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by Jeff Vespa/Getty Images

Cambridge 02138

Final clubs, comparing campuses, reading Greek

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DNA DRAWING

YOUR DISCUSSION of using gene drives to combat malaria was very even-handed ("Editing an End to Malaria?" May-June, page 37); but DNA is, and must be, right-handed in the twist of its helix. Alas, on your very clever cover illustration it is left-handed, although in another fine picture on page 55 you got it right.

JIM HABER '65
Wayland, Mass.

Editor's note: Other correspondents made the same point about our supervision of the cover illustration by artist

Pete Ryan. Author Jon Shaw amplifies:

Since DNA's structure was not part of my biology instruction in school, I had to look it up. Distinguishing left-handed from right-handed DNA is not intuitive even with both versions in front of you, and even when you know DNA is supposed to be right-handed. Maybe that is why this error occurs even in science journals and textbooks—especially on covers. For example, see www.ncbi.nlm.nih.gov/pmc/articles/PMC2775190 on nucleosomes, which are left-handed (it also refers to errors in depicting DNA). An image with incorrect chirality recently appeared on the cover of *Nature Structural and Molecular Biology*. (Finding these errors has become a game for some people.) Chirality (handedness) in molecules affects their biological activity, among other important consequences. *Some* DNA is left-handed; but right-handed "B-DNA" is the common form.

ROBOTS AND JOBLESSNESS

SELF-CHECKOUT at Home Depot and supermarkets permanently removes entry-level

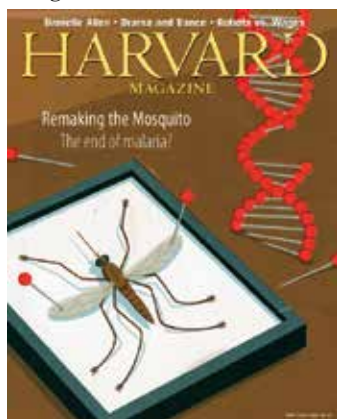
jobs. ATMs have permanently removed teller positions. While unrelated to robotics but similar in effect, movement of manufacturing offshore has permanently (likely) removed tens of thousands of working-class jobs ("Who Owns the Robots Rules the World," by Richard B. Freeman, May-June, page 37). The effect of all this rests nearly entirely on the tens of millions of people without degrees or advanced training. Retraining has not worked for these people. There are simply too many.

Robotics is inevitable. More working-class job losses will come. The effect will further increase the wealth gap between rich and poor, with dire consequences for the nation. Sharing of the wealth effects of robotics with the few workers left will not happen any more than sharing between management and workers occurs now. I suggest that you add homeless waiters and waitresses begging for cash to your depiction.

PAUL GABOURY, M.B.A. '80
Acton, Mass.

THE ARTICLE by Richard Freeman contains a logical flaw that renders its remedy ineffectual. He states: "In international trade, comparative advantage explains why a highly productive country does not 'steal' jobs from a less productive country. Instead, both countries benefit by specializing in sectors in which they have a relative advantage." Freeman then claims "comparative advantage" also explains why robots will not "steal" jobs from humans. "If a robot is twice as efficient as a human at driving a car, for example,

(please turn to page 5)



An Invincible Spirit

IN JANUARY 1916, more than 1,100 Harvard students, many motivated by the possibility of the United States' entrance into the Great War, joined what would become one of the country's first Reserve Officers' Training Corps (ROTC) programs. In addition to their usual course of study, young men in the Harvard Regiment received theoretical and practical military instruction, drilled and marched at Soldiers Field, completed complex exercises in nearby towns, and—on at least one occasion—paraded through Boston in a show of national “preparedness.” Their commander, Captain Constant Cordier, considered them inspired by “an invincible spirit” and remarked that “in all this land there is no better material for officers than is found in the student body of Harvard.”

One century later, we mark the return to our campus of the full complement of ROTC: Air Force, Army, and Navy. I have had the honor of restoring the full and formal recognition of these programs in the five years since the repeal of “don't ask, don't tell,” and I have admired those undergraduates who choose to serve the nation, whether they are completing deployments in Afghanistan, training pilots aboard aircraft carriers halfway around the world, or inspiring their fellow citizens with a flyover at the Harvard-Yale game. These young people join an extraordinarily distinguished group of alumni: the University has educated more Medal of Honor recipients than any college or university other than the service academies, and our graduates have been decorated with the highest honors from each of the service branches.

Our campus community includes hundreds of men and women who have already served or who will return to service after they complete their studies. At the Business School, the Kennedy School, and the Law School, among others, student veterans and service members bring to their learning and their practice rare perspectives and, in

sharing their expertise and thinking, give their classmates insight into an institution that is so important to our nation. They extend their influence beyond our campus through volunteer opportunities including the Center for Public Leadership's “Veterans Impact Day,” which recently put more than 150 students from Harvard and local colleges in direct contact with

those who have served. In the coming year, the Yellow Ribbon Program, which assists veterans with tuition and fees, will, for the first time, be open to an unlimited number of eligible students across our Schools.

Harvard's soldier-scholars undertake their diverse work in a place where one is everywhere reminded of distinguished military service and sacrifice. My days and nights in Cambridge are spent in Massachusetts Hall and Elmwood, both of which were used to house troops during the American Revolution; nearby Wadsworth House sheltered George Washington when he came to take command of the Continental Army. Other quiet corners are dedicated to those who served later and farther afield. Plaques and walls listing the names of those who gave their last full measure of devotion are familiar sights at the Divinity School, the Law School, the Medical School, and elsewhere, and Memorial Church and Memorial Hall have become landmarks, guiding our way as they stand testament to the human cost of supporting and defending the Constitution.

When I was preparing my remarks to the first class of students commissioned after



Harvard renewed its military ties, I found inspiration in a name etched into the walls of the Memorial Hall transept. Charles Russell Lowell, valedictorian of the College Class of 1854, served in the Union Army and died shortly after being wounded at the Battle of Cedar Creek—not far from where I grew up in Virginia's Shenandoah Valley. A decade before he made the ultimate sacrifice for his country, he addressed his classmates, urging them both to consider what *should* be and to imagine what *can* be. This uneasiness with the present married with an eagerness to shape the future is among the finest traditions shared by Harvard University and the United States Armed Forces, and we are privileged to renew fully in this centennial year a longstanding and vigorous partnership. “The world,” as Lowell would remind us, “always advances by impossibilities achieved.”

Sincerely,

Speaking Frankly, at West Point

DREW FAUST gave one of the signal speeches of her Harvard presidency at West Point this past March. The subject was education in the humanities—and in leadership. Her talk brought to the fore common Faust themes: immersion in the arts and humanities and learning to think critically about values. The venue and format (a formal address, rather than the occasions where an interlocutor poses questions, and Faust's answers are briefer) made a difference.

At the United States Military Academy (USMA), as Faust noted, “the humanities are resources that build ‘self-awareness, character, [and] perspective,’ and enable leaders to compel and to connect with others.” She identified three ways in which that occurs. “First,” she said, “leaders need perspective”—the historical and cultural lenses that clarify a situation through “empathy: how to see ourselves inside another person's experience. How to picture a different possibility.” Second, “leaders need the capacity to improvise. I often point out that education is not the same thing as training for a job....Circumstances evolve. Certainly, soldiers know...that our knowledge needs to be flexible, as we grapple with complexity in an instant.” Third, she emphasized how leaders like Churchill and Lincoln “use the persuasive power of language.”

Two broad applications to Harvard come to mind. One concerns transitions. West Point, Faust noted, was “the nation's first college of engineering.” Now, even as “other institutions drop liberal-arts requirements, military academies have been adding them. Over the past 50 years, West Point has transformed its curriculum into a general liberal-arts education, graduating leaders with broad-based knowledge of both the sciences and the humanities, and the ability to apply that knowledge in a fluid and uncertain world.” The College, grounded as it has been in the traditional liberal arts, is very much tilting the *other* way, expanding engineering and applied sciences, and inspiring entrepreneurship. That prompts anxieties about waning student interest in humanities and adults' responsibility to assure that their charges are broadly, not merely vocationally, educated.

The related relevant point is the com-

position of General Education. Recent reforms melded approaches meant to reinforce the civic intent of Gen Ed courses; maximize students' freedom of course selection; and somehow squeeze in a distribution requirement. Much less attention was paid to the pedagogical aims of those requirements.

As the faculty deliberated, Nicholas Lemann '76 wrote “What Should Graduates Know?” in *The Chronicle of Higher Education*. Drawing on his decanal experiences remaking the curriculum of Columbia's Graduate School of Journalism, he suggested that colleges need to specify what they are *for* (lest they become excessively vocational by default). As a “quick list of possibilities” for an undergraduate curriculum, he suggested “instruction around a set of master skills that together would make one an educated, intellectually empowered, morally aware person.” Among them: “Rigorous interpretation of meaning, taught mainly through close reading of texts. Numeracy, including basic statistical literacy. Pattern and context recognition. Developing and stating an argument, in spoken and written form.” And so on, through “Empathetic understanding of other people and other cultures.”

Lemann is also a member of the American Academy of Arts & Sciences' new Commission on the Future of Undergraduate Education. Bracingly, upriver from Lemann's school, the USMA course catalog states an “Educational Philosophy.” It details such academic goals as communication skills; critical thinking and creativity; lifelong learning; ethical reasoning; and subject-matter expertise in STEM fields and humanities and social sciences.

Gen Ed embraces some language about such purposes. But they were not the subject of the recent debate, and the faculty is unlikely to revisit the principles before the next iteration of the curriculum—around the quarter-century mark. Even when that happens, Harvard presidents are careful to give faculty members their head in such matters. But surely there was, and perhaps still is, an opportunity to engage more fully with these critical issues in the interim, on campus. It would be good for students and professors to hear more from the president, directly; as her West Point remarks attest, she has plenty to say, and forcefully. This is a conversation the community ought to have.

—JOHN S. ROSENBERG, *Editor*

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(continued from page 2)

but only 50 percent more efficient at picking blueberries, the robot would do the driving, while the humans would pick the blueberries."

But underlying the theory of comparative advantage in international trade is the assumption that the population in a highly productive country is not going to expand into a less productive country and thus will not take all the jobs in both countries. Unfortunately, that assumption can't be made for robots, the population of which is essentially limitless and borderless.

Freeman admits to this contradiction when he later refers to "armies" of robots. When there are "armies" of robots, then in his example, they will do the driving *and* pick the blueberries, because they can do both and are better at both.

This flaw undermines his remedy—policies that would encourage employees to be able to "share...in the ownership of the machines that replace them at work." It is questionable whether those former employees' shares of the "prosperity that the

robots produce" will equal or exceed the loss of earnings at their former jobs. Further, when there is no limit to the extent to which robots will displace employees, then there will be an ever shrinking number of employees left to share in an ever increasing amount of prosperity.

The combination of these factors will likely result in the same concentration of wealth in a few owners that Freeman's ineffectual remedies seek to avoid. I look forward to his offer of his robot assistant, who "will report shortly on what we should do."

GORDON BENNETT '68
Inverness, Calif.

FINAL CLUBS

THE PUNITIVE POLICY announced recently by the dean of Harvard College and President Drew Faust must be a crushing disappointment to all alumni who believed in Harvard as an enduring bastion of free inquiry and association [see page 27 and harvardmag.com/finalclub-16 and harvardmag.com/fall-out-16]. I cannot fathom how such an ill-advised, and, in the real world, constitutionally

suspect policy apparently didn't attract the concern of the Corporation, Board of Overseers, or University counsel. Harvard should not be positioned on this slippery slope of social engineering if it hopes to maintain its core integrity.

PHILIP STOCKTON '62
Miami

AS A GRADUATE MEMBER of the Owl Club, I believe Dean Rakesh Khurana's proposal to penalize students who are members of any final club which is not co-ed is the epitome of hypocrisy, logically flawed, and completely misguided.

It is hypocritical because the University discriminates on a massive scale. It just discriminated against 35,000 applicants by rejecting them based on arbitrary admission criteria. It discriminates against applicants of Asian descent who typically need SAT scores over 100 points higher than those of white applicants in order to be accepted. It now is discriminating against members of final clubs because the University will not apply the policy to all other single-sex organizations, including

Fragrance-Free Workplaces?

In the 1960s few would have believed that smoke-free workplaces would one day become the norm. Could fragrance-free workplaces, medical facilities, and nursing homes be the wave of the future?

In a 2009 policy statement the CDC banned air fresheners and scented candles in all its facilities. This policy states: "Fragrance is not appropriate for a professional work environment, and the use of some products with fragrance may be detrimental to the health of workers with chemical sensitivities, allergies, asthma, and chronic headaches/migraines." The full CDC policy can be viewed on the website of the Chemical Sensitivity Foundation, which contains information about multiple chemical sensitivity (MCS), including a research bibliography. We welcome hearing from you on this topic by phone, 207-373-3829, or through e-mail or snail mail via our website.

To learn more, play on YouTube the video "**Multiple Chemical Sensitivity: A Life-Altering Condition**," which contains footage of interviews with four leading members of Congress and a former Commander of Walter Reed Army Medical Center.

Please donate to the cause on www.ChemicalSensitivityFoundation.org

the South Asian Men's Collective and the Association of Black Harvard Women.

It is logically flawed because, to be consistent, the University should penalize any non-affiliated single-sex organization and yet no plans have been announced to deny admission to students who attend a single-sex high school, or who are members of the Boy or Girl Scouts. It also is logically flawed because even if the final clubs were to become co-ed, those not selected still would feel excluded and disempowered. Meanwhile, how are final clubs any different from the University's athletic teams? The athletic teams are single-sex organizations that foster values in the locker rooms that are virtually identical to those of the final clubs: friendship, shared experiences, and bonding.

The reality is it is impossible for any institution to function without discriminating, hence, the reason Harvard rejects 35,000 applicants. Furthermore, not all discrimination is bad. Harvard discriminates when it assigns students to single-sex roommate groups. Consequently, the University's attempt to eliminate sexual

discrimination is misguided and diminishes the freedoms of students who voluntarily choose to join any single-sex organization.

Students would be far better served if the University focused instead on making them aware of the many forms of discrimination, both good and bad, and on educating them on how to deal with being discriminated against.

MICHAEL ERICKSON '74
Corte Madera, Calif.

Editor's note: Claims concerning admission of Asian-American applicants are matters for debate in current litigation and in the

SPEAK UP, PLEASE

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contested Overseers' election, not settled fact. The SAMC and ABHA are officially recognized student groups (as the final clubs are not), and thus required to be open to any members of a different gender who may wish to join.

WHEN I LEFT Kansas for Cambridge in 1955, it was my first trip east of the Mississippi River. I had never heard of the final clubs. Of course I leaned about them soon enough, and ended up joining one as a sophomore, where I made many of my closest friends. Although I have contributed regularly to the College, and hardly at all to the club, I remain intensely loyal to both. So I am thrown into painful conflict by the administration's plan to blackmail the clubs. Luckily, I'm not a future sophomore who will be subject to manipulation in the cause of gender integration.

RICHARD H. SEATON '59
Manhattan, Kans.

GEN ED

GENERAL EDUCATION ("General Education Reconstituted," May-June, page 31) is

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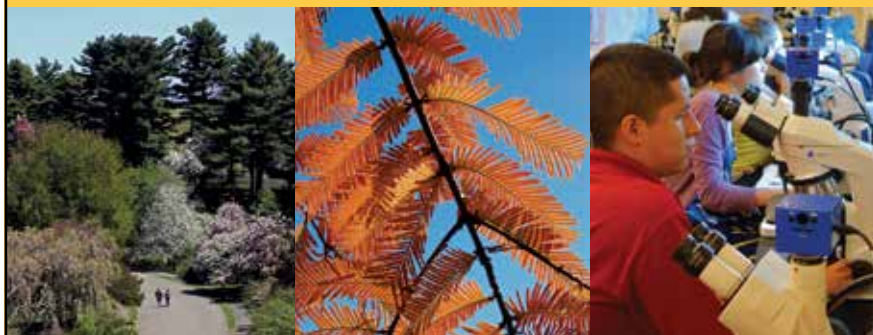


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LETTERS

different because it is general. Its goals are complementary: every student must learn to critically evaluate the advice of physician or accountant or tennis coach, while at the same time the future physician or accountant or coach must learn to think critically in crafting that advice.

In Gen Ed, differences are less important than similarities: for example, my university, where I am heavily involved in the Gen Ed program, has many more undergraduate clinical and professional programs than Harvard. No matter: Gen Ed is general, so we can compare. Harvard now joins us (and many other universities) in what I call the “charm bracelet” model: critical thinking, ethics, and cultural sensitivity dangle as discrete trophies next to the Empire State Building and Yellowstone Park.

I prefer the model in which Gen Ed is a core institutional value rather than an external decoration. In this model, every course in every discipline advances the wider goals of Gen Ed, especially when far from the liberal arts. In addition to technical skills, nurses and lawyers need just as much critical thinking as historians and mathematicians.

However, it is difficult to measure the “success” of this approach. Since both administrators and accreditors are uncomfortable with unmeasurable outcomes, it is unlikely that such a curriculum will appear widely or soon.

JAMES S. WOLPER '76
Professor of mathematics, Idaho State University

COMPARING CAMPUS STRATEGIES

AS A DEGREE-HOLDER from Harvard and Princeton, and also one who unexpectedly found his principal career for more than 30 years in higher education administration (with, in addition, significant connections to and long-time roles with Cambridge University and Sarah Lawrence College), I was greatly pleased (and a little surprised) to see the thoughtful and appreciative commentary, “The Tiger Roars” (May-June, page 2), commending Princeton’s recently produced strategic framework, and suggesting that Harvard might benefit from a comparable undertaking.

It has long been a truism that higher education in the U.S., and especially its multiplicity and variety, are treasures of our nation, widely admired throughout the world. Com- (please turn to page 74)

Right Now

The expanding Harvard universe

SAFETY-NET DIVIDEND

Food Stamp Entrepreneurs

ECONOMIST Gareth Olds has some unexpected advice for policymakers who want people to start their own businesses:

give them welfare, including access to food stamps and public health insurance. Contrary to the notion that welfare's safety net undermines ambition and hard work—"a safety 'hammock,' I've heard it called," Olds says—his research finds that public assistance gives would-be entrepreneurs the lift they need, in part by increasing their ability to save money for investment. "Most of the evidence we've seen so far says that the effects tend to be the largest for lower-income people," he explains. "Which makes sense, because they tend to be the most constrained. They're

the least likely to have access to credit, because they don't have collateral."

But just as critically, public assistance

reduces risk. Starting a business is inherently perilous. "If you can guarantee some kind of a floor"—if the venture fails, "their

kids will still have health insurance, that they'll still be able to eat—then they're more willing to take on a risk. And...that's very important to firm-creating and economic growth."

Olds, an assistant professor in Harvard Business School's entrepreneurial management unit, first published this conclusion in a pair of 2014 working papers during his doctoral research at Brown. One focused on the State Children's Health Insurance Program (SCHIP), which provides health insurance to children in moderate-income families. Using U.S. Census Bureau data from



1992 to 2011 to compare households just above and below the cutoff for SCHIP, both before and after the program began in 1997. Olds found that the self-employment rate among SCHIP-eligible households rose by 23 percent versus those households that weren't eligible. The rate of new business starts rose by 13 percent among households that qualified for the program, and the survival rate of new businesses rose by 8 percent. The largest growth was in newly incorporated businesses, many of which were substantial and successful enough to contribute to the family bank account: income from self-employment increased 16 percent relative to other wages.

Olds's other 2014 paper, on "Food Stamp Entrepreneurs," found a similar link between business starts and eligibility for

Alaska, he lived them. Money was tight: his stepfather worked a steady but low-paying job as a dental assistant, and his mother did a series of odd jobs, including as a secretary and a doula; she is now a nurse. They lived paycheck to paycheck. But when he was six, his parents launched a business, a training school for dental assistants, which they ran successfully before selling it a decade later. "It was one of those family businesses where everybody pitches in," he says. On Saturday mornings, the family would go to Costco and get muffins for the students; in the afternoons, he and his two sisters would serve as mock patients so students could practice taking x-rays and fitting dental dams.

At the time, Olds didn't think much about it. "I just knew this was what we did

All that put a floor under their feet. "That security, having that in the back of your mind, changes the risks you're willing to take," he says. "And they went out on a limb, and it worked."

Olds is now investigating whether the effect holds for other public programs. One area that interests him: student-loan debt, which has become a crushing burden. "We're looking at whether parents in areas where there's been a rising cost of public education are less likely to start a business. And we're finding that they are, and the effects are pretty large."

In a Maryland-based experiment, he is also offering business-training programs to food-stamp recipients, to find out whether lack of knowledge is "one of the big constraints" for the poor. Behind this question is his larger one: "Can public programs have an impact on entrepreneurship?"

"If entrepreneurship is something we're interested in supporting"—President Obama and many other politicians have talked about its importance, he notes—"we need to know if it's something public policy can control. If the answer is no, then we should get out of that business and make sure the financial institutions work well. But if there's something that isn't being provided in the market right now—like cheap training or income security—then that's something we should pay attention to." ~LYDIALYLE GIBSON

GARETH OLDS WEBSITE:

www.hbs.edu/faculty/Pages/profile.aspx?facId=738736

"If you can guarantee entrepreneurs some kind of a floor...then they're more willing to take on a risk. That's very important to firm-creating and economic growth."

the Supplemental Nutrition Assistance Program (SNAP), which expanded in the mid 2000s when its requirements were loosened. Newly qualified households were 20 percent more likely to start a business, and the number of incorporated businesses rose 16 percent among those who were newly qualified.

Those findings were familiar to Olds—as a child growing up in Anchorage,

on Saturdays, and this was why I couldn't play with my friends." But as he got older, he thought about the risk his parents had taken ("None of this was guaranteed," he says) and the money they'd had to save. They didn't take out a loan. "I started thinking, how did they save that money?" He recalled the years early on when the family was on food stamps and he and his sisters got healthcare through Medicaid.

"COLLECTIVE EFFERVESCENCE"

What Makes Teams Tick

MANY OF the most pressing issues of our time—climate change, economic inequality, human rights—require interdisciplinary solutions. Yet facilitating collaboration among individuals from disparate fields can often be challenging. A recent study on what contributes to successful interdisciplinary work has found that the "emotional aspect" of such collaborations is at least as important as their intellectual aspect.

The study, by professor of sociology Michele Lamont, lecturer on education Veronica Boix Mansilla, and Kyoko Sato, now a lecturer at Stanford, closely examined nine interdisciplinary networks funded by the Canadian Institute for Advanced Research, the MacArthur Foundation, and the Santa Fe Institute. These networks all brought together scholars from at least three disciplines; their research topics ranged from brain development to urban-

ization. Drawing on documents, observation, surveys, and interviews, the authors concluded that the markers of successful interdisciplinary collaborations include not just an intellectual, but also emotional and interactional elements, and they proposed a "shared cognitive-emotional-interactional platform" for evaluating such projects.

Lamont said the findings may appear counterintuitive. "Instead of thinking that the emotional and the interactional corrupt the cognitive," as the issue has often been framed in the literature, she explained, the authors view the first two dimensions "as interacting with knowledge production and as empowering." Success-

Successful collaboration requires the construction of a group identity, “a sense of ‘us.’”



ful interdisciplinary networks, she continued, are characterized by a “collective effervescence” that involves mutual respect and learning among team members.

When accomplished experts of different disciplines sit around one table, added Boix Mansilla, the resulting interaction is comparable to an intercultural dialogue, with all the ancillary stereotypes and assumptions about “the other.” The participants often underplay the need to construct an emotional cohesiveness—which the study found to be integral. “What our study suggests is that we need to pay special attention to something that we sometimes take for granted or forget,” she said. Successful collaboration requires the construction of a group identity, which Boix Mansilla encapsulates as “a sense of ‘us’; the degree to which a team can get excited about the idea and the leaders can keep this intellectual excitement alive.”

One group illustrating successful collaboration, Lamont said, was the MacArthur Foundation’s Research Network on Adolescent Development and Juvenile Jus-

tice, which probed the origins, development, and prevention of juvenile crimes.

The team’s work, she explained, has helped lead to changes in the courtroom.

The collaboration produced an influential article quoted in the landmark 2005 Supreme Court decision that outlawed the death penalty for juvenile offenders. Kyoko Sato said that what distinguished this group were the positive interactional and emotional features that facilitated dialogues among participants ranging from legal officials to experts in

psychology, public health, and education. “They really liked each other,” she said, “and they were also all bonded in a collective mission to make a difference in the juvenile-justice system.”

Howard Gardner, Hobbs professor of cognition and education at the Graduate

School of Education, who has led a study on interdisciplinary collaboration in the past, called the paper an “ambitious” and “creative synthesis” of various kinds of data. “I don’t know of any study that looked at longstanding networks over a significant period of time,” he said. “This is not the type of question that you can answer simply by doing a lengthy online survey; it doesn’t lend itself to large-scale ‘big-data’ methods.” His own research on successful collaborations yielded similar people-centered findings that emphasized factors such as the rigorous selection of team members and good leadership. “People need to like each other,” he said. “Nobody wants to work for years on something if he or she doesn’t like the other people.”

The major takeaway from the study, Lamont said, is that researchers should choose their collaborators carefully, assessing not just intellectual contribution, but also emotional intelligence and personality. “The days of the titans who dominated their disciplines at Harvard and elsewhere may be obsolete one day,” Lamont said, “because the key to innovation is now often collaboration.”

~ZARA ZHANG

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<http://sociology.fas.harvard.edu/people/michèle-lamont>

HELPING EVOLUTION MULTITASK

Why Sex Succeeds

WHY PAIR UP to procreate? Biologists have long wondered why so many organisms go to so much trouble to create offspring, when asexual reproduction fulfills the evolutionary goal of passing on as many genes as possible to the next generation.

During the last century, scientists developed two main theories. The “Red Queen” hypothesis says that DNA-sharing, because it speeds up evolution, allows organisms to

stay one step ahead of parasites and other pathogens by evolving to outsmart their attacks. (The phrase comes from the Red Queen’s remark in *Through the Looking Glass*: “Now here, you see, it takes all the running you can do, to keep in the same place.”) The second theory, “Plucking Rubies,” suggests that recombining genes in each generation preserves beneficial mutations; at the same time, harmful mutations are selected out of the gene pool.



Cabot associate professor of organismic and evolutionary biology Michael Desai has changed the conversation, becoming the first researcher to directly observe, at a molecular level, how sex provides an evolutionary advantage. He finds that natural selection *does* appear to pluck rubies, though in a more complex way than scientists originally proposed.

In findings published in *Nature*, Desai describes his studies of *Saccharomyces cerevisiae*: yeast used in beer- and wine-making that reproduce, conveniently, both asexually and sexually. “We can have genetically identical strains that are maintained in almost identical environments, the only difference being that one population periodically undergoes mating,” while the other is strictly asexual, he explains.

They faced one major complication: although *S. cerevisiae* can reproduce sexually, they almost always choose the asexual route. It took “a lot of coaxing,” Desai says. “The yeast actually don’t like to have sex in the lab.” He created a system to force one population to mate every 90 generations, by adding genes for antibiotic resistance to their DNA and prompting those genes to switch on only when genes for mating were active. Researchers subse-

quently exposed that population to antibiotics, which allowed them to kill any yeast that didn’t have sex.

Because *S. cerevisiae* reproduce quickly, it took Desai’s team just six months to produce 1,000 generations of both popu-

“Sex is a way of helping natural selection do more things at the same time.”

lations. Sequencing the yeast genes every 90 generations allowed them to track genetic mutations over time, and he and his team saw a clear advantage to mating. “We found that sexual populations of yeast adapt substantially faster, close to twice as fast as asexual populations, over a thousand generations of laboratory evolution,” Desai reports. They also learned a little about why: in the asexual yeast, beneficial mutations are less likely to “fix” (spread across the population) because the yeast compete and interfere with each other. “Many beneficial mutations are driven extinct by this competition,” he says. In contrast, mating yeast recombine deleterious mutations away and contribute different beneficial mutations, so positive attributes spread.

Desai’s team was also surprised by a striking new finding: a number of very harmful mutations in asexual yeast “hitchhiked” to subsequent generations alongside beneficial mutations. “These deleterious mutations spread through the population because they’re linked to beneficial mutations,” he explains. “The strength of this effect was stronger than theoretical work that we and other people have done would have predicted.” But in mating populations, recombination prevented those hitchhikers from fixing, confirming a version of the plucking rubies hypothesis.

Many questions remain. “These experiments don’t yet answer the question of why sex is so widespread,” Desai says—and future studies will need to con-

sider its costs. “Obviously it’s quite expensive to maintain all the machinery and spend all the effort that’s required for sexual reproduction,” he says. “What still needs to be done is to weigh these advantages that we have demonstrated

here against the potential costs.” Hoping to further clarify this key biological question, he’s planning new studies forcing sexual and asexual strains of yeast to compete against each other, to see which wins out.

“Our genomes are big and complicated, and there’s a lot going on, and natural selection is trying to do all of these things at once: it’s trying to keep the deleterious mutations out of our genomes and drive the beneficial mutations through the population,” Desai says. “Sex is a way of helping natural selection do more things at the same time. In a sense, it’s a way of helping evolution multitask.” ~ERIN O’DONNELL

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Languid afternoons



I2P In with the New
Harvard Square's Parsnip should ripen over time



Extracurriculars

Events on and off campus during July and August

SEASONAL

The Farmers' Market at Harvard

www.dining.harvard.edu/food-literacy-project/farmers-market-harvard

The market at the Science Center plaza

offers fish, meats, produce, breads and pastries, herbs, pasta, chocolates, and cheeses—along with guest chefs and cooking demonstrations. (noon to 6 P.M.; Tuesdays through November 22)

From left: *Clark's Point Light, New Bedford (1854)*, by William Bradford, at the New Bedford Whaling Museum; Anna Deavere Smith's one-woman show *Notes from the Field: Doing Time in Education*, at the American Repertory Theater; and *Extraordinary Playscapes*, at the Boston Society of Architects

MUSIC

Harvard Summer Pops Band

www.hcs.harvard.edu/~hub/events/summerband

The ensemble performs its popular annual concerts; program details appear online. (July 28 at 4 P.M. in Harvard Yard; July 31 at 3 P.M. at the Hatch Shell in Boston)

The Harvard Summer School Chorus

www.boxoffice.harvard.edu

The programs includes *Pilgrim Psalms*, by Ross Lee Finney, and the world premiere

FROM LEFT: COURTESY OF THE NEW BEDFORD WHALING MUSEUM; COURTESY OF THE A.R.T.; COURTESY OF THE BOSTON SOCIETY OF ARCHITECTS

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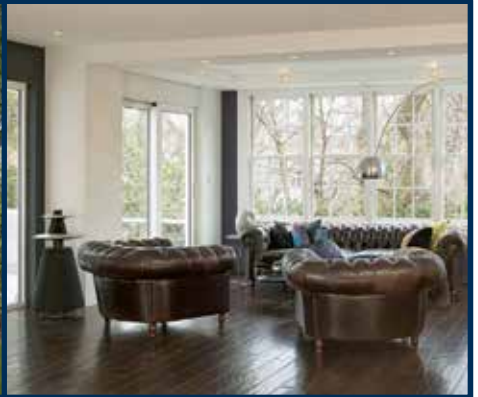
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HARVARD SQUARED

of *Rain Songs*, by Memorial Church composer-in-residence Carson Cooman. Sanders Theatre. (July 29)

The 30th Annual Lowell Folk Festival

www.lowellfolkfestival.org

Three days of music with hundreds of performers, including headliners King Sunny Adé & His African Beats, Natalie MacMaster and Donnell Leahy, rockabilly artist Jason D. Williams, and Deacon John Moore from New Orleans. (July 29-31)

Summer Gospel Festival

www.spirituallyfabulous.com/summer-gospel-fest

A celebration of this musical tradition, from classic to contemporary artists, with food vendors and children's activities. Institute Park, Worcester, Mass. (August 6)

FILM

Harvard Film Archive

www.hcl.harvard.edu/hfa

A retrospective on filmmaker **Theo Angelopoulos** highlights his poetic take on contemporary Greek life. Screenings include

Ulysses' Gaze, *Landscape of the Mist*, and *The Traveling Players*. (July 15-August 22)

The Complete Rouben Mamoulian looks at the Armenian American's long Hollywood career through his classic films, such as *Dr. Jekyll and Mr. Hyde*, *Silk Stockings*, and *The Mark of Zorro*. (Through August 30)

THEATER

American Repertory Theater

www.americanrepertorytheater.org

Created and performed by Anna Deavere Smith, BI '92, **Notes from the Field: Doing Time in Education** explores the origins and consequences of the school-to-prison pipeline. (August 20-September 17)

NATURE AND SCIENCE

The Arnold Arboretum

www.arboretum.harvard.edu

The arboretum (see page 37) offers weekend walking tours throughout the summer, along with family-focused outings (on July 16 and August 20), and an exhibit, **New England Society of Botanical Artists: The Art of the Woody Plant**. (July 8-September 11)

RECREATION

Tree Canopy Walkway

www.ecotarium.org

Kids and parents can swing from the trees (harnessed and helmeted) at Worcester's EcoTarium. There are also exhibits on nature, science, and animal life, and visitors can roam the 55-acre reserve in search of real-life signs of creatures' habitats.

EXHIBITIONS & EVENTS

Schlesinger Library

www.radcliffe.harvard.edu

Women of the Blackwell Family: Resilience and Change focuses on seven members of this illustrious, influential family who were particularly active between 1830 and 1850. (Opens July 5)

Carpenter Center for the Visual Arts

www.ccva.fas.harvard.edu

Artist Martin Beck's two-year exhibition **Program** has mined the center's history of academic pursuits, pedagogical mission, and gallery shows through what he calls "episodes." The tenth (and final) project reflects on a 1963 display, originally titled



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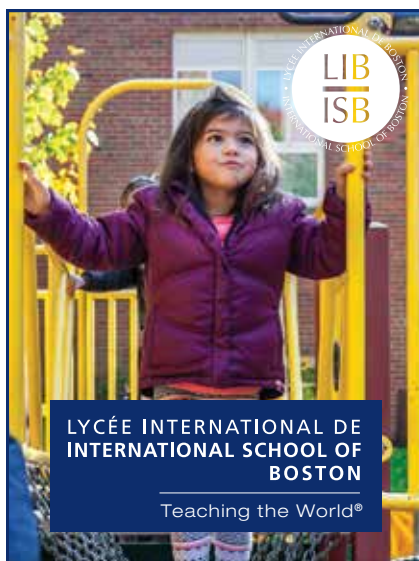
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HARVARD SQUARED

Fifty Photographs at Harvard: 1844-1966.
(July 6-August 7)

Harvard Art Museums

www.harvardartmuseums.org

Drawings from the Age of Bruegel, Rubens, and Rembrandt offers about 40 works from the museums' collection of Netherlandish, Dutch, and Flemish drawings from the fifteenth to the eighteenth centuries. (Through August 14)

New Bedford Whaling Museum

www.thewhalingmuseum.org

Inner Light: The World of William Bradford. A comprehensive look at this nineteenth-century painter best known for his depictions of ships and the Arctic, who also captured dramatic scenes of coastal New England. (Opens July 1)

Peabody Essex Museum

www.pem.org

More than 40 oil paintings and watercolors created between the late 1880s and 1912 are on display in ***American Impressionism: Childe Hassam and the Isles of Shoals***, revealing inspiring views of these beautiful and historic islands six miles off the coast of Portsmouth, New Hampshire. (Opens July 16)

Boston Society of Architects

www.architects.org

Curated by the Design Museum Boston, ***Extraordinary Playscapes*** explores the role of play, and designers' and architects' innovative efforts to spur children's healthy emotional, social, and physical growth. The show includes "Playground Passports" that promote some of Boston's most intriguing spaces, including PlayCubes, a new installation at Chinatown Park and PlayForm 7, a "playscape" added to City Hall Plaza in June. (Through September 5)

DeCordova Sculpture Park and Museum

www.decordova.org

Lotte Jacobi, Lisette Model: Urban Camera. A series of portraits, abstractions, and stirring street scenes lend insight into the sensitive, but also bold and versatile, work of these two twentieth-century artists. (Through September 18)

Events listings are also accessible at
www.harvardmagazine.com.

Spotlight



HARVARD MAGAZINE/UC

Check out 12 newly painted utility boxes throughout Harvard Square. Images of unicorns, pandas, and a wolf howling at the moon join rollicking abstractions, tranquil scenes of nature, and decoratively framed poetic texts. This form of public art, a trend evident in cities across the country, celebrates local artists, enhances public space, and deters vandalism. "The utility boxes were an eyesore," says Denise Jillson, executive director of the Harvard Square Business Association, which organized and financed the just over \$1,000 project, working in collaboration with the city and a host of volunteers. "This is a fun and powerful statement about how the whole community can work together to make everything more beautiful."

Artists represented include Harvard students—Grace Chen '19 (a rendition of Vincent van Gogh's *The Starry Night* across the street from the First Parish in Cambridge), Julia Grotto '17 (a somber portrait of a woman at 10 Eliot Street), and Nicole Flett '18 and Montita Sowapark '18 (scenes of trees and birds perched over a stormy sea at Winthrop Park)—alongside the Square's popular spray-paint artist and vendor Antonio Maycott, local painter Dennis Smith, and grade-schoolers at the nonprofit Community Art Center.

Harvard Square Business Association

www.harvardsquare.com



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The Animals' Kingdom

One woman's drive to build a piece of "heaven" on earth

by NELL PORTER BROWN



A WHITE CAT named Fluffy lounges beside a campfire, licking herself on a nippy spring day. Wizard, a black pug, trots into view, barking at his constant companion, an old beagle called Freedom. The two paw playfully at each other, flop over, and are rolling around in the dirt just as Debra White appears to greet visitors to her Winslow Farm Animal Sanctuary, in Norton, Massachusetts. "Now, come on," she tells the dogs, bending to stroke them, and they cheerfully move along. "The farm goes around in a circle," White says, turning to her human guests. "You can touch the animals, if they want you to. But not the pot-bellied pigs. Go up in the back under the pine trees to see the donkeys, they're out with the alpacas. Please make sure you close the gates behind you."

With these simple rules, visitors are unleashed to explore the 16.5-acre site that

is a "home for life" for 132 abused or abandoned animals. White founded the farm 20 years ago and depends on a crew of devoted volunteers, adults and teenagers, to keep it open to the public year-round. "There's no other reserve around like this, where the animals are so free," says volunteer Ron Mollins, who has been helping out since 1998. "We don't have lions or tigers, but if you really want to get to know animals, this is the place to do it."

Dozens of cats roam the grounds, while goats, mini-horses, rabbits, and emus peaceably share a corral. Harmony tends to prevail; their needs are met, White suggests, and there's nothing to fear. Nine separate feeding stations mitigate competition for food, newcomers are thought-



fully integrated, and their living quarters, cleaned daily, are rotated over time, "so they don't get bored." Many of the cats, like black, amber-eyed Velcro asleep by the aviary, have been thrown over the farm's roadside fence at night. "That happens," White reports, wearily. "We find them in carriers in the morning. No notes, nothing telling me anything about them."



Opposite: Beyond the farm entrance, goats roam the barnyard, peafowl commune at the aviary, and donkeys greet visitors. **Above:** Founder Debra White and Belle, a Haflinger saved from slaughter

One time we had 23 rabbits dumped over—it took us days to catch them all and then they all had to be spayed and neutered so they wouldn't reproduce."

White took in Athena, the black-nosed sheep, after the Animal Rescue League of Boston found her living on a median strip off Route 495. An Indian indigo peacock, now at least 30 years old, has been at Winslow Farm for more than half his life. During a recent visit, he was in full wooing form, fanning and quivering his six-foot spread of iridescent blue and green feathers at potential mates. White says that when she first saw him, he was living in a four-by-four-foot cage with "feces caked on his plumage." Every day White gets calls about animals in trouble or in need of a home. It's wrenching to turn any creature away, but the farm runs on a \$200,000 annual budget dependent on visitor admission fees, fundraising, donations, and grants, and is at capacity. "I try to teach people—and they should teach their children that responsibility—that when you get an animal, it is

By The Sea | Sotheby's
INTERNATIONAL REALTY



*Hamilton, MA - Waterfront living at Beck Pond
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Rich natural elements and a Craftsman-style aesthetic create stunning interior spaces: an oversized gourmet kitchen with soaring double cathedral ceiling is anchored by two 15' Carrera marble islands complemented by artisanal lighting and white oak floors which opens to an inviting family room with working fireplace. A deck overlooking the pond with its dazzling sunsets and extended dock, for fishing and recreation, lend themselves to entertaining on a grand scale.

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yours to care for. The way you treat it at first, when it's a baby, should be the way you always treat it throughout its life," White explains. "These are not little pieces of disposable trash."

THE FARM LIES between a country road and Meadowbrook Pond. An old pine grove shades the chunk of land where the donkeys and alpacas were hanging out recently

while a farrier cleaned and trimmed their hooves. Visitors are free to watch, ask questions, and learn. A few slowly approached the three donkeys and laid hands on their manes, smoothing down the fur. The four alpacas have big, liquid eyes, but are skittish; a calm approach occasionally yields a silky touch of their chocolate-colored fur.

The horses and mini-horses are in paddocks, where volunteers accompany visi-

tors, but rabbits are out and about, and doves fly in and around the aviary, where Jin (a red, blue, and yellow pheasant found in the parking lot of the Toys "R" Us in North Attleboro) lives with the peafowl. Chickens peck and squawk here and there, often congregating with the roosters, Harry and Larry, at the far end of the property, on the porch of the David Sheldon White Resource Center, which houses events,

ALL IN A DAY: Sweet Sweat

Public baths are an ancient tradition. Turks have the *hammam*, Russians have *banyas*, and Japanese, their *onsen*. For Finns and Swedes, it's the sauna: people happily clustered in a closed room heated to a toasty 220 degrees.

For devotees, it is a ritual, a spiritual and bodily cleansing, says David Straus, a regular at the region's traditional Finnish sauna, which has been run in rural Pembroke, Massachusetts, by the Uljas Koitto Temperance Society (UKTS) since 1927. For others, like Straus and his wife, Irina, from Latvia, who come weekly with their three young children, the experience is simply and deeply relaxing. Once hot enough, sauna-takers leave the cedar-paneled sweat dens, walk 10 feet, and dive into Furnace Pond. In the winter, a hole is cut into the ice for dunking. "You sweat out all the impurities of the work week, you open and shut your pores; it just feels good," says Straus, also the society's treasurer. "We spend the whole day together. And you disconnect from the rest of the world."

The Uljas Koitto Temperance Society
www.uktshome.com
Open year round; May through October,
Saturdays, 3 P.M. to 9 P.M.

The property sits at the end of Suomi ("Finnish") Road, a dirt drive leading into a pine-tree glade. It includes a lodge built around 1900, where coffee, tea, and snacks are served on a screened porch. UKTS is run by a core group of about 45 volunteers who have cared enough over the years to keep it alive.

A good number are descended from Finnish immigrants who first arrived in Quincy in the 1880s to work in the quarries; by 1920, that community had grown to more than

The saunas (below right) are steps from Furnace Pond (above), where a raft beckons swimmers. Old pines shade the rustic lodge (below left); guests are encouraged to enjoy its cozy living room.

1,000 people, enough to support saunas, churches, and social clubs. The Uljas Koitto ("Noble Endeavor") was a religious group founded in 1892 to stem drunkenness among fellow Finns—and liquor is still prohibited on the property.

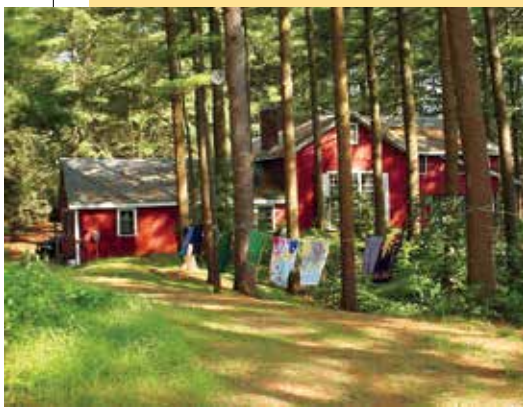
Newcomers are warmly welcomed—and given tips: eat a solid meal about 90 minutes before entering the heat, drink lots of water, and take it slowly. The temperature changes can be a shock, literally.

There are two wood-fired saunas, one for each gender; both have attached rooms for changing and showering. Guests should bring toiletries, a water bottle, and towels along with a bathing suit, although many people choose to go nude in the sauna itself. The place draws a mix of long-term South Shore-dwellers and more recent immigrants, mainly from Europe; everyone tends to sit outside on benches and talk in between sweats and swims. Guests can also gather in the lodge's living room, which has a fireplace, books, and toys.

It's not a spa or a nudist colony, although it's been mistaken for both. People seem to love it, or leave it. Straus has had friends visit "and never come back," he says, laughing. "They can't get used to so many people sitting in a small room barely clothed, or it's just too hot."

It's also not a place to be loud or flashy, take selfies, blab on smart phones, or commune with laptops. People mostly sit quietly, and enjoy the natural setting. "You can go in and out of the sauna, you rest in between, out in the open air," Straus says. "You can take the kayak out. You eat, you swim, you meet people. People just enjoy talking to each other. It's just so unique."

—N.P.B.

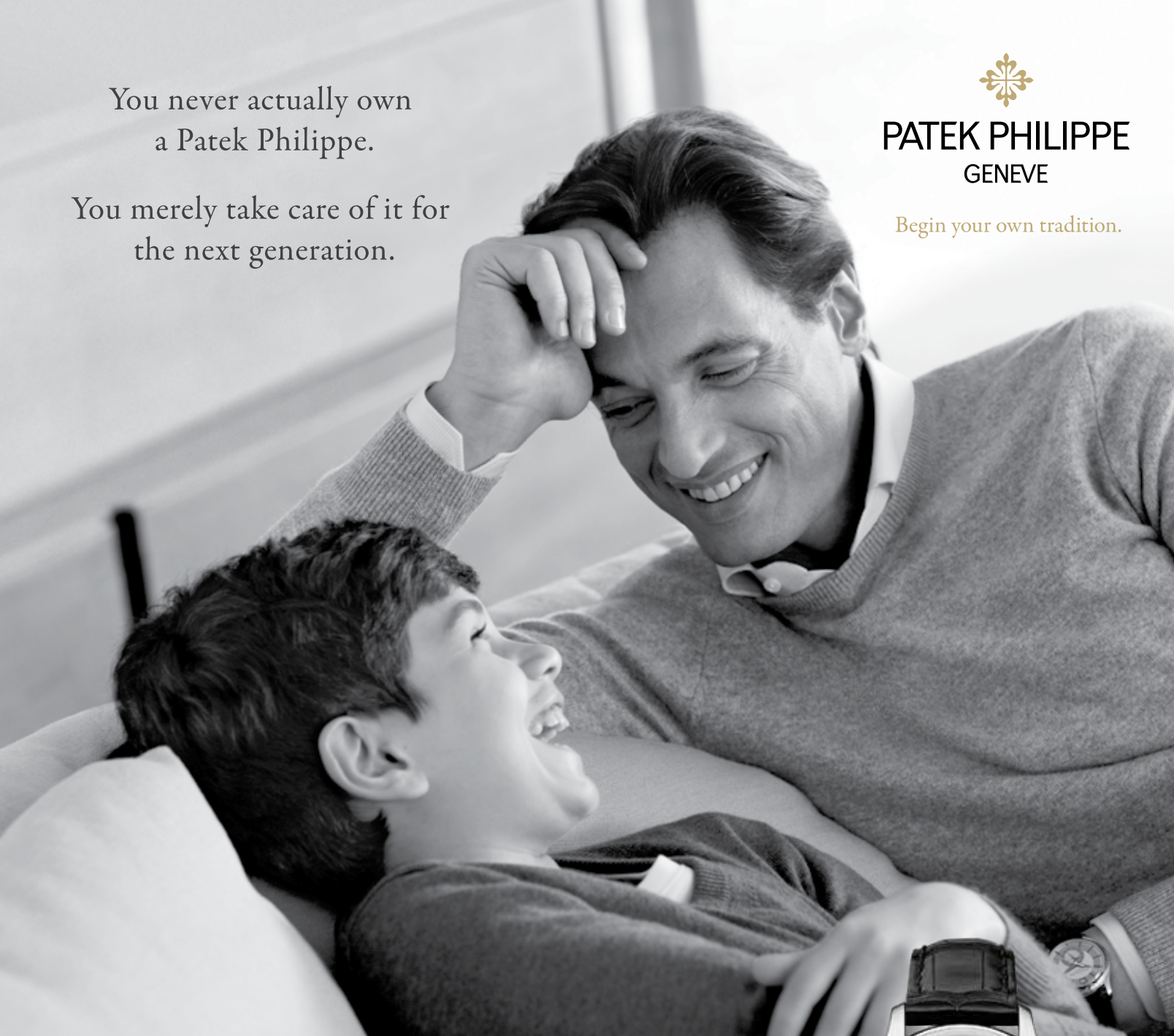




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educational programs, and even beds for volunteers who travel from afar.

White built it, as well as her own wood-framed house, and other beguiling structures scattered around the landscape. Sheds, cabins, chicken-wire enclosures, and even a tiny chapel to commemorate residents who have died, are often flanked by wildflower and herb gardens, or shrouded by wisteria. The handsome, hexagonal stone barn with round windows, a skylight, and a shingled roof, was constructed this past winter for the donkeys. Visitors also gather at play zones, picnic tables, or around a fire pit.

The place has a storybook feel. Visitors sit on bentwood furniture to watch the paddock, or wait for animals to wander by. Geese favor the hand-dug pool, banked by rocks. Dozens of stone animal statues are tucked into nooks or stand on pedestals in the gardens, offering the makings for an impromptu treasure hunt. Children are encouraged to explore and simply spend time with the animals, without any agenda. And unlike at petting zoos, no attempts are made to hide the evidence that this is a farm—ma-



Residents include alpacas, freshly sheared for summer; peacocks, free to spread their tail feathers; and this pig and sheep enjoying the sun.



nure and mud, dust, dirt, loose feathers and fur, food scraps, hay, grain, tractors, hoses, ropes, shovels, and sludge buckets—or the endless labor required to run it.

Since 1996, White says, she has taken only five days off. Three were spent in the hospital undergoing knee surgery, a break that “felt like a European vacation,” she says, laughing. Yet the farm offers a familiar routine. White grew up in a nearby log cabin, and helped care for her father, David Sheldon White, who had been a “genius inventor for Texas Instruments in the 1950s,” she says, but was diagnosed with Parkinson’s disease by the time she was three. “The way I had to communicate with him



was to be very quiet and observant. We didn’t talk very much,” she explains; often, she was her father’s hands, building what he could not. She also spent significant time outside, playing in the woods by herself, or in the company of her pets. “They were my happiness, they were always there

STAFF PICK: Cycling Sightseers

The Landscape Architect’s Guide to Boston is an online collection of tours through 26 neighborhoods, including South Boston, Jamaica Plain, and a few in Cambridge, many off the tourist track. The point is to give Boston’s 12 million-plus annual visitors *and* its residents a richer understanding, from a topographical perspective, of how and why the city has evolved.

One ideal half-day trip is a 10-mile loop called The Boston/Cambridge Bike Network, incorporating long stretches of car-

free pathways. The guide suggests starting at the New England Aquarium; bring along a bike on the MBTA, or rent one from the adjacent kiosk for Hubway, the city’s bike-share program. Ride along Commercial Street toward the North End, the traditional Italian neighborhood (an ideal stop for lunch, gelato, or pastries), then head onto Causeway Street, taking a sharp right just before North Station/TD Garden, to access one of the city’s most ingenious additions to cycling infrastructure: the 690-foot North Bank Bridge that curves under the Zakim Bunker Hill Bridge, through the Charles River Locks, and into Paul Revere and North Point Parks, which offer picnicking and sunbathing. Past those is the Museum of Science.

Then the tour U-turns back to Boston, picking up the Storrow Drive/Esplanade bike path. Take that to the Harvard Bridge, which returns riders to Cambridge, at the edge of MIT. Follow the guide’s map along Memorial Drive, taking a right just before the Hyatt Regency, then another onto the Vassar Street cycle track, which runs into a transformed Kendall Square (stop for a meal at Area Four, or ice cream at Toscanini’s). Then wind back to the Aquarium through the historic Back Bay (via Commonwealth Avenue) and the Downtown Crossing shopping district. At a leisurely pace, with

no stops, the trip would likely take two hours.

—N.P.B.



The Landscape Architect’s Guide to Boston
Boston/Cambridge Bike Network
www.asla.org/Boston



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HARVARD SQUARED

for me and brought me through a lot," she says, as did the sights and sounds of nature and its animals. "To this day, I feel I am in heaven on earth to be here," she adds. "I think a lot of people are just missing out on the simple things that are offered to us."

Winslow Farm is located on property that was owned by her father's family until it "was lost due to his illness," she says. In her twenties, White, who attended college for a year before choosing to stay home and

care for her father full time, decided to buy back a portion of the land and build a sanctuary. Working at three jobs (including as a veterinary assistant), she eventually saved enough money to do just that.

"I call her the 'Jane Goodall of Norton,'" Ron Mollins says while tending the campfire behind White's house. He comes every day for at least three hours to chop wood, rake, clean up—whatever "she asks me to do." Still, "I get more out of this place than

CURIOSITIES: Winslow Homer's Early Days

On Sunday afternoons through September, The 1853 Homer House, an Italianate mansion that dominates a hill just above Belmont town center, is open for tours. Visitors are also welcome to lounge outside, drink punch, and play croquet on the home's expansive front lawn. "We want it to feel like it is summer in the Victorian 1800s," says the site's volunteer curator, Susan Smart '71, CMS '01. She is a member of the non-profit Belmont Woman's Club, which saved the house—built by wealthy Boston merchant William Flagg Homer and his wife, Adeline Wellington—from demolition in 1927, and still owns it.

Guided tours highlight the largely untouched original interior architecture, along with the life and early work of the couple's nephew, Winslow Homer. A small exhibit includes "The War—Making Havelocks for the Volunteers" (the cover of an 1861 *Harper's Weekly*), which is set in the mansion's parlor, Smart says, and "The Robin's Note" (below, from an 1870 issue of *Every Saturday*) which "may have been set on the porch." Smart adds that a number of Homer's early illustrations and paintings, especially his rural landscapes, "contain Belmont scenes." The young artist spent much of his first two decades in West Cambridge, parts of which, including his relatives' homesite, became Belmont when that town was established in 1859.

He and his family lived nearby, but in a modest farmhouse (still standing and privately owned) because his father was a "get rich quick sort of fellow" and lost a bundle in the California gold rush, Smart explains. Homer spent time at the mansion, however, even after he moved to New York City in 1859 and began to emerge as one of the century's finest painters. Most people associate Homer with Maine, where from 1884 until his death in 1910 he lived and worked in his Prouts Neck studio, now owned, and opened for limited tours, by the Portland Museum of Art. "There, you learn about the last years of his life," Smart notes. "Here, you come for the young, romantic Winslow just starting out."

~N.P.B.

HARPER'S WEEKLY
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Early illustrations by Winslow Homer are on display in Belmont.

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The 1853 Homer House
www.1853homerhouse.org
"Summer Sundays with Winslow Homer," through September

IMAGES COURTESY OF THE 1853 HOMER HOUSE

I put into it," he adds. "It's magical—the way life should be, and could be. It's a nourishing place, nourishing to the spirit." White has never strayed from her initial, core mission: to rescue and care for maltreated animals. She also promotes animal welfare and the conservation



of natural habitats, offering barnyard tours, educational programs, and a partnership with nearby Wheaton College. Students, she says, "come to observe alternative lifestyle living" as part of courses on religion and philosophy, to study animal psychology and training techniques, or sometimes to do empirical research. (They have worked with the farm's miniature horses, assessing their cortisone levels, heart rates, and behaviors.)

When networking with other animal-rights and rescue organizations, White is happy to share information, but her daily duties are too demanding for much formal political activism. Even adopting out animals she rescues—which she used to do,

especially when she had about 300 animals on site—takes too much time and effort; too often adopters "did not realize what they were getting themselves into" and returned the animals.

At one time she dreamed of expanding the farm to include a charter school, trails and campsites, and an on-site holistic veterinarian. Now, she says, "my goals are completed. We are running as is."

It's enough. Recently a visitor sat down by the aviary and watched the peacock strut and call. A brindle cat came over and curled up in the sun. White doves flew by. A llama looped up. "The animals read each



Play areas for all ages blend in with the "storyland" ambiance.

other and if they don't see any fear, then they are all just cool and they're laying around together," White says. "I constantly know exactly what everybody needs here, without a hesitation, on a daily basis, even when they are sick, because I am quiet and always watching." People, she adds, "don't really stop and observe and experience what's going on around them. If humans didn't have voices, I think we'd all be better off."

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HARVARD
MAGAZINE

In with the New

Harvard Square's Parsnip should ripen over time.

by NELL PORTER BROWN



From left: The dining room, although refined and calm, could use a splash of warmth from the upstairs lounge.

was the filet of sole in a quintessentially French *sauce américaine* (\$30), accompanied by lobster-filled tortellini that were, unfortunately, a bit too tough and chewy.

The desserts are especially memorable. The lemon-balm sorbet paired with chunks of golden cake and a pool of buttermilk mousse (\$11) “eats like a strawberry short-

cake,” noted the affable waiter, “but much better.” Slices of faintly ripe strawberries added a pleasing herbaceous note. The poached pears, tasting faintly of anise and bergamot, lay on a plump bed of ricotta cream tweaked with honey and plenty of zested lemon (\$11).

Parsonip’s third-floor lounge is a warm counterpart to the dining room’s cool affect. Low lights, velvety seating, and small tables offer intimacy. Behind the bar, alluring liquor bottles cluster along shelves backed by a dramatically lit red wall. Food is served: a fine mix of lamb or fish in the form of sandwiches and salads, along with small plates of snacks that seem to change frequently.

The lounge’s porthole-style windows remain from the Upstairs days. They offer a bird’s-eye view of the continually morphing Square, epitomized by Parsnip itself. ~N.P.B.

PARSNIP, which replaced the venerated Upstairs on the Square last fall, lacks the sassy whimsicality of its predecessor. Gone are the fuchsia-colored walls adorned with leaping zebras, the gilded chairs, mirrors, and the sense of participating in an *Alice in Wonderland* moment that charmed diners for years. Parsnip is more buttoned-down: an affluent Brit in a flannel suit to Upstairs’s can-can girl.

The dining room still has its soaring ceiling and the large windows overlooking Winthrop Park. But the interior is now ruled by warm gray tones, a shining parquet floor, and 1950s-style, space-age chandeliers. The look-alike Jackson Pollock painting that looms over the tasteful, if generic, décor prompts the question: can Parsnip develop a character of its own?

The food tries to answer that. Continental fare with a French base, it’s the essence of “fine dining,” and therefore justifiably rich. The meal began with excellent home-

made rolls—potato, wheat, and oatmeal—and a dish of sweet butter. We recommend the appetizer of hand-plucked heads of carefully roasted baby cauliflower, purple and yellow, that arrived with a subtle apple purée and a slab of novel, cumin-spiced crème brûlée (\$14): rough crunch meets silky loaf, with a touch of burnt sugar. The fresh seared scallops in a truffle butter sauce came with poached baby gem lettuce, strips of prosciutto, and a generous clump of sweet pea tendrils that stitched the dish together (\$17).

An entrée of handmade cavatelli, small blobs of dough tenderly rolled in on themselves, was awash in whipped, melting, goat cheese (\$24). The creamy mass nearly obscured oyster mushrooms and the earthy, bitterish bite of fiddlehead fern fronds, and overwhelmed a sprinkling of pine nuts. Yet the lusty dish was tasty and filling. Lighter

PARSNIP

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www.parsniprestaurant.com

JOHN HARVARD'S JOURNAL

COMMENCEMENT 2016



Scene I, Take 2

FOR THE 365th Commencement, Harvard went Hollywood, with headline speakers Steven Spielberg (the afternoon exercises), Rashida Jones '07 (College class day), and Sarah Jessica Parker (Law School class day).

The set designers did their work well: for the second year in a row, the Big Day itself was spectacularly summery, verging on hot (but clear, nary a storm in sight), with lilacs and dogwoods lingering in bloom after a long, cool spring.

In the cinematic vein, the University itself unspooled some carefully prepared narratives this year. President Drew Faust began formal acknowledgment of Harvard's past entanglement with slavery, welcomed Air Force ROTC back to campus (see pages 29-30), and chatted about the arts and humanities with Conan O'Brien '85. Other staged appearances featured visitors Al Gore '69, LL.D. '94 (work on climate change in China) and Stephen Hawking, S.D. '90 (black holes—where, as in China, the sun doesn't shine).

Of course, there were unscripted stories, too: the long, bitter protests and sit-in at the Law School, aimed at addressing perceived deficiencies in diversity and inclusion; the Free Harvard/Fair Harvard slate of petition

Clockwise from top left: Law School graduates flaunt their profession's symbol of authority; a Kennedy School graduate prepared to bear the weight of the world; Mason Fellow Sidrotun Naim, MC/M.P.A. '16, of Bandung, Indonesia; and Garrett C. Allen, of Mather House and Bellevue, Washington, A.B.-to-be

candidates for election to the Board of Overseers (see page 67); and the year-ending controversy over new College policies aimed at reining in single-sex final clubs and other social organizations (see page 27).

As IF counter-programming the sunny backdrop and the intramural concerns of the preceding semesters, much of the week itself focused on the world beyond, in decidedly darker tones. On Tuesday morning, Cogan University Professor Stephen Greenblatt, orator for the Phi Beta Kappa literary exercises, drew on a personal experience of anti-Semitism and his immersion in *The Merchant of Venice* to make the case for understanding the other. He concluded with a commentary on an unperformed play about

PHOTOGRAPHS CLOCKWISE FROM TOP LEFT: JIM HARRISON; STU ROSNER (2); JIM HARRISON



Clockwise from top left: A new J.D. sends a message—modifying the school's former shield to reflect its slave connections; spirited Matherites (from left) Chris Bruno of Pompton Plains, New Jersey,

Daniel Ryu of Palisades Park, New Jersey, Robert Doles of Johns Creek, Georgia, Ryan Fortin of North Reading, Massachusetts, Duncan O'Brien of Wellesley, Massachusetts, Leo Lim of Seoul, and Viviana Maymi of Tampa; Legally Blonde Jessica Cohen, M.B.A. '15, J.D. '16; Ed.M. celebrants (from left) Bethany Dawson of Hometown, Indiana, Marcie Herring of Honolulu, and marshals Kara Lawson of Wausau, Wisconsin, and Shanae Burch of Buena, New Jersey; Adams House faculty deans Sean Palfrey, hugging Alexandra Sperry '16 of New York City, and Judith Palfrey presided at the diploma ceremonies.

ting of our chains./Take them off. Un-cuff us..../I've been a Black hole in the classroom for far too long;/Absorbing everything, without allowing my light to escape./But those days are done. I belong among the stars.”). Hrabowski saluted Livingston as a “twenty-first-century Martin Luther King,” and re-

Sir Thomas More, in a passage thought to be in Shakespeare's own hand, in which a mob demands the expulsion of “strangers” from England. He told the scholar-graduates-to-be that “You will have to decide for yourselves” how to deal with “wretched strangers” in flight—“to look away or become involved, to secure your safety or to open yourselves to risk, to succor or to punish.” He wished for them “the gift of seeing the other as a human being”—as Sanders Theatre suddenly felt close to southern Europe. (See www.harvardmagazine.com/commencement for detailed reports on PBK and all the other events summarized here.)

Wednesday's jam-packed roster of class days had a home-and-home series, of a sort. Freeman Hrabowski III, LL.D. '10, president of the deservedly exemplary University of

Maryland, Baltimore County (known nationwide for educating minorities, women, and low-income students in science, technology, engineering, and math), spoke to the Graduate School of Education candidates just days after Faust spoke at UMBC's graduation—her first non-Harvard commencement address. “[M]any colleges—most colleges—have not figured out how to do as good a job as UMBC at enabling all students to reach their highest potential,” she said.

Hrabowski's Cambridge remarks were preceded by, and turned out to echo, a moment that went viral: Ed.M. candidate Donovan Livingston's spoken-word poem, “Lift Off,” on freedom, education, and equality—and on African Americans' difficult, entwining histories with all three. (“As educators, rather than raising your voices/Over the rus-

called his mother's saying, "We the teachers make the difference."

Faust struck an almost grim tone on Thursday afternoon. After beginning non-committally ("[M]y assignment is to offer a few reflections on this magnificent institution at this moment in its history. And what a moment it is"), she was all business, and then some:

What is going on? What is happening to the world? The tumultuous state of American politics, spotlighted in this contentious presidential contest; the political challenges around the globe from Brazil to Brexit; the Middle East in flames; a refugee crisis in Europe; terrorists exploiting new media to perform chilling acts of brutality

and murder; climate-related famine in Africa and fires in Canada. It is as if we are being visited by the horsemen of the apocalypse with war, famine, natural disaster—and, yes, even pestilence—as Zika spreads, aided by political controversy and paralysis.

On Friday, "Building an Economy for Prosperity and Equality," the Radcliffe Day morning conversation, wasn't quite at the Four Horsemen level of despond—the current economic indicators are relatively robust, after all, particularly in the United States. But it didn't take long for panelist David Autor, Ph.D. '99, an economist at MIT, to declare that the halcyon decades from the end of World War II until 1970 (robust growth, rising incomes, and widely shared prosper-

ity) were an anomaly. Given slower productivity growth, an alarming erosion in educational and skills gains for workers, and what he called the "commodification" of unsophisticated labor under the twin hammers of globalization and technological change, he and others were downbeat. Louise Sheiner '82, Ph.D. '93, now at the Brookings Institution, pointed to the dismaying, divergent outcomes for those at the top and bottom of the economy: a clear and widening "inequality in life expectancy." Most agreed that investments in education and other policy prescriptions could help close those gaps. Whether economic growth can be reignited is "the hardest part," concluded Lee professor of economics Claudia Goldin. "Equity may be easier."

Honoris Causa

Six men and three women received honorary degrees at Commencement. University provost Alan M. Garber introduced the honorands in the following order, and President Drew Faust read the citations, concluding with the recipient's name and degree. For fuller background on each, see harvardmag.com/honorands-16.



STU ROSNER

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who models with ingenuity what it is to be good.

Judith Jarvis Thomson. Moral philosopher and metaphysician, a professor of philosophy emerita at MIT. Doctor of Laws: Eminent moral theorist and metaphysician who ponders with acuity what it means to be good; exemplar of reason and scholarly values,

David Brion Davis, Ph.D. '56. Yale's Sterling Professor of American history emeritus, a leading scholar of slavery and abolition. Doctor of Laws: *Confronting the unconscionable negation of freedom, discerning our demons and our better angels, a sterling chronicler of inhuman bondage who shows that the past not was, but is.*

The Right Honorable Lord Martin Rees. Astrophysicist and cosmologist, who has pioneered understanding of black holes and

the dark early universe. Doctor of Science: *Luminous star in*

the firmament of astrophysics, royal citizen of science and namesake of an asteroid, he has shone fresh light on the cosmic dark ages and the genesis of galaxies far, far away.

El Anatsui. Preeminent West African sculptor, best known for shimmering hangings made from found objects. Doctor of Arts: *Fusing ordinary articles of refuse into extraordinary artworks that refuse categorization, he*



STU ROSNER

El Anatsui

weaves strands of diverse cultures and genres into splendid cascades of gravity and grace.

Elaine Fuchs. A National Medal of Science-winning stem-cell researcher, based at Rockefeller University. Doctor of Science: *Stem-cell eminence and doyenne of the epidermis, whose innovative investigations of genes and proteins have pluripotent power to get under our skin.*

Arnold Rampersad, Ph.D. '73. The acclaimed biographer of W.E.B. Du Bois, Langston Hughes, and Ralph Ellison. Doctor of Laws: *Lifelong student of the human spirit, literary biographer extraordinaire, an erudite ex-*



STU ROSNER

Martin Rees

positor of the American experience who lucidly illuminates the matter of Black lives.

His Excellency Fernando Henrique Cardoso. Sociologist and former two-term president of Brazil. Doctor of Laws: *Expert on dependency and development, exponent of democracy and engagement, he has ascended the echelons of both academe*

and government to guide his nation through challenge and change.

Mary L. Bonauto. Lawyer and civil-rights director of GLAD, leader in the effort to eliminate discrimination based on sexual orientation. Doctor of Laws: *Savvy strategist in the quest for equality, supremely deft advocate for the dignity of all, she has brought to life stories both of love and of loss, and now, thanks to her, countless hearts may be glad.*



STU ROSNER

Mary L. Bonauto

Steven Spielberg. Film director, producer, and screenwriter. Doctor of Arts: *Sovereign of celluloid storytelling who draws us into the dark then directs us toward the light; his movies move us in magical ways as we closely encounter the terrors and wonders of life.*

MIRTH BROKE THROUGH the gloom from an unexpected quarter. During the Morning Exercises, the University brass, elevated on the dais beside Memorial Church, typically adhere strictly (one is tempted to say *religiously*) to their elaborate script, only to be knocked off course by ebullient M.B.A.s, or gavel-wielding J.D.s, or, especially, spirited A.B.s—full of beans, and sometimes effervescing beverages, cheering their fulfillment of “the Faculty’s requirements for the first degree in Arts or in Science,” as the script puts it (even if they do not seem, just then, particularly “ready to advance knowledge, to promote understanding, and to serve society”).

This year, frisky deans did a number on themselves, beginning with Xiao-Li Meng—a professor of *statistics*, for goodness sake. Presenting the doctoral candidates, he said, “As dean of the Graduate School of Arts and Sciences...,” paused, then continued, “hearing no cheering,” finally elicited the desired response—but not loud enough to satisfy—and cued another round. Faust, trying to confer said doctorates, was in turn interrupted, and had to command the rowdy scholars to “wait a minute, here comes the responsibility part. You can’t leave that out.”

There were further miscues and amusements. School of Dental Medicine dean R. Bruce Donoff approached the microphone and froze as Provost Alan Garber paused. At times, students were supposed to rise but did not, or when commanded to rise were deemed to have risen already. Dean David N. Hempton ad libbed about being leader of “the huge faculty of divinity.” (The school *does* have longevity: it celebrates its bicentennial this coming academic year.) Graduate School of Education dean James Ryan, stopped mid introduction by the future teachers’ cheers, said, “I’m gonna forget my lines.” He didn’t, of course. All in good fun.

Compared to their graduate and professional school predecessors, the undergraduates were downright orderly, reversing the normal order of affairs. People were fanning themselves, so perhaps the temperature, by then in the low 80s, was getting to them.

After the lunch respite, it fell to Spielberg (whom Faust called “one of the greatest storytellers of our—or any other—time”) to steer a middle course between the downbeat and the daft. He did so most winningly by talking about his own trajectory. “I can remember my college graduation—which is easy, since it was only 14 years ago,” he said.



Ph.D.s Anthony J. Covarrubias, of Gardena, California, and Eylul Harputlugil, of Izmir, Turkey, and New York City, were among those admitted to the “ancient and universal company of scholars.” Du Ruitao, S.M. ’16, of Foshan, Guangdong, China, was bedecked with blossoms and cash.



“How many of you took 37 years to graduate? Like most of you, I began college in my teens, but sophomore year I was offered my dream job at Universal Studios, so I dropped out. I told my parents that if my movie career didn’t go well, I would re-enroll. It went all right.” In the end, he went back “for my

kids. I’m the father of seven, and I kept insisting on the importance of going to college, but I hadn’t walked the walk. So in my fifties, I re-enrolled at Cal State, Long Beach, and I earned my degree. I just have to add, it helped that they gave me course credit in paleontology for the work that I did on *Jurassic Park*. Three years of *Jurassic Park*. Thank you.” Life lessons, learned.



Commencement Highlights

From Phi Beta Kappa and Rashida Jones to Federal Reserve chair Janet Yellen, harvardmagazine.com/commencement brings you in-depth coverage from Commencement week.



Poet and Renaissance Scholar Launch Commencement Week

The Phi Beta Kappa Literary Exercises featured Stephen Greenblatt and Robyn Schiff. harvardmag.com/pbk-16



Freeman Hrabowski: “We the Teachers Make the Difference”

Hrabowski encouraged education graduates to carry on the values of community and collaboration that animated the civil-rights movement. harvardmag.com/hgse-16



Prosperity and Equality

A substantive discussion at this election-year Radcliffe Day harvardmag.com/radcliffe-16

visit harvardmagazine.com/commencement

JIM HARRISON

FROM TOP: JIM HARRISON; COURTESY OF THE HARVARD GRADUATE SCHOOL OF EDUCATION; TONY RINALDO/COURTESY OF THE RADCLIFFE INSTITUTE FOR ADVANCED STUDY

The Talk

The Commencement-week speakers wove together affectionate observations, searing personal anecdotes, an explicit evocation of the apocalypse (in President Drew Faust's address, making the case for universities' role in troubled times), and that old standby, avuncular advice (from Steven Spielberg).

Kindness: A "Subversive Thing"

At Harvard Divinity School's Multireligious Commencement Service, in Memorial Church, faculty speaker Kimberley C. Patton, professor of the comparative and historical study of religion, evoked the school's spirit:

"What is it like to teach there?" I'm sometimes asked. I usually answer, wearily or humorously, depending on the day: "God bless them, they're

all trying to save the world." How weird and wonderful to see you world-savers today, and tomorrow, not as independent self-actualizing graduate students, but instead as tenderly encumbered, trailed

by your nearest and dearest. Your makers. Today your tribesmen are not only in your thoughts as you toil far away in Cambridge, but now in plain sight, like dreams suddenly manifest in the waking world, loving you, annoying you, photographing the life out of you. And sometimes, asking—behind your backs, or maybe right in front of you—what on Earth will she do with a Divinity degree? Especially in this economy.

What they would do, she hoped, was apply what they had learned:

You've spent years of training to become scholars and ministers, to become activists, to become writers, to become literate in what has always been one of the oldest and most persistent realms of human experience, the one that calls the shots for all the rest of them. There is no chronic injustice or pernicious evil in this world that can be solved without understanding the profound role that religion, culture, and ideology, intertwining as they do, play in its action.

And in doing so, pursue the hard work of being kind and promulgating kindness, beyond the seem-

ingly limiting reach of kinship and like-mindedness:

Kindness is so often dismissed as the anemic, saccharine twin of its more robust siblings in the terminology of world religions: compassion in Buddhism, mercy in Judaism and Islam, love in Christianity. Worse, kindness is often seen as a cowardly way to duck agonizing ethical dilemmas that involve the surrender of power, privilege, or capital; or

to ignore systematic violence against female, brown, child, or gay and transgender bodies; or to hack the gnarly challenge of injustice while racking up gold stars for being nice. But kindness is not niceness. It is, instead, a powerful and subversive thing. It is something that anyone can practice, even if she cannot bring herself to

feel compassion, or mercy, or love.

No matter the challenge, she urged, "Let us nevertheless practice kindness, the gateway to compassion, the gateway to justice."

"My Hand on Fire"

During the Commencement Morning Exercises, He Jiang related a story stemming from his youth in a farming community in Hunan province, far from images of today's modern, urban China—an incident that shaped his drive to pursue research on flu, malaria, and hepatitis, and to disseminate knowledge to less privileged areas, like his home village.

When I was in middle school, a poisonous spider bit my right hand. I ran to my mom for help—but instead of taking me to a doctor, my mom set my hand on fire.

After wrapping my hand with cotton, then soaking it in wine, and putting a chopstick into my mouth, she ignited the cotton. The flame quickly engulfed my hand. The searing pain made me want to scream, but the chopstick prevented it. All I could do was watch my hand burn—one minute, two minutes—until mom put out the fire.

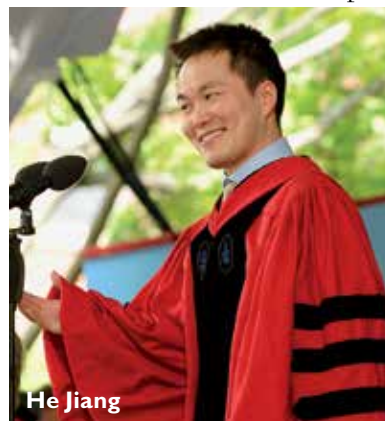
You see, the part of China I grew up in was a poor, pre-industrial farming society. When I was born, my village had no cars, no telephones, no electricity, not even running water. And we certainly didn't have modern medical resources. There was no doctor to see about my spider bite.

For those who study biology, you may have grasped the science behind my mom's



JUSTIN KNIGHT/COURTESY OF HARVARD DIVINITY SCHOOL

Kimberley C. Patton



He Jiang

STU ROSNER

Laugh Lines

Rashida Jones '97, College Class Day speaker, on selling a script for a \$16-million movie, only to watch the deal fall through and then making the movie with her partner, for \$840,000—"almost a year of Harvard tuition."

Chief Marshal **Sheryl Sandberg '91**, M.B.A. '95, COO of Facebook, representing the twenty-fifth reunion class at the Commencement day luncheon spread in Widener Library: "I am so happy to be here because this is one of the very few things I get to do that Mark Zuckerberg does not. I worked really hard to graduate from Harvard—twice. And then I go work for someone who didn't graduate once."

Fiftieth reunioner **Daniel Brooks '66**, waiting with classmates to process into Tercentenary Theatre for the afternoon oratory, where he was "looking forward to a Spielberg spiel."



Rashida Jones

JIM HARRISON



Sheryl Sandberg

Latin Salutatorian **Anne Ames Power '16** offered a "dictionary" of Harvardian terms (with English translation tucked into the Morning Exercises programs for the unschooled). Teasing out meanings, she explained: "[A]t Harvard a 'concentration' can be defined as 'an individual course of study' as well as 'what you lack in Friday morning class'"—and added the senior-year revelation "that 'thesis' can be a noun, a verb, and a state of being."

Commencement Confetti

Musical Notes

Joshuah Brian Campbell '16 did double duty—nailing his Senior English Address during the Morning Exercises but also, literally, singing for his dinner the night before. At the honorees' banquet in Annenberg Hall, accompanied by guitarist Alex Graff '17, he sang "Desafinado," by Brazilian songwriter Antônio Carlos Jobim (a treat for Fernando Henrique Cardoso, in lieu of the usual classical selection). During the Phi Beta Kappa Literary Exercises Tuesday morning, the Radcliffe Choral Society, somewhat surprisingly, sang "We Are..." by Ysaye Barnwell (of Sweet Honey in the Rock); its charming refrain is well suited for graduates with attending elders: "We are our grandmothers' prayers./ We are our grandfathers' dreamings./ We are the breath of our ancestors./ We are the spirit of God." Josh Bean '16 did the fresh arrangement of "Simple Gifts" for the Commencement Choir's Thursday performance.

Zingers

Commencement-goers may have noticed that the United States is conducting a presidential election. It turns out that academics and their guests are fully capa-

ble of delivering political one-liners as punchy as those deployed on the hustings. Some samples: "We cannot



will away or wall away the world" (former secretary of state Madeleine Albright, LL.D. '97, at Harvard Kennedy School's Class Day). "The ability to know, as former dean Jeremy Knowles used to put it, 'when someone is talking rot'" (President Drew Faust, Commencement afternoon address, on the role of education in informing

Joshuah Brian Campbell

discourse). "We are a nation of immigrants, at least for now" (Steven Spielberg, Ar.D. '16, in his afternoon address—before referring to his attending family member, his 99-year-old father).

Gendered (Club) Jokes

As debate roiled after the College's decision to pressure members of final clubs, fraternities, and sororities (see page 27), Dean Rakesh Khurana came in for some ribbing. Tuesday morning, Phi Beta Kappa president Robin Kelsey said, "Unlike some other societies bearing ancient Greek initials, Phi Beta Kappa is not embroiled in any campus controversy—of which I am aware," giving the dean a significant look. Kelsey went on to note the election of academic achievers to PBK, "whatever your sex, gender, or sexual orientation." In her Baccalaureate ad-



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END OF AN ERA. This year's festival rites are the last for Grace Scheibner, Harvard's first formal Commencement director, who retires after 24 such extravaganzas. Scheibner's successor faces a job that combines logistics mastery with penetrating psychology (tending to visiting heads of state and entertainers) and exquisite diplomacy (weighing last-minute ticket requests). President Drew Faust gave her a richly deserved shout-out after conferring the honorary degrees.

dress, President Faust teased about discussing with parents what is known as a "final club." Without an 's.'"

Leading Lecturers

The studious Phi Beta Kappans annually recognize teaching excellence. This year, they honored Kiran Gajwani, lecturer and concentration adviser in economics, who runs the senior-thesis research seminar; Charles S. Hallisey, Numata senior lecturer in Buddhist literatures; and Brigitte A.B. Libby, lecturer on the classics and Allston Burr assistant dean of Pforzheimer House (who had an excellent excuse for being absent: she delivered a daughter on Saturday, May 21). It is a small sample, but all three are lecturers, not ladder faculty members on



FULL-SERVICE. In a big year for ROTC, Ensign Adam Gracia '16 was joined at Wednesday's commissioning ceremony by his U.S. Navy family: Captains Jorge Gracia and Nancy Gracia, and (right) Lieutenant (j.g.) Alexandra Gracia, his sister. President Drew Faust's gift to the officers was *Leadership*, an anthology edited by Elizabeth D. Samet '91, professor of English at the U.S. Military Academy, who came to campus the next day for her twenty-fifth reunion.

the tenure track—perhaps a subtle comment on teaching.

Counting Who Counts

Harvard awarded 7,727 degrees and 11 certificates on May 26. College graduates garnered 1,661 degrees. Those entering “the ancient and universal company of scholars” (Ph.D.s) and those who “have surmounted with distinction the first stage of graduate study” (a master’s in arts or sciences) received 988 degrees from the Graduate School of Arts and Sciences, led by 538 doctorates. Other notable totals: business (934), extension (783), law (769), education (746), Kennedy School (584), and public health (546). The world is also the richer to the tune of 61 Harvard-trained dental specialists.



JIM HARRISON

to finance positions; a higher proportion of respondents will be in finance and consulting than any class since 2007.) More than half of those entering the workforce expect starting salaries in excess of \$70,000. Panelists at Radcliffe’s Friday conversation on “Building an



SIGNS OF THE TIMES. The Law School, having abandoned its shield, associated with a slave-owning family (see the decorated mortarboard, page 15), and absent a successor, hoisted plain banners on Langdell and in Tercentenary Theatre; stay tuned for the new design. In their anniversary years, the Harvard Alumni Association (175th) and Harvard College Fund (90th) hailed alumni community and philanthropy on the Yard’s light standards.

HARVARD MAGAZINE/JC



IVY BLING. Eliot Housemates Andrew Fischer ’16, of (well-named) Diamond Bar, California, a receiver, sports 2013-2015 football championship rings (next up: a job with Bank of America Merrill Lynch), as William Walker ’15, of Hingham, Massachusetts, shows his 2014 lacrosse championship hardware. After summer travel, he joins Fidelity Investments.

JIM HARRISON

Senior Survey

“This is the best time to enter the job market in close to a decade,” FiveThirtyEight’s Ben Casselman informed fortunate graduates in early May. *The Harvard Crimson*’s senior survey (906 responses) offers confirming evidence, with 21 percent headed to consulting jobs, 18 percent to finance, and 14 percent to technology. (The subsets are amusing: 43 percent of male final-club members reporting are heading

’81 cross paths in Washington, D.C., where the former is secretary of commerce and the latter deputy secretary of energy. They were joined on a reunion panel by none other than Loretta E. Lynch ’81, J.D. ’84, whose day job is attorney general.

Echoes

Honorand Arnold Rampersad, Ph.D. ’73, LL.D. ’16, has written acclaimed books about W.E.B. Du Bois, A.B. 1890, Ph.D. ’95,

Economy for Prosperity and Equality” lamented the small faction of College graduates (4 percent in 2016) entering public or nonprofit service.

Freshman Ties

First-year roommates Penny S. Pritzker ’81 and Elizabeth Sherwood-Randall

the first African American to earn a Harvard doctorate, and Ralph Ellison, Litt.D. ’74, author of *Invisible Man*, who was that year’s afternoon guest speaker. (In that dreary year, *Harvard Magazine* reported in its news headlines, “This year’s graduates: More interested in money” and “ROTC on the wane.”)

Whose Ox Gets Gored?

Radcliffe “Economy and Prosperity” panelist Douglas W. Elmendorf, dean of Harvard Kennedy School, proposed addressing federal deficits by cutting benefits and raising Medicare premiums from those who have done better in society—a suggestion greeted, to his amusement, by applause. “I don’t mean just Bill Gates [’77, LL.D. ’07],” he continued, and suggested extracting resources from the top third to half of the economic order—a suggestion, he joked, that elicited “slightly less applause.”



STUPOBNER

EXTRA! EXTRA! In a classic print-era hack, the *Lampoon* hoisted *Harvard Crimson* display racks and deployed them at the entry gates for the Morning Exercises—fully stocked with back issues of the humor magazine.



SOMBER SPEECHES. Canned oratory about life lessons congeals much graduation rhetoric. But sometimes, the talk becomes painfully real. “I am here today to thank you—for saving my life,” class day speaker Marcelle de Souza Gonçalves Meira, M.B.A. ’16, shown here, told her Harvard Business School peers. Her husband and classmate, Pedro Meira, died last September from stomach cancer, and her remarks addressed this ultimate challenge. The College class of 1991 elected as its Chief Marshal Sheryl Sandberg, who shares with Meira an HBS M.B.A. (’95), and the loss of her husband, Dave Goldberg ’89, little more than a year ago—the subject of her moving commencement address at the University of California, Berkeley, earlier in May.

SUSAN YOUNG/HARVARD BUSINESS SCHOOL

cure: heat deactivates protein, and the spider's venom is simply a form of protein. It's cool how that folk remedy incorporates basic biochemistry, isn't it? But I am a Ph.D. student in biochemistry at Harvard, I know that better, less painful treatment existed. So I can't help but ask myself, why I didn't receive one at the time?

"Truth Cannot Simply Be Claimed"

In troubled times, President Drew Faust told the afternoon audience, universities need to restate their basic values:

We sing in our alma mater about "Calm rising through change and through storm." What does that mean for today's crises? Where do universities fit in this threatening mix? What can we do? What should we do? What must we do?

We are gathered today in Tercentenary Theatre, with Widener Library and Memorial Church standing before and behind us, enduring symbols of Harvard's larger identity and purposes, testaments to what universities do and believe at a time when we have never needed them more....

We look at Widener Library and see...a repository of learning...a monument to reason and knowledge, to the collection and preservation of the widest possible range of beliefs, and experiences, and facts that fuel free inquiry and our constantly evolving understanding. A vehicle for *Veritas*—for exploring the path to truth wherever it may lead. A tribute to the belief that knowledge matters, that facts matter—in the present moment, as a basis for the informed decisions of individuals, societies, and nations; and for the future, as the basis for new insight. As James Madison wrote in 1822, "a people who mean to be their own

Governors, must arm themselves with the power which knowledge gives." Or as early twentieth-century civil rights activist Nannie Helen Burroughs put it, "education is democracy's life insurance."

Evidence, reason, facts, logic, an understanding of history and of science....These are the bedrock of education, and of an informed citizenry with the capacity to lead, to explore, to invent. Yet this commitment to reason and truth... seems increasingly a minority viewpoint. In a recent column, George Will deplored the nation's evident abandonment of what he called "the reality principle—the need to assess and adapt to facts." Universities are defined by this principle. We produce a ready stream of evidence and insights, many with potential to create a better world....

So what are our obligations when we see our fundamental purpose under siege, our reason for being discounted and undermined? First we must maintain an unwavering dedication to rigorous assessment and debate within our own walls. We must be unassailable in our insistence that ideas most fully thrive and grow when they are open to challenge. Truth cannot simply be claimed; it must be established—even when that process is uncomfortable. Universities do not just store facts; they teach us how to evaluate, test, challenge, and refine them. Only if we ourselves model a commitment to fact over what Stephen Colbert so memorably labeled as "truthiness"...can we credibly call for adherence to such standards in public life and a wider world.

We must model this commitment for our students, as we educate them to embrace these principles—in their work here and in the lives they will lead as citizens and leaders of national and international life.

"My Intuition Kicked In"

Steven Spielberg, visibly thrilled to be a Harvard honorand, mixed personal anecdote, filmic wisdom, and conventional graduation tropes:



Steven Spielberg

I left college because I knew exactly what I wanted to do, and some of you know, too, but some of you don't....Maybe you're sitting here trying to figure out how to tell your parents that you want to be a doctor and not a comedy writer. Well, what you choose to do next is what we call, in the movies, "a character-defining moment." Now, these are moments that you're very familiar with, like...Indiana Jones choosing mission over fear by jumping into a pile of snakes. Now, in a two-hour movie, you get a handful of character-defining moments. But in real life, you face them every day. Life is one long string of character-defining moments, and I was lucky that at 18, I knew exactly what I wanted to do. But I didn't know who I was.

How could I, and how could any of us? Because for the first 25 years of our lives, we are trained to listen to voices that are not our own. Parents and professors fill our heads with wisdom and information, and then employers and mentors...explain how this world really works....[B]ut sometimes doubt starts to creep into our heads, into our hearts, and even when you think, "That's not quite how I see the world," it's kinda easier just to nod in agreement and go along, and for a while I let that going-along define my character....

But then I started paying more attention. And my intuition kicked in. I want to be clear that your intuition is different from your conscience. They work in tandem, but here's the distinction. Your conscience shouts, "Here's what you *should* do," while your intuition whispers, "Here's what you *could* do." Listen to that voice that tells you what you *could* do. Nothing will define your character more than that. ▽



Drew Faust

STU ROSNER

Academic Allston, At Last

MORE THAN a quarter-century after Harvard began banking land for expansion in Allston, beyond the Harvard Business School (HBS) campus, academic growth there is reliably under way—and the faculties immediately involved are fostering intellectual collaborations ahead of their physical colocation.

The flagship project, housing much of the engineering and applied sciences faculty, received regulatory approval in April (see harvardmag.com/seas-16). Construction will be under way this summer, with occupancy expected in 2020. The complex includes 445,300 square feet of new classrooms, laboratories, and related facilities atop part of the subsurface footings where building stopped in 2010 during the financial crisis and recession; 51,500 square feet of renovated offices and classrooms at the existing 114 Western Avenue; and a 47,000-square-foot “district energy facility” to provide electricity and heating and chilled water. Total project costs are estimated at \$1 billion.

Interestingly, the energy plant has been relocated from underneath the science complex toward the eastern edge of Harvard’s landholdings—and it will be built at grade. According to the regulatory filing, these changes reflect both University studies of “climate resiliency” in an era of global warming (the area is filled land, at the level of the Charles River), and utilities planning for future academic growth and the anticipated siting of an “enterprise research campus” with significant commercial office and laboratory development—much of it on land at 100 Western Avenue, now in an extended process of environmental remediation (see harvardmag.com/fessler-16).

Meanwhile, the soon-to-be-neighboring academic colleagues were getting together.

As HBS dean Nitin Nohria wrote in his 2016 message to the business faculty, “One key area of integration about which we are deeply excited, and for which we are now laying the groundwork, is that with the John A. Paulson School of Engineering and Applied Sciences (SEAS), which will



Nitin Nohria



Francis J. Doyle III

be moving to Allston....We see tremendous synergy among our faculties in the area of innovation and entrepreneurship, and are planning a joint research symposium...to spur collaboration.”

That gathering—a reconfigured version of HBS’s annual faculty symposium, which focuses on fellow professors’ research—took place on May 12, and brought together many of both schools’ professors. It built on work Nohria and SEAS dean Francis J. Doyle III had already undertaken (symposium materials noted that Doyle met with Nohria *before* accepting Harvard’s job offer, and that their common interest in their schools’ possible collaboration influenced his decision), plus various teaching and research interactions among faculty members. The day highlighted research presentations, informal opportunities to discuss emerging areas of inquiry and opportunities for pedagogical collaboration, and other introductions: what one participant characterized as a “first date.” Its potential outcomes were importantly underwritten in June 2015 when John A. Paulson, M.B.A.’80, made a University-spanning, river-crossing pledge of \$400 million in unrestricted endowment

funds to foster the work of SEAS (see harvardmag.com/paulson-16).

In a brief conversation a few days later, an enthusiastic Doyle noted that although the schools differ significantly in scale and approach (the engineers and scientists seek precise solutions to intellectual puzzles,

while the management professors learn from businesses in operation and expect to influence practice through application and revision), they have much in common. Commenting on three faculty members’ May 12 presentations on their data-related research, he said, “I would have challenged an outside observer to tell which one was from which school.” He and Nohria, he added, “left there elevating our already very, very high expectations for these collaborations,” given their colleagues’ excitement.

Such collaborations, particularly on curriculum, may need a few years’ gestation, so it is timely to get them under way before much of SEAS is across the street from HBS. Doyle mentioned the possibility of fruitful “intellectual collisions” in data science (given SEAS’s large computer-science faculty), in the emerging “Internet of Things” (about which HBS professors are already writing, and SEAS has interests in materials, robotics, and communications technologies), and in the full spectrum of new pedagogies and teaching (from undergraduate to doctoral courses and modules). HBS’s prowess in executive education, he noted, is a whole new vista for SEAS. In a word, the day spent together promoted “very exciting dialogue between the schools,” with ample momentum to pursue joint opportunities.

Separately, on April 21, HBS formally broke ground for construction of Klarman Hall, its new conference center, auditorium, and community-convening complex (see harvardmag.com/klarman-16). Beyond its educational import, Klarman is an expansive step, extending the HBS campus south, into current parking lots. Huge classes like SEAS’s Computer Science 50 could draw undergraduates across the Charles into the high-tech Klarman facility, if HBS is willing. When Klarman and a second part of the facility are built and the existing Burden Hall is razed, HBS will

I N T H I S I S S U E

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have an extensive new quadrangle east of Spangler Center—and the makings of a new roadway along the southern edge of its campus. Its extension west will accommodate the sites for future HBS academic buildings, according to its campus plan.

Nor do those projects exhaust sidewalk superintendents' opportunities in Allston. Scaffolding is going up for the beginning of the four-year renovation of the Soldiers Field Park graduate-student housing complex at the eastern edge of HBS's campus. And work was well under way this spring to install the "life lab," a temporary, modular facility, complementing the iLab complex on Western Avenue, where entrepreneurs will have access to wet labs and related biology facilities. The Klarman, housing, and lab projects together represent another \$370 million of anticipated construction investments. ~J.S.R.

The Art and Science of Class Scheduling

ORGANIZING the science complex has been protracted, but scheduling undergraduate classes on both sides of the Charles once the SEAS complex opens may prove harder. The shortest pedestrian route runs 1.5 miles from the science facilities in the North Yard to the future Allston classrooms and labs. Given the logistical difficulties of crossing Soldiers Field Road on the lone footbridge (which is *not* accessible to people with disabilities), and the traffic-choked vehicular link from John F. Kennedy Street to North Harvard Street (which lies between Harvard Business School and the athletic facilities), it is no surprise that the Allston planners' Class Scheduling Task Force has been at work since 2012. Its co-chair, dean of undergraduate education Jay M. Harris, reported to the Faculty of Arts and Sciences (FAS) in April.

He outlined solutions that would *standardize class lengths* in 75-minute chunks (which could be combined for seminars, studios, labs, and so on); *expand the pass time* between classes from five minutes to 15; and *stagger starting times* for the first class each day, so that Cambridge courses might begin 30 or 45 minutes earlier than those in Allston—creating, with the pass times, 45- to 75-minute transit times between the classes on the other side of the river.

As the faculty mulls these possibilities, Harris also raised multiple other schedul-

HARVARD PORTRAIT



Dustin Tingley

Dustin Tingley is less interested in political personalities than in the mechanisms that animate politics. His new book, *Sailing the Water's Edge*, is a deep, quantitative dive into how the structure of American government influences U.S. relationships with other countries. That isn't to say he's uninterested in the here-and-now impact of his work: "There are presidential candidates who imply they're willing to carpet-bomb vast portions of the world," he says gravely. He sees engaging with the public as a mandate of his role. Tingley has studied everything from climate change to olfactory cues in mating to negotiations between young children, his disparate interests unified by his "obsession" with data, statistics, and disentangling cause and effect. "There are politics on the playground," he says, "and there are politics in the forums of the United Nations." Named a professor of government last fall, he contributes his empirical instincts elsewhere, too, leading the University's outcomes-based research for HarvardX on the science of learning. Between college at the University of Rochester and a Ph.D. from Princeton, Tingley taught high-school math and history, unsure if he would become a career academic. There were times when he wanted to be an environmental advocate, he remembers, or a music producer. But did he have any doubts about his path while in graduate school? "Very few," he answers. These days, between his work and family (he has a two-year-old son), Tingley has less time for the guitar, an old passion. He's played in a mix of bands—rock, jazz, experimental—but has never taken to formal lessons. "They always wanted me to read music," he jokes, "and I didn't really want to."

~MARINA BOLOTNIKOVA



College classes will cross the Charles.

ing issues. Most formal instruction has been jammed into the prime hours from 10:00 A.M. to 2:00 P.M. and largely from Monday to Thursday, imposing conflicts that limit many students' course options. Standardizing class lengths and starting times, building in periods for seminars and other extended instruction, and decompressing the midday clustering of courses—perhaps even truncating the beloved three-day weekend—hold the promise of maximizing students' educational choices; accommo-

dating professors' needs; and relieving conflicts over access to suitable teaching spaces.

Whether the faculty as a whole will accept the changes necessary to effect such improvements is uncertain (as is students' willingness to acknowledge, as Harris put it, that "the adult day doesn't begin at noon"). But Harris said FAS would ideally consider a formal legislative proposal and accompanying rules this fall—along with airing of norms, culture, and other issues important for effective implementation. If enacted during the 2016-2017 academic year, the registrar's office could begin reprogramming its information systems, redrafting the faculty and student handbooks, making room assignments, and so on. Then, during the 2018 spring semester, professors would schedule their 2018-2019 classes, effective with that year's fall term (when the new under-

graduate General Education requirements are also likely to take effect—yet another significant challenge). That would be a sufficient runway, Harris thought, to test and adjust the system before engineering and applied sciences classes begin in Allston in 2020.

Amusing though all this may sound, it is educationally consequential. More rational scheduling enables students to assemble desired courses of study. And making the trans-Charles logistics work as SEAS brings 17 classrooms on line, and accommodates burgeoning cohorts of concentrators, is essential if the College—in keeping with its fundamental value of providing an undergraduate education in the liberal arts—is not to separate engineers from other students.

For a full discussion of these issues, including the minute, but meaningful, details of the scheduling proposals, see harvardmag.com/allstonclasses-16. ~J.S.R.

University People

Honored Professors

The Faculty of Arts and Sciences has conferred Harvard College Professorships, its highest honor for teaching excellence (a five-year honorary title, accompanied by supplementary research funding), on David Charbonneau, professor of astronomy; Marla Frederick, professor of African and African American studies and of religion; Shigehisa Kuriyama, Reischauer Institute professor of cultural history (chair of East Asian languages and civilizations, and a faculty sponsor of the Early Sciences Working Group in the



David Charbonneau

history of science department); Ann Pearson, Ross professor of environmental sciences; and Salil P. Vadhan, Joseph professor of computer science and applied mathematics. The Roslyn Abramson Award for outstanding undergraduate teaching was conferred on Kirsten Weld, assistant professor of history, and Leah Whittington, assistant professor of English.



Salil P. Vadhan

Students' Choice

The Undergraduate Council selected the following to receive its Joseph R. Levenson Memorial Teaching Prize for excellence in teaching College students: Joseph Blitzstein, professor of the practice in statistics; Roger Porter, faculty dean of Dunster House and IBM professor of business and government; and Tess Wise, teaching fellow in government. The Council's John R. Marquand Prize for exceptional advising and counseling was awarded to James Biblarz, tutor in Eliot House; Judith Flynn, Allston



Roger Porter



CURRIER HOUSE CHIEFS: Latanya Sweeney, professor of government and technology in residence, and attorney Sylvia Barrett, A.L.B. '95, have been appointed faculty deans of Currier House (the first leaders appointed to that post since the title was changed from House master). The couple, who met at MIT as undergraduates and subsequently founded a computer company together, have a son, Leonard, who is eight years old. They succeed Moore professor of biological anthropology Richard W. Wrangham and Elizabeth Ross, who stepped down after eight years of service at Currier.

Endowment Insights

LAST FEBRUARY, three Republican members of Congress sent a questionnaire to the 56 private universities and colleges with endowments valued at \$1 billion or more, seeking information about those endowments, investments, financial aid, and financial practices. The answers, provided by the April 1 deadline, offer insights into the individual institutions' circumstances and policies (on Harvard, see harvardmag.com/queries-16), and for comparative purposes.

The University, for example, revealed its estimate of the endowment's loss of purchasing power since 2008. Even though, in nominal terms, its value as of June 30, 2015, finally exceeded the prior peak before the financial crisis in 2008 (\$37.6 billion vs. \$36.9 billion), "In real (inflation-adjusted) dollars, the endowment remains below the fiscal 2008 value, by approximately \$5 billion." (And distributions from those

endowment assets now support a larger physical plant, enhanced financial aid, and other costs.)

Other interesting tidbits include the following.

Investment-management expenses. Harvard Management Company (HMC) has always maintained that its hybrid asset-management model (investing a portion of the assets itself, less expensively, and retaining external managers to invest the rest) provided important economies. It has not detailed those economies to any significant extent, other than reporting, as in its fiscal 2014 letter, that its studies suggested savings of "approximately \$2.0 billion over the last decade as compared to the cost of management for a completely external model" delivering equivalent investment returns. The response to the congressional query notes that the management cost for *internally* managed funds is "generally below 0.75 percent" and that for *externally*

managed funds "generally averages 1-2 percent of assets under management." Making a back-of-the-envelope calculation, using fiscal 2015 assets (\$37.6 billion), yields, very roughly, \$110 million of internal costs (at 0.75 percent) and \$225 million to \$450 million of external management costs (at 1 percent to 2 percent).

Peer institutions, which maintain small internal investment staffs and pay external managers fees to invest essentially all their assets, reported these internal and external expenses for fiscal 2015 (as a percentage of endowment assets) respectively:

- MIT, 0.12 percent, 1.0 percent
- Princeton, 0.09 percent, 1.3 percent
- Stanford, 0.15 percent, 1 percent to 2 percent
- Yale, 0.14 percent, 1.22 percent

Yale's external cost ratio, which has declined significantly in recent years, is particularly notable. It invests less than one-quarter of its endowment assets in

Burr assistant dean in Quincy House, a lecturer on human evolutionary biology; and Susie Jang, tutor in Eliot House. And the Graduate Student Council recognized these faculty members with its Everett Mendelsohn Excellence in Mentoring Award: Jean Comaroff, Whitehead professor of African and African American studies and of anthropology; Drew Fudenberg, Abbe professor of economics; Kimberley Patton, professor of the comparative and historical study of religion (see page 18); Nancy Rosenblum, Clark professor of ethics in politics and government; and Leah Somerville, assistant professor of psychology.

National Academy Honorands

The National Academy of Sciences has elected 84 new members, including Myles A. Brown, professor of medicine; Oliver Hart, Furer professor of economics; Hopi E. Hoekstra, professor of organismic and evolutionary biology and molecular and cellular biology (and a Harvard College Professor); Robert E. Kingston, professor of genetics; and Steven Pinker, Johnstone Family professor of psychology.



Nicco Mele

Kennedy School Centers

The Harvard Kennedy School's (HKS) Shorenstein Center on Media, Politics, and Public Policy has appointed Nicco Mele as director, effective July 1, succeeding Alex Jones, who stepped down in 2015. Mele, most recently at the University of Southern California, was previously deputy publisher of *The Los Angeles Times* and webmaster for



Kimberley Patton



Hopi E. Hoekstra

Howard Dean's 2004 presidential campaign (for more on Mele, see "Rise of the Little Guy," September-October 2013, page 13).... Black professor of political economy David T. Ellwood, a scholar of poverty and welfare and HKS dean from 2004 to 2015, has been appointed director of its Wiener Center for Social Policy. He also chairs the U.S. Partnership on Mobility from Poverty, an academic-practitioner collaboration aiming to create expanded paths for economic and social advancement. Allison professor of economics Lawrence Katz and Beren professor of economics N. Gregory Mankiw are among the 24 members of the partnership.

Overseers Executives

Kenji Yoshino '91, the Chief Justice Earl Warren professor of constitutional law at NYU, and Nicole Parent Haughey '93, a former investment-research and corporate executive, have been elected president of the Board of Overseers and vice chair of the Overseers executive committee, respectively, for the 2016-2017 academic year.

Newsmakers

Jane L. Mendillo, president and chief executive officer of Harvard Management Company from 2008 through 2014, has been nominated for election to the board of directors of General Motors Company. She is already a director of Lazard Ltd., the investment bank, and a trustee of the Andrew W. Mellon Foundation.... The Radcliffe Institute's 55 fellows during the 2016-2017 academic year include a bumper crop of 11 Harvard affiliates, ranging from Tomiko Brown-Nagin, Paul professor of constitutional law and professor of history (who is working on a biography of Constance Baker Motley) to Eugene Wang, Rockefeller professor of Asian Art (Chinese art). See the complete list at www.radcliffe.harvard.edu/news/press-releases/from-around-the-world-and-across-harvard.

Yesterday's News

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

1901 J. P. Morgan signifies his intention of donating \$1 million toward the construction of new buildings at the Medical School. Grateful administrators cable their thanks to the financier, who is traveling in Europe: "Great gift received: beneficent results innumerable."

1931 The Law School announces the inauguration of a training course for prison wardens.

Before leaving to take on the world, the seniors offer some suggestions to the University. Among them: that varsity athletics be confined to the freshman, sophomore, and junior years, and that "radical improvement be made in the ventilation of Widener Reading Room (temperature 90 in the shade)."

1946 The *Bulletin's* Undergraduate columnist, Mitchell Goodman '45, reports that *The Harvard Crimson* has called for a local buyers' strike as rising prices in the Square make subsistence difficult for fixed-income veteran scholars who receive only \$15 a week of government subsistence. A

front-page editorial in the paper declares, "What was once proudly called the G.I. Bill of Rights has become a fraud: Existence on \$65 a month—or \$90 with dependents—is patently impossible."

1971 The Summer School celebrates its centennial year. Harvard's first regular summer course, in botany, was offered by Professor Asa Gray; many of his students were women teachers who thus became pioneers in the education of women at the University.

1981 During the summer Alumni College program, 171 people sign up for a week-long course in "basic computer conversation," which, by its close, has most of them programming.

2006 Crews remove the grass on the Harvard Stadium's playing field during the summer, replacing it with a new synthetic surface, a \$5-million project that will open the stadium for night, winter, and off-season use.

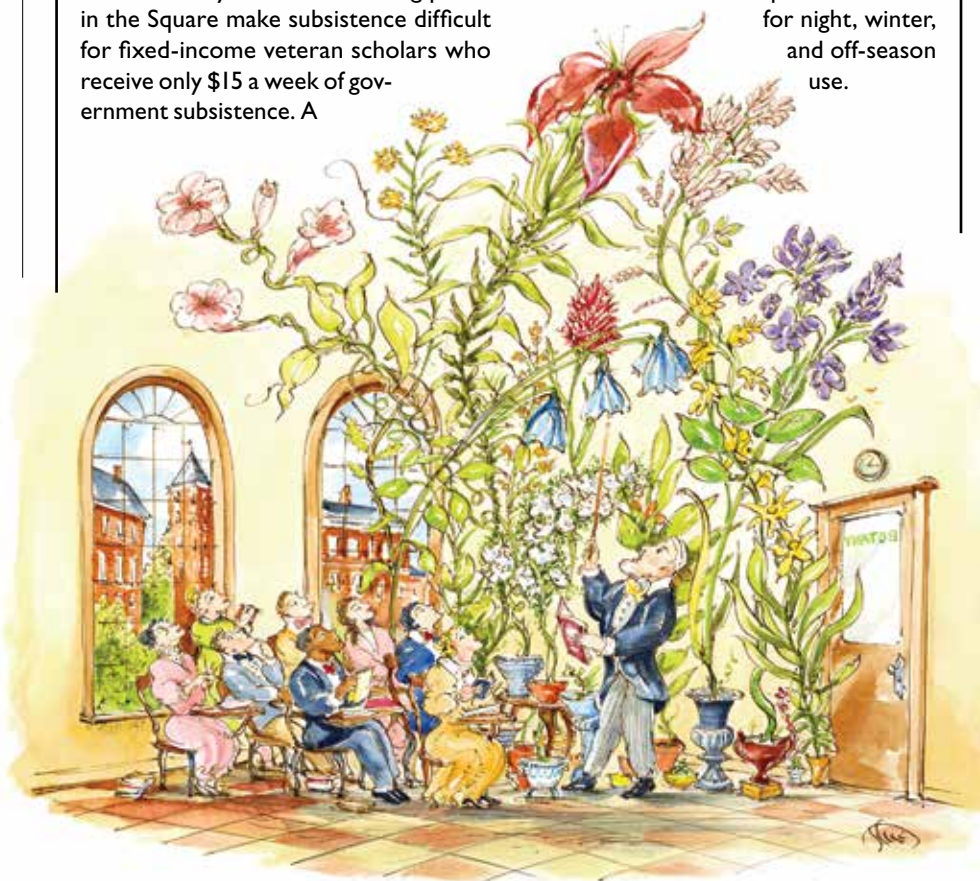
publicly traded stocks and bonds, the least expensive asset class to manage, and is heavily committed to typically higher-fee investments (such as private equity and venture capital), in which it has long reported extremely strong relative returns. Its low expense ratio may reflect favorable relationships it has developed with superior investment managers, who value Yale as a limited partner (investor); achieving those kinds of relationships is a high priority for HMC under its new senior management (see the discussion at harvardmag.com/overhaul-16)—plans that may be disrupted given the disturbing news that its CEO is on medical leave (see page 29).

Financial aid. The inquiring lawmakers have a special interest in undergraduate financial aid, and each responding institution spelled out its program in some detail (although with some differences in presentation); highlights follow.

Harvard reported that only one-quarter of the College class of 2015 took out loans; those who did graduated with median educational debt of \$10,900. Since financial aid was liberalized, beginning in fiscal 2004, the proportion of students who receive Pell Grants (a common indicator of lower-income family circumstances), has risen from 10 percent to 18 percent.

Princeton said that just 17 percent of students have assumed debt—and the average debt load for graduates is down to \$6,600. Its proportion of students receiving Pell Grants rose from 7.2 percent in the class of 2008 (entering in 2004) to 18 percent in the class of 2018. In Yale's class of 2015, 17 percent of students assumed loans—and their average debt was a hefty \$15,521. At Stanford, which unlike these peers is *not* need-blind for international applicants (who are therefore skewed to higher-income families), 22 percent of members of the class of 2015 assumed debt, with median loans of \$16,417.

Back to the land. Finally, three institutions reported an intriguing pillar of their investments: income from owned, developed land. Princeton owns somewhat less than half of the land at the nearby Princeton Forrestal Center, developed beginning in the mid 1970s. Stanford's "endowment land," valued at \$3.4 billion, encompasses the Stanford Research Park (with 10 million square feet of income-producing



properties), the Palo Alto offices at the heart of the venture-capital industry, and more. (Another asset is the Stanford Shopping Center.) Just down the Charles River, MIT owns more than 5 million square feet of rentable commercial spaces—much of it in the red-hot Kendall Square life-sciences and technology hub. (In fiscal 2015, MIT noted, its real-estate tax payments represented more than 13 percent of Cambridge’s total tax revenues.)

Harvard’s Allston planners are surely aware of the synergies to be had from locating inventive faculty members next to entrepreneurs, innovation-minded technology businesses, and venture investors: the rationale for the planned “enterprise research campus” envisioned for Western Avenue (see harvardmag.com/fessler-16). And its financial planners are certainly as aware of the potential to turn a vacant, brownfield landholding into a future source of long-term, stable income, at a time when other revenue sources (net tuition, sponsored-research funds, and endowment returns) appear more constrained, and volatile, than in past decades. —J.S.R.



KIT WU/THE HARVARD CRIMSON

Members of all-female social clubs protest against new sanctions on single-gender organizations.

Rhodes and Marshall scholarships. The policy follows a year of escalating hostilities between final clubs and Dean Rakesh Khurana, and will take effect in fall 2017, affecting only students entering with the class of 2021 and

News Briefs

Social Club Sanctions

CITING their history of gender discrimination and negative influence on campus life, the College announced in May that it would ban members of historically male final clubs and other unrecognized, single-gender social groups from holding leadership positions in athletics or official student groups, and from receiving College endorsements for fellowships, like the prestigious

thereafter. Two final clubs, the Spee and the Fox, became co-ed earlier this year, in response to pressure from Khurana (though the Fox’s graduate board disputed the move, and declared the new women members “provisional” pending approval by a two-thirds majority of alumni); they thus won’t be affected by the policy. No other clubs have yet announced plans to go co-ed in response to the new rules.

The clubs had been linked to sexual assault last spring, when a College-wide sur-

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vey found that 47 percent of senior women who participated in final-club activities reported unwanted sexual contact since entering Harvard, compared to 30 percent of senior women overall, and that 17 percent of assaults occur on property used by single-gender social organizations. But in their messages to undergraduates announcing the new policy, President Drew Faust and Khurana appeared to distance the decision from concerns over sexual assault, focusing instead on the discriminatory nature of single-gender groups.

Many students and alumni, unsurprisingly, greeted the decision with sharp disapproval; a few final-club affiliates threatened legal action against the University. Hundreds of women belonging to sororities and female final clubs gathered for a rally the week following the announcement, capturing national media headlines and provoking campus-wide debate about the legitimacy of the policy. Protesters called all-female groups “collateral damage” in the University’s effort to shut down final clubs, and stressed the importance of their organizations in creating

a safe, supportive community for Harvard women. Former dean of the College Harry Lewis ’68 wrote a letter to Khurana condemning the sanctions, arguing that they would create “a College culture of fear and anxiety about nonconformity” (though acknowledging that final clubs can have a negative influence on campus culture). Lewis later led a group of 11 other faculty members in drafting a motion in opposition to the social-club sanctions, to be voted on by the faculty next academic year.

Read full reports at harvardmag.com/finalclub-16 and harvardmag.com/fall-out-16.

—M.B. AND A.L.

David M. Rubenstein, Fellow

THE DAY before Commencement, the University announced that David M. Rubenstein—a private-equity executive and a Harvard Campaign leader—will become a Fellow of the Harvard Corporation, effective in July 2017.

Although the announcement a year in advance is unusual, the appointment is in effect a slow-motion double-switch, to use a baseball metaphor. Last December,

Princeton president emerita Shirley Tilghman was elected to the Corporation, filling the vacancy created by the death of James F. Rothenberg, an investment-management executive, the prior summer. Now, Rubenstein is in the queue to fill the planned departure of Nannerl O. Keohane, president emerita of Wellesley College and Duke, at the end of the next academic year. Read a full report at harvardmag.com/rubenstein-16.

David M. Rubenstein



COURTESY OF THE CARLYLE GROUP

Medical Conflicts of Interest

IN EARLY MAY, shortly before concluding his service as Harvard Medical School (HMS) dean on June 30, Jeffrey S. Flier completed a review of the school’s conflict of interest policy that he began in early 2015. Then, he cited the need to ensure that the policy “remains optimally constructed and relevant to the current environment and practices, striking an appropriate balance between ensuring the integrity of our work and permitting our faculty the maximal opportunity to improve human health through the discovery, evaluation and eventual introduction and use of new drugs and devices”—the latter involving engagement with commercial companies.

At the end of 2015, Flier promulgated changes in the “research support rule,” which he found “overly restrictive” and too rigid relative to circumstances that might arise in each situation. Accordingly, where faculty members who hold equity in *privately* held companies were previously presumed to be prohibited from receiving research support from those entities, the policy now permits a petition to rebut that presumption. Faculty members who own equity in *publicly* traded enterprises would not be prohibited from receiving research support from such businesses unless they owned more than 1 percent of the total equity; above that level, faculty members may petition for permission for such research support.

The May changes pertain to support for *clinical* research, where a separate rule had prohibited faculty members conduct-

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Reconsidering Race

At the end of April, Yale announced that it would retain the name of Calhoun College, its undergraduate residence named for U.S. vice president John C. Calhoun, the fervent proponent of states' rights, nullification, and slavery (and would initiate historical study of his legacy). It named two new residential colleges—being built to accommodate an expanded student body—for African-American civil-rights activist Pauli Murray (who was denied admission to Harvard Law School for advanced study, in an era when it was not coeducational; see “Two Women, Two Histories,” November-December 2007, page 29) and Benjamin Franklin, a slaveholder who became an abolitionist late in life....Separately, Princeton decided to retain the name of its Woodrow Wilson School of Public and International Affairs, and of the similarly named residential college, and to examine the former Princeton and U.S. president's segregationist history.

On Leave

The University announced on May 23 that Stephen Blyth, president and CEO of Harvard Management Company since the beginning of 2015, has begun an immediate medical leave. Chief operating officer Robert Ettl will be interim CEO, overseeing the endowment-investment operations. Details are at harvardmag.com/blyth-leave-16.



Stephen Blyth

Early-Childhood Education

Harvard Graduate School of Education has received a \$35.5-million gift, the largest in its history, from the Saul Zaentz Charitable Foundation, for an early-childhood initiative. Under the direction of Thompson professor of education and society Nonie Lesaux and Kargman associate professor in human development and urban education advancement Stephanie M. Jones, the initiative will conduct a five-year, population-based

study of early-childhood development. An academy will advance training of early-childhood educators, and there will be new fellowships and two new professorships in the field. Details are available at harvardmag.com/gsedonation-16.

On Other Campuses

As Harvard expands its academic footprint in Allston (see page 22), Stanford is redeveloping a former office park into a satellite Redwood City campus, relocating support operations from its aca-

Brevia



SPOTLIGHT ON SLAVERY. On April 6—drawing on research conducted by the student-inspired Harvard and Slavery Project—Corporation Senior Fellow William F. Lee, President Drew

Faust, and U.S. Representative John R. Lewis, LL.D. '12, spoke to an audience at Dudley House before unveiling a stone tablet affixed to Wadsworth House, acknowledging the four enslaved people who lived there when Harvard presidents Benjamin Wadsworth (1725-1737) and Edward Holyoke (1737-1769) were in residence. The simple plaque memorializes Titus, Venus, Juba, and Bilhah, and is meant to be the first step in University acknowledgement of its connections to slavery; read a full report at harvardmag.com/slaves-16.



demical core. The new venue, five miles from the university's central facilities and its first such expansion, will by 2019 accommodate 2,400 staff members involved in an outpatient medical clinic, business operations, buildings and real estate, human resources, dining, development, and libraries and archives. Ultimately, the site can accommodate 13 new buildings totaling 1.5 million square feet of offices and clinical space....The University of California at Berkeley, which disclosed severe budget deficits in February, has announced that it will eliminate 500 staff positions (6 percent of the total) through attrition and layoffs.

Peering into Space

Faculty members from the departments of astronomy, physics, mathematics, history of science, and philosophy have formed a Black Hole Initiative,

the only such center dedicated to the field. Abraham (Avi) Loeb, Baird professor of science and chair of astronomy, is the founding director; cosmologist Stephen Hawking, S.D. '90, spoke at Sanders Theatre on April 18, kicking off the initiative.

Campaign Contributions

Harvard Medical School has reported fundraising proceeds of \$539 million as of March 31, up from \$512 million two months earlier, suggesting steady progress toward its \$750-million goal—and continued gains for the \$6.5-billion University campaign overall; a status report is likely by late summer, following the June 30 close of Harvard's fiscal year.... Separately, in April, the University reported that the Lemann Foundation has expanded its support for financial aid and fellowships for students from Brazil, and will support visiting faculty members and underwrite a Brazil research fund. Jorge Paulo Lemann '61, a billionaire São Paulo-based investor, made significant commitments to financial aid

and research beginning in 2006.) Harvard's Brazilian ties were underscored in the award of an honorary doctorate of laws to that nation's former president, Fernando Henrique Cardoso, at Commencement (see page 16).

Climate-Change Developments

In August 2014, David F. Swensen, the Yale endowment's long-term chief investment officer, wrote to external asset managers, emphasizing that "greenhouse gas emissions pose a grave threat to human existence," therefore "making consideration of the impact of climate change essential when evaluating investment opportunities." In a letter to the community this April, highlighting this economic criterion (as opposed to ethical or other considerations), Swensen reported that small holdings in thermal coal and oil-sands operations were eliminated. Yale and its external fund managers now share a "common understanding" about not making new investments in "greenhouse gas intensive energy companies," and about risks posed by climate change to southern farmlands or low-lying coastal real estate, and potential regulations aimed at reducing emissions. Climate advocates continued to press for a formal policy of divestment, which Yale has declined to adopt. The Yale Carbon Charge Project, which assesses carbon pricing as a tool to promote sustainability, is being piloted in 20 campus units; in March, Yale became the first university member of the Carbon Pricing Leadership Coalition, formed by the World Bank and the International Monetary Fund. (MIT joined in May.)

Nota Bene

PAY PACKAGES. The University's annual disclosure reveals that for the fiscal year ending June 30, 2015 (data are reported with a lag), President Drew Faust earned \$816,370, plus other compensation (retirement and deferred compensation, the use of the presidential residence) of \$386,610. Harvard Management Company's departed president and chief executive officer Jane L. Mendillo earned \$13.8 million during her final 18 months overseeing the endowment. Further details appear at harvardmag.com/compensation-16.

THE YIELD. Nearly 80 percent of applicants offered admission to the College class of 2020 have decided to come to Harvard, down slightly from the 81 percent yield reported last year, but the fourth year in a row that acceptances have hovered around that level. As a result, 40 to 50 wait-listed applicants will be admitted.

MISCELLANY. Gap years got a high-profile boost with a May 1 White House news release: "The President and Mrs. Obama announced today that their daughter Malia will attend Harvard University in the fall of 2017 as a member of the class of 2021. Malia will take a gap year before beginning school"—during which the family will, of course, be moving to a new home. (Mom and dad are, respectively, J.D. '88 and '91.)...*The New York Times* and *Fortune* have both reported that Xfund—the seed-stage venture-capital fund founded by Patrick Chung '96,

M.B.A. '02, J.D. '04, and Hugo Van Vuuren '07, M.D.S. '12, and initially based at the School of Engineering and Applied Sciences to support ideas originating there—has foundered following disagreements between the two partners about its direction. Among investors in the fund is Corporation member James W. Breyer, a leading figure in the venture-capital industry....Corporation member Theodore V. Wells Jr., co-chair of the litigation department at Paul Weiss, who has previously represented Exxon Mobil Corporation, has been retained by the company to represent it as state attorneys general investigate whether it misrepresented to the public and investors its knowledge of climate change....*Harvard Magazine* congratulates contributing editor Adam Kirsch '97, a critic and poet who has written in these pages about Robert Frost, Seamus Heaney, and T.S. Eliot, among many other subjects; he has won a Guggenheim Fellowship, to pursue his work on the letters of Lionel Trilling.

EXTENSIVE EXTENSION: In reporting on the 2015-2016 academic year, Huntington D. Lambert, dean of the division of continuing education and University extension, observed just how far online learning has progressed. Of 787 courses offered, to 14,500 students (more than 3,000 of whom are pursuing degrees), more than half were online; 42 of those courses included a weekend session on campus. The Extension School offered 13 HarvardX courses, accompanied by teaching support and discussion sections, for credit, and deployed several of its own, internally developed, fully online courses.



AIR FORCE LANDING. Air Force Secretary Deborah Lee James visited campus on April 22 to sign the agreement for its decision to establish a reserve officer corps program at Harvard. That completes a five-year process that began with the return of Navy ROTC in 2011 and the Army a year later, following repeal of the "don't ask, don't tell" policy that had banned openly homosexual people from military service. Harvard students' ROTC training takes place at MIT.

ROSE LINCOLN/HPAC



STEPHANIE MITCHELL/HPAC



Jeffrey S. Flier

participants should be subject to heightened scrutiny because bias can directly impact the safety and welfare of clinical research participants," HMS will now liberalize the rules, which it found could "stifle research that is in the best interest of patients and human study participants." The income threshold is raised to \$25,000, and the limit on ownership in publicly held enterprises to \$50,000. The prohibition on owning equity in a private company from which a faculty member wishes to receive clinical research funding remains in place. A mechanism to permit petitions for exceptions to these guidelines was also put in place. ~J.S.R.



MIT campaigns, too.

"For a Better World"

FROM Harvard's perspective, the *second* most important fundraising effort in Cambridge launched publicly on May 6, when MIT—celebrating the centennial of its relocation from Boston—unveiled its outward-looking "MIT Campaign for a Better World." To put its ambitions in perspective, the goal is \$5 billion (as the Engineers' website puts it, 5x10⁹), compared to The Harvard Cam-

paign's \$6.5-billion target; but MIT—with 1,036 professors of all ranks, and 4,527 undergraduates and 6,804 graduate students—is about half Harvard's size.

Citing the institute's history of "discovery, knowledge creation, and innovation," the campaign announcement focused on fundamental science; the "health of the planet" (MIT has developed a multi-hundred-million-dollar research program on climate change, clean energy, and sustainability—see "A Modest Proposal," January-February, page 4); scientific and engineering research on human health; enhanced emphasis on innovation and entrepreneurship, to apply discoveries more rapidly and widely; teaching and learning (driven by a comprehensive strategy for broader, deeper use of online and other technologies, overseen by the Office of Digital Learning, and experiential learning—on campus, in the world, and for K-12 use); and in its core faculty resources, student financial aid, and facilities.

MIT's science- and engineering-intensive campus will require substantial spending to pursue this work. During the campaign's quiet phase, the institute borrowed \$1.3 billion for new facilities and to address deferred maintenance, assuming donor support to help meet the larger total costs. So far, that bet, and other aspects of the campaign, appear to be paying off: fundraisers had secured \$2.6 billion of gifts and pledges as of March 31—or 52 percent of the goal: an even more comfortable initial margin than Harvard's 43 percent when the public phase of the Crimson campaign began in September 2013. Given Harvard's stupendous results since, the omens appear favorable for its downriver neighbor.

On Writing Better

AT THE END of a year in which the Faculty of Arts and Sciences (FAS) reworked the General Education curriculum (see "General Education Reconstituted," May-June, page 31), dean of undergraduate education Jay M. Harris reported on plans to enhance the College's

one universally required course, Expository Writing, and to improve writing instruction generally. His briefing, a report on the work of FAS's standing committee on undergraduate education, noted the "challenges of teaching students who come to the College with varied levels of preparation for writing" (as Harvard extends its outreach to applicants, attracts students for whom English is not the primary language, and so on), as well as the need to help students "continue to develop as writers" as they pursue their concentrations.

Expos 10, an introduction to writing offered to students whose placement tests suggest a need for such work (limited to 10 students per class, with 15 to 17 sections offered in most years, enrolling about 10 percent of entering freshmen), and Expos 20, the required course (which varies in content based on the instructors' academic field), are largely taught by preceptors. These postdoctoral, term appointees are by definition likely to move on, or be hired away, rather than stay at Harvard long term. But they are trained in writing—and teach in a context where students receive close attention and must revise their work. (The written work required in many Gen Ed and concentration courses is generally used only for assessment, and rarely subjected to expert comment and revision that could improve writing skills.)

To determine the effectiveness of the marquee course, the committee retained Les Perelman, former director of undergraduate writing at MIT; he and a cohort of researchers read the placement tests for an entire Harvard freshman class, and then their final Expos essays, and scored their progress. Based on those findings, the committee has recommended "expanding our writing instruction on both ends of the spectrum," for less proficient writers and those who are most advanced. In the latter case, an experiment has been undertaken to allow very proficient writers to bypass Expos 20, and instead fulfill the requirement in a writing-intensive regular class: in 2015-2016, the Humanities 10a and



Jay M. Harris

10b sequence. Another pilot will be run this year. Both embed required writing instruction in the context of a course about which students are presumably passionate.

Beyond Expos, Harris's report noted, most "teaching of writing is done by graduate-student instructors, a relatively small number of whom may have received support as teachers of writing." To remedy that deficiency, this fall, the writing program and Bok Center are piloting training to equip teaching fellows to teach undergraduate analytical writing. Separately, a

digital teaching platform that highlights writing in subject-area concentration studies is being offered to departments, with discipline-specific exercises stitched in, to connect the skills honed in Expos to the rest of students' academic work.

These are incremental steps toward a focus on instruction in writing across the curriculum—perhaps increasingly necessary in an age of smart phones and 140-character messages. In time, one could imagine diverse disciplines in which faculty members with a strong interest in

writing develop courses—historical writing, scientific nonfiction, and so on—beyond the English department's relatively limited nonfiction offerings. And in the longer term, should graduate enrollment in humanities and other writing-intensive disciplines continue to plummet, Harvard professors may find that they have to read and grade those undergraduate papers and exams themselves—so they may welcome future student cohorts whose writing is subjected to continual improvement during their College years. ~J.S.R.

THE UNDERGRADUATE

Whittling Down

by BAILEY TRELA

AT HOME there's a box with my name scrawled atop it. It lies in a cubby in the upstairs guest room and contains, among sundry other small mementos, a scarf, a horseshoe engraved with my name, and two books, which I both wrote and illustrated, back in the polymath days of fifth and sixth grade.

I spent a week back home this semes-

ter, among a wistful gathering of relatives and family friends; we had come together to mourn, in ways both functional and personal, the passing of a matriarch. While there, I also went through many boxes, paring, weeding, and tossing away the bones of my childhood, decocting and distilling them until the brightest remnants

could be held in a single cardboard cube.

There was never a question of discarding the books I'd written when I was 11 and 12. I'm still exorbitantly proud of these juvenilia. They seem to me now the purest thing I've ever done, complete and whole in a foreign way, as though they were the products of a long-forgotten craft.

In a way, this was a rehearsal—going through the things I'd written when young, whereas soon I'd have to cull a more complicated mass: the uncollected notes of my more recent years, and the books I'd always meant to read. Before I returned to Harvard, my sister-in-law asked if I wanted to take an extra suitcase with me: "For when you have to move out." She was already thinking about graduation. About the great throwing-

out that accompanies it. I said

I didn't think that would be necessary, but the family persisted. My brother pulled me aside and asked, referencing the grand library I've amassed at school that everyone just seems to know I have: "What are you going to do with your books?"

I didn't know.

EVERY SINGLE THING I've written while at Harvard—essay, memoir, fiction, even what you're reading right now—began as a Word document with a tail-end section labeled: *Disjecta*.

I stole the word, the idea, from Samuel Beckett's *Disjecta*, an opaque collation of fragments and poems and critical exercises that simply



didn't fit anywhere else in his oeuvre. You get the sense, perusing it, that for Beckett it was a distasteful thing to publish, a bitter book. The pieces it contains that were written in another language remain untranslated; if you are interested in it, Beckett seems to say, you must be a serious scholar (the joke being: perhaps you are *too* serious).

When I write, the blank space beneath the heading of *Disjecta* fills up, gradually, with thoughts: the rames of arguments, passels of vocabulary, sheaves of tentative ideas. Some of them I incorporate, others I leave behind. The latter always ache to be mended, to be followed through to whatever their end might be. *Disjecta membra*—Beckett's *disjecta* is a shortening—is often used in the scholarly world to refer to sherds of ancient pottery; they are the leftover things, the whole of which can never be accounted for or completely understood. Like the fragments of my writing, they mean something only obliquely.

For a while now I've been worried about the way my mind works. Sometimes it seems I'm incapable of thinking in a continuous way. I came to Harvard as a freshman planning to study English, and at first I hoped that *literature*, over the course of four years, would come to make sense to me; with time I matured and lowered my hopes and began to wait for just *English literature* to reveal itself, its heart. Now I've struck realist bedrock: I try only to understand *writers*, one by one and on their own terms.

I wanted something infrangible, unscattered. I wanted the whole ancient pot. What I got was a mindful of tumbling sherds.

When I sit down in my room to write, the books that surround me begin to loom, to threaten. They are bound in glue and thread. They have a definite shape, a claim to wholeness. They seem to gloat, letting me know, in their own silent way, that I'll never make my way through them all, much less understand them. It seems silly to hold onto them.

Between those thoughts of mine that I'll never have time to chase down and these alien compendiums, I feel like the epicenter of a knowledge-based Big Bang, with the truth—whatever that might be—rocketing away from me in all directions.

I'VE BEEN IMAGINING the day of my departure from Harvard on and off in various iterations for the past few months, though the most ideal versions—I can't say why—always contain the curious moment when a wise and anonymous Frenchman pulls me suddenly aside at Commencement and reflects airily, “*Ah, le grand débouchement!*” And I understand him, somehow, miraculously. “The great opening-up,” I think to myself, and I call out to him as he melts into the crowd: “You’ve nailed it!”

There is a promise embosomed in the process of growing up. You hear it all the time. In its most basic form it is something like: *Things will come together*. “Things,” here, can and does have a number of concrete meanings: the world, your circle of

acquaintances, your identity, your mind. But I can't help worrying about the grand-scale fragmentation that comes with going out into life and that seems, at least to me, more definitive of postgraduation existence. Concretely, this worry makes sense: The people I've known will scatter, and the things they meant together will cease to be; they will have meaning only as the fragments of a whole.

And more generally, my interest in *disjecta* doesn't exactly bode well for the arrival of the coalescence I've been taught to expect. By the time I've finished whatever it is I'm writing, the unincorporated *disjecta membra*—those bits that I haven't managed to fold into the work's structure—no longer make sense to me. Though I've spent only a week or two writing, already the thoughts that came to me gleaming and eureka-bright have been dulled by the little changes in my mind, my thoughts. They belong to someone else; they make sense only to him.

There's a sense of pain and anxiety enveloped in the concept of *disjecta*, one that shows up etymologically. The mother phrase, *disjecta membra*, can be translated a number of morbid ways, though the first word is typically given as “scattered,” while *membra* becomes, variously, “limbs,” “fragments,” “members,” “remains.” The phrase itself, as the *Oxford English Dictionary* informs, has been whittled down from Horace's *disjecti membra poetae*: the “limbs of

a dismembered poet,” which nine out of 10 poets agree is the worst type to be.

The pain of cracking, of falling into sherds—the sad thing is that after awhile, if you don't think about it, you'll forget even this. And so I've begun to suspect that when things begin to make sense—to *come together*, as the phrase has it—it's only because we've discarded the other pieces.

YOUR STANDARD-ISSUE Harvard College desk comes equipped with three drawers on the right side: the top two of equal size, the bottommost slightly larger, slightly deeper. My third drawer is currently playing host to 24 dining-hall coffee cups, which I will probably return. The upper two are brimful of papers: old essays bearing indecipherable

I feel like the epicenter of a knowledge-based Big Bang, with the truth rocketing away from me in all directions.

professorial comments, notes I've scribbled to myself, half-hazy sketches and drawings, receipts, lists (to-do, shopping, and otherwise), sticky notes *sans* stick, problem sets, and all the other edible scraps that tend to flock together with time.

For four years this mass has accreted: at the end of each, I bagged it up, stuck it in storage, and transferred it, a few months later, to newer drawers. But now I'm not sure where I'll end up. The state of future storage is likewise unknown. Can I expect drawers where I end up settling? Will they be as nice, as dry, as preservative as those I've come to know? Or will there only be drawer-shaped holes in the wall that my papers will have to share with dust, spiders, the occasional opossum?

Disjecta, I've only just learned, shares a root with *dejected*. Both stem from a verb whose chief connotation, in the Latin, is to *throw*, or *throw down*. Hence the lowness of spirits, the melancholia that pertains to *dejected*. And hence the thrown-outness, the scattered-to-the-winds-ness of *disjecta*.

I know it's not absolutely necessary that I toss the contents of my drawers, or any one of my books, that I throw them out, down, or into the trash. It's not impossible to hold onto everything. If you're an adult with disposable income, and you want to do it, there's literally nothing stopping you. You can make a budget and set aside a stack of cash and purchase as many storage sheds as you'll need; you can cart your

childhood drawings and photographs and books about and stack them up and continue doing this until a worldly-wise storage-shed attendant claps you on the shoulder and suggests that it's time to move on.

You can do this, but I doubt you'd get anything more than back pain out of it. I know I'd like to compile and preserve all the scraps of paper and thought that have come to me during college. But the point of synthesis has passed; I can't make sense of

them anymore. They're far too scattered—it would take an expert on *me*, a scholar of my life, to draw them all together, and I'm far from that.

I've begun to whittle things down. When I tire of working through drawers, I move to my bookshelves, and vice versa. Some things, I've found, are easy to part with. Others I know I must keep. But there are trickier cases as well, things that evoke a dim pang of recognition, that recall images of my younger selves—and I

have to guess whether I'll ever make sense of them. I have to decide if I still harbor, somewhere in the obscurity of memory, the thoughts that once tied me to these objects.

Back home I've got two books with white cardboard covers, and they seem the last pure thing I ever did. ▢

Berta Greenwald Ledecy Fellow Bailey Trela '16, who wrote these words in early May, actually believes he'll one day finish The Magic Mountain.

SPORTS

A Fast Start

First-years Ngozi Musa and Gabby Thomas help set the pace for track and field.

by LYDIALYLE GIBSON

IN APRIL, sprinter Ngozi Musa, approaching the end of her freshman season on Harvard's track and field team, was telling a story about the time she

set her starting blocks incorrectly at the world junior championships in Eugene, Oregon. It was 2014, her first competition on an international stage, and she thought

(wrongly, it turned out) that a tape measure would be prohibited. So she eyeballed it. When the blocks felt strange under her feet right before the race, she assumed it was nerves; not until too late did she realize that their placement was off by 12 inches. "I didn't run very well, and I remember being angry about it the whole rest of the summer," she recalled, now able to smile. "It was a lesson never to get my blocks wrong again."

Sitting next to Musa, her teammate Gabby Thomas laughed. "So that explains why you're so anal," she said. A fellow freshman and sprinter, Thomas is Musa's best friend and closest competitor. She also takes a somewhat more relaxed attitude toward the precise position of starting blocks. "I don't pay attention to detail that same way, or maybe just to different details," she said. "If I forget my tape measure, I'll use my feet or something."

Then it was Musa's turn to laugh. "Yeah, she thinks outside the box. But we balance out. She's the calm and I'm the storm."

That's true in many ways, suggests Kebba Tolbert, Harvard's sprints/hurdles and horizontal jumps coach, describing Musa's explosiveness and Thomas's deliberation. "Ngozi's more tightly wound," he explains, "a little more powerful, a little more instantaneous. She's like, *boom*. Gabby's smoother. She's bouncier, more elastic. And much more deliberate."

In their first season in Cambridge, Musa and Thomas broke multiple Harvard and Ivy League records—some of them multiple times—in the 60-, 100-, 200-, and 300-meter dashes and in 4 x 100-, 4 x 200-, and 4 x 400-meter relays. In May, when the Crimson women brought home their third

Sprinters Gabby Thomas (left) and Ngozi Musa are teammates, close competitors, and best friends.



consecutive outdoor Ivy League Heptagonal title, Thomas won gold in the 100- and 200-meter dash and bronze in the long jump. Both women were part of the 4 x 100 relay that won it all. Thomas made first team All Ivy, Musa second team. In addition, Thomas qualified for this summer's Olympic trials, while Musa holds the national record in Sierra Leone, where she is a dual citizen (and for whom she competed in the 2014 world juniors), for the indoor 60-meter dash. She can run it in 7.40 seconds.

Jason Saretsky, McCurdy director of track and field/cross country, talks often about the national ambitions he has for Harvard's program, how he'd like to see his athletes competing every year for Ivy League championships and beyond. Musa and Thomas are part of that plan, and they shared a roster last season with stars like sprinter Autumnne Franklin '16, hurdler and middle-distance runner Paige Kouba '16, and shotputter and discus thrower Nikki Okwelogu '17.

But as freshmen, Saretsky says, Musa and Thomas were unusual. The first year of college can be difficult for track and field

Both spent the year shedding old habits to pick up speed.

athletes; they train hard throughout fall semester, grinding along day after day without the payoff of a meet until December, when the indoor season begins. It's a brutal stretch, he says, at a time when the new students are also making other hard adjustments. (As a freshman proctor, who lives in the dorms with his wife and two children, Saretsky sympathizes: "I see these kids, and I see the transition they go through.")

All that can take a toll on first-year runners' performance. "My usual rule of thumb," Saretsky says, "is that if they can get back to where they were by the end of their senior year in high school, that's pretty good." But Thomas and Musa began breaking records, their own and others, almost



as soon as they arrived on campus. "They have far, far exceeded what they did in high school. Part of it is luck, part of it is having each other, and part of it is surviving the fall."

HAVING EACH OTHER is the part both women talk about most. They met in spring 2015 during the Visitas weekend for admitted students, although they didn't hit it off until they met again, this time as team-



DON'T MISS A SNAP








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Sept 16 - URI

Sept 30 - Georgetown

Oct 8 - Cornell

Nov 5 - Columbia

Nov 19 - Yale

HARVARD FOOTBALL

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AWAY SCHEDULE

Sept 24 - at Brown

Oct 15 - at Holy Cross

Oct 22 - at Princeton

Oct 29 - at Dartmouth

Nov 12 - at Penn



Thomas and Musa hold Harvard and Ivy League records in the 4x100-meter relay and in May helped win a conference title.

mates, in the fall. After that, they became inseparable.

"It's such a blessing to have someone—," Thomas began.

"Such a blessing," Musa echoed.

"—that you can compete with at practice and during meets, someone who will push you," Thomas summed up.

Last season the two trained together 85 percent of the time, and as sprinters they overlap in most events, racing against each other often. Which means that somebody wins and somebody loses: last fall, their teammates told them about another close pair whose friendship eventually foundered because of their competition on the field. Musa and Thomas said they are determined not to let that happen to them.

"It's hard sometimes when you see someone else's successes, and you're like, 'But me, but me,'" Musa admitted. "But at the same time it's like, you have to rejoice with those who rejoice and make other people's successes your successes. I think that's one thing I've really been learning this year: making her successes my successes. Because she's my best friend. It's so cool to see how far she's come and how far she's going."

Musa and Thomas both came to track and field through the gateway sport of soccer, where they were the fastest forwards on their childhood teams. When she was nine, Musa's father, who himself ran track in college, enrolled her and her two older brothers in the Hershey's Track and Field games. She made it all the way to the nationals in the 50-meter dash and won first place. It was exciting. "So I said, I think I'll become a runner."

Thomas's story is similar, a journey from the soccer field to the racetrack, which she

made when she was 13. Her mother, a former high-school high-jumper, pushed her to run, "and then in junior year of high school I realized that I had potential to do well in track, and that's when I began to think seriously about it as something with a future."

For each, this past season meant shedding bad running habits they'd picked up in their early years in the sport, and learning to hone their natural gifts: Musa getting rid of a hunched posture that had her pushing down off the blocks, instead of up, and Thomas working to correct a stride that was too long. Tolbert goes down the list: "We're trying to teach them how to accelerate properly, how to run at top speed correctly. How to be relaxed, and how to run with the correct technical things: where their feet are, where their hips are, the way their arms are, good posture, good rhythms." The women's talent is both a blessing and a curse, he says. "The blessing is, you can achieve at a high level. The curse is that sometimes you don't realize all the work it's going to take to get to the next level, because the level you're at came fairly easy."

That's the hardest thing about the sport, Musa and Thomas admitted, harder than the long season—it runs the length of the school year and, for postseason competitions, beyond—and the rough practices, harder than the early bedtimes and strict diets their other friends don't have to keep, and the discipline required for getting homework done before practice, or writing papers on the bus.

Explained Thomas, "It's just, how much work it takes to change—."

"The littlest detail," Musa broke in.

"To get, like, one-tenth of a second better, that's hours and hours of work," Thomas said. "Because it's short sprints, so it's not like you have any room to mess up and make up for it."

"Yeah, if you mess up in the 100, you're

"One thing I've really been learning this year: making her successes my successes."

done," Musa added. "And the intensity has to be there, and that you're executing properly—"

"Like, your foot is cocked at a 90-degree angle, your arm is sitting at the correct position. And if it's not, then you've wasted a run."

One other thing the two share, which perhaps helped with their transition: midway through high school, both moved across the country when their parents changed jobs—Musa from Wisconsin to Seattle, and Thomas from suburban Atlanta to Northampton, Massachusetts. The move helped Thomas open up to new people; Musa, who initially dreaded the disruption of uprooting after tenth grade, grew to love Seattle so much that she wears a tiny silver pendant in the shape of Washington State on a chain around her neck. "My phrase is always, I want to become more comfortable being uncomfortable," she said. "Because I feel like, when you're uncomfortable, that's when you grow. That's when you get better." ♥

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The Plant Prospectors

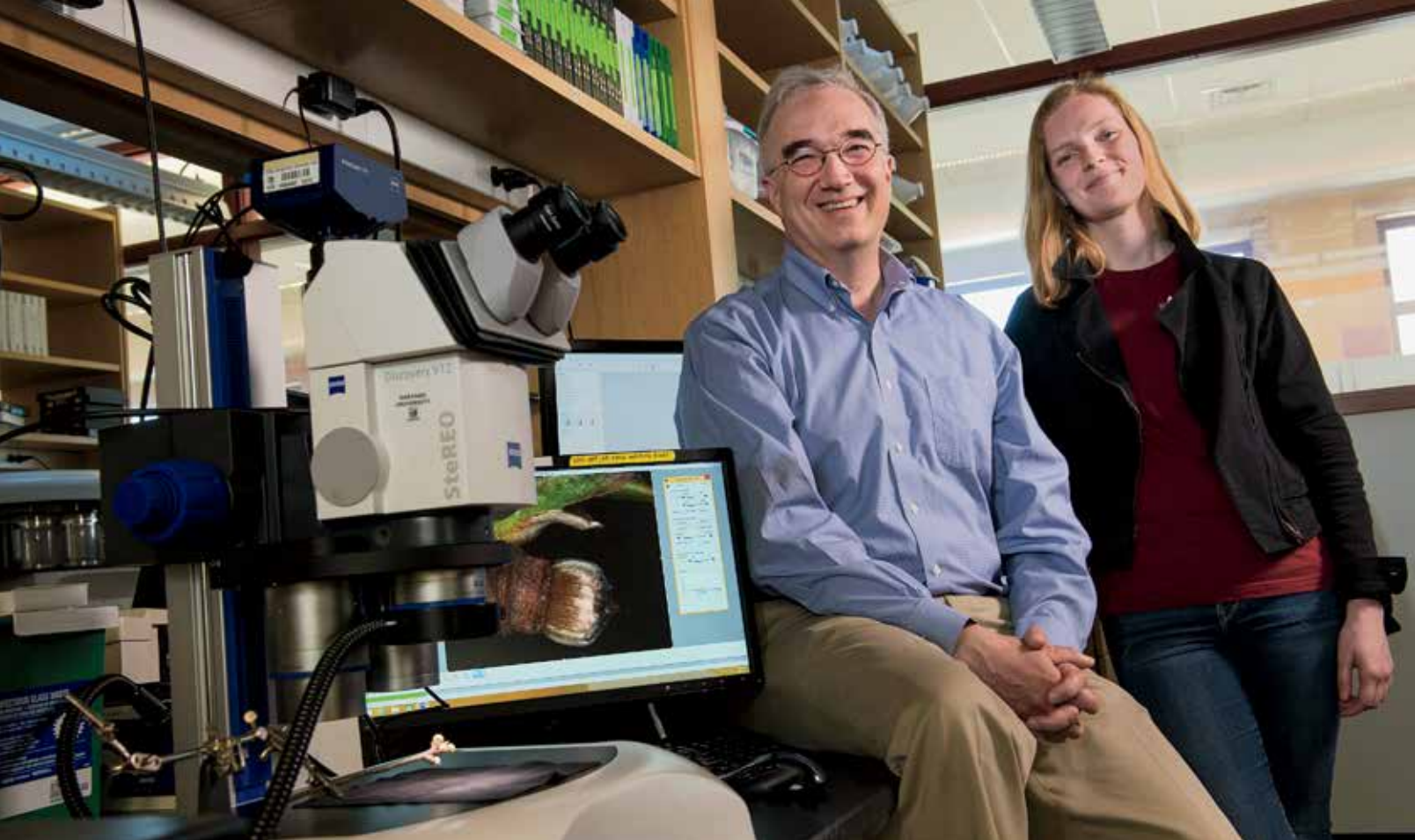
The Arnold Arboretum's systematic mission to sample botanic diversity

by Jonathan Shaw

MANY MORNINGS, before classes, Michael Donoghue would roll out of bed in the “rickety old house” he shared with several other graduate students, and consider how lucky he was. He lived rent-free on 281 acres, formerly an estate and contiguous farmlands, in Boston’s Jamaica Plain neighborhood. Periodically, when a wind-storm felled a tree on the grounds, workmen would deliver wood for the fireplaces. But that’s not why Donoghue, then working toward his 1982 Harvard doctorate, considered himself fortunate. For him, the draw of this enviable situation was the plants: trees and shrubs gathered from around the world, some rare or endangered, that grew just outside his door, where he could study them

at length and compare them side by side as they changed through the seasons and from year to year.

This global collection of botanical diversity at Harvard’s Arnold Arboretum is rooted in a tradition of botanist-explorers, stretching back at least to the eighteenth century, when the pre-eminent plant-hunters in colonial North America were funded by monarchs seeking ornamental specimens for their gardens and estates, or trees that would yield timber or fruit for the economic good of the nations they ruled. In October 1765, for example, John Bartram, royal botanist to George III, and his son William discovered an unknown plant with beautiful fruit growing along the



Arboretum director William (Ned) Friedman and graduate student Kristel Schoonderwoerd recently discovered that seed development in *Franklinia* continues for a full year after pollination, with a seven-month pause in winter—exceedingly rare among flowering plants. The plant, seen at far left in its autumn colors, is extinct in the wild. The silk tree at left, an Asian native prized for its fragrant and showy blooms, was introduced to North America in 1745.

ROBERT MAYER (LEFT); WILLIAM FRIEDMAN

banks of the Altamaha river in Georgia; they named it *Franklinia alatamaha* after fellow Pennsylvanian Benjamin Franklin. The Franklin tree, one of their most notable horticultural finds, is now considered extinct in the wild, but still grows in the gardens of connoisseurs—and at the decidedly democratic Arboretum, which has a particularly massive and long-lived specimen.

Other botanists introduced foreign plants. André Michaux, who served Louis XVI of France and discovered *Rhododendron catawbiense* crowning peaks in the Blue Ridge mountains with its purple flowers, also introduced the silk tree and camellia to North American gardens. Specimens of all these plants grow at the arboretum today. But the explorer who left the greatest legacy of botanical diversity to the arboretum was its own Ernest Henry Wilson, whose decades of exploration in East Asia in the early 1900s brought more than 2,000 new plants to the West, including *Acer griseum*, the paperbark maple, known for its beautiful exfoliating bark. Wilson called the arboretum, which he ran from 1927 until his death in 1930, “America’s Greatest Garden,”

and it has continued its plant explorations ever since.

Now, though, the arboretum is launching a new era of discovery, focused on collecting exceptional representatives of botanical variation from a rapidly changing world. A plan unveiled this spring aims to secure the collections’ scientific importance for the next century. The agenda is spurred by widespread destruction of native plant habitats due to global development, as well as threats to the diversity of plant populations caused by rapid changes in prevailing climatic conditions. It calls for 10 years of expeditions to global sites—principally in the Northern Hemisphere—to sample as much of the remaining diversity as possible among woody plants that will grow in Boston’s temperate, but warming, climate. This time, the collecting targets are driven principally by scientific criteria, including new understanding of plant phylogenies (family trees showing the evolutionary history of relationships among plants), conservation considerations, and attention to developing biological breadth among the arboretum’s existing living specimens.

Ephemeral Attractions

ON A GLORIOUS spring afternoon in April, when the sky was a continuous, deep blue, Arnold Arboretum director Ned Friedman set out on a quest on its grounds. He was seeking the perfect young female seed cones—red, brown, purple, or pink—of *Larix siberica*, the Siberian larch. He paused periodically, stopping to admire the beautiful exfoliating bark of *Acer griseum*, explaining that it is photosynthetic, like a leaf. This species is represented in the West by offspring of just two specimens brought back by the arboretum's great plant collector E.H. Wilson in 1901 and 1907. A recent expedition to sample the rare maple's genetic diversity from nine populations in China revealed a species under duress: only one population had produced seeds, and only a few.

At one rocky site at the base of the conifer collection, Friedman noted that horticulturists will attempt to grow *Ephedra*, the Mormon tea plant; it normally lives in deserts. Once thought to be a close relative of flowering plants, molecular work shows that it is instead most closely related to conifers—hence the siting within the arboretum collections. Along the way, Friedman greeted visitors; he chatted with a local bike-shop owner who had a suggestion relating to a new bike path that will take commuters off city streets and through the grounds instead.

Below a hill offering a long view up into the conifer collection, Friedman stopped again. At center stood a magnificent *Metasequoia glyptostroboides*, the dawn redwood—the first specimen to be grown outside of China, he said (the species was discovered in 1941, and was formally described by a Chinese botanist who had trained at the arboretum)—and one of the most beautiful conifers.

At last he reached the larches, and pulled down a low branch to show off the tiny female cones. “Imagine that photographed against the blue sky. More beautiful than a rose, and subtle.”

The cones are no more than a quarter-inch long, and an indescribable, deep crimson. “That’s the magnificence of this collection,” he said, “myriad ephemera. A collection of long-lived trees, but within that context, an infinite number of ephemeral events in the lives of organisms.”

Each week, Friedman photographs one of these “myriad ephemera” at the arboretum, and captions the image with scientific or cultural context in an e-mail to plant lovers around the world that is also posted to Facebook. It’s part of his public outreach, complementing the arboretum’s events and classes

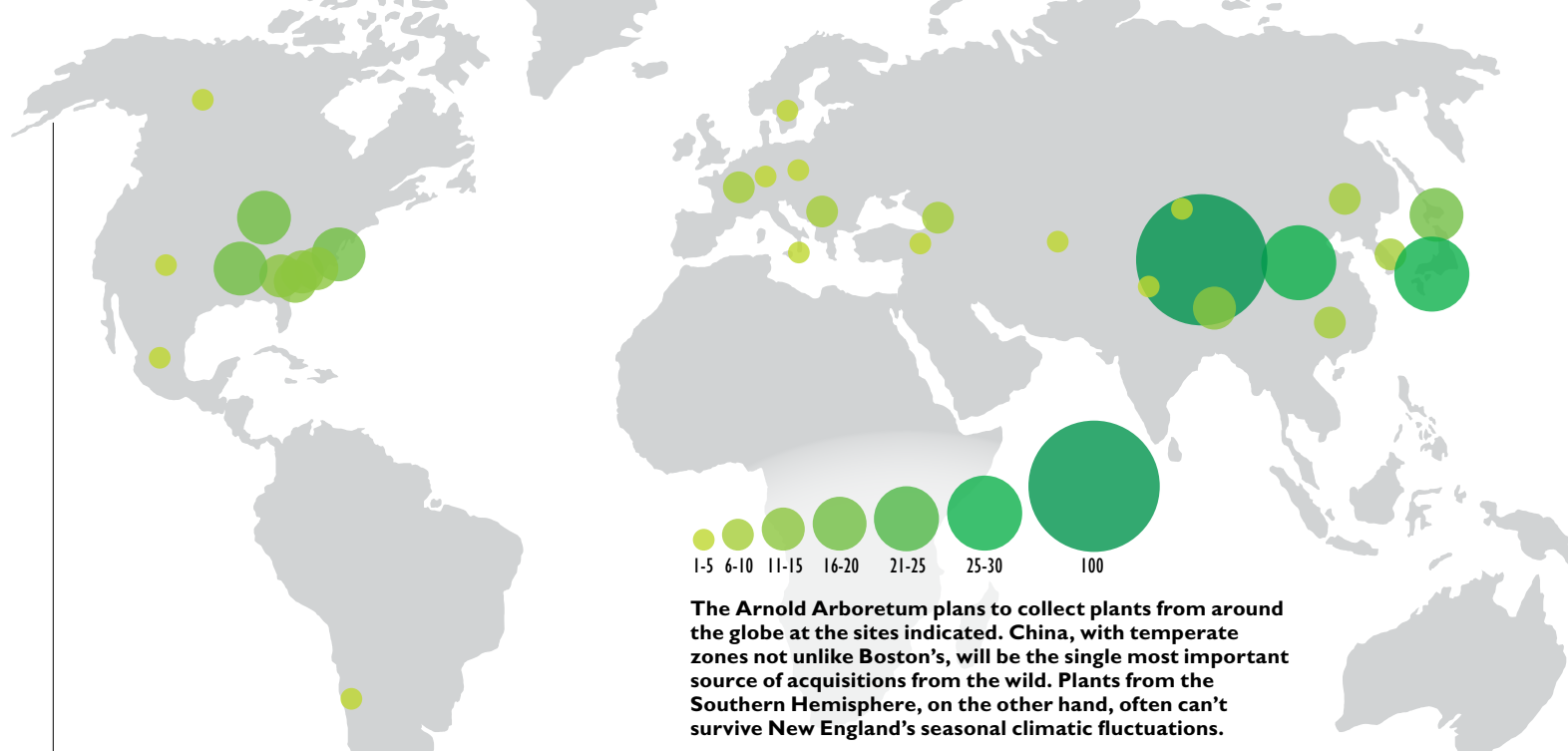


Found at the Arboretum (clockwise from top): a tiny, exquisite, pink female cone of a 116-year-old Siberian larch (*Larix siberica*); flowers erupting from a Norway maple bud (*Acer platanoides*); the curled-back bud scales of a Japanese maple (*Acer palmatum*) dating to 1898, its leaves and flowers (the red ovoids) yet to open. These and other stunning ephemera are found at Arboretum director Ned Friedman's [facebook.com/ArnoldArboretum](https://www.facebook.com/ArnoldArboretum). Harvard page. Bottom left: the first dawn redwood (*Metasequoia glyptostroboides*) grown outside China, in fall color

in a multi-pronged mission: serving the public, as well as meeting scientific priorities and conservation goals—an effort to connect people to plants and diversity. The arboretum, with its Frederick Law Olmsted-designed paths, roadways and vistas, incorporation into Boston's “emerald necklace” of parklands (Harvard donated the land to the City of Boston but retained a thousand-year lease), and free admission (unique among major arboreta), has had this important public role from the outset.

The broader, institutional message that he hopes to convey is about stewardship of the natural world. Why bring all these plants here? “It’s important because at a very basic level, some of them may be lost if we don’t. It’s important at another level because the arboretum has a critical role, in an urban landscape especially, to connect people with nature.” And at a scientific level, “the conception of how organisms work is being opened up in ways we couldn’t have dreamed possible. With new instrumentation and genomic knowledge, we are learning how plants sense and interact with the environment in astounding ways.” Such knowledge enriches the human condition, he says, and is the “centerpiece of Harvard’s mission, I think: to help us lead a good life *because we understand*. That’s what we’re doing here. As important as our work is for conservation, climate change, ecology, and evolutionary biology, our core mission engages the human condition, and helps ensure that we humans become better stewards of the planet that we share with millions of other species.”





Collecting from the Last Wild Places

"WE'RE FACING MASS EXTINCTION on the planet," said arboretum director William (Ned) Friedman, explaining the thinking behind the plan. "Climate change," continued the Arnold professor of organismic and evolutionary biology, "is fundamentally changing the way humans live, and will continue to do so. We have all manner of wonderful and rich questions about the evolution of life that remain unanswered. We have issues of conservation biology. And we have this world of genomes that is opening up right before our eyes, understanding biology by actually stringing out the sequence of DNA." Putting these issues together, Friedman and Michael Dosmann, the arboretum's curator of living collections, worked with an advisory board to develop a list of 395 "desiderata:" groups of plant acquisitions that Friedman said will make the living collection "extraordinarily relevant not just to the world, but also to Harvard University's academic mission for the next century and beyond."

"We don't aspire to have everything in the world," noted Dosmann—and the Boston climate circumscribes what can be grown outdoors—"but we *are* trying to be synoptic." As Peter Crane, dean of the Yale School of Forestry & Environmental Studies, put it, what makes the plan distinctive is its "strong science underpinning: the idea that they want to sample broadly" from families of related species, and "they want to get examples of unusual" groups of plants "that might otherwise be overlooked but that are

interesting from an evolutionary and developmental point of view."

For example, Friedman, an evolutionary biologist, studies the diversification of seed plants, and has made extensive use of the arboretum since his arrival at Harvard in 2011. Pollination biology in rhododendrons and conifers, bud formation and climate change in hickories and walnuts, and the role of mutation in new floral forms of redbuds have all drawn him and his lab team into the living collections. Most recently, he has been studying the arboretum's *Franklinia* specimens, which grow in the Explorer's Garden atop Bussey Hill, where the most sensitive plants are sited. He and graduate student Kristel Schoonderwoerd have discovered that the plant's extraordinary cultural history is matched by its most unusual reproductive biology: a seven-month winter dormancy that intervenes between the time a flower is pollinated in late summer and the moment the first fruits begin to develop the following season—akin to waiting two seasons for an apple to ripen. Friedman speculates that the Franklin tree's unusual pattern of hitting pause after pollination may have evolved as the plant's ancestors, which likely originated in the subtropics, migrated north and adapted to colder conditions.

Crane, who was formerly director of the Royal Botanic Gardens, Kew, recalled how one year a male ginkgo in their collection suddenly produced a few seeds. (Ginkgos, often called "living fossils," are the sole remaining representatives of a plant division called the Ginkgophyta.) "That is the kind of thing you see and could potentially investigate when you have a living collection," he said. "The opportunity to observe these plants closely over a long period of time is incredibly valuable. The Arboretum," he added, "is botanically among the very topmost important collections in the world," and has "a very distinguished history, particularly associated with the exploration of woody plants from East Asia, but also with a strong tradition of plant science at Harvard."

Consistent with E.H. Wilson's focus on China and environs, a region he called "the mother of gardens" because of the extraordinary biodiversity he had found there, by far the largest number of newly anticipated acquisitions is expected to come from

The plant collection plan by the numbers:

New species for the collections	177
marginally hardy	92
New genera for the collections	41
marginally hardy	31
Acquisition targets' regions of origin	
Eastern Asia	225
Eurasia	18
Europe	17
North America	133
South America	2

eastern Asia; the plants Wilson collected there adapted well to Boston's similar latitude. Now, of course, both regions are subject to climate change, and China is also an epicenter for development, habitat destruction, and impending species loss.

The collecting plan emphasizes acquiring wild species, including those already represented in the collections. As Larry Hufford, a professor of plant systematics and evolution at Washington State University and a member of the living collections advisory committee, explained, "Wild species are where the genetic diversity lies, and we really need to know what that diversity is. One of the attributes of complex landscapes like China or the American West is that there are unique pockets of genetic diversity," often small and geographically disparate—a pattern, he said, that has become clear only in the past couple of decades, thanks to the rise of DNA sequencing. The Torrey pine, *Pinus torreyana*, for example, grows only in two spots along the California coast near San Diego. Thought to be a relict of a population nearly extinguished during the last ice age, these trees now growing in southern California nevertheless retain the genes necessary to survive cold New England winters at the arboretum. "With habitat destruction ongoing all over the world, not just in the U.S. but in China, and with global climate change, which is likely to lead to extensive extinctions," Hufford said, "sampling that diversity now may be our last chance."

The arboretum's approach is exceptional, he continued, for using "knowledge of the evolutionary tree of the flowering plants and the conifers to think about how best to sample in order to represent diversity." Taking this new approach will make the collection even more valuable to researchers. Hufford himself worked on the first family tree of hydrangeas in the 1990s, using plants at the arboretum and at Kew to figure out the relationships among living species of that genus. Without those resources, he says, the project would have required years of work tracking down wild populations in China.

Another reason for acquiring more plants of wild origin has to do with provenance. The arboretum maintains extraordinarily detailed records about its 15,000 accessioned plants: where in the world they can be found, where and when they were originally collected, and their current health. There are even data about the 75,000 plants that have died or have been removed since the arboretum was founded in 1872, all georeferenced on map layers. This kind of documentation, much of it available online, makes the collection all the more valuable to researchers, and even to casual visitors. But because many of the species now in the living collections are either cultivars (selections of especially robust and at-

tractive plants that circulate in the nursery trade) or plants whose provenance is unknown, obtaining wild representatives, preferably from multiple places within their natural range, is a priority.

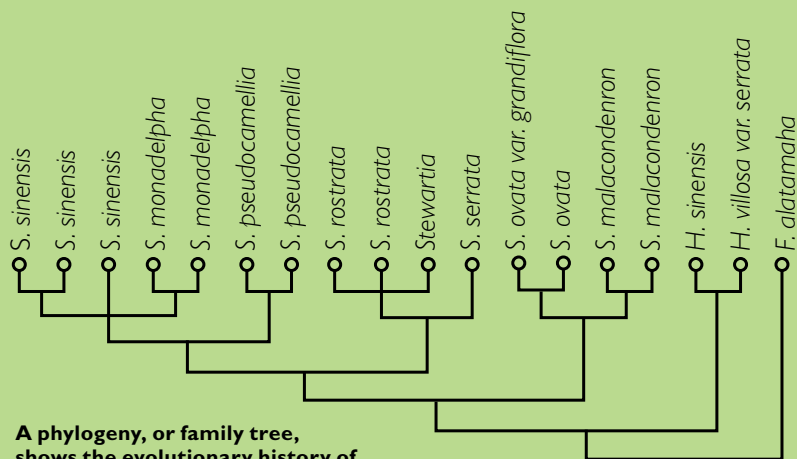
Latitude, Altitude, and Solitude

THE IMPORTANCE of sampling broadly from across a plant's natural range, in order to sample diversity *within* a species, was demonstrated early in the arboretum's history, when its first director, Charles Sargent, wanted to grow *Cedrus libani*, the biblical Cedar of Lebanon, a tree native to the Mediterranean. These trees may be seen all over Europe; they were carried back as mementos of the Crusades. But in Boston, none proved hardy enough to survive the winter. Sargent therefore acquired seed from trees growing high in the Taurus Mountains of Turkey, where the elevation ensured freezing temperatures. That population proved completely hardy at the arboretum, and even further north.

A significant number of the plants targeted for collection during

Relict wild populations of the Torrey pine (right) grow only in Southern California, at the southernmost reach of the last glaciation, but the plant retains genes that make it hardy at the arboretum. Curator of living collections Michael Dosmann with *Acer griseum*, the paperbark maple.





A phylogeny, or family tree, shows the evolutionary history of *Stewartia*, and its ancient relationship to *Franklinia*. This phylogeny (from Li et al., 2002) was constructed using molecular data from the arboretum's living collections, and was used to study the geographical distribution of New World and Old World groups of *Stewartia*. At right, the characteristic mottled bark of *Stewartia pseudocamellia*.



ARNOLD ARBORETUM

the future expeditions are considered marginally hardy in Boston today. But winters are becoming milder, and remote temperature monitoring throughout the grounds has produced more granular understanding of the arboretum's own microclimates, helping its horticulturists site plants with ever better precision. The push for biological breadth has led to ambitious attempts, for example, to grow flowering plants with evergreen leaves. In 2012, Michael Dosmann and a colleague from the Morris Arboretum of the University of Pennsylvania collected acorns and cuttings from the northernmost U.S. stand of live oaks (*Quercus virginiana*, the southern, evergreen species seen dripping with Spanish moss in movies), located on the Virginia coast, in the hope that they might get a plant to survive. "We'll have to get creative if we want to add some of this material to the collections," Dosmann admitted. "We are going to lose some of the live oaks, maybe all of them—but why not grow" them as part of the arboretum's bonsai collection, which horticulturists move into greenhouses during the cold season, so "a researcher could still grab the DNA from a leaf?" This is an innovative way to expand the scope of the collection into less hardy genera. With live oak now mostly in hand, the arboretum's wish list includes similarly ambitious quarry among other groups of plants, including an evergreen shrub, *Viburnum davidii*, a subtropical species native to China.

This is the kind of acquisition that, 40 years after he lived on the grounds, still excites Michael Donoghue, past director of the Harvard University Herbaria and now a professor at Yale. The leading expert on *Viburnum* evolution (his vanity plate reads "VBRNM"), he visits the arboretum regularly to conduct research and called the *V. davidii* "a classic example of what we want to try to do. It has large, very beautiful, thick, leathery leaves, with a very special venation pattern." Donoghue and his colleagues have been studying physiology in viburnums recently, measuring their photosyn-

thetic rate and how water flows out through the leaves. "But all we've got is information on these wimpy deciduous plants with thin little leaves," he said. "It would be really cool to expand this data set to include some of these evergreen species." *Viburnum davidii* has been grown successfully for the last two years at the New York Botanical Garden. Getting it to grow in Jamaica Plain would be a stretch, he admitted, but would fulfill multiple aims: "One, it brings us a beautiful plant. Everybody would love it. Two, it brings us a different lifestyle for this group, because it's evergreen, meaning it is functionally different. And three, it brings us phylogenetic diversity because this would add an ancient *Viburnum* lineage that we don't have represented now."

Other genetically important additions to the collection, he

Expeditions last year returned with 73 kinds of plants, of which only 24 were actually targeted. And he expects more of the same—including the discovery of species previously unknown to science.

said, would be *Viburnum microcarpum*, which grows in moist, cloud-forest habitats in Mexico, and the rare and isolated *Viburnum ellipticum*—the only one of the world's 165 viburnum species endemic to the northwestern United States. Both plants, relatively straightforward to acquire but hard to grow, would add significant biological diversity to the collection, adhering to the plan's conscientious approach of finding rare plants from different parts of the world, with different lifestyles. "That's why everything on this list is interesting," Donoghue said. "I love that."

"We can't know exactly what will be important 50 years from now," Dosmann noted. "Nobody could have predicted that plant phenology [the study of events such as flowering time or leaf-out in response to seasonal phenomena including temperature, length

of day, drought, and so on] would become useful in the study of climate change.” Phenological work at the arboretum from the 1970s to the present, for example, helped Donoghue and his co-workers recognize that two factors—the branching architecture of the plant, and the type of buds that a plant has—are the best predictors of how well *any* species will respond to fluctuations in climate. Now phenology is a principal focus for researchers like the arboretum’s Elizabeth Wolkovich, assistant professor of organismic and evolutionary biology, who has recruited a team of citizen scientists to record such events on the grounds. She wants to understand how differences in the way plants react to cues such as warming, chilling, and photoperiod affect their competition for resources and the formation of plant communities. Climate change will alter the composition of temperate forests, she says, and her research aims to predict the effects of such change. What happens if important mast-producing species such as oak and beech, for example, reach the limits of their ability to respond to changes in seasons, fail to set seed, and decline?

Nobody knew in 1910, when E. H. Wilson first collected a single *Tsuga chinensis*, the Chinese hemlock, that by the end of twentieth century its American cousin *Tsuga canadensis* would be decimated by an insect infestation (see “A Hemlock Farewell,” July-August 2014, page 8) to which the Chinese plant is resistant, as horticulturists at the Morris Arboretum observed in the 1980s. The single plant Wilson collected had been the parent of all Chinese hemlocks in the United States until 1979. A number of new collections have been made since the mid 1990s, but the arboretum wants more specimens from China in order to increase diversity of the species in the United States.

The institution’s goal is to be a repository of both plant material and knowledge, a resource at the ready for an uncertain future. To that end, the arboretum has also targeted for acquisition many woody plants—clones from the exact, individual specimens—that have already had their genomes sequenced. Such plants, which might be languishing in a research greenhouse somewhere or growing near a lab—and could easily perish from neglect—are scientifically valuable because they are the source of rich, painstakingly annotated genetic data. For the same reason, the arboretum will simultaneously encourage researchers the world over to use individual plants from its living collection for whole-genome sequencing. This project, supported by special funding, will create a kind of genetic library that can be used for reference purposes in the future. Having genetic sequences to complement seeds, cuttings, and living plants will provide another resource for scholars.

On the Trail of Undiscovered Species

WITH EFFORTS on this scale, Friedman knows that arboretum expeditions will bring home more species than the 395 that are on its list. Expeditions last year returned with 73 kinds of plants, of which only 24 were actually targeted—a powerful reminder of the diversity that exists in the wild just waiting to be studied. Friedman is thrilled by what the explorers were able to obtain: “There’s

a genus of plant that we never had here that Michael Dosmann collected in China with our wonderful Chinese colleagues and partners at the Chengdu Chinese Academy of Sciences Institute of Botany. We never would have dreamed that we could acquire this material from the wild.” And he expects more of the same—including the discovery of species previously unknown to science.

Many of these expeditions will be run in collaboration with other arboreta, under the auspices of the North America-China Plant Exploration Consortium (NACPEC, which includes more than a dozen institutions in the United States and China). That ensures a wide distribution of seeds and cuttings—and thus the long-term survival of the germplasm they collect. It also helps control expenses. (The Arnold Arboretum hopes to raise \$5 million for its decade-long expeditions effort.) But University of Pennsylvania Morris Arboretum executive director Paul Meyer explained that, relatively speaking, the expeditions themselves are not the principal challenge: “The big expense begins when you get home. In some ways,” he said, “it is a little like having a baby. The baby comes pretty quickly, but it is 20 years of expense in raising it.” Many supporters, he added, often like supporting

Acquiring *Viburnum davidii*, an evergreen representative of the genus, would add a completely new evolutionary lineage to the arboretum’s living collections.



the actual expedition, which may cost \$6,000 to \$10,000 per participant. But “running the greenhouse, staffing it, moving the plants out into the garden, and documenting and evaluating everything is where the real expense lies.”

Even so, the price of such knowledge seems, if anything, low compared to the return. The 350,000 species of flowering plants (the angiosperms), which include every fruit, vegetable, and grain, emerged in an explosion of evolution about 135 million years ago. They form the basis of the food chain on the planet, yet the question of why they have been so much more successful than the other seed plants that preceded them—of which there are under 2,000 extant species, mostly conifers and cycads—remains unanswered. If flowering plants are the bulwark of life, wouldn’t it be crucial to know what climatic conditions or inherently evolved traits fueled their diversification and success—and the limits of their adaptability? ▽

Jonathan Shaw '89 is managing editor of this magazine.

Nathaniel Bowditch

Brief life of a mathematician and businessman: 1773-1838

by TAMARA PLAKINS THORNTON

IN 1816, Harvard awarded Nathaniel Bowditch an honorary doctor of laws, a decade after its (unsuccessful) offer of the Hollis professorship of mathematics and natural philosophy. These were remarkable moves, considering that Bowditch was entirely self-taught. But Bowditch was no less remarkable. He was the country's most accomplished mathematician, the man Thomas Jefferson called "a meteor of the hemisphere." Though remembered now largely for his *New American Practical Navigator* (1802), the ubiquitous guide for nineteenth-century mariners, he took much greater pride in his annotated translation of that apotheosis of Enlightenment quantitative sciences, Pierre de Laplace's *Mécanique Céleste*.

So did his countrymen. For a young nation anxious to prove to Europe that it was not a cultural desert, this accomplishment would "be something to boast of," wrote Harvard professor Edward Everett in 1818. Earlier Everett had complained that Europeans were barely aware of American scientific publications, noting that the only copies of Bowditch's article on meteors to be found on the Continent were "the one my brother had brought in his trunk to Holland, and I in mine to Germany." Citizens were therefore elated when in 1818 the Royal Society of London "paid a tribute to American genius," as one Boston newspaper put it, designating Bowditch an honorary member of that august institution.

But why did he turn down the Harvard professorship? At the time, Bowditch already headed a marine insurance company in his native Salem, and unlike the Hollis chair, that post provided a generous salary and leisure to pursue his studies. He could hardly have doubted his ability to teach teenagers math and science (not until 1803 did the College add arithmetic to its admissions requirements), but he was haunted by his lack of a gentleman's education, with its immersion in Latin and Greek. He was, one contemporary observer commented, afraid of "singing small on classic ground."

Harvard tried again in 1810, seeking him as an Overseer. Once assured the "indispensable duties of the office" were minimal, he accepted. He assumed a far more significant role in 1826, when he was named to the Corporation, appointed this time for business, not mathematical, expertise. The College was in a financial mess and Bowditch, who had taken charge of a Boston trust and investment company, had a reputation for making it operate like a miniature solar system, a "great machine" running "with the regularity and harmony of clock-work." Had Harvard's powers-that-be known what he would do, they might have thought twice about their decision. "Order, method, punctuality, and exactness were, in his esteem, cardinal virtues; the want of which, in men of official station, he regarded not so much a fault as a crime," Josiah Quincy reflected in his *History of Harvard University*, and when Bowditch detected

such wrongdoing, he "would descend on the object of his animadversion with the quickness and scorching severity of lightning."

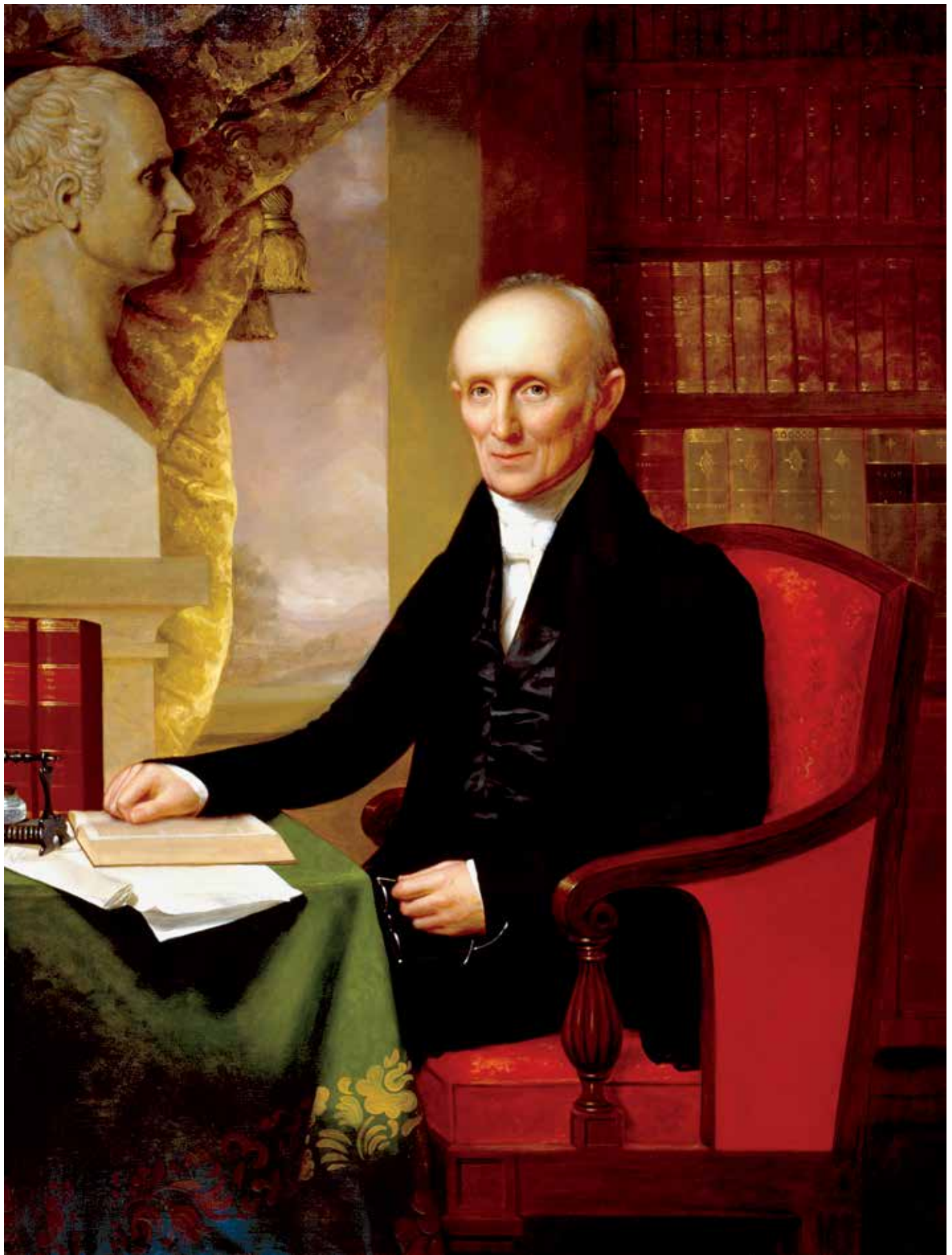
Once Bowditch caught on to the loose, even negligent, way Harvard was run, the storm was not long in coming. College monies were mixed in with personal accounts, the books hadn't been kept in years, and official papers consisted of "detached scraps" and shorthand "hieroglyphics." President John T. Kirkland distributed scholarships without the Corporation's knowledge or consent, awarded honorary diplomas against its explicit orders, regularly skipped chapel duty to dine with patrician friends in Boston—and then sought reimbursement for the bridge tolls. Bowditch set about cleaning house, social niceties be damned! Out went the College treasurer, the steward, and finally Kirkland himself.

Proper Boston was appalled, not so much by what Bowditch had revealed, or even by the results of his actions, but by the roughshod way in which he had conducted affairs. F.R.S. though he might be, Dr. Bowditch lacked the polished manners of the classically educated gentleman. It was all a "shameful business," confided Charles Francis Adams in his diary. "But some men have no delicacy." On campus, wrote Ralph Waldo Emerson, Bowditch "is sincere assafoetida"—a foul-smelling gum.

Eventually the Brahmins realized that Bowditch's forthright ways had their uses. The patrician corporations he administered—financial, educational, and cultural alike—ran efficiently and profitably, and his willingness to offend powerful people had political utility. In maintaining the rule-bound Bowditch as a standard-bearer of their class, Brahmins promoted the notion that their institutions operated impartially, treating wealthy capitalists and poor folk with the same no-exceptions, clockwork regularity. When Bowditch received more European honors in the 1830s for his newly published Laplace volumes, elite Bostonians eagerly embraced this American Newton as a cultural ornament to the Athens of America.

Bowditch made no permanent mark as a scientist, but his methodizing, systematizing, rationalizing ways shaped American institutional life and the *modus operandi* of American capitalism. Harvard is a case in point. He left his Laplace manuscript to the College, and somehow it ended up at the Boston Public Library, sidelined like Laplacean science itself. But a numbering system for Harvard's libraries? Printed annual reports of the President? That carefully managed endowment? Look no further than the Laplacean businessman on the Corporation. ▢

Tamara Plakins Thornton '78, professor of history at the State University of New York, Buffalo, is the author of Nathaniel Bowditch and the Power of Numbers (University of North Carolina Press), published this April.



In this 1835 portrait by Charles Osgood, Bowditch sits with the first two volumes of his *Mécanique Céleste* translation, as a bust of Laplace looks on. Image © 2006 Peabody Essex Museum/Photograph by Mark Sexton
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The Outsiders' Insider

How Franklin Leonard's Black List is reshaping Hollywood

by Sophia Nguyen

SMC

BACKSTAGE at the Montalban Theater in Los Angeles, Franklin Leonard '00 takes his catered sandwich to the green room. It's his party, in a manner of speaking, and the table's been set with beer and wine and someone else's preferred brand of bourbon, and has TV actors of varying fame and uniformly good looks seated around it. They're all on a dinner break before a live reading of "College Republicans," a screenplay written by Wes Jones that follows a young Lee Atwater and Karl Rove on their 1973 campaign through the South. Leonard—in a blazer and Converse sneakers, his dreadlocks tied back in an elegant knot—retreats to a cluster of chairs to the side, where his team members balance their plates on their knees. The situation is reminiscent of the divide in high-school theater, between the thespians and the techies. "Joining the kids' table?" his events manager quips, and he nods.

A self-described micromanager, Leonard goes over a few last details: collecting the cast members' contact information; choosing the house music as the audience files in ("Southern funk. Allman Brothers," he decides, firmly); drafting introductory remarks. He especially worries that the auditorium full of Hollywood liberals might boo his guests: Alex Smith, the current sitting (and first woman) national chair of the College Republican National Committee, and two of her friends; they'd taken him up

on an invitation he had extended on Twitter. "Honestly," he says, "kudos to her for coming into the lion's den."

Despite apologizing earlier for "running around neurotically," the supremely unruffled-seeming Leonard sits down long enough for a brief interview. "What are your plans?" he asks. "Do you want to be a screenwriter?" Hesitation prompts him to prod, "Oh, come on, you must have designs on *something*."

Leonard is used to writers wanting *something*. If he can, he will help them get it. Actors get more glamor and directors more credit, but he is passionate about spotlighting screenwriters; he seems to believe in pure story, conceived on the page—not through aesthetic or cinematic observation—as the prime mover of filmmaking. He calls himself the writing community's hype man: "I'm cool with being the Puff Daddy to their Biggie." And he became that by creating a Black List that people dream of being on.

The Black List 1.0: "A Way to Quantify Heat"

LEONARD LIKES TO SAY he founded the Black List by accident. In December 2005, he was a junior executive at a production company, frustrated that he couldn't seem to find good scripts. He went through his calendar, pulling the contacts for every executive he had met with that year, coming up with a list of go. From an anon-

ymous address, he polled them about their favorite unproduced screenplays from that year, and, after tallying the results, sent the numbered list back to them as a PDF under the title “The Black List.” Then he went on vacation to Mexico.

“I went to the resort business center to check my e-mail” for his work account, Leonard recalls. “And there were 75 e-mails where the list had been forwarded back to me. People were saying, ‘This list is amazing! Where did it come from?’” He kept quiet about his involvement, but a few months later, an agent calling to promote a client’s script came up with a bald-faced lie that made Leonard realize that he’d started something big: “Listen, don’t tell anyone, but I have it on good authority that this is going to be number one on next year’s Black List.”

“A) I had decided I wasn’t going to do it again because I was afraid of getting fired, and B) even if I was, it’s a survey, so six months out, there’s no legitimate authority on what’s going to be on the list—certainly not number one,” Leonard says. “He was using the possibility of the thing as a tool to sell his client.”

That incident convinced him to continue compiling his survey. People began to pay attention in 2008, when two scripts that had been on the 2005 roster, *Lars and the Real Girl* and *Juno*, were nominated by the Academy of Motion Picture Arts and Sciences for best original screenplay. Black List titles have been made into movies as various as *The Social Network*, *Whiplash*, *Selma*, *The Hangover*, and *World War Z*. Four of the last six Oscars for best picture, and 10 of the past 14 for adapted or original screenplays, went to films highlighted on the Black List. As the announcement of the Black List became an anticipated annual event, Leonard expanded his survey’s scope. He now polls some 550 to 650 people, with a response rate of roughly 50 percent. “The idea of a PDF has become adorable,” he adds—scripts on the list are now announced, one by one, on Twitter or through YouTube videos.

Beyond trade publications like *Variety* and *The Hollywood Reporter*, media outlets like *The Los Angeles Times* and *Slate* took notice, eager to peer into this window on the industry’s conversations: zombies were in, then out again; biopics have consistently done well, as have making-of stories about beloved classics like the Muppets or *Jaws*. At one point, even *Mother Jones* joined in the fun of speculating about what titles might one day come to theaters.

Leonard takes care to emphasize that these are not the *best* unproduced screenplays but the *most liked*. The distinction emphasizes that the list is not about quality per se—or some external, aesthetic standard—but about the gut: these are the stories that a critical mass found moving, thrilling, or fun. It also suggests the list’s true utility: taking the temperature of Hollywood’s excitement. The first participants may have praised the list less for its new titles than for those they recognized. Aphorisms abound about the industry’s conservatism: executives are said to spend their days saying “No, no, no, and no,” then going to lunch; saying yes will get them fired. Nancy Oliver told *Entertainment Weekly* in 2008 that her romantic dramedy about a man and a sex doll, *Lars and the Real Girl*, “had been making the rounds for a few years, but it was still an invisible property. The Black List changed all that. It gave permission for other people to like it.” Leonard’s survey had an observer effect. Measuring—and thus, cementing—consensus, it became a Hollywood fixture.

The awards-season success of Black List films sits next to a more sobering statistic: of the 1,067 screenplays highlighted in the past 11 years, 322 lived to become movies. Even so, some of their authors

have parlayed the attention into jobs on massive studio franchises. Brian Duffield, of the Black List class of 2010, earned his first writing credit on the young-adult blockbuster *Insurgent*; Marvel Studios hired Chris McCoy (named to the Black List three times) for *Guardians of the Galaxy*, and Stephany Folsom (whose script on Stanley Kubrick made the 2013 list) for their next *Thor* sequel. Josh Zetumer, a former lawyer’s assistant, found himself writing on-set dialogue for a James Bond movie and, later, the script for a *Robocop* reboot. No one on the List is pulled from total obscurity; scripts still need to reach the right desks—and enough of them. But the List can bottle the otherwise transient buzz around a writer; it makes the glow last a little longer. As Zetumer told *The Boston Globe* in 2012, “The Black List is a way to quantify heat.” Making the case for an unproven talent or a script written on speculation was much harder before it existed. The Black List gave people something to point to.

The Outsiders’ Insider

LEONARD HAS ALWAYS thought of himself as an outsider—or at least, he concedes, someone who’s gotten access to, but not comfortable with, the inside. This is partly the product of a roving, army-brat childhood: born in Hawaii, he lived in El Paso, Fort Leavenworth, Heidelberg, and Frankfurt before his family settled in Columbus, Georgia. Leonard’s mother was a schoolteacher and his father a colonel and surgeon who, upon retiring to civilian life, specialized in neonatology. They were strict, he says, but “it was also a very loving home. It’s not at all that sort of cliché military upbringing.”

As a child, he had a stutter, which he outgrew, and a love of soccer, which he did not. (On weekends, he plays in a Santa Monica pickup league called Untitled Football Project, as a defender; in spare moments he reflexively checks on his fantasy league, on his phone.) Adding to his shyness: “I was a giant nerd. I was Steve Urkel [from TV’s *Family Matters*], basically. People called me that all the time in high school, and I was like, ‘That’s so mean, that’s not true,’ but in retrospect? Not inaccurate.” He joined the Boy Scouts and captained the math team; his senior year, the state senate commended him for, among other achievements, perfect SAT scores.

At Harvard, Leonard got involved with the Institute of Politics—not the Lampoon, the usual hangout of the Hollywood-bound. Still, in hindsight, it’s possible to see the roots of his interest in the behind-the-curtains systems that support creativity. He was publisher of *The Harvard Advocate* in 1999, and wrote his social-studies thesis on liberal democracy and slam poetry. During summers interning in New York City, he explains, venues like the Nuyorican Poets Cafe were an attractive hangout for a kid under 21.

His path to Los Angeles took a few detours through politics and media: back then, law school seemed basically inevitable; Leonard imagined that he’d then pursue a career at the Southern Poverty Law Center. After graduating from college, he worked on the congressional campaign of John Cranley, J.D. ’99, M.T.S. ’00, his mentor and onetime teaching fellow for a history class on the Warren Court. (Leonard says, of that time, “It was great. I mean, it was weird.” They were being taped for the MTV reality show *True Life*; the episode aired after the election, which they lost.) He then auditioned to be a video deejay, but, failing that, went to Trinidad for seven months, where he observed the aftermath of the country’s contested parliamentary election and wrote for its oldest daily paper. Returning to the States, he took a consulting job at McKinsey & Company. In the months following the Sep-

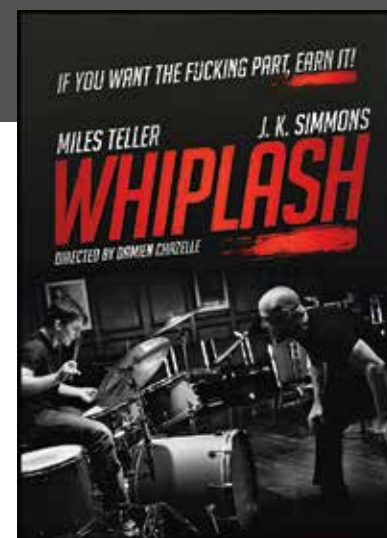
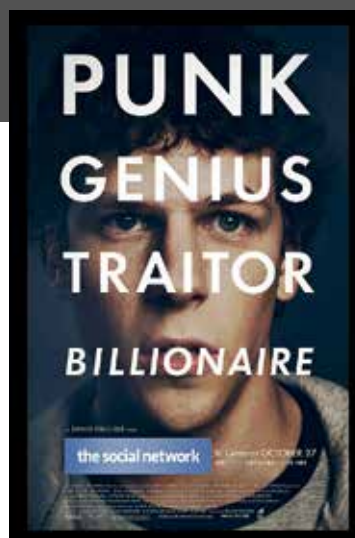
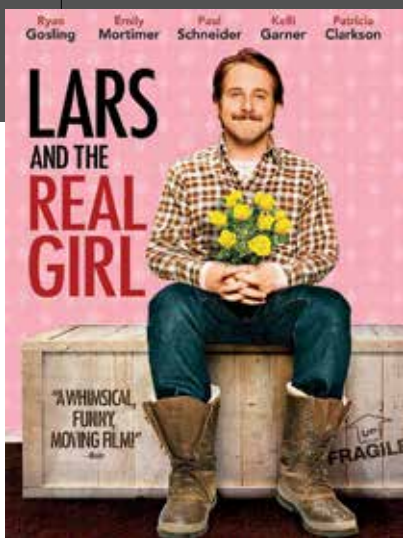
tember 11 terrorist attacks, though, the firm laid off his entire recruitment class with five months' severance. Leonard spent much of his time watching rented DVDs before heading west, to Los Angeles, where a friend tipped him off to an open assistantship at the Creative Arts Agency. He was hired the next day.

Leonard was working at Leonardo DiCaprio's company, Appian Way, when he sent out the first Black List in 2005. After he sent out his second list, the *Los Angeles Times* published a story identifying him as its creator. Though he considers himself naturally introverted and a homebody at heart, he began being invited to speak at colleges, panels, and festivals as an industry sage.

Here's the thing. I didn't do anything with those scripts. I didn't write them, I didn't direct them, I didn't produce them, I didn't finance them, I didn't act in them, I didn't run cable or post lights on set. I didn't even give them from one person to another, who would go and do those things. All I did was change the way people looked at them. But again—and I really cannot stress this enough—I did not do a damn thing to make them.

In that moment, Leonard named the strange truth of his career: that until a few years ago, he was best known for devising an instrument to measure others' opinions.

"I didn't do anything with those scripts....All I did was change the way people looked at them. But again—and I really cannot stress this enough—I did not do a damn thing to make them."



"It's still sort of surreal. I think that the thing that sort of gets me asked back or gets me invited to speak is that I'm constitutionally unable to bullshit." Proving that, he continues: "And I think there's some amount of, like—from a casting perspective—I'm a black guy with dreadlocks, and that person with the Harvard background talking about the economics of the industry. It's fundamentally interesting." Though he has grown used to public speaking over the years, he still vomited before giving a speech at *Fast Company's* 2010 Most Creative People in Business conference: "Ray Kurzweil was right before me," he explains. "Just to give you a sense of how out of place I was."

In a video from a more recent speech in New York, on an assigned theme of "How to Change the World," Leonard looks faintly green. (He has been described as soft-spoken, which is not quite right; his talk is sometimes boisterous and always fast, a rate accelerated by nerves.) He piles on self-deprecating asides, some planned, others clearly ad-libbed, almost under his breath. Issues more pressing than showbiz weigh on his mind—protests in Baltimore, an earthquake in Nepal—and they foreground his remarks about the Black List's unlikely successes. This goes some way toward explaining his tone when he tells the audience:

Modernizing the Dream Machine

IF THE BLACK LIST's origin tale starts with serendipity—its founder stumbling across a once-invisible need—its next chapter has a more deliberate arc. In 2009, Leonard met software engineer Dino Sijamic through a mutual friend, and they struck up a conversation about the difficulty of finding worthy material for film development. "Coming from a very different world, where essentially everything that I did was about automating, making things faster or more efficient—when he told me about these problems, that was interesting," Sijamic says. "Because they can definitely be solved. It's just a matter of time, and going about it in the right way."

Their solution was a website they dubbed "a real-time Black List," an online hub where members—agents, managers, producers, financiers, directors, and actors—could find promising projects. Writers pay a monthly fee for the Black List to host their scripts, then choose from some 1,000 tags to index it; these describe genre ("alien invasion," "prehistoric fantasy," "heist comedy"), theme ("self-discovery," "guilt/regret"), and other elements ("combat with weapons," "\$1-10mm [budget]," "twist/surprise ending," and "female protagonist [diversity]"). Writers can then boost their visibility by paying for evaluations from the site's stable of anonymous professional readers, who give each script a

numerical rating and brief comments about its strengths, weaknesses, and commercial viability. Highly rated scripts are featured in the website's "top lists," and highlighted in e-mail newsletters.

Sijamic's tech-world optimism was a natural complement for Leonard's McKinsey-honed mentality: both were confident that they could modernize the Hollywood dream machine. The Black List embodies a philosophy: that through savvy entrepreneurship, capitalism can encourage not just efficiency, but meritocracy, in show business. That the system could be tinkered with to yield higher-quality entertainment. That, if engineered properly, the marketplace could identify the best material, to the benefit of all—financiers, creatives, and audiences. It's a theory of industrial art-making that's powerfully attractive in a business as resource-intensive, risk-averse, and data-hungry as Hollywood.

The website also included a component that catered to this abiding interest in taste by numbers. Leonard had followed the Netflix Prize—a contest to come up with better movie-recommendation software—with interest, and had been impressed

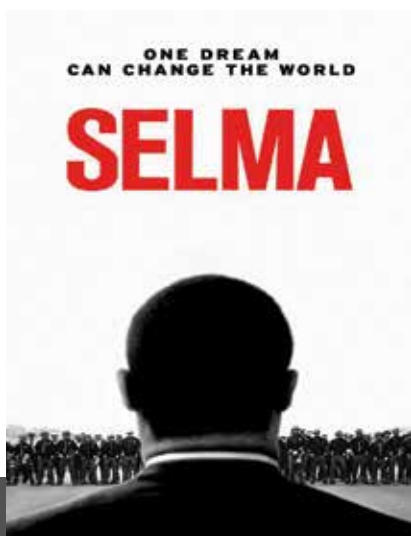
everyone, with the probable exceptions of Leonard and Sijamic, is an aspiring writer. The small, close-knit team meets at cafés, in each other's kitchens, or at Soho House, the private club in West Hollywood where Leonard is a member. Free to be a remote CEO, he says he seizes the opportunity to travel while he's still unmarried and doesn't have kids. In 2015, he was on the road 120 days, attending film festivals, entrepreneurship conferences, and other events from Oaxaca to Toronto to Nairobi; even when he's home in Los Angeles, he spends much of his time stuck in transit, and while stuck in traffic, conducts phone conferences and listens to podcasts—and, more recently, the cast recording of *Hamilton* (a musical that happens to be deeply concerned with the power of writing).

Initially, some accused the Black List of piling on in the already-crowded arena of reading services and competitions seeking to make money off luckless hopefuls. From this view, offering the possibility of exposure is akin to selling lottery tickets. The skepticism has faded, though, in part due to Leonard's readiness to answer pseudonymous critics on online message boards and Reddit question-and-answer sessions, often late at night and for hours at a time.

The site has been popular enough that it recently raised fees to cope with rising demand, promising to give out more coupons for free hosting and evaluation to compensate. More significantly, the founders also added a new mechanism to their marketplace. Scripts receiving high scores from paid readers will earn a few months of free hosting and some free evaluations. The best material could go on a hot streak, entering an endless loop of free reads, racking up enough high ratings to be highlighted. This may keep talented writers

from being scared off by the price hike; it also keeps the strongest submissions from languishing simply because their creators couldn't afford to invest in more attention.

So far, a few scripts have attained sufficient escape velocity to break through to the vaunted annual list: Justin Kremer's "McCarthy," about the Red Scare—"When it first came through the site with really good reviews I was *convinced* someone was playing a practical joke on me. It was just way too on the nose," says Leonard—and Jason Mark Hellerman's "Shovel Buddies," about a group of twenty-somethings fulfilling the last wishes of a friend with cancer. Both were unknowns before joining the site: Kremer was living in Staten Island with his parents; Hellerman had a desk job routing calls for a producer. The writers crowned number one on the 2014 and 2015 lists were also discovered by their reps through the site, Leonard adds. But his favorite success story—"the craziest, and probably the one I'm most proud of"—doesn't share that straightforward trajectory; it doesn't involve the annual list at all. In 2012, Ruckus and Lane Skye, a husband-and-wife



The scripts for *Lars and the Real Girl* (2007) and *Juno* (2007) were at the top of the first Black List, in 2005. The List has since included celebrated veterans like Aaron Sorkin (writer of *The Social Network*) and relative unknowns like Damien Chazelle '07 (of *Whiplash*).

by Amazon's system ever since it suggested the books of Polish journalist Ryszard Kapuscinski, who subsequently became "my favorite writer of all time." After Sijamic built their site's first algorithm, Leonard enlisted the help of his college roommate, Sean Owen '00, who'd worked at Google and gone on to found his own company, Myrrix, "so we have a recommendations algorithm that is far more powerful than it has any right to be, for a company as small as we are," Leonard admits. "If I'm being honest, it's still the most underutilized part of the site." He suspects that Black List members resist the idea that their preferences can be predicted. "Everyone wants to believe their taste makes them special—like, who could possibly divine what I will like?" (He doesn't state the irony: that the annual list succeeded, at least in part, because it reassured gatekeepers that their tastes were shared by their peers.)

The co-founders launched the Black List site in October 2012. Now, they employ several full-time staff members who assist in its various projects and day-to-day operations. With no fixed hours or offices, the company allows time and flexibility for other pursuits—

team based in Georgia, uploaded a thriller that eventually caught the eye of a film executive in Abu Dhabi. The Arabic-language movie that resulted, *Zinzana*, was reportedly the first genre flick ever made in the United Arab Emirates.

According to Scott Myers, who runs the popular screenwriting blog “Go Into the Story” (which started in 2008, and became the Official Screenwriting Blog of the Black List in 2011), the Black List is the latest shift in a longer historical change in Hollywood: “It used to be a closed-loop system,” he says, one that expanded periodically to recruit writing talent—mostly journalists and novelists; the market for scripts written on speculation boomed in the 1980s and 1990s, but even that was built on personal connections or film-school networks.

These days, says Leonard, people take one of two routes: “You enter the Nicholl Fellowship, which is the Academy’s screenwriting competition, and the biggest screenwriting competition on earth, and if you place in the top 30, somebody will probably call you. Or you move to L.A. and you get a job at Starbucks and you network until somebody pays attention to you.” But, he continues, warming to his subject, “If you’re a married man with a mortgage in Raleigh, North Carolina, you’re a terrible father if you pick up your family and move them to L.A. because you want to figure out how to be a screenwriter. If you’re a single mom on the South Side of Chicago, that’s not an option for you.” For these hypothetical talents, he maintains, his site’s hosting and evaluation fees are a bargain.

The site tends to pitch itself less as real-time analog to the annual list, and more as a place for new writers to be discovered, and for established writers to promote themselves. (Members of various English-language Writers Guilds can list their work for free, and get other services at a discount.)

All can submit their work to various contests: usually, the site’s algorithm determines the strongest scripts for a shortlist, and then those finalists submit personal statements and résumés.

So far, the prize opportunities have included deals with studios like Warner Brothers and the Walt Disney Company, fellowships with the National Football League, Google, and the Hasty Pudding, and spots in screenwriting labs.

Kristina Zacharias, working full-time as an administrator at New York University, considered herself a “hobby writer” until recently, when she won a fellowship to attend the Sundance Film Festival under the wing of a prominent producer, and a spot in a workshop at the women-centered Athena Film Festival. Since then, she has been working on a film treatment with a producer she met at Sundance, and taking calls from potential managers. “When I decided to take it seriously, the Black List was the way that I actually could get a little bit of traction,” Zacharias says. And, she adds, Leonard has sent introductory letters on her behalf to agencies and festival labs.

“I have no idea how to thank him—he keeps saying, ‘This is what we do,’” she reports over the phone, sounding elated. “And I’m like, ‘No! No one knows that *this* is what you do.’ This is like you’re in this select, members-only club, and you have access to all these great resources, and I mean *that*, to me, is like the real value. Once you’ve sort of proven that you’re serious, the Black List will do anything that it can to help.”

Cinderella stories like hers are tantalizingly rare. But the Black List may have a subtler, more diffuse effect on people working beyond Hollywood, through the happy hours it organizes in some dozen cities, hosted by local volunteers. Shelley Gustavson has found collaborators at the Chicago events, but says the aim is to build camaraderie among screenwriters: “We want to get them away from their laptops, and help them feel supported.” While the Chicago happy hours have been drawing some 150 attendees, the New Orleans happy hour (held at a supposedly haunted converted mansion) draws a crowd a third that size on a good night, according to actor Hunter Burke. “We’re trying to be part of the community that’s trying to bring back a local film movement,” says Burke, who hopes to make his next movie on the cheap, in his city, with Louisiana-based financiers. He thinks the Black List’s name will attract a critical mass. “Really, it was a no-brainer to put them at the forefront of the community-building exercise we should start doing here.”

The range of Black List activities has also grown to reach an audience far broader than its core constituency. These include the “Black List Live!,” staged readings of still-unproduced scripts from the annual list. Leonard has also, in effect, become a part-time radio host and producer, putting out a weekly podcast of interviews and full-cast table reads of scripts from the site. “The podcast definitely represents a shift, I’d say, from the Black List brand being a sort of industry-facing thing, or sort of B2B, to us being consumer-facing, so what I’d say is that we’re sort of a B2B2C.” He pauses. “And it’s strange for me, I’m not going to lie. I’m sort of fundamentally uncomfortable with the idea of being in the public eye, period. That transition has been an awkward one for me.”

Within the next year, the company’s ventures are set to expand even further. The site just rolled out a social feature that enables writers to associate personal profiles with their scripts, so industry mem-



Leonard speaking at the most recent Sundance Film Festival, where he served on the jury

“If you’re a married man with a mortgage in Raleigh, you’re a terrible father if you pick up your family and move them to L.A. because you want to figure out how to be a screenwriter.”

bers can search for people, as well as for material; Leonard hopes this will particularly help women and people of color to promote themselves as diverse talent. He also plans to raise money for a film fund, so the business can start financing projects. To his mind, “We find the best material first, and have access to most of it. It would be cool if we could put money behind the stuff that we identify as being good.”

Asked about their long-term ambitions for the Black List, the co-founders often point to AngelList, a website that matches startups, investors, and job-seekers. But when they’re feeling more expansive, they say they’d like to be the “Google of scripts.” That suggests an ambition to make the Black List not merely one resource among many, but the default. Theirs would be the most comprehensive, specific, and reflexively trusted tool for summoning—instantaneously—whatever screenplay any asker could think to ask for.

“It’s Supposed To Be a Movie”

WES JONES NEVER considered himself especially political. But like many Americans circa 2008, he got caught up in election excitement—the punditry, polls, and prognostications—such that when it ended in November, he says, “There was a little void.” A documentary about Lee Atwater then airing on PBS offered first a kind of methadone, and then inspiration for his next screenplay. “College Republicans,” imagining the road trip taken by the young Atwater and fellow Young Republican Karl Rove, got Jones an agent and manager. His reps pushed the script onto the desks of various studios and production companies throughout January 2010, and in March flew him out to Los Angeles for meetings. Jones was escorted through what he dubs “the bottle-of-water tour,” a courtship ritual befitting a desert city: the debutant talent leaves each office with a bottle of water in hand, and the hope of work in his heart. By midsummer, he’d snagged several assignments: a deal with Warner Brothers, a book-adaptation project.

For Jones—Indiana-raised, New Jersey-based, and working low-level jobs on the fringes of indie filmmaking for more than a decade—“College Republicans” opened the door to the wider industry; the Black List, in naming his script number one in December 2010, gave his arrival some real fanfare. “I’m saying the same things. I have the same ideas. I am the same guy I have been for years, trying to do this stuff—but all of a sudden, people *care*,” he says, chuckling and chagrined. “Because, you know, I have back-up. I’m on the Black List. It creates a status—and a reputation, in fact—where none was before.” At the time, he didn’t believe it when a Sony executive told him, “You know, you’re going to get work off this for years.” But when his agents put him up for a staff job on the new cable drama *Billions*, “What did they send, in 2015? ‘College Republicans.’”

Even as that screenplay brought its creator steady success as a writer-for-hire, the project itself stalled. Actors were attached, then detached; money was hard to come by. Jones still

remembers one time when the pieces seemed, finally, to fall in place—the production schedule was set; they were hiring crew and renting offices—and how the filmmakers waited at the bank for a wire transfer that never came: “That’s indie financing for you,” he says. “It happens more often than you realize.” Then he adds: “No, it sucked. It sucked. It was a heartbreaker.” To Jones, “The script is just a map. It’s not an art form in and of itself. It’s supposed to be a movie.”

Though the Black List had long pushed for a live reading of his script, Jones and his collaborators had said no until recently, worried that it might complicate an already dicey development process. This time around, with the director and lead actors seeming fully committed, it felt safer; the event might even lend the production some momentum, keeping it on the industry’s radar. It would be many months before Jones’s scenes would play out on-screen, but the performance made his script, briefly, “a live, breathing thing.” Introducing it, Jones told the audience that he had never heard his words spoken aloud before the afternoon’s rehearsal.

“College Republicans” played well in the room. Even in 2016, when Karl Rove has somewhat faded from public consciousness, the recent primaries have lent new weight to the narrative of a political party remaking its identity, and young men with out-sized dreams are never out of style. This was what the industry, circa 2010, dreamed of making: a well-balanced script that, for all its scheming and swearing and PG-13 sexual content, seems strangely wholesome in its eagerness to please, its efforts to give a little something to every kind of viewer. The power struggle is intercut with slapstick comedy, romance, and a heist. With its focus on character over ideology, it does indeed work, as Leonard maintains, as a nonpartisan coming-of-age. Everyone laughed at the right moments, and, after his deft introduction of Alex Smith as the CRNC’s first woman leader, they applauded; no one booed.

At the after-party in the theater’s mezzanine lobby, Leonard quietly went about getting everyone settled, offering congratulations or drinks. Finally, lacking anything else to do but enjoy the celebration, he confessed, “I hate this part. I’m *really* bad at mingling. This is the part that makes me, like, want to lock myself in a closet somewhere.” He meant it, but no sooner had he said it than the trio of Republicans appeared at his elbow, gesturing toward the famously blue-eyed actress standing within earshot. “We’re *obsessed* with her,” they said, and without missing a beat, he made the introductions and rotated through their smartphones to take their photos. When the moment no longer needed him, he returned to replaying the night mentally. It went well, he thought, but as ever, “There were a couple of things that could have gone better.” Rather than name them, he shrugged. “I’m already thinking about the next one, for better or worse.” ▢

Sophia Nguyen is associate editor of this magazine.



CLOCKWISE FROM TOP LEFT: BRENDAN HOFFMAN/GETTY IMAGES; NAMY H. HUI/ASSOCIATED PRESS; CEM OZDELAN/ANADOLU AGENCY/GETTY IMAGES; BO RADER/WICHTA EAGLE/NTS VIA GETTY IMAGES; RAINMAKER PHOTO MEDIA PUNCH/ASSOCIATED PRESS; JOE RAEDLE/GETTY IMAGES; KEVORK DJANSEZIAN/GETTY IMAGES; ALEX WONG/GETTY IMAGES; AND ALAN REDMOND/PHOTOFEST

Does Money Matter?

How super PACs actually shape U.S. presidential politics

by Idrees Kahloon

THESE DAYS, super PACs (political action committees) don't seem so super anymore. Donald Trump wrapped up the Republican nomination without significant support from one, while his money-flush rivals dropped off one after another. Jeb Bush fizzled out in February when the \$100 million spent by his Right to Rise super PAC failed to generate liftoff. Marco Rubio threw in the towel a month later, when the \$62 million donated to his support groups couldn't spare him the humiliation of losing in his home state. And no matter how much money oil barons lav-

ished on him, Ted Cruz, too, had to go gentle into that good night.

So does money really matter?

The fear that U.S. elections and institutions would all come crashing down in a flood of money was ignited after the infamous *Citizens United* ruling in 2010. In this panicked view, the Supreme Court had not only inaugurated a new Gilded Age, but also given it the veneer of constitutionality—leaving the nation's imminent plutocracy impervious to future legislative correction. Though *Citizens United* actually focused on a small rule banning nonprofits from airing “electioneering communications” within 60 days of an election, its logic was expanded in subsequent cases into this basic principle: As long as political spending is “uncoordinated” with candidates and their official campaigns, it cannot be regulated under the First Amendment, even if the donor is a corporation or a labor union. That opened the door to unlimited contributions to, and spending by, these parallel campaigns—in theory giving them financial leverage that could overshadow candidates’ official campaigns (contributions to which fall under strict federal limits).

Opponents quickly sloganized the ruling as “Money is speech and corporations are people”—though, as with all slogans, theirs contained only a fraction of the truth. Its philosophical thrust was correct: the court had upended the rationale for the modern regime of campaign-finance regulation (in place since the 1970s) that had allowed regulation of both “corruption or the appearance of corrup-

tion.” Instead, the majority opinion limited future regulatory intervention to narrower *quid pro quo* corruption (think money-stuffed manila envelopes). But even seemingly cut-and-dried corruption cases might be suspect under the new order: disgraced Virginia governor Bob McDonnell is currently challenging before the Supreme Court his conviction for accepting \$177,000 worth of luxury items and gifts from a businessman on the grounds that it was all just speech, not bribery. The outcome is uncertain as of this writing.

Though the issues are often muddled together, journalists, open-government activists, and ordinary citizens highlight two criticisms of the post-*Citizens United* era.

The first is *adequate representation*: the possibility that the super-wealthy, now free to cut multimillion-dollar checks, will become disproportionately important to politicians, who will in turn influence bureaucrats, lobby fellow lawmakers, and cajole government agencies to benefit their patrons. In the phrasing of Furman professor of law Lawrence Lessig, a prominent crusader for campaign-finance reform, serious candidates not in possession of private gold mines will all be forced to win the “invisible primary” of the ultra-wealthy donor class, at the expense of ordinary citizens whose votes are now worth much less—or, for all practical purposes, worthless.

The second is the matter of *adequate selection*. It is the fear that money, spent on advertisements, voter files, canvassing, consulting, statistics, or anything else, could actually change the minds of voters, and thus swing whole elections. And it’s hard to see that as anything less than a grave threat to democratic order.

To the first charge—that the ultra-wealthy have tightened their dominance over political donating—America must plead guilty. During the 2016 presidential race, through May 31, \$462 million had already flowed to super PACs: 36.9 percent of total donations. Compare that with the 2012 contest between Barack Obama and Mitt Romney, where the role of super PACs was also bemoaned, though their funding supplied a now paltry-seeming 22 percent of total donations. Earlier in the 2016 cycle, an astounding two out of every three dollars was going to an outside group rather than directly to candidates. (The decreasing percentage of super PAC contributions since then reflects both the rise of Bernie Sanders’s online small-donation operation, and the winnowing of the Republican field.)

Much of that money comes from the richest of the rich. An early press release from Jeb Bush’s super PAC actually touted the fact that 95 percent of its donors had donated less than \$25,000—not exactly within the price range of the middle class. In fact, nearly half of all super PAC money comes from just 50 donors, according to a *Washington Post* analysis. The much-vilified Koch brothers have set up a deeply financed network of political groups that almost parallels the Republican Party in funding and political prestige (even if it’s not paying dividends just yet: “You’d think we could have more influence,” Charles Koch bemoaned in the *Financial Times* earlier in the year).

But are big donors getting *any* bang for all those bucks? Given that politicians seldom admit outright that a controversial vote has been swayed by the influence of a heavyweight donor—at least while they are still in office—it can be hard for journalists to say for sure. But academics have had a bit more success. By using decades of survey data, Princeton professor Martin Gilens has

demonstrated that American policymakers essentially respond *only* to the preferences of the affluent—those at the 90th percentile of the income distribution and above. The same goes for well-funded business lobbies vis-à-vis mass-based interest groups. Disturbing correlations, to be sure—but correlations nonetheless.

How do the voters fare amid this deluge of money? The question may be new, but the answer will be the same as another that has been intriguing political scientists for decades: Do political campaigns actually work? If they do, then the more money the merrier for aspiring elected officials. If they don’t, then maybe the qua-

To the charge that the ultra-wealthy dominate political donating, America must plead guilty.

drennial, multibillion-dollar spectacles that voters behold in the presidential race are only elaborate exercises in money-burning. Today, in fact, the availability of open data and statistical analysis enable us to begin to find answers.

IN THE 1960s, when party alignment was much stronger and face-to-face social networks were much more important to voter opinion (people were still bowling together then), the reigning theory was one of “minimal effects.” Campaigns were held to matter very little in determining election outcomes. But in the decades since, political scientists have come around, with some studies showing convincing associations between advertising and voting behavior, though the consensus is far from fully formed.

For my senior thesis in applied mathematics, I considered this question by analyzing the effects of television advertising on public opinion in the 2016 Iowa caucuses and New Hampshire primary. Because these contests were heavily polled (almost 100 for Iowa and 50 in New Hampshire), public opinion was registered almost instantaneously, allowing for comparison with data on the political television ads shown in each state (recently released to the public by the Television Ad Archive).

For Republican voters choosing among multiple candidates, ads seemed to work—a bit. Even when controlling for the number of rallies held and mentions on national and local television, swings in advertising volume were strongly correlated with swings in public opinion.

Between two competing Republicans, it would take an average of 232 more airings of positive ads over the span of a week to induce a single-point swing in voter preference. The returns to negative advertisements were weaker, though their effect was still statistically significant: 440 more negative ads directed at a candidate over the span of a week would trigger a one-point decline in the polls. That’s not to say negative ads necessarily have less effect on voters’ minds. Studies of voter psychology actually show that such ads are a bit better at piquing interest than positive advertisements touting a candidate’s character, biography, or accomplishments. But negative ads may just cause voters to shift to any number of *competing* candidates, diluting their benefits, while positive ads tend to increase the vote share of the *target* candidate.

No other variable registered a strong, statistically significant effect, including so-called earned media—the free publicity obtained from frequent news coverage—that self-flagellating journalists have taken to blaming for Donald Trump’s inexorable rise.



very well: 88 percent of official, campaign-sponsored advertisements in Iowa and New Hampshire were positive, compared with just 35 percent of super PAC ads. The mudslinging so frequently derided by pundits may be getting a second wind from this new campaign structure. This is not a small phenomenon: in Iowa and New Hampshire, a majority of commercials aired in the Republican race were super PAC-sponsored.

For down-ticket races, it stands to reason that political advertising effects are even *stronger* than for the presidential race. Even the most hardened politicians do not generally discuss the local state legislative race at the dinner table. Advertising

Holding more candidate events was actually associated with *drops* in vote share, but this appears to be because candidates struggling to gain traction preferred aggressive, on-the-ground efforts to spending their limited funds on expensive advertising.

Among Democrats, where the race quickly shrank to Bernie Sanders and Hillary Clinton, I did not find a significant return on advertising. A few factors may help explain this. Advertising seems to yield benefits only when there are large imbalances among candidates. Both Sanders and Clinton swamped the airwaves with ads at very similar rates, as Sanders turned his impressive fundraising into a slight advantage over the Clinton machine. In addition, Republicans had the option of choosing among 11 or so serious candidates, some of whom were political neophytes or first-termers, making public appraisal less sure and thus more susceptible to the effects of advertising.

Perhaps the best way to conceptualize political advertisements, then, is as an arms race. One candidate's dominance in the ad game, if unanswered, will soon lead to electoral advantage, but another candidate's advertisements will tend to cancel out that gain.

If campaigns matter, then campaign money does, too. True, turning advertising into actual electoral advantage is an expensive endeavor: the cost of the 232 positive ads needed to deliver a single-point increase is more than \$100,000 in relatively small markets like Iowa and New Hampshire, and more than that for the super PACs (which aren't covered by the federal law requiring television stations to charge official campaigns the lowest possible rates). But these large sums are well within the means of the modern super PAC, the most prominent of which can expect to raise several million dollars in a week.

But it's not just *more* advertising that super PACs buy—it's also a different *kind* of advertisement. Since Congress passed a "Stand By Your Ad" provision in 2002, candidates have been required to give the now-familiar "I endorse this message" at the end of all commercials sponsored directly by their campaigns—and when these advertisements go very negative, there's a real risk of backlash that does more harm than good. But commercials sponsored by independent organizations, and aired without a candidate's endorsement, sidestep this problem. More significantly, voters also tend to believe them more, according to psychological studies.

Campaign managers appear to understand this phenomenon

and local media coverage likely constitute a greater fraction of the information diet for the less publicized races, probably making their importance greater—especially now that presidential-style campaigning has been exported to these races as well. Today, many Senate races and more than a few House races attract the support of single-candidate super PACs. And while we may hope that a future president is unlikely to move national policy on behalf of a benefactor, a senator or representative facing reelection may have fewer qualms.

Some analysts maintain that the "conventional wisdom" about the dominance of super PACs has been upended—that their effects, in competitive races, cancel each other. But such critics may be using the wrong counterfactual: it's not that candidates with the super PAC have lost, it's how much worse they would have fared without such aid. Of course, among a field of a dozen or so competitors, almost all of whom have major super PAC backing,

Few would agree that democracy should only reflect the views of the affluent.

only one can emerge a winner. (To quote Syndrome, the villain of the animated superhero film *The Incredibles*, "When everyone's super...no one will be!")

The evidence suggests that those who speak apocalyptically about super PACs as a new regime of legalized *bribery* are a bit overwrought. Instead, these entities are powerful new instruments for *influence*—over both voters and elected officials—that are beyond the means of the average citizen. Economic elites did not suddenly acquire political influence in 2010—but they may have further tightened their grip on it. One does not need to be an ardent majoritarian to find that worrying.

Maybe democracy shouldn't reflect the views of the median voter, but few would agree that it should only reflect the views of the affluent. But unless and until the Supreme Court reverses itself, the current regime of lax campaign finance and ever-more-important super PACs will continue. The chance of that depends largely on the outcome of the 2016 presidential race. And the outcome of the 2016 race will likely depend on those very same super PACs. ▽

Idrees Kahloon '16 concentrated in applied mathematics.

CLOCKWISE FROM TOP LEFT: DAVID NEWHEUSER/GETTY IMAGES; JUSTIN SULLIVAN/GETTY IMAGES; PATRICK SEMANSKY/ASSOCIATED PRESS; LAURA BUCKMAN/BLOOMBERG VIA GETTY IMAGES; AND JEWEL SAMAD/AP/GETTY IMAGES

Montage

Art, books, diverse creations



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Stepwise

A ballet career, earned through college and cattle-calls

by MAGGIE SHIPSTEAD

“IT’S SO BRUTAL,” Elizabeth Claire Walker ’11 says of ballet, the art form she loves. The dancer isn’t just talking about the daily classes and rehearsals, the aches and pains, and the wrenching pursuit of impossible physical ideals. She’s talking about the daunting, ever-replenishing ranks of young talent competing for limited jobs. “You have to be really lucky,” she says, “and you have to never stop working, and never give up, and not get hurt, and also develop your personality as

a dancer. There’s always someone to replace you, so you have to have no ego but also be very confident. It’s a tricky thing.”

Still, during a recent rehearsal, Walker radiated contentment. In a warm, sunny studio, she and the rest of Los Angeles Ballet’s corps de ballet were learning the finale to George Balanchine’s *Stravinsky Violin Concerto*. Its tempo was quick, the counts long and complex, but Walker remained unruffled. In ballets like this one, dependent on an impeccable corps, she dances for herself and her own commitment to her art, but also for the sake of the whole: for the other dancers who move with her in precise, shifting formations across the stage, to realize the choreographer’s vision and dazzle the audience. During breaks, other dancers sought her out for help,



SAMUEL AKINS

From left (and from the Los Angeles Ballet’s 2015-2016 season): Elizabeth Claire Walker in “Arabian Dance” from *The Nutcracker*, and poised backstage during *Don Quixote*

counting and gesturing through the phrases they’d just learned, double-checking the movements. Like almost all ballet dancers, she is slight but very strong, with spectacular posture. Her technique is crisp, her presence alert yet serene. She smiles as she

dances. “I feel like I’ve had it almost taken away so many times that I’m just astounded with the fact that I’m still able to keep going,” she says.

Walker’s path has been uncertain, and unusual for a professional dancer. A native of New York City, she studied at American Ballet Theatre’s elite Jacqueline Kennedy Onassis School as a teenager. Her senior year of high school—even after she’d been accepted to Harvard—was spent attending massive cattle-call auditions for professional companies. Just when she was

about to give up, she spotted a notice for Los Angeles Ballet, a new company with impressively pedigreed artistic directors. The audition happened on a rainy day, she remembers; her mother encouraged her to go. “She said I’d regret it if I didn’t. I was sewing pointe shoes in the car.” A week later, she got the call.

Walker deferred college and headed west. Both city and company proved to be good fits, but an experimental summer-school stint in Cambridge in 2007 made Walker fall in love with Harvard, too. She

decided to put her career on hold. While earning her degree in the history of art and architecture, she squeezed in classes at José Mateo Ballet Theatre in Harvard Square and kept up a heavy involvement in the Harvard Ballet Company, even though she was plagued by a ligament she’d torn in her foot back in her JKO School days. Though she always felt the pull of ballet, she says, “I wasn’t sure if it was a possibility for me. I wasn’t sure if my body was going to be able to handle it.”

In her junior spring, mostly healed, she took a leave to dance a two-month contract with Los Angeles Ballet. After graduation she endured yet another cattle-call audition before being taken back into the company full time. During her second season, in class on Valentine’s Day 2012, disaster struck. “I was doing *soutenu*, the simplest step you could do,” she says, of a turn performed by extending one leg and bringing the other to meet it, “and somehow my foot slipped, and all my weight was on it in a twisted way over the pointe shoe, and I felt it go.” She had torn the same ligament as before, this time severely enough to require surgery. For four months, she couldn’t put any weight on the foot. Her recovery was grueling: “I had to teach myself to dance again, basically,” she says. “That was a really, really low point for me.”

Even for the luckiest dancers, careers are relatively fleeting; the fragility of the body, pushed to extremes, is part of ballet’s allure and its heartbreak. As the curtain rose for the following year’s *Nutcracker*, Walker found herself tearing up, overwhelmed. “I wasn’t sure it was going to happen,” she says.

Now in her sixth season with Los Angeles Ballet, Walker has danced a wide range of roles; her favorites include the Dark Angel in Balanchine’s *Serenade*, Desdemona in Limón’s *The Moor’s Pavane*, and Arabian in *The Nutcracker*. She has also avoided major injury since her surgery, although, at 28, she has begun considering what she will do after she retires. She used to think she would seek out an entirely distinct second career, but now she is increasingly intrigued by the prospect of contributing to the survival of American ballet. “The longer I’m in this world, the more I realize what a special thing ballet is and how much it’s struggling,” she says. “The business model is not ideal. It’s just so hard for these incredible companies to keep going. I’d love

OPEN BOOK

Guilt-Free Childbirth

Amy Tuteur ’80, an obstetrician-turned-writer and mother of four, is the self-proclaimed “Enemy Number One of the Natural Parenting Industry,” a spirited combatant in the childbirth wars. In *Push Back: Guilt in the Age of Natural Parenting* (Dey St./HarperCollins, \$26.99), she enters the fray with zest. From the introduction:

No woman should ever feel guilty about the choices she makes regarding childbirth, breastfeeding, or the manner in which she cares for her baby. Surprised? Unfortunately we live in a society where these fundamental aspects of a woman’s life are now an arena where judgment, second-guessing, and guilt reign supreme. It is no longer enough to give birth to a healthy baby and to care for that baby, providing food, warmth, and tenderness. Now all of these acts must be done, in many circles, in ways decreed “correct” by the natural parenting industry.

Where did this industry that dictates the behaviors of millions of women come from?

Surprisingly, the currently popular philosophies of natural childbirth, lactivism, and attachment parenting are based on nothing more than the personal beliefs of a few individuals, most of them men. To my mind, though, the most damaging aspect of this paradigm is that the judgment and guilt surrounding childbirth and child care are heaped upon women most often by other women....



ISTOCK IMAGES

Initially I was simply bewildered by the ways in which my patients tormented themselves. After delivering a beautiful healthy baby to a joyous healthy mother, I would visit her the next day in the hospital and find her tearful over her “failure.” Instead of enjoying the miracle of her new child, she would be berating herself that she had “given in” and gotten an epidural for pain relief. Or perhaps she would have concluded that her C-section reflected the fact that her body was “broken.” There was a myriad of if-onlys. If only she hadn’t agreed to the postterm induction; if only she had trusted birth more. Sometimes I wondered if the process of birth was more important than the baby itself.

Walker in the *Pas de Trois* (a dance for three) from *Swan Lake*, and as *Queen of the Dryads* in *Don Quixote*

to somehow make an impact.”

For now, she dances. “I’m going to keep doing it until I can’t anymore or until it doesn’t make sense to anymore,” she says. Back in the studio, *Stravinsky Violin Concerto* took shape with amazing quickness. Walker, in black tights and diaphanous green skirt, darted and turned and leapt. After an hour, the dancers had mastered Balanchine’s clockwork choreography. The company would not revisit the piece for six months, until final rehearsals for the performance, but when the time came, Walker would remember the steps.

Is she glad she took time away from ballet? Walker’s characteristic gratitude is tempered by what-ifs. “Some days I’m

frustrated, because you never know if you’d be farther along in your career if this or that hadn’t happened,” she says. But she wouldn’t give up what she learned, or the people she met, while at Harvard. “With time lost from that and time lost from the injury, I think I appreciate everything I get to do a lot more,” she

continues. “I feel like I’ve earned the things that I do.”

Maggie Shipstead ’05 is the author of Seating Arrangements and a second novel, Astonish Me, about ballet.

Brain Food

Comics to chew on

by SAMANTHA MALDONADO

TAPING a package closed, shaving an armpit, coaxing bread out of a toaster with a fork, sitting on a toilet while staring at a phone—chin resting in hand, pants puddled around ankles. In her comic drawing “Faces of Death,” Andrea Tsurumi ’07 imagines skeletons performing each of these banal activities. No

words explain the message: Is this a parallel universe? A setting for a cautionary tale? Are death’s most ordinary

moments just x-rays of life’s? Equal parts grave and goofy, the image captures Tsurumi’s specialty: life observed and shown as absurd.

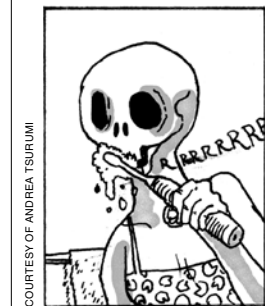
In her work—which includes one-off drawings, visual book reviews, picture books, and illustrations—Tsurumi pushes situations to their extremes, asks “What if?” and then adds fanciful elements. “If I give my brain enough stuff to chew on,” she says, “something random will pop out.” For example: “I love watching people choose desserts. It’s a very naked and vulnerable indulgent moment, where someone who’s very serious will be, like, ‘Oh wait, they have coffee cake!’”

“There’s no way to get ahead of Andrea’s brain,” says Tsurumi’s literary agent, Stephen Barr, who is guiding the development of her forthcoming children’s book, *Accident*. In it, an armadillo knocks over a jar of strategically placed red liquid and rushes around encountering other animals who are experiencing their own accidents. Barr describes *Accident* as a “high-calorie picture book,” dense with jokes and detail; Tsurumi says *Ac-*



Tsurumi at work in her studio, and details from “Faces of Death”

cident is “Richard Scarry-crazy”—and the animals with attitudes, colorful liveliness, and earnest sense of wonder in her images do seem descended from his drawings of Busytown.



In Tsurumi's work, details explode from the page. Her cheeky maximalism packs a visual punch, whether she's using hard lines or a hazier, impressionist approach. En-



countering it can be as overwhelming, trippy, and thrilling as visiting a new place—allowing the reader to see things in a more fun and zany light. Her sensibility, delighting in what might seem mundane, can resonate with people of all ages. It's almost as if Tsurumi is sharing secrets of the world's possibilities, and it's exciting to behold—even if how she discovers these secrets and develops them on paper can be difficult to pin down.

Tsurumi's first book, *Why Would You Do That?* exhibits her dark humor and tendency toward surrealism. Published in May, this playful assortment of her comics and drawings also documents her **Detail from "Challenging the Gods: Rubens Becoming Rubens," Tsurumi's contribution (adapted from curator Christopher D.M. Atkins's essays) to *Prometheus Eternal***

various obsessions: dogs, books, history, and food. The cover depicts two ice cream cones fighting: one, cone-fists balled up at the end of stocky cone-arms, has just punched the other's scoop-head off. Within the book, fluffy bichons become trichons become tetrachons, like Cerberuses with an extra profusion of heads; a food photographer shoots breaking news for a newspaper; a Civil War battle is imagined with desserts in "Cake vs. Pie." The latter is gleeful and gruesome: cakes on roller skates aim arrows at multi-legged pies, a fortune cookie spars with a muffin, and a jelly roll bashes a cinnamon roll. Later, an ice-cream orderly empties a bed pan while a biscotti doctor stands by, splattered in guts. Tsurumi commits to every joke, and her attention to detail in realizing these conceits keeps them from becoming precious.

For her contribution to *Prometheus Eternal*, an art anthology showcasing a recent Philadelphia Art Museum exhibition, Tsurumi

Off the Shelf

Recent books with Harvard connections

A Sea of Glass, by Drew Harvell (University of California, \$29.95). The Blaschkas, of glass-flowers fame, first modeled marine invertebrates (see "A Glass Menagerie," harvardmag.com/glasssea-16, on Harvard's specimens). A professor at Cornell, who curates the marine invertebrate collection there, uses the glass creatures as her point

of departure to examine the living equivalents today, and to probe the changing oceanic ecosystem and the threats that may make the actual fauna more fragile than the Blaschkas' enduring works.

Louisa: The Extraordinary Life of Mrs. Adams, by Louisa Thomas '04 (Penguin, \$30). The marriage of London-born Louisa Catherine Johnson and John Quincy Adams, as New England as they came, united Old World and New at a pivotal time. Their fruitful lives together, not always easy, unfolded on farms and in the White House, from Russia and Prussia to Washington. And during its course, she emerged as a distinctive, towering figure in her own right, here vividly portrayed in full for the first time.

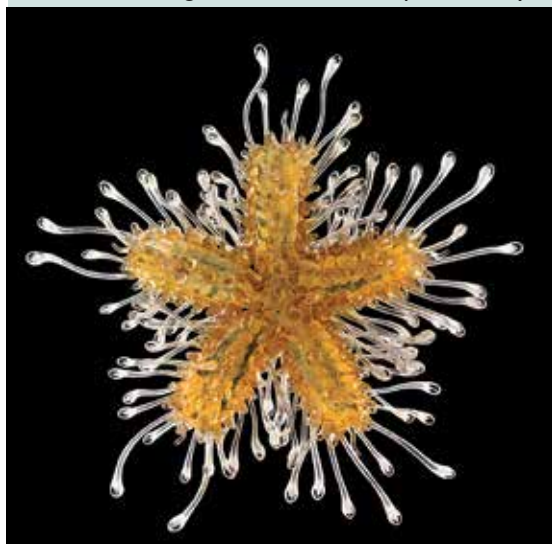
Hogs Wild, by Ian Frazier '73 (Farrar, Straus and Giroux, \$26). A collection of the author's essays and journalism. The title piece, grounded as ever in fact—domesticated hogs become feral "readily," and reproduce "quickly and

abundantly," meaning that "The wild hog is an infestation machine"—is a good point of departure. The omniscient Frazier was profiled in "Seriously Funny" (September-October 2008, page 40).

Legal Plunder, by Daniel Lord Smail, Baird professor of history (Harvard, \$39.95). A close scholarly examination of household goods as they were accumulated in late medieval Marseille and Lucca reveals the rise of the modern consumer economy, with valuables enmeshed in webs of exchange, credit, and state-run debt collection: the "plunder" of the title.

Magic and Loss: The Internet as Art, by Virginia Heffernan, Ph.D. '02 (Simon & Schuster, \$26). An observer of digital culture for *The New York Times* (profiled in "Savant of Screens," September-October 2007, page 19) here sets out to address "the trippy, slanted, infinite dreamland" of the Web, assembling "a complete aesthetics—and poetics—of the Internet" from its basic building blocks of design, text, photos, video, and music.

Putin Country: A Journey to the Real Russia, by Anne Garrels '72 (Farrar, Straus and Giroux, \$26). Life in the country today, outside Moscow, emerges in the little de-



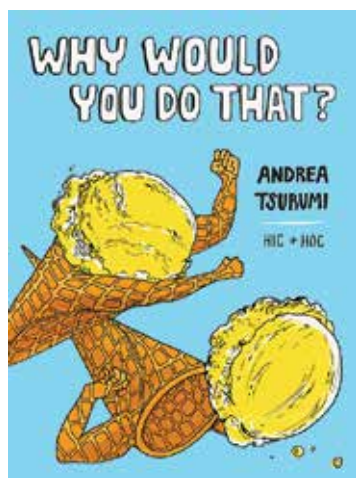
GUIDO MOCAFFO/COURTESY OF THE NATURAL HISTORY MUSEUM OF IRELAND

A star is born (in glass): a juvenile common sea star, *Asterias rubens*.

Tsurumi's first book documents her many enthusiasms.

rumi adapted the curator's catalog essays into a historical comic. Narrating why and how Rubens painted *Prometheus Bound*, she depicted the old master as a child, doing pushups and nursing schoolgirl-like crushes on Michelangelo and Titian. She takes humor just as seriously as she does her subjects, which makes her shy away from treating *anything* too reverently. Humor can help readers access unexpected ideas and ways of thinking, she says: "It's a great horse that can bring you into a common experience, which is very uniting and empathetic."

She recently moved from New York City to Philadelphia, where she's enjoying



the relative calm. New York provided endless material for inspiration, as shown in her people-watcher diary comic *Eavesdropper*, which records happenings in the city. But the relentless pace grew over-stimulating. It turned her off as an observer, she says, and she grew numb to her environment—

dangerous to an artist whose job requires paying close attention to what's going on around her. Tsurumi's dedication to her work prevents her from moving through her days on autopilot. It keeps her mind fed, imagination active, and art exuberant. "Art is a way to fight the shorthand," she says. "To quote Vonnegut—oh god, I'm quoting Vonnegut—art is not a living, it's a way to live."

HM Explore More

For more online-only articles on the arts and creativity, see:

Michael Pollan's Crooked Writing Path

At Radcliffe, the author talks on nature, food, and altered states of consciousness. harvardmag.com/pollan-16



2016 Norton Lectures

Toni Morrison speaks on race and literature. harvardmag.com/toni-16



tails: an "ideal prisoner," up for early release, pays the judge's \$10,000 price—but when the head of the prison is left unhappy, not having received his cut, he blocks the deal. Solid on-the-ground reporting.

Unequal Gains: American Growth and Inequality since 1700, by Peter H. Lindert and Jeffrey G. Williamson, Bell professor of economics emeritus (Princeton, \$35). A scholarly economic history details alternating periods of egalitarian and of unequal incomes in the United States. The authors don't shy from the implications: "The second great rise of American income inequality after the 1970s was probably avoidable," had the country not fallen short in education, financial regulation, and the taxation of heritable wealth.

What Works: Gender Equality by Design, by Iris Bohnet, professor of public policy (Harvard, \$26.95). A behavioral economist suggests overcoming unconscious biases indirectly, by altering institutional arrangements in the workplace—from reviewing résumés in new ways to looking at how hallways are decorated and what role models are available.

Blue in a Red State, by Justin Krebs '00 (New Press, \$24.95). A MoveOn.org cam-

paigner probes what it feels like to reside as a member of a political minority (in this case, liberals in conservative redoubts, but one can imagine the opposite) in an increasingly polarized, and geographically divided, country. And speaking of fish out of water, Joel K. Goldstein, J.D. '81, a law professor, has explored America's least-scrutinized, but potentially most important, leaders in **The White House Vice Presidency** (University Press of Kansas, \$34.95); the subtitle refers to "the path to significance" during the past four decades. Scrutinize the entire ticket this fall, voters!

Metropolis Nonformal, by Christian Werthmann, former director, master in landscape architecture program, Graduate School of Design, and Jessica Bridger, M.L.A. '09 (Applied Research and Design, \$34.95). Multiple perspectives on the pervasive phenomenon of self-assembled urban growth (via slums, favelas, and shantytowns), with wonderful photographs. Separately, in **Landscape as Urbanism** (Princeton, \$45), Charles Waldheim, Irving professor of landscape architecture, advances a theoretical underpinning for



A typical example of informal urbanization, in Medellín, Colombia

breaching the barriers that have separated urbanism and landscape; the aim is a more coherent view of what cities can be.

Illiberal Reformers, by Thomas C. Leonard '82 (Princeton, \$35). A reinterpretation of the Progressive Era economic reformers, whose enthusiasm for taming laissez-faire capitalism did not extend to everyone, as they also embraced Darwinism, racial science, and eugenic theory to exclude immigrants, people of color, women, and "mental defectives." A timely complement to "Harvard's Eugenics Era," featured in this magazine's March-April issue.

With Seamus Heaney in Elysium

A new translation from the Aeneid

by RICHARD F. THOMAS

IN THE FALL of 2002, in those war-darkened days when Seamus Heaney was still among us at Harvard (then as Emerson Poet in Residence), he generously agreed to come to a session of my freshman seminar on poetic translation. For two hours he joined in discussions of the Horace translations by some of the 12 entranced 18-year olds, some now published poets and writers. He also talked about his own Horatian translation, of *Odes* 1.34, written the year before in response to the terror attacks of September 11, 2001. The poem concerns life's unpredictability, in the metaphor of Jupiter's

lightning striking in a clear sky. At the time of the seminar, Heaney was still living with the poem, first published as "Jupiter and the Thunder" in *The Irish Times* of November 17 of that year. He would continue to do so until it was published as "Anything Can Happen, after Horace *Odes* 1.34" in *District and Circle* (2006), with Horace made new: "Anything can happen, the tallest towers | Be overturned."

Since that visit, fully five verse translations of the entire *Aeneid*, the Roman epic of Horace's contemporary Virgil, have appeared: by Stanley Lombardo (2004), Robert Fagles (2006), Frederick Ahl (2007),

Sarah Ruden (2008, the first by a woman), and Barry Powell (2016). In 2011, A.T. Reyes published C.S. Lewis's *Lost Aeneid* (book 1 and most of book 2, in rhymed alexandrines). Each has its appeal, each its adherents. Let a thousand *Aeneids* bloom, I say, for to read the poem in the Englished versions of some of our age's best poets is to be doubly enriched. There has been no comparable period in the 600 years since the first English (Middle Scots, actually) translation by Gavin Douglas, written in 1523, published in 1553. Others followed until Dryden's great *Aeneis* of 1697 silenced translators throughout the eighteenth century and into the nineteenth. (Wordsworth started a version and got through most of book 3, before abandoning it.)

Into this abundant stream steps Seamus Heaney with the posthumous *Aeneid Book VI*, marked "final" in his hand a month before he died. In fact, Heaney had been in this stream for some time. As he put it in *Stepping Stones* (Dennis O'Driscoll's series of interviews with the poet):

[T]here's one Virgilian journey that has indeed been a constant presence, and that is Aeneas's venture into the underworld. The motifs in Book VI have been in my head for years—the golden bough, Charon's barge, the quest to meet the shade of the father.

By then he had already begun the translation, "in 2007, as a result of a sequence of poems written to greet the birth of a first granddaughter," he writes in the Translator's Note that leads off this new volume. It is also "the result of a lifelong desire to honour the memory of my Latin teacher," Father Michael McGlinchey, with whom he read *Aeneid IX* at St. Columb's College in County Derry. He recalls McGlinchey's "sighing, 'Och boys, I wish it were Book VI.'"

Even earlier, in 1991, "The Golden Bough," a translation of *Aeneid* 6.124–48, came out as the first poem in *Seeing Things*. Twenty years later, "Album" (also in 2010's *The Human Chain*) fondly recalled three separate embraces of the father dead since 1986, culminating in a simile "just as a mo-

Aeneid Book VI: A New Verse Translation, by Seamus Heaney, Litt.D. '98 (Farrar, Straus and Giroux, \$25)



An iconic motif: Aeneas and the Sibyl (at upper left) in the Underworld, c.1530 (a plaque with enamel and gold on copper)

ment back a son's three tries | At an embrace in Elysium"—a clear invocation, in words full of their own literary memories, of Aeneas as the hero tries and fails to embrace the shade of his own father. The 12 sections of "Route 110" (in *The Human Chain*) "plotted incidents from my own life against certain well-known episodes in Book VI" (vii–viii), by way of the bus route from Belfast to Heaney's home in County Derry. In "Route 110," the poet buys a "used copy of *Aeneid* VI," then takes the bus ride home, reading of Lake Avernus and "Virgil's happy shades" to the sound of "Slim Whitman's wavering tenor."

Lingering Where It Matters

AENEID VI starts with the hero's making landfall at Cumae, the northern point of the Bay of Naples. There the Trojan exile meets the Sibyl, prophetess of Apollo, who guides him down into the Underworld, directs him to the golden bough that will give him access, and joins him on his ghostly journey: encounters with Charon's ferry of the dead, the hellhound Cerberus, Trojan comrades and Greek foes fallen in the war at Troy, the shade of Dido who died for love of him, and finally to the desired meeting with his father, Anchises (replacing the mother visited by Homer's Odysseus).

The lines of "The Golden Bough" from 1991, now iambic pentameter like the whole book, have been tightened and trimmed, overhauled and reordered in a process revealed at the end of the preface:

rhythm and metre and lineation, the voice and its pacing, the need for a diction decorous enough for Virgil but not so antique as to sound out of tune with a more contemporary idiom—all the fleeting, fitful anxieties that afflict the literary translator.

Virgil's language is not ornate: "neither overblown nor understated," as a Roman contemporary put it. All great poetry is modern, that is, readable in the modernity of its idiom—whatever the occasional recourse to high style, to archaism, to technical language, to neologism. The job of the translator is to create poetry out of poetry, idiom out of idiom, and Heaney has done that job superbly, capturing the energy of the original, emptying the word-hoard with narrative, description, and character speech brilliantly represented and renewed, always in tune with the varying emotional registers of this, the

Chapter & Verse

Correspondence on not-so-famous lost words

W.H. Levit hopes someone can provide an exact citation for a statement generally attributed to Voltaire: "I was never ruined but twice; once when I lost a lawsuit and once when I won one."

"something wrong with the experiment" (May-June). Mark Davis noted the similarity of Professor William Doering's comment to "a famous quote attributed to Einstein, though no one seems to be able to confirm it: 'If the facts don't fit

the theory, change the facts.' If Einstein did say it, some say he was joking, while others argue he was emphasizing that there can be bad experimental data and that good theories should not necessarily be discarded because of contradictory results from a single experiment."

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

most pathetic of the *Aeneid*'s books. Rare is the translation that brings over into true poetry, as this one does, the words, the tone, the music of the original.

Heaney's 1,222 lines convey the entirety of Virgil's 908, printed on facing pages—clearly important for Heaney. The morphological and syntactical compression of Latin, relative to English, make this just about right (Dryden needed 1247 lines, Mandelbaum, 1203). Heaney, like them unconstrained by the Latin line, can linger where lingering matters, as when Aeneas looks his last at the unresponsive shade of Dido, in a single, packed line of Latin that here becomes almost two: "gazes into the distance after her | Gazes through tears, and pities her as she goes." The expansion by repetition draws attention as well to Virgil's striking use of the verb *prosequor*, here used in Latin for the first time to mean "follow after with the eyes." Elsewhere, memory of a son's fall, through failure of a father's art, leads to a second failure of art, and the falling of the artist's hands: "Twice | Dedalus tried to model your fall in gold, twice | His hands, the hands of a father, failed him." The consecutive lines of Virgil begin with *bis* ("twice"), a word effectively moved to line-end in the English. In the Latin, Virgil's description ends mid-line, mirroring the unfinished artwork, but the translation needs two full English lines. Virgil in three words gets the horror of the father trying and failing to depict the death of the son: *patriae cecidere manus*. He does so by placing the adjective ("belonging to a father"), which in Latin can have the force of a noun, in the emphatic first position.

Heaney gets the same effect in nine words, by doubling "hands" (*manus*), supplying the noun ("of a father"), with the indefinite article universalizing the catastrophe. "Fall" and "failed"—cognates in Latin as well (*casu...cecidere*)—get to the heart of the noun and verb. This sort of exercise could be repeated over and over again throughout the translation. Or just read it, and know you are close to the poet with whom Heaney was living these last years.

English, in Touch with Metaphor

ENGLISH for the most part has lost touch with the metaphor in its (frequently Latin) etymology, but Heaney's English nestles up to those origins, again keeping a version of the Latin in his words. He clearly cares about the language and about his representation of it. The body of a dead comrade "Lies emptied of life" (*iacet exanimus*, literally, "breath gone out of it"); the cave to the Underworld is "A deep rough-walled cleft, stone jaws agape" (*hiatu*, often with the meaning bodily gape, yawn). Down below we meet various personified evils, including "Death too, and sleep. | The brother of death," as always eschewing the Latinate (*consanguineus*) with the Anglo-Saxon "brother" underscoring the metaphor. And where Heaney finds pure metaphor, he translates that, too, as in Virgil's "rowing with wings" for Daedalus, or his "prows frill the beach" for the Trojan ships on the shore of Italy.

Among many vivid descriptive passages are the lines on Charon, the ferryman dear to Heaney, as to Dante, Dryden, and Delacroix, among many others:

And beside these flowing streams

and flooded wastes

A ferryman keeps watch, surly,
filthy and bedraggled

Charon. His chin is bearded with
unclean white shag;

The eyes stand in his head and
glow; a grimy cloak

Flaps out from a knot tied at the
shoulder.

All by himself he poles the boat,
hoists sail

And ferries dead souls in his rust-
ed craft

Old but still a god, and a god in
old age

Is green and hardy.

Not a single Latinate word, as the vital-
ity and squalor come fully across. Later
Charon delivers his unwonted mortal car-
go to the further shore,

Under that weight the boat's
plied timbers groan

And thick marsh water oozes
through the leaks,

But in the end it is a safe crossing,
and he lands

Soldier and soothsayer on slithery
mud, knee-deep

In grey-green sedge.

Every word has an analogue in Virgil's
Latin, but the voice is that of Heaney. The
sounds of Hell are well represented, as in
the punishment of Salmoneus for imitating
Jupiter in his thunder cart with "the bat-
ter of bronze and the clatter | Of horses'
hooves," the alliteration responding to and
extending that of Virgil (*cornipedum pulsu*).
Or in the noise of the Fury Tisiphone's tor-
turing sinners: "Sounds of groaning could
be heard inside, the savage | Application of
the lash, the fling and scringe and drag | Of
iron chains." Or "a grinding scrunch and
screech | Of hinges as the
dread doors open."

Some critics, chiefly
Anglo-Saxonists, found
fault with the Hiberno-
Englishisms of Heaney's
translation of *Beowulf*,
as indicating inept ap-
propriation. But others
rightly saw it as an act of
stealing in the best sense,
transforming "the song of
suffering that is *Beowulf*
into a keen for his own
people's troubles," (as
Thomas McGuire wrote



DAVID LEVENS/GETTY IMAGES

in *New Hibernia Review*). The much reduced
use of such language in *Aeneid* Book VI con-
firms this more creative view of the mat-
ter. Not that Virgil cannot be treated that
way at times, as with "scringe" ("scratch-
ing sound") above. In fact the practice of
domesticating into Hibernian—never in-
trusive, but unmistakable—continues that
found in Heaney's translation and adapta-
tion of Virgil's pastoral eclogues in *Electric
Light*, from 2001: "Bann Valley Eclogue,"
where the Virgilian golden age is thoroughly
Irish: "Cows are let out. They're sluicing the
milk-house floor"; or the translation, "Virgil:
Eclogue IX," where a bull is "The boyo with
the horns," while the older shepherd says,
"That's enough of that, my boy. We've a job
to do." Virgilian pastoral and Irish poetry
are akin, both close to the soil, in Heaney as
in Patrick Kavanaugh and John Montague.

At Home in Ireland

So IT IS that this *Aeneid* can feel at home in
Ireland: "fell like a dead man | On a heap of
their slobbered corpses" for *confusae* ("jum-
bled")—perhaps recalling the "warm thick
slobber | of frogspawn" from "Death of a
Naturalist"; "nor bury in home ground";
"in the very lowest sump"; of Silvius, "the
lad you see there." Heaney's Aeneas, at the
funeral of his captain Misenus, even takes
on the look of Father McGlinchey, "asperg-
ing men lightly | From an olive branch." This
all works because we want to hear Heaney
along with Virgil. Does he go too far when
the Sibyl, to subdue Cerberus, "flings him
a dumpling of soporific honey | And heav-
ily drugged grain"? I think not. It is worth
it to think of our poet smiling at that line,
even in the Underworld.

In a fragment of an Afterword, Heaney
called it "the best of books and the worst
of books." Best because of
"the pathos of the many
encounters it allows the
living Aeneas with his
familiar dead." Worst
"because of its imperial
certitude, its celebration
of Rome's manifest des-
tiny, and the catalogue of
Roman heroes..." down
to the man under whose
new monarchy Virgil
would find himself: the
"last of the war-lords," as
Augustus has been called.
Though these lines—An-



Virgil (70-19 B.C.E.) sits between Clio, the Muse of history, and Melpomene, the Muse of tragedy, in this third-century mosaic from a site at Sousses, Tunisia. Below, Seamus Heaney

chises's, not Virgil's own—are not without
pathos, and resist being called encomium,
Heaney here thought the translator's task
"is likely to have moved from inspiration
to grim determination," as his preface puts
it. Not that his translation fails them in
any way. But his heart is elsewhere, as was
Virgil's, in Aeneas's encounters with dead
comrades and his dead lover Dido, in the re-
union with his father and the embrace that
cannot happen, and in the loss, memory, and
consolation that come through the music of
these scenes. The poets are also in Elysium,
an inviting spot as the legendary Musaeus
describes it in Heaney's evocative verse:

None of us has one definite
home place.

We haunt the shadowy woods,
bed down on riverbanks,

On meadowland in earshot of
running streams.

It is not hard to imagine Seamus Heaney,
who spent so much time with Virgil in this
world, now reunited in the next, haunting
such woods with the Roman poet, as they
do in this breathtaking new translation. ▢

Richard F. Thomas, Lane professor of the classics,
is the author of several works and commentaries on
Virgil, and co-editor, with Porter professor of Medi-
eval Latin Jan M. Ziolkowski, of the three-volume
The Virgil Encyclopedia (2014). For more on the
Encyclopedia, see "A Poet's March of Ages" (Jan-
uary-February 2014, page 11). For more about the
poet, read "Seamus Heaney, Digging with the Pen," by
Adam Kirsch (November-December 2006, page 52).

Teach a Man to Fish

How Gloucester's Russell Sherman got hooked

by NELL PORTER BROWN

HAVING SPENT the last days of the groundfishing season on the open ocean east of Cape Cod, Russell Sherman '71 chugged into Gloucester Harbor in April and docked his *Lady Jane* at the Jodrey State Fish Pier. Running the 72-foot trawler around the clock, he and two crewmen had taken shifts at the wheel and ultimately caught 6,000 pounds of bottom-dwelling species, mostly haddock, flounder, redfish, and cod, along with a slew of lobsters. He netted \$9,000.

A decent haul, Sherman said, given the decades-long decline of the New England saltwater groundfishing industry, but laughable compared to his days on deck in the 1970s. Then, Gloucester was home to generations of fishermen at the center of a thriving business that had been feeding Americans since the seventeenth century. Fresh out of Harvard, Sherman took a summer job on a boat, and essentially never left. "You came and went as you wanted," he said. "Plenty of dough in my pocket. And when times were a little tough,

you worked a little harder, that's all."

A high-school football player, he reveled in the physical labor, the manly camaraderie at sea, and standing up to gale-force winds and 15-foot swells "that knocked me around," he added. "Being young and vigorous, full of fire in the belly, I loved the life I led."

But the North American fishing industry, already wrangling with foreign fleets,

would soon start changing dramatically. The Fishery Conservation and Management Act of 1976 (commonly referred to as "Magnuson-Stevens") officially asserted U.S. jurisdiction over waters within 200 miles of shore. This boon for domestic fishermen, who supported it, initially spawned optimism and an influx of newcomers, especially in Gloucester. Yet the law simultaneously addressed overfishing, a concern voiced as early as the turn of the last century, by mandating unprecedented management of American fisheries. John Bullard '69, regional administrator of the National Marine Fisheries Service, a branch of the National Oceanic and Atmospheric Administration (NOAA), credits the act with foreseeing the need to safeguard fish stocks from domestic vessels as well, especially given the advances in dragging gear.

Regional governing councils were established, and the law, tightened to increase conservation and enforcement efforts in 1996 and 2006, set in motion the constantly shifting, often labyrinthine, federal regulations that have since frustrated groundfishermen like Sherman. The councils and NOAA can now specify everything from fishing-ground closures, catch quotas, bycatch requirements and protected species, to boat monitors and their fees (paid by the fishermen), and components of gear.

The most recent groundfishery management system to be adopted in New England, in 2010, is the quota-based Annual Catch Limit (ACL); it replaced the age-old effort-based "days at sea." The ACL percentages are set annually, based on NOAA's Northeast Fisheries Science Center stock assessments, and represent the number of pounds of 16 different monitored species a given boat can



Commercial fisherman Russell Sherman still admires the fishermen he worked for in his early days: "Strong, and strong-willed, independent men. Most were veterans of World War II, and had been through a lot—they had tremendous work ethic. And I wanted nothing but to earn their respect."

land (bring ashore) each season.

Groundfish historically dominated the regional industry, but now represent only one of 16 Northeast fisheries, including surf clams and quahogs, herring, and deep-sea red crab, many of which, like sea scallops, are flourishing. The fishermen of New Bedford, Massachusetts, where Bullard used to be mayor, are the country's leading sellers of sea scallops, a nearly \$500-million business, for example (compared to the \$60-million average annual revenue from groundfish). Various stock levels can and do fluctuate, even year-to-year: the quotas for Georges Bank Cod were cut more than 60 percent this year, but hiked very slightly for Gulf of Maine Cod: "They are still in trouble," Bullard says. On the other hand, the quotas for redfish, pollock, and Georges Bank haddock rose, he adds, because surveys show they are the most plentiful of the 20 groundfish stocks. But because cod and other low-quota species often swim among them, "the challenge is, how do fishermen catch the fish that are abundant without catching the cod and other [re-

Aboard the *Lady Jane*, Sherman gears up for his forty-fifth year on the water.

stricted] species? It's very hard to do." Some of the different species tend to swim together. And once fishermen fulfill their quotas for cod, for example, they are precluded from fishing in waters where cod live.

More pointedly, the overall population of groundfish will never return to the 1970s levels Sherman and others knew, Bullard asserts. Ultimately, "You're not going to have happy groundfishermen," he adds, "because there is no longer enough groundfish for all of them to catch and make a good living, and the managers are going to have to restrict the catch no matter what system they use."

Human contributions to climate change, and the resulting deleterious effects of warmer temperatures and acidification on the ocean and its marine life, he adds, share much of the blame for declining fish stocks across the globe. Fishermen are asked to put



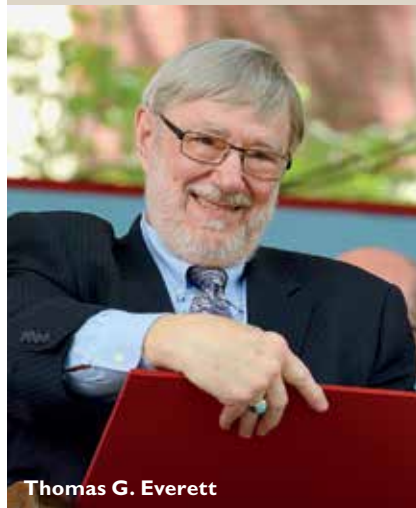
fresh fish on our tables, he says, and "then we collectively put carbon into the atmosphere that makes [their] place of business a more hostile environment. It's not fair."

NOAA measures, although aimed at balancing the often competing interests in the ocean's health and resources, spur continuing, often volatile debates. The Gulf of Maine codfish, for example, has been the poster child for all groundfish. "And because they regulate to the weakest stock," Sherman points out, "we're set up for a fall right away." Yet based on his own experience, and what he hears from fishermen in

Harvard Medalists

FOUR PEOPLE—Thomas G. Everett, Roger W. Ferguson Jr. '73, A.M. '78, J.D. '79, Ph.D. '81, John H. McArthur, M.B.A. '59, D.B.A. '63, and Betsey Bradley Urschel, Ed.M. '63—received the 2016 Harvard Medal for "extraordinary service to the University" on May 26, during the Harvard Alumni Association's (HAA) annual meeting on the afternoon of Commencement day. President Drew Faust read the citations, printed in italics below.

• When Thomas G. Everett, now director emeritus of the Harvard Bands, arrived in 1971, he found the campus to be (in the words of *The Harvard Crimson*) "a jazz wasteland." He started the Harvard Jazz Bands, developed courses on the genre and its history,



Thomas G. Everett

and brought in artists for master classes and residencies. Meanwhile, he directed the Harvard University Bands for decades—and in that capacity, oversaw football game halftime shows, the Harvard Wind Ensemble, and the Harvard Summer Pops Band. Everett has also been a supporter of the Harvard Alumni Jazz Band and the Harvard Band Foundation.

Harvard's beloved music man for more than four decades, you calmly guided the Harvard Bands "through change and through storm," setting the stage for the jazz program and touching the lives of generations of students, alumni, faculty, and staff through your prodigious creativity, your trailblazing scholarship, and your boundless generosity of spirit.

• Roger W. Ferguson Jr., president and CEO of the financial services provider TIAA, is also a member of President Obama's Economic Recovery Advisory Board and a former vice chairman of the Federal Reserve Board of Governors. Besides serving as president of the Board of Overseers from 2008 to 2009, Ferguson has contributed to a number of committees at the University: he chaired the standing committee on institutional policy and Harvard's audit committee, and also served as a member of the executive committee and the board's standing committees on social sciences and alumni affairs and development.



Roger W. Ferguson Jr.

Esteemed economist and trusted advisor to presidents from Mass Hall to Pennsylvania Avenue, you have served the University with humility and wisdom, leading the Board of Overseers and countless committees with a steady hand, a sharp mind, and a deep devotion to Harvard's educational mission.

Massachusetts, Maine, and New Hampshire, the cod “are everywhere. When we’re out there, we can’t *avoid* catching cod.”

The “right answer,” Bullard allows, referring to balancing these competing agendas, is ever elusive. That’s partly because the resources shift and scientific data can lag such trends, but also “because the fishing industry is incredibly complicated and litigious—for every action, there are multiple counter-actions.”

Sherman agrees that relations are acrimonious. “We feel there is more interest in getting rid of fishermen than in saving the fish,” he explains. The problem, as he sees it, is worsened by “over-used and unenlightened” policies produced by bureaucrats who fear lawsuits by the “enviros,” and have therefore “privatized what have been common resources for 400 years” (the fishing grounds) and destroyed “the industry that built this Republic.” He has learned to live with the ACL system, and has survived by “stubbornness” and a canny ability to switch up his targeted species, fish inshore and offshore, and gauge ways to benefit

from trading his ACL quotas (which is allowed) among fellow fishermen. The ACL system “has done its work, which was to pare us down to very few participants,” he adds. “But they keep cutting the quotas. And now we are in the death throes.”

Educated and outspoken, Sherman has often been drafted to advocate for his community, which he was glad to do—believing that “we could reach fair and equitable solutions for the environment and the traditional fishing folk.” He started in the late 1980s (when some fishermen and environmentalists were actually working together productively), and was heartened by the hard-won battle that helped lead to a ban on oil exploration and drilling on Georges Bank, a particularly nutrient-rich stretch of sea floor between Cape Cod and Nova Scotia. Sherman has since testified before Congress, served on advisory panels for the New England Fishery Management Council, helped co-found the nonprofit Northeast Seafood Coalition—and even engaged in brainstorming sessions with environmentalists, scientists, and politicians. In

2014, he won the industry’s National Fisherman Highliner Award for his efforts.

Regulators should “cease focusing on us as the *bête noire*,” he said during a recent interview at his Gloucester home, four miles from the downtown pier. They should “focus on the other problems that exist: natural predatory mortality—seals, dogfish, and skates are doing a better job than fishermen; pollution—sound and chemicals; and water quality. I am not saying we’re lily-white, but the majority of us have done exactly what we’ve been told since they have been in charge since 1976. Now, where the hell is the result?”

PAINFULLY AWARE of his role as a relic, the 68-year-old wants to retire, but can’t. In 2000, against the wishes of his wife, Christine, he invested in a bigger boat that could operate both inshore and offshore, thereby hedging unpredictable fishery closures. That’s the main reason he’s still in business at all. But having done that, he now cannot get a decent price for his nest egg, *Lady Jane*. So Sherman hangs on, and this spring he

• John H. McArthur, dean emeritus of Harvard Business School, joined the HBS faculty in 1962, teaching courses in corporate finance; he became dean in 1980. During his 15-year tenure, he introduced new fields of study and overhauled the school’s M.B.A. program and publishing arm, and also improved its campus. Reporting in 1995 on how McArthur brokered the merger that created the Partners HealthCare System—now the state’s largest private employer (and the provider network where the University spends most of its health-benefits money)—the *Crimson* wondered, “Is John H. McArthur the Most Powerful Man at Harvard?” A University professorship was named for him and his wife, Natty, in 1997; HBS’s McArthur Hall was dedicated in 1999.

McArthur has also served elsewhere at Harvard: at the College,



John H. McArthur

as honorary coach of the men’s ice hockey team; at the medical school, as a member of the Board of Overseers; and at the schools of education and public health, as a member of their Dean’s Councils. He is the honorary chair of the current HBS capital campaign.

Distinguished Harvard statesman and visionary leader with an unparalleled gift for building consensus and cultivating warm personal relationships, you expanded the frontiers of intellectual thought at Harvard Business School and provided wise

counsel to Schools and institutions across the University and around the world, earning the respect and admiration of colleagues and communities from Cambridge to Canada.

• Betsey Bradley Urschel is highly regarded for her volunteer service in Texas and in Cambridge. She has contributed her leadership in a variety of capacities, including as an elected director, regional director for Texas, and vice president of University affairs of the HAA Board of Directors. A past president and director emerita of the Harvard Club of Dallas, she co-chaired the club’s centennial events in 2014 and, with her late husband, Harold, started the community service fund that bears their name and provides financial assistance to a College undergraduate working in a public-service internship in north Texas.

The heartbeat of the thriving Harvard Club of Dallas, you have given generously and passionately of your time and talents to many areas of the University, galvanizing the alumni community and mentoring other volunteer leaders with exemplary grace, unwavering dedication, and Texas-sized enthusiasm for Harvard.



Betsey
Bradley Urschel

geared up, despite a titanium hip and bursitis in both shoulders, for his forty-fifth year on the water, saying simply: “You do what you have to do.”

That ethic, he says, grounded family life while he was growing up in modest circumstances in the small “backwater mill town” of Putnam, Connecticut. His father was a World War II veteran who worked hard at any job he got, on railroads, as a meat-cutter, truck driver, and insurance agent, and ultimately as a bank-debt collector repossessing cars in Hartford’s toughest neighborhoods. “He was a real gentleman, he was calm and rational,” Sherman says. “And after the war, nothing scared him. He used to say, ‘Put your best foot forward, *always*, but if somebody steps on it, all bets are off.’”

A top student and football player on scholarship at St. George’s School in Rhode Island, Sherman arrived at Harvard, also on scholarship, in the fall of 1967. Political and cultural tensions already were roiling the campus, and by sophomore year, things turned violent. He recalls “seeing the cops drag a young lady out of building who had beautiful blond hair, and it was soaked in blood, and I lost it. I charged. I was an

Cambridge Scholars

FOUR SENIORS have won Harvard Cambridge Scholarships to study at Cambridge University during the 2016-2017 academic year. Alona Bach of Berkeley, California, and Cabot House, a history and science concentrator, will be the Lionel De Jersey Harvard Scholar at Emmanuel College; Vivek Banerjee, of Studio City, California, and Dunster House, a social studies concentrator, will be the William Shirley Scholar at Pembroke College; Ramya Rangan, of Los Altos Hills, California, and Currier House, a joint concentrator in computer science and mathematics, will be the Charles Henry Fiske III Scholar at Trinity College; and Tamara Fernando of Colombo, Sri Lanka, and Adams House, a history and literature concentrator, will be the John Eliot Scholar at Jesus College.

excitable boy at that age, a young Irish spalpeen. Big mistake. Billy club. I got taken to pieces.” Perhaps more privately traumatic was his personal life. At the end of freshman year Sherman married his prep-school sweetheart, Marion Pratt, who was pregnant; the couple moved off campus and shared brief roles as parents to two infants—both whom died of a rare genetic disease—before separating at the end of his senior year. Moving to Gloucester soon after that, he fell in love with the place, with “her people and history, the bedrock of our Republic,” as much as with fishing.

Sherman catalogs his life choices, and knows he had more than many because of his Harvard education. Turning one’s back on a professional career was not that unusual among his classmates, he says, at least in the years following graduation, largely as a consequence of political activism—the fight against the Vietnam War, the fight for social and economic equality. His only regret about college, where he concentrated in history, is that he didn’t study hard enough.

In 1982, when he married Christine (a Gloucester native from a fishing industry family), his parents, always disappointed by his career decision, urged him to return to school for an advanced degree. But he “wanted to be the captain of my own boat, my own business.” He put \$10,000 down on his house, and in 1984 borrowed another \$10,000 to buy the *Captain Dutch*. In 2000, at age 52, Sherman took on a second mortgage to buy the *Lady Jane*, knowing that the increased financial burden would mean spending more time on the water, catching more fish, and adding crew. The industry outlook had somewhat improved, he recalls. In an interview with producers of the 2002 documentary film *Empty Oceans, Empty Nets*, in which he is featured, Sherman agreed that although the industry was shrinking, a “hard-core” group of fishermen “who stick it out for this interim period [of] the next three or four years, are going to be rewarded at the end. I have to believe that.”

Sherman has never been against “intelligent” regulation that conserved fish stocks, and has voiced his beliefs even if they ran counter to those around him—“often to my

The Senior Alumni

THE OLDEST GRADUATES of Harvard and Radcliffe present at Commencement were 99-year-old Ruth Rabb ’37, of New York City, and Leon Starr ’40, of Boston, due to turn 98 in July. Both were recognized during the afternoon ceremony by Harvard Alumni Association president Paul Choi ’86, J.D. ’89. Starr,



Ruth Rabb and Leon Starr

whose seventy-fifth reunion was last year, was accompanied by his wife, Jacqueline. “There are a lot more women here than when I was at college,” he said, adding that the custom in his day, of having Harvard professors teach the men and then walk over to Radcliffe College to teach the women separately, “was cuckoo”; they should have “had the classes together.” Rabb, seated a few chairs away beside her daughter, Emily Livingston (wife of David Livingston ’61), said she was “very pleased to be a ‘Cliffie,’” although “it was awful in my day that we were not recognized.” Harvard does seem to run in the family: her late husband was Maxwell Rabb ’32, J.D. ’35, her other children include Bruce Rabb ’63 and Priscilla Rabb Ayres, M.B.A. ’69, and her grandson is Jeremy Maltby ’90. Rabb was glad when, in 2000, the College began granting only Harvard degrees, she added, “because now we’re on the same playing field.”

JIM HARRISON

detriment,” he reports. “I’ve had my gear sabotaged, I’ve had personal threats.” But he does think regulation has “gone too far now.” So far, he worries, that the next time federal leases for offshore exploration or extraction are proposed for sites in the mid and south Atlantic Ocean (a process that could begin as early as 2019), there won’t be any independent fishermen “screaming and hollering like scalded cats, ‘Don’t drill!’ Georges Bank is too rare a jewel.” Because,” he says, “we are gone.”

IN 2012, when Sherman’s blood pressure hit 190 over 90, his doctor warned him to bow out of political activity, or risk having a stroke. He is now out of the danger zone, but it was nevertheless a relief, he says, to come ashore after finishing the 2015-2016 season, to work on repairs and maintenance for the *Lady Jane*, and to sleep in his own bed.

By mid June he was back on the water, following a business plan revised to reflect the new ACL allocations and grounds-closure timetables, volatile market auctions, weather patterns, the state of his health, and that of his crew. “I’ve been 30-odd years a captain now, and I’ve never been a high-liner—what we call a guy who just made the fish dance aboard. What I did was by rote, by cussedness,” he says. “So I did okay. We raised our daughter and had our house. And in a business full of corruption, I’ve never cheated anyone, always played by the rules. Took care of my crew. And if I can just retire out, please, without ever having hurt anyone or lost anyone on my boat, and knowing people will say, ‘Jeez, that Russell did all right by me,’ then I will be a happy guy, my career a success.”

Election Results

THE NAMES of the new members of the Board of Overseers and of the new elected directors of the Harvard Alumni Association (HAA) were announced during the HAA’s annual meeting on the afternoon of Commencement day. For complete coverage of the contested Overseers election, see harvardmag.com/overseerelection.

For Overseer (six-year term), voters chose:

Lindsay Chase-Lansdale ’74, Evanston, Illinois. Associate provost for faculty and Frances Willard professor of

Centennial Medalists

THE GRADUATE SCHOOL of Arts and Sciences Centennial Medal, first awarded in 1989 on the occasion of the school’s hundredth anniversary, honors alumni who have made contributions to society that emerged from their graduate studies. It is the highest honor the Graduate School bestows, and awardees include some of Harvard’s most accomplished alumni. The 2016 recipients, announced at a ceremony on May 25, are: Francis Fukuyama, Ph.D. ’81, a political scientist, political economist, and author; David Mumford ’57, Ph.D. ’61, a theoretical and applied mathematician who studies visual perception; John O’Malley, Ph.D. ’65, a priest, professor of theology, and historian of early modern Catholicism; and Cecilia Rouse ’86, Ph.D. ’92, an economist who served as adviser to two presidents and is now dean of the Woodrow Wilson School of Public and International Affairs at Princeton. For more about the honorands, see harvardmag.com/centennial-16.



From left: John O’Malley, Cecilia Rouse, David Mumford, and Francis Fukuyama

human development and social policy, Northwestern University.

Helena Buonanno Foulkes ’86, M.B.A. ’92, Providence, Rhode Island. President, CVS/pharmacy; executive vice president, CVS Health.

Ketanji Brown Jackson ’92, J.D. ’96, Washington, D.C. Judge, United States District Court.

Alejandro Ramírez Magaña ’94, M.B.A. ’01, Mexico City. CEO, Cinépolis.

Kent Walker ’83, Palo Alto. Senior vice president and general counsel, Google Inc.

For elected director (three-year term), voters chose:

Janet Nezhad Band ’83, M.B.A. ’89, J.D. ’90, New York City. Development consul-

tant to nonprofit organizations.

Rye Barcott, M.B.A.-M.P.A. ’09, Charlotte, North Carolina. Managing partner and co-founder, Double Time Capital.

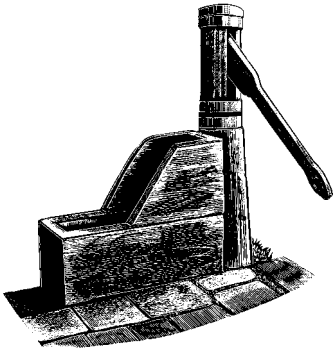
David Battat ’91, New York City. President and CEO, Atrion Corporation.

Susan M. Cheng, M.P.P. ’04, Ed.L.D. ’13, Washington, D.C. Senior associate dean for diversity and inclusion, Georgetown University School of Medicine.

Farai N. Chideya ’90, New York City. Distinguished writer in residence, Arthur L. Carter Journalism Institute, New York University.

Michael C. Payne ’77, M.D. ’81, M.P.H. ’82, Cambridge. Attending physician, department of internal medicine, division of gastroenterology, Cambridge Health Alliance.

26 Ways to Get into Harvard



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

QUICK TRIVIA QUIZ. What do these names have in common: Bradstreet, Bacon, Dexter, Morgan, McKean?

All are gates to Harvard Yard. Clockwise, from due north, they are: the newest gate, opposite the Science Center, a 1995 gift from Radcliffe honoring seventeenth-century poet Anne Bradstreet; the Robert Bacon or Class of 1880 Gate, monumental and unused, just south of Lamont; the Samuel Dexter or Class of 1890 (or "Enter to grow in wisdom") Gate; the Edward D. Morgan or Class of 1877 Gate, the largest of all, just south of Widener; and the "Porcellian" or "Boylston" gate, ornamented with a boar's head, dedicated to Joseph McKean, who founded the Porcellian Club in 1791.

So says *Gates of Harvard Yard* (Princeton Architectural Press, \$15.95), a collection of essays edited, introduced, and partly written by the *Chicago Tribune's* Pulitzer Prize-winning architecture critic, Blair Kamin.

This is a book that began as a week-long Harvard Wintersession 2013 class in arts journalism led by Kamin during his year as a Nieman Fellow. Its collection of essays and photographs by students and

instructors was issued later in 2013 as a Nieman Foundation e-book (see harvardmag.com/harvardgates-16). Now a new paperback puts those essays, with fresh color photographs, drawings, and a map, into your coat pocket.

Gates are for getting through, but Kamin, his fellow instructors, and their students ask us to pause and contemplate: a fence excludes, a gate admits—but selectively. Both assert power. No wonder Harvard's wrought-iron pickets bristle with spear points.

Until the 1880s, Harvard had made do with rustic wooden rails on granite posts. Monumental ironwork enclosures were part of Charles William Eliot's imperial ambitions for his university.

The Johnston Gate—the first to be built, in 1889—was the work of Charles McKim of McKim, Mead, and White, the New York architects who would shape much of Harvard's and the nation's rise to international prominence in the next few decades. McKim set the pattern for Harvard gates: Georgian, not Gothic; "Harvard brick" of variegated hues with stone accents; iron spear-points with floral flourishes. From gates, the neo-Georgian style spread to buildings and made much of the Harvard we know today.

By the University's Tercentenary in



The long-gone Dudley Gate, caught with no hands on its clock

1936, the Yard was fully fenced and gated. But of today's 26 gates, nine are locked permanently or opened only rarely. Some have been blocked by new buildings, made useless by new traffic patterns, or denied the spacious malls they were supposed to face. Some languished in disrepair. Kamin's work inspired repairs to the Johnston Gate, but two of these essays point out other gates still in need of restoration.

It's too late for the Dudley Gate, completed in 1915 and demolished in 1947. On Quincy Street, where there is now a self-effacing nonentity of a gate leading to Lamont Library, there once stood a proud folly as fanciful and impudent as the Lampon Castle: a triple gate with a helmeted clock tower commemorating Thomas Dudley, erroneously identified, by letters carved in stone, as "First Governor of Massachusetts." (Take that, John Winthrop!)

~PRIMUS PRO TEMPORE

(continued from page 8)

petition among our immensely different institutions and types of institutions—especially competition for faculty, students, and resources—is a healthy aspect of the U.S. “non-system” (alas, much less healthy in my own view has become their often out-of-control athletic competition—which much less importantly, but more visibly and often insidiously, heavily characterizes American culture).

Competition is, however, most positively effective when those engaged in it are open to learning from one another. This can be taken too far—it is possible for dangers of the antitrust sort to emerge (as the Department of Justice did indeed conclude was occurring in regard to student financial assistance several decades ago). But greater lost opportunities for the general benefit—toward the common objectives of increased knowledge and more effective teaching—have resulted from institutional failures to learn from one another.

Especially now, at a time when higher education is facing severe stresses, including, it appears, significant losses of public confidence, *Harvard Magazine's* commentary and recommendations deserve a vigorous Three Cheers!

THOMAS H. WRIGHT, J.D. '66
Emeritus vice president and secretary,
Princeton University

PENICILLIN

I READ WITH great interest the article “Champ Lyons” (Vita, May-June, page 48). The authors mentioned Lyons's early use of penicillin and further stated that even though penicillin was discovered in 1928, it “was not used to treat humans until 1941.”

In fact, the world's first authenticated therapeutic use of penicillin occurred on August 28, 1930, at the Sheffield Royal Infirmary in England by doctors Cecil George Paine (a pathologist) and Albert Boswell Nutt (an ophthalmologist). They used crude penicillin mold juice topically to cure a bilateral neonatal gonococcal eye infection.

Purified, extracted penicillin was first used systemically on October 16, 1940, by Martin Henry Dawson at the Presbyterian Hospital (Columbia University, New York) to treat a case of subacute bacterial endocarditis. He presented a series of unsuccessfully treated cases to the American Society for Clinical Investigation in Atlantic

City, on May 5, 1941, and, on the front page, *The New York Times* published an article entitled “‘Giant’ Germicide Yielded by Mold.”

It was the treatment of police constable Albert Alexander, the first of Howard Florey's patients to receive systemic penicillin at the Radcliffe Infirmary, Oxford, that incorrectly established the 1941 date. Alexander's treatment was begun on February 12. However, after an initial improvement of his massive mixed staphylococcal/streptococcal ocular-orbital-facial infection, the patient died.

Fortunately for all of us, the great work of Lyons and so many others ultimately established the wonder of the “wonder drugs.”

JOHN D. BULLOCK, M.D. '68, M.P.H. '03
Dayton, Ohio

Editor's note: Thank you for the historical amplification. The Lyons article was referring to more widespread use of the therapy.

IT'S NOT GREEK TO THEM

I AM PUZZLED by the transliteration of the Greek letters in the phrase *metechein tês politeias* in the inspiring article about Danielle Allen (“The Egalitarian,” May-June, page 40). Especially the word *tês* seems strange to me. I don't think that it should be *tais*, but maybe *tas*. I wish that you had had the courage to use the Greek script, which I estimate that at least 50 percent of your readers can decipher, and a Library of Congress mode of transliteration, rather than the one which I suspect may come from a computerized version. I may be entirely wrong, and I apologize if this is the case.

MARY FRANCES (RAPHAEL) DUNHAM '54
M.A.T. '59
New York City

Editor's note: We doubt that that many readers know Greek! One who does is author Spencer Lenfield, who responds:

Many thanks for your query. *Metechein tês politeias* is a translation of *μετέχειν τῆς πολιτείας*; I was following the transliteration procedure used in the work of writers like Allen herself and Martha Nussbaum. I can see where you might think that *tas* (fem. acc. pl.) would be appropriate here, but the verb *μετέχειν* usually takes a genitive object, and only rarely an accusative object, as is noted in the *Liddell-Scott-Jones Greek-English Lexicon* entry here (“1. mostly c. gen. rei only”). The usage that Allen cites is exemplified by Lysias (6.48, 30.15). So the

phrase means “to have a share in the constitution” (singular), rather than “to share the constitutions” (plural) (i.e., *πολιτείας* is f. gen. sg. rather than f. acc. pl.). Taking genitive objects is also true of verbs with related meanings like *μεταδίδοναι* (to give a share in) and *κοινωνεῖν* (to have something in common). The use of the genitive in this situation is similar to the partitive usage of the genitive (as in English, we say sometimes, “have a share of a firm,” “share some cake,” etc.).

Please don't give it a second thought: it is a finer point of Greek usage, and I am glad to be in a spot to help out a fellow friend of the classics. My main concern in transliterating, rather than using a Greek typeface, was to make the term a bit more translucent for the 50 percent or more of Greek-less readers—especially the word *politeia*, with its clear relationship to “politics,” “polity,” etc. And it made some sense in writing about Allen—such a skilled Hellenist herself—to follow her own books' democratizing practice on this point.

GENDER EQUITY

THE ARTICLE on Professor Claudia Goldin's work (“Reassessing the Gender Wage Gap,” May-June, page 12) cites interesting research about how some fields pay their senior professionals more per hour for working more than 40 hours per week. As an experienced consultant, I can offer some possible explanations. One key may be that in some settings (e.g. the larger law, consulting, or accounting firms), the value created for the firm by the expert is almost entirely due to the number of staff used in an engagement—since there is a big profit margin on their fees. The large, complex engagements that use numerous staff seldom fit a straight 40-hour-week model, and evenings and weekends may not be optional.

Another key to high earnings is a willingness to accept new work whenever it appears, even if one is already busy with other projects. An expert's reputation also matters for attracting well-paying business, and a key to that is a demonstrated willingness to be available to the client at all times, and to work as hard as necessary to meet the client's needs.

In other words, rather than hired workers performing assignments allocated by the employer, in these fields the best-paid professionals can be more like entrepreneurs

using the firm as a base of operations. Occupations where hourly earnings are more linear might not share these characteristics.

CARL DANNER PH.D. '86
Alamo, Calif.

OVERSEERS' ELECTION ODDS

A CANDIDATE whose name appears first on a ballot has an advantage. To assure a fair election, some states, including my California, mix up the order of candidates on different ballots so the advantage is evenly distributed.

The current ballot for the Board of Overseers [for coverage of the contested Overseers' election, see <http://harvard-magazine.com/overseerelection>; the results appear at page 67] makes use of the first-place advantage by listing all the "official" candidates—those nominated by the Alumni Association—first on the ballot and first in the voter information pamphlet. Petition candidates—the officially disfavored—appear at the tail end.

The position of all candidates should be determined by lot. Why isn't this done? Because a quarter-century ago, a petition candidate (a "mere" graduate student and the youngest candidate in Harvard's history) was elected to the Board by a narrow margin. It should be no surprise that, by lot, she appeared first among all candidates.

Maybe next year the petition candidates will appear first and the "official" candidates will bring up the rear. Maybe—but don't hold your breath. Fairness was never the Overseers' strong point.

JOHN PLOTZ '69
Hayward, Calif.

Editor's note: The University, when asked, declined to comment on the balloting procedures used in such elections.

NOT FROM KANSAS ANY MORE

I THOROUGHLY enjoyed Bailey Trela's Flyover State essay (The Undergraduate, March-April, page 25). When I arrived in Cambridge in 1958 from Kansas, it didn't matter that I had been to probably 35 or so states (but, let the record show, not Paris and not Florence); I was deemed a hick.

During my four years of undergraduate study, I was occasionally asked what my father's occupation was. Even though he in actuality owned and operated a bank, that was entirely too conventional an explanation for a Flyover State resident, so I

told everyone who asked that he was an "Indian Agent," which better fit their expectations. The follow-up question was usually, "What does an Indian Agent do?" and I always responded that he did a lot of things but principally was concerned with "keeping firewater off the reservation." Not once in four years did anyone question the veracity of my answer.

Keep up the good work with your writers.

BILL SCHWARTZ '62
Nashville

AMENDMENTS AMENDMENT

RICHARD JOHNSON states (Letters, May-June, page 4), "The Thirteenth Amendment accorded citizenship to African Americans. Since then protections have been granted to..."

The Thirteenth Amendment abolished slavery but did *not* mention citizenship.

The Fourteenth Amendment granted citizenship to all persons born or naturalized in the United States but that is all such persons, regardless of race. African Americans are not mentioned. The original text did say citizenship "denied to any male inhabitants...twenty-one years of age," so I suppose you could say, "The Fourteenth Amendment accorded citizenship to African American males twenty-one or older and to all other males twenty-one or older."

ROBERTA B. ROSS '57
Baltimore

AMPLIFICATIONS AND ERRATA

"THEATER, DANCE, and Media's 'Next Act'" (May-June, page 18), reported that "Aside from the Harvard Dance Project, a for-credit ensemble led by OFA Dance Program director Jill Johnson, the concentration offered no dance classes in the fall, and two in the spring." Elizabeth Epsen, program assistant for dance, reports there were, in fact, two for-credit dance courses offered in fall 2015, both shown on TDM's online course listing.

Reporter Sophia Nguyen notes that her source, the Harvard course catalog, did not list the fall courses under the TDM concentration, but under Music.

IN THE May-June Off the Shelf (page 71), author Lesley Lee Francis's name appeared correctly in the accompanying photo caption, but was misspelled in the book listing. We apologize for the mistake.



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A Queen's Seat

"Experimental archaeology" at the Harvard Semitic Museum



use in daily life or in the afterlife is always the question."

The throne was discovered by accident, shattered into thousands of pieces, by a joint Harvard-Museum of Fine Arts expedition in 1925, when a photographer stumbled (literally) into a burial shaft containing the queen's tomb. Three years after the discovery of Tutankhamun's tomb, the public remained hungry for stories about the treasures of ancient Egypt. "This was a sensational discovery," says Manuelian. "For the next two years the team spent all their time down there, lying on mattresses with tweezers, picking up every tiny fragment."

out how to reproduce the faience tiles took a year. "The Egyptians' artists were far better," jokes Rus Gant, lead technical artist of the Giza Project.

To be fair to the Semitic Museum, the royals had vast resources at their disposal. "This was a very tightly centralized period in Egyptian history," Manuelian says, "where the ruling family and their relatives were totally in charge." He calls the project "experimental archaeology," a process meant to shed light on the Egyptians' artistic methods, and tell us something of their hidden lives.

~MARINA BOLOTNIKOVA

HMD
Visit harvardmag.com to see images of the construction of the throne

MUCH IS STILL unknown about the world of the ancient Egyptian elites, whose lives are fossilized in the riches of the ruins at Giza—and reflected by the luminous throne that sits on the second floor of the Harvard Semitic Museum. Crafted from cedar wood, covered in delicate gold foil, and inlaid with turquoise-colored faience tile, the piece replicates a 4,500-year-old chair that belonged to Queen Hetepheres, the mother of King Khufu, who built the Great Pyramid at Giza. How the throne was used, or whether it was used at all, remains elusive. "Sometimes things are used in daily life and put into the tomb, and sometimes they're dummy objects created for burial," says King professor of Egyptology Peter Der Manuelian. "Whether it's built for

Most of the furniture in the queen's tomb—a bed, a more modest wood throne, a handsome sedan chair—had been reconstructed for display in Cairo and at the MFA, but no one had tried to reproduce the grander of the two thrones. Flanked with falcons on either arm and inlaid with tiny pieces of tile depicting beetles, arrows, and other Egyptian iconography, it appeared too complex to imitate, even working from the excavation team's detailed sketches.

It took a crew of craftsmen at the Harvard Giza Project three years and 1,000 hours of labor, plus 3-D imaging technology and a computer-driven carving machine, to rebuild the throne. Just figuring





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—Andrew D. Klaber MBA '09,
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—Lea Paine Highet '88 and
Leslie P. Hume '69

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—A'Lelia P. Bundles '74



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—William A. Shutzer '69, MBA '72

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