both their hobby and their professions.

"Sometimes you're in a scurry over at the hospital, trying to get to rehearsal, and you wonder if it's worth it," says Wright. "But then you get there for five minutes, and yup, it was."



Visit harvard-mag.com/extras to listen to the Longwood Symphony Orchestra CD, "The Sounds of Healing."

Connecting with China

CHINA DISORIENTS the visitor. The scale and bustle of its cities—propelled by the greatest economic growth and urban migration in history—overwhelm. The currency features Mao's likeness, but new luxury apartment towers have displaced commoner housing all around the site of this summer's Olympics in his capital city. The ubiquitous advertisements for Western consumer goods in Shanghai symbolize openness to the world, but during the March protests in Tibet, *China Daily* duly reported overseas Chinese students' outrage at purported distortions by "the Western Goebbels' Nazi media." Along a Shanghai thoroughfare near the "Cowboy Boot Bar," laundry dries on bamboo poles extended from balconies to the passing telephone wires; at street level, a retailer's lingerie display would make Victoria's Secret close the curtains.

Perhaps it should not surprise that such contrasts, arising within a generation of the Cultural Revolution, can disorient the Chinese, too. Under the twin pressures of the one-child policy and the migration of 150 million rural workers to urban jobs (with a quarter-billion more expected to follow within 20 years), traditional, extended families have shrunk. Frantic growth and projects like the Olympics have uprooted whole communities and created new ones; what

will it mean for the way people live, for instance, as 97 new airports open by 2020?

During a recent visit, some of these issues were tackled by alumni and fellows who have spent time in Massachusetts, by Harvard faculty members and their academic partners in China, and by panelists at the Harvard Alumni Association's (HAA) conference in Shanghai (March 28-30). They also looked deep into China's history, analyzed its present challenges, and tried to support its pursuit of a more fulfilling future for its 1.3 billion people.

THE STATISTICS in official accounts of every aspect of China's transformation obscure as much as they explain. The pace and scope of change demand the telling of individuals' stories, of neighborhoods enduring the whirlwind—the tools of social anthropology. But that discipline has scarcely existed in the Chinese academy, apart from ethnographies of minority groups within the People's Republic.

Now, Pan Tianshu,



Ph.D. '02, one of perhaps a dozen western-trained social anthropologists in the country, is pioneering the field. Trained by faculty members including Rabb professor of anthropology Arthur Kleinman (who has worked in China since 1978 and in Taiwan the prior decade), Pan described how he inserted himself into one of Shanghai's "lower quarter" neighborhoods. His dissertation details the effects of the "unemployment scheme" that stripped state-enterprise jobs from "work-unit persons" during China's economic reforms. In response, they began besieging the official neighborhood organizations, once organs of social control, for job aid and welfare.

These same marginal city dwellers—once Mao's vanguard class—saw their neighborhoods targeted for clearance and redevelopment. Pan said that their initial embrace of the promise of better housing was followed by mourning for the loss of community, and ultimately anger at inadequate compensation. More generally, he said, the residents have suffered from a "change of time-space," a "compression" of their lives and the city's meaning for them.

Now an assistant professor at Fudan University's School of Social Development and Public Policy—itself created only in 2004—the energetic Pan is in a hurry to bring such qualitative, human-

istic research into China's more technocratic, quantitative academic mainstream. (The importance of doing so *throughout* China's higher education system was a principal theme of the HAA keynote address by Geisinger professor of history William C. Kirby, director of the Fairbank Center for East Asian Research. He observed that for centuries, imperial China's examination system brought the most accomplished humanists into high state service precisely because they were broadly learned, *not* because they were experienced administrators or—as are most current senior leaders—engineers.)

Pan teaches four courses per term and edits authorized translations of exemplary American works. Among them are books by mentors Theodore Bestor, professor of anthropology; senior lecturer Rubie Watson; and Kleinman, whose *What Really Matters* contains a shattering portrait of a doctor whose life was all but destroyed during the Cultural Revolution and by repeated personal betrayals. Thus Pan introduces a new perspective into China's contemporary discourse on itself.

PAN'S ACADEMIC WORK touches on other broad changes in Chinese life. Not only work and neighborhood but family have been redefined. During President Drew Faust's visit to Shanghai No. 3 Girls High School (where a student greeted her, "Good afternoon, respectable president"), she listened as a student explained the appeal of extracurricular groups: "We are the only child in the family, so we seldom have the chance to organize such big programs." Faust said that Chinese students at Harvard had told her "how much they felt they were the prod-

uct of being only children."

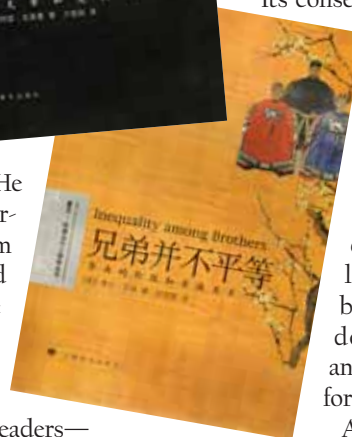
Across the society, Pan said, citizens refer to the "four-two-one" family (grandparents, parents, child), an abrupt shift from the past resulting from the strict family-planning policy.

Its consequences range from altered family experiences to China's looming rush toward the uncertain demographics of hundreds of millions of elderly citizens—living longer, but bereft of traditional domestic supports and as yet unprovided for in other ways.

Amid so much rapid dislocation, Chinese experts report more mental-health problems: depression, pervasive anxiety, drug abuse, eating disorders, even Internet addiction. There is also greater willingness, at least in urban centers, to recognize and address such challenges—best symbolized by the new Shanghai Mental Health Center (SMHC), a treatment and teaching complex considered the standard-setter for China. The 900-bed facility, and a larger unit where geriatric, rehabilitation, and combined mental-infectious-disease cases are cared for, now handle more than 4,000 hospitalizations and a third of a million outpatient visits annually, according to Xu Yifeng, professor of psychiatry and incoming chair of the Chinese Psychiatrist Association.

In China, proposed national legislation on mental illness has been through 10 drafts since 1985 but remains unadopted, and medical training is less specialized than in the United States, so fellowships for one or two professionals annually to study at Harvard have played a significant role in educating SMHC's staff members, and in advancing care. (Xu was one of the first such fellows, in the late 1990s.) In a group meeting with several former fellows, center president Xiao Zeping emphasized, "All the candidates come back as a master of the hospital," prepared to lead a unit or department.

She said of her colleagues that the Free-



Above: Translations of works by Harvard scholars Arthur Kleinman (top) and Rubie Watson, edited by their former student Pan Tianshu. Below, Peking University students Zhou Jia and Liu Jiang, and Professor Deng Xiaonan, are part of an international consortium transforming the study of Chinese history.



Green Goals

A new task force, appointed by President Drew Faust on February 27, will examine Harvard's greenhouse-gas emissions and recommend University goals for reducing them; it is to report by the end of the academic year.

Brooks professor of international science public policy and human development William C. Clark is chair; Thomas Vautin, associate vice president for facilities and environmental services, is vice chair. Details about the task force mission and its membership are available at www.news.harvard.edu/gazette/2008/02.28/99-sustainability.html.

Endowments Profiled

Harvard reports that just 17 percent of its \$34.9-billion endowment is truly unrestricted by donors. For Stanford and Princeton (which posted their reports on line; Harvard did not), the comparable proportions are nearly 25 percent and "approximately 30 percent." Those were among the interesting tidbits revealed in February, when more than 100 universities and colleges responded to queries from U.S. Senate Finance Committee members Max Baucus and Charles Grassley concerning the size, growth, management, and use of their endowments. The senators have been exploring whether the institutions' spending policies and financial aid are, in their view, consistent with recent strong endowment growth and tax-exempt status—perhaps with an eye to legislating mandatory annual payouts of 5 percent or so.

Life-Sciences Shortfall

Harvard and six other research institutions have published "A Broken Pipeline?" (www.brokenpipeline.org), a report on the consequences for science of five years of flat funding for the National Institutes of Health, the principal source

Brevia



THREATENED TREASURES. Many rare drawings, posters, and archived documents from the Harvard Theatre Collection as well as Houghton Library holdings were damaged when a large drainpipe ruptured in Pusey Library during heavy rain on the night of March 8, sending more than 500 gallons of water into the stacks. Thomas Horrocks, associate librarian for collections at Houghton, surveyed preservation efforts (above); the destruction would have been worse had the Harvard College Library not arranged for security staff to conduct extra checks of the stacks following weekend flood-watch warnings from the National Weather Service.

of grants for biomedical research. On March 11, President Drew Faust, the Johns Hopkins medical-school dean, and an Ohio State biologist, testified about the problem before the Senate Committee on Health, Education, Labor, and Pensions. Young researchers, Faust said, "see a future defined by new limits—not in ideas, energy, intelligence, or enthusiasm—but in opportunity." If not corrected, "[O]ur position as the primary destination for the best and brightest researchers from around the world may be challenged." One example of that challenge emerged a week earlier as Berkeley, Stanford, and the University of Texas each signed multimillion-dollar agreements with King Abdullah University

of Science and Technology—opening in Saudi Arabia in 2009—to help it recruit faculty members and collaborate on research; one attraction is the new institution's \$10-billion endowment, which promises ample research funds. In the

United States, the Howard Hughes Medical Institute pledged \$300 million to underwrite the early research of 70 promising young biomedical faculty members nationwide.

Nota Bene

PRICE CHECK. Harvard College tuition, room, board, and fees for 2008-2009 will rise to \$47,215, an increase of 3.5 percent (compared to last year's 4.5 percent increase). Need-based schol-

arship aid will grow substantially—by 21.4 percent—to \$125 million. Princeton raised its term bill 3.9 percent, while Yale committed to an increase of 2.2 percent (in line with core consumer price inflation).

RENOVATIONS RECOMMENDED. The Faculty of Arts and Sciences (FAS) has begun planning a major renovation of the 12 undergraduate residential houses, a process that may take as long as 15 years. The condition of four Houses—Dunster, Leverett, Lowell, and Mather—has been assessed; the remaining eight will be evaluated during the next several months. FAS dean Michael D. Smith is appointing a House Program Planning Committee of faculty and staff members and students "to examine the mission and purpose of House life and to develop an architectural space plan for the House system."

TUITION TRIMMING. Complementing its loan-forgiveness program, Harvard Law School next fall will begin waiving third-year tuition (\$41,500) for students who commit to five years of work in government or nonprofit jobs after graduation. At Harvard Medical School, starting next year, students whose families earn less than \$120,000 a year will no longer have to make a parental tuition contribu-

tion, saving them an average of \$12,500 annually in their four years of study. The policy will affect just over one-third of current medical students.

NAME GAME. The Kennedy School of Government has rebranded itself the Harvard Kennedy School.

HISTORIANS HONORED. Historian of science and Graduate School of Arts and Sciences dean Allan M. Brandt has won the 2008 Bancroft Prize, the top professional honor for books in American history, for *The Cigarette Century: The Rise, Fall, and Deadly Persistence of the Product That Defined America*. Peter Silver '92, assistant professor of history at Princeton, also won, for *Our Savage Neighbors: How Indian War Transformed Early America*.

DISEASE DIGITIZED. Understanding of disease evolved dramatically with the advent of modern germ theory in the final third of the nineteenth century. Before then, individual susceptibilities—not disease-causing agents—were thought to drive many illnesses. A new University Library Open Collections offering, “Contagion: Historical Views of Diseases and Epidemics,” now examines in rich detail (500,000 pages of books, serials, manuscripts, and images) medicinal beliefs about miasmas, malign bad smells, and other issues (sin, for instance), while exploring cholera, smallpox, influenza, yellow fever, and more. Shown here: Fighting pneumonic plague in Manchuria. Access the collection at <http://ocp.hul.harvard.edu/contagion>. Other on-line archives cover working women and immigration to the United States; a collection of materials on Islam will appear in late 2008.



Allan M. Brandt

EXCELLENT ENGINEERS. Radcliffe Institute interim dean Barbara J. Grosz, Higgins professor of natural sciences, who investigates natural-language communication between humans and computers, has been elected to the National Academy of Engineering. Also elected were Frans A. Spaepen, Franklin professor of applied physics, for work on amorphous metals and semiconductors, and Zhigang Suo, Puck-



Zhigang Suo

ATHLETICS AND ADMINISTRATION. Faculty of Arts and Sciences executive dean Nancy Maull, FAS's chief administrative and financial officer for 15 years, stepped down at the end of February. On an interim basis, Nichols Family director of athletics Robert L. Scalise assumed those responsibilities; he formerly served in a similar capacity at Harvard Business School.

EDUCATING WOMEN ENTREPRENEURS. Harvard Business School is among 16 institutions working with Goldman Sachs & Company on the latter's \$100-million, five-year philanthropic effort to provide 10,000 women in developing countries with business and management skills. HBS will focus on training business school deans and senior faculty members in India to provide case-method training. See www.10000women.org for details.



Barbara J. Grosz



Frans A. Spaepen

ADVANCING FILM. The Faculty of Arts and Sciences has approved a new doctoral-degree program in film and visual studies (www.ves.fas.harvard.edu/gradprogram.html), the natural outgrowth of expanded faculty, facilities, courses, and student interest in visual images (see “Cinema Veritas,” November-December 2005, page 34).

POETIC PIQUE. Poking fun at the Faculty of Arts and Sciences for canceling two of its scheduled meetings and grappling with unpredictable attendance (which has prompted an exploration of decreasing the required quorum), the *Crimson* editorialized on March 10 in villanelle form, beginning: “The Faculty Council mused about its forum./Attendance at monthly meetings dwindled low./‘We think the problem must be with the quorum!’/‘We must not stoop to pressure or implore ’em./Who cares if professors never go?’” (For the complete verse, see www.the-crimson.com/article.aspx?ref=522404.)



Brian W. Casey

MISCELLANY. Faculty of Arts and Sciences associate dean for academic affairs Brian W. Casey, Ph.D. '00—a senior figure in recruiting new professors—has been appointed president of DePauw University, in Greencastle, Indiana, effective July 1....Harvard Extension School attracted 350 students worldwide for “Positive Psychology,” its largest distance-learning enrollment to date; the course was a smash in real life, too (see “The Science of Happiness,” January-February 2007, page 26)....James M. Poterba '80, chair of MIT's economics department, has succeeded Baker professor of economics Martin S. Feldstein as president of the National Bureau of Economic Research....The on-line social-networking site Facebook has hired Sheryl Sandberg '91, M.B.A. '95, who spent six years at Google, as chief operating officer. She reports to company founder Mark Zuckerberg '06, who dropped out to work on the enterprise....The Malkin Athletic Center has installed that must-have amenity for modern fitness buffs: satellite video service.



man Foundation Fellowships, coordinated through Kleinman in his Harvard Medical School (HMS) capacity—he is professor of psychiatry and professor of medical anthropology—and Fogarty Fellowships underwritten by the National Institutes of Health, “change their mentality and their knowledge.” The returning fellows, she added, “have a large influence on students, policy, and the culture”; several play significant roles in advising on China’s mental-health policies and care system.

Chen Jue, a 2004–2005 Fogarty Fellow, conducted research on eating disorders. After observing group therapy at Harvard hospitals, she introduced group-therapy techniques in her eating-disorders clinic at SMHC, and reports “much better success.” Cheng Wenhong, a vice professor, used part of her fellowship year, in 2003–2004, to observe at Children’s Hospital, before she established a clinic for adolescents.

Predating even the earliest exchanges for mental health were joint efforts to strengthen the foundations of modern public health in China. At Fudan University’s School of Public Health, near SMHC, Professor Chen Jie recalled studying at the Harvard School of Public Health (HSPH) in 1985–1986. Her focus then was on hospital management and health economics; today, she teaches graduate courses in hospital management and in the assessment of new healthcare technologies and practices. Her Ministry of Health-affiliated laboratory evaluates the efficacy of drugs, devices, and procedures proposed for use throughout China’s medical system (and advises on such topics throughout Asia).

Chen has chaired the Harvard affiliates of the Shanghai Overseas Returned Scholars Association, a role now passing to Qian Xu, the school’s vice dean. Qian studied maternal and child health at HSPH and Tufts in 1992–1993. Both speak passionately about their continuing contacts with colleagues in Boston and their strong desire to keep in touch more closely and regularly. Underscoring the point, SMHC’s Xiao said the center maintains relationships with dozens of academic institutions worldwide, but Harvard’s training role is the most extensive and important—of particular value because “the U.S. is the engine of the world”

Students at Shanghai No. 3 Girls High School performed traditional music for President Faust.

for the development of science.

MANY SIMILAR professional and academic ties, some directed at pressing new priorities, were evident throughout a week’s travel. On a weekday afternoon, a presentation on the nation’s truly alarming air pollution began at Tsinghua University, in northwestern Beijing. Seated at tables supplied with bananas and bottled water, with tea nearby, Chris Nielsen, Wang Yuxuan, and Mun Ho outlined the findings from *Clearing the Air*, the latest product of a multiyear, interdisciplinary collaboration between Harvard and Tsinghua’s department of environmental science and engineering.

The trio—Nielsen, executive director of the China Project at the School of Engineering and Applied Sciences; Wang, who will join the Tsinghua faculty after receiving her Harvard doctorate this June; and Ho, an economist who is a fellow at Harvard’s Institute for Quantitative Social Science—were presenting novel research. Theirs is the first detailed model of Chinese air pollutants by source (electrical power, mostly from coal; cement; steel; chemicals; and China’s burgeoning vehicle fleet), the health impact of each, and the effectiveness and costs of economic means (“green taxes”) to mitigate the problem.

Their audience was novel, too: not environmental scientists, but faculty and students from Tsinghua’s School of Economics and Management—people who will help shape China’s energy, environmental, and global-warming policies. In the ensuing discussion, none of the audience members undercut the researchers’ basic assumptions or market-based approach to pollution control. Rather, they questioned details of the scientists’ model, their

The HAA event attracted more than 600 people.

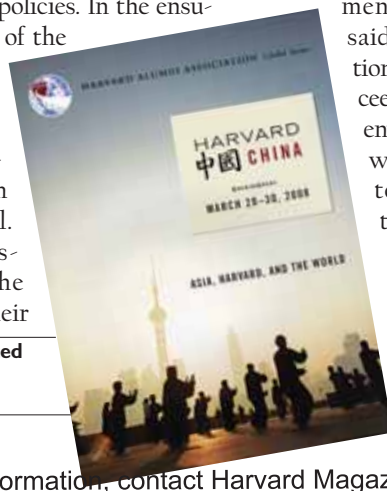


health data, and projections of economic impacts from various uses of green-tax revenues—points the Harvard speakers embraced as they seek to further refine their projections and demonstrate remedies for troubling pollution and global-warming trends.

Interviewed separately, Deborah Seligsohn ’84 underscored the sense that Chinese policymakers are addressing energy, environmental, and global-warming problems, to a degree not widely acknowledged in the United States. Seligsohn, who recently left the Foreign Service after 21 years so she could remain in Beijing and focus on the environment, now directs the World Resources Institute’s China program. The nation, she said, “is at this major overall inflection [point]....There is a new idea of what development means”—not just raw gains in output, but all the aspects of “creating what looks like an affluent society” in terms of citizens’ health, education, the physical environment, and income equality.

“That’s what they want,” she said of the leadership, whose ranks have recently broadened to include new disciplines and greater administrative experience; they have carefully embraced new goals as well (including such terms as “harmonious society” and the “scientific concept of development”). “What’s needed,” she said, “is more serious international action to help China succeed” in attaining its energy and environmental goals, beginning with American commitments to develop and deploy new technologies.

There are tangible signs of the kinds of changes Seligsohn identified. Tsinghua’s School of Public Policy and Management, established



in 2000, is busily educating administrators using a curriculum and case-teaching method developed in cooperation with Daewoo professor of international affairs Anthony Saich and Harvard Kennedy School (HKS) colleagues. (Saich, who also directs the University Asia Center, runs executive-education programs in the United States and China for public officials at all levels of the Chinese government.) During a recent morning class in the school's new master in international development program, associate professor Cheng Wenhao—a 2003 HKS fellow—led students from China, Ethiopia, Korea, South Africa, Taiwan, and Zambia through exercises in performance management for a police department and other agencies. Elsewhere, his colleagues were using sharply drawn case studies on such hard issues as public opposition to relocating the Beijing zoo, farmers' demands for price supports, and compensation for people displaced by redevelopment.

A few minutes away by taxi, at Renmin University of China School of Law, the country's largest, Wang Liming was advancing a two-front humanitarian agenda. As dean, he has established China's first legal center and clinic devoted to disabled persons. As a member of the National People's Congress, he is helping to develop a comprehensive revision of the 1990 law on "protection of disabled persons"—a landmark, but too generally worded to promote effective action.

In describing his work, Wang—a Harvard Law School (HLS) fellow in 1998-1999—cited Stimson professor of law William Alford, who directs the graduate legal program and international and East Asian legal studies at HLS. Alford has been involved with the Special Olympics for 30 years, and has extensive contacts in disability issues.

When Renmin convened a conference in early 2007 to seek diverse "suggestions about how to amend our law," Wang said, Alford helped invite experts from around the world. The conference proceedings have been published, in Chinese, by the school. Among the key participants was Ma Yu'e, deputy director-general and chief legal officer of the Chinese Disabled Persons' Federation (CDPF)—the intermediary between the state and disabled

citizens. She began drafting the amended law in 2005, and said it now incorporates strong language prohibiting discrimination and outlining government responsibilities toward disabled people. Alford has been a regular conduit of information to HLS and international experts, she said, particularly because "We did not know about the implementation or the cost to enforce the disabled people's rights."

While taking care to suggest that any policies must be China's own, Alford has been encouraged by the momentum building for reform of the disability law—and its wider implications. He has spoken about the CDPF as one form of representation for a citizenry who need many more such avenues to express their views and secure their rights.

Another of Alford's Chinese associates, Lu Zhian, associate professor at Fudan University Law School, has in fact added the study of disability to his expertise in international and human rights law. Although his students principally go into international business law, Lu said he had engaged them in rights questions, particularly as he coaches contestants in international moot court competitions, where rights issues frequently arise. He has drawn on wide public interest in recent, horrific legal cases, such as the forced sterilization of two institutionalized, mentally disabled girls when they began having painful menstrual periods. As Fudan-HLS student and faculty exchanges proceed, Lu said, he sees rising interest in the field.

A *China Daily* report that President Hu Jintao led a March 28 Politburo meeting on the need "to provide better welfare for the country's 83 million handicapped people" as a "major barometer of the progress of society and civilization" suggested that final legislation might indeed be near.

Conference proceedings and papers on disability law, published by Renmin University

ULTIMATELY, the paths China pursues will reflect its own history and interests. In a young country like the United States, it can be easy to forget the weight of a civilization that has persisted for millennia.

In a traditionally styled building on the northern edge of Peking University's campus, professor of history Deng Xiaonan and her graduate students are part of an international consortium that will make China's past accessible to radically fresh research and exploration. The China Biographical Database (CBDB), including the university, the Harvard-Yenching Institute, and the Academia Sinica (in Taiwan), is meticulously recording names, homes, writings, official positions, histories, family relationships, and other information on the tens of thousands of known Song dynasty figures (960-1279). Ultimately, it aims to extend forward and back in time to capture the records of hundreds of thousands of other documented scholar-officials.

Carswell professor of East Asian languages and civilizations Peter K. Bol, who leads CBDB's Harvard contingent, said that the historical record in total exceeds that available from any other civilization—and that when the records are computerized and opened to scholars worldwide, they will enable unprecedented inquiries into China's leadership and political and economic development over time. (This technological infrastructure will also fit neatly with the historical geographic information systems Bol has built separately with Fudan colleagues; see "Hello, Geotech," November-December 2006, page 44.) Liu Jiang and Zhou Jia, students who are doing some of the data entry, said they had already identified new research questions about the relationships among families, social groups, and members of the administrative elite. Professor

Deng, herself a Song specialist, said she imagined that "the method of history studies might be greatly changed" by the CBDB technology.

The stakes are not merely academic. Bol moderated perhaps the most animated of six panel dis-



cussions at the HAA “global series” conference at a modern hotel in the Pudong section of Shanghai. “Does Chinese Culture Have a Future?” engaged professor of East Asian languages and literatures Tian Xiaofei, historian Zhu Xueqin of Shanghai University, and philosophy professor Xu Youyu of the Chinese Academy of Social Sciences in a vigorous, bilingual critique of the government-sanctioned vogue for “national learning”—an attempt, most thought, to justify a particular Chinese path that would support an increasingly market-driven economy without the trappings of liberal democracy. In historical perspective, this reflects a huge reversal from Mao’s original proposition that China was caught in a cultural backwater, and had to be yanked into line with the universalist principles of modern Marxist-Leninist communism. Such debates echoed sharply across China from the dying days of the imperial government in the late 1800s throughout the twentieth century; in different forms, they still do today.

In her remarks at Peking University, where she received an honorary degree on

March 26, President Faust spoke of the sixfold increase in China’s higher-education enrollment during the past decade, and of the recognition that “knowledge and learning are as essential to human beings as food,” particularly as “we struggle to understand what it means to be human amid such disorienting shifts in our societies and our lives.” She spoke of education in the Chinese context as “illuminating one’s bright virtue.”

Whatever the differences in culture and circumstances, Harvard has been able to play a role in that illumination for a growing number of Chinese professionals and academicians—and increasingly the traffic is flowing in the other direction.

He Yanling—a Freeman Fellow at HMS in 1998-1999, now at Shanghai Mental Health Center as a clinician, psychiatry professor, and researcher investigating the need for mental-health care—compared her Chinese education to “feeding the Beijing duck”: force-feeding of knowledge and facts. Harvard, she found, was “totally dif-



President Xu Zhihong of Peking University confers an honorary degree on the visiting President Faust in Beijing on March 26.

ferent.” Faced with the challenge to “stimulate your thinking,” she said, at first she found “my brain was very quiet.” But soon she discovered herself exchanging views with colleagues in elevators, reveling in the library collections, and learning how to collaborate in designing research projects. The whole experience “opened my mind, opened my eyes. That was the most exciting thing to me.” Brief though her fellowship was, He said, “It changed my view of medicine.”

—JOHN S. ROSENBERG

THE UNDERGRADUATE

Getting My Feet Wet

by LIZ GOODWIN '08

I REMEMBER MANY THINGS from my cousin’s wedding—my poofy bridesmaid’s dress, the humidity, how pretty the small church looked during the ceremony—but most of all, I remember the guests’ advice, bestowed with drawled urgency, about how to survive in New England. It was the summer before my freshman year of college, and my relatives (from my mother’s 100-percent-Texas side of the family) were anxious to help me avoid the pitfalls of living in an arctic, Yankee-filled part of the country, referred to simply as “up there.” Many of them were impressed that I was going away to Harvard, but that was not the point. The point was that I was venturing off to a far-away land, where I knew none of my future

classmates and was unprepared for the conditions that awaited me.

The night before the wedding, many of us were sprawled about on deck chairs next to the hotel’s pool. A distant cousin approached me and sat down.

“Have you heard about the bugs?” I replied that I had not. “They have enormous bugs up there—big as softballs! They fly into your clothes and bite you. Don’t ever leave the house without some strong bug spray on.” After this advice was dispensed, my cousin leaned back into the deck chair and took a sip of his beer. “You should talk to Bill, though,” he added, mentioning a distant relative by marriage to whom I had hardly ever spoken. “He lived up there for a couple of years.”

I had no intention of seeking out more terrifying counsel, but, Bill, it turned out, found me anyway. After exhausting the subjects of the size of the wedding party, the quality of the food, and the humidity of the day, Bill turned to my precarious future in Massachusetts.

“I only have one thing to tell you, kid.” I waited in suspense, hoping to hear nothing more of enormous insects. “Never—and I mean never—get your feet wet.”

I looked at him expectantly, but Bill seemed finished talking.

“Don’t get my feet wet? Like when I go swimming?” I asked.

“Don’t get your feet wet, period! You know what I used to do? I used to put both of my feet in Ziploc bags, then put my socks on, then put my shoes on,” he said. “That’s the only way to guarantee your feet will remain dry. Do what you have to do. Just don’t get them wet.”

The rest of the weekend passed in a blur of photographs, dancing, and feasting. But a vague sense of foreboding accompanied me as I drove home with my parents that Sunday. My anxiety at the prospect of

leaving my hometown and family seized on my relatives' dramatic warnings, even though they would have made me laugh in other circumstances. Neither of my parents detected my unease, which quickly dissipated in the excitement of planning my departure. In a few weeks' time I was packed up and ready to go, the memory of

ize what I saw as my apartness from the smoother, more sophisticated people who surrounded me.

For most of my first year, I defined myself against Harvard and the people I categorized as a part of Harvard; it was a reassuring way of remembering who I was and reminding myself that I belonged

"these people" for a few years: adapt to, yet not take on, their bizarre customs.

By the end of my freshman year, however, my plan of autonomous survival had become more complicated. I had learned to use stories from my hometown to amuse my peers, and to define a more comfortable spot for myself among them. I told my classmates about the high-school parties we had in empty pastures, or about friends my age who had married or had children, or about an acquaintance's antiquated (and in Cambridge, even foreign-seeming) prejudices or beliefs. It did not exactly feel treacherous, since I often laughed at those things myself when I lived at home.

But in laughing at the very background that I wanted so desperately to define myself by, I also gained distance from it. I noticed that my slight drawl had disappeared, leaving only the word "y'all" and nothing else. I no longer viewed people who ridiculed less sophisticated and less urban swaths of America as irreconcilably different from me. The "Texas Girl" identity I had chosen no longer fit as snugly, much like the roomy winter coat I bought in a rushed trip to the mall in October. I suppose that, despite being warned, I had gotten my feet wet, and there was no going back.

HAVING INTEGRATED much of my experience in "Yankee-country," it became difficult to cross over between home and school. Instead of a welcome respite, being back in Texas felt like a strange species of limbo.

A party at a friend's house during Christmas break only underscored my in-between state. Because almost everyone there attended a major state college or was still living in our hometown, the guests were all intimately involved in each other's lives, as if high school had never ended. At this party, relationships strengthened or weakened, subtle hierarchies formed and reformed, and a few people's semester-long romantic hopes were realized or dashed. Everyone else seemed so inextricably connected to each other in webs of familial, romantic, or social involvement, yet I felt completely apart—like an out-of-towner who has wandered into a party by mistake. A few friends



my relatives' warnings long faded. Yet into a small inside pocket of my biggest suitcase, I slipped a precautionary container of bug spray.

INSTEAD OF SCARY INSECTS or frostbite, intimidating peers confronted me at Harvard. At the first party I ever went to as a freshman, an older, immaculately dressed student asked me where I was from. When I answered, "Texas," he said, "Oh, what a coincidence. My family owns a ranch in Montana." I didn't see the coincidence, and this comment came to symbol-

somewhere. In spite of my previous longing to go far away for college, and the fact that I never quite felt like I completely fit in with my hometown, I began to cling to the identity of the girl from Texas.

I latched onto this chosen identity because I felt legitimately threatened by people who seemed to share a common language learned in high schools where going to the Ivy League was the norm, instead of the exception. I sensed that if I, too, tried to use this language it would sound false, so I rejected it and cultivated my own. I told myself that I had to get along with

asked me how Harvard was going and then stood silently in front of me, out of things to say. My best friend was with me, which made the experience less isolating, but I could not shake the feeling that my past, instead of waiting patiently for my return, had swept on ahead of me, heedlessly, and that I would never catch up.

This sense of in-between-ness, of not quite fitting in anywhere, is, of course, the stuff of growing up, canonized in coming-of-age literature and discussed by young people everywhere. Yet my own experience felt immensely personal and uniquely troubling, as most of my close friends, both in Texas and at Harvard, did not feel the same disconnect between their hometown lives and their lives at college. I had achieved an uneasy truce between two worlds, but I longed for something more definite and more comfortable. I wanted a home.

WHEN MY MOM CALLED last October to tell me my grandfather had died, I was printing out my Portuguese paper in Lamont Library. I sat down in the stairwell, clutching my cell phone, and listened to her news. He had been very sick for several months, and I had thought I was prepared for his death, but sadness washed over me anyway, submerging my desire to go to class or turn in my paper. I bought a plane ticket to the funeral a few hours later, and left my Harvard worries—my

thesis proposal, classes, duties at the *Crimson*—in Cambridge.

Some of the same people who had attended my cousin's wedding three years earlier were at the funeral, which was a big event despite my grandfather's desire for a small graveside service. His female cousins cooked pounds and pounds of peach cobbler, and a group of Comanches, whom my grandfather befriended decades ago, chanted and beat drums by his grave. A military honor guard laid a flag over his casket for his service in the Second World War. As the former editor of the local newspaper, he had known a wide variety of people, as was evident in the diversity of the crowd. While I remembered him as quiet and shy, preferring to be out with his cows rather than participating in rowdy family discussions, many of the people at the funeral remembered him as an inspiring boss with a sly sense of humor, or as the "midnight cowboy" because of the odd hours he spent in his pastures.

I could not help but absorb the scene hungrily, appreciating its strangeness and narrative value as I never would have done had I not gone away and adapted to a different world. Although deeply moved by the service, a part of me was observing instead of participating, caught up by the same watchful feeling that accompanies me everywhere as a partial outsider, half-

adapted to two very different environments.

As people were heading to their cars to drive over to the reception, a squat lady dressed all in black, with long, gray hair, approached me.

"Are you the granddaughter that goes to Harvard?" she asked. "I hear you are writing a book about Paul. That's just great. Someone should really write about his life and how wonderful a person he was. I'm so happy you're writing that book."

I was startled by her words, and shocked that this rumor was making its way through the crowd. Yet as she went on to describe how she met my grandfather (when he wrote an article about her getting snowed in with her 13 collies), I found myself taking mental notes, wondering to myself at the world's strangeness, at the sheer vastness of experience that one human life is granted in 80 years. During his life, my grandfather had been many different people to those who knew him, yet they loved him more—not less—for his versatility. It really would make a good book, I thought. She left, and I stood there alone for a little while before walking quickly to catch up to my family, and to drive home. ▢

*Berta Greenwald Ledecy Undergraduate Fellow
Liz Goodwin '08 is not exactly writing her grandfather's biography, but is, at least, finished with her senior thesis.*

SPORTS

Leap, Arch, and Tuck

Raising the bar

CITIUS, *Altius, Fortius*—that's the Olympic motto: faster, higher, stronger. *Altius* is Becky Christensen's specialty. The junior high jumper, who hails from the small town of Celina, Texas, north of Dallas, won the Heptagonal Championships, took second at the ECACs, and finished fourth at the 2008 NCAA indoor track and field championships this spring. For

her finish in the top eight nationally, she was named an all-American indoors, one of only three *Crimson* women high jumpers ever to earn that honor. At the meet, Christensen missed twice at 1.80 meters before clearing the bar on her third and final try. When the bar was raised to 1.83 meters, or six feet, she cleared it on her first jump, tying her personal best, set outdoors last year against

Yale. Christensen has always jumped better outdoors, so her performance thus far bodes well for the upcoming season and her ultimate goal: a trip to the Olympic trials, which she could clinch with a jump of 1.85 meters.

Christensen says she first tried the high jump in elementary school, during a "track and field day when you could pick any event." She discovered that she was "pretty okay at it." (When asked, she acknowledges that she won, yes, "but there were only seven people in the class.")

In high school she got serious about her interest. In the Texas state championships, she placed third as a freshman in her division, then second as a sophomore, and finally won first in her junior and senior years. "I'm not sure how Harvard found me," she says, but former field-events



Becky Christensen

coach Paul Turner persuaded her to visit Cambridge. "When it is cold in the winter, I wonder why I came all the way up north," she confesses, but when she came to visit, it was snowing. "I hadn't seen that in a long time," she says, not since she lived outside Chicago when she was eight. "It seemed a really beautiful place to be."

At Harvard during competition season, Christensen is focused: strength work on Mondays and Wednesdays (Fridays, prior to meets, are easy days); jumping on Tuesdays and Thursdays. High jumpers today use a technique called the Fosbury flop to clear the bar, though Christensen's father, who is six foot four, cleared six feet in middle school using an old-fashioned technique called the Western rollover. Christensen herself hasn't tried the "Western roll—nobody does that anymore," she says with a laugh—but she is thrilled to have cleared the same height as her father.

THE HIGH JUMP appears simple enough: run toward a bar suspended between two standards, throw yourself in the air, and land on a big, soft mat. But clearing a bar higher than you are (Christensen is 5 feet, 11 inches) is no mean feat. The physics of the event are perplexing, to say the least. High jumpers run a J-shaped path toward the bar. "You have to run a straight line toward the mat until you get pretty close and then turn fairly tightly and lean away from the bar," in order to compensate for your momentum toward it, Christensen

explains. Her initial approach is not so much a run as a series of measured bounds, a deliberate gathering of speed down the straightway. As she enters the curved part of the J, her steps become quicker and shorter until she pops suddenly off her outside foot, driving up with the opposite knee and throwing her inside arm up in the air to guide her body over the bar. "You have got to put all your energy into that last step," she says.

The goal is to have every part of the body—arms, head, shoulders, hips, calves, feet—pass through a curve

that reaches its apex just above the bar. Achieving that requires a good measure of flexibility and (since the body is simultaneously rotating) an impeccable sense of timing—something Christensen, who also

plays the flute, piccolo, and tenor saxophone, clearly has in abundance. "When you are over the bar you want to be on your back in an arched position, with your head upside down looking at whatever is behind the mat" she explains (see page 57). "Beginners sit over the bar, instead of letting themselves lie backwards."

Christensen spent her high-school years perfecting the arch. At Harvard, she worked on leaning away from the bar, and that gained her three inches. Now she works on little things: from run up, to keeping her shoulders open as she falls toward the mat, to tucking her chin down to her chest, which, in the jump's final stage, provides a fleeting counterbalance when she flips her feet over the bar.

She is focused now on the Olympic trials. "I don't have any dreams of advancing from there," she says, "because there are a lot of really good jumpers. I just want to go and compete." For Becky Christensen, the pursuit of excellence is all about the altitude. ~JONATHAN SHAW

Questions about Recruiting

AN ARTICLE ALLEGING that Harvard had lowered academic standards for recruits to its men's basketball program, and might also have skirted or violated National Collegiate Athletic Associations (NCAA) rules governing recruiting, appeared March 2 on the front page of the *New York Times* Sunday sports section. "Harvard has never won an Ivy League title in men's basketball and has not reached the NCAA tournament since 1946," the article began, asserting that, in an attempt to improve the program, the College had adopted a "new approach" that could "tarnish the University's sterling reputation."

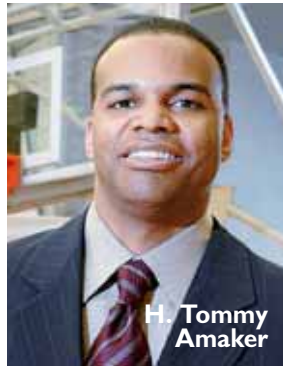
University officials vigorously disputed the allegation that Harvard had lowered its academic standards in any way even before the article appeared. In a written statement quoted in the *Times*, Harvard vice president for government, community, and public affairs Alan J. Stone characterized "any suggestion that our standards have been lowered for basketball" as "absolutely inaccurate." But two high-

ranking University sources say separately that Harvard is investigating (under the auspices of the Ivy League) the possibility that NCAA recruiting rules were violated, with a focus on the actions of assistant coach Kenneth L. Blakeney in the weeks before the team hired him last July.

Last June, Blakeney reportedly played pick-up basketball on separate occasions with two recruits later admitted to Harvard, during a period when contact with potential players is not allowed. Even though Blakeney was not a Harvard employee at the time, if such contact leads to "a significant competitive or recruiting advantage," according to wording on the NCAA website, it could be considered a major infraction of its rules. A reviewer chosen from outside the Harvard athletics department will submit findings to the Ivy League Office and a committee made up of representatives from each of the other Ivy schools, who will take the case from there, and to the NCAA if necessary.

The *Times* article based its separate assertions that Harvard had lowered its standards for men's basketball on the admissions status—then unknown—of one or more of the athletes whom Harvard

head coach H. Tommy Amaker had been recruiting for the incoming freshman class. The reporter sought comment on Harvard's list of prospects from several sources. The Yale men's basketball coach, James Jones, was quoted as saying, "We don't know how all this is



H. Tommy Amaker
STU ROSNER

going to come out, but we could not get involved with many of the kids that they are bringing in." Two former Harvard assistant coaches whose contracts were not renewed under Amaker, now in his first year on the job, commented that academic standards for the recruits appeared lower than they remembered. Amaker did not respond to requests for an interview.

But "coaches do not make admissions decisions" in the Ivy League, athletic director Robert L. Scalise, who hired Amaker, pointed out in an interview. The admissions process is separate and, typically, only about half the recruits on a coach's wish list are admitted. In a letter sent to alumni athletes in March, Scalise (who became interim executive dean of the Faculty of Arts and Sciences [FAS] that month) noted that "all of the student-athletes who we've been recruiting have had significant contact" with the other coaches mentioned in the article.

The *Times* article was widely reported in the media. Several commentators suggested that recruits Harvard had planned to admit now would not be admitted, whether or not they had received "likely letters" (notifications to applicants, primarily athletes, issued before the official

reply date, that they can expect to be admitted). But that is unlikely: the Ivy League has specific rules about the academic performance of recruited athletes, and all seven schools share information about their recruits and teams on an annual basis. The league's standards are predefined and enforceable. In an interview, dean of admissions William R. Fitzsimmons confirmed that no likely letters sent to men's basketball recruits had been rescinded.

The Ivy League uses a measure called the "academic index" (AI) to monitor compliance. Based on standardized test scores and secondary-school class rank (or grade point average in the absence of class rank), the minimum AI allowed for any individual Ivy athlete is 171. (Applicants with lower AIs may be admitted, but not on the basis of athletic ability.) But the mean AI for any incoming class of recruited athletes across all sports (except football, which uses a different system) has to be within one standard deviation of the mean AI of *all* students—athletes and non-athletes—at a particular institution, as calculated when they entered as freshmen. That means Harvard recruits must meet a standard higher than that at other Ivy colleges, to the extent that the mean AI of the Harvard student body is higher. The system is designed to ensure that "student-athletes be 'representative' of the undergraduate student bodies to which they are admitted," according to an Ivy League fact sheet.

There is some wiggle room within this framework. "When a new coach comes on board, we realize that it usually leads to a kind of culture change within the team," said

Scalise in an interview. "Sometimes you go for a couple more [recruits] so that you can get your kids and your culture into the program." In other words, a thriving sport might get fewer recruits one year, so that more recruits can be directed to a program that needs them. "That is what we have done [for basketball]," says Scalise. "We have *not* given them a lower AI target than we have given them in the past." Instead, the basketball program received a larger number of the total pool of recruited first-year athletes. That has apparently had minimal impact on the team's AI. "It appears that the basketball athletes we've recruited for next year's class will have one of the highest AIs of any school in the League over the past several years," Scalise wrote separately to alumni athletes.

Harvard Crimson editorials questioned the practice of recruiting athletes at all. One declared that Harvard should be pursuing "world-changing talent instead." In an interview, FAS dean Michael D. Smith, himself a varsity swimmer at Princeton and now a member of the FAS standing committee on athletics, pointed out that the two are not mutually exclusive. "Harvard admits students with broad ranges of backgrounds: it is not just athletics, but musical ability that students bring, drama, [a desire to] write for the *Crimson*. All those different aspects [of student life] are ways that we look at extending the learning environment outside the classroom." Smith is concerned that there is an implication, in some of the articles being written, that some students on campus don't belong here. "The admissions process has not been lowered in any manner for students we are bringing in now, or students we are bringing in in the future," he says. "I'd hate to have our students feeling that maybe they don't belong here. All of our students absolutely belong here."

The executive director of the Ivy League, Jeff Orleans, said in an interview that the *Times* allegations relating to basketball admissions will be reviewed in the regular Ivy League athletic admissions meeting in May, and that a statement would be made at that time.



Robert Scalise
KRIS SNIBBE/HARVARD NEWS OFFICE

Hockey Wrap-Up

Women's Hockey

The top-ranked icewomen (32-2, 22-0 Ivy) dominated the East all season but fell to fourth ranked Wisconsin in the NCAA semifinals March 20. Junior forward Sarah Vaillancourt, who had 26 goals and 36 assists on the season, won the Patty Kazmaier Memorial Award, given to the top women's college hockey player.

Men's Hockey

After a slow start, the stickmen (17-13-4, 12-7-3 ECAC) finished their season by winning 6 of 7 games, earning them a trip to the conference championship, where they lost to Princeton, 4-1.

ALUMNI

Fishing for Answers

A paleontologist looks at the origins of the human body.

IN 2005, parents and school officials in Dover, Pennsylvania, were locked in a courtroom debate over a school-board mandate that intelligent design be presented as an alternative to evolution in ninth-grade science classes. The judge in the case ultimately ruled in the

parents' favor, deciding that the requirement was unconstitutional. Throughout the trial, paleontologist Neil Shubin, Ph.D. '87, Bensley professor in the department of organismal biology and anatomy at the University of Chicago, struggled to remain quiet in his office: on his desk lay

the bones of a strange flat-headed, fish-cum-crocodile-like creature-with-a-neck that he and colleagues had found the year before while scraping away at ancient rocks in the Canadian Arctic.

Roughly 375 million years old, from the Late Devonian period, the fossilized creature was a genus of the extinct sarcopterygian (lobe-finned) fish that shares several key features with tetrapods (early four-legged animals). In addition to the neck and non-conical head, *Tiktaalik roseae*, as it was named, boasted expanded ribs and parts of a shoulder, along with webbed fins—inside which were also primitive bones corresponding to an upper arm, forearm, and pieces of a wrist. All are explicitly non-fish features. Shubin and other scientists say *Tiktaalik* helps bridge the gap in our understanding of what changes occurred as sea animals crept ashore, and plays a critical role in understanding—and proving—human origins.

“During the Dover trial, I couldn't tell anyone apart from colleagues about our find,” Shubin says now, with a smile: the news was an exclusive, scheduled to be announced in *Nature*'s April 2006 cover story. Most of the nation's news media, major publications, and science magazines followed up with articles about *Tiktaalik* (the word means “large, freshwater fish” in the Inuktitut dialect of Inuit).

Hailed as “the fish that crawled out of the water” and “the missing link,” *Tiktaalik* is by far the most important discovery of Shubin's career, which has centered on the evolution of limbed beings. “I've devoted my life to this evolutionary biology stuff—I love it,” he exclaims. “I enjoy going to work because it's fun working with worms, fish, and salamanders. I think it's beautiful that remedies for the problems we suffer from will be found by seeing pieces of us nestled in the most primitive and humble creatures that live on the earth.”

His new book, *Your Inner Fish*, is an infectious exploration of the 3.5-billion-year history of the human body. It traces our organs back to fossils and prehistoric DNA—how our arm and hand bones came from fins; how our teeth first formed as spiky structures in the mouths of tiny, ancient, jawless lamprey-like fish known as conodonts; and how major aspects of our genome are similar to those of worms. Our



Photograph by Ralf-Finn Hestoft

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ability to talk, for example, depends on the larynx, which is composed primarily of cartilage akin to the gill bars in a fish or shark. Even hiccups—a nerve spasm and inhalation, followed almost immediately (35 milliseconds, Shubin writes) by the “hic” sound—are the product of our shared history with fish and tadpoles, respectively. And the process through which teeth first formed in fish—at base, from the interaction between two layers of tissue—is the same process involved in the subsequent development of scales, hairs, feathers, and sweat glands.

Shubin says he wrote the book to explain his work to his father, Seymour Shubin, who still writes crime novels and thrillers for a living at 87. “I gave him the first draft and he said, ‘I don’t understand it,’” Shubin said at a winter reading at Harvard Book Store in Cambridge. “He told me, ‘Neil, nobody ever lost money writing a page turner.’ I said, ‘Dad, I’m a scientist. We don’t write page turners.’ But I wrote it over again. And this time he liked it.”

Your Inner Fish, in fact, is something of an adventure tale. It pulls in the reader even though the *Tiktaalik* discovery took six years and four often frustrating, error-filled trips into deep wilderness to complete. “For starters, there were polar bears,” says Shubin, a city boy from Philadelphia. “And polar bears eat people.” On the group’s first expedition to the Canadian Arctic, in 1999—which Shubin calls a “colossal bad choice” all around—they took rifles and motion detectors, which they set up in their tents before going to sleep. Not long after, the detectors went off and everyone jumped up, cocked their guns, and raced outside. Nothing was there. This scenario played out at least four times before someone realized that it was not lurking man-eaters setting the detectors off, but ferocious winds. “These detectors were made for suburban New Jersey, not the Arctic,” Shubin jokes. “You’ve just got to learn in fieldwork that you never get it just right.”

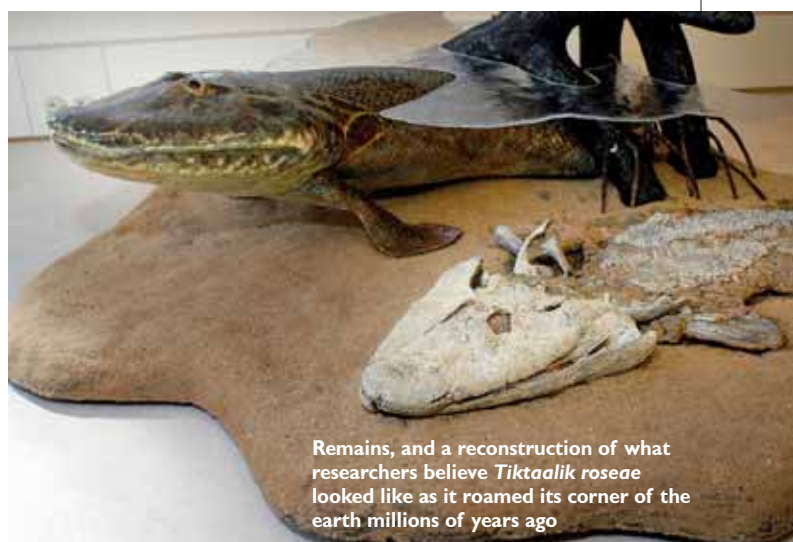
THAT WASN’T the first field trip to leave a strong impression on him. As a child, he loved going to museums, especially the Academy of Natural Sciences in Philadelphia and the Natural History Museum in New York City. In high school, he worked

on an urban archaeological site and “loved ancient Egypt and Tutankhamen and seeing the past inside the dirt,” he explains. “Paleontology pulled me into the immediacy of discoveries. If you know where to look, and crack inside the rocks, and find a physical piece of evidence that can change the way we look at our past—this struck me as very powerful.” At

Columbia, he majored in biology and anthropology, which led to paleontology and then doctoral work at Harvard.

In the 1980s, academic research in anatomy and development focused on the relationships between living creatures and fossils on the cellular level, using embryos. “Only a handful of people were doing it, and few as well as those at Harvard,” Shubin points out. (This was before new technological tools enabled scientists to work on the molecular level.) His first Harvard-affiliated expedition came in 1983, on the field team of professor of biology and curator of vertebrate paleontology Farish A. Jenkins Jr., who was working in the American West, looking for new sites and early mammals that could help explain how humans developed the ability to chew. Shubin writes that the mammalian method for chewing first emerged in fossil records dating from 225 million to 195 million years ago, in big-headed reptiles that walked on all fours and had bony jaws with teeth that fell out and re-grew throughout their lives.

Having finally learned how to spot bones in the dust, mud, and dirt, Shubin grew eager to lead his own trip. He explored 200-million-year-old Connecticut rocks a half-day’s trip away from Cambridge before expanding to Nova Scotia; ultimately, he found enough bones to fill a few shoeboxes among the sandstone cliffs in the Bay of Fundy. Among them was a significant find: a piece of an early mouse-like mammal with a tiny jaw and



Remains, and a reconstruction of what researchers believe *Tiktaalik roseae* looked like as it roamed its corner of the earth millions of years ago

a few teeth best seen under a microscope. The remains of this tritheledont, previously linked only to South Africa, showed it had a human way of chewing food. “I had an idea for field research and Harvard had the resources to support this independent research,” he says. “If that hadn’t existed, I wouldn’t be here talking about all of this today.”

By now, his main academic interest was the morphology of the tetrapod limb. Working with the embryos of salamanders, frogs, and fish, Shubin wrote his dissertation on developmental biology and the similarities between fins and limbs. He spent the next two years doing postdoctoral work at the University of California, Berkeley, where he also met and married geologist Michele Seidl ’85 (now director of planning for biological sciences at the University of Chicago). An 11-year stint at the University of Pennsylvania followed.

AT PENN, and still searching for the origins of limbed creatures, Shubin focused his sights on the already well-studied Catskill Formation of Pennsylvania. In the Late Devonian age, when Shubin and others say some animals were making the switch from sea to land, this region was akin to today’s Amazon River delta, he notes, with many streams draining into a large sea where Pittsburgh now stands. In 1993, he and one of his graduate students, Ted Daeschler, began visiting rock zones recently blasted out by the state transportation department to prepare for more roadways. To their surprise, Shubin relates

COURTESY OF NEIL SHUBIN

in *Your Inner Fish*, Daeschler one day found “a marvelous shoulder bone” that they named *Hynerpeton*, Greek for “little creeping animal from Hyner,” Pennsylvania.

The two men formed a dynamic partnership—Shubin always pushing on to the next target; Daeschler patiently working to examine a given spot thoroughly. In 1998 they were in Shubin's office, having an academic argument about the next most plausible search sites, when one of them pulled out a geology textbook to prove a point and found a diagram that stopped them short. It showed three places on earth with known Late Devonian freshwater rocks: eastern North America—home of *Hynerpeton*; the east coast of Greenland (where the earliest known tetrapods had already been found); and well-exposed rocks in the Canadian Arctic that, the duo realized, were unexplored. No paleontological field guides existed for that area, but Shubin knew one man who had led previous trips to Greenland

and was experienced enough to help them: Farish Jenkins. (Later that day, Shubin adds, he and Daeschler went to a Chinese restaurant where Shubin's fortune cookie held this gem: “Soon you will be at the top of the world.” This slip of paper was taped to his office door for years.)

That first outing, in 1999—the time of the motion-detector debacle, when terrible weather kept the researchers inside tents for three weeks rereading every book they'd brought—was on Melville Island in the western part of the Canadian Arctic. They found plenty of fish fossils, but all appeared to be deep-water dwellers, not the shallows skimmers that ultimately crept on shore.

The following year, better prepared for five weeks in the wild, Shubin, Daeschler, and their team set up camp on Ellesmere Island, with permission from the Inuit people of the Nunavut Territory. One evening, an undergraduate in the party, Jason Downs, failed to return to the base

camp on time. “We were very worried, but then he came limping into the cook tent with a wild-eyed stare, like he'd been chased by polar bears,” Shubin recalls. “But we knew he hadn't been, because his pockets were full of bones.” That same night, the team spent hours (in the Arctic summer, the sun never sets) documenting the site and gathering fragments.

Fast-forward to July 2004. With grant money running out, and the prognosis looking poor, Shubin and Daeschler opted for a fourth and final trip (their third to Ellesmere). Shubin describes cracking ice and rock in the bottom of a quarry one day when he saw a patch of fossilized scales and a jaw-like “blob” in ice unlike any fish mouth he'd ever seen. The next day, while foraging at the top of the same quarry, Shubin's colleague and former fellow graduate student Stephen Gatesy, Ph.D. '89 (now a biology professor at Brown), dug out a piece of rock and “we realized we saw a flat-headed something, something unknown,” Shu-

Centennial Salute

One hundred years ago, Henry Lee Higginson, class of 1855, founder of the Boston Symphony Orchestra and donor of Soldiers Field and other gifts to Harvard, became the first president of the Harvard Club of Boston. He and other early club leaders set the tone of solid relations with the University, philanthropic-minded ventures, and the promotion of “social intercourse” among Harvard men and, in time, women (at first admitted only to an “annex,” in 1940) that remain hallmarks of the club today.

About 400 alumni and guests gathered on March 12 to celebrate the club's centennial with a lavish dinner and listen to remarks by President Drew Faust. When the club founders agreed to “disseminate the standards of education and right living of Harvard University,” she told the crowd, they did so at a time when their annual expenses were just over \$1,700—“which would not even pay for our parking bills tonight.” But in essence, they “were part of a world of aspirations and initiatives really no different from our own.” Among the early recipients of a Harvard Club scholarship for Boston boys, she noted, was James B. Conant, “the Harvard president perhaps best known for opening the University to what he called ‘gifted youth of limited means.’” Continuing in that tradition, the club last spring awarded 36 scholarships worth \$4,500 each to incoming freshmen of the class of 2011. The club also recognizes nearly 300 high-school students each year for academic excellence, sponsors 13 sum-

mer interns at nonprofit agencies in Greater Boston, and this year plans to launch and fund a Harvard Club of Boston community-service fellowship under the auspices of the Phillips Brooks House Association, says Philip C. Haughey '57, president of the club's board of governors (and a member of this magazine's Board of Incorporators).

The club works actively to retain its 5,272 members and recruit more, especially younger ones. “It is not an easy time for clubs in general, because people have moved to the ‘burbs, families are buried in regulated activities with their kids, and it's a challenge to know how best to appeal to young members and their families,” Haughey says. The main club on Commonwealth Avenue (built in 1913) offers fitness centers, squash courts, dining, and something to see or do almost every night of the week: from concerts, films, and lectures to sports-oriented events, holiday dinners, and the annual children's Christmas party and father-daughter tea dance. The downtown affiliate on Federal Street also offers dining and events.

A mix of members came to celebrate the centennial. Friends Bruno Marino, Ph.D. '91, and Lewis Lutin, A.L.M. '88, were chatting in the oak-paneled bar. “This place is my home away from home,” reported Marino, a scientific entrepreneur who lives in Maine and spends at least one night a week at the club for business reasons. “It's a great place to meet all kinds of people for all kinds of reasons.” Lutin, of Falmouth, Massachusetts, added, “I've been coming here every week for 20 years. This place is about friendship.” Boston attorney Maura Pelham '00 said she found the majestic rooms, glittering chandeliers, and Old World ambience so beautiful, she joined the club last year mostly so she and her fiancé could

bin reports. “It was a snout sticking straight out from the rock.”

The team spent the rest of the summer painstakingly chipping away at the rock around the creature so they could wrap up the boulder-cum-fossil and transport it thousands of miles to the lab where, for two months, preparers used dental tools to pick apart the specimen. What was revealed was a creature with eyes on top of its flat head, a neck, upper arm bones, a wrist, parts of a palm, and “an elbow joint that *Tiktaalik* would’ve used to push itself up off the substrate, as if it were doing push-ups,” Shubin explains. “And it had ribs—larger and more expandable ribs than you’d ever see on a fish.” In short, “*Tiktaalik* is not a random find,” he says. “It is a piece of the human story.”

To date, the core research team has found about 20 individuals—based on isolated fins, jaws, and other pieces—but only about four really good specimens. “We’re the only people working up there and we’re going back this summer, in

July, in hopes of finding more bones,” Shubin says. “You never know what’s going to happen when you get there, because of the weather, but the goal is to go to the original site and work on new areas around it” to find slightly younger or slightly older rocks and see if any bones they contain shed light on further developmental changes. The group has found other water-based creatures—some “really bizarre-looking” armored fish, some eight- or nine-foot-long predatory fish, and some fish as tiny as a fingernail.

Shubin is excited that the *Tiktaalik* find has also inspired other scientists, who are looking at new, undisclosed geological locations for more Late Devonian specimens. “We are beginning to unlock the mechanisms that underlie evolutionary change, so we can ask what is the genetic and developmental recipe that built the human, and how is it different from fish?” he says. “We’re at a moment in scientific discovery where we can begin to see that

that kind of understanding is possible within our lifetimes, that the basic tool kit and developmental processes are very ancient—that a version of same tool kit that builds a worm builds a human. It’s been a remarkable time for paleontology, a very powerful revolution on a lot of scientific fronts.”

After his talk at Harvard Book Store, the audience asked Shubin questions that ranged from specifics about *Tiktaalik*’s anatomy to his arctic experiences and plans for the future, to his views on intelligent design and creationism. Did he think his discovery would sway religious beliefs? What should teachers say about *Tiktaalik*—how is it a scientific tool for students? “No degree of evidence will shift the views of a creationist,” Shubin responded, then added with a laugh, “but if, next to my *Tiktaalik*, I’d

President Drew Faust addressing a sold-out crowd at the Harvard Club of Boston’s centennial celebration; the club rolls out the crimson carpet; a delectable *Veritas* dessert

hold their wedding reception there. “None of my friends are members,” she noted, “but I am going to make an effort to get them here.” Norton Reamer, M.B.A. ’60, a former Radcliffe College trustee who finds the downtown club more convenient for lunch and business meetings, had come to the main clubhouse primarily to hear Faust in her new role.

The president spoke of making Harvard more affordable, of addressing changes in undergraduate teaching and advising, and of developing the new Allston campus. She discussed the new task force she has charged with defining the role of the arts at a research university and in a liberal-arts education, and laid out the increasingly international nature of the University on the eve of departing for the Harvard Alumni Association’s global series event in China (see page 67).

In closing, she talked about Harvard president Charles William Eliot, the guest speaker at the first annual Harvard Club of Boston dinner, in 1909, not long before he stepped down after 40 years in office. “The University has before it an opportunity to make sure



of continuous growth and continuous improvement,” Faust quoted from his speech. “I hope we have accepted his challenge,” she declared. “I hope we continue to carry it forward. And I acknowledge the partnership with the Harvard Club of Boston that has made possible the advancement of the University and the continuing of the University....I will look forward to spending more birthdays with you.”

found a human skull, then that would be truly devastating" to evolutionists. What about intelligent design? "I don't have time for it because it's not testable,

it's not science," Shubin explained. "I have a job to do and that's making hypotheses and going out in the field and finding out if they are true. I became a

scientist because I like looking at creatures and discovering new things that tell us about the history of life."

~NELL PORTER BROWN

For Overseer



Lynn Chang

Anne Fadiman

Paul Finnegan



Robert Freedman

Eve Higginbotham

Michael Holland



Anand Mahindra

Regina Montoya

David Oxtoby

Vote Now

THIS SPRING, alumni will choose five new Harvard Overseers and six new elected directors for the Harvard Alumni Association (HAA) board. The candidates' names appear in ballot order below, as determined by lot.

Ballots, mailed to reach alumni by April 15, must be received back in Cambridge by noon on May 30 to be counted. The results will be announced at the HAA's annual meeting on June 5, on the afternoon of Com-

mencement day. All Harvard degree holders, except Corporation members and officers of instruction and governance, are entitled to vote for Overseer candidates. The election for HAA directors is open to all alumni.

For Overseer (six-year term, five to be elected):

Lynn Chang '75, Newton, Massachusetts. Concert violinist; violin professor.

Paul Finnegan '75, M.B.A. '82, Chicago. Co-CEO, Madison Dearborn Partners, Inc.

Michael Holland '66, New York City. Chairman, Holland and Company LLC.

Anne Fadiman '74, Whately, Massachusetts. Author; Francis writer-in-residence, Yale.

Eve Higginbotham, M.D. '79, Atlanta. Dean and senior vice president for academic affairs, Morehouse School of Medicine; surgery professor.

Regina Montoya, J.D. '79, Dallas. CEO, New America Alliance.

David Oxtoby '72, Claremont, California. President and professor of chemistry, Pomona College.

Anand Mahindra '77, M.B.A. '81, Mumbai, India. Vice chairman and managing director, Mahindra and Mahindra Limited.

Robert Freedman '62, Philadelphia. Partner, Dechert LLP. (Nominated by petition.)

For Elected Director (three-year term, six to be elected):

Robert Kraft '76, Los Angeles. President, Fox Music.

Kevin Jennings '85, New York City. Founder and executive director, Gay, Lesbian and Straight Education Network (GLSEN).

Alejandro Santo Domingo '99, New York City. Managing director, Quadrant Capital Advisors Inc.

Carolyn Hughes '54, Oceanside, New York. Retired; former project manager, Empire Blue Cross Blue Shield.

Elizabeth Reilly '91, Boston. Attorney, WilmerHale.

Joseph Bae '94, Hong Kong. Member and managing partner, KKR Asia.

Rosa Wu '03, San Francisco. Associate product manager, Google.

Rodney Hardy '60, Minneapolis. Vice president/owner, Sienna Corporation.

Andrea Zopp '78, J.D. '81, Chicago. Senior vice president and chief human resources officer, Exelon Corporation.

For Director



Joseph Bae

Rodney Hardy

Carolyn Hughes



Kevin Jennings

Robert Kraft

Elizabeth Reilly



Alejandro Santo Domingo

Rosa Wu

Andrea Zopp

Comings and Goings

UNIVERSITY CLUBS offer a variety of social and intellectual events, including Harvard-affiliated speakers (please see the partial list below). For further information, contact the club directly, call the HAA at 617-495-3070, or visit www.haa.harvard.edu.

On May 2, executive dean of the Radcliffe Institute for Advanced Study and law lecturer Louise Richardson talks at the Harvard Club of the West Coast of Florida about “What Terrorists Want: Understanding the Enemy, Containing the Threat.” On May 6, the Harvard Club of Santa Barbara gathers to learn about “Petroleum, Putin, Power, and the Rise of the New Russia” from Marshall Goldman, Davis professor of Soviet economics emeritus at Wellesley College and former associate director of the Davis Center for Russian Studies at Harvard. (He speaks to the Harvard Club of Northeast Ohio on May 28, and to the Harvard-Radcliffe Club of Rhode Island on June 11, where he will lecture on “Vast Changes in Russia—What It Means for the U.S. and the World.”) The Triad Harvard-Radcliffe Club hosts the Kennedy School’s Shattuck professor of government Paul Peterson for a discussion of “What Can Be Done about the Current Crisis in American Education?” on May 8. That same day, the Harvard Club of Mon-

tana (Billings) offers “Alexander the Great: A Man for All Seasons” by Loeb professor of classical art and archaeology David Mitten. Mitten also speaks to members of the Harvard Club of Montana (Missoula) on May 9. Also on May 9, the Harvard Club of Western North Carolina hosts Plummer professor of Christian morals and Pusey minister of Memorial Church Peter Gomes, who discusses “Nearly 40 Years On: A View from The Memorial Church.” On May 15, the Harvard Club of Cincinnati hosts a dinner to celebrate the 2007 Ivy League Championship Harvard football team with guest Tim Murphy, Stephenson family head football coach, who talks about “Harvard Athletics Today.” Also on May 15, the Harvard Alumni Club of Oregon and Southwest Washington offers a lecture on “The Imagined Earth: Reflections on the Human Place in Nature” by the Kennedy School’s Pforzheimer professor of science and technology studies Sheila Jasanoff. Xenia Dormandy, director of the Project on India and the Subcontinent at the Kennedy School’s Belfer Center for Science and International Affairs, talks about “Understanding India and Pakistan: Harvard Kennedy School’s Role in the Policy Process” for the Rocky Mountain Harvard University Club on May 18. On May 21, the Harvard Club of New York City hosts Loeb professor of Germanic lan-

A New Radcliffe Room

The College Club of Boston, 117 years old, calls itself the oldest such women’s club in America. Radcliffe was represented among the 19 pioneers who gathered in 1890 to form a club where college-educated women could “‘enjoy sociability and companionship’ while advancing their knowledge of literature, public affairs, history and the arts” (see www.thecollegeclubofboston.com). In restoring its Victorian townhouse at 44 Commonwealth Avenue, the club’s board members dedicated the 11 guest rooms to its founders’ schools; among them is the Radcliffe Room, designed by John Montgomery and Susan Able, RS ’97.

guages and literatures Maria Tatar, who explores “Touching Magic: The Power of Stories in Childhood” (members only).

On June 18, the Harvard Club in Concord (Massachusetts) learns about “The Aging Mind” from Douglas H. Powell, clinical instructor in psychology at the Medical School. On June 19, Berkman visiting professor of entrepreneurial legal studies Jonathan Zittrain, of the Law School, examines “The Future of the Internet—And How to Stop It” at the Harvard Club of Western Pennsylvania (Pittsburgh).

Above and Beyond

aid Iraqi civilians. Tin-Yun Ho ’07 (’08) thought up and helped create the website last year, after reading about a civil-affairs officer who had organized a school-supplies drive for Iraqi children among her friends and family back home. “She was able to channel so much good will into an Iraqi neighborhood,” he says. “I wanted a way to link more soldiers in Iraq with Americans who want to help.”

The project is a kind of “Craigslist for soldiers and marines in Iraq,” explains cofounder Katharine Buzicky, J.D. ’07, now a military lawyer. The group aims to make it “easy, secure, and efficient” for military personnel to request items needed by ordinary Iraqis—eyeglasses, shoes, bandages, soccer balls, mechanics’ coveralls, sewing machines—from anyone in America “willing and able to assist,” and for donors to offer supplies that may be useful. Beyondorders facilitates matches, provides donors with APO addresses for the military recipients, keeps tabs on shipments, and

Beyondorders.org helps U.S. service members “rise above the call of duty” to

posts on its website the recipients’ accounts, and often their photographs, of how the donations have been used in Iraq.

“Small things can have a big impact,” says cofounder Matthew Scherrer, M.B.A. ’07, who spent four years in the army in Afghanistan and Iraq before attending the Business School. He and Ho, who was busy trying to put his idea into practice, were introduced by a House tutor and began organizing a network of fellow students, including Buzicky, who helped with such legal details as incorporation. (“Beyond Orders is a great model for how [Harvard] schools that tend to be fairly segregated can work together,” says Scherrer.) They approached alumni, and Scherrer contacted and rallied military units behind the exchange program: to date, Beyondorders has registered more than 30 service members and completed more than 100 donations—one with 750 packages of school supplies.

Board members Buzicky, Ho, Scherrer, and West Pointer Rajiv Srinivasan continue working to get more military and civilian volunteers involved. When Ho, who took a semester off to set up the site (tutoring to raise money to keep it going), was interviewed by a local TV station, he told viewers, “I need you to get on the site, register, and tell the troops in Iraq what you can do.” That’s still true.

A Peal before Leaving



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

QUESTION: "What was I, a young American student of medicine and electrical engineering—and an observant Jew—doing in the frozen bell tower of a Russian Orthodox monastery in Moscow on the eve of the New Year?" Benjamin Isaac Rapoport posed that question in a February talk at morning prayers in Memorial Church.

Answer: Rapoport, A.B.-A.M. '03, who is in his fourth year of the M.D.-Ph.D. program at the Medical School and does research on the design of brain-implantable electronic devices, is also head ringer of the Russian bells at Lowell House. During the winter recess, he and three undergraduate Lowell *Klappermeisters* went to the Danilov Monastery in Moscow, seat of the patriarch of the Russian Orthodox

Church, to study the cultural significance of these bells, to learn how best to ring them, and, said Rapoport, to become part of a renaissance of ringing in Russia.

The Danilov Monastery is the once and future home of the Lowell bells. Stalin wanted to melt them down. Industrialist Charles R. Crane, LL.D. '22, bought them and gave them to Harvard in 1930. They go home this summer (see "Bell Swap," November-December 2006, page 88).

"The more deeply I have become involved in the repatriation project," said Rapoport, "the stranger and more miraculous it seems to me....In the 20 years since communism began to loosen its grip, the Russian Orthodox Church has sent a stream of requests asking Harvard to return the bells....Until 2002, all such requests fell on deaf ears. Who would have imagined that Diana Eck, a preeminent American scholar of religion and also an outspoken supporter of gay rights—and herself married to a female minister in this church—who would have imagined that such a figure would mastermind the return of these bells to the great monastery of the Russian Orthodox patriarch, who has publicly denounced

gay marriage and whose church does not ordain women? And who would have imagined that the same patriarch would share public stages...before massive television audiences with Diana Eck? Furthermore, who would have imagined that when the patriarch called publicly for a philanthropist to finance the repatriation of the bells, his call would be answered by Viktor Vekselberg, a Russian Jew, whose foundation is run by a Russian Muslim?"

In Russian ringing traditions, bells sound rhythmic patterns, not melodies. (Although Lowell's bells can't ring a chromatic scale, Rapoport has discovered over the years that tunes *can* be played with them, including "Hatikvah," the Israeli national anthem.) Readers may hear them ring traditionally during a bell festival and symposium on June 1 and 2 (see www.lowell.harvard.edu/Bells/ for details) hosted by Eck, the master of Lowell, and participated in by monks, foundrymen, the Yale Russian Chorus, members of the Crane family, Vekselberg, and project manager Peter Riley, who will explain how, in July, workers will remove a bit of the bell tower, take out the old bells, and hoist in 27 tons of new ones.

"Our Russian teachers and colleagues know that their traditions will live" with us, said Rapoport. "On returning from Russia, I sent a recording of our first Lowell House ringings back to Moscow. I received the following response from the monastery: 'It is very joyful news for me the Lowellians like your new (and at the same time very old) style. Ben, I also was happy to receive and listen to your audio files. My soul sang with the bells!'" ~PRIMUS V

Valery Anisimov, director of the Vera Foundry in Voronezh, Russia, came to Lowell House in February 2007 with a team of artisans to make molds (right) of the surface decorations and inscriptions on the venerable bells. Back at the foundry, workers modeled the new bells in wax, created clay molds, and poured the bronze. Harvard chose this foundry because it was the only one able to make a bell as big as the Bell of Mother Earth, the largest of Lowell's set of 17. On March 30, 2007, the superior of the Danilov Monastery prayed and the foundry cast the 14-ton replacement Mother Earth.



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LETTERS

(continued from page 10)

Islam—Nye is accepting unquestioningly the corrupted vocabulary whereby the United States is engaged in a phony “war” on terror that the sitting president has used to ram through his anti-civil libertarian agenda.

[Life exists beyond the narrow confines of “soft” and “hard” modalities in the exercise of American hegemony.] One need only introduce a different question: “Why?” Why assume that the United States has an obligation to shoulder a twenty-first-century version of the “white man’s burden”? Why not assume that countries other than the U.S.A. rightfully have national interests which their governments are pursuing in a rational manner and that those governments, whether democratically elected or not, are as politically mature as our own?

Our “mission” should be to create the institutional basis for consensual, multipolar security arrangements. This means replacing the confrontational policies of military and economic containment directed against China and Russia, whose continuation Nye advocates, and jettisoning the false issues of “values gaps” and spreading democracy by force. Instead we should be accommodating graciously and proactively worldwide economic and demographic change, bringing the BRIC countries [Brazil, Russia, India, China] to their rightful positions of influence in the United Nations, the IMF, the World Bank. This also entails dismantling NATO, now that it demeans its member countries by serving merely as a “tool kit” for an American bully, prevents the emergence of a much-needed EU defense agency, and is ultimately counterproductive to U.S. aims.

In many ways the situation before us parallels the run-up to World War I, and it is an open question whether we will do better than the U.K. did then as we step up to the mark.

GILBERT DOCTOROW '67
Brussels

NO MENTION IS MADE of Israel as a factor in our nation’s past, present, or future foreign policy. Our present “only for Israel” foreign policy has caused us to make enemies, brought us to 9/11, and is a likely reason for the current Iraq war, with its tragic loss and cost.

Working toward a better foreign policy

is a practical goal. That would be to pursue life, liberty, and the pursuit of happiness for all peoples of the Middle East. The lavish aid we give Israel should be spent only to promote peace and prosperity evenhandedly in the Middle East. An economic union is a feasible mechanism. Borders have long been established by the United Nations.

Beginning in the Middle East, this model could serve well for global application.

FRANCIS SULLIVAN '46
Greer, S.C.

MEDICAL ERRORS

MY WIFE AND I have been in medicine for more than 60 years each. We have never been told to hide the facts regarding a medical error. “The Talking Cure” (March-April, page 60) would leave your readers believing this was a universal and common practice. In none of the eight major medical institutions here or in Scotland where we have practiced were we ever instructed not to inform a patient or his/her insurance company that an error was made.

In truth, we were told very little about the matter for the first 45 to 50 years of practice, certainly not at Harvard Medical School. I can recall only one instance of the subject coming up during my years there. We medical students in the 1940s passed on among us the tale about the great Brigham [Hospital] surgeon, John Homans: to the effect that he had apologized to a patient for some minor lapse in judgment or technique. The story was told not so much because it was an object lesson but because it reflected the well-known honesty and humanity of the man. In more recent years, the advice my wife and I have always heard in various relevant meetings has been to report errors immediately to the patient and to hospital administration. Perhaps our experience is unique, but I doubt it.

GIULIO J. D’ANGIO, M.D. '45
Philadelphia

AUTISM REMEDIES

AS A PHYSICIAN and the grandfather of an autistic 10-year-old, I am dismayed both by the letter of Theresa V. (Makin) O’Brien ’00 (March-April, page 5, concerning “A Spectrum of Disorders,” January-February, page 27) and your decision to publish it. I believe that the entire letter is not only undocumented, but viciously

false. Perhaps her source of information is Deirdre Imus, whose public forum is granted to her by her entertainer-husband, but that doesn’t justify either O’Brien’s tone or her message. I trust that thoughtful Harvard scientists can help O’Brien understand how uninformed her published letter turned out to be.

JOSEPH R. BARRIE, M. D., '60
Harvard, Mass.

MILITARY JURIST

IT IS INDEED refreshing to read an account of an alumnus—an exceptional man by any standard—who is doing work of the very highest importance for the nation (“Wartime Legalities,” by Willy Stern, March-April, page 72). Colonel Martins is emblematic of the hundreds of judge advocates of all the armed forces serving in the theater, who every day forward the rule of law among the Iraqi population, ensure that combat operations are conducted according to international standards, advise commanders on a host of issues, and assist in maintaining good order and discipline among our own personnel, all at great personal risk and under conditions of substantial hardship.

I have been fortunate enough to work in and around the Judge Advocate General’s Corps of the respective armed forces for most of my career. These uniformed lawyers represent some of the best in the American legal profession. In an era in which the bottom line seems to be the only criterion for success, they have chosen the path of duty and sacrifice. Given the load of educational debt that the average law graduate emerges with, many of them have in a real sense mortgaged their futures to serve the nation. I salute them, and hope that that nation continues to be worthy of their sacrifice.

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

I READ WITH GREAT PRIDE the account of Colonel Mark Martins and his service to our country in Iraq, and am particularly impressed at the positive, strategic impact this one Harvard-trained lawyer has had. It’s ironic that Harvard’s influence in our armed forces is greatly diminished by a continuing ban on ROTC training on campus.

RALPH ERICKSON, M.P.H. '89
Columbia, Md.

MAKING CREDIT SAFER

(continued from page 37)

charter that would permit them different options in developing and marketing financial products. If the regulated can choose the regulators they want, it should be no surprise when they game the rules in their own favor.

Unfortunately, in a world in which the financial-services industry is routinely one of the top three contributors to national political campaigns, the likelihood of quick action to respond to specific problems and to engage in meaningful oversight is vanishingly slim. This leaves consumers effectively unprotected in a world in which a number of merchants of financial products have shown themselves very willing to take as much as they can by any means they can.

A FINANCIAL PRODUCTS SAFETY COMMISSION

IT IS TIME FOR A NEW MODEL of financial regulation, one focused primarily on *consumer safety* rather than *corporate profitability*. The model for such regulation is the U.S. Consumer Product Safety Commission (CPSC), an independent agency founded in 1972 during the Nixon administration. The CPSC's mission is to protect the public from risks of injury and death from products used in the home, school, and recreation. It has the authority to develop uniform safety standards, order the recall of unsafe products, and ban products that pose unreasonable risks. In establishing the commission, Congress recognized that "the complexities of consumer products and the diverse nature and abilities of consumers using them frequently result in an inability of users to anticipate risks and to safeguard themselves adequately."

The evidence clearly shows that the CPSC is cost-effective. Since it was established, product-related death and injury rates in the United States have decreased substantially. The CPSC estimates that standards for three products alone—cigarette lighters, cribs, and baby walkers—save more than \$2 billion annually (more than the agency's total cumulative budget since its inception).

So why not create a Financial Product Safety Commission (FPSC), charged with responsibility to establish guidelines for consumer disclosure, collect and report data about the uses of different

financial products, review new products for safety, and require modification of dangerous products before they can be marketed to the public? The agency could review mortgages, credit cards, car loans, and so on. It could also exercise jurisdiction over life insurance and annuity contracts. In effect, the FPSC would evaluate these products to eliminate the hidden tricks that make some of them far

more dangerous than others, and ensure that none pose unacceptable risks to consumers.

An FPSC would *promote* the benefits of free markets by assuring that consumers can enter credit markets confident that the products they purchase meet minimum safety standards. A commission could collect data about which financial products are least understood, what kinds of disclosures are most effective, and which products are most likely to result in consumer default. It could develop nuanced regulatory responses; some credit terms might be banned altogether, while others might be permitted only with clearer disclosure. A commission could promote uniform disclosures that make it easier to compare products, and to discern conflicts of interest on the part of a mortgage broker or seller of what are now loosely regulated products. For example, an FPSC might review the following terms that appear in some—but not all—credit-card agreements: universal default clauses; unlimited and unexplained fees; interest-rate increases that exceed 10 percentage points; and an issuer's claim that it can change the terms *after* money has been borrowed. It would also promote such market-enhancing practices as a simple, easy-to-read paragraph that explains *all* interest charges; clear explanations of when fees will be imposed; a requirement that the terms of a credit card remain the same until the card expires; no marketing targeted at college students or minors; and a statement showing how long it will take to pay off the balance, as well as how much interest will be paid if the customer makes the minimum monthly pay-

ments on the outstanding loan balance.

With every agency, the fear of capture by those it regulates is ever-present. But in a world in which there is little coherent, consumer-oriented regulation of any kind, an FPSC with power to act is far better than the available alternatives. Whether it is housed in a current agency such as the CPSC or stands alone, the point is to concentrate the re-

The point is to concentrate the review of financial products with a focus on the safety of the products *as consumers use them*.

view of financial products in a single location, with a focus on the safety of the products *as consumers use them*. Companies that offer good products would have little to fear. Indeed, if they could conduct business without competing with companies whose business model is to mislead the customer, then the vendors offering safer products would be more likely to flourish. Moreover, with an FPSC, consumer-credit suppliers would be free to innovate on a level playing field within the boundaries of clearly disclosed terms and open competition—not hidden terms designed to mislead consumers.

The consumer financial services industry has grown to more than \$3 trillion in annual business. Lenders employ thousands of lawyers, marketing agencies, statisticians, and business strategists to help them increase profits. In a rapidly changing market, customers need someone on their side to help make certain that the products they buy meet minimum safety standards. Personal responsibility will always play a critical role in dealing with credit cards or other loans, just as personal responsibility remains a central feature in the safe use of any other product, but a Financial Product Safety Commission would be the consumers' ally. And for every family that avoids a trap or doesn't get caught by a trick—that's regulation that works. ▢

Elizabeth Warren, RF '02, is Gottlieb professor of law and faculty director of the Program of Judicial Education at Harvard Law School. An earlier version of this article appeared in *Democracy: A Journal of Ideas* (democracyjournal.org/article.php?ID=6528).

HOME OF THE HUMANITIES

(continued from page 56)

from the classic Veracruz culture, on the east coast of modern Mexico—informs viewers about the culture's widespread ball games, believed to have served both ritualistic and recreational functions; the athletic equipment on display includes stone elbow and knee protectors. In another gallery, visitors learn about Maya religion by viewing a bust of the maize god and a bowl with a carved image of the chocolate god.

The Blisses snubbed the sensibilities of their time in favor of collecting pieces that brought them pleasure. Just as they were early Byzantine enthusiasts, Robert Bliss “was ahead of his time” in collecting pre-Columbian artifacts, says Bühl: his collection, first displayed at the National Gallery, was one of the earliest to recognize the objects' artistic value, as well as their status as historical artifacts. A special exhibit for the grand reopening features his first acquisition, a nine-inch-tall jade Olmec statuette he found at an antique shop in Paris in 1912. Here, the figure assumes a double meaning, commenting on both Olmec culture and the Blisses' life history.

The main house, which dates to 1801, is a museum in itself, exquisitely decorated with floors of exotic Hawaiian wood and furniture collected during the Blisses' travels around the world. After buying the property, they added a greenhouse, a stable (which by the time they completed it was a garage instead), an orchid house (today a periodical room attached to the new library), servants' quarters, the museum wings, and, of course, the gardens. But their main structural addition was the music room.

In decorating this room, they spared no expense. The appointments include a fireplace with a hulking sixteenth-century limestone mantelpiece that stretches to the 15-foot ceiling. Its previous home was the Château de Théobon, in the Dordogne. (The Blisses had to have the foundations of the house reinforced beneath the spot where it would sit.) They also commissioned a

A pendant representing the crocodile god, one of the most widespread deities among the pre-Columbian peoples of what are now Costa Rica and Panama. Made of a gold and copper alloy, the pendant is believed to be between 500 and 1,300 years old.

multicolored, ornate ornamental ceiling as well, copied from a chateau in the Loire Valley. A monthly, public concert series fulfills their wish to have the room used for chamber-music performances.

On one December evening, the concert is by the vocal ensemble Pomerium. (Fittingly, its medieval Latin name translates as *garden or orchard*.) In the minutes before the concert begins, people crane their necks unabashedly to stare at the ceiling, recently restored to its original state after years of bad restorations that had, staff members ruefully recall, left cherubs looking like Casper the Friendly Ghost. Along the sides of the room are a work by El Greco; an early Renaissance painting depicting the martyrdom of Saint Peter, painted in the fifteenth century by Jacobello del Fiore; and a wooden sculpture of the Virgin holding the Christ Child, carved as a model for a life-size version by the fifteenth-century German sculptor Tilman Riemenschneider.

The ensemble sings in front of a Palladian arch; tapestries from the fifteenth century hang above the singers' heads. The scene is framed by the floor of red Verona marble, the Italianate columns, the gilded bronze wall sconces—designed for candles but now electrified—



Curator and museum director Gudrun Bühl

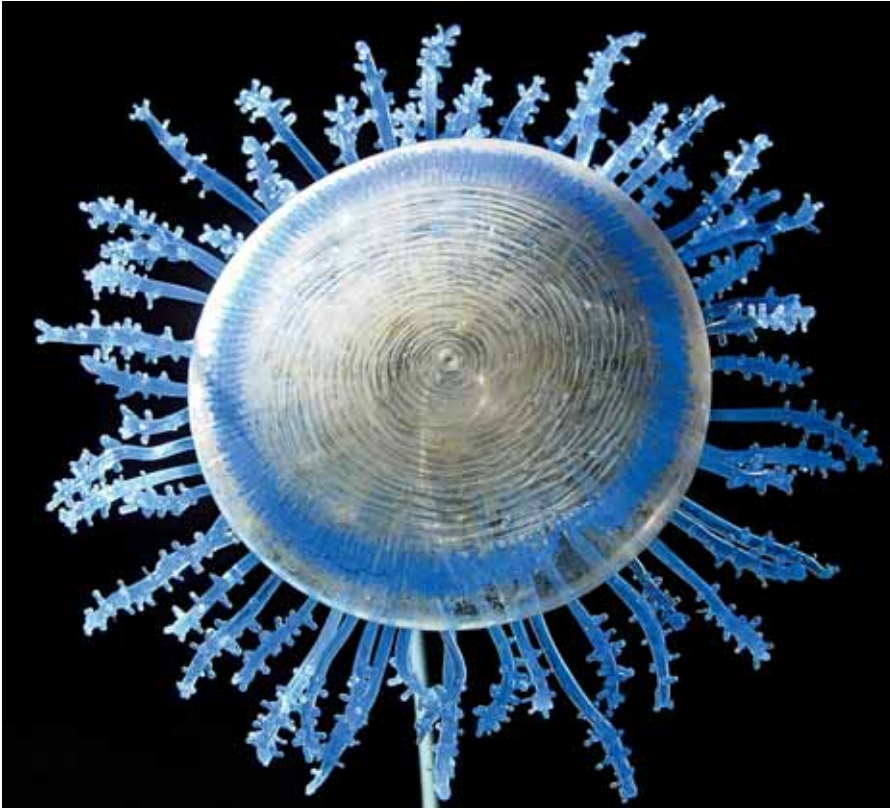
and the massive silvered-brass light fixtures, said to be from the cathedral of Segovia in Spain.

The program is songs of Christmas, but not those that would be familiar to modern ears. The ensemble sings in Latin, starting with a monophonic Gregorian chant version of each song—haunting in its sparsity—followed by its layered and textured polyphonic elaboration, like a stove with all its burners going at once, different dishes bubbling and boiling. Some listeners are undoubtedly considering this a commentary on stylistic change between the Middle Ages and the Renaissance; others, just as certainly, are simply appreciating the lush sounds. The Blisses' names may be unfamiliar to many listeners, but this scene fulfills their wishes just the same. ▽

Elizabeth Gudrais '01 is associate editor of this magazine.

Glass Jelly

Move over, Glass Flowers.



THE BLUE BEAUTY at left is *Porpita mediterranea* rendered in glass, reproduced here at about twice life size. These jellies, moved by wind and wave across the surface of the open sea, are composed of colonies of specialized organisms. They trap and subdue their prey with tentacles bearing stinging cells that eject barbed threads with a paralyzing toxin, according to Janis Sacco, director of exhibitions at the Harvard Museum of Natural History. They don't sting humans.

The University's greatest indoor tourist attraction are the more than 4,000 astonishing "glass flowers" made especially for Harvard from 1887 through 1936 by artisans Leopold and Rudolph Blaschka, father and son, at their studio near Dresden. The plants now share the spotlight with sea slugs, squid, jellyfish, and other soft ones of the ocean, also rendered in glass and wire by the Blaschkas. The new exhibition *Sea Creatures in Glass* will continue through January 4, 2009. Alongside the 58 models are specimens in bottles, a video, and a recreation of the Blaschka studio.

Before they turned exclusively to plants, the Blaschkas mass-produced models of more than 700 marine invertebrate species. Harvard acquired its 420 models around 1878 to use for teaching. With the advent of underwater photography, the collection began to suffer from benign neglect ("The Glass Animals," July-August 1997, page 92). "Most of the models still need to be cleaned and restored," says James Hanken, Agassiz professor of zoology—a process to be completed, he judges, about \$250,000 from now. A few of the first batch to be rescued were shown last year in Minnesota at Underwater Adventures Aquarium, whose CEO, Todd Peterson '84, M.B.A. '87, spurred Harvard's efforts. The crystal creatures flew West in their own first-class seat on the plane. ▾

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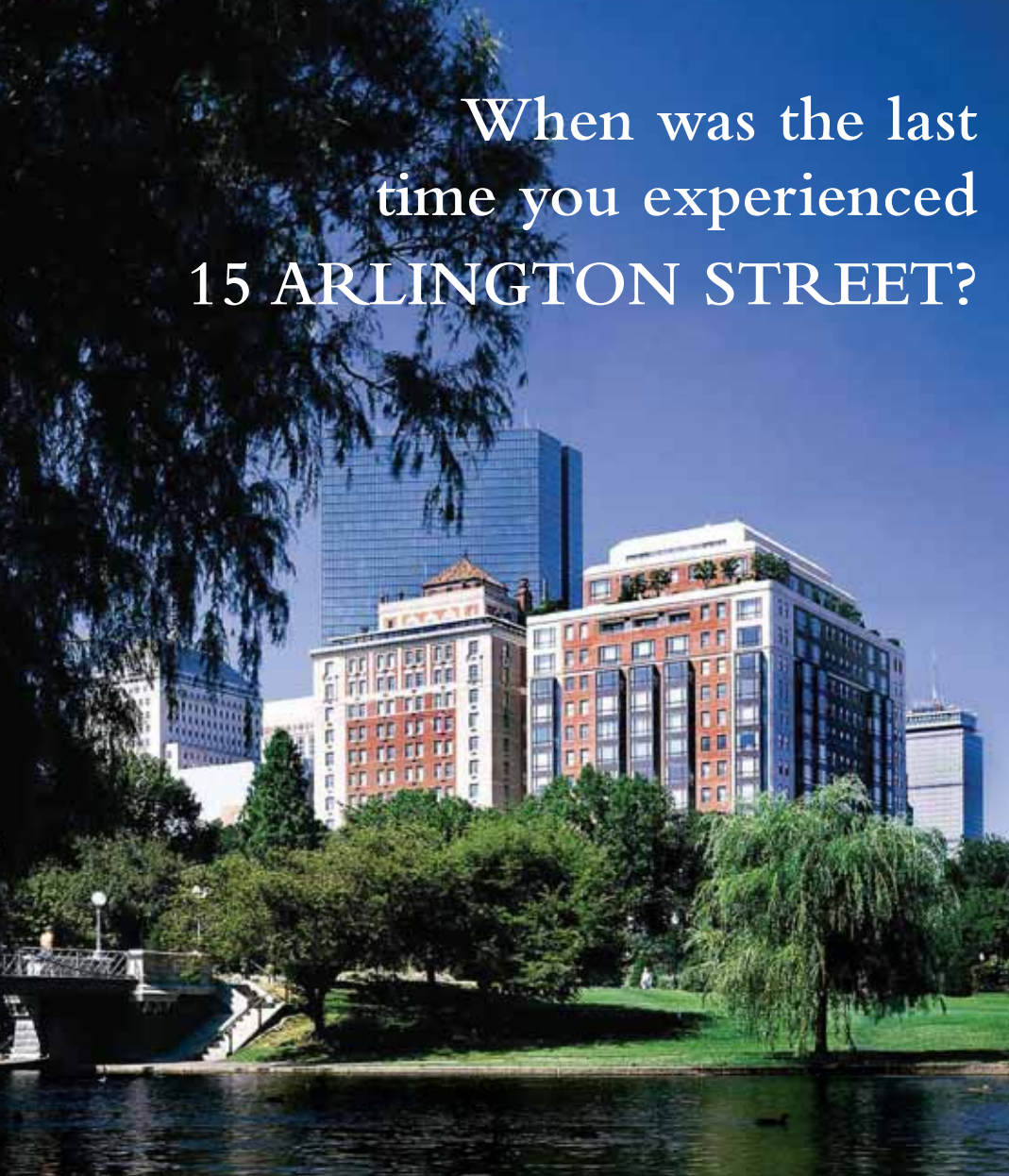
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