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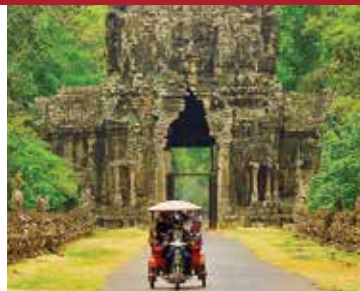
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FEATURES

- 42** Medicine in the Middle of Nowhere | by LYDIALYLE GIBSON
Stuart Harris and the art and craft of the wilderness physician
- 50** Forum: The College Chasm | by CHARLES T. CLOTFELTER
Market forces are increasing inequality in American higher education
- 54** Vita: Guy Davenport | by ERIC ALLEN BEEN
Brief life of a polymathic stylist: 1927-2005
- 56** The RoboBee Collective | by JONATHAN SHAW
Engineering swarms of mobile microbots
- 61** The Justice Gap | by LINCOLN CAPLAN
The unfulfilled promise of equal access to the law

JOHN HARVARD'S JOURNAL

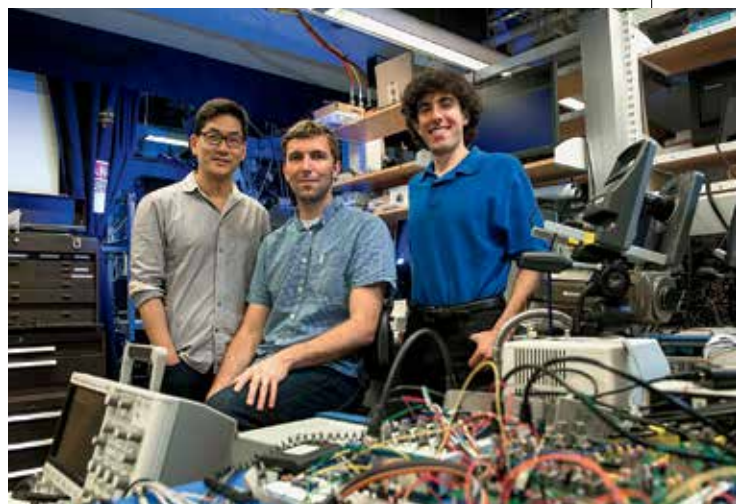
- 18** Winthrop House renewed, helping first-generation and low-income students thrive, online-media leader, public-health priorities, when Tommy's turned off the lights, disappointing endowment returns—and a long turnaround, Kennedy School fellowship and final-club controversies, a scholar's Bob Dylan, education and Radcliffe deans depart, stressed-out undergraduate writers, early-season football—and a horrific injury, hockey's calm goalie

DEPARTMENTS

- 4** Cambridge 02138 | Letters from our readers—and a comment on a strategic vision for Harvard
- 5** The View from Mass Hall
- 12** Right Now | Earthquake prediction via neural networks, climate change and food crops, buying happiness
- 16A** Harvard² | Autumn events, international cultural centers, holidays at Old Sturbridge Village, Houghton Library's drugged-out exhibition, Moldovan dining, and more
- 73** Montage | Listening to noise, Clifton Fadiman, translating Turkish, reveling in Ultimate, poetry critic, the history of hoaxes, and more
- 82** Alumni | A Western conservationist, HAA award winners, and other honorands
- 88** The College Pump | Improving Harvard's sign language, and architectural aspirations
- 104** Treasure | A path-breaking telescope—and astronomer
- 89** Crimson Classifieds



p. 18

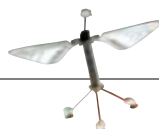


p. 56



p. 50

On the cover: Dr. Stuart Harris on Denali
Photograph by Menno Boermans



p. 56

Cambridge 02138

Vietnam, final clubs, Puritans

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ELSA DORFMAN

WITH GREAT JOY I READ "The Portraitist" (by Sophia Nguyen, September-October, page 30), on Elsa Dorfman. I clearly remember her coming to Mather House to be a tutor, her smile and her expertise. With amusement I remember her posting a notice regarding the newly established darkroom in the Mather House basement. What caught my eye under her elaborate stationery letterhead was an undulating sentence that stated simply: "Some day your prints will come."

I laughed then, and I laughed again when I recognized her on the cover and remembered that witticism. Glad to read she is going strong. Thank you for your article.

TOR SHWAYDER '75, M.D.
Detroit

CRIMINAL INJUSTICES

I WANT TO thank you for "Criminal Injustice" (by Michael Zuckerman, September-October, page 44). I'm an attorney who occasionally handles criminal matters, usually for people I'm handling other things for, or those near and dear to them. Last year, I had a client who was unemployed himself, and whose parents were employed respectively as a home health aide and an auto mechanic. The judge set his bail at \$3 million. (One of the bailiffs asked me, "What president did he assassinate?") Eventually, we got it reduced—to \$300,000.

Obviously, our client couldn't afford the "lower" bail either, so he spent nearly a year in jail awaiting trial before accepting a relatively good plea bargain rather than spend any more time in jail to take his chances at trial before a judge who obviously thought



he was a dangerous person to begin with. And, given the rather well-known conditions in Cook County jail, it should be reasonable to expect the judge to take judicial notice that nobody stays there voluntarily, and that any amount of bail that keeps a defendant locked up there is by definition "excessive."

Constitutionally, the only matter at issue for a defendant locked up in Cook County jail is "deprivation of liberty." It is precisely the same constitutional issue that could legitimately be raised by somebody locked up in the VIP Suite of the Ritz Carlton with unlimited room service and no doorknobs on the inside. The conditions of the place where one is deprived of liberty are constitutionally irrelevant. But to the defendant, the conditions are the real issue. Had our client been offered confinement in the Ritz Carlton for however long it would take his case to get to trial, he would probably have accepted it. (I certainly would have advised him to.)

If the court had ordered an amount of bail he could actually afford (somewhere around \$1,500, I'm guessing), this would not only have enabled him to stay home and work while awaiting trial, it would also have enabled him to pay his own lawyers, and pay them in full, rather than relying on his parents, who could afford only partial payment at best.

More important, it would have enabled our client to insist on a trial. (More than 97 percent of U.S. criminal cases never go to trial, but are "plea-bargained out." The issue of pretrial incarceration has a lot to do with that. The constitutional guarantee of "due

Measuring an Education

HOW DO YOU MEASURE the impact of a liberal arts education? It is a fundamental question educators face. There are traditional assessments: tests, quizzes, final papers, and projects. Yet can these capture the full weight of a Harvard education? In the long term, what do we do here on campus that stays with our students five, ten, or twenty years after they graduate?

Some might insist we measure the value of a Harvard education in stark terms of financial compensation; a common statistic is the average starting salary for graduates. While we wish for our students to thrive in every dimension, we reject the idea of measuring education achievement by financial gain alone. A liberal arts education should prepare students to lead successful lives, but also curious, meaningful lives that are fulfilling across multiple dimensions. If we do our job well, we have prepared our students not for first jobs, but for enduring and satisfying careers.

We know more now about how people learn than we did even a few decades ago. New technologies have enabled us to see how students engage with digital content, so we can better guide their study habits and research. Our online learning platform, HarvardX, tracks how students progress through courses and gives us valuable data to refine online education. Those findings are translating to the residential setting as well, with professors incorporating new techniques to tailor instruction to the needs of their students. Online tools offer a new generation of assessments and guidance for instructors and students alike.

These are the latest activities in a longstanding quest to evaluate how well—and what exactly—students learn. When I earned my PhD, in 1975, the idea of course evaluations was new. At Harvard, and elsewhere, faculty were resistant to being graded by their students. In the early 1970s, Derek Bok, president of Harvard from 1971 to 1991, initiated the first formal process for students to review their classes. The project began modestly. In 1972, twenty courses were evaluated by students. Today, about ninety percent of Harvard College students submit course reviews, and their input has been essential in making our curriculum and teaching stronger—and insights gleaned from the evaluations also figure into faculty hiring and promotion decisions.

But student evaluations alone are not enough to prove that we are providing the very best instruction. The Harvard Initiative for Learning and Teaching (HILT) catalyzes excellence in learning across campus to meet the pedagogical and technological needs of our students. HILT's activities—cataloging innovative classrooms around campus, circulating research to instructors, hosting events to bring people together—have elevated these conversations. The work is ongoing: in September, HILT hosted a conference that allowed hundreds of instructors across Harvard



to develop new strategies for academic assessment.

The nature of assessment of students has changed as well. The Derek Bok Center for Teaching and Learning has transformed how faculty imagine undergraduate instruction and has initiated a culture shift. The Center challenges students and faculty to contend with questions of engagement and achievement, and has resulted in educationally sound, forward-thinking demonstrations of learning. In an evolutionary biology course, students design a visual arts project to show the evolution of plants; in CS50 Introduction to Computer Science, students present digital products for their peers and participate in hackathons; in a neurobiology class, students conceive of and direct short videos to illuminate biological concepts. The Bok Center, too, has provided invaluable resources to train graduate students as teaching fellows—developing the kinds of instructional and academic skills that will last for their careers.

On a residential campus, learning happens through both formal instruction and chance encounters, through structured lectures and informal time with mentors and with fellow students in the library, the lab, or the Yard. We can evaluate the academic consequences of some of these encounters, but so much of the learning that happens at Harvard occurs outside the classroom and transcends the pages of a grade book or a file of course evaluations. While our graduates may not remember every fact from every lecture, they keep with them the power of the Harvard experience, which has, we hope, imbued them with habits of mind and creative ways of thinking that allow them to flourish.

Sincerely,

Drew Faust

process” doesn’t mean much if you have to spend several months in Cook County jail to get it.) In this particular case, my colleague and I were quite sure we could have won an acquittal, or at least gotten the charge reduced to something not involving physical violence or use of a weapon. The prosecution could not have proved either of those elements. Our client had never touched a gun. There was absolutely no physical evidence that he had.

And that in turn would have meant that, after the criminal proceedings were over, we could have sued the police department civilly for shooting our client five times, causing him considerable pain and suffering and leaving him with a permanent limp. (The reason the police and prosecutors in the case brought charges that could even remotely be considered to justify a seven-figure bail was that they needed to justify shooting the defendant five times in a case in which nobody else was killed or even injured.) In all likelihood, the city would have settled for a reasonable sum. The decision to set bail in an amount that neither the defendant nor his family could have raised saved the city a whole lot of money and got them off the hook for shooting the defendant for no particular reason.

The decision to set bail on my client at \$3 million, or even \$300,000, was obviously a strategic one. It was meant to subject the defendant to unpleasant and dangerous conditions to pressure him into a plea bargain. Thus the state could avoid having to try a questionable criminal case and then to settle a civil case to compensate the defendant for the injuries inflicted by police overzealousness. It worked. I cannot possibly believe, nor expect my fellow alumni to believe, that this case was unique. It is part of a pattern that enables the state to run its criminal-justice system at what it considers a reasonable cost. It is a system based on ransom and extortion. America deserves better. Human beings, made in the divine image, deserve better.

MARIAN HENRIQUEZ NEUDEL '63
Chicago

I AM INSPIRED and excited by the work of Alec Karakatsanis to end human caging and wealth-based detention. A few statements in the article especially caught my attention, as they point to a related issue. The author points to “a danger, in focusing on the work of a privileged white man” and

of “falling into...the white savior trap.” He later mentions that “all of us are complicit in the social injustices that we’ve allowed to fester...”

Much of the social progress that we Americans have made in the last few decades can be tied directly to mass movements for civil rights, women’s rights, and gay rights, among others. However, as we look at the current political landscape, typified by President Trump, we realize that we have never experienced a badly needed movement to modernize white men. Instead, we see white supremacists, white male legislators who interfere with women’s reproductive rights, white male fear of immigrants (who built and continue to build this country), and too many other injustices to mention. We badly need to have men like Karakatsanis to model a more enlightened way for us white (Caucasian) men to behave.

FREDERICK (FRITZ) ENGSTROM '70, M.D.
Brattleboro, Vt.

THE ARTICLES on Alec Karakatsanis and Carl Thorne-Thomsen [see below] made me especially proud to be a Harvard graduate. With all the criticism of higher education these days, we need more stories like these.

MIKE CLEMENT, M.B.A. '71
Birmingham, Mich.

CARL THORNE-THOMSEN

THANK YOU and Bonnie Docherty for the article on Carl Thorne-Thomsen (Vita, by Bonnie Docherty, September-October, page 38). I was two years behind Carl at Lake Forest High School and Harvard College. His leadership and bravery were long-standing. Starting with my freshman year in high school, Carl was one of my heroes. He would speak out in support of racial minorities and LBGTQ students as a high-school leader. His calm and articulate insight was a beacon for all who knew him. He is deeply missed.

MARK C. SHIELDS '70, M.D. '75
Chicago

THERE IS certainly a quality to be admired in the character of Carl Thorne-Thomsen, who died in the Vietnam war after rejecting the safety of a student deferment. However, I have something of a problem with the stance the piece appears to take. Refusing to accept the privilege inherent in a student deferment does, perhaps, represent a kind of moral courage. However the role that Carl

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in so doing accepted is unfortunately one that involved the killing of large numbers of Vietnamese, not to mention ravaging their culture and their countryside. That is a role that a number of Vietnam-era Harvard students rejected, on what could arguably be even more compelling moral grounds. No doubt a wish to personally escape the risks and unpleasantness of military service en-

tered into many students' calculations; human motives tend to be mixed, especially when moral issues are involved. But the implied comparison between Carl and his somehow less upstanding, more craven fellow students does not sit well with me. At the very least it is unfair to the many who sincerely—in many cases passionately—believed that fighting in this war was more

ethically repugnant than sitting comfortably on the sidelines.

DAN BRESLAW '59
West Corinth, Vt.

I WAS profoundly affected by the life story of Carl Thorne-Thomsen and found great resonance in the history of my classmate, Commander Melvin Lederman, who grad-

7 WARE STREET

Strategically Speaking

ON JULY 11, Corporation senior fellow William F. Lee wrote to the Harvard community, soliciting advice about the qualities the University's new president should have. The same day, the Pew Research Center reported unsurprising, but dismaying, news: reversing earlier polls, a majority of Republicans and Republican-leaning independents now think colleges and universities damage the

country. Weeks later, a Democratic political-action committee released polling research that found that a majority of white working-class voters believed a college degree ensured more debt but little likelihood of securing a good job; 83 percent concluded that a college degree no longer guaranteed success. Such findings seem to spell disaster for the

prospect of Americans agreeing on an agenda to advance knowledge and equip citizens with what they need to succeed.

What does this have to do with the search for Harvard's twenty-ninth president? At a minimum, it suggests that she or he should be talented at communicating the institution's role in society—and eager to do so beyond the Crimson community. It also raises questions about who gains admission in a hyper-competitive era, and points to the need to air that out more fully (see the articles on pages 18 and 50).

Those demands—and the many others any president will face—underscore the urgency of articulating a more sharply defined, credible narrative about the institution that reflects a rigorous strategy. Charles William

Eliot declared in his inaugural address, in 1869:

This university recognizes no real antagonism between literature and science, and consents to no such narrow alternatives as mathematics or classics, science or metaphysics. We would have them all, and at their best.

Harvard leaders have understandably embraced his robust formulation. It is comforting to associate with greatness, and “best” has a nice ring to it: aspirational, good for fundraising. And that limitless “all” eliminates the burden of choosing.



Eliot: Having it all

But perhaps Harvard has lingered in the shadow of having it all and at its best too long. In the past decade, as an implicit strategy, the University has invested heavily in engineering and applied sciences. But even as those fields draw more students, the faculty remains far smaller than Princeton's (not to mention MIT's)—and scaling up further will take additional billions, amid the competing needs of other

pricey priorities like life sciences. Should Harvard partner with MIT in a regional engineering and applied-sciences cluster? As the neurobiologist now at Stanford's helm aims at a Bay Area life-sciences cluster (perhaps embracing UCSF, Berkeley, large local biotechnology enterprises, and the many area data scientists), can Harvard, with Boston's natural advantages, build unquestioned leadership in that field—and again, at what cost? Meanwhile, the University is tiptoeing into more curricular art-making—but trails Yale, while Princeton and Stanford have recently created campus arts precincts.

Suggesting that Harvard or any institution has it “all” today, and “at their best,” is an invitation to complacency or self-delusion. No one has enough money to fulfill that

aspiration, or the facilities to accommodate everyone who would have to be involved. Insisting on it will only confuse constituents at hand (faculty members, students, administrators); those emotionally nearby (alumni, philanthropists); and those farther afield (the rest of the country and world, including political leaders).

In his useful and accessible recent book, *Realizing the Distinctive University: Vision and Values, Strategy and Culture* (Notre Dame Press), Mark William Roche, a scholar of German and of philosophy, and former dean of Notre

Dame's College of Arts and Letters, writes, [O]ne of the great dimensions of the American university landscape is its diversity. Ohio State has a different vision of itself than does Williams College. Notre Dame is different yet again. Each university benefits from being able to articulate in meaningful and not simply incidental ways why a particular student or faculty member should be drawn to that institution.

Roche adds that such a vision is also “the best brake on the homogenizing tendencies of rankings. It offers students, faculty, and others additional opportunities for intrinsic motivation and emotional identification”—invaluable, even if not toted up on a balance sheet. Conceiving and animating a vision does “require tremendous effort in terms of faculty socialization, support structures, communication, incentives, and leadership,” he notes. But given the complexities of running universities in an era of rising costs and doubts about their societal value, any institution and its leader are clearly better off defining such a vision than simply winging it.

Eliot would be proud that his ambitions still resonate as the University he transformed nears its four-hundredth anniversary. To do him credit, and make that celebration a great one, bringing the community together to articulate a vision and refine a strategy tops any Harvard leader's agenda.

—JOHN S. ROSENBERG, *Editor*

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uated in the Harvard Medical School class of 1956. He was the class bon vivant, had great acting and singing chops, and for this reason, was the star of our second-year show as well as in the Aesculapian show of our senior year.

He had served [in the army] in World War II, and for that reason had fulfilled his military requirements. However, after completing his surgical internship and residency, he elected to re-enter the military as a naval surgeon in 1968. He was stationed onboard ship, off the coast of Vietnam, but elected to join a helicopter crew in order to be closer to the wounded servicemen. He was killed in Vietnam in a helicopter crash on November 29, 1969. Like Thorne-Thomson's, his name can be seen on the Vietnam memorial in Washington, D.C.

He was another example of a person "for-saking self-interest for principle."

RICHARD SOGG '52, M.D. '56
Los Gatos, Calif.

POLITICAL CORRECTNESS, FINAL CLUBS, THE "PURITANS"

AS A LOYAL Harvard alumna and parent, and past president of one of the governing boards, I find it appalling that Harvard would ban students from joining clubs because it thought doing so would improve social life. I hope the faculty votes down the social clubs mandate and figures out some better way to make undergraduate life more appealing to all.

Undergraduates from California, as I



was, from elsewhere in the US and abroad, as well as the faculty, should be free to associate with whomever they please without fear of punishment by Harvard College or the government. Some of us remember President Pusey protecting the Harvard faculty by standing up for that principle during the McCarthy era. It is time for the faculty to do likewise and stand up for its students.

JOAN MORTHLAND
HUTCHINS '61
President, Board of
Overseers (1999-2000)
Harvard Medal
Recipient (2004)
Elizaville, N.Y.

VIOLATIONS of human rights will destroy the fabric of a community, shattering its ideals like glass ("Social Club Ban?" September-October, page 20). And this occurs most readily in times of deep anxiety and frustration. Seized by the crude formula "Us. vs. Them," people cluster in mobs and committees and seek to ease their distress by tormenting a scapegoat, almost always some minority perceived as a threat.

So, now, a committee at Harvard, along with some administrators, have attempted to scapegoat a small group of students, aiming to stigmatize them and strip away their right to freedom of association. These students' rights have been trampled upon, and the values that should bind and inspire the University have been defiled. This shameful episode must end, the appalling abuse of power must be denounced, and Harvard's better angels must throw a clear light on the psychology of the mob and its destructive consequences.

JOHN J. ADAMS '62
New York City

IN GRATITUDE for what Harvard has done for my daughter, I had planned to continue my donations toward financial aid, but I can't. Harvard's stance against single-gender groups is too troubling.

In the Harvard Gazette, President Drew

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Faust stated, “We want to make sure that everybody feels fully welcome and can participate fully in campus life. The single-gender social organizations are antithetical to much of that....”

My daughter competed to join the Crimson Key and the *Advocate*. After both refused her, she found a home at the Bee. Some of her most positive experiences and leadership opportunities happened through the Bee, where she enjoyed the camaraderie of its diverse members of all colors, nationalities, and backgrounds.

As one of the 16 percent of plastic surgeons who are women, I published an article about gender bias in *Plastic and Reconstructive Surgery* in which I applauded the Business School’s project covered in 2013 by *The New York Times* (“Harvard Business School Case Study: Gender Equity”)—described as Dean Nitin Nohria’s attempt “to remake gender relations at the business school...to change how students spoke, studied and socialized.” That project, which President Faust supported, was brilliant because it was both objective and constructive.

At a time when male-dominated STEM industries struggle to increase their number of women employees, Harvard’s attack on all-female clubs in the name of combating sexual assault, the ban’s original intent, defies logic. An all-female club can be a respite for young women, particularly for those who might have experienced sexual assault.

Forcing members of all-female clubs to confess membership and be punished has a chilling resemblance to McCarthyism and is anathema to the explicit right of people to peaceably assemble under the First Amendment. Stanford, my alma mater, like most major residential universities, struggles with sexual assault, yet they just added their eighth sorority to meet demand. If banning single sex clubs were based on logic and facts, and not prejudice and political correctness, surely Stanford would have followed Harvard’s lead.

HEATHER J. FURNAS, M.D.
Santa Rosa, Calif.

ENOUGH IS ENOUGH!!! Since the history of Harvard is being reviewed and revised within the current political mindset, I believe it is time to go a step further. Change the school’s name to, say...how about something like Obsequious University? This way no one will possibly be threatened or insulted by Harvard’s early history. After 380,

years it’s only appropriate! It is so reassuring to know that the current administration is always eager to support the current political ideologies.

STEVE VOSE A.L.M. ’10
Middlebury, Vt.

AS A DESCENDANT of the “staunch Puritan” Michael Metcalf (1578-1664) and several other early settlers of the Massachusetts Bay Colony, I am responding to the implicit challenge in *The College Pump* (“Puritans’ Passé?” July-August, page 68). Encouraged by William Pike’s letter in that issue and the letters in September-October, I offer the following alternative ending for “Fair Harvard” as an expression of my sentiments:

Let not passing correctness cause thee
to reject
The traditions that long have held fast.
Be the herald of Light and the bearer of
Love
While the stock of the Puritans last!

JAMES METCALF ’67
Wayland, Mass.

I WAS DEEPLY disappointed to hear that the Kennedy School withdrew its invitation to Chelsea Manning following pressure from past government officials. [See page 31.]

It would be bad enough if fear of displeasing the intelligence community inhibited Harvard from extending invitations to controversial persons. To rescind an invitation already extended is worse. Harvard has sent a clear message to the public and the government that those who offend the intelligence community will not be tolerated.

The Kennedy School has hosted foreign despots and U.S. officials whose actions have caused misery and death for millions around the world. Some have done things so widely condemned that they dare not travel to countries where they might come under the jurisdiction of the International Court of Justice, yet they find safe harbor in Cambridge. Is it the considered scholarly opinion of our premier school of government that Chelsea Manning’s actions are plainly more criminal or more damnable than those of Henry Kissinger [’50, Ph.D. ’54] or Hector Gramajo [M.P.A. ’91]? I understand that the experiences and perspective of such VIPs provide important additions to the campus discourse; while their presence at Harvard may offend me, I do not assume it means the Kennedy School approves their actions. Other readers may celebrate these men

and have different villains, but can doubtless find members of their own rogues’ gallery who have been invited to the Kennedy School.

U.S. universities and the federal government have a complex, interdependent relationship. Yet Harvard is among a handful of universities whose resources and reputation allow it to risk standing up to the government, costly as that could be. With this privilege comes responsibility to exercise it appropriately. It is a sad day when Harvard instead chooses to bow down.

DAVID FEURZEIG ’87
Huntington, Vt.

DEPARTMENT OF AMPLIFICATIONS

I WAS DISAPPOINTED to read “Anti-Aging Approaches” (Right Now, September-October, page 8), as it was one-sided and misleading.

Despite referencing (and misrepresenting) our company multiple times in the article, you did not reach out to us for comment. If you had talked to us, we would have shared the extensive scientific research supporting the potential benefits of nicotinamide riboside and pterostilbene. Furthermore, we conducted a double-blind, placebo-controlled clinical study of our product BASIS demonstrating that it increases and sustains nicotinamide adenine dinucleotide (NAD⁺) levels. The study is registered on clinicaltrials.gov for anyone to view.

Elysium Health is dedicated to improving lives by translating advances in science and technology into effective, scientifically-sound products that help people manage their health. We are working directly with the world’s leading scientists, clinicians, and academic institutions to progress our understanding of science. In fact, we entered a multi-year research agreement with Harvard to fund research projects focused on cellular function and other key modulators in the aging process—a fact you left out of your story.

As a Harvard graduate, I expected better from you. At the very least, we deserved the courtesy of being called for comment.

ERIC MARCOTULLI, M.B.A. ’12
Chief executive officer,
Elysium Health
New York City

Marina Bolotnikova responds: Elysium cites evidence that its product increases levels of NAD⁺ in the human body. But there is no

scientific evidence to date linking NAD+ to any health or anti-aging benefits in humans. The article (which was about anti-aging research at Harvard, not about Elysium specifically) pointed out that Elysium markets its product for its health benefits, despite the lack of evidence supporting this claim.

Editors' note. The story "Poetry, Voiced" (by Sophia Nguyen, July-August, page 32) focused on Frederick C. Packard Jr.'s pioneering audio collection, and the activities of the Woodberry Poetry Room's current curators. Readers curious about the institution's history, and in the collection and conservation efforts

of previous curators Jack Sweeney, Jeanne Broburg, Stratis Haviaras, and Don Share, can learn more at the Wood-



Visit harvardmag.com for additional letters.

berry Poetry Room's website (<http://hcl.harvard.edu/poetryroom/about/>), as well as in Haviaras's "Among Harvard's Libraries," published in the *Harvard Library Bulletin* (New Series Fall 1992, volume 3, number 3).

The sidebar, "Records, Rescued," stated, "In 2014, Woodberry Poetry Room successfully resurrected Ezra Pound's 1939 recording of *The Cantos*." More precisely, the project retrieved and digitized data from a disc containing Canto 56. For more about Pound's Harvard recordings, see the Woodberry Poetry Room's notes for its 2015 exhibition, "Not to be Played" (<http://woodberrypoetryroom.com/?p=1938>), or this magazine's coverage, "Pound, on the Record" (<http://harvardmagazine.com/2015/10/pound-on-the-record>).

And in other articles.... "Practicing My Purpose" (by Max Suechting, Montage, September-October, page 53) refers to songwriter Dan Wilson as having "written for or with many of the biggest names in pop," among them Joni Mitchell. Wrong pop star: the author meant to list Carole King.

The Harvard Portrait featuring Sunil Amrith (September-October, page 19) rendered the title of his professorship incorrectly. He is the Mehra Family professor of South Asian studies. Our apologies.

A photo credit accompanying the Vita profile of Carl Thorne-Thomsen misidentified the date for the image from the Lake Forest High School yearbook; the correct date is 1964.

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NEURAL NETWORK

A Rosetta Stone for Earthquakes

ISTANBUL, a city of 14 million people and a crossroads of cultural exchange dating back millennia, may also be where Turkey's next major earthquake strikes. Cities along the North Anatolian Fault, which stretches from eastern Turkey to the Aegean Sea, have experienced an advancing series of strong quakes during the past 80 years, beginning in 1939 when a devastating 7.8-magnitude rupture leveled the city of Erzincan and killed 33,000 people. Most

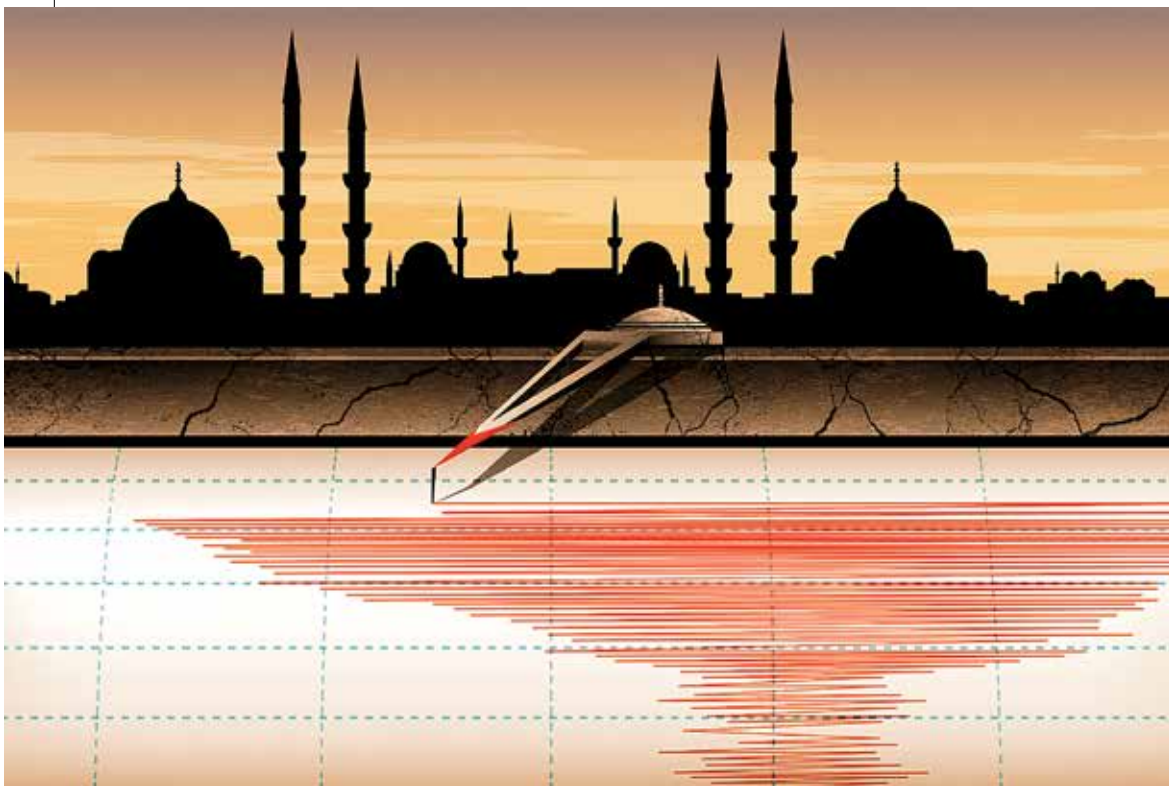
recently, in 1999, 7.4-magnitude quake near the city of İzmit left 17,000 dead and half a million homeless. A few months later, another shock hit Düzce, 60 miles away.

Brendan Meade, an applied computational scientist and associate professor of earth and planetary sciences, recently built a computer model of conditions in the North Anatolian Fault. His computer code—incorporating a massive amount of geodetic and seismic data, plus 2,000 years of recorded

earthquake history—simulated how stresses from one earthquake propagate from the epicenter and can eventually trigger other quakes. It also sought to explain the tectonic motions, perturbations, and strains observed in the North Anatolian Fault in the years before and after the massive İzmit quake. Meade and three collaborators calculated that, along the entire fault system, the fastest estimated slip-deficit rates and the strongest viscoelastic stress transfers from

previous quakes—both indicating higher earthquake risk—right now occur just 30 miles east of Istanbul.

Those calculations took 2.5 million central processing unit (CPU) hours to complete, and a supercomputer capable of running many CPU hours simultaneously. “We tried to make the code as efficient and fast as possible, and I think we did a good job,” Meade says. But still, “That’s a lot of CPU hours.” It would be useful, he and the others thought, to analyze other earthquake regions—the San Andreas Fault in California, the Kunlun in Tibet, the Alpine in New Zealand—but in order for that to be feasible, the calculation time would have



to speed up. So, Meade says, “we asked a neural network to do the work for us.”

With two graduate students, he built a small artificial neural network—a machine-learning system inspired by the neurons and synapses in the human brain that process and pass along information—and trained it to reproduce the results of his computer code. Instead of 2.5 million CPU hours and a supercomputer, the computations took less than five hours. That’s a 55,000 percent acceleration, one that could run on a laptop. Meade and his colleagues published their findings this year in *Geophysical Research Letters*.

The catch is this: Meade doesn’t yet understand exactly how his neural network’s computations operate. In neural networks, this is often the case. But in that mystery, he says, lies the promise for science. “The neural network we built has come up with some representation of what our computer code does,” he explains. “But it doesn’t necessarily use the same functions that we’ve used,” ones with names and known mathematical properties. Instead, the neural network—which Meade trained using his trove of earthquake data and the end calculations his computer code yielded—can develop its own, much more computationally efficient, functions for getting from A to B. “In other words,” he says, “neural networks may be a tool for discovering functions that we haven’t gotten around to identifying and naming yet.” By “interrogating” the network after the fact, scientists can pick apart those nameless functions and learn from them. “This is an incredible tool for discovery,” Meade says. The goal is to start mapping the links between classical mathematics and as-yet undeciphered functions he and others are learning from neural networks: “Essentially, to create a Rosetta Stone.”

But the promise is more than just faster ways of completing calculations that scientists already understand; neural networks, he believes, may help decode complex natural systems whose underlying dynamics right now seem too messy or irregular for scientists to model effectively. Biology abounds with these conundrums, Meade says. So do the earth sciences. “When you think about fields that maybe aren’t as ‘clean’ as classical physics—the interaction between different parts of the environment, or within climate systems, or how the function of tectonic plates leads to earthquakes and builds mountains—we have lots of observations and data about these things,” but little ability to accurately predict how altering one element in a



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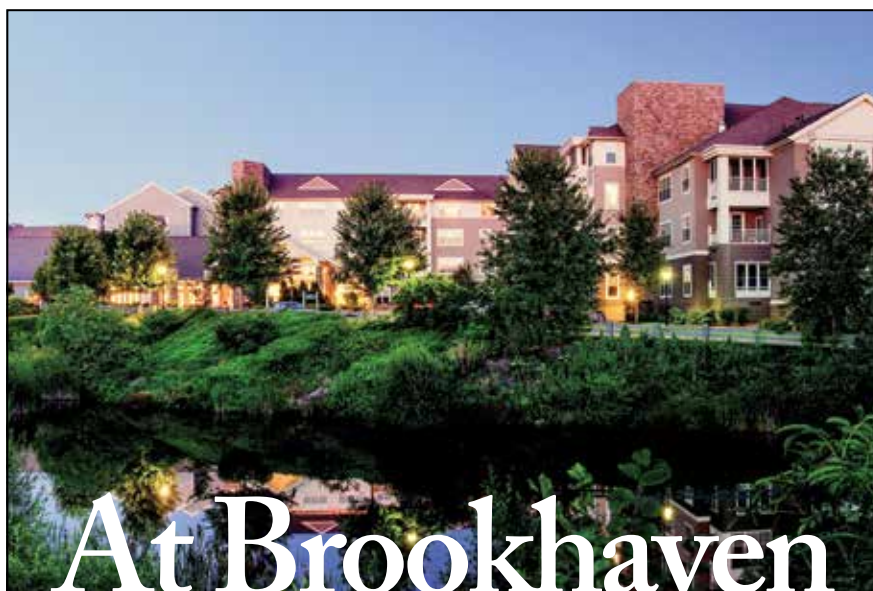
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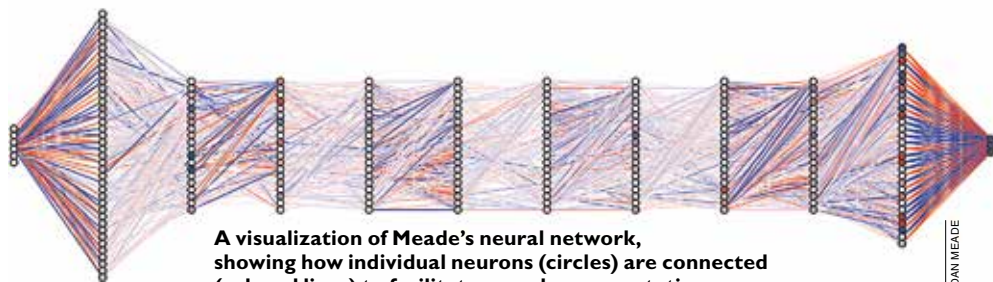


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system of millions or billions might change a single output. Neural networks offer the prospect of making those predictions, Meade says, “even if we don’t understand the entire system at first.” That’s because, by processing data much faster and more efficiently than is otherwise possible, neural networks can spot previously invisible patterns and trends that current scientific models have had no way to identify and represent. “That’s truly the deep power of neural networks and artificial intelligence,” he says. “We have a tool now that can suggest new ideas to us. When we don’t know what to do, neural networks can give clues to a way forward.”

And Meade’s next step forward? He has recently turned his attention to a growing number of studies that attempt to identify *precursors* to earthquakes. Although scien-



A visualization of Meade's neural network, showing how individual neurons (circles) are connected (colored lines) to facilitate complex computations.

tists can tell with some accuracy *where* earthquakes are most likely to happen, it remains notoriously impossible to predict *when* one will strike. The studies conducted during the past decade have been confined to single earthquakes and small collections of isolated data, Meade says, but he wonders if neural networks might help scientists uncover broad and robust correlations that might

help a city like Istanbul forecast and prepare for a quake. “The question now,” he says, “is whether we can assemble data sets that are large enough and coherent enough that we can go after the earthquake-prediction problem in earnest.” —LYDIALYLE GIBSON

BRENDAN MEADE WEBSITE:

<https://summit.fas.harvard.edu>

PROTEIN PAUCITY

Climate Change and Crops

NORTH AMERICANS GET most of their protein from animal-sourced foods, but most of the world relies on a handful of staple crops like wheat, rice, and corn. Cli-

mate change may alter the nutritional value of those crops, creating significant health risks, particularly in places where protein deficiency is already a problem (about 660 million people worldwide are affected).

By 2050, a new study projects, 148 million more people, equivalent to 1.6 percent of the world’s projected population, will be at risk due solely to the impact of carbon dioxide on nutrients. More than a third of them live in India, where the population depends heavily on rice for protein; nations in sub-Saharan Africa and South America would also be seriously affected. The study, says senior author Samuel Myers, a principal research scientist at the Harvard T.H. Chan School of Public Health (HSPH), exemplifies an emerging field—planetary health—which has grown from the observation that

“human activity is disrupting our planet to such a degree that it’s coming to be a primary driver of global health.” He directs the Planetary Health Alliance at HSPH.

The study, co-authored by Danielle Medek, a former fellow at the University Center for the Environment, and professor of environmental epidemiology Joel Schwartz, builds on Myers’s 2014 meta-analysis of 143 different comparisons of staple crops, which found that climate change could significantly alter their nutritional value. That research, published in *Nature*, showed that carbon dioxide levels of about 550 parts per million (the current level hovers around 400 PPM) reduced the iron, zinc, and



Pakistanis eating rice, a staple crop and major source of protein in South Asia.

A MAJEED/AP/GETTY IMAGES

protein content in six staple crops grown over 10 years on three different continents. Protein levels decreased by 6.3 percent in wheat, and 7.8 percent in rice. “That means for exactly the same number of calories from rice, you’ll get less protein,” Myers explains—and more carbs.

The team applied those findings to a database published by Myers and colleagues last year that estimated the per-capita intake of foods among nearly all the world’s population. (Myers considers it “the most comprehensive dietary database in the world.”) This allowed them to estimate how many people could become protein deficient when atmospheric CO₂ reaches 550 PPM. But for every new person who will drop below the minimum protein requirement, Myers stresses, “there are four to 10 times more who are *already* deficient, and whose deficiencies are going to be made worse....In many instances having a mild deficiency is nowhere near as bad as having a moderate or severe deficiency.”

The study’s basic assumption, that people’s diets will remain exactly the same for the next three decades, might seem unrealistic, Myers acknowledges. But, he says, there are two narratives about how economic development and climate change will influence those diets. One predicts that nutrition will improve as developing countries become richer; the other, that food production will be unable to keep pace with rapid global population growth and constraints on natural resources. Because versions of both narratives are likely to prove true in different locations, keeping the data on food consumption constant allowed the team to isolate the effect of CO₂ itself. “You can decide as a reader,” Myers adds, “whether you think this is an underestimate or overestimate.”

The researchers still don’t know what causes the changes in plants’ nutrient profile, he explains, because the original experiments on crop nutrients under different CO₂ levels weren’t designed to uncover the mechanism. The simplest explanation, says Medek, a plant physiologist, is carbohydrate dilution: at higher levels of CO₂, plants absorb carbon from the air and produce starches more efficiently, which might “dilute out” other nutrients. But the 2014 meta-analysis tested for levels of many different nutrients—selenium, boron, and others—in the crops grown throughout the test period and found that their concentrations didn’t

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decrease at similar rates; some of them even *increased*, suggesting that a more complicated process—perhaps in addition to carbohydrate dilution—is going on.

Whatever the underlying mechanisms, the changing composition of crops might pose a risk not just to low-income countries, but to the developed world, too. The researchers cite evidence that increasing the ratio of carbs to protein in North American diets is linked to higher blood pressure and a higher risk of heart disease. Though that

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Extreme-weather Evolution How the 2013-2014 polar vortex produced rapid evolution in lizards. harvardmag.com/anoles-17



PICCOLI/MAGNET/ WIKICOMMONS

link is still speculative, Myers says, it suggests that more work is needed on the health impact of higher-carb diets in the West—and that changes in staple-crop nutrition could pose a challenge that goes beyond global malnutrition, to affect human health in other ways even as the world gets richer.

—MARINA BOLOTNIKOVA

SAMUEL MYERS WEBSITE:
environment.harvard.edu/about/faculty/samuel-myers

GUILT BEGONE

Cashing Out for Happiness

ANYONE WHO’S INDULGED in retail therapy can affirm that money can’t buy happiness—but according to new research from Harvard Business School, money *can* make people happier when they spend it to buy *time*. Assistant professor of business administration Ashley Whillans has found that, in developed countries, people across the socioeconomic spectrum who trade money for time—by choosing to live closer to work, or to hire a housecleaner, for example—*are* happier.

“People have been trying to find ways to use their discretionary income to maximize their quality of life for a long time,” Whillans says, citing extensive research that confirms the positive emotional effects of taking vacations and going out to the movies. “We were really interested in seeing if buying ourselves *out* of negative experiences might be another pathway to happiness that had been relatively unexplored.”

According to the researchers, two key

components of happiness make up people’s subjective sense of well-being: how they describe their life on the whole; and how satisfied they feel in the moment, which the researchers measured by checking in with participants on the day of a given experience. Feelings of “time stress”—more common among the wealthiest individuals—also affect happiness. Higher-earners feel that every hour of their time is more financially valuable, and when something is perceived as valuable (like water in a desert, Whillans says), it is also perceived as more scarce. That scarcity translates into time stress, which can easily contribute to unhappiness.

To assess the impacts of buying one’s way out of negative experiences, the team surveyed residents of the United States, Canada, Denmark, and the Netherlands, ranging from those who earned just \$30,000 per year (but reported that their basic life needs were being met) to middle-class earners and



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millionaires. Study participants in Vancouver, for example, were given \$80: half to be spent on a service that would save one to two hours, and half to be used for a material purchase, like clothing or jewelry. After making a time-saving purchase—take-out food proved the most popular item—participants were more likely to report positive feelings and less likely to report feelings of time stress than after their shopping sprees.

Whillans did identify a caveat, however: recurrent time-saving purchases can eventually lead to complacency, which threatens future satisfaction from more such purchases. To minimize this “hedonic adaptation,” she suggests consciously filling those one to two saved hours with an activity people would otherwise not have time for. This creates an internal transaction in which the decision to get take-out rather than cook, for example, affords an hour or two for a pleasurable activity instead.

People who repeatedly report having positive daily experiences, Whillans found, are more likely to seek out the kinds of relationships and activities that, over time, can lead to higher life satisfaction. Conversely, a person who deals with repeated stressors is less likely to have the mental and emotional resources for happiness-enhancing activities and socializing. The theory helps to explain why working single mothers, in particular, are likely to benefit from time-saving purchases, which offer them a way to obtain social support through the market economy that might otherwise be supplied

by a partner who shares household chores or grocery shopping.

In Canada and the United States, where busyness is often flaunted as a status symbol, outsourcing tasks such as cooking and cleaning can be culturally challenging—people like to pretend they can do it all, Whillans admits. Women in particular find themselves stuck with a “second shift,” returning from work to housekeeping chores and child-care. As a consequence, Whillans explains, women “have more educational opportunities than before, and [are] likely to be making more money and holding high-powered jobs,” but their happiness is not increasing commensurately. Continuing research in collaboration with Brierley professor of business administration Michael Norton will explore the role of gender in making time-saving purchases, and its influence on relationship satisfaction and chore division at home. “The initial evidence,” she says, shows that among couples who buy time, “both men and women feel less pulled between the demands of work and home life, and that positively impacts the relationship.”

She hopes her research will ameliorate some of the guilt both women and men may feel about paying a housekeeper or hiring someone to mow the lawn—or ordering Chinese takeout on Thursday nights: after all, the benefits are quantifiable. —OSET BABÜR

ASHLEY WHILLANS WEBSITE:

www.hbs.edu/faculty/Pages/profile.aspx?facId=943704

PUTTING YOUR GIFTS TO WORK



“When I was a freshman, I didn’t comp the *Crimson*, thought of myself as a relatively shy person, and generally assumed that journalism was just something that ‘other people’ did. I liked writing essays, though, and my Expos preceptor suggested that I might be interested in applying for a position as an undergraduate columnist as one of *Harvard Magazine*’s Ledecky Fellows. Not only did I get the privilege of learning how to think out loud and write for an audience, I also had the opportunity to

learn to do something I’d never have imagined: interviewing, reporting, and writing journalism. Little did I expect that I’d get to talk with E. O. Wilson about ants, cover an academic conference at the Radcliffe Institute, or pitch and follow through on my own ideas for stories. The generosity of the **Ledecky Fellowship** dramatically changed both my time at Harvard and my sense of what I’m capable of doing as a writer—and it also showed me the truth of a certain old but valuable piece of advice: that some of the most important experiences you have in college are the ones you never expect.” — Spencer Lenfield ’12



“Ten years from now, I will probably have forgotten many of the things I learned sitting in Harvard’s classrooms. But what I will remember, and continue to benefit from, are the skills and knowledge that I acquired through writing about the University as the **Steiner Undergraduate Editorial Fellow** at *Harvard Magazine*. Ten weeks of working alongside superb editors who respected my opinions, dispensed useful advice, and gave me the freedom to explore has fundamentally

changed how I write and how I think about writing. On a technical level, I learned to omit needless words, to make good judgments about hyphens, to edit and reedit fastidiously, to bring commas inside quotation marks, to paraphrase un compelling quotes, and to never end a paragraph with ‘he said.’ From now onwards, whenever I need to make an editorial decision, I will ask myself: What would my editors at *Harvard Magazine* do?” — Zara Zhang ’17

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Tower Hill Botanical Garden, in Boylston, Massachusetts, puts on a festival of lights

From left: Tower Hill holiday lights; a scene from William Wellman's *Wings*, screening at the Harvard Film Archive; a performance of the ancient South Indian art form Kudiattam Sanskrit Theater, presented by the Harvard Department of Music

outside, among its formal gardens and sculptures. Inside are nature-inspired gifts, an igloo made of recycled goods, and two conservatories filled with subtropical plants that offer hope of spring's eventual return. (November 24-January 7)

Ceramics Program Holiday Show and Sale

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Works by more than 50 artists—from mugs to jewelry to garden ornaments—are on display in this annual show. (December 7-10)

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The Legends of William Wellman celebrates the versatile early Hollywood director. The line-up include *Wings* (1927), *Public Enemy* (1931), *A Star is Born* (1937), and *Good-bye, My Lady* (1956), which offers one of the top canine performers ever to grace the screen. (Through November 26)

Shuji Terayama, Emperor of the Underground. The writer, photographer, sports critic, cultural agent provocateur, and film director hugely influenced postwar Japanese avant-garde cinema. The archive calls Terayama's best-known film, *Emperor Tomato Ketchup*, "a mesmerizing fever dream that follows the strange adventures of a child king wandering through his anarchic kingdom." (November 3-27)

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www.americanrepertorytheater.org

Sense and Sensibility. Eric Tucker's innovative production of Jane Austen's novel explores the age-old question: at what price do we follow our hearts? Loeb Drama Center. (December 10-January 14)

A.R.T. Institute alumnus Dmitry Troyanovsky directs a cast of its current students in E.B. White's timeless tale, **Charlotte's Web**. Loeb Drama Center. (December 17-January 7)

NATURE AND SCIENCE**The Arnold Arboretum**

www.arboretum.harvard.edu

Forest therapy guide Tam Willey, who is completing her practicum at the arboretum, takes a group on a "**Forest Bathing**" excursion to practice (and explain) *Shinrin-yoku*,

an essential aspect of wellness and preventive health care in Japan. (November 18)

LECTURES**Radcliffe Institute**

www.radcliffe.harvard.edu

"Hidden in Plain Sight: Family Secrets and American History," with panelists/writers Gail Lumet Buckley, Susan Faludi '81, RI '09, and Alex Wagner, is moderated by Harvard Law School's Warren professor of American history, Annette Gordon-Reed. Knafel Center. (November 16)

Mahindra Humanities Center

www.mahindrahumanities.fas.harvard.edu

Prasenjit Duara, professor of history and East Asian studies at Duke, addresses "Spiritual Ecologies: Sustainability and Transcendence in Contemporary Asia" in **The Environment Forum**. Tsai Auditorium. (November 16)

The Tanner Lectures on Human Values

series features lawyer Bryan Stevenson, J.D.-M.P.A. '85, Sc.D. '15, founder and executive director of the Equal Justice Initiative

**WHY I JOINED THE HARVARD CLUB OF BOSTON**

There are many different reasons to join the Harvard Club of Boston. Christopher Cleveland is a Harvard College alum and currently a PhD Candidate in Education Policy and Program Evaluation at Harvard Graduate School of Education. Here's why he joined.

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-Christopher Cleveland '14



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HARVARD SQUARED

and author of *Just Mercy*; a panel discussion will follow. First Parish in Cambridge. (December 7)

MUSIC

Kudiyattam Sanskrit Theater

www.music.fas.harvard.edu

The Harvard Department of Music presents a rare chance to experience the traditional music and dance art form, performed by the South Indian troupe Nephathya. Agassiz Theatre. (November 9)

Harvard-Radcliffe Chorus

www.harvardchoruses.fas.harvard.edu

J.S. Bach's cantata "Ein feste Burg ist unser Gott" and Mass in G Major top the program. Sanders Theatre. (November 17)

Harvard-Radcliffe Orchestra

www.harvardradcliffeorchestra.org

The **Winter Concert** includes works by Leonard Bernstein, Claude Debussy, and Dmitri Shostakovich. Sanders Theatre. (December 2)

An Evening with Chris Thile

www.harvardboxoffice.edu

The premier mandolin-player (and host of National Public Radio's *Prairie Home Companion*) performs classic and original compositions. Sanders Theatre. (November 21)

Capitol Steps

www.harvardboxoffice.edu

Orange Ain't the New Barack. The veteran satirical songsters lampoon the latest events in American politics. Sanders Theatre. (November 25)

EXHIBITIONS

Johnson-Kulukundis Family Gallery of Byerly Hall

www.radcliffe.harvard.edu

Feminist Archaeology, an interdisciplinary project by New York City-based artist Jennifer Bornstein, RI '15, explores historic and diverse strains of feminism that are not always aligned. (November 15-January 20)

Harvard Semitic Museum

www.semiticmuseum.fas.harvard.edu

New fabricated casts by museum curators and Harvard students reveal how ancient kings commemorated military and civic triumphs in **From Stone to Silicone: Recasting Mesopotamian Wall Carvings**. (Opens December 16)

Ethelbert Cooper Gallery at the Hutchins Center

www.coopergalleryhc.org

Wole Soyinka: Antiquities Across Times and Place highlights ancient African artifacts collected by the Nobel Prize-winning Nige-

STAFF PICK: Antique Treasures

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More than 100 dealers proffer treasures ranging from under \$100 to well over \$100,000. Appraisers are on hand, and a panel discussion can help guide those new to the passion. Christine Nelson, curator at the Morgan Library & Museum, in New York City, lectures on "Of Books and Wild Beasts: Thoreau's Wilderness Library," and sleight-of-hand artist Ricky Jay reveals his own acclaimed stock of books and other materials related to "Magicians, Cheaters, & Remarkable Characters."

~N.P.B.



Boston International Antiquarian Book Fair
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rian playwright, activist, and author.
(Through December 21)

Carpenter Center for the Visual Arts

<https://carpenter.center>

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Harvard Art Museums

www.harvardartmuseums.org

The Art of Drawing in the Early Dutch

Golden Age, 1590-1630: Selected Works from the Abrams Collection highlights groundbreaking approaches to rendering landscapes and nudes, among other subjects. (Through January 14)

Addison Gallery of American Art

www.andover.edu

Invisible Citings: Elaine Reichek and Jeanne Silverthorne. Sculptural works and embroidery explore the lasting, or ephemeral, place of text, paper, and images in the age of screens. (Through December 31)

POETRY

Woodberry Poetry Room

www.hcl.harvard.edu/poetryroom

A Provocation: Poetry in the Age of Mass Incarceration features Joshua Bennett, Reginald Dwayne Betts, Jill McDonough, Christopher Soto, and Jackie Wang. (November 8)

The Artifactual Consciousness. Authors (and siblings) Alexandra Zapruder, Ed.M. '95 (*Twenty-Six Seconds: A Personal History of the Zapruder Film*) and Matthew Zapruder (*Why Poetry?*) discuss what differentiates knowledge from information, and how each is dispersed. (December 5)

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



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Spotlight



“Mark Dion: Misadventures of a 21st-Century Naturalist,” at The Institute of Contemporary Art (ICA), is the first U.S. survey of the conceptual artist’s oeuvre. More than 20 sculptures and installations feature several hundred objects—from plant and animal specimens to books, vintage photographs, and trash—that he’s collected from around the world. Evoking curiosity cabinets for modern times, the works merge art and scientific inquiry to explore how humans perceive, interact with, and control the natural world. (They also offer prime “I spy” treasure hunting for younger museum-goers.)

Institute of Contemporary Art

www.icaboston.org

Through December 31

Making Global Local

Greater Boston's international cultural centers strive to enlighten.

by NELL PORTER BROWN



“OUR LIBRARY has 30,000 volumes and a children's room, we hold 50 to 60 events a year—wine tastings and cooking demonstrations, discussion groups, and concerts,” Barbara Bouqueneau, executive director of the French Cultural Center, said while leading a tour around the 1860s Beaux Arts-style Back Bay mansion that has housed the center since 1945.

There's a new “Behind the Scenes” fashion series kicking off on November 16 with a cocktail reception, fashion show, and guest speakers, and the annual *Marché de Noël*—quality nibbles, stylish gifts—on December 9. “And,” she notes, “we teach French to 700 students a year, starting from age one, until you can't take it anymore.”

The center is among many such interna-



Clockwise, from upper right: Cooking lessons, a discussion with guest speakers, and the children's library at the French Cultural Center; German class and a festive dinner at the Goethe-Institut; and workshops in traditional art forms at the Turkish Cultural Center of Boston.

tional educational organizations in Greater Boston—the Iranian Association of Boston, the Irish Cultural Centre of New England,

ALL IN A DAY: Historic-ish Holidays

The colder months might be the ideal time to visit Old Sturbridge Village. The craftspeople—blacksmiths, tanners, potters, and coopers—ply their trades as other costumed interpreters bring early American history “to life,” yet the crowd of visitors has thinned. What’s more, Thanksgiving is celebrated throughout November, and for Christmas, there are carolers, Yule logs, roast-chestnuts, and candlelit tours.

The museum, an hour’s drive from Cambridge, highlights daily life in New England communities between 1790 and 1840. Even then, Thanksgiving was a big deal. “The Puritans and their descendants didn’t celebrate Christmas, so this was the time people got together,” says village communications director Michael Arnum. Visitors can watch preparations for feasts of turkey, and meat or squash pies.

Two new exhibits are also open during November. “Armed & Equipped: Firearms and the Militia in New England, 1790-1840” highlights the village’s collection of weaponry, uniforms, and other artifacts. “Planned, Grained, and Dovetailed: Cabinetmaking in Rural New England” delves into the critical nineteenth-century industry through woodworking tools, techniques, and stories of prominent woodworkers, like Samuel Wing and Tilly Mead. Rare furniture is on display, along with cradles, coffins, drumsticks, boat frames, and beds.

That Puritan disdain for Christmas—not always celebrated as a Christian holiday back then, and often marked by drunkenness and dancing—prevailed in some semblance through several generations, slowly softening by the 1820s. (December 25 was officially named an American federal holiday in 1870.)



Celebrating Thanksgiving at Old Sturbridge Village (above and at right); horse-drawn carriages and “villagers” are on hand for Christmas By Candlelight events.



But Old Sturbridge Village fully decks the halls in December, resembling more of a Victorian town. It’s open Friday through Sunday, from 3 until 9 P.M., and the whole community is lit only by electric candles and strings of outdoor tree lights. There’s live music, along with horse-and-carriage rides, sing-alongs, children’s games, holiday food, a gingerbread-house contest, and traditional craft workshops. A model train set chugs along tracks in one gallery, and a miniature-sized “Little Town of Bethlehem” is on display at the Quaker Meeting House,

where guides read the story of Christmas. They also lead village tours and talk about how modern Christmas traditions developed. Roasting chestnuts, for example, was already popular by the 1830s, but caroling came in later, says Arnum. “We also have a nightly tree-lighting ceremony—and, of course, Santa.” ~N.P.B.

Old Sturbridge Village
www.osv.org



the Japan Society of Boston, the Dante Alighieri Society of Massachusetts, the Turkish Cultural Center of Boston, and the

Goethe-Institut, among them—that serve a wide audience, from expats and visiting professionals to scholars and foreign-culture ‘philes.

The larger organizations all offer a range of public activities focused on arts and culture, food, holiday celebrations, history, and current events most often aimed at preserving or promoting cultural heritage. They can also help supplement academic programs in the region and independent learning, from the elementary grades through adulthood.

“Our purpose is to connect Japan with Boston, for friendship, mutual understanding, and learning,” says Matt Krebs, executive director of the Japan Society. That includes working with local Japan scholars and language teachers, or university students and administrators developing trips to Japan, and reaching out to the Japanese expat community. There are monthly brown-bag lunches with speakers at the society’s Boston office, and anyone can subscribe to the society’s bimonthly newsletter, which lists its own and other Japanese-related events around the region. On November 7, at Harvard, the society is co-presenting a lecture, “Japan’s Trade Strategy in an Age of Protectionism,” by Japanese diplomat Yoichi Suzuki, a visiting fellow at the University’s Weatherhead Center for International Affairs.

The Turkish Cultural Center of Boston, on Commonwealth Avenue in Allston, strives to foster cross-cultural awareness. Its classes—Turkish, cooking (from baklava to kebabs), and art (*ebru*, or paper marbling, and *çini*, ceramic painting)—are typically geared to Americans. “In one year we have more than 4,000 students, and only about 50 of them are Turkish-Americans,” says center manager Olsen Turan. Unless they are learning the language, he says of the latter group, they “don’t want to take these classes

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CURIOSITIES:

Getting High at Houghton

Houghton Library is letting it all hang out. “Altered States: Sex, Drugs, and Transcendence in the Ludlow-Santo Domingo Library” offers pornographic comics and French erotica, along with glimpses of psychoactive drug use by Thomas De Quincey and Samuel Taylor Coleridge through their books and letters. Or, attend the show just for the sensational graphics for pulp-fiction books like *Marijuana Girl* and *Hippie Sex Communes*.

The 120 objects on display through December 16 are from private collector and jet-setter Julio Mario Santo Domingo, who died in 2009. Over many years, he amassed more than 100,000 items reflecting a range of fascinations: drugs, social taboos, sexuality, counterculture rebellion, nineteenth-century French culture and literature, the occult, and “the juxtaposition of ‘high’ and ‘low’ cultures,” says show organizer Leslie A. Morris, curator of modern books and manuscripts. “He was very rich and he collected everything, not just from the 1960s and 1970s in America. He was interested in botany, how poppies were grown, the medicinal uses, legal constraints.” Still, she believes it’s the first time Houghton has posted a “parental discretion” disclaimer at the door.

Harvard received more than 50,000 of the items in 2012 and dispersed them, by subject, among several of its libraries. A separate exhibit of Santo Domingo materials at the Schlesinger Library, “Altered Gazes: Sex, Drugs, and Rock & Roll” (October 2-January 19), explores women’s roles in making and using counterculture products.

The Houghton exhibition reflects the unwieldy scope of the original collection and takes a broad view of humans’ age-old search for a “high”—something, anything, that’s more enticing than quotidian life. *Orgy Town*, a 1961 paperback, promises “a wild weekend of jazz and junk in a hot-bed of sex.” A section on cocaine includes the decadent-looking collector’s edition of *Snowblind*, by Damien Hirst, Howard Marks, and Robert Sabbag; it features mirror covers, an AmEx card to cut the nose candy, and a dollar bill rolled up for snorting it. These objects, and the early cartoons of super-sized sex organs and hyperbolic public campaigns against drug use seem funny, in hindsight.

Morris balances the human urge toward excess with the realities of sexual exploitation and addiction. There’s a haunting photograph of a prostitute in an 1892 diary by French poet and writer Pierre Louÿs that details his sex life. Dutch artist Ed van der Elsken’s *Amsterdam?* (1984) captures a junkie shooting up. In a letter to his publisher, De Quincey, author of *Confessions of an English Opium-Eater* (1821), notes his dependence on laudanum. “I never know at present for a minute that tranquility which you and most men know constantly... most men in my situation would have committed suicide long ago.”

—N.P.B.

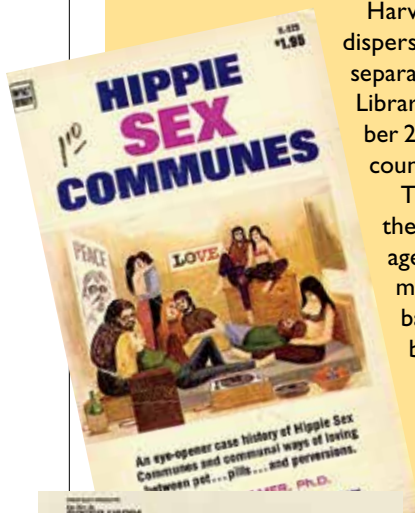


variety of activities, events, and programs, which promote and showcase Irish culture” across the region.

In addition to the Boston Irish Festival, held every June, it offers classes in Irish language and history, and music and dance (tin whistle, fiddle, *bodhrán*, and accordion; and set dancing and percussive stepping), along with dramatic performances and readings of Irish plays and books. For sports enthusiasts, there are summer games (hurling and Gaelic football) played through the Northeast Division of the Gaelic Athletic Association. And the pub on site, open on weekends, features traditional Irish sessions on Friday nights.

For German language and culture, the Goethe-Institut Boston has been around since 1967. Its historic Back Bay townhouse closed for renovations at the end of September, to reopen next summer, but a full lineup of language classes and events is being held elsewhere, according to cultural program curator Karin Oehlenschläger.

The organization has strong ties to Boston’s artistic and academic communities, and regularly sponsors lectures, book and film gatherings, philosophical talks, and culinary events. Gatherings this fall included an art exhibit and a panel discussion of the ramifications of the German elections. On November 5, as part a continuing German film series at the Coolidge Corner Theatre in Brookline, rising director Julia Langhof will be on hand for a screening of her movie *LOMO: The Language of Many Others* (2017), about an adolescent boy grappling with questions of identity.



Houghton Library
www.hcl.harvard.edu



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The Iranian Association of Boston, based in Watertown, runs Farsi classes as well as popular holiday gatherings. Students range from curiosity-seekers and those studying the Middle East to Iranian-American children “whose parents want them to understand the Persian/Iranian traditions,” says center president Saeed Pirooz.

The nonprofit association was established in 1989 specifically as a nonreligious, non-political group to “promote Iranian cultural exchange,” he says. Anyone can attend events. “The only things not welcome,” he adds, “are any kinds of religious or political statements, or agendas. IAB is not the venue for those discussions. The focus is on culture and art.”


**“Folk-dancing
Iranians are loud and
fun,” he says,
cheerfully. “And they
try to really have
a good time at parties.
Everyone gets
out on the floor.”**

October marked Mehregan, a harvest festival featuring Persian-related poetry and live traditional music, he says. Participants can share poems they love, recite their own, or just come to listen and enjoy Persian food. (There are at least five year-round places for Persian fare in Watertown itself: Molana Restaurant, Shiraz Persian Cuisine, Tabrizi Bakery, Roksana's, and Dizin FruttiBerri ice cream.)

On December 16, the association hosts a Yalda Night party to celebrate the longest night of the year. “There are discussions about what families do on this holiday, what kinds of foods are eaten—food is a huge part of the culture, and I think it's the best-tasting food, it was [developed] over thousands of years. But I may be biased in that,” he says. There's also music and dancing. “Folk-dancing Iranians are loud and fun,” he says, cheerfully. “And they try to really have a good time at parties. *Everyone* gets out on the floor.”


—NELL PORTER BROWN

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TASTES & TABLES: Bites from Eastern Europe

Behind a sunny storefront in Newton is Greater Boston's premier (if not only) Moldovan restaurant. That country is not much bigger than the state of Massachusetts, but offers a more robust culinary heritage.

Foods and flavors of neighboring Romania and Ukraine, as well as Turkey and Russia, show up on the menu at the Moldova Authentic Restaurant: lamb kebabs and stewed chicken, cabbage salad, stuffed grape leaves, pickled vegetables, and homemade noodles topped with butter and feta cheese. (Appetizers, \$6.45-\$11.45; entrées, \$16.45-\$24.95.) And for dessert? Cherry crêpes topped with whipped cream (\$9.95).

Owners Artur and Sandra Andronic immigrated to the United States a few years ago, and ran an Italian restaurant before moving on—or back—to familial fare.

They're keen on cultural exchange. The dining room displays rosy images of Moldovan hills, flowers, and farmland. A black-and-white map of Europe

shows the country, shaped like a baby bootie, in red. Some diners may need reminding that the Principality of *Moldavia* was part of the Ottoman, and then the Russian, empires, but that *Moldova* (the poorest nation in the European Union) was established in 1991 upon the dissolution of the USSR.

The restaurant fits right in with the Nonantum neighborhood's mix of unique stores. Before eating, check out the modern home accouterments at Greentail Table, the perfumes, soaps, and mus-tache wax at Colonial Drug (the relocated Harvard Square mainstay), and the cream puffs at Antoine's Pastry Shop.

Moldova
671-916-5245
tastemoldova.com

Moldova is open all day. On a winter afternoon, housemade fruit punch, coffee drinks, or a glass of wine or beer pairs well with any of the appetizers—chicken and mushroom crêpes, chicken noodle soup—or try the traditional *plăcinte la tigăie* (pan-fried pie) stuffed with apples: all evidence that big tastes turn up even in small places. ~N.P.B.



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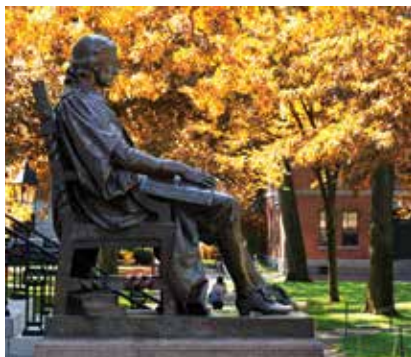
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| 11/24-12/31 | Sparklefest |
| 11/25 | Tree Lighting at the Charles Hotel |
| 12/9-11 | 11th annual "Everyone Loves Latkes" |
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JOHN HARVARD'S JOURNAL

Mastering the “Hidden Curriculum”

How some colleges help first-generation and low-income students succeed

A NEW STUDENT heard a classmate mention choosing a gift from a bridal registry for a friend. “What the hell is a bridal registry?” she wondered. As she tried to choose courses, she had to visit the library to explore what unfamiliar subjects *were*, before registering—painfully aware that fellow freshmen “had gone to high schools that sounded more like mini-colleges, with library buildings of their own and sophisticated electives” and AP courses that enabled them “to leapfrog ahead” of her introductory selections. “Maybe I just wasn’t as smart as they were?” She certainly wasn’t as moneyed, as the weekly letter from her grand-

mother, containing a dollar bill, reminded her. Over time, she recalled,

I came to accept during my freshman year that many of the gaps in my knowledge and understanding were simply limits of class and cultural background, not lack of aptitude or application as I’d feared. That acceptance, though, didn’t make me feel less self-conscious and unschooled in the company of classmates who’d had the benefit of much more worldly experience. Until I arrived...I had no idea how circumscribed my life had been, confined to a community that was es-

entially a village in the shadow of a great metropolis....I was enough of a realist not to fret about having missed summer camp, or travel abroad, or a casual familiarity with the language of wealth....The agenda for self-cultivation that had been set for my classmates by their teachers and parents was something I’d have to develop for myself.

That was at Princeton in 1972, as Sonia Sotomayor depicted her student self in her memoir, *My Beloved World*. Develop herself she clearly did: she is now an associate justice of the U.S. Supreme Court.

Four decades later, at Princeton or almost any other elite college, Sotomayor’s experience likely would have unfolded similarly. Having diversified their student bodies by race, gender, ethnicity, and nationality since



THE OLD MADE NEW. Winthrop House, renovated and expanded, welcomed undergraduates back this fall. Those who still read books have a gorgeously refreshed library in which to do so. House amenities include this new rooftop terrace, and an extended terrace in the refurbished Gore Hall courtyard. The contractors have moved on to Lowell House, where the renewal will take two years (students are in swing spaces now; see *Brevia*, page 34, on the diaspora). Consult harvardmag.com/new-winthrop-17 for a full Winthrop tour.



the 1960s, highly selective universities began scrambling to address the one glaring omission that remains. After largely outsourcing the education of low-income and first-generation students to public institutions, they have made stronger efforts during the past decade to enroll academically strong students whose family incomes and K-12 preparation resemble Sotomayor's—far from the resources available in America's best suburban systems and prep schools. And most recently, these elite institutions have begun to recognize that gaining admission is only the *first* challenge many such students face.

Although first-generation and low-income status often overlap, not all FLI undergraduates (to use Princeton's acronym) have come from under-resourced secondary schools. Anthony Jack, a Junior Fellow who will join the Harvard Graduate School of Education faculty, distinguishes those who attended superb magnet schools or won

scholarships to, say, Exeter, from those who did not (see "Aiding the 'Doubly Disadvantaged,'" September-October 2016, page 11). But beginning undergraduates who attended the weakest public schools, urban and rural—lacking AP courses or calculus, science labs or instruction in writing—may now find even greater disparities than Sotomayor encountered. That is another reflection of widening American socioeconomic inequality in the intervening decades (see "The College Chasm," page 50).

The best evidence that Sotomayor's anecdotes resonate today comes from Rachel L. Gable, Ed.D. '16, in her doctoral dissertation, "Pathways to Thriving: First- and Continuing-Generation College Student Experiences at Two Elite Universities." Forty years after Sotomayor's affirmative-action cohort,



Rachel L. Gable

Gable surveyed Harvard and Georgetown sophomores about their academic preparation compared to peers'. First-generation students were more than *twice* as likely to feel less prepared than continuing-generation students (with college-educated family members). And by their senior year, after encountering higher-level concentration courses and independent work, that gap *widened*: 57 percent of first-gen students felt less prepared than peers, versus just 20 percent among the continuing-generation cohort.

How, then, do colleges that admit such students help them thrive once they arrive on campus—for many, their first trip away from family and home? Some institutions offer late-summer orientations. Others have multiweek academic immersions—accompanied by guidance about university norms

I N T H I S I S S U E

- | | | | |
|----|--|----|---------------------------|
| 21 | Harvard Portrait | 30 | News Briefs |
| 22 | Public Health's Past and Future | 32 | A Classicist's Dylan |
| 26 | Yesterday's News | 33 | Brevia |
| 28 | "Disappointing" Endowment Returns—and a Protracted Restructuring | 36 | The Undergraduate |
| | | 38 | A Rugged Start |
| | | 40 | "Too Normal" for a Goalie |

such as office hours and seeking academic help, and discussions about being a first-gen or low-income student surrounded by wealthier peers and legacies. Increasingly,



Burgwell Howard

COURTESY OF BURGWELL HOWARD

to attend First-Year Scholars at Yale (FSY): a five-week summer experience on campus combining coursework with introductions to the community and its resources that turned out to be “a really big deal.”

Now a junior and a residential counselor for the 2017 FSY cohort, this summer López saw some of what he learned reflected in them: “It’s very tempting for them to ‘present’ themselves and not be honest” about their backgrounds as they try to adapt to their new circumstances—an adjustment that can “take a lot of energy, emotional and mental.” Embedding in FSY, he said, enables participants to share what a student in 2013, the inaugural year, called “an invisible kind of identity.”

For John Kauffman, another residential counselor, the academic menu—a for-credit, summer-school version of the freshman writing class, plus advising on quantitative studies—“was by far the most important aspect” of FSY. In his rural high school, outside Chicago, there was “no one to ask” about Ivy League expectations (few students had ever enrolled), and long writing assignments were three pages (with little, if any, revision). Freshman fall, he elected to pursue Directed Studies, Yale’s reading- and writing-intensive Western Civ. immersion. Absent FSY’s course in “what it meant to write a college-level paper,” Kauffman, now a junior, said, “I would not have been able to survive D.S.”

Sophomore Hannah Nikole Almonte, born in the Philippines and raised in California, came to New Haven already confident about her reading and writing. For her, the workshops and “dean’s time” (conversations about issues the students would encounter and resources available to them) were the central FSY experience: learning to “deal with people from a different socioeconomic background” and “how to have conversations in suites” as a freshman. This past summer, she served as a tutor for ONEXYS, the online quantitative-reasoning course Yale has added to FSY—effectively doubling students’ class load, but a useful preview of the academic multitasking to come.

These stories align with two Yale College aims that converged in FSY. More than a decade ago, according to Burgwell Howard, senior associate dean and associate vice president of student life, planning began for two new residences and a 15 percent expansion in undergraduate enrollment—including more students who “have the in-

tellectual acumen” but lack the preparation that comes with attending “Andover or Dalton.” Conversations with undergraduates and alumni from first-gen and low-income backgrounds identified two focal points for such students’ success: familiarization with college life to minimize “culture shock,” and classes to bridge the academic gap between their high-school and college courses.

Jeremiah Quinlan, dean of undergraduate admissions, described the transition to college as a challenge for every student, all of whom therefore undergo orientation. A subset of 160 or so students take ONEXYS off-campus, to prepare for quantitative courses, and atop the pyramid is FSY, which enrolls 60.

President Peter Salovey and Quinlan, who both took office in 2013, have directed a shift in Yale’s “standard demographics,” increasing the share of matriculants eligible for Pell grants by about five percentage points. “We cannot make these changes without supporting the students once they get here,” Quinlan continued. Once applicants are ac-



April Ruiz

PAUL MCKINLEY

such programs precede matriculation and continue through the undergraduate years.

This past summer, *Harvard Magazine* visited such efforts at Yale, Georgetown, and Princeton. The following account reflects reporting in the period between Harvard’s decision last winter *not* to initiate such a program (see harvardmag.com/firstgen-17) and College dean Rakesh Khurana’s August note to upperclassmen disclosing a 2018 pilot pre-orientation program aimed at “building community and fostering a sense of belonging among students from historically marginalized communities.” A September Harvard summit on “academic inclusion” in higher education, reported at harvardmag.com/inclusion-17, also addressed these issues.

“A place I could see myself in”

“THE ACADEMIC PART was not that much of a worry,” said José López. “I *knew* the academics would be difficult and challenging.” As one of four children of Mexican-immigrant parents living in a studio apartment in downtown Los Angeles, on a family income of less than \$20,000, his concerns were about “looking forward to making it a place I could see myself in.” For López, a first-generation student, the path toward belonging was an invitation, after he gained admission,

cepted, he and his staff review “the highest [financial] need students who went to high schools with lesser course offerings” to determine whom to invite to FSY.

Would they come? Howard noted practical obstacles: the students are being asked to leave their families before the fall term; they lose summer income; travel logistics may seem daunting. Yale accordingly helps to arrange the travel and covers travel and living expenses, eliminates the summer income requirement from financial-aid packages, and conveys the program’s seriousness by conferring full credit for the writing course. (None of this is cheap: Howard said the annual cost was in the six figures.)

HARVARD PORTRAIT

Most do attend, Howard said, and acquire “some social currency.” The trip to campus is less intimidating than if it immediately preceded matriculation. And FSY students, who have learned their way around campus, can then tell fellow freshmen to “follow me”—an advantage formerly confined to legacies. And, “They have a *group*.” Howard cited the Posse Foundation’s model of sending students to college together (see “Widening the College Pipeline,” July-August, page 63).

As the students themselves suggested, FSY seems to have been productive. Michael Fitzpatrick, Yale Summer Session’s associate director for academic affairs (and himself a low-income, first-gen student at Cornell), described two gains. First, students from under-resourced high schools are “probably less likely to ask for help.” (As Rachel Gable puts it, they need to know that in college—reversing their prior experience—studying with others and “seeking assistance is a habit of *excellence*, not a sign of weakness.”) FSY workshops, briefings with faculty members who describe their own experiences and invite students to office hours, and the classes themselves are structured to convey those messages. Second, the experience is designed to overcome “imposter syndrome”—the hoary admissions-mistake trope that looms larger for students whose material circumstances and preparation can suddenly seem so below the norm. Quinlan visits the FSY cohort to assure them, humorously, “The admissions office doesn’t make mistakes.” Students confirm gains in confidence on both counts.

Academically, FSY is both nascent and evolving. Prior results from ONEXYS showed statistically significant gains in learning, and subsequent gains in students’ grades, according to James Rolf, the mathematics instructor who developed it—hence its adoption by FSY (other colleges are considering using it, too). Further studies will monitor that effect, and determine whether taking the course correlates with students’ concentration choice. Quinlan said freshman-year data show that FSY students do better in writing and quantitative courses than peers who did not have the summer experience, and in their grades overall.

There may also be unquantifiable effects. José López, for example, admitted regrets about becoming a chemistry concentrator, despite feeling comfortable in the field. Recognizing that he was “among the very few



Nicco Mele

Nicco Mele owes a lot to the Internet. The new director of the Kennedy School’s Shorenstein Center on Media, Politics, and Public Policy grew up across Asia and Africa—the son of two foreign-service officers—and first connected with American culture by checking baseball scores online. When he learned his future mother-in-law “had lived in the same house in South Orange for 35 years or something, [it was] the most exotic thing I’d ever encountered.” After majoring in government at William and Mary, he joined the rapidly expanding online organizing scene at Common Cause; he also worked on Howard Dean’s presidential campaign, and later, on Barack Obama’s 2004 Senate campaign. His wife, Morra, founded Women Online, a marketing organization that has worked with both Hillary Clinton and Obama. But instead of diving deeper into a career in politics, Nicco found satisfaction in a “selfish love of learning” by landing teaching jobs at Johns Hopkins and HKS, thanks to his expertise in the intersection of the Internet and politics. This expertise later drew him west to join the *Los Angeles Times* as deputy publisher in 2015. As one of the self-proclaimed earliest forecasters of Donald Trump’s success (he says it with sorrow, not *schadenfreude*), Mele has turned to the Internet once again to connect with the American public in what he calls “an extremely uncertain future” for democracy. The Shorenstein Center will play a critical role in preventing the rise of fake news, he claims, by helping audiences become smarter consumers of information online. The biggest challenge will be innovating to keep both sides of the political aisle engaged. “I’ve always been an entrepreneur. If I weren’t at Shorenstein, I’d still build some kind of business in the media space.” —OSET BABÜR

male Latinos in the sciences,” he’d felt pressure to proceed, sacrificing his passions for music and education. (Gable’s research revealed that first-gen students had greater difficulty choosing an academic field—for diverse reasons, like López’s.) Yet his continuing engagement with FSY and with friends from the program has helped put his choice into perspective and encouraged him to redirect it. He has added education courses to his studies, to prepare for work in schools—perhaps in his home community.

April Ruiz, dean of FSY and of the Hopper College residence (and a first-generation, low-income Yale graduate), said the cumulative effect was to give students the sense, “I am not weird.” Combining an “intentional academic component” with the equally “intentional creation of community,” she said, helped such students adapt to utterly new circumstances. Her weekly conversations with FSY students explored what it would feel like to balance four demanding college courses, pursue extracurriculars, manage time, and, generally, “take advantage of these privileged opportunities while the

folks at home never could—you advance, they don’t.” Along with the peer mentors like López, Kauffman, and Almonte, she sought to help the students understand both “how things work” and “how things feel” in a setting where some of them would have experiences as traumatic as “coming out as poor.”

The program aims to help the students understand both “how things work” and “how things feel.”

Quoting Ruiz’s predecessor, Howard said of those challenges, “Students should never struggle alone.”

“Roadblocks are not deficiencies”

IF YALE IS newly committed to supporting undergraduates from under-resourced high schools, Georgetown established the playbook.

• In 1968, amid the country’s convulsive urban traumas, it launched an effort to en-

roll and support underrepresented students—the forerunner of its Community Scholars Program (CSP), a summer academic immersion, like FSY, for 75 students.

• A Georgetown Scholars Program (GSP), launched in 2005 (a response to the Harvard Financial Aid Initiative and other well-endowed schools’ aid enrichments), increased

grants and reduced loans for targeted low-income students. It encompasses the CSPers and more than 150 undergraduates per class, and has transformed from extended financial aid to a four-year system of fostering first-gen and low-income students’ school engagement, leadership training, and other elements of success in college and beyond. They are supported by a five-person staff and alumni have responded with enthusiasm to a \$25-million fundraising campaign,

Public Health’s Past and Future

Michelle A. Williams attracted a great deal of attention last year when she was appointed dean of the Harvard T.H. Chan School of Public Health (HSPH)—less for her career as a distinguished epidemiologist than because she is the first African American to lead a Harvard school. In person, her soft-spoken disposition doesn’t appear to invite public attention. Was the symbolism of her appointment personally important to her? “It was my first exposure to a massive amount of public attention,” she recalled at a recent interview in her Kresge Building office. “And it did set me back a little bit. So much focus on my race, my gender, and the fact that I’m foreign born” (her family emigrated from Jamaica to New York when she was a child). “I’m proud of all of those. If I can be a positive symbol, that it’s possible to overcome minority status and that there are no limits to the capacity to excel and achieve leadership roles at the highest institutions, then it’s important to me.”

Williams, who earned her Sc.D. in epidemiology from HSPH in 1991 and whose research has focused on maternal and infant health, assumed office last July, succeeding Gregory professor in cancer prevention emeritus David Hunter, who had temporarily taken up the post following the departure of Julio Frenk (now president of the University of Miami). HSPH had exceeded its capital campaign goal of \$450 million, thanks to an unrestricted \$350-million gift that transformed its financial structure—the largest-ever donation to a public-health school. Williams says the central goal of her tenure has been to use the gift to “position the

school to soar to even greater heights,” particularly as federal funding as a share of the school’s research funding has decreased. “It’s an urgent area of concern,” she said. “After the 2008 crisis, it became very evident that we as an institution had to work diligently to diversify our funding streams. Seventy-five percent of our funding comes from sponsored research; 85 percent of that comes from the federal government. We are the most dependent of the Harvard schools on federal funding.”

HSPH’s campaign aimed to position the school as a premier center of research into the determinants of human health in the twenty-first century: old and new global pandemics; harmful physical and social environments (including industrial pollution and gun violence); poverty and humanitarian crises; and failing global-health systems. Williams’s expertise at the intersection of epidemiology and biology, as well as her sensitivity to the social context of health, position her well to lead across those domains. The campaign also aimed to raise funding for new professorships, student financial aid, and renewal of the school’s infrastructure. The latter, according to Williams, might sound boring, but remains essential to promoting interdisciplinary work: “We’re spread out across 25 physical addresses, which means we don’t benefit from having the enormous talent represented in the school collocated in a way that fosters collaboration.”

To those ends, the naming Chan gift, along with new partnerships with the for-profit sector and foundations (what she called “non-traditional collaborators”), have augmented HSPH’s re-

for aid and the program itself.

• In addition, GSP students now organize a five-day pre-orientation Preparing to Excel Program (PEP), aimed at entering low-income and first-gen Hoyas (the template Harvard College now seems to be considering).

In August, during this year's PEP, former admissions officer Melissa "Missy" Foy, who launched the GSP, held an audience of first-year students rapt as she exposed their commonest anxieties, beginning with that imposter trope and assuring them, "You are sitting in a seat that was chosen for *you*." She then turned to tough love: "For students who are prideful about their writing, it's probably time to get over that." (But she also recalled a senior-year journalism assignment so egregious her instructor wrote "No!" in place of a letter grade, using her experience to illustrate overcoming an ego-deflating challenge.) Georgetown, she continued, is "supposed to be hard. If it's easy, you picked the wrong college." Working through their other inner thoughts, she detoxified fears by turning them into *community* concerns. That

emphasis on community runs throughout Georgetown's embrace of these students. The dean of student financial services, Patricia McWade, who addressed the PEPers, said separately that raising funds for GSP had been one of the greatest rewards of her quarter-century at Georgetown. Charles A. Deacon, the even longer-serving dean of admissions, who just admitted his forty-fifth class, said, "We have their back."

Through PEP and other channels, the students make unusual connections with the financial-aid representatives who help them manage their scholarships and loans (often without parental help), and their academic deans (who join the PEP cohort for a first-day lunch). Even more directly, charismatic staff members available 24/7, like Foy and Devita Bishundat, who directs CSP, put Georgetown into perspective. Senior Fabienne El-Cid—a GSP student-board member, peer-mentoring co-chair, and former PEP coordinator—said the activities collectively work "wonders in making the campus feel *smaller*, as you walk around it and recognize faces."

These forms of soft support, combined with the students' resilience and drive, are associated with tangible results in the classroom. During a morning session of CSP's critical reading and writing course, a student volunteered her draft for review—among the hardest experiences for most young learners to endure. Twenty minutes of peer critiques, kindly expressed but tough and extensive, ensued. Their recipient then thanked everyone and said she looked forward to incorporating their suggestions in her revision. Most teachers of undergraduates would testify to how much they would value the kind of learning such give-and-take enables for everyone in a class. (The writing class continues into the fall, with the same teachers, and students take a second summer course, related to their intended concentration—also for full credit. They register for freshman classes before the term begins, assuring access to their preferred options.)

Achieving such an environment is not serendipitous. In a faculty meeting after that morning class, led by Bishundat, the

sources as public funding has attenuated; in May, for example, the school was awarded \$4.9 million from the Massachusetts Life Sciences Center, a private investment agency, to fund an initiative to study the microbiome. Philanthropy has also helped fund a new professorship in humanitarian studies; a Center for Health and Happiness; and a global cancer-prevention initiative; and has helped fund the school's transition from an Sc.D. program to a fully funded Ph.D., to attract and support the field's strongest students. Students still in the Sc.D. program typically don't receive living stipends or the same benefits as Ph.D. students: "The irony is that the transition highlighted very obvious inequities," Williams explained. With the Chan gift, "We did manage to close the gap—it's not completely closed, but we've worked with the Sc.D. students to provide tuition support and help cover the gap."

At last year's Commencement, Williams spoke about the philosophy of public health as a field that for the first time linked the categories of health and human rights. But in the twentieth century, Williams stressed, the field experienced transformational shifts in its philosophy and practice: "There are some not very appealing episodes in the history of public health in this country. There have been episodes of coercion used against minority populations: outside of reproductive health, we've had ugly episodes like the Tuskegee trials. Those are horrible cases whose ramifications are still felt in communities of color." And "in light of public health's especially troubling history concerning reproductive health," she added, it is "critically important...to recognize where the field stands *today*: for reproductive justice, which means every woman should have a right to the full array of repro-

Michelle A. Williams



ductive health services, including birth control, screening for reproductive disorders, and abortion rights.

"There has to be recognition, when community outreach is being done," she said, "that the history [of the field] is not ignored. Because of that history, public health needs to be attentive to the diversity of its workforce, needs to be attentive to the fact that the philosophy of public health is that it's a social movement that is designed to optimize maximum human potential at a population scale, that it is about honoring individual human rights."

—MARINA BOLOTNIKOVA



**Devita Bishundat
and Melissa "Missy" Foy**

KEVIN DURHAM

teachers discussed reordering the readings to better promote students' writing gains. One happily reported that students had begun coming to office hours, another that the "crestfallen" response to a low grade on a paper had been succeeded by acceptance

at advising sessions and academic workshops is mandated. Omaris Caceres, a sophomore from Clearwater, Florida, described the requirements as direction on acquiring "tools that really help me succeed": study skills, test-taking, going to office hours, net-

("The standards are the standards at Georgetown," as a student put it) and moving on. In general, as Matt Pavesich put it, CSP students are "less polished" than other entering students, but they exhibit "greater willingness to take risks as writers" and learners—a trait the whole faculty team seconded.

Outside the classroom, academic support extends to organized study groups, seminars, and workshops on resources on and off campus (internships, research opportunities, and study abroad). CSP upperclassmen serve as mentors: some are residential advisers during the summer, like their FSJ counterparts at Yale. School-year attendance

working, and budgeting.

Academic progress is paramount, but the confidence necessary to achieve it stems as well from an encompassing suite of co-curricular activities, most shaped by the students themselves. The myriad current programs range from email outreach from the program staff and socializing to student-led GS Proud events that embrace an identity as lower-socioeconomic-status members of a campus where much greater affluence prevails.

Meanwhile John Wright, assistant director of the counseling and psychiatric service, is available to consult directly with students, waiving wait times for appointments, meeting confidentially outside the counseling center, and serving as a "community psychologist" to discuss immediate issues or unaddressed family traumas that may hinder academic success. During the summer CSP program, he introduces these ideas in chats about "thriving in your first year." His school-year workshops address adjusting to a new community, returning home for the holidays, and coping with pre-exam and other stress. Given students' lim-

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recognizes its historical ties to slavery—its first professorship was endowed by Isaac Royall Jr., an eighteenth-century sugar plantation owner—with a memorial plaque at the center of the school's campus. harvardmag.com/hls-slavery-17

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CLOCKWISE FROM TOP RIGHT: JON CHASE/HAPAC; RADCLIFFE INSTITUTE; SPENCER LENFIELD; GIL TALBOT/HARVARD ATHLETIC COMMUNICATIONS

ited prior access to such resources, or reluctance to use them (“We don’t talk about mental health in our communities,” one student said), Wright’s work is a core investment in what one dean called Georgetown’s “wraparound” care for them.

That commitment has spread. A provostial query turned up hundreds of faculty and staff members who were first-generation college-goers and allies. In late September, the day after a formal “induction ceremony” for first-gen students, the faculty and staff supporters donned T-shirts identifying themselves—making the first-gen campus community even more visible.

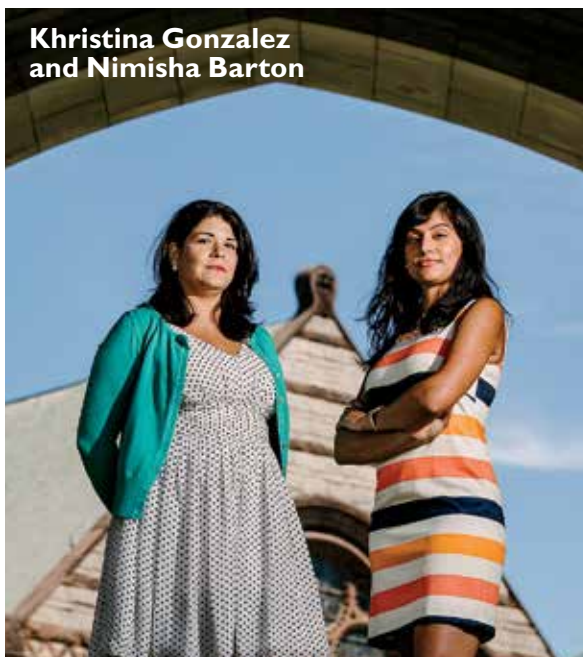
Such measures “empower students to see that roadblocks are not deficiencies,” as Foy put it. Students reported that Georgetown’s resources were their first, or only, channels for such guidance; they affectionately described Foy, Bishundat, and others in parental terms, and their student peers as family. Sophomore Hashwinder Singh, from Tacoma, putting his fingers together, said “My family and I were like this. I didn’t have anyone but my family.” Despite confidence in his academic skills, “I was so scared to come to Georgetown”—so the CSP community was a lifeline.

In that sense, said Dean McWade, CSP and GSP and PEP do exactly what Georgetown intends: they welcome cohorts whom the university wishes to educate, but who lack “cultural capital through no fault of their own.” At the same time, she said, first-gen and low-income outreach to the broader community helps “educate the faculty about who’s in front of them these days,” as the student body evolves. For Charles Deacon, who admitted them, the stakes go far beyond the pipeline from recruiting through enrollment; the outcome overall, he said, is “about first-generation students being successful.”

“I’m here to help you grow”

PRINCETON, OF LATE, has focused its energy and resources on an unequaled scale, bringing every element of programs for first-generation and low-income students’ success into an integrated whole, with

thoughtful preparation for their academic, co-curricular, and social lives on campus. Long perceived as elitist, it has moved aggressively to change the reality: from a minimal 7 percent of students eligible for Pell grants in the class of 2008 to 22 percent in the class of 2021 (likely leading the Ivies; the first-gen cohort has increased from 6 percent to 17 percent). It hosts the Leadership Enterprise for a Diverse America summer institute for promising low-income high-school juniors, and recruits heavily among them. A planned 500-student expansion could enlarge this cohort; among its aims is making “a concerted effort to identify



and attract more students from low-income families and ensure these students receive the support they need once they are on campus.” For the first time since 1990, it is also accepting transfer students for 2018—and explicitly encourages applications “from students from low-income backgrounds, community college students, and U.S. military veterans.”

Compared to its past profile, “Princeton is different,” said Khristina Gonzalez, associate dean of the college and director of programs for access and inclusion—but making admissions more accessible does not ensure “equity of access to the resources once you arrive.” Unlike legacies (and perhaps continuing-generation students generally), for whom “implicit knowledge, passed down generationally,” leads seamlessly to fellowships, research opportunities, study abroad, and so on, newcomers to

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Yesterday's News

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

1927 “To vagabond,” i.e. “to rove around classrooms where one does not belong,” has entered the undergraduate vernacular. The *Bulletin* reports a noticeable increase in the practice during the fall, in part because *Crimson* editors have begun printing daily lists of lectures deemed to be of general interest.

1942 Thirty-nine members of the Harvard Auxiliary Fire Department, organized to supplement the regular Cambridge department in case of fire from enemy air attack, receive their badges at a special dinner with University officials and Cambridge firemen.

1947 The Band expresses student opinion on a suitable World War II memorial by spelling out “Harvard Needs a Student Activity Center” during half time at the Princeton game.

1952 Oliver Bolton '39 (R-Ohio) is elected to Congress, joining his mother, Frances Payne Bolton (re-elected for a seventh term), as the first mother-and-son representatives in U.S. history.

1957 Harvard Student Agencies Inc. has been chartered as a private non-profit Massachusetts corporation.

tion. HAS plans to work closely with Harvard financial-aid officers to assist needy students by encouraging and helping to organize student-conducted business enterprises.

1962 A bequest from bacteriologist and immunologist William A. Hinton '05, M.D. '12, Harvard's first black professor, has set up a Dwight D. Eisenhower Scholarship Fund for graduate students, to recognize that administration's accomplishments toward acceptance of the principle of equal opportunity for all.

1967 Meeting at Harvard, the National Association of Graduate School Deans unanimously proposes scrapping existing selective-service laws in favor of a lottery.

1992 Tommy's Lunch, “a Mount Auburn hangout for generations of Harvardians,” closes its doors on Thanksgiving weekend, without fanfare, after 35 years of feeding hungry undergraduates.

higher education have no roadmap to this “hidden curriculum.”

That was certainly so for the young Sonia Sotomayor. But a twenty-first-century Sotomayor might be welcomed by Gonzalez to the seven-week summer Freshman Scholars Institute (FSI). If not among the 80 students invited for FSI, she might participate in an online version, and then, once enrolled, join the Scholars Institute Fellows Program—also led by Gonzalez, with associate director Nimisha Barton. (SIFP is a four-year series of workshops, faculty mentorships, and other experiences that extend the FSI immersion and broaden it to all similar undergraduates throughout their Tiger years. Underscoring its interest in such students, Princeton's materials for applicants highlight first-gen students and faculty, and describe SIFP.)

Together, since 2015, drawing on their common experiences through their Ph.D. degrees and as Princeton writing teachers, Gonzalez and Barton have scaffolded opportunities that help all first-gen and low-income undergraduates adapt to their new surroundings, take responsibility for their education, train for leadership, and make the most of the university's resources. Alongside coursework, FSI has seeded extracurricular learning: students receive “Bingo Plus” cards on which they must check off attending sessions about the undergraduate research office, nutrition and wellness counseling, fellowships advising, the writing center, and many other resources.

FSI, like Georgetown's summer immersion, dates to the late 1960s, when Princeton began orientations for minority students prospectively interested in engineering. It now incorporates two courses: “Ways of Knowing” (WK), a sort of interdisciplinary analog to Harvard's freshman Expository Writing, with close writing and reading; and since 2015, one of three purpose-built quantitative or scientific offerings: a foundational engineering lab; a life-sciences research course; or a course in data, visualization, and quantitative methods. (Each confers full credit; students know the stakes, learn about college grading, and earn breathing room during subsequent se-

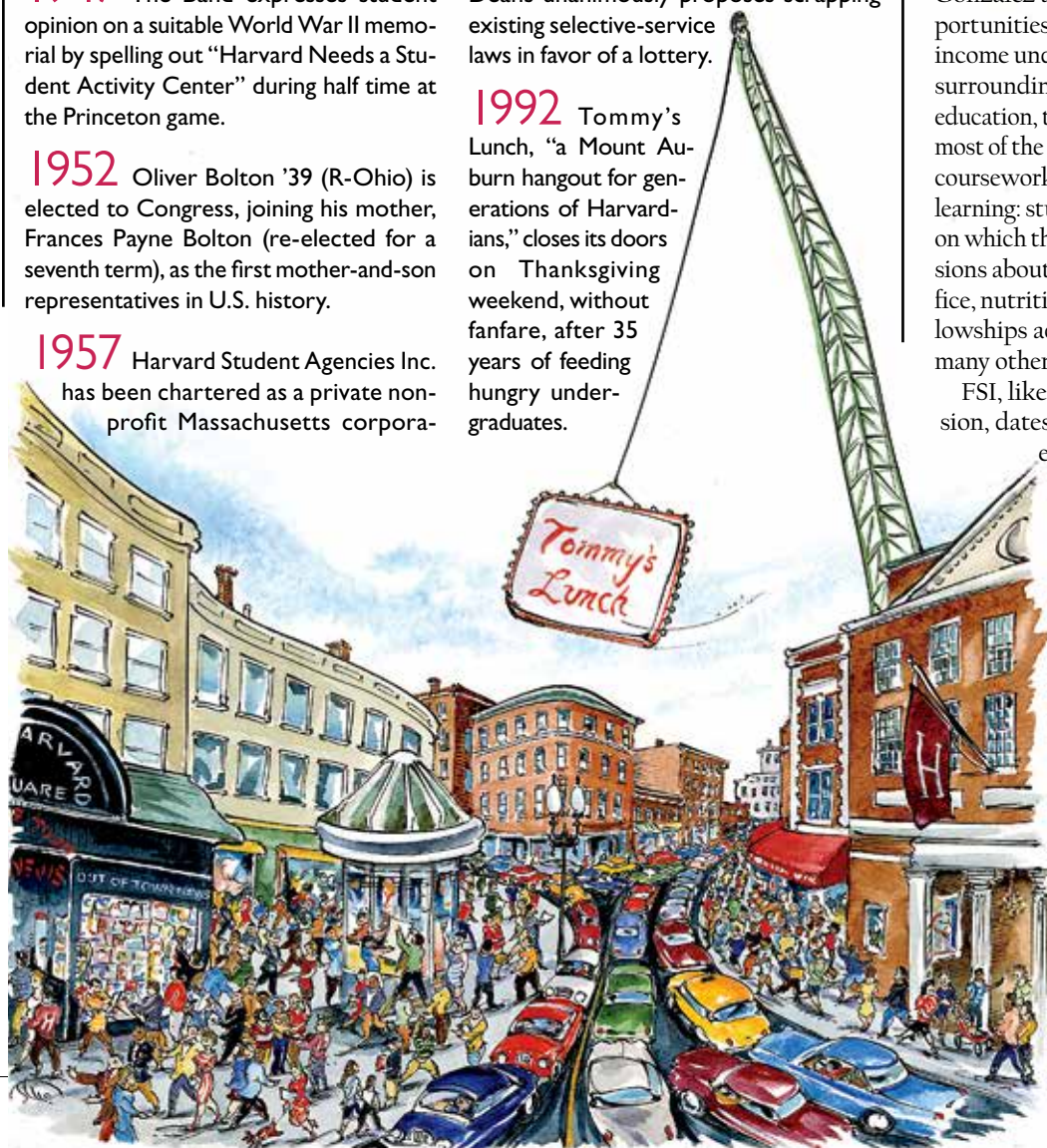


Illustration by Mark Steele

menters for extracurricular or further academic pursuits.)

The content and teaching are fully up to Princeton standards—and conducted in ways that support students' embrace of them. In this year's WK, students encountered everyone from Plato to Einstein. During one class, instructor Erin Raffety, a post-doctoral lecturer in the writing program, told a student anxious about drafting and revising a paper, "I encourage you to come in, talk about your progress" and ideas. "I'm here to help you grow. If you feel you're not, I want to know that." Addressing the difficult opening passage of Toni Morrison's *The Bluest Eye*, she reminded them, "You guys are all sophisticated readers, so you can see how it's written."

During a break, a student from Seattle said the course helped him and his peers "wade into the water before we get taken by the undertow." Another said her FSI peers had in common not only lower socioeconomic status than their other imminent classmates, but also "what comes with that and why it happened. Maybe your family isn't perfect, maybe their household is dark-

A student said the course helped him and his peers "wade into the water before we get taken by the undertow."

er, not what you think an ideal childhood should be." Yet even facing new intellectual demands and a full FSI schedule, she said, "It's the most relaxed I've been in a while."

Once back to business, Raffety guided students toward their reading of diverse critics' approaches to Morrison's novel. Watch what "scholarly moves" they make, she counseled—drawing on the text, or using outside sources—so they could plan their own work as incipient Princeton scholars.

In the biology class, organized around a problem in serotonin signaling, Heather Thieringer circulated among benches where pairs of students in lab coats worked together, offering comments, but not lecturing. When one asked whether she should be adding something to her *C. elegans* (round-worm) sample, Thieringer answered neither "yes" nor "no," but as a scientist: "It

depends on your research plan." Besides offering many of the students their first lab experience, she said, she aimed to pilot a research-based approach for Princeton's introductory molecular-biology courses—one of many examples of applying FSI instruction to the college at large. (Her co-instructor, Geneva Stein, is assistant director, undergraduate learning, for the McGraw Center for Teaching & Learning; a direct connection to Princeton's home for enhancing pedagogy and the curriculum, and strengthening student study skills.)

In "Foundations of Engineering," Claire Gmachl, Higgins professor of electrical engineering, oversaw FSIs diligently designing and building bottle rockets. She, too, had an ulterior motive for teaching the course, for the third consecutive summer: to find ways to accelerate the progress of first-year students lacking AP math and physics into

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actual engineering. “I love teaching it,” she said, “because they’re not jaded yet, they’re so eager to learn.” (The students remain visibly young at heart: one had inscribed on the rocket fins, “To Infinity and Beyond”; another, in Tiger orange, “21”—the planned graduation year.) Perhaps united by their first-gen and low-income identities, groups of students who had completed their apparatus prepared for a test together—calling out variables, leafing through a text, pro-

tion in classroom teaching and pedagogical strategy within the McGraw Center. Their presence gives the FSI students immediate access to a multiyear cohort of Princeton undergraduates, many with backgrounds similar to their own, enabling informal connections and conversations.

The fellows also conduct academic-year workshops for students, coordinated by Barton, on myriad aspects of that “hidden curriculum” on campus (how to apply for

fellowships, participate in a section, write a research proposal, and master the intangibles, like speaking “prof-o-saurus” during casual conversation or office hours) and beyond (how to network, prepare a résumé, and manage finances). Volunteer faculty

members help them substantively, and often participate in the sessions.

Barton has outlined a four-year sequence of experiences that help students choose concentrations, prepare for thesis research, and identify and pursue postgraduate plans. The fellows gain confidence and leadership skills that have increasingly propelled them, Gonzalez reports, to positions of leadership across campus—an outcome strongly supported by her peers at Georgetown and Yale.

What might students learn from this welter of experiences? According to senior Jessica Reed, “You are forced to learn to ask for help, and you are forced to collaborate”—lessons about learning that might well apply to undergraduates everywhere.

HOW MIGHT HARVARD and other colleges best address the needs of the students they are admitting from under-resourced high schools and families constrained in means? Is a five-day pre-orientation meaningful? Do certain students need a multiweek bridge program? Are there needs extending throughout the undergraduate years?

Rachel Gable, now at Virginia Commonwealth University’s global education office, said her research in Cambridge and Washington, D.C., persuaded her that different in-

stitutions could pursue distinct approaches suited to their cultures. Georgetown’s centralized programming reflects both its Jesuit tradition of service and what she called a “multicultural” theme, extending back a half-century: a recognition that groups of people differ, and are best served by devising programs tailored to their needs. Harvard has what she called a “liberal” approach, in the classical meaning of the word: each individual is to be treated as an individual. Thus, its preference for what she termed “capillary” programs and resources, such as enhanced peer advising and training for academic advisers who are available to all students, in the expectation that each will benefit in personally suitable ways.

Evangelists for substantial, centralized programs—Foy at Georgetown, Princeton’s Gonzalez—argue that their efforts focused on cohorts of first-generation and low-income students will, over time, spread across their communities, changing their cultures. Whether the programs are “capillary” or narrower in focus, faculty members agree that virtually *all* students today could benefit from efforts to highlight the co-curricular and soft skills that contribute to every student’s academic performance, and impel improvements in teaching. To the extent that these initiatives derive from admitting more economically diverse students and assuring that they can thrive once on campus, they of course promote more inclusive interactions among undergraduates whose life circumstances vary more widely than ever before. So far, no campus appears the worse for trying.

—JOHN S. ROSENBERG

“Disappointing” Endowment Returns—and a Protracted Restructuring

ON SEPTEMBER 19, Harvard Management Company (HMC) CEO N.V. Narvekar reported an 8.1 percent investment return on endowment assets during fiscal year 2017, ended last June 30, observing bluntly, “Our performance is disappointing and not where it needs to be.” Although the positive return (after investment expenses) reverses the prior-year *negative* 2.0 percent return, HMC’s gains substantially trailed peers’ reported results. Taking into account the



COURTESY OF HARVARD COLLEGE FIRST GENERATION STUDENT UNION

Members of Harvard’s First Generation Student Union advocate a summer bridge or pre-orientation preparation.

gressing through a tricky formula—with none of the ethnic self-segregation that sometimes arises in other campus settings.

There is early evidence that all this careful work pays off. Gonzalez cited a post-FSI survey indicating a 26-percentage-point gain in students’ confidence in asking questions in class, a 34-point gain in talking to a professor, and more than doubling in confidence in their ability to write course papers. Overall, students reported a 31-percentage-point gain in confidence in their ability to have an academically successful freshman year.

Plenty of upperclass peers reinforce that growing optimism. As at Yale and Georgetown, they serve as residential advisers during the summer. At Princeton, they may also be summer “course fellows,” running sections and mentoring students. Those fellows are not only “approachable near-peers,” as Keith Shaw, director of transfer programs, put it, but also trained educators: FSI alumni and others who choose to become “institute fellows” through the SIPF program benefit from regular, structured instruc-

investment return, the distribution of funds for the University's operating budget, and gifts received, the endowment was valued at \$37.1 billion at the end of the fiscal year, up 3.9 percent from \$35.7 billion at the end of fiscal 2016—but barely above the peak value (not adjusted for inflation) of \$36.9 billion at the end of fiscal 2008, before the financial crisis and recession.

The University is growing (Harvard's expenses were \$4.7 billion in fiscal 2016, up from \$3.5 billion in fiscal 2008), and its financial model assumes a rising stream of funds available for distribution from the endowment each year. Of late, that distribution has accounted for 36 percent of Harvard's operating revenue—about as much as the next two sources, sponsored research support (21 percent) and tuition and fees (17 percent), combined. In the meantime, inflation erodes the endowment's value (to the tune of \$5 billion in lost purchasing power during that period; see harvardmag.com/congress-queries-16). So it is especially worrying that tepid investment performance is sapping endowment growth even in nominal terms, especially during the recent robust gift-giving, spurred by The Harvard Campaign, which has augmented endowment funds by several hundred million dollars annually.

Narvekar was appointed CEO in September 2016 and arrived at HMC last December, charged with overhauling the organization and its strategies to overcome persistent underperformance (see harvardmag.com/narvekar-16). Through the end of fiscal 2016, HMC's average annualized investment return for the prior decade was 5.7 percent, well below the University's 8.0 percent planning assumption. That goal, if achieved, would accommodate distributing about 5 percent of endowment value each year, to pay for teaching and research, and earning a 3 percent margin to offset inflation, thus preserving the endowment's purchasing power. On an endowment corpus of \$37 billion, falling 2.3 percentage points short of the return objective amounts to about \$900 million of unrealized endowment value in a single year—

a sum that compounds with reinvestment.

Narvekar's initial annual report explained HMC's recent results in broad terms, and then sketched the sweeping actions under way that are intended to boost performance in the long term.

• **Recent results.** During fiscal 2017, he wrote, "Performance reflects strong returns from public equity, private equity, and our direct real-estate platform, while natural resources experienced a challenging year." That general comment on public- and private-equity and real-estate results was consistent with other endowments' reported

performance versus market benchmarks—or, apparently, even five- and 10-year rates of return. That decision reflects internal changes under which HMC intends to manage the endowment as a whole, rather than by discrete asset classes (see below). But it does make it more difficult for outside observers to have a sense of the operation; for instance, since the rate of return is calculated on a time-weighted basis (reflecting when HMC disburses funds to the University and when gifts are received), external analysts will no longer be able to calculate long-term rates of return that are comparable to the

prior format, unless the management company decides to do so in the future.

The University's annual financial report, published each autumn (after this issue closed), may provide further guidance. It details the investment return (perhaps \$2.5 billion to \$3 billion this year), the operating distribution (perhaps \$1.8 billion), and gifts received (perhaps \$500 million), yielding the \$1.4-billion growth in endowment value during the year. It also shows assets by category for the General Investment Account, which does not align exactly with the endowment.

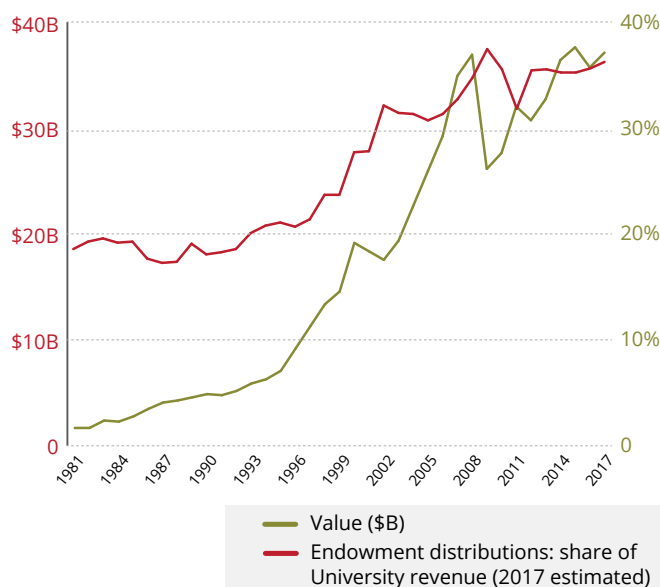
At the end of fiscal 2016, natural-resources holdings were valued at \$3.6 billion. Narvekar observed that for years HMC's internally managed program "generated strong

returns" (investing in timberland and related assets, for instance). "At this stage," he wrote, "while most assets remain attractive, a few have significant challenges" and the board of directors "took some markdowns on value prior to my arrival, and we have taken more markdowns in fiscal year 2017, which meaningfully impacted our results."

Absent any quantification from him and whatever information may be gleaned from the forthcoming financial report, if HMC wrote down natural-resources assets by 30 percent in fiscal 2017, that would reduce reported returns by about \$1 billion—enough to reduce the total investment return by about 3 percentage points. Nor did HMC break out additional one-time restructuring costs—such as severance payments or losses

Endowment Growth—and Rising Distributions

With the long-term growth of the endowment, Harvard has become progressively more reliant on endowment distributions to fund its academic operations.



returns: 14.6 percent at Dartmouth, 12.4 percent for the University of Virginia, and 14.3 percent at the perennially strong MIT, whose endowment has grown from \$9.9 billion at the end of fiscal 2008 to \$14.8 billion now. (Princeton, Stanford, and Yale, peers with similar endowments, had not reported results by the time this issue went to press.) During the year, according to the Wilshire Trust Universe Comparison Service, median returns for large endowments were in the range of 12 percent to nearly 14 percent.

What accounted for the shortfall at HMC? Narvekar didn't say. Ending past practice (see the fiscal 2016 reporting format at harvardmag.com/endowment-drop-16), he will no longer detail how the endowment is invested, returns by asset class, perfor-

(if any) on the sale of some private-equity and real-estate investments late in the fiscal year—that may have affected the reported investment return, and therefore the value of the endowment, this year. (Given the endowment's size, any such costs, if incurred, may not be material, and therefore may not have to be reported.)

As a back-of-the-envelope calculation, an estimated natural-resources write-down and the other expense factors might imply a 3-percentage-point penalty, leaving HMC's 8.1 percent reported return still 2 to 3 percentage points behind the best peers' results. Although Narvekar emphasizes that raw investment performance is not the right comparative metric, since each institution's risk tolerance, investment aims, and portfolio must be tailored to its own objectives and financial needs, he still characterized HMC's result as disappointing. Hence the need for corrective action.

• *Restructuring report.* This past January, he signaled sweeping changes in HMC's organization and strategies—including significant reductions in personnel and the hiring of new senior managers (details available at harvardmag.com/hmc-overhaul17). He signaled then that “transforming HMC's organization and portfolio is a five-year process.”

His September report indicates the scope of the overhaul he has undertaken, proceeding from his conclusion that “The endowment's returns are a symptom of deep structural problems at HMC and the resultant significant issues in the portfolio. These matters have challenged HMC for years....”

Outsiders may be surprised by the scope of the resulting changes. In a take-your-breath-away summary paragraph, Narvekar wrote that since “the time had come for an aggressive plan to restructure HMC and create the necessary organizational and investment culture,”

[M]y first seven months included establishing a generalist investment model, recruiting new senior investment team members, integrating existing team members from the previous silo model and new team members (including myself) into our generalist model, spinning off various internal platforms and preparing to spin off others, rebuilding our investment processes and analytics, creating a new risk framework, generating meaningful liquidity, and designing our new compensation framework.

When these changes are fully effected, the endowment will be entrusted to a small team of senior professionals—perhaps a couple dozen in all—discussing opportunities and risks across the universe of investment options and making commitments for the endowment as a whole. (See a detailed report at harvardmag.com/hmc-summary-17.)

Those new HMC investment professionals will have to establish new relationships with external money managers—a pressing

The HMC transition period Narvekar invoked may well extend beyond five years.

priority after the many changes in HMC's leadership during the past decade, and its investing constraints in the wake of the large endowment losses in 2008 and 2009. Moreover, illiquid assets are customarily tied up for multiyear periods (the time it takes for a private-equity investment in a company to be made and sold, or to develop and lease a real-estate development). Even with the sales of assets effected last June to provide liquid funds for new investments, there is a limit to the volume of commitments Narvekar and his team can and would confidently make in the near term. From external managers' perspective, too, it can take years to put newly raised funds to work. So the transition period he invoked last winter may well extend beyond the five-year interval he sketched.

In the meantime, HMC's board and the Harvard Corporation will have to define the University's risk tolerance. Harvard differs significantly from peers like Penn, Stanford, and Yale, which own and operate large hospital systems; and from Princeton, given its minuscule professional-school component.

And at some point, Narvekar, his board, and the University will have to determine whether it is realistic to project long-term annualized returns of 8 percent. The stakes are significant: reducing the return assumption to 7 percent could imply a 20-percentage-point reduction in the funds distributed to the faculties (from 5 percent of the endowment market value to 4 percent): a shock if imposed suddenly, or a longer-term concern if phased in over time.

All those issues loom over HMC's re-

structuring. “In a perfect world,” Narvekar wrote, “we would have moved through these changes over a much longer period. However, given the time needed for these changes to impact results, the HMC board of directors and I strongly believe that HMC will be in a far better position by moving quickly. We have done so.”

Given fiscal 2016 investment losses and tepid 2017 returns, deans will receive level endowment distributions next year, and expected minimal gains in fiscal 2019. To ease the pain, the Corporation has decided to budget 2.5 percent to 4.5 percent increases for fiscal 2019 to 2021, beginning with the lower figure in the first year—stabilizing guidance during Harvard's presidential and HMC's transitions.

In light of the leverage represented by enhancing HMC's returns over time—and the fundamental importance of those returns to the University's academic mission—Narvekar and his colleagues continue to have the most important financial jobs at Harvard.

~JOHN S. ROSENBERG

News Briefs

Centered on Community

WITH NATURAL DISASTER (Hurricane Harvey) and cultural confrontation (in Charlottesville and elsewhere) occupying the national conversation, Harvard leaders chose to focus on this community's purposes and values as they welcomed the College class of 2021 and the new academic year.

Speaking at Freshman Convocation on August 29, President Drew Faust drew on a favorite anecdote (“It was on this annual occa-

sion of welcoming the incoming College class that a former dean of the Faculty of Arts and Sciences, the late Jeremy Knowles, described what he saw as the most important goal of higher education. It was, he said, to ensure that graduates can recognize when someone is talking rot”) to draw some lessons for the new circumstances. “In recent weeks we've seen threats of global nuclear war, frightening examples of extreme weather, devastating acts of terrorism...and chilling instances of hatred, racism, anti-Semitism, and violence at an American college town not so different from this one,” she said. “What should a uni-

versity education be at such a moment?” She answered by outlining Harvard as an engine for learning through engaging with difference:

[W]e have asked all of you to uproot your lives, move to Massachusetts with carloads filled with paraphernalia and teary-eyed families forced to bid you goodbye. Why do we do this? We do it because we believe in the power of community as an essential educational force. But that community must be constituted so that it does not simply present you with what you already know....It is its diversity, its elements of unfamiliarity and difference that render Harvard College the extraordinary experience that I know you will find it to be.

Underscoring the point, College dean Rakesh Khurana described the class as “the most diverse in Harvard’s history.”

The next day, speaking at Morning Prayers to open the academic year (her last time doing so as president), Faust was pointed about Harvard’s qualities (“our diversity offers us the strongest possible foundation for our strength”) and the dismaying forces loosed

in the larger society. Referring to Charlottesville, she said, “[W]e have seen loathsome demonstrations of hatred and violence, reviving the most shameful episodes of the past and foregrounding the very worst of what we have been and regrettably still are as a nation.” (She grew up in the Virginia riven by *Brown v. Board of Education* and its tumultuous aftermath.) In the August disturbance, she said, “I saw white supremacy resurgent, setting its sights on a university town with values like our own to mount its challenge and advance its evil and its cruelty.”

Against “a world where people are categorically excluded, where minds are closed or overtly hostile to differences of perspective or experience or identity, where violence and threats replace rational discourse and exchange,” she exhorted Harvard to be otherwise:

We must condemn the racism that feels free to speak in a way it hasn’t for nearly half a century. We must denounce the Nazism and anti-Semitism that my father and so many others of his generation risked their lives to defeat. We must affirm the full

citizenship of LGBTQ Americans, including their right to qualify for military service.

Education, Faust emphasized, “serves as the arteries of a just society.”

Full accounts appear at harvardmag.com/convocation-17 and harvardmag.com/amprayers-17.

~MARINA BOLOTNIKOVA and SOPHIA NGUYEN

Former Fellow Chelsea Manning

THE MID SEPTEMBER appointment of Chelsea Manning—a former soldier convicted of leaking classified information, pardoned by President Barack Obama, and a prominent transgender activist—as a “visiting fellow” of Harvard Kennedy School (HKS) was never going to be popular. (Nor were the appointments of Corey Lewandowski, a former campaign adviser to President Donald Trump, and former White House press secretary Sean Spicer to the same status.) Following Manning’s appointment, Michael J. Morrel, a past deputy director of the CIA, resigned as a fellow; thereafter, CIA director Mike Pompeo, J.D. ’94, abruptly canceled an HKS speaking appointment. And shortly



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Photo by Jean Spencer

after *that*, dean Douglas W. Elmendorf withdrew Manning's fellowship, saying HKS had been mistaken to extend the honorific in this instance, when an invitation to speak would have sufficed. That response created a further uproar, as critics charged the school with caving in to the intelligence community or discriminating against convicts (see harvardmag.com/jonesmanning-17). The incident thus overshadowed the traditional role the HKS's forums have played in hosting wide-ranging, civil presentations extending across the spectrum of political, policy, and international discourse, and thus became more partisan ammunition amid many other heated debates about speech on campuses nationwide. The dean later announced that he was consulting widely to develop new standards and procedures for appointing future fellows; an "improved approach" should be in place later this year.

Final Clubs, Continued

THE FIRST Faculty of Arts and Sciences (FAS) meeting of the year, on October 3, heard a news-filled annual report from dean Michael D. Smith detailing an initiative on inequality in America; growth and diversification of the professorial ranks; and improvements in FAS's finances—at least temporarily, thanks largely to a substantial restructuring of the debt it has incurred to pursue House renewal. (These topics are covered in depth at harvardmag.com/fas-octmtg-17.)

But most attendees' attention focused on the continuation of contentious business from last year: whether the College should take action against unrecognized single-gender social organizations (USGSOs: final clubs, fraternities, and sororities), whose membership policies discriminate on the basis of gender. Anticipating wide interest, the meeting was moved from the Faculty Room at University Hall to a large Science Center auditorium, and it was nearly filled.

Professor of music Suzannah Clark, co-chair of the USGSO committee appointed by Smith, presented its final report—which, surprisingly, conveyed three possible courses of action, not one: prohibiting student membership in such organizations, effective for undergraduates enrolling next fall; retaining the May 2016 policy, in effect now, sanctioning students who join such organizations (denying them leadership positions on athletic teams or other campus groups, and withholding required recommendations for fellowships); or some mixture of en-

hancements in College social programs and spaces and education about inclusive community values. The regulatory approaches are meant to be an incentive to the clubs to modify their policies, and a lever to affect student choices; the third option relies on persuasion and cultural change.

Gordon McKay professor of computer science Harry Lewis, who introduced a motion last year opposing the sanctions, in the name of protecting students' right of free association in legal organizations, produced a revised motion with the same aims. It is intended to assert faculty primacy in making policy governing student life, rather than ceding that role to administrators.

A Classicist's Dylan

IT TOOK SIX MONTHS for Richard Thomas to draft the manuscript for his newest book, *Why Bob Dylan Matters*, a study, among other things, of the songwriter's deep and abiding connection to the poets of ancient Greece and Rome. Thomas sat down at his keyboard a couple of weeks after the announcement last fall of Dylan's Nobel Prize in literature, and by the following spring, the pages were in his editor's hands. "I'm not sure how I did it," he says.

In truth, though, the Lane professor of the classics—whose freshman seminar "Bob Dylan" always fills up fall-semester classrooms—has been working on this book for a very long time. In 2001, he listened to *Love and Theft* a few days after the album was released and heard Virgil's words singing back to him in Dylan's voice. "I'm gonna spare the defeated—I'm gonna speak to the crowd," Dylan rasps in "Lonesome Day Blues," the fifth track. "I'm gonna teach peace to the conquered, I'm gonna tame the proud." This was the *Aeneid*. The language was unmistakable. Virgil's lines, translated from book six of his epic, read like this: "Remember Roman, these will be your arts: / to teach the ways of peace to those you conquer, / to spare the defeated peoples, tame the proud." It turned out that

Conant University Professor Danielle Allen introduced a fresh motion, seeking to balance the right of association with the right to be free from discrimination. Invoking Massachusetts law, it would effectively extend recognition to final clubs and similar organizations; if they failed to comply with College policies on nondiscrimination and governance, students who chose to join them would then face removal from the College community—a different mix of incentives and leverage.

Further discussion and voting may take place on November 7. A complete report on the October meeting, motions, and speakers appears at harvardmag.com/usgsos-oct-17.

~JOHN S. ROSENBERG

Thomas's two lifelong obsessions—Bob Dylan and the classics—were intertwined.

Academics have been poking around Dylan's oeuvre since at least the 1970s, sifting for clues to his enigmatic meanings and origins and influences. But in the past 10



Bob Dylan in 1965. Already, the classical world was starting to influence his writing.

years or so, scholarly "Dylanologists" have begun truly plumbing the depths, dredging up connections to—and often almost verbatim quotations from—Milton, Keats, Tennyson, Pound, Eliot, Shakespeare. In *Why Bob*

GRANGER

Long Run

Leverett House faculty deans Howard Georgi, Mallinckrodt professor of physics, and Ann Georgi—widely known for hosting a Wednesday-night physics study session and for doling out monkey bread—announced August 30 that they will conclude 20 years of service at the end of June. Howard Georgi described House leadership as “the solution to our empty-nest problem” and thanked students for “the wonderful job you...have done in keeping us young.” A familiar figure in his biking gear at faculty meetings, he has long been director of undergraduate studies for physics (his office door commands visitors *not* to knock, but simply to come in), and has been honored for his leadership in diversifying the physics professoriate.

Athletic Awareness

In the wake of revelations last year of sexually explicit “scouting reports” produced by members of the men’s soccer team about



their women counterparts, and of other misconduct (see “Gender Agenda,” January-February, page 23), the athletics department undertook a “cultural review.” According to a message from Nichols

Bob Scalise

Family director of athletics Bob Scalise, the department has now promulgated new training programs for student athletes, created processes for airing concerns, and expanded training on gender, gender equity, sexual assault, and harassment prevention for athletes, coaches, and staff. It also aims to clarify how athletics fits into the Harvard College experience.

Sexual-Assault Standards

U.S. secretary of education Betsy DeVos has announced that the federal government has rescinded the Obama adminis-



Betsy DeVos

tration’s 2011 and 2014 guidance on campus sexual assaults under Title IX. Until the department formally promulgates new regulations, schools need no longer use the looser “preponderance of evidence” standard for judging sexual-assault cases, and may instead adopt the stricter “clear and convinc-

Brevia



HEADING HOME. James E. Ryan, who left the University of Virginia’s law school to become dean of the Harvard Graduate School of Education in September 2013, will return to Charlottesville as president of UVA, effective October 1. Ryan has had signal success as a fundraiser during the capital campaign, securing a landmark gift for early-childhood education research, and made numerous appointments as professors retired and the faculty expanded. The Harvard Teacher Fellows program, launched on his watch, opened the door wider for undergraduates interested in pursuing education careers. Read more at harvardmag.com/ryan-uva-17.

On October 3, historian Lizabeth Cohen, who has been at the Radcliffe Institute helm since 2011, announced that she would step down as dean at the end of the academic year; details at harvardmag.com/rias-cohen-17.

ing evidence” standard. Neither Harvard nor peer institutions have indicated that they will move toward the stricter standard.

On Other Campuses

Princeton began its new academic year by opening its Lewis Arts complex (a 22-acre development of studios, theaters, performance and exhibition spaces, and other facilities for dance, music theater, and music) and a new campus childcare center with capacity for 180 infants and children. It also unveiled an initiative for additions to its portrait collection, intended to better represent the community’s diversity....Cornell has inaugurated its Cornell Tech campus on New York City’s Roosevelt Island, with 30 faculty members and 300 students in place; it is expected to expand to 2 million square feet of facilities housing

2,000 graduate students....After a pilot program, Yale has begun imposing a carbon charge on more than 250 buildings, which account for nearly 70 percent of campus carbon-dioxide emissions. The program, intended to be revenue-neutral, creates a clear incentive to decrease greenhouse-gas generation....As part of its strategic planning, Dartmouth is analyzing expanding its undergraduate enrollment (at 4,310, the smallest in the Ivies) by 10 percent to 25 percent; Yale began phasing in an 800-student expansion this year, and Princeton plans to increase enrollment by 500.

Research (and Other) Resources

MIT and IBM announced a 10-year partnership for research on artificial intelligence; IBM will invest \$240 million in a common lab, staffed by scientists from each institution. Separately, The Engine, MIT’s new venture fund focusing on several challenging technologies, announced that it had raised \$200 million: \$25 million from the school, and the rest from outside investors....Boston University opened its 170,000-square-foot Rajen Kilachand Center for Integrated Life Sciences & Engi-

neering, and noted that its naming funder, a trustee, had also provided \$100 million as an endowment to support related research.... The University of California, Irvine, has received a \$200-million naming gift for its College of Health Sciences from Susan and Henry Samuels; it is earmarked to support “interdisciplinary integrative health” research.... The Walton Family Charitable Support Foundation (of the Walmart Waltons) has given the University of Arkansas \$120 million to found a school of art.

Nota Bene

ALLSTON ADVISER. Shaun Donovan '87, M.Arch.-M.P.A. '95, former director of the White House Office of Management and Budget and secretary of the U.S. Department of Housing and Urban Development, has been appointed part-time “senior strategist and advisor to the president on Allston and campus development.” He arrives as Harvard readies its plan for the development of the 36-acre “enterprise research campus” in Allston. Read more at harvardmag.com/donovan-17.

M.B.A. AID. Harvard Business School has received a \$12.5-million gift from Jeannie '88 and Jonathan Lavine (both M.B.A. '92), its largest donation for scholarship aid. Some

\$10 million is a challenge fund, to encourage other gifts for aid; \$2 million endows fellowships to be used, where possible, for students who are the first members of their families to attend college. Separately, HBS created a Forward Fellowship, beginning with the M.B.A. class of 2020, providing awards of \$10,000 to \$20,000 per year, atop need-based aid, for students with large financial obligations as a result of family background or circumstances.

ANALYTICS CERTIFICATE. HBS and the School of Engineering and Applied Sciences, already partners in a new joint S.M./M.B.A. degree (see harvardmag.com/eng-mgmt-17), have partnered with the department of statistics to create an online Harvard Business Analytics Program, an executive-education certificate offering. Interestingly, it will be run on the 2U Inc. platform, not HBS's HBX operation.

CS50 EVOLVES. The introductory computer-science course, which has pioneered online pedagogies, reverted to one traditional academic norm this year. Among the “What’s new for fall 2017?” guidance in its FAQs: “Unlike last year, students are encouraged to attend all lectures in person this year....” Last year, a large cohort of students was investigated for academic misconduct after assignments and code were checked for duplications or copying from online sources. In its annual report for 2016-2017, the Harvard College Honor Council reported that it had “received a significant number of reports from one large introductory course”—an apparent reference to CS50. This year, the *Crimson* reported, dean of undergraduate education

Jay M. Harris appeared in class to exhort students to read the course’s honesty policy—and to follow it scrupulously.

SCIENCE CENTER RESIZED. A regulatory filing for the science and engineering complex now rising in Allston (the future home of most of the engineering and applied sciences faculty) shows that the building has increased in size—without actually growing. It now totals 496,000 square feet of gross floor area, up from 445,000, but occupies the same footprint, volume, and massing. The difference is attributable to recalculating the interior space once the actual thickness of the walls was determined, and to relocating the area energy facility from the basement to a separate site nearby.

MISCELLANY. The College has named Roland S. Davis associate dean for diversity and inclusion, filling a year-long vacancy; he has been executive director of the office of undergraduate advising and student success at Simmons.... With fewer students than usual electing to defer admission, more members of the class of 2021 than expected enrolled this fall; 28 freshmen are being housed in overflow rooms in DeWolfe. William R. Fitzsimmons, dean of admissions and financial aid, raised the possibility, *The Harvard Crimson* reported, that the College will be more conservative this season, and then resort to the wait list to round out the next class—a departure from recent practice.... The Harvard Film Archive has graduated—from associate membership to full membership in the International Federation of Film Archives, reflecting, among other factors, the growth in its holdings.... Susan Dackerman, curator of prints at the Harvard Art Museums from 2005 to 2015, has been appointed Freidenrich director of Stanford’s Cantor Arts Center museum. She and Agassiz professor of the humanities Jennifer L. Roberts have just completed a catalogue raisonné of Jasper Johns’s monotypes.... John Lithgow '67, Ar.D. '05, won an Emmy for outstanding supporting actor for depicting Winston Churchill in the Netflix drama series *The Crown*.



Shaun Donovan

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT



A TOUCH OF HOME: The bell tower, like the rest of Lowell House, is being renovated, but faculty dean Diana Eck arranged reinstallation of the Commemorative Bell, formerly located in the House courtyard, at Lowell’s temporary two-year hub in the former Inn at Harvard. The replica celebrates the 2008 completion of the swap that returned the original Russian bells to Moscow’s Danilov Monastery, seat of the Russian patriarchate, and their replacement by a duplicate set in Lowell’s tower.



John Lithgow

JON CHASE/HFAC

Dylan Matters, Thomas—who reckons he has seen Dylan in concert perhaps 80 times over the years—adds Rimbaud, Twain, Burns, and the Civil War poet Henry Timrod to the list. And of course, the ancients. His book is the first, Thomas believes, to approach Dylan from a classics perspective.

It is also the first to offer a long look at one of the artifacts in the newly opened Bob Dylan Archive in Tulsa: a small spiral-bound notebook containing drafts of what would become “Tangled Up in Blue.” (In March 2016, the George Kaiser Family Foundation purchased from Dylan his career-spanning collection of 6,000-plus artifacts. The archive opened to scholars earlier this year; a Bob Dylan Center with public exhibits is planned for 2019.) The song drafts of “Tangled up in Blue,” crammed with additions and cross-outs and a list of rhyming words, reveal, Thomas says, a writing process not unlike what records show of Virgil’s: a morning spent composing or reciting lines, “then going back, deleting, changing, licking into shape.”

After Love and Theft, Thomas began listening for other echoes of antiquity in Dylan’s songwriting.

A native New Zealander, Thomas began learning Latin at nine. He began learning Dylan four years later, when “Blowin’ in the Wind” arrived on the local airwaves. His church choir performed the song in 1964, while watching the U.S. civil-rights movement from afar. A decade later, Thomas was packing *Blonde on Blonde* into the trunk he shipped from Auckland to Ann Arbor, Michigan, where he would soon start graduate school in the department of classical studies. That album was one of only two he brought with him to the States (the other was *Songs of Leonard Cohen*), along with his well-thumbed undergraduate copies of Virgil and Homer, Horace, Ovid, Sappho, Catullus.

After *Love and Theft*, Thomas began listening for other echoes of antiquity in Dylan’s songwriting (and in his interviews and press conferences and memoirs) and discovered a whole universe of them, go-

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ing back almost to the beginning. In songs like “If You See Her, Say Hello,” from *Blood on the Tracks*, an album recorded in 1975 as Dylan’s marriage was beginning to break up, Thomas hears the lyric poet Catullus, whose pungent verses on the pain of lost love and the tumult of modernity are some of the best, he says, in literature—sharp and electrifying and revolutionary. Shimmering behind 1978’s “Changing of the Guards,” a song whose overt imagery is Christian, lies a deeper resonance—traceable in an earlier draft—that points Thomas to Virgil again, this time the poet’s messianic *Eclogue 4*, which describes a boy who will become a god and rule the world.

Dylan’s more audacious borrowing—some have called it stealing, a charge Thomas answers with a cheerful-but-firm explanation of creative theft in art and T.S. Eliot’s famous passage about good poets—began much later, likely with *Love and Theft* or 1997’s *Time Out of Mind*. That’s when Dylan started embedding whole lines and phrases from other works into his own lyrics, “activating” and transforming them, Thomas says. His book maps out the correspondences between Dylan’s 2006 album *Modern Times* and Ovid’s poems of exile, in *Tristia* and the *Black Sea Letters*. In the album *Tempest* a few years later, Thomas writes, Dylan channels Odysseus, soaking up lines and images from Homer’s great epic, cloaking himself in the character of the hero. “I’ll strip you of life, strip you of breath, ship you down to the house of death,” Dylan sings in a version of “Early Roman Kings,” nearly word for word from book nine of the *Odyssey*.

A disarmingly personal early chapter of *Why Bob Dylan Matters* chronicles the trip—a pilgrimage, really—that Thomas and several other Dylanologists took in 2007 to the singer’s hometown: Hibbing, Minnesota. They visited his childhood home and the high-school auditorium where his band belted out Little Richard; they listened to a talk by Dylan’s charismatic former English teacher. Thomas, as the classicist in the group, was looking for something else, too: traces of Dylan’s early interest in ancient Rome and Greece, “our shared bond.” He finds it in a yearbook and later a school newspaper column on 15-year-old Dylan’s Latin Club experience; and in the movie theater down the street, once owned by Dylan’s uncle, where the young singer must surely have seen some of the same 1950s films that exposed Thomas to antiquity as a boy: *Julius Caesar*,

Dylan performing in England in 2012. Age has added “compelling” edges and layers of meaning to the singer’s voice, Thomas says.

Jupiter’s Darling, Helen of Troy, Alexander the Great, Spartacus. “Whatever we think we are doing on such journeys,” Thomas writes, “what moves us is the sense of being at the wellspring of artistic creation, where creative genius began to form the art that would become central to our own lives and imaginations.”

Listening to Thomas talk about Dylan and his place in the firmament of classical literature, it becomes clear that this scholarship is not a sidelight to his work on Virgil and Horace and Homer but an integral part of it. One reason he sees so many threads between Dylan and the ancient po-



BEN STANSALL/AP/GETTY IMAGES

ets is because he considers Dylan to be one of them, an artist writing classic texts that outlast his own time. “It’s the same river,” Thomas says. “Just a different stage of it.”

—LYDIALYLE GIBSON

THE UNDERGRADUATE

Writing, Blocked

by NATASHA LASKY '19

I’VE ALWAYS SAID that if you want to take every class at Harvard, work at the Writing Center. Think of it as scholarship meets improv: you’re sitting in a closet of an office, alone, until random undergraduates in classes you’ve never even heard of show up with papers they want you to fix, and you have to learn as much about the subject as quickly as possible in order to properly advise them. The first year I worked there, I saw an overwhelming number of freshmen scrambling through Expos 20—the mandatory first-year academic-writing class—but I also counseled chemists on their lab reports, helped design outlines for stressed seniors polishing their theses, and even guided particularly ambitious undergrads through their law-school applications.

I worked a 9 A.M. shift, and because early appointments are like pesticide to perennially sleep-deprived undergraduates, those who signed up for my hour tended to be miffed, frazzled—this was their last resort.

So when a girl walked into my office, puffy-eyed and scowling, I initially thought nothing of it. She entered smoothing her

stained white T-shirt and running shorts, only to slam her backpack down on the ground and collapse into the gray office chair across from me.

I asked her what she wanted to work on, and she sighed. “My Expos paper, I guess,” she told me, tightening her ponytail. “To tell you the truth, I already know what I need to work on, but my preceptor told me I had to come.”

Each time I asked her to explain an aspect of her paper, she would snap back with a reason why it was my fault I didn’t understand it. After about 40 minutes of this back-and-forth, she leaned back in her chair and crossed her arms, snidely mumbling, “It’s weird to me that you’re not getting this, ‘cause it seems pretty obvious to me.”

Was she right? Was I too stupid for this job? I looked down at my feet and tried to think of what to tell her.

“OK, maybe you’re right, and it does make perfect sense and I just don’t get it,” I said, finally. “And it’s not like you have to change anything if you don’t want to. But I don’t really know what you want me to say, ‘cause if I didn’t give you honest criticism, I wouldn’t be doing my job.”

We sat in silence for a moment. When I looked back up at her, I saw a tear spilling down her cheek. She brushed it away with the back of her hand. “I’m so sorry,” she said, and cleared her throat. “It’s just that I don’t know if I can fix this paper. I have so much else to do.”

I reassured her that her essay didn’t need as much work as she thought it did, and she looked at me blankly; this sort of well-intentioned banality was clearly something she had already heard. But before I could say anything more, the hour was up. She had to go to class. She blinked off another tear, gave me an obligatory “Thanks,” and left the office.

AS AFTER every conference, I started filling out a report to explain how it went, but found myself merely looking at the screen. The typical questions—“Did the student feel ready to revise his or her paper?”—suddenly felt alien. It seemed as though I hadn’t helped her do anything, let alone word her thesis more precisely or delete excess adverbs.

The next time we had an all-tutor meeting, I asked my peers what to do when students come in, ostensibly to talk about their papers, only for both parties to realize that their problems have little to do with writing. I was surprised at how many of us had similar stories. As we picked at piles of popcorn on our paper napkins, we listened to each other describe experiences with students who lashed out at simple criticism, or went to the bathroom to cry, or simply refused to speak, too afraid of failing to say anything at all.

The head of the center, a preceptor in the Expos program, told us that if we’re worried about a student who comes in, we should report it to her. But when it came to the question of how we should treat our crying tutees in conference, people were more equivocal. “Don’t worry too much about it,” said one tutor. “It’s just part of the job.”

Across the table, another shook her head. “I mean, I’m not saying we shouldn’t be nice to people when they’re crying, but, at the end of the day, we’re writing tutors. We should leave therapy to the people who are trained to do it.”

If I could have sent my weeping tutee to another counseling service, the most obvious choice would have been the Bureau of Study Counsel (BSC), which targets academic issues specifically. Much of the advice offered on its website is pragmatic and good-natured, centering around easily implemented tips like making to-do lists and keeping a calendar. Elsewhere, the tone shifts. For example, the BSC counsels undergraduates having problems with their theses this way: “In an intimate relationship of any depth and duration, there is bound to be some disappointment and conflict. Those do not necessarily indicate that the relationship must end; sometimes working through a conflict or misunderstanding can lead to greater intimacy.”

CERTAINLY there is something ridiculous about the prospect of seeking greater intimacy with a paper. But academic work is personal. I find that my friends’ emotional issues often manifest most acutely in moments of academic stress. One was gripped with such intense test anxiety that he couldn’t eat or sleep for days before he took his exams; another realized she wanted to take the semester off when she found herself paralyzed, unable to finish the final paper for her concentration.

One could call these mental-health instead of academic issues, but I wonder if this semantic distinction actually helps anyone. Allocating people’s issues to strict categories, pulling apart their “academic” and “mental health” problems as if they were Lego bricks stuck together, might be counterproductive. Embarrassing as it is to admit, I have cried about my papers so many times it’s impossible to count. When it’s 3 A.M. and I’m weeping over the fact that

I still have four more paragraphs to write, I don’t know if it matters what I call my problems—I just want to be listened to.

Perhaps this is where the Writing Center comes in. There’s no prescribed relationship between tutors and the people we work with; we’re students and teachers and peer counselors simultaneously. In this way, we can mold ourselves to help students in whatever way they need, whether they’re struggling with the personal implications of what they’re writing about, cracking under the pressure of perfectionism, or wondering why they write papers at all. Not every writing center conference is so fraught. But even in conferences that deal with theses and topic sentences, I find myself spending less time with the paper itself than with the person who wrote it. ▢

Berta Greenwald Ledecy Undergraduate Fellow Natasha Lasky '19 is still working at the Writing Center.





At Rhode Island, junior powerhouse Charlie Booker III rumbled for gains of 50 and 57 yards en route to a game- and career-high 139.

GIL TALBOT/HARVARD ATHLETIC COMMUNICATIONS

SPORTS

A Rugged Start

An Ivy win and a terrible injury mark Harvard football's early season.

ON SATURDAY, September 16, at Meade Stadium in Kingston, Rhode Island, players from the Rhode Island football team leaped in ecstasy at the final gun, having pulled off the season's first shocker: a 17-10 win over perennial Football Championship Subdivision power Harvard. But there were at least seven other schools whose players, coaches, and fans were jumping for joy—those of the rest of the Ivy League. The defeat at Rhode Island was the Crimson's third in a row, stretching across two seasons and encompassing the 21-14 humbling in the 2016 Game at the hands of underdog Yale. That

triumph, which was the first victory for the Elis in the series in 10 years, had made the long offseason awfully blue. In the 2017 preseason media poll, the Crimson had been tabbed co-favorite with co-defending champion Princeton, but the Rhode Island game seemed to expose flaws on both sides of the ball. Was this the season in which high-and-mighty Harvard—winner of at least seven games for 16 consecutive years—would get its comeuppance?

As football announcers sometimes say when indicating that a long gain is about to be called back by a penalty: Hold the phone.

Thanks to some legerdemain by coaching maestro Tim Murphy, the Crimson bounced back the following Saturday with a convincing 45-28 win over Brown, a victory that had added import because

son on the Crimson sideline, the coach was cognizant of the All-Ivies he had to try to replace: man-mountain offensive linemen Max Rich and Larry Allen Jr. (the latter, a member of the class of 2018, is taking a year off from school); sure-handed tight end Anthony Firkser; and defensive-line sackmeister James Duberg.

No foe was shedding any tears for Murphy. Harvard had a battle-tested quarterback in fifth-year senior Joe Viviano and other splendid offensive weapons, the most dangerous being a pair of slippery junior wide receivers, Justice Shelton-Mosley (who is also one of the league's most dangerous kick returners) and Adam Scott. The defense was anchored by three seniors: linebacker (and 144th Crimson captain) Luke Hutton, quarterback-harassing defensive end DJ Bailey, and hard-hitting cornerback Raishaun McGhee. If the team seemed not as imposing or complete as recent predecessors, including the 2016 group that finished 7-3 overall and 5-2 (good for third place) in the Ivy League, then Murphy surely had men in the pipeline. He always does.

The opener at Rhode Island was marred by a frightening injury that will resonate the rest of the season. The Crimson had scored first. Harvard's 5-foot-9, 200-pound junior running back Charlie Booker III rumbled 50 yards to the Rhode Island four; when the at-

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Junior defensive end DJ Bailey (99) registered one of five Harvard sacks against Brown quarterback Nick Duncan.

tack failed to get the ball into the end zone, junior Jake McIntyre booted a 38-yard field goal. Now the Rams had the ball. On third-and-15 from the Rhode Island 31, Rams quarterback Tyler Harris dropped back, looked left and aimed a pass for receiver Marven Beauvais, who was covered by Crimson defensive back Ben Abercrombie, a freshman from Hoover, Alabama. Beauvais made the grab for an 18-yard gain and was knocked down by Abercrombie. Both men initially stayed on the ground. Beauvais got up; Abercrombie did not. After a somber six-minute delay, he was taken away on a stretcher and transported to Rhode Island Hospital, where he would undergo spinal surgery.

On the first play following the stoppage, Harris found receiver Aaron Parker all alone behind the Harvard defense for a 51-yard touchdown. C.J. Carrick booted the extra point. Rhode Island 7, Harvard 3. Moments later Carrick drilled a 21-yard field goal. Rhode Island 10, Harvard 3.

Then it was again Booker time. On first and 10 from the Harvard 35, the burly back barreled 57 yards to the Rams' eight. He would finish with a game- and career-high 139 yards. Booker, a Houston product, emerged in the Crimson backfield last year after recovering from early-season hamstring woes; he scored the first touchdown in the Yale game on a 27-yard jaunt. His specialty is shedding tacklers and heading to the outside and upfield. Call it the Booker Bounce. "Sometimes when I get stuck in a pile at the line of scrimmage," he says, "I know that a lot of defenders will converge on the inside, so that will leave the outside open."

On the play after Booker's long run, 5-foot-10, 180-pound freshman Aaron Shampklin, out of Long Beach (California) Polytechnic, glided into the end zone. McIntyre booted the extra point. Harvard 10, Rhode Island 10.

The draw was short-lived. On the Rams' next possession, Harris, avoiding Crimson defenders with aplomb, again connected with Parker, this time for 39 yards. Five plays later, Harris slid off left tackle for a one-yard touchdown run. Rhode Island 17, Harvard 10.

That's the way it ended. In the second half, the Crimson had its chances to knot



TIM O'WEARA/THE HARVARD CRIMSON

things up, most notably at the beginning of the fourth quarter when Viviano took Harvard on a 12-play, 76-yard drive that at its farthest reached the Rhode Island seven. During the series, Viviano was finally able to connect with Shelton-Mosley for two completions, one of 10 yards, another of 20. Shelton-Mosley made the second grab with a Rams defender hanging all over him. But the drive's final play was a botched hand-off from Viviano to Booker, which resulted in a five-yard loss and the ball going over to Rhode Island on downs.

In all, the Crimson incurred three offensive-holding calls and 10 penalties for a loss of 80 yards. Viviano was sacked five times and otherwise spent much of his day trying to evade aggressive Rams defenders. He finished a respectable-sounding 17-for-32 passing for 192 yards.

That was not good enough to keep his starting job. The following Saturday at the Stadium, against Brown, Murphy pulled a stunner, naming as the opening quarterback a freshman, Jake Smith out of Ithaca (Michigan) High and Exeter. Smith is the first Crimson freshman to start at the position since 2001, when Ryan Fitzpatrick '05 got the call. As Murphy explained afterward, "The bottom line is that Jake had performed the best as a quarterback in practice over the last two weeks." Pointing to his team's sluggish of-

fense in the latter part of last season and against Rhode Island, Murphy added, "We needed a jolt."

The coach's choice was vindicated on Harvard's second offensive series when Smith nimbly led the Crimson 62 yards in five plays, the last two a 31-yard toss to Scott and a 16-yard Booker touchdown blast. A few minutes later, though, Smith was trapped behind Harvard's goal line and tackled for a safety.

Usually teams tally a touchdown or at



TIM O'WEARA/THE HARVARD CRIMSON

Capping a 98-yard drive, sophomore back Lavance Northington (2) dove into the end zone for the Crimson's third touchdown against Brown.

least a field goal after registering a safety, but here the Crimson defense flipped the script and made the play of the game. On third and five at the Brown 34, Bruins quarterback Nick Duncan dropped back and threw to his left. Tracking it like a laser, Harvard senior defensive back Tanner Lee snagged the pigskin and cantered 39 yards the other



Pick six! Against Brown, senior defensive back Tanner Lee clutched Harvard's first interception of the season, which he turned into a game-breaking touchdown.

downs against a Harvard defense turned over (like the offense) largely to the subs made the final score look more respectable than it was.

As Murphy announced afterward, the game ball was ticketed for Abercrombie. Before the playing of the national anthem, the scoreboard had showed a video that included heartfelt greetings to him from mem-

TIM O'NEAR/THE HARVARD CRIMSON

way into the Brown end zone. The interception was Harvard's first of the season and one of three on the day. The Crimson now had a 14-2 lead.

During his tenure Murphy has been renowned for "taking the temperature of a game." With 9:31 left in the second quarter the thermometer dictated another quarterback switch—back to Viviano. "Based on the first couple of series, I felt like Joe would give us the best opportunity to maximize our chances of winning this game," said Murphy. The place where Viviano had to begin was hardly propitious: the Harvard two-yard line. In nine plays Viviano took the Crimson 98 yards to pay dirt, the big plays being tosses of 31 and 27 yards, respectively, to Scott and fellow junior wideout Henry Taylor. The capper came when sophomore running back (and former high-school quarterback) Lavance Northington, working from the wildcat formation, took a direct snap and ran six yards for a score. McIntyre kicked the extra point. Harvard 21, Brown 2.

With the Crimson defense throttling the Brown running game (23 yards on 20 attempts) and sacking Duncan five times, Viviano set about building the lead. By late in the third quarter it reached 38-9. Murphy pulled Viviano—he finished 11 of 13 passing for 150 yards—and reinserted Smith. In the fourth quarter the freshman (five of seven passing) threw his first touchdown toss, a five-yarder to a fellow Exeter product, junior tight end Cecil Williams, who made his first touchdown catch. Four late Brown touch-

bers of Harvard men's and women's athletic teams; it can be viewed on gocrimson.com and on YouTube. On their helmets this season the Crimson players will wear decals reading "BA." Said Tanner Lee, like Abercrombie an Alabama product: "The season's now about winning games but also for a lot of us about putting a championship ring on Ben's finger."

~DICK FRIEDMAN

"Too Normal" for a Goalie?

Merrick Madsen was the brick wall in net for last season's Frozen Four team.

LAST MARCH, Harvard goaltender Merrick Madsen '18 played one of the best games of his life: a 3-0 shutout against Providence, on the road, in the east regional semifinals of the NCAA tournament. The contest was a big deal—Harvard had made seven NCAA tournament appearances in recent years, but the team hadn't won a game there since 1994. This season was already something different, though. By the time the Crimson reached Providence, it had begun to seem unbeatable. The players were riding a streak of 14 consecutive wins. They'd won the Beanpot Tournament for the first time in 24 years. Two weeks before the Providence game, they had taken the ECAC conference championship, thrashing perennial foe Cornell 4-1 in the final at Lake Placid, New York. That victory had earned them the chance at this one. And so here they were, back at the NCAAs. Before the game, Madsen told himself that he was go-

The following week in the nation's capital, Harvard was barely challenged in whipping Georgetown for the fourth straight year. The highlight came early in the first period, when Shelton-Mosley fielded a punt at his nine-yard line, identified a seam and, set up by a wall of blockers, streaked to a touchdown. The 91-yard return was the longest in Crimson history, surpassing the 89-yard effort of Hal Moffie '50 against Holy Cross in 1948. Smith again started at quarterback and went 16-for-30 passing. Booker powered to two touchdowns, the Crimson defense forced four turnovers and McGhee had Harvard's second interception return for a touchdown in as many weeks, a 23-yarder. All in all, a good warmup for the cauldron of the Ivy campaign.

Tidbits: Harvard has not lost a home opener since 2000, and it has not dropped an Ivy League opener since 2010. Murphy is 19-5 in Ivy openers.... Of the home states of players on the Crimson's opening-day roster, California was most represented, with 17, followed by Texas (14), Georgia and Massachusetts (eight each) and Alabama (seven).... At season's start, nine former Harvard players were on NFL active rosters or practice squads.

ing to leave everything he had out on the ice, no matter what. "I thought, I want to be stretched off if I have to. Because I am trying that hard."

In the next three periods, Madsen stopped 41 pucks, a furious assault from the Friars, who took half again as many shots on goal as the Crimson. In the first three and a half minutes alone, he made seven saves. That was pretty much how the next two hours went. "I think we had something on our side," Madsen told reporters after the game. His coach, Ted Donato '91, put it a different way: "I think it starts with the goaltender."

And yet, when you ask Madsen to think back on the season that took his team all the way to the Frozen Four, the first game to come to mind for him is an earlier, less glorious contest: a late November matchup against Boston University. At that point in the season, Harvard was 5-2-1; they'd had a

couple of significant games, but most were still to come. “We had been playing pretty well, a few blips along the way,” he says, “and we were in a tight game against BU—we always play a tight game against BU—and then we ended up losing.” The final score was 5-3. A couple of the Terriers’ goals were fluke, a weird bounce from the corner, a puck that chipped in off Madsen’s stick. Still, he says, he should have saved those. He remembers thinking afterward that what he was giving the team wasn’t enough, that he would have to work harder, play better, dig deeper. “I carried that with me through the year,” he says.

At 6-feet-5-inches, 190 pounds, with an enormous wingspan and a .923 save percentage, Madsen is one of the few returning players from last season’s core of stars and one of three senior co-captains this year—a rare position for a goalie and a testament, Donato says, to Madsen’s character and work ethic. It is also perhaps a testament to his un-goalie-like calm and equanimity. Madsen’s parents sometimes call to check on him after games, because he looks so tranquil on the ice—maybe too tranquil. He’s intense too, he says, but the calm is important; it moves through the lineup. “If you have a panicky goalie in net, then everyone’s panicky, and you don’t need that.” He doesn’t nurture any superstitions, either. Gave them up years ago, including the one that had him turning over his pillow the night before each game. “I used to be the most superstitious person ever, and what I realized is that it’ll drive you crazy,” he says. So now, during those molasses-slow two hours before game time, he chats with teammates and eats a granola bar. “Merrick’s almost too normal to be a goalie,” Donato jokes. “I say that with affection.”

He wasn’t always so at ease. “People say goaltending is 10 percent physical, 90 percent mental,” Madsen says. The 90 percent is the hard part. “When your teammates are successful, it shows up on the scoreboard. You celebrate. As a goalie, when you’re doing things right, it just means you’re doing what you’re supposed to do. No one is exactly supposed to go out and score a hat trick every night, but every single shot, broken

down one by one—I should be able to save almost all of them.” The confidence to do that took time to grow into.

Madsen was raised mostly in southern California—more of a hockey region than people realize, he says—and learned to skate at four years old; he started playing hockey a year later. He wasn’t a good skater at first, he remembers, and he hardly scored. Then his team’s goalie aged out of the league and his father, a former player himself, suggested he try out for the role. Instantly, he became a better hockey player. The net was where he belonged. He stuck with it, and in high school became one of the best players on his team.

Then he came to Harvard and played in only one game his freshman year, a 5-1 loss to St. Lawrence (goalie Steve Michalek ’15 was the senior star that season). “And that

that moment too. “We were trying to light a spark in him,” he says.

The next year, Madsen found himself competing against incoming freshman Michael Lackey, who’d played internationally—and won medals and accolades—with the U.S. National teams’ under-17 and under-18 squads. They split the season between them, Madsen taking the lion’s share—“We were each pushing each other,” he says—and then last year he locked down the job, starting all 36 games (Lackey was right behind him as backup). It was an incredible season, which ended at the Frozen Four in Chicago, where Harvard lost to Minnesota-Duluth, which then lost to the eventual NCAA champion, the University of Denver. From late January until early April, though, the Crimson had not dropped a game. They ended the season at 28-6-2.



was kind of it,” Madsen says. “It’s tough to come in and not be that guy anymore, the guy who starts every game.” He recalls going to Donato and the other coaches that year, thinking that if they’d just put him in another game, he could find his confidence again. “And I remember Coach telling me something I’ll never forget: he said, ‘You’ll never get confidence from us.’ That the way you get confidence is within yourself, and once you find it there, then you’ll be able to play. I’d never thought about confidence that way,” he says. “My coach was telling me I had to do more work,” build strength, physically and mentally. Donato remembers

This year, they begin again. Eight players from last year’s roster graduated in May. Madsen is unfazed. “Every year I’ve been here, we’ve always been underestimated,” he says. “Last season everyone thought we wouldn’t be that good, because we had lost Jimmy Vesey [’16] and Kyle Criscuolo [’16]. But then everyone showed up....If anything, we know that we have the ability to prove people wrong. It’s going to be about guys stepping up and playing a bigger role. Those guys who didn’t play much last year—we need them this year. Just like we did before, everyone needs to show up.”

—LYDIALYLE GIBSON

Medicine in the Middle of Nowhere

Stuart Harris and the
austere practice of
wilderness physicians

by LYDIALYLE GIBSON



THERE WAS STILL some light in the sky that evening after supper, when everybody started shuffling over to find a spot near the fire. The heat of the day had faded only slightly. Still, they were carrying extra layers and puffy jackets. And headlamps: one thing these last three weeks in the woods had taught them was that no matter how much they'd sweated under their packs during the afternoon, once the sun slipped behind the canyon, the world got very cold and dark, very fast.

"OK," said Stuart Harris, looking around the circle at the dozen or so faces looking back at him. "I think we're all here. Ready?"

The 20- and 30-somethings nodding in response were medical students, most just days away from graduation and the start of residencies at teaching hospitals in Delaware, Minnesota, New York, Virginia, Massachusetts. Soon, when the phone rang at 3 A.M. with the news that a patient couldn't breathe or was having chest pains, they'd be the ones who would have to decide what to do.

For now, though, they were still medical students, and this was one last chapter in their education: a course called "Medicine in the Wild," a month-long backpacking expedition through western New Mexico's remote Gila Wilderness, where they learned how to cook pizza and brownies from scratch over a gas flame and to tie their food in trees out of the reach of bears, how to read a compass and follow a trail map, how to set up a campsite and find water and cross a river safely. They'd seen javelinas (small wild pigs native to the Southwest) and a rattlesnake and heard coyotes; one night, some of them had watched several elk crossing a meadow, bigger than anything they'd imagined, bugling wildly. A couple of people had spotted a bear.

The course, led by instructors from the National Outdoor Leadership School (NOLS) and a fourth-year medical resident from Harvard, also introduced them to wilderness medicine, which is pretty much what it sounds like: providing emergency care, using limited tools, to people who get sick or injured in remote environments (Harris's succinct definition boils it down further: "the provision of resource-limited medicine under austere conditions"). Along the way, there'd been lectures and simulated scenarios—the most dramatic was a feigned leg fracture, requiring the students to construct a litter out of backpacks and sticks and carry the "patient" to a helicopter rendezvous at the top of a hill.

The course had also offered some unplanned pedagogy: a mild bout of altitude sickness, which struck one student after the first day's climb (she recovered with a night's rest and two doses of Zofran), and, later, an unexplained allergic reaction that forced one of the instructors off the trail a few days early with a fever and a red, swollen face (she, too, recovered). One year, Harris recalls, a rabid fox wandered into camp in the middle of the night and bit a student's foot through his sleeping bag, breaking the skin. The

incident led to an in-the-field vaccination and yielded a scholarly paper: "Rabies Exposure—Implications for Wilderness Travelers."

Now, finally, near the end of this arduous, exhilarating adventure, the 12 students were sitting around a fire with Harris, who has spent years practicing what they had come here to learn. An emergency-medicine doctor at Massachusetts General Hospital (MGH) and associate professor of emergency medicine at the Medical School, Harris is also a wilderness physician. Now 50, with a silver-threaded beard and a honeyed Virginia drawl, he has looked after patients on the slopes of Denali and in the Everest region of Nepal, in northern Japan after the 2011 tsunami, and in the vast and empty reaches of Siberia. He's accompanied scientific missions to the Amazon and the Mekong as the doctor on call in case something goes wrong out in the wet and tropical middle of nowhere. Nine years ago, Harris founded MGH's wilderness medicine division (he's now chief), a part of the emergency department, and he directs its fellowship program. He's also one of the founders of this NOLS course; every

spring he swoops in to teach the final segment.

He'd met up with the group not long after daybreak, hiking in from a campground five miles away, where he'd spent the night after leaving his rental car at the end of a narrow twisting road through ponderosa pines—following a three-hour drive on Interstate 10, and two flights in from Boston. That afternoon, sitting under the trees alongside the middle fork of the Gila River and the soaring jagged walls of Little Bear Canyon, he'd given a talk on altitude illness, his principal area

of research. Now, in the falling darkness, it was time to talk about Chekhov.

Harris had asked the students to read the short story "Misery," a sharp study in casual inhumanity and uncompassion. Set in 1880s St. Petersburg, it follows a cab driver in deep despair over the death of his young son. Several times he tries to share his grief with his passengers and fellow cabbies. No one listens. They don't even let him get the words out. The story ends with him unburdening himself instead to his horse.

"So," Harris began. "Why would I send a story called 'Misery' to a bunch of doctors? What the hell does this have to do with what we do?"

Everyone stared into the fire. Harris told them a little about Chekhov: the son of a serf who worked his way into medical school, a writer as well regarded in his own time as now, a man whose social conscience propelled him on a 6,000-mile journey to investigate and write about the forced-labor prison camps in Russia's far east.

"It's about the importance of listening," interjected one student. "This story."

"Exactly," Harris answered. "The healing influence of listening." He noted how easy it can be, in everyday medical settings, to feel too busy for listening. But taking the time—and sometimes it's only 30 seconds—to hear the person in front of you is important. In



Working near the summit of Denali National Park, Stuart Harris (far left) and other members of his climbing ranger patrol evacuate a patient.

MENNO BOERHANS



the wilderness, away from X-ray machines and MRIs and blood-chemistry workups, the patient's testimony and a physical exam are often all the doctor has to go on. The patient history, Harris said, is the diagnostic engine of medicine.

Sometimes it's more than that. "When I was in Japan after the tsunami," he recalled, "I kind of felt stupid after a while, because, since it was a cold-water tsunami, most people had either died—gone hypothermic and drowned—or they were basically fine. And so then you show up to try to help, and I felt like I was mostly sitting around hearing a lot of stories." Venturing out from the school that had been transformed into a shelter and hospital, he made house calls on survivors in a devastated coastal town, sat in people's kitchens, drank their tea. Many of them were in their eighties and nineties, and their stories astonished him; he still chokes up thinking about their dignity and graciousness in the face of overwhelming loss. But Harris wasn't sure he was doing much to help. Why was he there, he wondered. Later he realized the listening was the why.

"Medicine is the most human of the sciences," Harris told the students, who were now fully bundled into their jackets. Someone got up and put a fresh log on the fire; he kept talking. The night deepened around them. "The most human of the sciences," he said again. That's perhaps even more true in the wilderness, which strips away sophisticated implements of the physician-patient relationship and lays bare its most basic elements.

Harris with NOLS students and instructors (including MGH emergency medicine resident Zheng Ben Ma, in the orange shirt) in New Mexico's Gila Wilderness

"The Soothing Balsam of Yore"

WILDERNESS MEDICINE came together as a formal discipline, with practice guidelines and conferences and scholarly journals, in 1982, when three young doctors from California founded the Wilderness Medical Society. The International Society of Mountain Medicine followed three years later, and in 1991, the International Society of Travel Medicine was formed. Wilderness medicine itself, however, is perhaps as old as civilization. ("It's really the ur-Western medicine," Harris told the students one afternoon, at the end of a long answer to a question about beginnings. "Twenty-three hundred years ago, Hippocrates sat down with a student and a patient under a plane tree on the island of Kos off the Greek mainland and took a good history and performed a good physical exam.")

The field shares a common ancestor with nautical and tactical medicine, whose physicians have always had to work outside established infrastructures, with limited tools and improvised techniques. The foreword to *Auerbach's Wilderness Medicine*—the field's

definitive textbook, now in its seventh edition and co-edited by Harris—notes that until World War II the number of soldiers killed in combat was much smaller than those who died from other, often environmental, causes. For much of history, weather and infectious diseases were a greater threat than opposing armies. Soldiers died from typhus, smallpox, dysentery, diarrhea, cholera, pneumonia, hypothermia, frostbite. Infections turned survivable injuries into fatal ones. Noting several milestones in tactical care, the foreword's authors, Robert Quinn and George Rodway, start with of Machaon, the Greek fleet surgeon who, in Homer's telling, treated Menelaus after he was wounded by an arrow during the Trojan War: "cleansed it from blood, and sprinkled over it / with skill the soothing balsam of yore."

By the eleventh century, naval surgery in the Mediterranean was handled by barber-surgeons. In the early 1600s, English naval surgeon Thomas Woodall pushed nautical healthcare forward with *The Surgeon's Mate*, a text guiding shipboard doctors through wound treatment, fractures, and amputations. Woodall's observations on scurvy were ahead of his time. A century and a half later, Admiral Horatio Nelson—whose career with the British navy included firsthand run-ins with malaria, yellow fever, depression, lacerations to his back and abdomen, a blinded left eye, and an elbow so destroyed by grapeshot that his arm had to be amputated just below the shoulder—swept in a new era of disease care at sea.

In North America, military medicine moved to the front lines after the Civil War, reintroducing tourniquets and other tools to the battlefield. Amid battles with Native American tribes, civilians and doctors alike began using instruments like the *belucum*, whose invention dates as far back at 500 B.C.E., to extract arrows from wounds. Frontier medicine added another ancestral thread to wilderness medicine. When Lewis and Clark and their Corps of Discovery set off for the Pacific in 1804, Clark was serving as expedition doctor. He had

no degree but enough medical knowledge to tend to the corps (on the two-year journey, only one person died, a Sergeant Floyd, likely felled by appendicitis). Other “physician/naturalists” followed, write Quinn and Rodway, as explorers ventured farther into unmapped, and often extreme, territory. Increasingly, these were trained doctors who could also serve as field biologists, and they were, as Clark had been, skilled outdoorsmen integral to the mission. Doctors accompanied explorers into the depths of the ocean, and to the North and South Poles; in 1912 English physician, painter, and ornithologist Edward Wilson died on Antarctica’s Ross Ice Shelf with Robert Scott and three other crewmembers from the doomed *Terra Nova* expedition.

The Most Fertile Soil

STUART HARRIS ALWAYS KNEW he wanted to be outdoors. It took him six years after college to figure out that he wanted to be a doctor and wend his way to medical school, but the wilderness had been calling to him forever. His maternal grandparents met in the woods, helping to construct what would become the Appalachian Trail—a detail Harris offers almost as proof of his own provenance. He recounts a story his mother tells, about a family camping trip in the Smoky Mountains, when Harris was about three weeks old. As he sat in a baby seat in the tent, with his parents at a table not far away, a bear and her cubs came walking in between them. Neither he nor the bears seemed perturbed. “And my parents were like, ‘Well, I guess he’s going to be OK.’”

When Harris was four years old, the family moved from Nashville to Lynchburg, Virginia, a foundry and factory town in the middle of the state that hugs the James River. “I came to the outdoors by way of whitewater,” he says. The James was in his backyard, and the Maury and Tye rivers were not far away. By the time he headed off to The University of the South in Sewanee, Tennessee, he was an accomplished whitewater boater. He captained his college canoe team for three years, and when he wasn’t in class, he was usually on the water. “The Ocoee and the Nolichucky and all the great creeks of eastern Tennessee and of the Cumberland Plateau, they’re just glorious things. God, so much fun.”

In the fall of his junior year, he took a semester-long NOLS course in the Rockies. The curriculum was intense: 30 days learning mountaineering in Wyoming’s Wind River Range, two weeks of caving in the Dakotas’ Jewel Cave National Monument and Wind Cave National Park, two weeks of climbing at Devil’s Tower National Monument, then two weeks of winter mountaineering, and, finally, two weeks in the desert. By the end, he’d been living outdoors for 95 days. He felt safe and comfortable and confident in the deepest wilderness. It was the most tremendous experience he’d ever had.

After graduation, he didn’t know what to do, so he left the country. An English major at Sewanee, he applied to an exchange program that sent young Americans to towns and villages across Japan to teach English. Harris ended up in a high school in Iwaizumi, a little village in the mountainous, snowy north, about 10 miles from the Pacific Coast. When he arrived, he spoke no Japanese. He was, he believes, the first foreigner to live there. His life there was strange and often isolating, and he loved it. He studied judo every day (he has a black belt) and practiced his mountaineering skills; he read constantly and learned to speak passable Japanese. He wrote a novel, never published (“It was terrible, but I learned a lot”), which he based loosely on Shakespeare’s *The Tempest*. It was about a young man’s coming of age and environmental awareness.

At the end of his two-year tenure, the school principal handed him an envelope with \$6,000 in cash, enough for a one-way business-class flight back home to the States. Instead, Harris bought a ticket on a slow boat to Shanghai, and from there made his way through China to Hong Kong, Thailand (where he waited out a monsoon), India, and Nepal. “I spent six months coming home on the money they gave me for a 12-hour flight,” he says. It might have taken him even longer, but just before he was about to head to Kenya, he blew out his knee while backpacking in the Himalayas, on the slopes of Everest. By then it was almost Christmas. “I wrapped a Therm-a-Rest [a thin, inflatable sleeping pad] around my knee to lock it in place,” he says, “and walked out of the Khumbu like Frankenstein.”

Back home, Harris spent a few months teaching English and coaching whitewater boating at a boarding school in western North Carolina. The place was gorgeous, and the people were nurturing, but he was restless. “I found myself sitting out on country roads listening to Mahler’s First and drinking entirely more than was reasonable,” he says. He enrolled in graduate school at William and Mary, studying English and biochemistry. That wasn’t quite right, either, but it was closer. Through a friend he’d made in China, he landed a spot on a fishing boat in Alaska and spent one summer and then another there, seining for salmon and longlining for black cod and halibut. Periods of furious, backbreaking, round-the-clock labor would intersperse with long fallow days amid almost indescribable beauty. “We went to some place out in the Kenai Peninsula when we were out in the Kodiak,” he recalls, “and, my God, it was just spectacular. We’d just harbor up in these places that people spend thousands of dollars to get to.”

When he returned home at the end of that second summer, a letter was waiting for him in Virginia: an acceptance to the University of Iowa’s prestigious M.F.A. program—he’d applied using a chapter from his unpublished novel. Classes were starting in a week. Harris packed a bag, jumped in his car, and started driving west. That was 1993, the year of the Great Flood, when the Mississippi and Missouri rivers reached levels not seen in 100 years. Iowa City was partially underwater, so he camped out at a nearby state park for two weeks while he

“I wrapped a Therm-a-Rest around my knee to lock it in place and walked out of the Khumbu like Frankenstein.”

went to class and looked for a place to live.

At Iowa, he felt “like a random seed that had landed in the world’s most fertile soil.” His mentors were novelist Marilynne Robinson and essayist Jim McPherson, “two great souls,” he calls them, whose influence on his intellectual and moral development would be hard to overestimate. He spent a semester reading *Moby-Dick* from a Calvinist perspective with Robinson (“the highlight of my academic life”), and with McPherson read Ralph Ellison’s *Going to the Territory*, a book that reordered Harris’s social and racial thinking. (He also met a young classmate in the fiction workshop, Malinda Polk—“She was the only one I wanted to talk to,” he recalls. Six years later, they got married in the chapel of the Groton School in Massachusetts, where her father was headmaster; they have three children, Walker, Emma, and Elizabeth, and live within shouting distance of the Blue Hills.)

“You can tell writers right away when you meet them—they don’t talk like anybody else,” says Porter University Professor Helen Vendler, who became friends with Harris a few years ago. “One can hardly meet Stuart without seeing that he is an intensely verbal and narrative person. He wants to show you the world as he sees it.” To tell you a story. “I feel that he should be writing all the time.”

And yet, by the time he left Iowa’s creative-writing workshop, he knew he was bound elsewhere. The fall after his graduation, he started classes at the Medical College of Virginia. The son of two doctors, Harris had grown up hearing medicine spoken at the dinner table every evening, and the profession had always remained in the back of his mind, even as he roamed elsewhere. (“You can’t turn off being a writer—it’s in you,” Vendler says, but “you can’t turn off being a doctor, either.”) He’d learned CPR as a kid, and during a drive through the Virginia mountains with fellow summer-campers when he was about 15 years old, the group came upon an accident. A woman had jumped out of a moving vehicle and split her head open. “Everybody in the van turned and looked at me,” Harris says, “like, ‘You can stabilize this.’” He and the others did, stopping the bleeding and holding her spine in place until the ambulance arrived. As a medical student 15 years later, Harris found his way to emergency medicine—it was the specialty that combined everything he loved about all the other rotations—and in 1999 he began his residency at Harvard. Already, he was intent on making wilderness medicine his academic focus.

“Anyone with Anything at Any Time”

“YOU HAVE TO BE CAREFUL when you spend time with Stuart,” says David Brown, chief of MGH’s emergency-medicine department. “You’ll get bitten by the bug, and the next thing you know, you’re spending three months in Nepal, working at clinic on the side of a mountain.”

He isn’t kidding. This past spring, as the NOLS students began backpacking their way through the Gila Wilderness, two MGH wilderness-medicine fellows and four shorter-term research fellows were working at clinics on the side of a mountain in Nepal, halfway through a three-month stint treating patients and gathering data for a study on altitude sickness. The time in Nepal has become a staple of the two-year fellowship program that anchors the wilderness division, which Harris first proposed when he was a fourth-year resident. Wilderness-medicine programs have been multiplying rapidly in recent years, but back then, there was only one, at Stanford. “Stuart convinced me to more or less take a flyer on what he wanted to do,” Brown says. Harris’s idea was not only

to practice wilderness medicine but also to study and improve it, and to use what he learned to improve MGH’s own emergency department. There’s a natural coherence between wilderness and emergency medicine, Brown adds: after all, “Our mantra is, anyone with anything at any time.”

The wilderness-medicine division officially launched in 2008, though MGH had been offering training in that field since 2003. The program has graduated nine fellows, who arrive as practicing physicians, typically at the end of their emergency-medicine residencies. Like Harris, they are also experienced outdoorspeople: skiers, mountain climbers, backpackers, scuba divers. “Adrenaline junkies,” one former fellow joked. A love for wild places and environmental advocacy are built into the program. They’re also at the core of the NOLS course.

Every year Harris assigns a list of books, and each NOLS student picks one to report on to the group during their last day together in the canyon. The titles wind loosely around the theme of humans’ relationship to nature—everything from Cormac McCarthy’s *The Road* and William Faulkner’s “A Bear Hunt” to *The Forest Unseen* and *Cadillac Desert* and *Silent Spring* and John McPhee’s *Encounters with the Archdruid*. (Harris carries a copy of each book with him into the field when he meets with the students; carefully tucked into Ziploc bags, they nearly fill his backpack.) In the students’ presentations, you can sense the distance they’ve traveled internally during their weeks in the wilderness. They come back to the books with new eyes. Harris always assigns someone *The Practice of the Wild*, a collection of essays by Gary Snyder, the poet and scholar of the natural world whose 1975 book *Turtle Island* won a Pulitzer. Snyder is the wilderness division’s poet laureate—he’s listed on the website alongside the program’s faculty, fellows, and alumni—and his concept of “deep ecology” has shaped Harris profoundly. “Nature is not a place to visit,” Snyder writes in *The Practice of the Wild*, “it is home.”

That sensibility infuses the wilderness-medicine division and the training its fellows receive. Several of them have gone on to staff, or start, similar programs at other universities. One of the first fellows, Tracy Cushing, traveled to Arizona as a third-year Harvard resident to treat patients on the Hopi Reservation and came back to Boston with an interest in remote medicine; after her fellowship, she moved to Denver and founded a wilderness program at the

In Nepal, wilderness medicine fellow Nathaniel Mann served with other volunteer physicians in Manang (left) and gathered patient data for a study on altitude illness.



Photographs by David Hu

University of Colorado. (With Harris, she also co-edited the most recent edition of *Auerbach's Wilderness Medicine*.)

In Nepal each year, the fellows are stationed at two mountain clinics run by the nonprofit Himalayan Rescue Association. One is in Manang, a town of about 6,500 at the foot of the Gangapurnapurna glacier; bordering two major hiking routes, it is a popular resting spot for trekkers. The other is in Pheriche, a smaller village a little higher up—elevation 14,000 feet—two days' hike from Everest Base Camp. The trip out to each from the fellows' starting point in Kathmandu involves several days' hike through steep, rocky, and usually snow-covered countryside. There are boulders and 500-foot cliffs. Cell-phone access is nonexistent, and the clinics are small stone-and-mortar structures outfitted with basic medical supplies and heated only by a kitchen cookstove that burns yak dung, and only during the day.

Patients are a mix. Local residents use the clinics for their everyday healthcare needs (the closest hospital is often a day's hike or farther away), and the rest are trekkers and climbers and their Nepali porters. The fellows see everything from colds, fevers, minor cuts, chronic ailments, and traveler's diarrhea to heart attacks and head injuries and broken bones and serious altitude illness. In the most urgent cases, patients are evacuated out by helicopter. In Pheriche this past spring, MGH fellow Terez Malka estimates that she and the other doctors evacuated 40 to 50 patients. In Manang, fellow Nathaniel Mann treated a four-year-old with high-altitude pulmonary edema (HAPE), a life-threatening accumulation of fluid in the lungs. The child was unresponsive when the team put him in the helicopter to Kathmandu. "I don't know how it turned out," Mann says. "Sometimes you don't ever find out."

But here's what else he remembers from those three months: the 88-year-old woman, all strength and energy, who stopped by the clinic one day with a minor complaint and in a mood to chat. The amazing group that passed through, not hiking or even climbing, but *running*. And also, the Nepali porters who carried luggage and supplies for many of the trekkers. Most of them were not native to the high mountains, Mann says: they were people from down in the valley, unaccustomed to elevation, poor and looking to make a little cash. Often they hiked without proper shoes or equipment, and the loads they carried were extremely heavy. Unsurprisingly, these men made up a not-small percentage of Mann's patients. Sometimes he and the other clinic doctors would make house calls on porters who'd fallen sick or gotten hurt. "It was pretty heartbreaking," he says. Besides patching them up so they could go back out, there wasn't much he could do for them—except listen to their stories. That part was rewarding. "You feel like you can help a little bit."

In April 2015, when a 7.8-magnitude earthquake struck Nepal, MGH fellows Renee Salas and Laura Phillips were there. Salas, who now is second in command in the wilderness-medicine division,

As expedition doctor, Harris accompanied a 2016 research mission to Thailand's Mekong River.



"The next thing you know, you're spending three months in Nepal, working at a clinic on the side of a mountain."

as assistant fellowship director, was then at the Pheriche clinic. At about noon that Saturday, she heard people screaming and buildings collapsing. It took a few seconds to realize what was happening. She felt, she said later, like someone on a boat in heavy seas. About nine hours after the shaking stopped, patients started arriving, and during the next 24 hours, she and the two other doctors received roughly 75 injured people in their four-bed clinic, many of them critically hurt, whom the doctors tried to keep alive and stable until they could get them off the mountain and into a hospital. One room of the clinic became a makeshift ICU and the doctors borrowed dining rooms and lodges from locals whose homes were still standing.

As soon as the weather cleared, they started evacuating patients, 18 at a time, on a jumbo helicopter. "Everybody was doing what they could," Salas says. A woman from a neighboring village who worked in a pharmacy and knew how to take vital signs helped triage the most fragile patients; others arrived to carry stretchers; a group of women whose home had been destroyed brought tea. People came without knowing what they could do to help or what was needed. They just came. In the frenzied crush of those hours, the usual paperwork and patient charts fell by the wayside. People simply talked to each other. That's how they made sense of what was happening, who was where and who needed what. Salas remembers the overwhelming humanness of it, a story unfolding, everything immediate.

This is sort of thing Harris is talking about. Several years ago, he did a patrol as a National Park Service climbing ranger on Denali. Along with four or five others, he followed the glacier up to 14,000 feet, then climbed the ridge to the "high camp" at 17,000 feet and the summit at 20,320 feet (a route pioneered by Bradford Washburn '33, A.M.'60), to help staff the seasonally operated medical-aid station. "We were the last patrol of the season, so we were responsible, ultimately, for the whole mountain," Harris says. They saw a couple cases of HAPE and recovered the body of a professional climber who fell and died, but the stories Harris tells are about the long night he spent waiting for a helicopter with a patient who may have been having a heart attack and the hours he spent with a former

staff sergeant with an amputated leg who was climbing as part of a “wounded warrior” group. “An impressive guy,” Harris says. He got into pulmonary trouble, and after Harris had done what he could for him, he stayed by his bedside, talking and listening, until the weather cleared and they got him evacuated.

The sickest patient Harris ever saw in the wilderness was in 1999, during his first time working in Nepal, as a medical student on a fellowship. A Tamil climbing guide had fallen ill while chopping tent platforms in the Khumbu Glacier for a climbing party half a mile below the Everest Base Camp. “He was sitting there alone, looking kind of purple and all hunched over,” Harris recalls, with a heart rate in the 120s, a respiratory rate of 50 (normal is less than 20), oxygen saturation in the 50s (normal at that elevation is in the 80s), unable to walk: a clear case of HAPE. An expedition doctor had misdiagnosed him with pneumonia and given him antibiotics. By the time Harris came across him, he says, the man was almost dead. Harris and others got him into a clinic and gave him oxygen and medicine, and the next day, after he was

“A Tiger Jumping Out of the Woods”

THE Massachusetts General Hospital wilderness-medicine division’s mission is three-fold: clinical practice, teaching, and research. For years, Stuart Harris, division chief and an emergency-medicine physician, has focused on high-altitude sickness in its most serious forms: AMS (acute mountain sickness), HAPE (high-altitude pulmonary edema, an accumulation of fluid in the lungs, the most common cause of death from high-altitude illness), and HACE (high-altitude cerebral

edema, a swelling of the brain—less common but more deadly). Altitude illness seems like a simple problem: when people ascend too quickly for their bodies to acclimate to decreasing levels of oxygen, they get sick; symptoms often begin with headaches, nausea, and vomiting. “The body responds to hypoxia”—the lack of oxygen—“as a life threat,” Harris explains, “as if a tiger were jumping out of the woods.” But although scientists know how to *prevent* altitude sickness (ascend slowly, don’t over-exert); the actual *mechanism* for the illness, he says, remains more mysterious.

“We know what much of the physiology is—essentially, a lack of oxygen,” Harris explains, “but we don’t understand what the pathophysiology is”—in other words, what goes wrong in the brain because of this lack of oxygen. And there are reasons besides scientific curiosity to figure it out: “By studying how low oxygen states affect the organism, the organs, the organelles, you know a lot more about the things we treat every day at sea level in the MGH emergency department. Acute heart attack is a sudden loss of oxygen to the heart muscle; acute stroke is the same thing for the brain. And most pulmonary processes are essentially variations on the hypoxic theme.” In the mountains of Nepal this past spring, fellows from the division, as part of a study on altitude’s effect on the brain, carried with them small handheld ultrasounds, which they used to examine climbers’ and trekkers’ optic nerves for swelling, to see whether that swelling corresponded to an altitude-related effect his team recently discovered, a potential decline in cognitive function. Meanwhile, at MGH, Harris has

stabilized, they put him on a yak and sent him down the mountain. (He didn’t have the money for a helicopter evacuation.) Three days later he was back, grinning, healthy, “looking like a rose,” and ready to return to work. “That’s classic for HAPE,” Harris explains. “You can be sicker than hell and on the verge of death, and then days later the fluid clears and you’re back.” He and the man stayed in touch for several years.

Harris and the MGH division also have a longstanding partnership with Woods Hole Research Center scientist Max Holmes, whose Polaris Project analyzes permafrost and river water to investigate the causes and consequences of climate change. Every summer, Holmes takes a group of 15 to 20 students and researchers into the field, often to Siberia, more recently to Alaska. Since 2011, when a member of the team fell ill with atrial fibrillation in Siberia, necessitating, as Harris calls it, a “big, hairy” State Department evacuation, Holmes and his team have taken Harris or one of the fellows with them. There’ve been no big scares since that one, though there are “endless minor things that could escalate if we weren’t on

been collaborating with other scientists on research that simulates high-altitude conditions in study subjects to investigate hypoxia as a potential therapy for mitochondrial diseases. Mouse models have shown a benefit.

One major project uniting all Harris’s altitude work is an effort to develop a rigorous and objective way to diagnose AMS, one that can pinpoint the depth and spread of the disease. Currently, it’s diagnosed only by its symptoms—a highly subjective measure, Harris says, which he would supplement with blood tests for biomarkers and perhaps ultrasound imaging of the optic nerve sheath.

More recently, the division has taken on research and advocacy related to climate change. This springs from Harris’s lifelong upbringing and education in the outdoors, and more proximally, from his partnership with Woods Hole Research Center’s Max Holmes, an earth-system scientist who studies the effects of climate change in rivers, watersheds, and arctic permafrost. Climate change is also a particular interest of emergency physician Renee Salas, the division’s assistant fellowship director—her passion, Harris says, has helped drive this project. Climate change is already being felt, she explains, and, increasingly, the coming decades will bring related public-health emergencies: natural disasters, increased pollution, heat waves, heat injuries, asthma, and infectious diseases moving into environments where they have never existed. “And these people are going to be presenting in emergency departments,” she says. “When people have asthma exacerbations because of increased pollen and smog events, you’re going to come to the ED. When there’s severe weather and there’s injuries, you’re coming to the ED. When people are having increased heart attacks because of smog—ED. Waterborne illnesses and outbreaks.... We’re the safety net of the healthcare system.” And many acute events will also happen far away from hospitals and emergency departments. “There are especially vulnerable populations that exist outside of settled infrastructures,” Salas points out—but infrastructures themselves, she warns, “are going to be displaced. The biggest thing we can do is figure out ways to help them adapt.”

—L.G.



top of it.” Holmes says that Harris’s presence has had another, unexpected benefit. “From a mental-health perspective, it really helps for people in the group just to have someone to talk to confidentially. Participants are away from home in a remote environment for an extended period. Often we’re camping out. There can be language issues, weather issues, lack of sleep. We’re dealing with a lot of extremes.” Harris listens, and it helps.

“Can You Tell Me Your Story?”

ON A weekday evening this past spring, Harris was on the floor of the MGH emergency department, in the middle of an eight-hour shift that was scheduled to end at 11 p.m. but would stretch past midnight. He was recently back from the Gila Wilderness, and in a few days he would fly out to Alaska, to make house calls by float plane on patients living in tiny rural, and often impoverished, villages in the far northwest. After that, he’d head into the permafrost to meet up with Holmes and the Woods Hole crew.

But tonight he was here. His first patient was a middle-aged woman with chronic pulmonary disease, a smoker on methadone. She was having trouble breathing. Harris moved the curtain aside and strode over next to her bed. “I’ve got your story,” he said—he was holding her chart—“but I want to hear it from you. Can you tell me what brought you here?”

He said those words again and again during the night—to someone with heart palpitations who’d almost fainted reaching for a glass of water; a young cancer patient who’d come in with unexplained bleeding, her husband kneading his hands as he sat by her side; an obese man with sores running the length of his belly; a patient on a religious fast who needed stitches and fluids; an old woman with pneumonia, sweet and funny and pretty, so slight she almost disappeared into the sheets; a garrulous man whose low blood pressure seemed to have no immediate explanation; a woman recovering from surgery who was angry and tearful and in pain everywhere. “Can you tell me your story?” And they did, about the tattoos on their arms and the sweltering heat the day they were born (“My poor mother”) and the pain and weakness and the sweating or shaking or shortness of breath.

“Their history, their labs, their tests, their vitals—they all fit together to give us an answer,” Harris said later, stopping briefly at a computer terminal to dictate his notes into a microphone. “It’s

In 2011, Harris volunteered with a climbing ranger patrol in Denali National Park, staffing the medical station at 17,000 feet and helping to rescue ill and injured climbers.

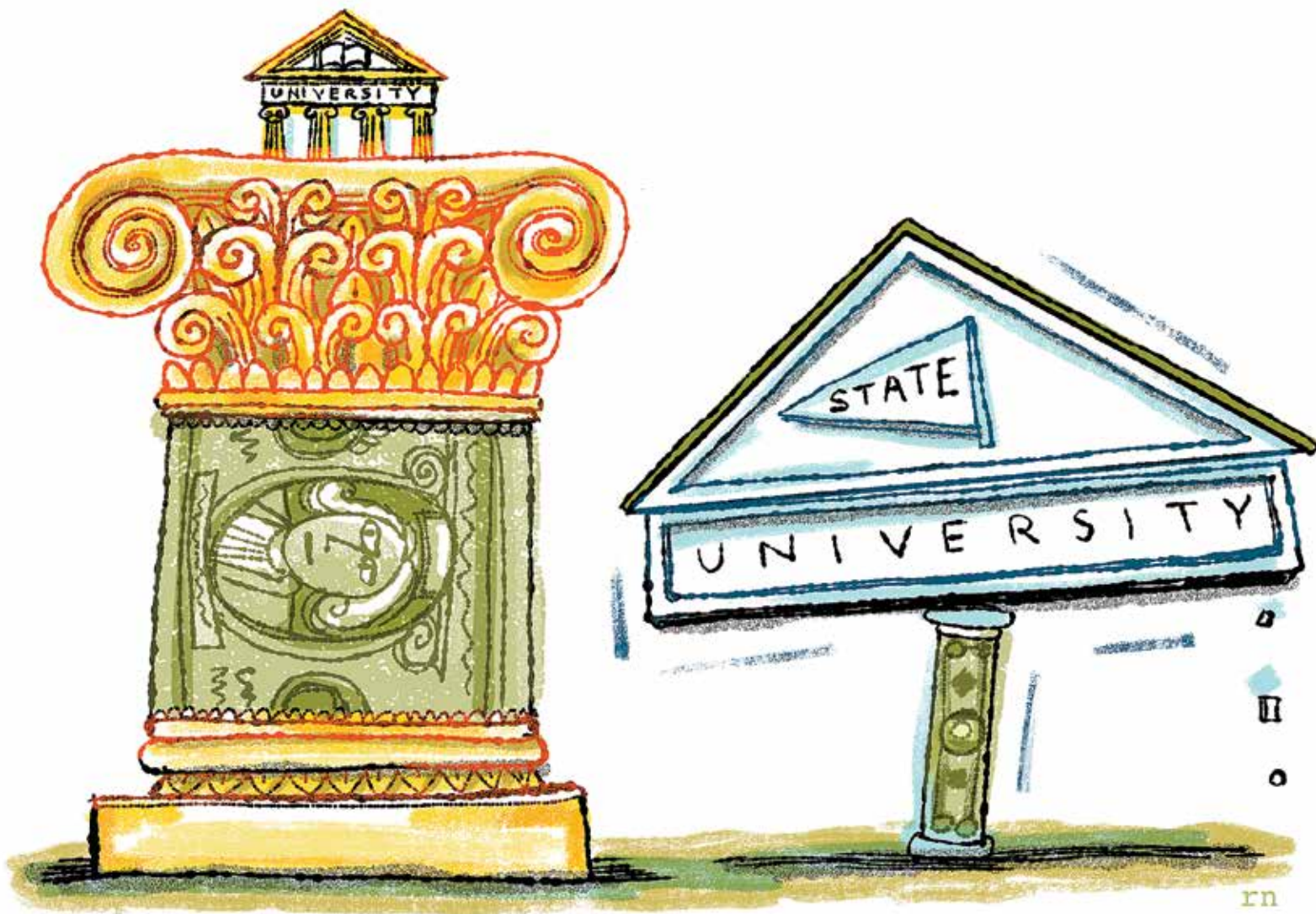


all telling a story, making the story fit together.”

When David Brown talks about Harris bringing lessons learned from the wilderness to the emergency department, this is partly what he means: renewed attention to careful histories and physical exams, to the close connection between doctor and patient. “Modern medicine, with all of its tests and technologies,” Brown says, “has moved us away from actually listening to patients.”

The last patient Harris visited that night was a man who’d come in some hours earlier with chest pain and nausea, so pale he looked almost green. A whole medical team had swarmed to his bed, Harris with a stethoscope, shouting questions into his near-deaf ears and the old man staring at him blankly, while his siblings looked on in fear and confusion. Harris told a colleague, “His story is good for ACS”—acute coronary syndrome—and indeed a little while later the tests came back with a result: a mild heart attack. At midnight, Harris returned to the dark stillness of the room and knelt by the bedside. “You’ve had a long day,” he said, shouting again. The man smiled. “You’ve had a long day yourself.” His voice was a thin whisper. Would he have to stay all night? “Yes, I’m afraid we need to keep you here.” And then they talked about sleep and siblings and mothers and work and how much it all means. “Time to go home?” the old man asked as Harris rose to his feet. “Yes,” Harris said. “Get some rest. We’ll see you tomorrow.”

LydiaLyle Gibson, Harvard Magazine staff writer and editor, has recently profiled Susan Cain and Jennifer Lewis in these pages.



The College Chasm

How market forces have made American higher education radically unequal

ALTHOUGH AMERICA'S RESEARCH UNIVERSITIES are the envy of the world, our system of baccalaureate education inspires as much hand-wringing as pride. Concerns about the unevenness of undergraduate education have grown with evidence of falling college completion rates and disappointing results in international comparisons of learning. Most prominent have been misgivings about equity and privilege. As income inequality has worsened, elite colleges are being called out as "bastions of privilege." Critics have asked pointedly whether America's colleges, rather than serving as a mechanism for equal opportunity, are in fact contributing to *more* inequality.

Perhaps these equity concerns are overblown. Haven't admissions criteria become ever more objective and merit-based? Aren't our college campuses

more racially diverse than ever before? Have ever-present disparities simply become salient of late, thanks to the spotlight aimed by egalitarian observers? Or are the critics justified in their jeremiads—perhaps inequalities are growing and the apparent *racial* diversity simply masks increasing *class* uniformity among undergraduates?

As a citizen, I am of course aware of the growing economic inequality in American society. As an economist of higher education, I have studied the peculiarities that characterize this industry, its components, and the market for baccalaureate education. Now, I have systematically combined these perspectives to address how undergraduate education has changed as our society itself has changed during the past several decades. I find that interacting market forces have substantially widened the gaps among institutions of higher education and those whom they serve—in ways that pose

by Charles T. Clotfelter

real challenges for educators, policymakers, and the public at large.

Undergraduate Education as a Market

THOUGH IT is rarely referred to in these terms, the market for baccalaureate education is supplied by one of the country's most consequential industries. Its firms are the roughly 2,000 colleges and universities that offer four-year degrees. It is a quirky industry, to be sure. The product that it sells, sadly for those who wish to measure it, is both amorphous and idiosyncratic. (One reason the output of these firms is so hard to measure is that their *customers* also supply some of the principal *inputs* to production: time, attention, and effort.)

Instead of treating all colleges and universities alike—as we normally do, for example, in calculating statistics on educational attainment or the economic value of a college degree—I focused on the differences across colleges. Some of the contrasts that emerge are breathtaking. From the “comprehensive” public universities that once were teachers’ colleges, to tiny religious colleges where students must attend chapel, to our world-famous public and private research universities, the colleges that make up this industry differ in mission, in academic rigor, and in the resources available for learning. The difference between public and private status, in particular, is obviously consequential—fundamentally so.

My aim was to document as many of these differences as possible and to see whether the differences have grown or narrowed over time. I divided colleges into more than a dozen contrasting categories, based on the SAT scores of their students around 1970 and whether they were public or private. I also separately analyzed historically black institutions, owing to their distinctive history. Then I examined the institutions in these categories, where possible, across four decades, roughly from 1970 to 2010. (In making comparisons, I used detailed data from UCLA’s Freshman Survey on students who attended one of 188 colleges at three points over this period. I collected other types of information on colleges as well, making sure that each change over time was based on a fixed set of colleges.)

The categories I used are shown to the right. Because private colleges tend to participate in the Freshman Survey more often than public ones, the data could support a more detailed breakdown among the former institutions than the latter ones, leaving some categories much broader than others. For example, the category containing public institutions whose average student SAT score placed them below the national median in 1970 accounts for nearly 40 percent of all four-year college students. By contrast, the private colleges and universities whose average student SATs were in the top percentile—the marquee selective-admission schools that command so much attention among readers of this magazine and most researchers of higher education—*enroll less than 1 percent of all students*. It is worth bearing that in mind as we consider where most students are educated, and with what resources.

Scholastic Sorting

TO APPRECIATE the magnitude of some of the disparities between colleges, consider the academic credentials of students who attended schools in those two categories:

the below-median public colleges (containing, for example, the University of South Carolina and Rhode Island College); and the top-scoring private colleges (containing Amherst and Caltech, among others). In 1972, the cohorts of students enrolling in these two categories of institutions brought markedly different high-school records. Just 7 percent of first-year students in the below-median public colleges reported having high-school grade averages of A or A+, but 39 percent of those at the top-scoring private colleges had that kind of secondary-school record. This 32-percentage point gap is gigantic, though it is the sort of difference that is seldom acknowledged in polite conversation.

Remarkably, this academic gap between the least-selective public and the most-selective private colleges grew even *wider* over time, as more and more of the best students looked beyond their state or region to the nation’s most selective colleges. By 2008/09,

17 Categories of Colleges

SAT Percentile in 1970	Illustrative Example	Share of All 4-year College Students, 2013
Private Colleges and Universities		
0-25	Iowa Wesleyan	5.3
25-50	Gonzaga University	5.1
50-60	Ohio Northern University	3.0
60-70	Texas Christian University	3.1
70-80	University of the Pacific	2.7
80-85	Lewis & Clark College	1.1
85-90	Tulane University	1.7
90-95	Colorado College	2.4
95-98	Northwestern University	1.5
98-99	Wesleyan University	1.0
99+	Amherst College	0.8
Public Colleges and Universities		
0-50	University of South Carolina	37.9
50-80	University of Michigan-Flint	20.0
80-90	U. of North Carolina Chapel Hill	7.1
90+	Stony Brook University	4.0
Historically Black Colleges and Universities (HBCUs)		
Private	Howard University	0.9
Public	Winston-Salem State University	2.3

NOTE: Colleges shown are among the 188 colleges for which data from the Freshman Survey were available for each of three survey waves (1972, 1989-90, and 2008-09).
SOURCE: Clotfelter, *Unequal Colleges in the Age of Disparity* (Harvard University Press, 2017)

the gap in high-school grades between the South Carolinas and Amhersts had expanded markedly, reaching 43 percentage points.

The students who would enter those most-selective private colleges in 2008/09 had earned their grades by studying even more than their predecessors who had attended those same colleges in 1989/90. While the average reported time spent studying *declined* for students entering the less-selective public colleges during this period, from 5.0 to 4.6 hours per week, students headed to the most-selective private colleges *increased* the time they committed to high-school academics, from 10.2 to 11.0 hours per week.

In other ways, too, the academic worlds of the less selective and highly selective colleges have become ever more distinct. For one thing, while less-selective public colleges have increased their offerings of practical, vocational majors, the most-selective private colleges have held fast to the traditional liberal-arts majors. If you want a measure of the academic gulf between these contrasting sets of colleges, consider the outsize footprint of graduates of the two highest-SAT categories of private colleges measured by entering students' SAT scores. Although these institutions educate less than 2 percent of all four-year college students, their graduates earned 11 percent of all Ph.D.s, made up 39 percent of Harvard Law School students, and won 57 percent of all Rhodes Scholarships.

The Demand Side: Affluent Families and the Admissions Frenzy

NOT SURPRISINGLY, the demand for admission to these highly selec-

tive colleges has increased steadily, buoyed by the rising economic fortunes of families on the top rungs of the income distribution and by the prestige of the colleges themselves. Unlike firms in most markets that encounter rising demand for their product, these colleges chose *not* to expand their capacity nearly enough to accommodate this demand. The result was progressively stiffer competition for admission—witness the top schools' annual tally of tens of thousands of applicants and single-digit admission rates.

For thousands of affluent parents, an acceptance letter to one of the colleges in this rarified group ranks as one of life's most prized trophies. But unlike the markets for almost every other highly desirable commodity, from modern art to exclusive real estate, buyers of higher education cannot secure an admission spot simply by out-bidding other applicants, because these firms employ a decidedly different means of rationing these prized admissions spots. To ration their scarce slots, colleges look to grades, test scores, and other accomplishments.

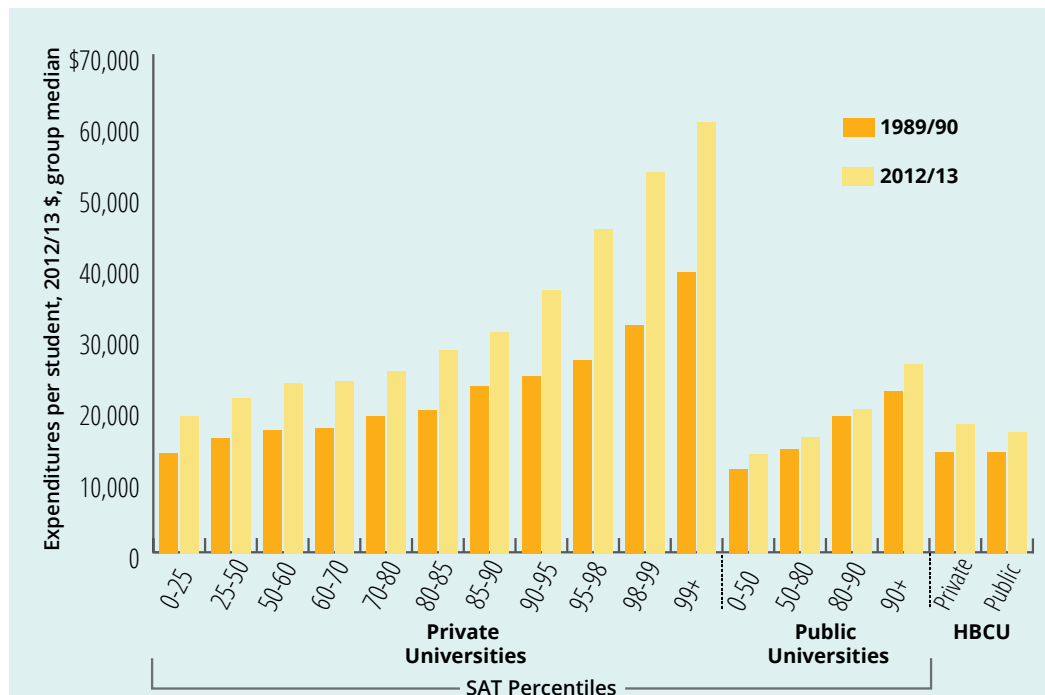
Affluent parents have been quick to adjust to the heightened emphasis on documentable evidence of merit. Often starting well before high school, children of highly educated parents were playing soccer, field hockey, and lacrosse: sports played at elite colleges. They were volunteering, traveling abroad, and working as unpaid summer interns. Heeding the advice of school and private counselors, they signed up for test-prep courses, often taking the SAT or ACT multiple times. They loaded up on Advanced Placement courses. Many enrolled in private schools that offered academic extras.

As a result, affluent families managed to hold their own in this

increasingly meritocratic admissions process. Comparing again the below-median public institutions with the most-selective private colleges, the *gap* in average family income (in constant 2008/09 dollars), rose from \$67,800 in 1972 to \$105,000 in 2008/09. During this period, the share of students in the "South Carolina" category whose parents made more than \$250,000 (in constant dollars) rose from 3 percent to 7 percent; the share for the "Amherst" category increased from 15 percent to 22 percent.

Confirming this evidence of diverging economic status of students enrolled in the most-selective colleges, consider the share of students who had attended a private secondary school. From 1972 to 2008/09, the share of students at the less-selective public colleges who had attended private high schools held steady at 12 percent, but the share of students entering the most-selective private colleges from

Education and Related Expenditures per Student, by College SAT Percentile, 1989/90 and 2012/13 (2012/13 dollars)



SOURCE: Clotfelter, *Unequal Colleges*. Based on calculations for 1,114 colleges and universities with data for 1990 and 2013. IPEDS, Delta Cost Project. Medians by group. Education and related expenditures are defined as follows: instruction + student services + (education share) X (academic support + institutional support + operation and maintenance), where the education share = (instruction + student services)/(instruction + student services + research + public service). The median for education and related expenditures was divided by the median of full-time enrollment for each group. The enrollment-weighted average of class medians was \$15,762 for 1989/90 and \$19,465 for 2012/13.

private high schools rose from 26 percent to 33 percent.

Just as critics have asserted, therefore, the economic gap between the great mass of students attending the less-selective public institutions and those at the most-selective private colleges has indeed grown. Most of this growing economic disparity does *not* reflect students from the richest families taking the places of those from lower down the income distribution; rather, it reflects the spectacular increases in income enjoyed by those at the top.

The Inequality Dividend

MORE POTENT than these shifts in *demand* in solidifying the inequality across colleges were marked shifts in *supply*, all courtesy of broad economic forces—especially the rise in income inequality in American society. Three forces in particular brought about an unexpected financial bonanza for the most selective private colleges:

- First, the unprecedented surge in income enjoyed by those in the top fifth of the income distribution meant that affluent parents—if only their children could be admitted—would not balk at paying the hefty tuition bills charged by selective private colleges.

- Second, the rapid growth in disposable income for those at the very top of the income distribution spurred charitable giving, much of which went to name-brand colleges and universities.

- Third, thanks to a red-hot stock market and other lucrative investing opportunities not available to ordinary individuals, the top university endowments enjoyed fabulous rates of return.

In a textbook example of the Matthew effect (“The rich get richer...”), the already wealthy colleges made out like bandits while colleges of lesser means had to settle for lower returns. To boot, colleges in the public sector faced the additional challenge of state legislatures reining in appropriations.

Endowments at the most-selective colleges and universities skyrocketed. In 1970, the median endowment per student in the two most-selective categories of private colleges was roughly \$200,000 (in 2013 dollars). By 2013, those endowments had skyrocketed, respectively, to \$520,000 and \$1,000,000 per student—a source of revenue virtually nonexistent for less selective private and most public institutions.

This breathtaking divergence in economic resources also meant widening differences in *spending* on academic programs. The chart opposite summarizes expenditures on education and related activities per student in 1990 and 2013 at more than a thousand colleges and universities. The fruits of the inequality dividend bestowed upon the most-selective private colleges are plain. While inflation-adjusted spending per student at the less-selective public colleges edged up 12 percent, reaching \$14,000 in 2013, the comparable figure for the most-selective private colleges jumped by a stunning 50 percent, reaching more than \$60,000. (In inflation-adjusted dollar terms, the gap in spending per student increased from about \$28,000 to about \$47,000 during that period.) These expanding gaps in spending meant bigger disparities in the classroom and across campus, allowing the highly selective private institutions to keep their classes small and hire the most sought-after professors. Meanwhile, students in public institutions and the also-ran private colleges—the places that educate the vast majority of American undergraduates—have had to make do with less.

What It Means

NO ONE MEANT for this to happen. Forces of demand and supply, not malign motives, produced this growing inequality in the college

market. Indeed, the leaders who guide America’s colleges and universities have consistently advocated greater access for low-income students and adequate funding for colleges across the board. But by pursuing prudent policies to protect and advance their own institutions—awarding no-need scholarships, giving admissions preferences to children of alumni, offering applicants the option of early decision, and so on—these leaders have, collectively, added to both the economic forces that have intensified the academic disparities between colleges and the advantages enjoyed by affluent applicants.

American colleges do not need to be as unequal as they are. If some of the largess currently showered on our best colleges were spent instead at institutions of more modest means, we would still have great colleges at the top, but better ones on down the line.

But halting or reversing the slide toward more unequal colleges won’t be easy, even if the desire exists to do something about it. To be sure, Harvard and some of its peer institutions have made efforts, like eliminating loans for their low-income students. Of course, wealthy colleges on their own could certainly do much more—for example, by cutting back on admissions policies favoring the well-to-do or seeking out more low-income applicants—though trustees will tolerate such unilateral actions only so far. More effective would be for colleges to take such actions in unison, but any such concerted efforts would surely prompt antitrust challenges. That leaves government policy, though the appetite in Washington for expanding Pell Grants or easing tax advantages for universities, let alone for changes in taxes or broad social programs that would reduce overall income inequality, is nowhere to be seen.

The founders of America’s colleges, among them philanthropists, religious organizations, and state legislatures, invariably saw in them benign instruments for advancing the greater good. Historian Samuel Eliot Morison tells us that, for its founders, Harvard College represented just one component in a larger set of initiatives, including common schools and printing presses, which were “made by the ruling class of New England and supported by the people at large.”

It should not be surprising, therefore, that for much of our history access to college was largely confined to children of the wealthy and influential. But, as Christopher Jencks and David Riesman wrote nearly 50 years ago in *The Academic Revolution*, it would be unwise to allow colleges simply to replicate elites from one generation to the next, without allowing clever and energetic young persons of modest means to ascend into positions of influence. To their credit, America’s most selective colleges have become steadily more meritocratic in their admissions criteria, but this has not been enough to overcome the forces of inequality.

In assessing the changes in the market for college, we would do well to keep in mind the potential for good that colleges as a whole have to serve the country by, as Thomas Jefferson wrote, training future leaders who would be “called to that charge without regard to wealth, birth, or other accidental condition or circumstance.” This will be a continuing challenge for America’s market for colleges. ▢

Charles T. Clotfelter, Ph.D. ’74, Z. Smith Reynolds professor of public policy and professor of economics and law at Duke, is author of *Big-Time Sports in American Universities* (2011) and *Buying the Best: Cost Escalation in Elite Higher Education* (1996), among other works. His new book, *Unequal Colleges in the Age of Disparity*, has just been published by Harvard University Press.

Guy Davenport

Brief life of a polymathic stylist: 1927-2005

by ERIC ALLEN BEEN

“UNLESS THE WORK OF ART has wholly exhausted its maker’s attention, it fails,” Guy Mattison Davenport Jr., Ph.D. ’61, once advised. “This is why works of great significance are demanding and why they are infinitely rewarding.” The author, artist, and professor lived up to his own advice, producing works both deeply edifying and unclassifiable: nearly 50 books of fiction, essays, commentary, poetry, and translations. The arts, for him, were an attempt to explain the nature of things rather than, as science does, the “mechanics of everything.” In this sense, he considered himself a teacher foremost, and his writings “an extension of the classroom.”

He often joked that he had only 13 to 18 readers, but he also asserted he didn’t write “for scholars or fellow critics, but for people who like to read, to look at pictures, and to know things.” By one account, he traded mail—often including drawings and paintings—with more than 2,300 people, including John Updike, Cormac McCarthy, Joyce Carol Oates, and Dorothy Parker. Many who sought out his work considered him one of the greatest prose stylists of his generation. Erik Reece, a former student and friend, recalled experimental writer Donald Barthelme once greeting Davenport at an award ceremony with “I read you in hardback.”

The South Carolina-born Davenport, the son of a Railway Express shipping agent and a Baptist housewife, wrote that ambition was “unknown” to his family and his “childhood was far from bookish,” but his restless, singular mind emerged early. He left high school in tenth grade, heading north to attend Duke as a “desperately poor” undergraduate, “romantically and self-indulgently lonely,” focused on English and classics. Nevertheless, he landed a Rhodes scholarship—and would publish the first Oxford thesis on James Joyce.

Two years of military service and a teaching stint at Washington University intervened before he began a doctorate at Harvard, studying under literary critic Harry Levin and serving as a teaching assistant for poet Archibald MacLeish. In a 2002 *Paris Review* interview, Davenport recalled how Levin’s seminar on Melville greatly influenced his own thoughts on “iconography”—“how to read images in a text—that literature is as pictorial as painting or sculpture.” Otherwise, he said, he “learned early on that what I wanted to know wasn’t what I was being taught.”

Ezra Pound perhaps inspired him most. They met in the 1950s, while the poet was incarcerated for treason and Davenport, working on an article about Pound, wrote to him. Pound invited Davenport to visit, and they corresponded until Pound’s death. They didn’t share political beliefs, but Davenport wrote his dissertation on the poet’s *Cantos* and once said the best interpretation of his own work was that he was trying to do in prose what Pound did in poetry: make “ideographs.” He was enchanted by the idea that Pound and his contemporaries modernized the arts not by creat-

ing something new from scratch, but by bringing something ancient up to date: James Joyce reworking the *Odyssey*, for instance, or Picasso recasting African masks. Davenport’s aesthetics were akin. He called his writing style primitive and routinely referred to his stories as “assemblages”: collage-like vignettes where a page was “a texture of images” that he used to construct prose from his knowledge of philosophy, natural history, archaeology, and other subjects. “Art,” he once wrote, “is the attention we pay to the wholeness of the world.”

In 1963, Davenport settled in at the University of Kentucky and taught English until winning a MacArthur fellowship in 1990. In class, his student Paul Prather recalled, if an essay they were reading mentioned a bar of soap, “Davenport would stop in mid-sentence and launch into a 10-minute soliloquy on the significance of soap: its origins in the ancient world, how rarely various kings and queens of English history bathed, when the habit of daily baths caught on, the changes in soap’s ingredients over the centuries. Then, seamlessly, he’d resume reading.” On a broader level, Davenport often declared that the purpose of imaginative reading was “precisely to suspend one’s mind in the workings of another sensibility.”

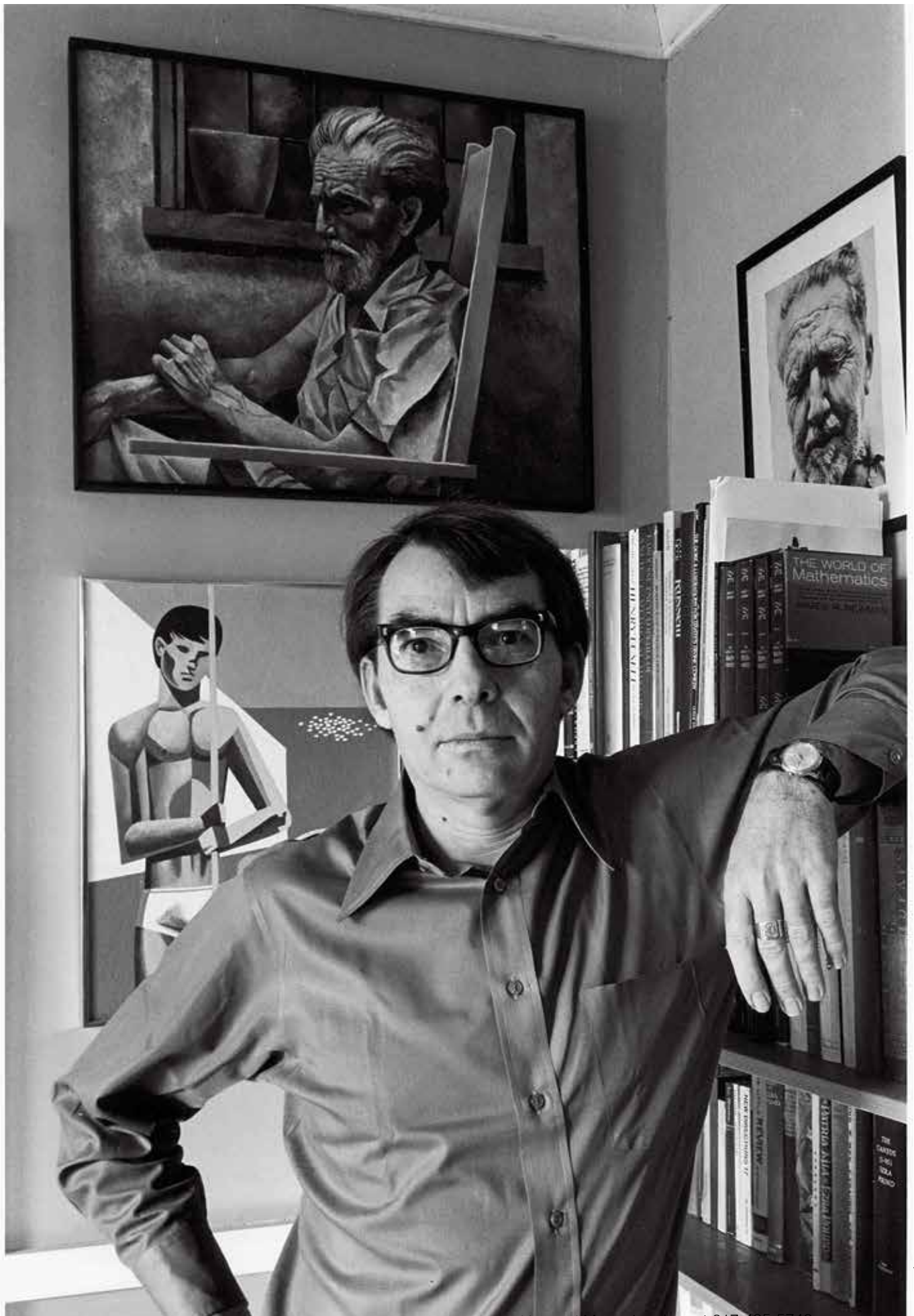
When it came to fiction, the usually precocious writer bloomed late. *Tatlin!*, his first collection, appeared in his forties. Some of the stories blurred the line between fact and fiction: “The Richard Nixon Freischütz Rag,” for instance, has Nixon chatting with Mao Tse-tung; Leonardo da Vinci tinkering with a bicycle; and Gertrude Stein and Alice B. Toklas visiting Assisi. His non-fiction roamed as freely: one celebrated essay, “The Geography of the Imagination,” connects, among other things, Helen of Troy to Edgar Allan Poe, Gnosticism to Pinocchio, and an Athenian mime to Mark Twain.

Davenport wasn’t a political writer but had a radical idealistic streak: he was a devotee of the French utopian philosopher Charles Fourier, who believed the suppression of desire ruined civilization. In compiling his final book, *The Death of Picasso*, Davenport drew largely from his stories reflecting Fourier’s ideas. Characters in several of them seek ways to invent their lives as they see fit, just as he sought to do with his imagination. Indeed, for Davenport, the imagination was that vital key for unlocking the best bits of humanity. “For without desire, the imagination would atrophy,” he wrote in the essay “Eros, His Intelligence.” “And without imagination, the mind itself would atrophy, preferring regularity to turbulence, habit to risk, prejudice to reason, sameness to variety.” ▢

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Davenport at home in 1975, with two of his own works behind him. An image of Ezra Pound by Richard Avedon partners Davenport’s portrait. Photograph by Guy Mendes

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The RoboBee Collective

Exploring engineering's limits to build
a mobile microbot colony

by Jonathan Shaw

ONE DAY nearly a decade ago, Gu-Yeon Wei was walking the corridors of Harvard's newly established School of Engineering and Applied Sciences when he passed the office of Robert Wood. Wood had just made a splash in the engineering world by successfully demonstrating the first robotic fly. Wei, an electrical engineer, designs computer chips; lost in thought, he'd been contemplating the approaching deadline for a five-year, \$10-million "Expeditions in Computing" grant from the National Science Foundation. These grants, for "ambitious, fundamental research agendas that promise to define the future of computing and information technology," are among the largest investments the NSF makes in computer science and engineering, and they encourage combining the creative talents of many investigators to achieve transformative, disruptive innovations.

"I saw the fly," Wei recalls. "I had just read an article about the colony-collapse disorder afflicting honeybees. He knocked on Wood's door, and made a pitch on the spot: Let's build robotic bees. 'You have the body,' he told Wood. 'David [Brooks, a computer-systems architect], and I could build the brain. Let's get a couple of other people to work with us. They can do colony.'"

Wildly ambitious, the project united 12 principal investigators (PIs), including Wood, the Charles River professor of engineering and applied sciences, and Wei, Gordon McKay professor of electrical engineering and computer science, who faced 12 impossible

engineering tasks. "You've got to actually build the robots using unknown aerodynamics and unknown manufacturing techniques, subject to impossible weight and power limits, and with non-existing power sources," explains Justin Werfel, who worked on the colony aspect of the project. "And then the bees have to follow unknown algorithms to coordinate as a group."

Ostensibly, the goal of "RoboBees: A Convergence of Body, Brain, and Colony," was to create a swarm of flying microbots that could pollinate flowers. But this envisioned application was more a motivating framework than a principal aim. The potential applications are varied and compelling, ranging from search and rescue, to surveillance, to environmental monitoring.

In fact, the primary purpose was to advance the limits of robotic engineering on multiple fronts, under extreme constraints in terms of parameters such as size, weight, power, and control. Extraordinary advances in applied science and engineering would be necessary in order to create "insects" as small as bees that could navigate, communicate, and function as part of a collective. Wood's fly (see "Tinker, Tailor, Robot, Fly," January-February 2008, page 8), marvelous as it was at the time, remained tethered to a wire that provided power and control. To achieve autonomous function, the researchers would have to solve problems ranging from the mechanics of flight at that scale, to the intricacies of mass manufacture, to miniaturization of onboard sensors, to the understanding and programming of group behavior—many requiring substantial advances in basic science and engineering.

Wei's initial serendipitous proposition, inspired by nature, and now delving into realms of engineering unimaginable even a few years ago, has advanced technologies now filtering into medicine, electrical engineering, computing, and consumer electronics by pushing the engineering requirements to their limits.

Impressing Archimedes

FROM THE OUTSET, the researchers divided the RoboBee work into the three parts indicated by the proposal's title: body, brain, and colony. The challenge began with the daunting physical constraints imposed by insect-scale robotic flight. How should the wings be shaped? How fast should they move? Where would the power come from? How could these tiny but complex robots be manufactured at scale?

Because flight is energy-intensive, weight was a limiting factor that guided the design's development. Conventional motors were excluded immediately: they are heavy, explains Wood, and at insect-size scales, forces of friction on gears and bearings consume an unacceptable proportion of the energy they use. He focused instead on the development of highly efficient actuators made of piezoelectric materials (solid substances typically used to convert mechanical energy into electricity) that could, merely by the application of an electric field, make the wings oscillate in a motion akin to treading water.

There is piezoelectric material in virtually every backyard grill in America. Turn on the gas, press the button, and "poof," with a muffled explosion, the grill ignites—because the built-in crystalline piezoelectric materials emit an electric charge in the form of spark when their structure is perturbed by the physical force of pressing the button. The wings of a RoboBee beat by *reversing* that principle: applying an electrical field to a piezoelectric material causes the crystalline structure to deform, minutely. Although this motion is nowhere near enough to flap a wing, Wood has overcome that limitation by building a series of connected, origami-inspired folds that connect to the hinges of the wings. Each fold acts like a tiny lever, amplifying the initial minuscule piezoelectric deformation by building on the amplification of the one before until the wings "beat." Archimedes would have been impressed.

The ingenuity of this solution becomes even more evident in the manufacturing process—each bee is laser machined from alternating layers of soft, flexible polymers and hard carbon fiber. Wherever the rigid carbon layers are further cut away to expose a pliant polymer layer, the laminated construction of the insect leads to a series of flexure joints that allows the bee to take three-dimensional shape as it is lifted from the substrate—like a page in a children's pop-up book.

Manufacturing complex machines with tiny, integrated piezoelectric motors in this way is expected to lead to a new generation of minimally invasive microsurgical tools, says Wood, who has been exploring collaborations with surgeons in one of Harvard's teaching hospitals and with partners in industry.

Not all the challenges inherent to building the bee have proven as tractable. Shrinking an energy source, even one that will let the bee fly for just a minute or two, is exceedingly difficult. Given the voltage requirements, wing shape, flapping frequency, battery weight, and so on, Wood calls powering the RoboBee "a complex, multi-dimensional optimization problem." He and Wyss professor of biologically inspired engineering Jennifer Lewis (see "Harvard Portrait," November-December 2013, page 62 and "Building Toward

a Kidney," January-February, page 37), are on the cusp of developing a 3-D printed lithium-ion battery small and light enough for onboard integration. Simultaneously, he is exploring the use of ultra-thin solar panels for recharging batteries (to keep the bees aloft using solar power alone would require 30 percent more sunlight than reaches the Earth's surface now—or significantly better photovoltaics). Wood's research group has also developed a technology for use in conjunction with an energy-conserving strategy: perching. An electro-adhesive material that clings to surfaces when a small current is applied allows the RoboBee to perch virtually anywhere, from a wall to the underside of a leaf; it could then recharge before moving to a new location.

Because the RoboBee project involved many distinct engineering challenges, solutions could not be worked out seriatim: parallel processing was mandatory. The other teams therefore took their cues from Wood's initial fly design, says David Brooks, who worked with Wei to develop the RoboBee's brain.

Building a Brain

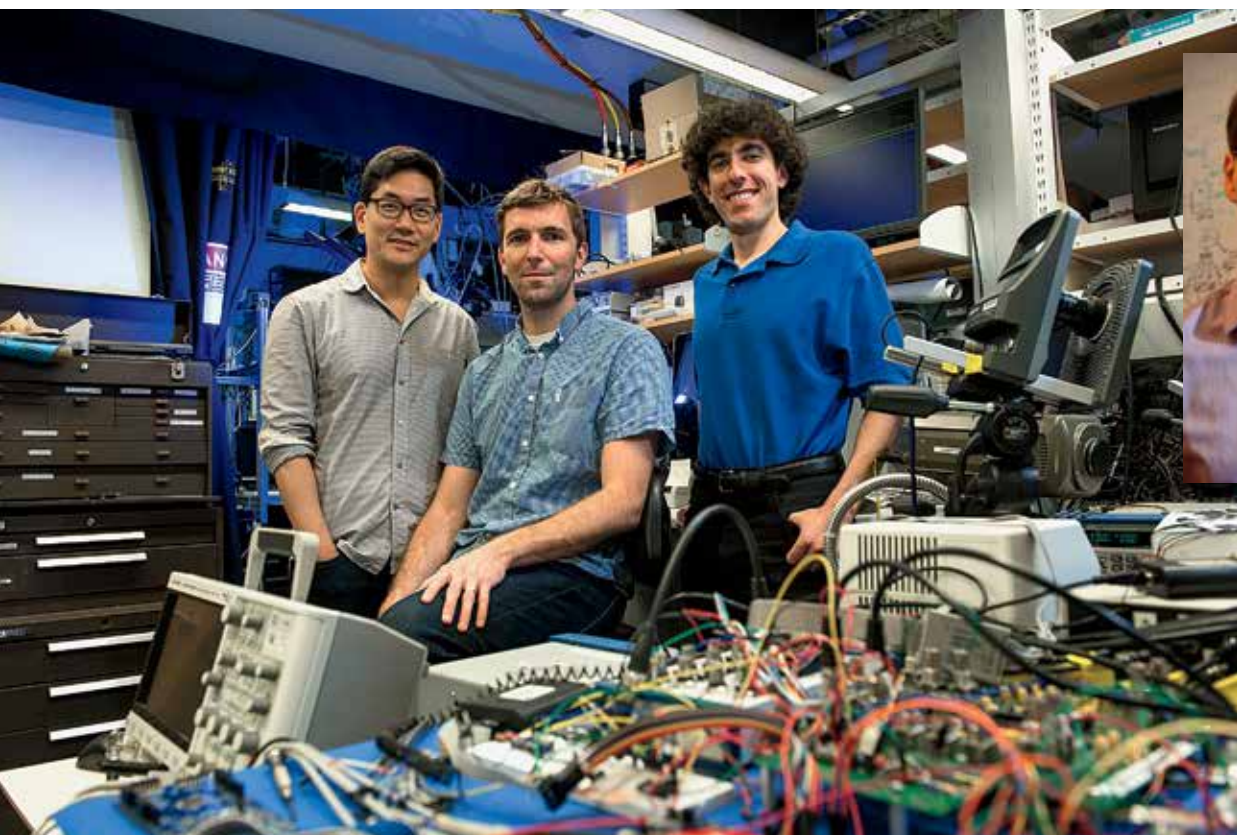
WHEN YOU DRIVE along a highway at 60 miles per hour, the adjacent roadside flashes by in a blur of green leaves, brush, cement. When you turn to rubberneck, individual objects spring into focus—but only for a second. How can the driver of a car stay centered in one lane of a highway without have to look left and right constantly to maintain position? The answer is optical flow—and bees use the same principle to navigate.

"Think of yourself as walking down a corridor," explains Brooks, the Haley Family professor of computer science. Peripheral vision indicates the sides of the hallway. "Optical flow doesn't try to recognize the hallway itself. It just tries to recognize the *motion* that you see as you pass through it. If you're closer to the right side, you'll feel like things on that side are moving faster. If you're closer to the left, you'll feel that side's moving faster. And if you're right in the middle, you'll feel that it's equal." In experiments, researchers have coaxed honeybees to fly down a chute with a repeating black and white pattern on the walls. As they fly, the bees sense the speed of the alternating pattern, and try to balance the flow by staying in the middle, because they don't want to bump into a side wall. When researchers change the pattern frequency in order to simulate a change in speed, they observe that the bees drift to the left or the right to maintain balance. "That's how we know these bees are actually using optical flow to guide themselves," Brooks explains. In the RoboBee, he says, "We want to use the same optical-flow strategies."

The approach has several advantages. One of the RoboBee's onboard sensors is a tiny camera. "If we didn't use optical flow," says Brooks, "we probably would use some other kind of optical sensing based on trying to take a picture of a wall, detecting that it's a wall, and trying to avoid it." But the camera would be taking millions of photographs for analysis continuously, which would be computationally expensive. "Flow is an attractive algorithm because it is much simpler to calculate," he explains. "You don't need a lot of pixels" to detect the simple contrast differences on which optical flow relies. That means the cameras can be quite simple, small, lightweight, and very low power, and the bee's brain doesn't have to perform high-resolution computation on the pixel data.

Optical-flow data will be combined with information from an inertial motion unit (IMU) that combines an accelerometer, gyroscope, and magnetometer—devices that provide data about acceleration, rotation, and the direction of true north. These units, now common





From left: Gu-Yeon Wei, who built the brain; Robert Wood, who created the body; and Justin Werfel, who writes algorithms controlling colony-level behavior. Inset: David Brooks, who co-created (with Wei) the RoboBee brain.

components that make them much larger than

in cellphones, have become small enough, Wei says, that they were bought off-the-shelf for use in the RoboBee. In combination, these sensors will allow the bee to achieve stable flight—at least in theory.

Like real flies, RoboBees are inherently unstable. That's one reason flies are so difficult to swat—they can change direction in an instant, taking advantage of their natural tendency to pitch and yaw in unexpected ways. In the RoboBee, such unpredictability is less desirable, so it will fall to a custom microprocessor—a computer system on a chip (SOC) nearly 10 times as energy-efficient as a general-purpose microprocessor—to keep the bee aloft. The work on this “brain” SOC, developed specifically by Brooks and Wei for the RoboBee's extreme weight and power constraints, began in 2010, and culminated in the production of a chip just 40 nanometers—or billionths of a meter—across in 2015. Unusually, all the components needed to run the microprocessor as a freestanding system, which are normally developed separately, were integrated, allowing the team to minimize the system's overall weight.

Still, this integrated system's power management presented its own unique problems. The chip runs on just under one volt of power (anything more could destroy the sensitive electronics), but the robot's piezoelectric wing actuators require as much as 300 volts. A series of students advised by Wei, Wood, and others figured out how draw power from a 3.7-volt battery, ramp it up to 300 volts for one application, and tamp it down to just 0.9 volts for the system's brain—all using as few of the standard tools of microelectronics (such as resistors, inductors, and capacitors) as possible.

In fact, the system they developed for ramping up the voltage for piezoelectric actuators, like those that drive the RoboBee's wings, represents another example of the project's technological spin-off effects. General Electric uses a similar technology to drive tiny fan-like bellows for cooling electronics, but those are built from discrete

the RoboBee's integrated version. Wei believes the newer technology could find numerous commercial applications, perhaps at GE, and elsewhere.

But the ability to learn is probably the most stunning advance Wei and Brooks have incorporated into their latest chip design. Just 16 nanometers across, about the size of the flu virus, the chip integrates a deep neural network (DNN), a design that mimics the architecture of the brain's many connections among neurons, and therefore has the ability to do many things at once in real time. DNN-powered computers are far better than traditional ones at tasks such as image recognition, and have the capacity to learn by example or by doing. (Last year, a program running on a DNN that had been trained to play Go, a game many times more complex than chess, became arguably the best player of the game in history after watching humans play and then playing simulations against itself.)

Because deep neural networks can learn by doing, they may enable the RoboBee to teach *itself* to fly.

The implications are profound. DNNs can enable speech recognition, potentially enabling voice control of RoboBees. And because DNNs can learn by doing, they may enable the RoboBee to teach *itself* to fly.

“Ever since we started looking into deep learning, I've had this dream,” says Wei. “I'd say to David [Brooks], ‘It's so hard to set all the parameters just right in order to be able to get this bee to fly in a stable way.’ From what I hear,” he continues, “Rob's students run mini experiments, where the wings flap, and the bee turns over this way, and flips over that way, and they tune this variable and that, and then over time—and it really takes an instinct to be able to do it just right for that particular bee—they can stabilize it. And I thought,

JIM HARRISON

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Clockwise from right: A light-sensitive sensor keeps a RoboBee prototype upright. Static electricity allows the robot to cling to surfaces, conserving energy during breaks from flight. The body is manufactured like a pop-up book, laser-machined from layers of material. A real bumblebee wing is tested on a RoboBee to explore its aerodynamic properties.



‘You know, we ought to be able to teach these bees how to fly. There must be some way. Why can’t we use neural networks to implement the flight-control algorithms?’ Instead of human-tuned parameters, the bees would attempt flight in a motion-capture lab (a box equipped with high-speed cameras) and over time, using the deep neural network, learn how to fly based on this feedback, in the same way that training wheels help teach a child how to ride a bike. (The NSF recently provided funding to pursue this idea as part of a larger project Wei unofficially calls “RoboBees 2.0.”)

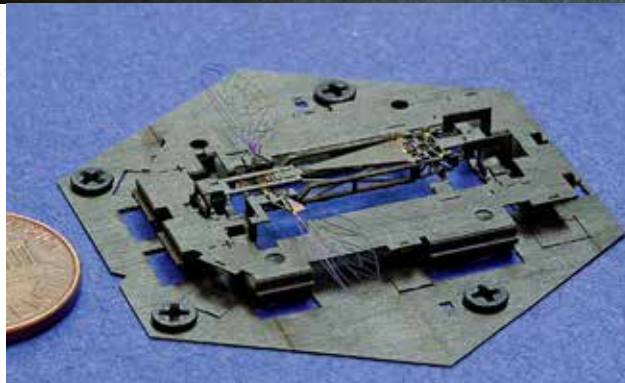
There will be many commercial applications for the technology, he explains. The DNNs that Google or Apple now run in the cloud to enable speech recognition services such as Siri, for example, require “massive” computing capacity. What if such a system could run on a tiny chip in home coffeemakers or televisions? With this kind of *locally processed* speech recognition, the privacy issues that now plague implementations of the Internet of Things—connected household appliances—would vanish. No one would have access to personal data revealing what time people wake up or how much time they spend watching TV—or have to worry about electronic eavesdropping on a conversation by the water cooler.

But the applications of the RoboBee itself, whether for search and rescue (seeking body heat or CO₂ signatures in collapsed buildings), or as mobile sensor networks that could move and collect data before returning to a central location, all rely on the idea that no RoboBee will operate alone.

“Doomed to Succeed”

THE BEE IS NOT DESIGNED as a failure-proof, single machine. Instead, the vision is to deploy hundreds or thousands of these tiny robots—a swarm—that will complete a task as a collective entity. It is a powerful idea, because it means that success does not depend on the fate of a single RoboBee. If 20 crash, flying as part of a hive of a thousand whose mission is to locate a single object, the search will not be compromised. But programming and coordinating the actions of many robots is a challenge unto itself.

Sheep brains floating in jars of slightly cloudy preservative line the shelves in the office of Justin Werfel. He runs Harvard’s Designing Emergence Laboratory, which studies and designs the simple rules that govern the behavior of individuals within a group, but that lead to complex collective behaviors. “We study these systems from both a scientific and an engineering standpoint,” Werfel explains. “Can we predict the collective outcome from the rules the



individual agents follow? Can we design low-level behaviors that guarantee a particular high-level result?”

Models of robot colonies that perform construction projects adorn his desk, and five multicolored juggling balls rest by his keyboard (he can juggle all five—at least for a moment—and ride a unicycle). Werfel, a senior research scientist at the Wyss Institute for Biologically Inspired Engineering, writes algorithms that control how individual robots behave, and studies the sometimes surprising outcomes of their collective behavior. Herds, swarms, schools, and colonies are the biological inspiration for his work. The sheep brains are a playful nod to that; almost all his research is done on a computer. His lab works closely with the self-organizing systems research group headed by Kavli professor of computer science Radhika Nagpal. Together, they study how complex properties emerge from the decentralized actions of simple agents. But none of their colony work, led by Nagpal, used actual RoboBees, he explains, because the bees didn’t yet exist.

Instead, they developed numerous simulations and relied on complex systems theory, he explains. At times, they drew upon proxies, from tiny helicopters to an antlike swarm of terrestrial kilobots whose coordinated actions successfully moved a cutout of a picnic basket from one place to another.

As part of the project, Werfel studied patterns of communication and subsequent action among honeybees. Although much has been made of the way honeybees communicate the location of pollen resources via a “waggle dance,” Werfel and his student collaborator wanted to know how many bees, after receiving this information, actually went to the location described. Prior research had shown that many bees ignore the instructions and return instead to locations where they have successfully collected pollen before. In other

words, the dance was effectively received simply as a message that pollen was available. From a systems perspective, Werfel and his student were able to show that this apparent deviance makes sense: if every bee went to the same location, the pollen there would soon be depleted, and the hive as a whole would suffer. In essence, they teased out an insight—about the advantages of avoiding absolutes in rule-making—that could optimize the writing of software programs governing collective behavior.

Werfel's interest in the subject began two decades ago, when as a physics undergraduate he began reading about mound-building termites, insects he finds extraordinary: "You've got millions of independent insects, and none of them knows what the others are doing. They don't know what the mound looks like. They don't know what they're trying to build. They don't know where they are. They're not getting assigned instructions from the queen. And they're blind. And somehow, all of them following whatever rules they're presumably following, all of them doing whatever they're doing, you wind up getting these huge-scale, complicated structures."

But what are those instructions? Werfel has been probing this question by studying natural populations of termites, and by running simulations, experiments, and mathematical analyses with robotic termites (the TERMES system) that can build structures based on simple rules of his devising. In the first instance, he is studying two virtually identical species of termites that live near each other in Namibia. Even experts with microscopes and field guides in hand, he explains, have difficulty telling them apart based solely on their morphology. One species, *Macrotermes michaelseni*,

must either be one brick higher than the stack the robot is on now, or be the same height, if the blueprint calls for no further bricks to be added there. For every site the robot might visit next, the stack has to be the same height as the one the robot is leaving.

"Why that should work is not obvious," Werfel adds. But the advantage of working on collective construction, as he calls it, is that

**"There's a saying in robotics:
'Simulations are doomed to succeed.'
When you use real hardware, you always
learn things you don't expect."**

the resulting structure—the thing that gets built—is the physical manifestation of the emergent behavior, there for everyone to see in all its glory, or failure. "There's a saying in robotics," he says: "Simulations are doomed to succeed." When you try it with real hardware, you always learn things you don't expect."

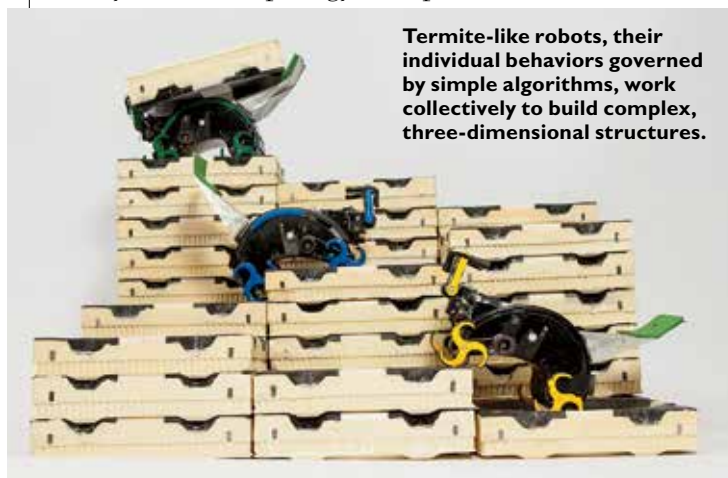
The study of emergent behavior, and of the programming of individual agents, whatever the group goal might be, seems likely to find application in human realms sooner than expected. It doesn't take a big cognitive leap to perceive the analogies between tiny mobile robots and the autonomous vehicles, already being road-tested, that operate by a set of rules little different from those Werfel runs in his simulations.

Developing rules for the collective behavior of RoboBees depends on the mission they are asked to accomplish, which in practical terms remains undefined. But applications have never been the driving force or the measure of the project's achievements. "We can build the RoboBee at insect-scale," says Wood. "We understand the dynamics, and we know how to navigate in this complex design space. We understand actuation, we have good solutions to the power electronics, and we understand the fluid mechanics of the wings. We have developed sensors that can stabilize flight, so the bee can hover and land."

He is optimistic that the bee can be trained for full flight using deep neural networks. The biggest remaining challenge is integrating all the components into a single flying bee. That seems like a simple final step, but Wei, for one, questions whether it will ever happen. "The research has been done," he says, "and the bee is a solved problem in some sense." What remains—"Tinkering, and fighting engineering problems—which is not as interesting to academics"—he thinks may be better left to industry.

It is the *next* hard problem that engages the passion and creativity of these engineers. Werfel is already thinking about how to build swarms of robots that could live in the human body, clearing arterial plaque, for example, by using DNA as a building block for tiny intravascular machines. Wood, while committed to seeing the discoveries spawned by the Robobee project applied to medicine and manufacturing, is engaged in a complementary new realm, too: how to build and control soft robots, with no hard moving parts, that can safely interact with biological tissues and organisms, even in extreme high-pressure environments like those found in the deep oceans. Brooks and Wei aspire to build tiny, low-power computer chips that could use speech and vision to control not only a bee, but anything one can imagine. It might be called "Robobees 2.0," says Wei. Or anything, really. The attendant limits in a name are there, it seems, only to inspire fresh innovation. ▽

Jonathan Shaw '89 is managing editor of this magazine



Termite-like robots, their individual behaviors governed by simple algorithms, work collectively to build complex, three-dimensional structures.

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builds "striking spires," while the other, *Macrotermes natalensis*, he says, constructs low, "lumpy nothings." By studying their behavior under controlled conditions, Werfel hopes to tease out the differences in the rules that govern their behavior.

In complementary work, he started with the very simplest artificial systems he could devise, involving two dimensions. His robots were instructed simply to build a plane, a flat surface, with no holes in it. In an iterative process of trial and error, he began to understand how instructions could lead to surprising patterns in group behavior. Even the three-dimensional structures built by TERMES robots followed the simplest of rules. To avoid getting stuck in a situation where they can't keep building, the robots are instructed, before adding a brick, to check where material is already present around them: for every site that a robot could have just come from, the stack of bricks there



Visit harvardmag.com to watch video of a RoboBee in flight.

ALMOST A CENTURY AGO, a young Boston lawyer named Reginald Heber Smith published a landmark book called *Justice and the Poor*. It was about how people struggling economically were faring in the American legal system and why American lawyers needed to provide them with free legal aid. He wrote, “Nothing rankles more in the human heart than the feeling of injustice.” At the time, there were only 41 legal-aid organizations in the country, with a total of about 60 lawyers. The Boston Legal Aid Society, founded in 1900, was one of them. As a student at Harvard Law School, Smith had spent his summers as a volunteer there. When he graduated in 1913, he became the leader of that four-lawyer office and instituted a

“daily time sheet”—on which lawyers recorded the hours they spent on cases—as a tool for increasing efficiency in addressing the 2,000 or so cases the society had on behalf of clients.

Smith’s book recounted how American lawyers had devised a system of substantive law and legal procedure so convoluted that it denied access to justice to anyone who didn’t have a lawyer to navigate it. That system, he contended, had to be fixed by greatly multiplying the number of legal-aid societies. Smith wrote, “It must be possible for the humble to invoke the protection of the law, through proper proceedings in the courts, for any invasion of his rights by whomsoever attempted, or freedom and equality vanish into nothingness.” His goal was to give “reality to equality by making it a living thing.” He warned that “denial of justice is the short cut to anarchy.”

If the bar provided lawyers for free, the poor would have access to justice and society would benefit. Smith’s vision was of lawyers for the poor providing the full range of legal services that lawyers for the rich were expected to deliver. His book’s introduction summarized his view: “Class hostilities would diminish, the turbulent marketplace would return to stability, and the poor’s disposition toward righteous conflict would be diverted. Society would be cleansed of its anarchistic elements, and the confidence of poor people in lawyers and the legal system would be re-established.”

Smith’s vision has never been realized in the United States, but it haunts the debate about how best to serve the legal needs of poor and low-income Americans—and about whether we even know what

works best to solve the problems of this group. Poverty’s effects on human health are well documented: lives tend to be sadder, harder, and shorter. But the effects on poor and low-income people’s lives of needing a lawyer and not having one are not well documented at all.

The main divisions in the debate today are about resources: between those who want to see Smith’s vision realized, with lawyers central to the story, and others who are convinced it’s not possible to provide enough lawyers to meet the need—and who also believe that, in many instances, a lawyer isn’t needed to solve the problem; and between those who think it’s essential for the federal government to fund legal aid (with many convinced the government should provide much more money than it now does) and others, like of-

ficials in the Trump White House, who say the federal government should have no role in paying for legal aid.

The leaders in this debate are far-flung and from diverse backgrounds and institutions. But Harvard Law School (HLS) and people with Harvard ties appear prominently in this story, beginning with Smith himself. In 1976, the first president of the country’s main funder of civil legal aid, the Legal Services Corporation, was Thomas Erlich, LL.B. ’59. The corporation’s current board chair, who is leading the fight to maintain funding for it, is John G. Levi, J.D. ’72, LL.M. ’73. The vice-chair is Martha Minow, the former dean of the law school, who broadened and deepened the school’s commitment to public-interest lawyering more than any leader in the school’s history and is one of the country’s most influential advocates for civil legal services.

Initiatives under way at HLS have returned it to a prominent role in advancing legal aid—and in devel-

oping new approaches that will change and enhance the delivery of these services in the future. Daniel Nagin, vice dean for experiential and clinical education and faculty director of both the school’s Legal Services Center and its Veterans Legal Clinic, is exploring improvements in legal services that could help bridge the divide between those who insist that lawyers are essential in providing legal services and those who believe they aren’t. Green professor of public law D. James Greiner, faculty director of the Access to Justice Lab, is HLS’s main proponent of the view that sometimes the solutions can be simpler and less expensive. The work of all three,

THE JUSTICE

America’s unfulfilled promise of “equal justice under law”

GAP

by LINCOLN CAPLAN



A young girl jumps rope on the sidewalk next to her family's belongings after they received a court order of eviction that was carried out by McLennan County deputy constables in Waco, Texas. Families like hers are the kind of clients badly in need of legal representation—and most often unlikely to receive it.

creating this need: almost nine out of 10 of their low-income adults have no college degree; six out of 10 have no more than a high-school education. Of those who qualify for civil legal services, 44 percent are white. Trump's margin among white voters without a college degree was the widest in any presidential election since 1980. In effect, whites without college degrees who qualify for and need legal aid elected him. The number who qualify for such aid is likely 50 percent greater than the "Justice Gap" report described; based on U.S. Census Bureau data for all of 2015 (the most recent available), an additional 32 million people had incomes at or below 125 percent of the federal poverty level for any two-month period that year—making a total of almost three out of every 10 Americans.

and of many others at the law school, is important to anyone who knows about America's enormous unmet needs for legal services.

"Small claims in the Nation's eye"

EARLY THIS YEAR, almost 20 percent of Americans lived in families with household income low enough to make them eligible for legal aid paid for by the federal government. The threshold is at or below 125 percent of the federal poverty level (\$30,750 for a family of four this year). Of these 60 million or so people, around seven out of 10—more than 40 million—were in households that had faced a civil legal problem the previous year. Most said the problem "severely" or "very much" upset their lives: they lost disability benefits, for example, and could no longer afford essential medical care; they were arrested on a drug charge and the state put their children in foster care; or they fell behind on rent and were evicted.

Despite the high incidence of these problems and their often-devastating consequences, in nearly nine out of every 10 instances, the people involved lacked the help of a lawyer, leaving them at the mercy of courts and other government agencies with byzantine rules, insufficient resources, and short supplies of mercy. That's the basic measure of the "Justice Gap," as a recent report by the Legal Services Corporation calls it—the difference between low-income Americans' *need* for legal help in dealing with calamitous matters and the *resources* available to provide it. These are "small claims in the Nation's eye," President Richard M. Nixon said in 1971, when he proposed the organization to Congress, "but they loom large in the hearts and lives of poor Americans."

The 2017 report concluded that this "gap" in fact "has stretched into a gulf." In the 15 states plus the District of Columbia where the percentage of the population eligible for legal aid exceeded 20 percent, the gap was worse: from Mississippi, with 28 percent eligible, to the District of Columbia, Florida, and Texas, with 21 percent eligible.

All those states, except for New Mexico, went for Donald J. Trump in the 2016 presidential election. (The District also favored Hillary Clinton.) Especially in these states that went for Trump, there is vast need for legal aid. Lack of education appears to be a crucial factor in

The Legal Services Corporation (LSC), a not-for-profit organization funded by the federal government, remains the single largest funder of civil legal aid in the United States. In the 2017 fiscal year, beginning in October 2016, it spent \$360 million on grants and other services. That was about two of every five dollars spent by the 133 organizations receiving grants (they are mostly not-for-profits serving all or part of a state), and likely two out of every eight dollars spent *in total* on legal services in the United States.

James J. Sandman, the president of the corporation, describes it as the backbone of America's system for delivering civil legal services. "Our goal," he says, "is to be sure that people everywhere have some access to these services." At Pine Tree Legal Assistance, in Maine, services range from providing simple legal advice, say, about a veteran's benefits, to full representation in larger cases. More than half the matters it handled in 2016 involved housing—helping tenants avoid evictions and home-owners avoid foreclosures on their mortgages helped saved the state \$2.6 million in the cost of housing them in emergency shelters. At four organizations in Massachusetts, services cover a similar range. Last year about half dealt with housing troubles as well, and about one-fifth with family matters like securing guardianship of orphaned and abused children and helping survivors get protective orders against abusers. Those and other services saved the state \$16 million in medical and other costs. At seven organizations in Florida, seven out of 10 matters dealt with family and housing troubles. About two out of 10 dealt with money problems—lost jobs, lost benefits, lost credit, and lost nest eggs. Legal services saved the state \$60.4 million in avoided costs for foreclosures, emergency shelters, and more. In every state and Washington, D.C., providers of legal services helped low-income individuals and families meet their basic human needs: housing, food, income, safety, education, and well-being. To put LSC in context, its grantmaking in 2014 would have ranked it among the top 20 American foundations. But its total revenue in 2015 would have ranked it only 100th among law firms around the world.

Quietly supporting the organization would be an obvious way to aid an essential part of the president's political base. Instead, in March, the Trump administration's proposed budget for fiscal year

2018 called for doing away with LSC, 43 years after Nixon signed the law creating it. The justification was a version of federalism: state and local governments “better understand the needs of their communities,” the Office of Management and Budget said; shutting down LSC would put more control in local hands and “encourage nonprofit organizations, businesses, law firms, and religious institutions to develop new models for providing legal aid, such as pro bono work, law school clinics, and innovative technologies.”

The LSC budget request for fiscal year 2018, which is \$527.8 million, also details the amount of money each state, plus the District of Columbia, would have to make up in current funding for civil legal services if LSC no longer provided grants: almost nine-tenths of total funding for legal aid in Alabama and Vermont, eight-tenths in Connecticut and South Dakota, and between half and three-quarters in 19 other states. These entities would almost certainly be unable to make up the difference.

LSC is unlikely to be eliminated, but it will likely receive much less funding in fiscal year 2018 than it seeks. LSC is being funded at its current level through the beginning of December 2017 under the three-month spending law that Congress and the president approved in September. When Congress decides on the budget for the rest of the fiscal year, the Senate Appropriations Committee has recommended funding at the current level. The House Appropriations Committee has recommended about one-sixth less than the fiscal 2017 budget of \$385 million (including funding for management and oversight). Letters from state chief justices and court administrators, state attorneys general, law-school deans, and corporate general counsels, as well as from members of the House and the Senate, underscored what one letter called “united, bipartisan opposition to the Trump Administration’s proposal to eliminate all federal funding for the Legal Services Corporation” and substantial support for it.

The bipartisan support in the letters reflects bipartisan backing. From 2011 to 2015, as Congress became increasingly polarized, the number of members voting in favor of LSC funding increased by about one-third, especially among Republicans. Members of both parties understand that, among other things, the corporation provides a valuable form of constituent service.

A turbulent, and restricted, history

YET BOTH the House and the Senate recommendations maintain dozens of restrictions on how LSC can spend its money. Legal-aid organizations receiving LSC grants can’t take part in class-action lawsuits; they can’t get involved in litigation or other activities about immigration, abortion, assisted suicide, desegregation of public schools, or civil rights of prisoners, LSC itself, or (with narrow caveats) criminal cases. They can’t engage in legislative or regulatory lobbying, political activities like voter registration and promoting ballot measures like referendums, or welfare reform. They can’t engage in or encourage public demonstrations, picketing, boycotts, or strikes.

The restrictions are meant to keep legal-aid organizations focused on solving legal problems for *individuals*. More to the point, they are meant to keep them from engaging in collective action to reform laws and public policies, from representing large groups of people in lawsuits challenging government agencies or major corporations, and from taking sides in disputes about the most divisive

The restrictions are meant to keep legal-aid organizations from reforming laws and public policies. They safeguard the status quo.

social issues. They are intended to safeguard the status quo.

Rebecca Sandefur, a professor of sociology and law at the University of Illinois, says the restrictions are “bad in a range of ways.” They make helping poor and low-income people less efficient, so money spent on legal aid goes less far: “A class-action suit or law-reform effort can impact the lives of literally tens of thousands of people and enforce compliance with the law on entire industries, reducing the need for future litigation and preventing future harms. By comparison, an individual action litigated to the hilt might help one

family and maybe establish a little case law to be used in the next case for the next individual family.”

A further restriction is that LSC must follow a formula when making grants: each state receives its share of funding based on its share of the American population in households with income at or below 125 percent of the federal poverty line for households of that size, from one person (\$15,075) to eight (\$51,650), with each additional member allowed a modicum of extra income (\$5,225). In fiscal year 2015, 93 percent of LSC’s total spending was on formula-based grants to legal-services organizations everywhere, with the most (\$43 million) going to California and the least (\$0.5 million) to Vermont.

The bipartisan backing in Congress is a product of all of these restrictions, which reflect a history filled with controversy. A national Legal Services Program was part of the Office of Economic Opportunity during President Lyndon Johnson’s War on Poverty in the mid 1960s. Although only a small fraction of the initial funds went to legal services, the new program greatly increased the country’s support of legal aid for the poor.

Earl Johnson Jr., then the program’s director and later a judge on California’s Court of Appeals, reported in 1968 that it had funded “250

Daniel Nagin



Photograph by Jim Harrison

locally-operated programs in forty-eight states” which had “set up 850 Neighborhood Law Offices” and hired “more than 1,800 full-time attorneys”—“almost as many lawyers” as were “employed by the United States Department of Justice and all of the United States Attorneys Offices around the nation.”

Those lawyers provided legal aid to the poor while seeking to reform law that penalized people for being poor. During the almost century that some form of legal aid had existed in the United States before the Legal Services Program, the Supreme Court heard one case brought by a legal-aid lawyer. Between 1965 and 1974, legal-services lawyers became the voice of the poor at the Court. It accepted 64 percent of the cases the lawyers asked them to, a remarkably high rate. Of the 110 cases considered, those lawyers won 62 percent, with conservative justices supporting those victories as fully as the liberals. Legal-services lawyers developed a new field of poverty law while obtaining justice.

From the beginning, however, the program faced angry opposition: from lawyers and bar associations, and from local politicians and members of Congress when the program funded legal aid for policies they opposed. The favorite punching bag was California Rural Legal Assistance (CRLA), a network of offices set up to represent migrant farm workers against agribusiness, which received a million-dollar grant from the program. Then-governor Ronald Reagan vehemently opposed the network and the legal counsel it provided. The State Bar of California joined him in opposition, on grounds that CRLA represented “militant advocacy on a state-wide basis of the contentions of one side of an economic struggle now pending.” In response, Sargent Shriver, who led the Office of Economic Opportunity, ribbed the state bar’s president: “Look, I’ll make an agreement with you. If you will agree that no lawyers in California will represent the growers, I will agree that no legal services people will represent the pickers.”

The hostilities led, in 1974, to the creation of the Legal Services Corporation as an independent organization funded largely by the

Low-income Americans rarely seek legal help for the problems they most commonly experience, resulting from health issues and consumer and financial disputes.

federal government, with the purpose of providing poor people with access to justice as a means of solving problems—but no longer with the aim of alleviating, or even eliminating, poverty. In the final year of Jimmy Carter’s presidency, the LSC budget reached its high point, allowing it to support 325 grantees, with 1,450 offices and 6,200 lawyers. But in 1981, President Reagan brought his antipathy to CRLA and to legal services with him to the White House. His team submitted a zero-budget request to Congress for legal services. LSC, as an independent agency, submitted its own request for an increased budget. With some political wrangling, the organization ended up with “only” a 25 percent cut in funding.

The contrast between the ardor of the Carter administration and the antipathy of the Reagan administration established the pattern for Democrats and Republicans that has continued since. Making matters worse, by the end of the second Bush admin-

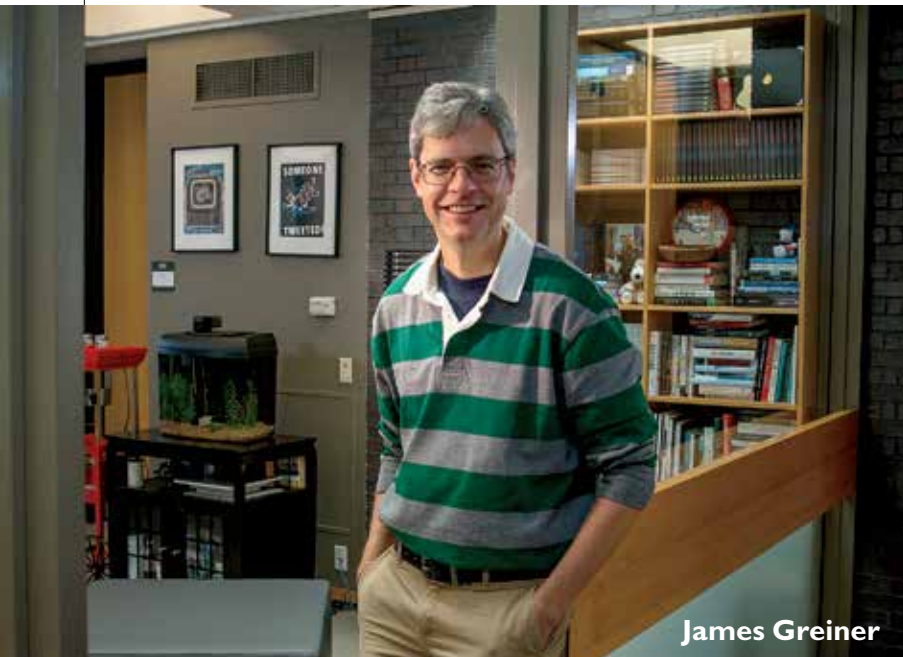
istration, in 2009, LSC’s luster was tarnished by a series of scandals involving embezzlement, fraud, misuse of money, and shoddy financial controls of grantees. There were also lesser ignominies involving sloppy financial controls and lavish spending on travel and entertainment by LSC executives. Some of the bad news reflected political spin by LSC’s critics. Politics was reducing it to a bureaucracy where squabbling about real and alleged misdeeds distracted from the mission.

“The essential decency and evenhandedness in the law”

JOHN LEVI, LSC’s chairman since 2010, is the son of Edward H. Levi, an eminent intellectual who left the presidency of the University of Chicago to become U.S. Attorney General from 1975 to 1977. He restored honor to the Justice Department after the political espionage, law-breaking, and cover-up of Watergate during the Nixon administration. His concern went far beyond the department he was recruited to lead: he sought to rebuild American confidence in what he called “the essential decency and evenhandedness in the law.”

John Levi’s quest as board chair has been for LSC to greatly expand decency and evenhandedness for low-income Americans. He leads with a combination of urgency, chutzpah, and good cheer. In August, in a speech to the American Bar Association (ABA), he quoted his father’s 40-year-old farewell address as Attorney General, in which he said that the values the United States is founded on “can never be won for all time—they must always be won anew.”

Establishing justice was among the critical reasons for establishing the Constitution, as its Preamble states. In saying what the American flag stands for, the country’s Pledge of Allegiance says how justice should be applied: “with liberty and justice for all.” The Supreme Court perpetually declares that its ultimate responsibility is to render that result: carved in the pediment of the Court’s building is “Equal Justice Under Law.” When LSC celebrated its fortieth anniversary in 2014, the late Justice Antonin G. Scalia, LL.B. ’60, told the gathering, “I’ve al-



James Greiner

Photograph by Jim Harrison

ways thought that's somewhat redundant. Can there be justice if it is not equal? Can there be a just society when some do not have justice? Equality, equal treatment, is perhaps the most fundamental element of justice."

The founders had immense blind spots about the scope of equality as an element of justice: they authorized slavery in the Constitution and approved the exclusion of women from political, economic, and social power. But they identified "liberty and justice for all" as an essential aspiration. In a rule-of-law country that revolted against the rule of an autocratic king, they put their faith in a system prizing a government of laws, in which Lady Justice wears a blindfold to represent her impartiality.

John Levi is a partner in the Chicago office of the law firm of Sidley Austin. He hired an HLS student named Barack Obama as a summer associate in 1989 and asked Michelle Robinson, an HLS grad who was a first-year associate and enthusiastic about the firm, to be Obama's summer adviser. They got married in 1992. Levi has been a cheerleader for both in their careers, and raised money for the former president's campaigns. When the Obama presidential transition team asked Levi if he wanted to join the administration, he said he planned to stay in Chicago but would be interested in a substantive part-time role. (He told them he wasn't interested in "fluff.") Chairing LSC has elevated him from prominent Chicagoan, carrying on a family tradition of community service, to influential national leader among lawyers.

LSC under Levi has embraced traits taken for granted during the Obama administration: pride in delivering good government; belief in the importance of bipartisanship in policymaking; and insistence on the highest possible standards in public service. Levi was eager to have Martha Minow as vice chair of the board because of her long involvement with legal services for the poor and the prominence she gave public-interest law both in the HLS curriculum and in what she championed as a career for its graduates when she became dean in 2009. (Bromley professor of law John F. Manning succeeded her in July; she is now Carter professor of general jurisprudence.) They will remain board members until their successors are picked by the Trump administration and confirmed by the Senate, after their current three-year terms end this December. In 2011, they chose Jim Sandman as president. After spending 30 years at the law firm of Arnold & Porter, in Washington, D.C., where he was managing partner for a decade, he became general counsel and chief legal officer of D.C. Public Schools from 2007 to 2011. He was also a past president of the D.C. bar and a past board member of D.C.'s Neighborhood Legal Services program, which LSC supports.

Under the leadership of these three, the hundred or so employees of LSC have functioned like grant-makers at a tautly run foundation. They have imposed fiscal discipline on themselves and the organizations they fund, and promoted high performance. They have worked closely with the ABA and other groups to increase the amount of legal-services time that lawyers provide low-income Americans without charge (*pro bono*) or at low rates (*low bono*). They have persuaded Congress, foundations, and corporations to support experiments in the use of technology so there will be a baseline of support everywhere in the country for people who can't afford a lawyer—including in rural areas, which are especially hard to serve.

In addition, they have learned that the help legal-services offices



John Levi

most commonly provide—giving legal advice, helping fill out legal forms and documents, and representing clients in court—is *not* what people who qualify for aid are most likely to seek help for, which usually relates to children and custody, wills and estates, veterans' issues, family issues like physical or sexual assault, and disabilities. They have also learned that low-income Americans rarely seek professional help for the legal problems they most commonly experience—those resulting from health issues and consumer and financial disputes—either because they think they can manage without lawyers, or don't see the problems as legal ones. Rebecca Sandefur, who advised LSC about its justice-gap survey, says this pattern "suggests we need to completely re-think our outreach strategies—to radically re-think how we connect people to services."

Levi considers the justice gap a crisis on the scale of a public-health epidemic and has worked to make eliminating it a national priority, among lawyers but also among leaders outside the legal world. He persuaded the American Academy of Arts & Sciences, of which he is a member, to undertake a project to define the scope of the justice gap and educate American leaders about the extent and the consequences of it. He has also enlisted celebrities to join LSC's Leaders Council as advocates for legal services: Henry Aaron, the great home-run hitter, John Grisham, the best-selling author of legal thrillers, and others in business, finance, and other fields.

But the justice gap remains a gulf, and LSC is notably constrained in how, and how much, it can address the problem. During the past decade, the average number of eligible households with at least one civil legal problem was about 9.5 million annually. The average number of households served by LSC-supported legal-aid programs during that period was 815,000: about one-twelfth of the need. In 2015, about 9,000 people worked on legal-service problems at LSC grantees—about 4,600 of them lawyers. Assuming those lawyers represent between half and three-fifths of the lawyers in the country providing legal aid full-time, the total today is likely well under 1 percent of America's 1.2 million or so lawyers. With average salaries of about \$50,000 a year, they are the lowest-paid group of lawyers in the country.

In the World Justice Project's 2016 Rule-of-Law Index, the U.S. ranked ninety-fourth of 113 countries in "accessibility and affordability

of civil justice.” “Liberty and justice for all” remains far from a reality.

“Legal policy is where medicine was in the 1930s and 1940s”

FORMER HLS DEAN Martha Minow was among the minority of deans whose mark on their law schools strongly reflected their scholarly interests. From the start of her career as a professor in 1981, she showed a passion for exposing inequities embedded in American law and for helping create a more egalitarian society. As vice chair of the Legal Services Corporation, she has pushed for what’s possible from the government and the legal profession. As dean, she pushed for what neither of those institutions has done—for imagining and creating what is necessary to address the justice gap. She helped spark much of the school’s scholarship and innovation that hold the promise of reshaping legal practice and broadening access to legal services.

Minow emphasized HLS’s mission as a *justice* school, as much as a law school, by expanding opportunities for public-interest work and by bringing the curriculum and clinical offerings closer together—so theory informs practice and vice versa. She told me, “Ours is a nation founded on a set of civic ideals, not on an ethnicity, not even on a common history. It’s an experiment. What holds us together as Americans is a commitment to recognition of the worth and dignity of each individual, regardless of identity or background, and to equality under law. There’s an aspiration to create a mechanism for each individual to be heard and to be

“We want students to feel the weight of the case on their shoulders. Students are not just implementers, where we tell them what to do and then they have to go do it.”

able to secure the predicates for a good life, the same that any other individual could, especially under law.”

About 80 percent of recent HLS graduates have “taken a clinic,” in law-school vocabulary—just as they took traditional academic courses and received credit for them. The school now offers three dozen choices for experiential learning. They begin with the Harvard Legal Aid Bureau (HLAB), the oldest student-run legal-services office in the United States, where students earn credit for doing law-reform activities like litigation that can change public policy, or for representing low-income clients in housing, family law, and other civil legal issues), and extend to the WilmerHale Legal Services Center, which houses five distinct clinics and remains the largest of the school’s legal-services providers.

HLAB involves a two-year commitment for 2Ls and 3Ls of at least 20 hours a week during term-time, and often 40 or even 60 hours, on top of other academic requirements. Current students in the bureau choose 25 new students each year, in an onerous process designed to deter any dabblers. They favor applicants whose experiences are likely to help them empathize with clients. Many students accepted are the first in their families to go to college or law school. Most are people of color. Seeing themselves as gatekeepers, since the HLAB receives far more pleas for legal aid than it can handle, they feel a duty to use their time and talent on behalf of clients who are especially needy even if the need is different from those the bureau has traditionally tried to meet.

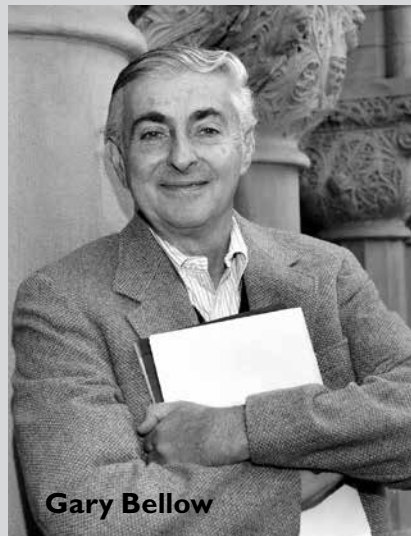
“Nothing rankles more than the feeling of injustice”

REGINALD HEBER SMITH’S *Justice and the Poor* is in the library of Harvard Law School’s Legal Services Center, in the Jamaica Plain neighborhood of Boston, about five miles from Harvard Square, along with many other books from the personal collection of the late Gary Bellow, LL.B. ’60, who co-founded the center in 1979. Among them is a first edition of *The Lawyering Process: Materials for Clinical Instruction in Advocacy* (1978), the first American textbook designed to teach law students about the role, craft, and values of lawyering—how to practice law—which Bellow co-authored.

Bellow had prepared for creating the law school’s clinical program without planning to. For three years, he was one of the first lawyers at what became Washington, D.C.’s exemplary Public Defender Service and an uncommonly successful criminal-defense lawyer; for another three years, he helped run the Office of Economic Opportunity’s community-organizing agency in Washington. He also spent a couple of years as deputy director of California Rural Legal Assistance, where he riled Ronald Reagan by representing Cesar Chavez and members of the United Farm Workers, and three years at the University of Southern California Law School, representing the UFW and the Black Panthers and building the school’s clinical program.

When Albert Sacks became HLS’s dean in 1971, he invited Bellow to visit as a clinical professor and asked him to build a clinical program at the school. Bellow agreed to do that for five years. At the end of that stint, when he said it was time for him to return to practicing law in a neighborhood legal-services center, Sacks asked, “What would you like to do? I don’t mean, ‘What would you like to do *here*?’ I mean, ‘What would you like to do?’”

In 1999, the year before Bellow died at 64 when the heart he had received in a transplant gave out, he recounted in an oral history, “I said, ‘Well, I think the thing that’s most needed are legal-services schools.’” He had in mind what he called “teaching law offices,” like teaching hospitals where medical students learn to be doctors by caring for patients; in a 1977 essay, he had writ-



Gary Bellow

HARVARD PUBLIC AFFAIRS AND COMMUNICATIONS

During the financial crisis of 2008 and after, students expanded their housing practice from representing tenants who were being evicted from apartments to people who owned property and faced foreclosure because they couldn't pay the mortgage. For the past 12 years, they have had a wage-and-hour practice, which represents victims of wage theft: by employers who owe employees money and don't pay them, or who don't pay the minimum fair wage, overtime pay, or vacation pay they owe under state and federal law. Many of the clients are undocumented immigrants. Esme Caramello, a clinical professor who is the bureau's faculty director, told me, "Within five years of graduating from the law school, a lot of students who did HLAB are in public-interest jobs, doing legal services and otherwise. They feel compelled to do this work."

For students, the draw of these opportunities to practice law is the responsibility they require. "Without removing the safety net that clinical teachers provide, to ensure ethical and competent practice," Nagin says, "we want students to feel the weight of the case on their shoulders. Students are not just implementers, where we tell them what to do and then they have to go do it. We want them to understand that the outcome in the case depends on their performance. The point isn't to cause students stress. It's that responsibility is a really important component of effective learning."

A major premise of the Legal Services Center is that the United States is not going to solve the problem of scarce access to justice by providing a lawyer for everyone who needs, yet can't afford to pay for, counsel. Instead, the Harvard center pursues what Stanford law professor Deborah Rhode terms "adequate access to justice": this includes, she wrote, "increased simplification of the law; more self-help



initiatives; better protection of unrepresented parties; greater access to non-lawyer providers; and expanded opportunities for informal dispute resolution in accessible out-of-court settings"—in other words, different levels of intervention, depending on need and circumstance.

The most powerful simplification of the law today comes from technology. William Palin, whom Nagin described as a one-of-a-kind, out-of-this-world software developer, is HLS's first Access to Justice/Technology Fellow. A graduate of Boston's Suffolk Law School, he taught himself how to write code using books from the Cambridge public library, where he had set up a one-man practice in family law. In 2014, he won a contest co-sponsored by Suffolk (please turn to page 103)

ten that legal education was so incomplete, "a lawyer certified by the bar to practice is generally not competent to do so. That is, he or she has, in most instances, never handled a case, interviewed a client, examined a witness, or negotiated a settlement." As Climenko professor of law Charles Ogletree summarized in a posthumous tribute to Bellow, "The dominant line of thinking was that legal services centers provided clients with legal assistance in circumstances in which they would not have received any assistance in the past, and so a poorly qualified and inexperienced lawyer was better than no lawyer at all. Professor Bellow sharply dismissed this paternalistic attitude in his advocacy for mandatory and competent representation."

The Legal Services Corporation agreed to fund a pilot project to teach law students how to practice law, and to explore how best to make use of clinical teachers' and law students' time by expanding the roles of legal assistants in providing legal services and of technology in providing legal services, and then teaching how to do that well. Sacks agreed to match the funding and the Harvard Model of clinical education was born in 1979. Called the Legal Services Institute, it was a partnership between HLS and Greater Boston Legal Services, where 25 students (from HLS, Northeastern Law School, and other schools) did an 11-month apprenticeship of courses, supervised practice, clinical seminars, research, and writing. It was the first major law-school clinical program that had broad delivery of legal services at its core.

The experiment ended in 1982, after the Reagan administration

cut off its LSC funding, but two years later, the program morphed into a partnership with the Boston-centered firm Hale & Dorr (where Reginald Heber Smith was the first managing partner after he left the Boston Legal Aid Society). The Harvard Model evolved into a teaching law office where HLS students learned from clinical teachers and from experience, and practiced alongside and learned from Hale & Dorr lawyers. After the program outgrew its quarters, what's now the WilmerHale Legal Services Center of Harvard Law School opened in 1993 in a repurposed Jamaica Plain factory.

As community legal needs have changed, the center's services have, as well. It now has a Project on Predatory Student Lending, in response to the rise of for-profit higher education and the resultant scams. It has a Tax Clinic, because welfare reform in the 1990s embedded much of the social safety net in tax credits. In addition, while much of its work remains rooted in the local community, some is national in scope and in impact through class-action lawsuits, public-policy efforts, and otherwise.

Daniel Nagin, faculty director of the center, says, "I tell students that, if they really want to make a difference, they should explore all of the things Congress has tried over the years to restrict grantees of the Legal Services Corporation from doing: class actions; lobbying the government; efforts to change and improve the law on behalf of groups."

and the ABA with an app he developed called PaperHealth. It lets people in Massachusetts quickly fill out, sign, and save living wills (“If my heart stops, I do not want it to be restarted”) and health-care proxies (“a simple legal document that allows you to choose someone to make medical decisions for you”) and then emails them to designated hospitals and health-care providers. In the next two years, he transformed himself into a software developer and started at HLS.

He works within the school’s clinics, hanging around with teachers and students to learn what they do and how they do it and thinking about whether he can develop a piece of software or an app that simplifies and speeds up their work—in his words, “helps them become better lawyers.” He helped Jeffrey Roderick, J.D. ’17, develop software that saves five or six hours a case by automating what happens when a clinic accepts a client and gathers basic information about the matter. On the website of Developing Justice, Palin’s HLS program, there’s a link to the Guardian Service Project, a tool he developed to help people who want to file for guardianship of an adult who has “a clinically diagnosed medical condition” and is “unable to make or communicate effective decisions about their everyday self-care, health, and safety.” The project emerges from another premise of the Legal Services Center: that matching the client with a lawyer is not always necessary.

According to Jim Greiner, head of the Access to Justice Lab, sometimes people need a lawyer in the fullest sense. Sometimes they need a lawyer for a one-time representation. Sometimes they would be better served by a limited legal technician (permitted in Washington state), who is trained and licensed to help people going through a divorce, a child-custody battle, and other family-law matters—just as a nurse practitioner can

treat some patients and prescribe medication. Sometimes people can help themselves.

Greiner believes that most decisions about what best serves a client are based on gut instinct and a form of politics, since there is little reliable scholarship on what works and why. “Legal policy,” he says, “is where medicine was in the 1930s and ’40s. A consensus was beginning to form then that the randomized study”—randomly putting people in a group receiving the treatment being studied or, as a control, in a group receiving standard treatment or a placebo—“was very helpful in making decisions about which drugs to provide widely and which medical instruments to use widely, but there was still major disagreement—with pushback largely from rural doctors. They believed that their experience and their understanding formed the basis for making those kinds of choices. It took 40 years to reach the consensus that the randomized study should, ordinarily, be relied upon to decide which drugs and medical devices were safe and effective. It took still another 40 years for similar thinking (not yet a consensus) to take hold with respect to medical things, like reminders to doctors to wash their hands regularly.”

What is the opposing view?

“Ignorance, basically, about the value of evidence-based research,” Greiner says. He thinks very few in the American bar or on the bench believe in rigorous evaluation of civil legal services or court techniques—but “just because we have been doing something one way for a long time doesn’t mean it’s the best way to address any particular problem.” The premise of the Access to Justice Lab is that the way to figure out what works is to do it and test it.

In Massachusetts Housing Court, for example, Greiner and colleagues “randomized” the potential clients who received offers of traditional attorney-client relationships from legal-aid staff attorneys and those who got only the limited service of a lawyer for a day. In examining whether matters not yet in litigation eventually reached court, whether tenants remained in possession of their housing, and other issues, they found “no statistically significant evidence” that full versus limited representation made a big difference in any of the outcomes.

Greiner is also convinced that the access-to-justice problem doesn’t merely burden poor and low-income Americans, because only a small fraction of Americans can afford the justice they need. That’s a problem of the



Esme Caramello

JESSICA SCRANTON/COURTESY OF HARVARD LAW SCHOOL

legal market for all but wealthy individuals and organizations. There is wide agreement that the current eligibility threshold for federally subsidized legal aid (125 percent of the federal poverty level) is far too low. Many programs funded by sources other than the LSC provide services to people with incomes up to 200 percent or even 400 percent of that level, because many of those households are financially precarious. That makes the justice gap even wider. It makes Congress’s and the country’s longstanding indifference to the gap even more profound.

* * *

JOHN LEVI HAS SET a goal for the United States of closing that gap completely by 2026, when the country will be 250 years old. However the gap is defined, it’s very unlikely the country will close it by then. But his other goal is to shift the gap from a concern only of lawyers into a concern too critical to be left to lawyers alone: they haven’t solved the problem, and they have had a century to try. If he succeeds in transforming it from a legal problem into a moral and a political one, he will do as much as anyone ever has to help close the gap. ▢

Contributing editor and legal journalist Lincoln Caplan ’72, J.D. ’76, who is a senior research scholar at Yale Law School, profiled Supreme Court Justice Stephen Breyer in the March-April issue.

In 2014, Earl Johnson Jr. published a comprehensive three-volume work, *To Establish Justice for All*, about the history of civil legal aid in the United States, from which some of the history in this article is distilled.

The project of the American Academy of Arts & Sciences to define the scope of the justice gap and educate American leaders about the extent and the consequences of the gap includes a special issue of the Academy’s journal *Daedalus*, which Caplan is working on as a guest co-editor.

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Montage

Art, books, diverse creations



- 74 Open Book
- 75 Found in Translation
- 76 Off the Shelf
- 78 “Kingmaker” to Gatekeeper
- 79 Believe It or Not!
- 82 Chapter and Verse



Up Close

Ashley Fure wants people to listen to noise.

by JENNIFER GERSTEN

THE MUSIC of composer Ashley Fure, Ph.D. '13, asks listeners to come to terms with wanting to linger beside sounds from which they'd otherwise retreat. During an August rehearsal for her opera *The Force of Things*, the percussionist Ross Karre—a member of the International Contemporary Ensemble, which commissioned the work—stood behind an aircraft

cable stretched across two hemispheres of styrofoam, wielding a double-bass bow. Hearing a cue through his headphones, he applied bow to cable. Metallic shrieks emanated, of the sort that kills plants and sends animals scurrying. Watching him was like watching a magician give up trade secrets, while remaining amazed: would Karre mind making that ghostly noise again?

For Fure, a professor at Dartmouth whose accomplishments last April alone—a Guggenheim, her Pulitzer finalist standing, and a Rome Prize—might suffice for a lifetime, this second complete staging of the opera since its first public performance in 2016 in Darmstadt, Germany, was her most ambitious production yet. Previous performances were smaller-scale: at a theater in Ypsilanti, Michigan, the staging filled the space to the point of “just

Above left: Fure focuses during a July workshop for *The Force of Things: An Opera for Objects*, a music theater piece involving—among other elements—electronics, saxophone, bassoon, subwoofers, and singers that was first performed last year (above) in Darmstadt, Germany.

O P E N B O O K

Oenophile Par Excellence

For many Americans, Clifton Fadiman embodied books and learning in the twentieth century: Simon & Schuster editor; *New Yorker* book editor, National Book Awards host, Book-of-the-Month Club judge, and, switching media, radio and television quiz-show host. His daughter, Anne Fadiman '74—no slouch herself as reporter, *American Scholar* editor, essayist, and now writing teacher at Yale (and an Incorporator of this magazine)—remembers him in *The Wine Lover's Daughter*, a new memoir (Farrar, Straus and Giroux, \$24). The title's origin becomes clear from the vivid opening:

My father was a lousy driver and a two-finger typist, but he could open a wine bottle as deftly as any swain ever undressed his lover. Nearly every evening of my childhood, I watched him cut the capsule—the foil sleeve that sheathes the bottleneck—with a sharp knife. Then he plunged the bore of a butterfly corkscrew into the exact center of the cork, twirled the handle, and, after the brass levers rose like two supplicant arms, pushed them down and gently twisted out the cork. Its pop was satisfying but restrained, not the fustian *whoop* of a champagne cork but a well-bred *thwack*. He once said that the cork was one of three inventions that had proved unequivocally beneficial to the human race. (The others were the wheel and Kleenex.)

If the wine was old, he poured it into a crystal decanter, slowing at the finish to make sure the sediment stayed in the bottle. If it was young, he set the bottle in a napkin-swathed silver cradle to “breathe”: one of several words, along with “nose” and “legs” and “full-bodied,” that made wine sound more like a person than a thing. Our food was served—looking back, I can hardly believe I once accepted this as the normal order of things—by a uniformed cook who ate alone in the kitchen and was summoned by an electric bell screwed to the underside of the dinner table just above my mother's right knee. But my father always poured the wine himself. The glasses were clear and thin-stemmed, their bowls round and generous for reds, narrow and upright for whites. (Had he lived



EVERETT COLLECTION/ALAMY STOCK PHOTO

long enough to see *Sideways*, he would immediately have recognized that the wine-snob hero was seriously depressed: only thoughts of suicide could drive someone to drink a Cheval Blanc '61 from a Styrofoam cup.) My father swirled the wine, sniffed it, sipped it, swished it, and, ecstatically narrowing his eyes, swallowed it—a swallow that, as he put it, led “a triple life: one in the mouth, another in the course of slipping down the gullet, still another, a beautiful ghost, the moment afterward.”

...[T]hat erotically charged description is from a 1957 essay called “Brief History of a Love Affair.” When I was ten or so, I spotted the title in the table of contents in one of his books, eagerly flipped to page 133, and was grievously disappointed to discover, in the fourth paragraph, that the lover in question was not a woman but a liquid.

short of actually sawing through the walls,” Fure recalled. In the ample, readily configurable space of Montclair University's Kasser Theater, the work—co-produced with Fure's architect brother Adam—was “being unleashed,” she said. “Each time you revisit it, because it's a wild, collaborative piece, it grows and sprouts new appendages.”

The Force of Things, meditating on humans' relationship with the environment amid ecological crisis, is not an opera where singers sweat in period costume. There is no explicit plot or text. The singers make breathy, fragmented noises, as though all coherent language had rusted in their throats. From the objects and their players come groans, creaks, and screams. “I wanted to see if we could elicit pathos and emotional connection through nonhuman sources, where humans and materials are undergoing different types of evolution across the scope of the piece,” Fure explained. “What I'm trying to create is a place to sit and feel and grieve this very slow and very fast crisis that's happening around us. And just uncomfortably, collectively—without words and messages and data and silence—just feel the volatility of it, the interconnectedness of it, and the danger of it.”

During the hour-long Kasser production, performed in early October, sound, light, and the performers' physical movements guided attendees through a landscape of traditional musical instruments and inert objects, like that aircraft cable, exploited for their jarring sonic capabilities. The audience was free to move about and observe: much of the time, two singers, a bassoonist, and a saxophonist hovered at the fringes, firing eldritch tones through the darkness. As in Fure's other work, the opera dropped unanticipated, often noise-laden sounds from unexpected sources into new harmonic contexts, allowing her audience to confront the possibility of expression from avenues that seem least suited for it.

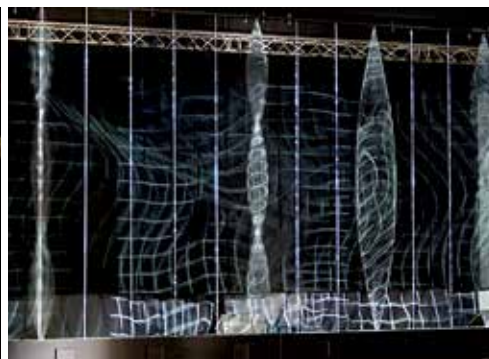
With her jaunty haircut and dangle earrings, Fure is like the cool older sister, who, yes, left home to join a band, but returned with a Harvard degree to keep Mom and Dad quiet. She is at ease with what powers her art, though she cannot explain it: how her ear perks to sonic pariahs. “To me, they're not esoteric,” she said. “I'm genuinely, viscerally turned on by them. For whatever reason, this is what I feel called to, and I'm trying to go there fearlessly.”

Fure (pronounced “fury”) grew up in Marquette, Michigan. She began composing and improvising at age four, when her

MARINA LEVITSKAYA/PEAK PERFORMANCES AT MONTCLAIR STATE



Above: Percussionist Ross Karre of the International Contemporary Ensemble “plays” an aircraft cable stretched across two styrofoam hemispheres in *The Force of Things*. **At right:** A still from *Tripwire* (2011), Fure’s multimedia installation project, in which motorized elastic strings oscillate in response to onlookers’ movements



JEAN-MICHEL ALBERT

born in noise. In two recent works—“Bound to the Bow,” her Pulitzer finalist composition for orchestra and electronics, and the septet “Something To Hunt”—listeners are asked to challenge hardwired listening habits. “I think,” Fure said, “I am looking

to believe that’s possible. I have to believe that the better I get at what I do—the more specific, and distilled, and exacting I can be—the greater chance there is my work might speak beyond the bound-

for—and trying to offer—a type of empathetic engagement with material that most people in the audience, particularly those who think Stravinsky is challenging, don’t spend much time trying to engage with.”

With a few months to go before the opera’s opening, Fure was still trying to find out what sorts of new sounds the performance space allowed for, how close she could get to what she was hearing in her mind. Midway through one rehearsal, the percussionist, was testing the sound a rope made when placed inside a subwoofer (a loudspeaker that produces low bass frequencies). As he repeatedly lifted the speaker and set it down, the rope, which was suspended from the ceiling, began to twirl. It stuttered, then twirled again with renewed vigor, like a forgetful dancer.

“It’s life!” someone gasped, noting its resemblance to a double helix. “Look at the insane sound it’s making,” Fure murmured, gazing at the string with something like admiration. She seemed to have found what she was listening for: an agile whirring, slight yet tenacious, like a mind as it begins to spin.

parents, noting her interest in music, set her up with piano lessons. Music soon became her ticket to new experiences. Feeling held back at her high school, she won admission to the composition department at Interlochen Arts Academy, and then to Oberlin. But Fure assumed she would one day choose a field more explicitly entwined with political action—education, perhaps, or conflict resolution. Guilt about her work’s utility trailed her to Harvard, where she enrolled as a composition doctoral student directly after college. There, in a class on modernism, she discovered Virginia Woolf, whose writing eased Fure’s fraught relationship with her own work. “Woolf was the first person who taught me that you can go down to get out. She goes so deeply inside of her characters that she hits the universal through the extremely specific,” Fure said. “I have

aries it’s born into.”

Concurrently, Fure began working with the microphones in the campus electronics studio. “This is what’s difficult about the concert hall for me: I want people to feel the sound right here,” she explained. “I want to whisper it into their ear. But instead I have to play it on a stage that’s 80 feet away, which always loses that crisp, intense, intimacy of proximate sound.” Being able to hold microphones right next to the sounds she was working with—like a glass tile that she placed, on a whim, inside a piano and then rotated, to earsplitting satisfaction—allowed her to create music exactly as she heard it.

The wish for closeness is present across Fure’s oeuvre: the desire to bring audiences close to netherworldly sounds they wouldn’t otherwise encounter, and to offer a catharsis

Found in Translation

Maureen Freely on the trials and tribulations of Turkish-to-English translation

by OSET BABÜR

TURKEY HAS SEEN no shortage of political upheaval and cultural shifts in the 70 years since Sabahattin Ali first published *Madonna in a Fur Coat*, a story of doomed love in 1930s Berlin, reflected through the protagonist’s

personal diary. An outspoken leftist who mysteriously died at the Bulgarian border while trying to flee Turkey in 1948, Ali has proved to be an enduring symbol of anti-government resistance, and after dancing in and out of Turkey’s bestseller lists over the



Maureen Freely

ANDRE AVANESSIAN

years, *Madonna* is now considered something of a cult classic. In the wake of the Gezi Park protests in 2013 and the attempted coup in 2016, international readers who've turned to Turkey's Anglophone voices to better understand the nation's current evolution have reawakened interest not only in contemporary voices like Elif Şafak, but also in authors from Turkey's past, including Ali, Sait Faik, and Ahmet Hamdi Tanpınar.

Maureen Freely '74 is widely regarded as the foremost translator of Turkish literature into English; *Madonna* is her fourteenth work. She's also written seven novels and is at work on her eighth, while serving as the president of English PEN and head of the department

Bringing a text into another language is gradual but also somewhat frenetic.

of English and comparative literature at the University of Warwick. Born in New Jersey and now based in England, she grew up in Istanbul, where her late father, physicist John Freely, taught at Robert College (now Bogazici University). In conversation, she is frank about how her position as a Westerner has influenced some readers' perceptions of her abilities: they are hesitant to believe she will overcome her cultural biases. "Inevitably, somebody bringing in the daughter of an American professor who taught Turks for 50

years can be seen as part of some imperialist project," she says. "I don't see it that way, but people have written papers about how I am an 'orientalist.' These tensions between the political and literary cultures are real."

Freely's first foray into translation, in her twenties, was with Turkish writer Sevgi Soysal's account of being a political prisoner. Directly thereafter, she began what she jokingly refers to as her many years of "apprenticeship" with Orhan Pamuk, who would win the Nobel Prize in literature in 2006. Between

Off the Shelf

Recent books with Harvard connections

Schlesinger: The Imperial Historian, by Richard Aldous (W.W. Norton, \$29.95). If current events have you yearning for administrations past, this biography of Arthur M. Schlesinger Jr. '38, JF '43—historian, faculty member, and author, in many senses, of the Camelot version of the Kennedy presidency—may fit the bill. Aldous, himself an historian at Bard, is well suited to take stock of the historian/popularizer/public figure, "always ready to write."

The Lost Founding Father: John Quincy Adams and the Transformation of American Politics, by William J. Cooper (Liveright, \$35). Looking even deeper into the country's past, to a still-earlier Harvardian president (A.B., A.M., LL.D.), Cooper, an emeritus historian at Louisiana State, exhumes a world-traveled leader who "occupies a camouflaged position in U.S. history." Adding to the Crimson resonances, the author took up work begun by his academic mentor, David Herbert Donald (later Harvard's Warren professor of American history), but left unfinished at his death.

Improbable Destinies: Fate, Chance, and the Future of Evolution, by Jonathan B. Losos (Riverhead, \$28). The Lehner professor for the study of Latin America

(and, more to the point, curator in herpetology) accessibly explains evolution as an *experimental* science, helping lay readers understand what is determined and what contingent in life's procession. (Read about his recent work on lizards' swift adaptation to climate change at harvardmag.com/anoles-17.) In **Darwin's Backyard** (W.W. Norton, \$27.95), James T. Costa, RF '05, travels back in time to the domestic experiments and puttering that underscored the development of the world-changing theories.

Gorbachev: His Life and Times, by William Taubman '62 (W.W. Norton, \$39.95). A sweeping life of the "hard to understand" leader (in his own words) who drained the Soviet swamp—and perhaps set in motion the events that led to the perils of Putin-era Russia. The author, an Amherst political scientist emeritus, won a Pulitzer Prize for his biography of Khrushchev. Nonspecialists will be grateful for the 11-page "cast of characters," like those accompanying a vast Russian novel, given the similar scope.

The Written World: The Power of Stories to Shape People, History, Civilization, by Martin Puchner, Wien professor of drama and of English and comparative literature (Random House, \$32). Drawing on his course on world lit (in the classroom and online), the two-time Norton anthology editor makes a breathtaking leap from Homer to Derek Walcott, il-

lustrating why it is impossible to imagine a world without literature.

100 Amazing Facts About the Negro, by Henry Louis Gates Jr., Fletcher University Professor (Pantheon, \$40). Riffing on the 1957 *100 Amazing Facts About the Negro with Complete Proof* by the Pittsburgh Courier's Joel A. Rogers, and columns from *The Root*, Gates explores Malcolm X at Oxford, the emperor of Mali, Homer Plessy of the eponymous litigation, and more.

A Century of Wealth in America, by Edward N. Wolff '68 (Belknap/Harvard, \$39.95). A New York University economist provides a definitive examination of the "remarkable growth in household wealth" during the twentieth century, and the equally remarkable "sharp increase in wealth inequality" during the past four decades—along with the status of those who did not benefit from that great skewing. Scholarly, but with wide application to public discourse.

Saamaka Dreaming, by Richard Price '63, P.D. '70, and Sally Price '65 (Duke, \$26.95 paper). How can you not like people who begin a memoir about doing anthropology in Suriname this way: "Despite physical discomforts, periods of boredom, ailments ranging from funguses...to hepatitis, and periodic ridicule for being culturally clueless, we have always loved ethnographic fieldwork." A charming guide to a lost world.

Straight Talk on Trade: Ideas for a Sane World Economy, by Dani Rodrik,

2004 and 2009, she translated five of Pamuk's best-selling novels, starting with *Snow* and ending with *The Museum of Innocence*.

By her account, the process of bringing a text into another language is gradual but also somewhat frenetic. She and Pamuk have spent entire summers passing drafts back and forth at his home in Heybeliada, a beautiful island near Istanbul. Individual words are treated as puzzles, with author and translator challenging one another to pinpoint translations that best preserve a work's integrity. In particularly contentious cases, they move on, tabling the puzzle for another day. English chapters slowly sprout from tribulations and arguments.

It is of the utmost importance that the

translator preserve the author's voice and original vision, Freely says. The translated text should reflect the writer's strengths. Two of Pamuk's are his ability to mimic voices and set what Freely calls "a strong narrative trance": "He really knows how to tell a good story that just sucks you right in from the start." Translation also means paying special attention to a writer's idiosyncrasies. Pamuk has strong feelings about never beginning a sentence with the Turkish word "Ve," which translates to "And." Freely is also mindful of his disregard for grammatical conventions, and his love of sentences that seem to go on and on, ending in unexpected ways that may require readers to double back to make sure they understand what's going on. "I still see

those in my dreams," she says, laughing.

Walking the fine line between accessibility and verisimilitude is a continuing challenge in translation, especially with older texts like *Madonna*. When the author has died, many decisions about how much to "domesticate" a text fall to the translator—and during the editorial process, copyeditors sometimes introduce errors. Freely had a particularly frustrating experience while translating Pamuk's *Snow*: a copyeditor, worried that readers would confuse *şerbet* (a drink of flower petals and fruits, especially popular with Ottoman sultans) with *sorbet* and thus miss a key plot point, changed *şerbet* to *sahlep* (a warm milk beverage). "There is a view at many publishing houses that American readers should never

Ford Foundation professor of international political economy (Princeton, \$29.95). An assessment of globalization, by a critic, in light of resurgent populist and nationalist economic policymaking. The author aims for a middle course: a global political economy buffered by nationalist characteristics, if you will.

An American Family: A Memoir of Hope and Sacrifice, by Khizr Khan, LL.M. '86 (Random House, \$27). The Gold Star parent, an immigrant from Pakistan, did more than any other speaker at the 2016 conventions to illustrate the stakes—for individuals and the larger society—in then-candidate Donald Trump's antipathy to migrants and open borders; here, he amplifies the narrative. In **The Other Side of Assimilation: How Immigrants Are Changing American Life** (University of California, \$29.95 paper), Tomás R. Jiménez, Ph.D. '05, a sociologist at Stanford, takes a scholarly, but warm and accessible, look at how newcomers change those in whose midst they arrive, as America is "remade through a bumpy process."

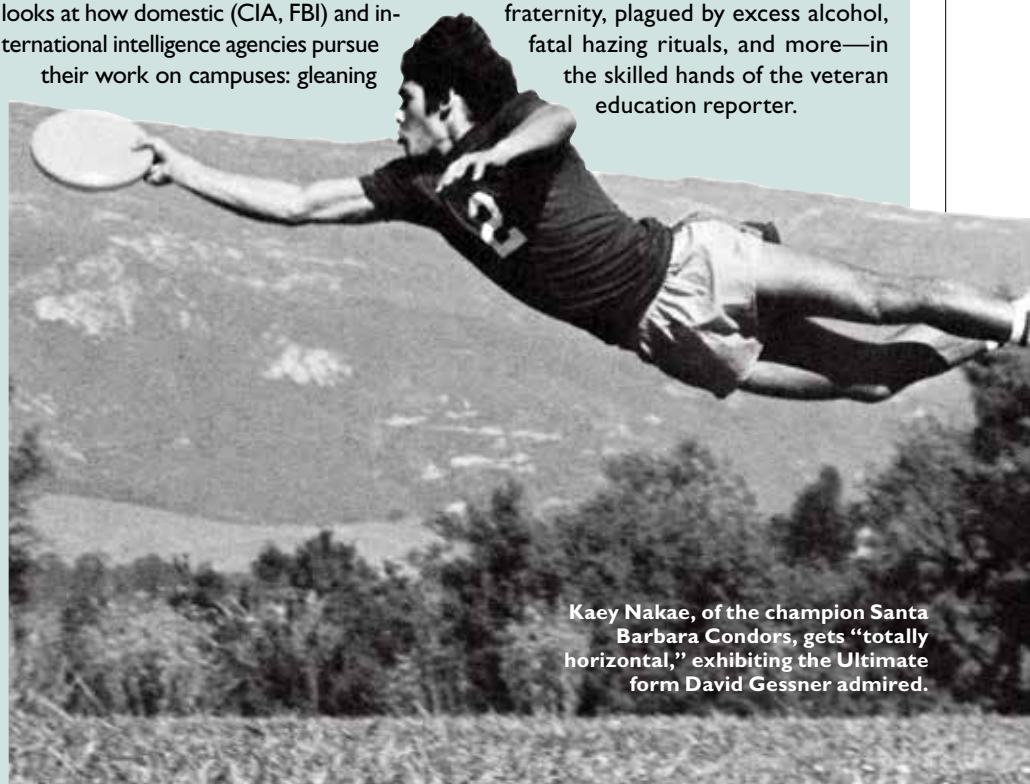
Greater than Ever: New York's Big Comeback, by Daniel L. Doctoroff '80 (PublicAffairs, \$28). The Big Apple's post-9/11 economic recovery, as recounted by the then-deputy mayor. As the national discourse turns slightly less kindly toward cities—and in the wake of calamities like those that recently befell Houston—an optimistic urbanist voice is especially welcome and timely.

Ultimate Glory: Frisbee, Obsession, and My Wild Youth, by David Gessner '83 (Riverhead, \$16 paper). The title and subtitle accurately capture a loving recollection of youth, doubled: the author when young, wholly given over to a sport then in its infancy.

Spy Schools, by Daniel Golden '78 (Henry Holt, \$30). Golden, whose journalism has probed both admissions to elite colleges and the shortcomings of for-profit schools, now looks at how domestic (CIA, FBI) and international intelligence agencies pursue their work on campuses: gleaning

pertinent research findings, developing sources (and potential talent) from among faculty members and students, and more.

True Gentlemen: The Broken Pledge of America's Fraternities, by John Hechinger (PublicAffairs, \$28). At a time of seemingly unending debate at Harvard about whether to sanction final clubs, fraternities, and sororities and the students who join them, it may be sobering to take a deep dive into the real deal—a national fraternity, plagued by excess alcohol, fatal hazing rituals, and more—in the skilled hands of the veteran education reporter.



Kaey Nakae, of the champion Santa Barbara Condors, gets "totally horizontal," exhibiting the *Ultimate* form David Gessner admired.

be rattled,” Freely says. “There’s a tendency to think that you have to travel very close to the American reader’s known world.”

When discussing the back-and-forth that creates a strong translation, the aspect Freely returns to most often is her desire

to convey Turkish words and idioms that don’t have direct English analogues. In *Madonna*, for example, the protagonist introduces his wife as his “life companion” (*can yoldaşım*). The phrase sounds quite banal in English, but in Turkish, it is a powerful ex-

pression of the longevity of love. “If I’m trying to bring a beautiful Turkish book into English, I want them to hear the cadences of Turkish thought,” she says. “Not just the music of the language, but the music of the way of thinking.”

“Kingmaker” to Gatekeeper

Stephanie Burt’s new role in the poetry world

by TARA WANDA MERRIGAN

PROFESSOR OF ENGLISH Stephanie Burt ’94 is the kind of poetry critic who provokes anger in other poetry critics. Called a “kingmaker” by *The New York Times Magazine* in 2012, Burt writes often for the *Times*, but also for *The London Review of Books* and *The Times Literary Supplement*. She’s the kind of poetry critic who shapes how readers think of the literary climate, through projects like *The Poem Is You*, her anthology of 60 worthwhile works of contemporary poetry, and through several books of literary scholarship and her own volumes of verse (the most recent, *Advice from the Lights*, was released this October).

Success alone can stoke negative sentiments in competitors, but Burt’s particular critical persona—gracious and enthusiastic, verging on hyperbolic—has made her a target. “Gleeful and gorgeous,” Burt wrote of Angie Estes’s collection in 2009; “Few writers have shown at once the vividness and the evasions of memory so well,” Burt characterized Killarney Clary. In 2013 (before Burt began exclusively using female pronouns), a *New Republic* critic complained that Burt “strains enough superlatives to make his praise seem cheap.” The piece claimed that Burt spent too much time explaining how a poem worked, rather than deciding whether or not a poem was worth reading, and let the audience down by refusing to sort the great from the good from the bad. Burt responded in the online arts review *Partisan* that as a poetry critic, she was more concerned with looking for originality than defining works as major or minor. “If I look only for greatness,” Burt wrote, “for what’s likely to ‘change the conversation’ or last a hundred years or demonstrate mastery or advance the whole art, I’m going to miss a lot of what’s

pleasing, enlightening, beautiful, now.”

The question of what is “worth” reading can be incredibly fraught, and Burt is keenly aware of how her personal biases may color her evaluations. This summer, she was named co-poetry editor of *The Nation* (along with Carmen Giménez Smith), a weekly with a longstanding reputation for being a sort of intellectual standard-bearer for the American left. When asked in August about how she would approach her new position, she launched into an explanation about how the poetry ecosystem has become more demographically diverse in recent decades, and rattled off a list of her own identities: transgender, Harvard-educated, Jewish, white. These social markers, she said, will affect her taste when choosing poems for the magazine. Burt later explained by email, “If I read and love a poem about trans lady identity and fighting transmisogyny, or about raising a toddler, or about watching Maya Moore shoot three-pointers, or about the Dark Phoenix saga, or about reading Gerard Manley Hopkins, I can’t be entirely sure whether it’s a great poem, or just an OK poem that I like because I’m drawn to the subject.”

Nonetheless, she thinks that disentangling the influence of her own personal tastes from her judgment of a poem’s worth and value

is vital, especially given recent changes in American poetry. “To do a good job of understanding where American poetry is in general,” she said, “and choose poems that I want to recommend to strangers, I get to—and have to—think about the experience of people of color more than I thought I would have to when I got into this line of work.”

As poetry editor, Burt will act as an advocate not only for diverse poetry but also for the magazine’s readers. “We expect to receive (and therefore, probably, to publish) some poems in harmony with the progressive mission in the front of the magazine, because in a giant universe of poets who could send their work anywhere, poets who think about social justice a lot are incrementally more likely than others to send their work to *The Nation*, Burt wrote. “But I hope we won’t condescend or get predictable.”

This mindfulness is a skill she first developed while an undergraduate—but not while



Stephanie Burt

writing art reviews for *The Harvard Crimson* or discussing poetry at *The Harvard Advocate*, as one might suspect. The student paper taught her how to write on deadline, and the literary magazine provided her with a community, “but the thing that has most influenced my gatekeepership—where I learned to sort and select—was doing the radio show *Record Hospital*” on WHRB, then housed in the basement of Memorial Hall. “To do a good audio show, you have to keep the audience in mind. If you are doing a college radio show where you pick the records and you want to do it well, you have to think about what’s a discovery for you, what’s a discovery for your listeners, what your listeners expect, what will make them tune out, what will make them call you, what will make them say ‘Wow! What was that? That’s amazing,’ what will make them say, ‘That’s my favorite song and I haven’t heard it in five years.’”

Nonetheless, Burt felt ready to take on these responsibilities again in her new position. “It’s a kind of power that I am okay with having and would like to wield responsibly and also collaboratively,” she says. “It feels good.”

Believe It or Not!

In Bunk, Kevin Young showcases America’s history of hoaxes.

by NIELA ORR

FOR ME, it’s not the commemorative McDonald’s commercials, nor the reverent social-media hashtags, nor simply the calendar that signals Black History Month: it’s February when the Sophia Stewart *Matrix* Hoax recirculates around the Web. The legend goes that Stewart, who’s black, pitched a short story to the Wachowskis back in 1986, which they plagiarized and turned into the *Matrix* franchise and, inexplicably, *The Terminator* saga. Supposedly Stewart sued them and Warner Bros. for copyright infringement and won a multibillion-dollar judgment. That this story has been debunked on Snopes.com and elsewhere does not keep it from finding an audience. Although the misinformation allegedly began in 2004, with an article published in a Salt Lake City student newspaper, the

Stewart hoax persists more than a decade later because some of us want to believe it.

Kevin Young’s new book, *Bunk: The Rise of Hoaxes, Humbug, Plagiarists, Phonies, Post-Facts, and Fake News*, is as exhaustive as its subtitle: part survey of modern imposture, part detective story about the origins of American fakery. Though he detours in Europe, profiling art forgers like Han Van Meegeren and a

few other non-American figures, the focus is mostly on the history of artifice in this country. It’s an important book for 2017, not only because “fake news” is a part of the zeitgeist, but because public discourse about white supremacy and political hucksterism suffers

Bunk: The Rise of Hoaxes, Humbug, Plagiarists, Phonies, Post-Facts, and Fake News, by Kevin Young ’92 (Graywolf Press, \$30.)

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from citizens' short memory. With *Bunk*, Young '92 brings this collective amnesia into relief. P.T. Barnum, JT LeRoy, Rachel Dolezal, Donald Trump, and many other figures are all subject to his analysis.

The revelation of this information is mixed with the disappointment of not having access to such a compendium before now. The natural thought is: we needed this book years ago, before the 2016 election. But as *Bunk* makes clear, trickery has been an inextricable part of American culture since the mid-nineteenth century, if not earlier—and moreover, it's inextricable from the social construct of race. The very term bunkum comes from a Buncombe County, North Carolina, congressman's filibuster on the Missouri Compromise. The confluence of artificial lingo, race, and politics, then and now, is enough to make one feel stuck in a time loop. The big American hoax, like *The Terminator*, seems to say, "I'll be back."

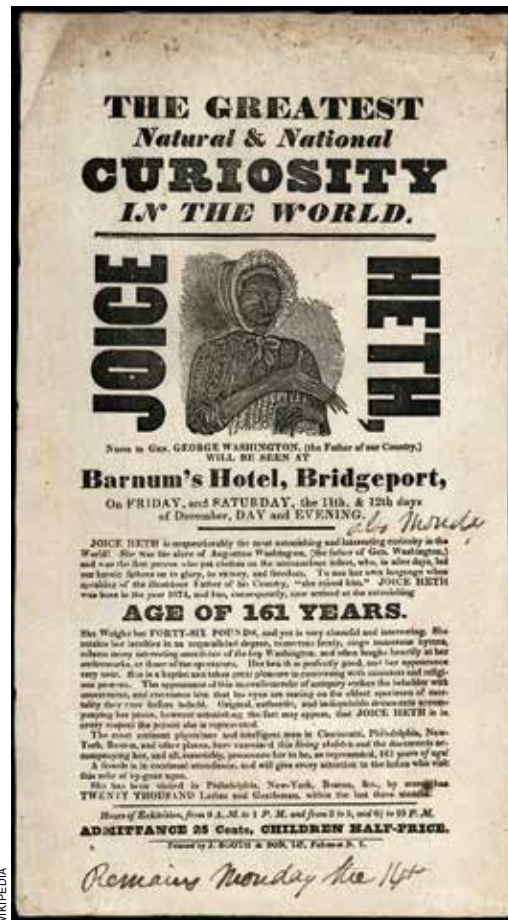
Bunk's intricacy extends to its author's method of organizing his subjects, which does not follow strict chronological order. He makes ties between seemingly disparate episodes, confidently suturing the U.S. cycling scandal to Edgar Allan Poe, and the writer's lesser-known past as a plagiarizer. The zigzagging structure can feel disorienting at times, but these pivots feel purposefully zany: they show how wild yet interconnected such events are. In an early chapter, Young reviews Richard Adams Locke's Great



Among the nineteenth-century frauds Kevin Young explores are the pseudo-scientific Great Moon Hoax and P.T. Barnum's display of "George Washington's nurse," in reality a slave named Joice Heth.

Moon Hoax, accounts of supposed lunar life published circa 1835 in *The Sun*, a paper that Locke also edited—getting to Stephen Glass, Jayson Blair, and other scandals that have plagued American journalism only some 300 pages later. Were these discussions silenced off into neat chapters, it might be easy to ascribe a strictly professional reason for why, say, mid-aughts memoirists were able to deceive editors and audiences so easily. But the method of distribution—print newspaper, Internet, memoir, porn—matters little in the history of the hoax. Young makes clear that our willingness to believe means the con begins in our own heads.

Bunk is filled with the sort of turns found in magic shows: the unexpected (though easily substantiated) connection is Young's great trick. He shows us the history—now you see it—which we collectively forget—now you don't. The nation's quiet, furtive



obsession with the conman, "a covert cultural hero," reflects what he calls one of the foundational "discrepancies between our ideals and our conduct": "Nowhere did nineteenth century America's hypocrisy show itself, and hide itself, more completely than in chattel slavery," he writes. "In a young country dedicated to liberty, here was a 'peculiar institution' that the Constitution could not speak of clearly, but euphemized instead." That tendency toward habitual self-deception was foundational to American pop culture. One of *Bunk's* inciting incidents is Barnum's sideshow, which Young suggests began pop culture in the United States, together with the minstrel show. Its most prominent act involved Joice Heth, a black woman Barnum passed off as the 161-year-old former nursemaid of George Washington, who in actuality was an enslaved woman he'd purchased. Young applies the hoax concept to other incidents of American trickery in the centuries since. The Heth act was easily identifiable as untrue by most 1835 audiences, and stereotypes related to race, gender, and sexuality can be received in much

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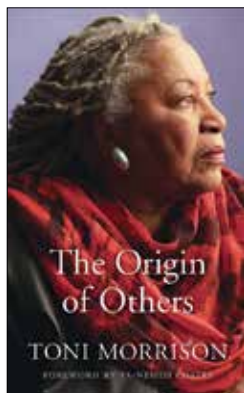
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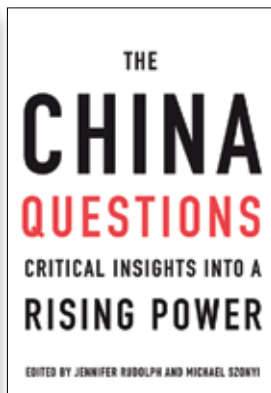


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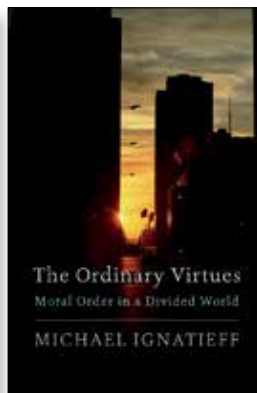
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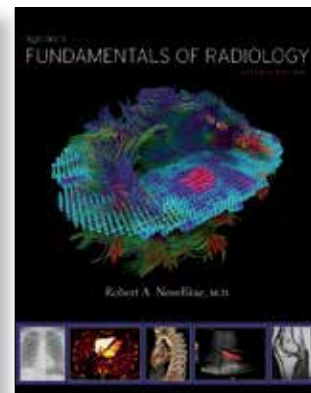
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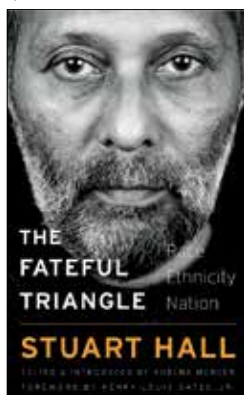
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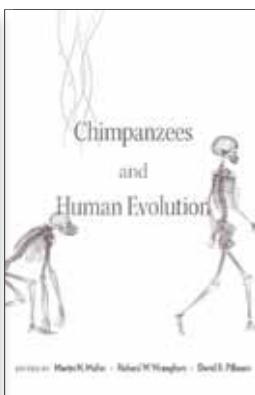
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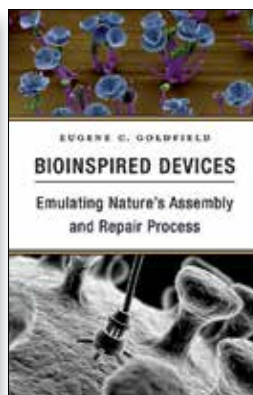
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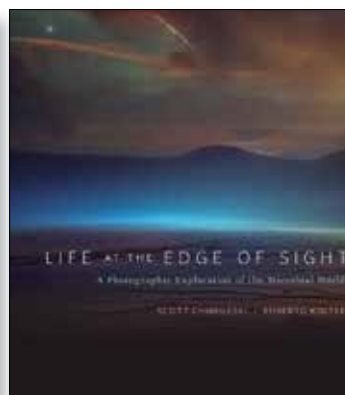
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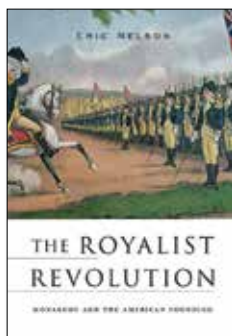


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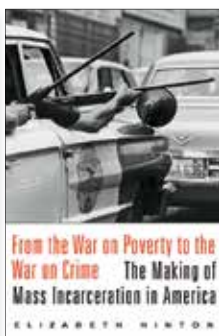


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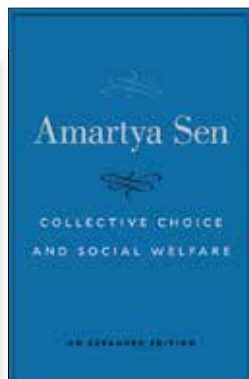
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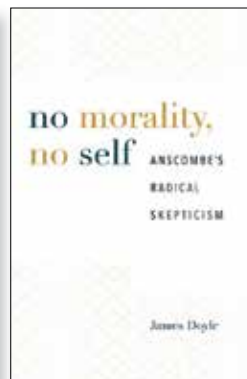
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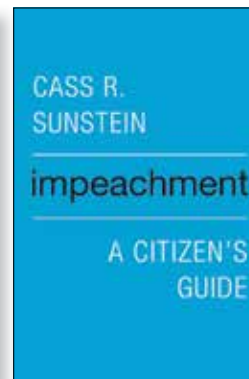
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the same way: something collectively understood as false but maintained anyway.

Young is poetry editor at *The New Yorker* and director of the Schomburg Center for Research in Black Culture, and his body of work, both as a poet and a scholar of black history, make him well-suited to engage this material. In the same way that Suzan-Lori Parks uses drama as an apt scalpel for history, Young uses creative nonfiction, often employing the same elegant puns and pivots that appear in his verse. Where Parks in her play *Topdog/Underdog* used three-card monte and the arcade as symbolic showcases for American violence and its bloody repetition, Young demonstrates in *Bunk* how the “con” works in more abstract ways. In the early twentieth century, the so-called long-con went from being perpetrated nomadically to taking place in a “store,” a semi-permanent set of displays meant to resemble a real shop that targets could visit repeatedly. His use of the conman’s “store” as a metaphor for America’s repository of dubious racial ideas and gender stereotypes is particularly insightful. Along with his winking approach to the material, his bemused attitude helps to detract from the horror, offering a model for processing current national affairs. *Bunk* suggests that one has to smirk at this stuff once in awhile, to avoid getting too freaked out.

Young’s compendium does have a noticeable gap. What about the counter-cons enacted by non-white people? What of passing for white, or the Internet folk who pass

Tobe Kemp asks if anyone can identify sources for two compliments occasionally used by relatives hailing from East Texas: “upstanding and downsitting” and “ambidextrous as well as bifocal.”

Eve Golden is seeking a source for the phrase about an individual who “shall remain nameless, but his initials are Johann Sebastian Bach [or whoever]”—an ex-

pression “in wide circulation in many slight variants, but likely encountered in an old movie, one of the romantic/screwball comedies of the 1930s or ’40s. It’s driving me nuts. Any help?”

Send inquiries and answers to “Chapter and Verse,” *Harvard Magazine*, 7 Ware Street, Cambridge 02138 or via email to chapterandverse@harvardmag.com.

along Sophia Stewart out of an impulse to redress historical theft? For that, readers might turn to Young’s *The Grey Album: On the Blackness of Blackness* (2011), where he writes about a tradition that he calls “storying,” a “counterfeit tradition” that he frames “not as mere distraction from oppression but as a derailing of it.” Although there is a mention of how the pioneering black nineteenth-century novelist Harriet Wilson utilized phony Spiritualism to subversive effect, *Bunk* offers no real contemporary examples of that kind of counter-ingenuity.

Yet this is a small gripe. *Bunk* is a consistently incisive look at the nature of American imposture and epistemology itself: How do we know what we know, how do we learn? How do we undo what we learn, and how do we avoid making the same mistakes? As of

this writing, there’s a controversy regarding the PEN Awards and a writer, John Smelcer, pretending to be Native American. Joanne the Scammer is a cult hero, *Catfish* a hit TV show. As Young writes in the book’s epilogue, “This is the world we’ve made; one that we can only hope from here on out is not entirely made up.”

Niela Orr is a columnist for *The Baffler* and a contributing editor of *The Organist* podcast. Her work has also appeared in *The New York Times Book Review*, *Elle*, *McSweeney’s*, *The Believer*, and *BuzzFeed*.

Kevin Young was first interviewed in this magazine after the release of his verse collection *For the Confederate Dead* (“Rhythms of Race,” September-October 2007); he is also a member of the Dark Room Collective (profiled in “Elbow Room,” March-April 2016).

ALUMNI

This Land Was Made For...

A Utah activist reflects on 40 years of land conservation—and what’s coming next.

by NELL PORTER BROWN

A WEEK after defending his biology dissertation, Bill Hedden ’73, Ph.D. ’76, and his wife, Eleanor Bliss ’73, packed their stuff into a pickup truck and drove west. They settled in southeastern Utah, near the city of Moab, on nine acres of unspoiled valley

land framed by coral sandstone cliffs, snow-topped mountains, and the Colorado River.

With no power or water well, they camped out for two years—cooking on an open fire, bathing under a waterfall. When they needed money, he worked as a river guide, a carpenter, or on a construction

crew for local mining company Atlas Uranium. “We slept in the back of our truck and watched the sky,” Hedden says. “When you do that for awhile, you realize the universe spins around you all the time.”

The New Jersey boy was in love with the American West. He’d never experi-

enced wide-open, wild country, or been so attuned to the sun, rain, and clouds, in a place where it seemed he could walk forever and not see a person.

It helped that Bliss, from Salt Lake City, knew her way around red rock and rattlesnakes. They had \$5,000 in savings to slowly build a homestead, and for emergencies. But even without that, says Hedden, who is now the executive director of the Grand Canyon Trust, nothing, not even a promising career in neurobiology, would have stopped him from at least trying to build a life among boundless beauty. “The canyons stunned me,” he said in a speech last year at the University of Colorado Law School’s Getches-Wilkinson Center for Natural Resources, Energy, and the Environment. “If my life of activism has amounted to anything, it was all nascent in those first days of awe and delight.”

Within two years Hedden was more than reveling in this “desert idyll”; he began protecting it. Prompted by the Arab oil embargo and the energy crisis, the U.S. Department of Energy (DOE) was looking to build a nuclear waste dump. Moab, a uranium hub since the 1950s, was home to generations of mining and ranching families used to industrial jobs and detritus, and southeastern Utah officials were in favor of the project. Hedden was not.

For one, it would have sacrificed Canyonlands National Park: nearly 336,000 acres where the Green and Colorado Rivers meet in primitive high desert filled with sandstone canyons, buttes, mesas—unique rock formations millions of years in the making. “They would have had a train running through Moab and some of the country’s most extraordinary and historic landscapes, carrying nuclear waste from all over the United States,” he says. He wrote an op-ed for the local newspaper, went to a few meetings, and then the governor appointed him to a task force on the issue, where Hedden became the leading voice of opposition.

The waste repository search dragged on until 1984, when the DOE named 10 sites for further study, none of them in Utah. (Congress ultimately chose Yucca Mountain, in Nevada; nothing’s been built yet.) Hedden kept up with land-use issues across the West,



but was absorbed with family life—he and Bliss had built a small house on their land in Castle Valley, had daughters in 1979 and 1982, and kept a garden and fruit trees, which produced much of their food. “We were lucky if we had \$1,000 in the bank, but it was really a rich time for us,” he says, “rich in time.” He’d also started making furniture, eventually selling pieces at a fashionable Santa Fe gallery.

They were among a small but noticed influx of newcomers living largely off the land around Moab. The local culture was relatively conservative, and the Sagebrush Rebellion, which has never really died away in Utah, was actively promoting local control over public lands. “Tensions were in the air,” Hedden says. Grand County sheriff’s deputies often came to the valley, suspicious of what else was being cultivated in those vegetable plots. “And they were right,” he says, laughing now. “I think it’s OK to say that—the statute of limitations must be up. Oh, I don’t care!”

The true threat, however, was the death of the region’s economic engine, in 1984. “Everyone voted for Ronald Reagan here in Utah, and then when he did what he said he was going to do—pull the energy subsidies—the uranium industry was over, and within days Moab had lost 35 percent of its employment and went into a pretty long and desperate economic slump in the middle of the 1980s,” Hedden recalls. Then it began to catch on as a mountain-biking mecca.

Hedden in the northern section of Utah’s Bears Ears National Monument. Behind him are the Six Shooter Peaks, where, he says, “the U.S. Department of Energy wanted to build a nuclear waste plant.”

That “turned Moab’s trickle of tourists into a torrent,” according to a 1996 *Christian Science Monitor* article, and helped trigger a larger demographic shift that’s still transforming the region’s economy and politics: “In what some see as the emergence of the ‘New West,’ there’s a growing movement here to forge a consensus around preserving the natural environment.” Some did foresee (and fear) what Moab would become today—a booming commercial gateway for outdoor recreation that includes thousands of world-class rock-climbing routes. The city of 5,200 residents bloats to between 15,000 to 30,000 people on weekends, and reaps a fair share of the state’s \$8.4-billion tourist industry. Arches National Park alone, a 10-minute drive from downtown, reported 211,706 “recreation visits” in June, up nearly five-fold from the same period in 1979. Construction of hotels, restaurants, outdoor-service companies, and second homes has basically kept pace.

Back in the early 1990s, at the start of this transition, Hedden mostly stayed out of the political fray, but admits he was always appalled by what he heard: debates over grazing “rights” (“Grazing on public land is a privi-



TIM PETERSON

Hedden doing what he loves on Warner Lake in Manti-La Sal National Forest, not that far from his backyard

lege, not a right," he notes, and cows wreak havoc on fragile, arid land); the sacrosanct "right" most Utahans seemed to voice about being able to do "whatever they wanted, wherever they wanted"; the simplistic blaming of the federal government for the mining-

industry collapse.

But then, he says, one controversial "boondoggle" known as the Book Cliffs Highway became a crisis. The 43-mile truck route was to run "through the largest unprotected roadless area in the Lower 48," Hedden says, from the hydrocarbon fields in the Uinta Basin through wilderness to Interstate 70, and connect to trans-

continental rail lines. Amid public outcry, the Grand County government—a three-man "old boy" commission that he says had long run the show—was replaced by a seven-seat council. Asked by fellow county residents to run for a spot, Hedden did, and won it in early 1993, beating out a dozen others on a "nonideological" platform that emphasized practical concerns. The Book Cliffs Highway was defeated, although just last year a coalition of county officials put it

back on the table—evidence to Hedden "that no truly terrible idea ever goes away."

As a new councilman, he focused on shifting precious mineral-lease monies and revenues from royalties on federal lands away from supporting the highway and toward keeping the local hospital afloat, upgrading telecommunications infrastructure, and improving the school system.

It was a wild time. Every meeting of the new council "was standing-room only and filled with angry people. The Sagebrush Rebellion [proponents] were sure," he says, that "a bunch of crazy environmentalists were taking over, that we would re-introduce wolves onto public lands"—but really those first two years in office were consumed with "dealing with financial mismanagement that had left us with a county budget a half a million dollars in the red." At the next election, the galvanized traditional forces won back some seats, so the body, he says, was ideologically split between progressives and mining and rancher-minded councilors, and one person who was "just a nice guy."

Hedden quickly saw that this group of relative amateurs—he includes himself de-

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spite his scientific training—was routinely charged with making hugely consequential decisions about public-land use and influencing federal policy. The “nice guy” cast the deciding vote to open part of Moab’s watershed, the Mill Creek Canyon, to development, Hedden says, yet after the meeting asked if the land in question was “up behind the old drive-in movie theater?” It’s far from the only example of locals “not knowing best” that Hedden can reel off after four decades of conservation work.

Hedden does understand scientific data and debates over balancing uses of terrain, especially over the long haul. He went to Harvard wanting to be a marine biologist, then shifted focus as a student of Gund research professor of neurosciences John E. Dowling. But, he says, “At that point all the experiments were mortal and I just decided I couldn’t kill animals anymore.” He’d already taken a few trips out west with Bliss, and decided he’d “go out there and do something else. I figured if that didn’t work out, I could go back to science.”

THREE YEARS into his new political life, Hedden was hired by the Grand Canyon Trust (GCT) as the Utah conservation director, which meant expanding his activism and no longer relying on woodworking to support his family. Then he took the helm in 2002.

The environmental-advocacy organization was founded by a group that included then-Arizona governor Bruce Babbitt, LL.B. ’65, in

1985. It seeks to safeguard the greater Grand Canyon region from destructive mining and other development, and is currently involved in the six-year battle against the proposed Grand Canyon Escalade resort and gondola (meant to take up to 10,000 visitors from the East Rim to the canyon floor each day), in support of the Native American campaign against the project, Save the Confluence. (The project is up for a vote by the Navajo Nation Council in October). GCT also joins in the long-running fight that includes Native Americans, against a massive commercial complex on the South Rim—hotels, homes, shops, restaurants—proposed by the Italian-owned Stilo Development Group USA. That would require drilling into the aquifer that supplies seeps, springs, and streams in the Grand Canyon. “They would dry up the things that support wildlife and even make it impossible for people to hike there,” Hedden says. “Water is already such a precious resource.”

GCT encompasses the entire Colorado Plateau. Its roughly 130,000 square miles sprawl across the Four Corners region and include the Colorado River and its tributaries (on which 40 million people depend for water); 55 national parks, monuments, and wilderness areas; and the territory of the Navajo Nation, which covers the lower third of the plateau, south of Moab. Proj-

ects are based primarily in northern Arizona and southern Utah. GCT was instrumental in obtaining protection for Bears Ears, a 1.35-million-acre tract located north of the Navajo Nation, designated a National



Arches National Park, near Moab, Utah

Monument by the Obama administration. Named for two 8,700-foot buttes and, Hedden notes, among the richest archaeological districts in the country, Bears Ears is considered sacred ancestral homelands by many of the area’s Native American tribes. GCT is now in full-on defense mode because Bears Ears and Grand Staircase-Escalante National Monument (also within the plateau) are under threat from U.S. Secretary of the Interior Ryan Zinke. At press time, a



COURTESY OF THE HARVARD ALUMNI ASSOCIATION

Aloian Scholars

The Harvard Alumni Association (HAA) has named Aldís Elfarsdóttir ’18, of Eliot House, and Hannah Smati ’18, of Adams House, the 2017 David and Mimi Aloian Memorial Scholars for enriching communal life of the Houses.

As the Resource Efficiency Program (REP) undergraduate representative for her House and a former member of the University’s Climate Change Task Force, Elfarsdóttir, of Belmont, Massachusetts, is committed to sustainability issues. She has created programming for compostables and zero waste at House events. Her project, “Networked Energy-saving Temperature Sensors (NETS),” investigated Eliot’s winter heating system and produced a data-driven model to improve thermal comfort and building-energy maintenance.

Smati, of Houston, is co-chair of the House Committee and has helped the governing body become more inclusive and dynamic. She developed the Student Photography Initiative, and formed a system of liaisons with the tutors for each House team (race relations, LGBTQ, music, wellness, etc.) to encourage open discussions. Smati is also co-president of the Harvard Undergraduate Global Health Forum, a peer counselor for Room 13, and was director of operations for the 2016 Harvard Arab Weekend.



STEVE GREENWOOD/ALAMY STOCK PHOTO

A glimpse of the Bears Ears National Monument, which is under threat of shrinkage by the Trump administration

leaked copy of Zinke's memo showed radical shrinkage recommended for both those monuments, as well as others, along with changes to the land management plans in many places to allow, Hedden says, for "traditional uses. Meaning: oil and gas and mining. In essence, it's an attempt administratively to make the American Antiquities Act of 1906 meaningless." GCT and many other groups, including the tribes who worked

for the designation of Bears Ears, he adds, are "ready to sue as soon as the president does something like that that is beyond his authority."

During his tenure, Hedden has established new and stronger relationships with tribal communities and developed a program that fosters inter-tribal collaboration and sustainable economic development. He has also doubled GCT's budget to \$4 million, (mostly from major

donors and foundations, but helped by dues from 3,500 members) and has bolstered an already powerful board of trustees. That includes Native American Rights Fund executive director John E. Echohawk and University of Arizona law school professor Rebecca Tsosie, an expert on indigenous peoples' law, along with Hansjörg Wyss, M.B.A. '65, a funder of bioengineering at Harvard, and Texas billionaire David Bonderman, LL.B. '66, founding partner of TPG Capital. Hedden also recruited his College roommate, Wash-

ington, D.C., attorney Ty Cobb '72, who as a young lawyer took on, pro bono, and won a challenge on behalf of GCT and others to the harmful fluctuating water flows of the Glen Canyon Dam. (In July Cobb resigned from the GCT board, which he'd chaired for four years, to join the Trump administration.)

The organization operates within a web of richly vested interests vying for land and resources, Hedden notes, even as the "industrial-strength tourist industry" and climate change are irrevocably altering the landscape.

The Moab area is overridden with car traffic and people, including local residents, he says, who "tear up and down the high desert hills and canyons in off-road vehicles, or mountain bike all over, zoom around on the river in motorboats and jet skis." Surrounding towns don't want to become another Moab, he says, yet when he asks, "Is there one activity you are willing to forbid, so that won't happen?" they look at me blankly. They don't even comprehend what I'm asking them. They're like, 'Hey, this is a free country, people can do what they want.' And I say, 'Yes, that's what's happening in Moab.'"

Even the animals can't find refuge. "Hunters are going into the back country with four-wheelers and shooting" deer, he says. "There's

Hiram S. Hunn Awards for Alumni

In October, seven alumni received Hiram S. Hunn Memorial Schools and Scholarships Awards from the College's Office of Admissions and Financial Aid for their volunteer efforts to recruit and interview prospective undergraduates.

Peter J. Bernbaum '71, of Rye Brook, New York, has been interviewing candidates since 1975, mainly with the Harvard-Radcliffe Club of Westchester's schools and scholarships committee.

Lindsay Brew '66, of Tucson, has been an alumni interviewer for more than three decades, including as president of the Harvard Club of Southern Arizona (from 1993 to 2000), and has chaired the club's schools and scholarships committee since 1994.

John Daley '61, of Needham, Massachusetts, and his wife, Marion, devoted more than 30 years to the Harvard College Host Family Freshman Program, and he has interviewed applicants for more than 20 years.

Joel Z. Eigerman '63, of Cambridge, recently retired after more than

20 years as chair of the Cambridge schools and scholarships committee, and has met with prospective students for more than three decades.

Diane Feldman '80, of Highland Park, New Jersey, has interviewed students from her home state since 1981.

Tom J. Karr '84, of Washington, D.C., co-chaired the District's College admissions interviewing group from 2003 to 2007, and then became co-chair of the Harvard Club of Washington D.C.'s metropolitan-area school and scholarships committee until 2013.

Hannah J. Jackson '76, moved to Los Angeles in 1991 and joined the Harvard Club of Southern California and its schools and scholarships committee; ultimately she became chair of the group that covers the western section of Los Angeles.



Peter J. Bernbaum



Lindsay Brew



John Daley



Joel Z. Eigerman



Diane Feldman



Tom J. Karr



Hannah J. Jackson

no 'back of beyond' anymore because we have so many ways of getting there."

Climate-change forecasts tell other grim stories. Bigger, more severe fires across the Southwest will eradicate forests and other habitats, and "if something grows back, it will be from the south, a different eco-region—you burn off the spruce and fir mountain forest and you will get scrub oak or lodge pine, and that changes everything," he says. Species cannot adjust fast enough, and will be "out of luck."

When native grasses are gone amid much hotter weather within the next 20 to 30 years, he says, "ranchers are going to get hammered because no one will want to buy their grazing permits. By pretending they are protecting them, the Congress is instead setting them up for a big fall."

In the past, the GCT and willing ranchers negotiated market-rate prices for their permits and those lands were closed to cattle, but that ended during the first Bush administration, Hedden says, under pressure from the grazing associations.

Along with disappearing habitats—for animals *and* humans—there will be "a monumental dearth of water. Even now, rain is erratic," Hedden warns: the 1922 Colorado River Compact, in which seven basin states agreed to jointly allocate that water supply, overestimated available volumes, and "when the agreement falls apart, it will be the mother lawsuit to end all lawsuits. An interesting mess."

In January, Hedden begins turning over the executive director role to a longtime colleague, in order to return to working on specific GCT projects—and try to finish a book he's writing about fishing, something he finds restorative, especially during the summer weeks spent alone in the Canadian wilderness "to gain some perspective."

At home, in Castle Valley, he and Bliss still live where they settled in 1976. Their children are grown. The fruit trees they planted have become orchards, and the Fremont cottonwoods now stand 10 feet in diameter. The range of 2,000-foot-high Wingate sandstone cliffs still runs across horizon, and to the south and east the craggy La Sal Mountains still loom like a surreal postcard.

Standing outside his house, or hiking in Bears Ears, Grand Staircase-Escalante, or the back reaches of Arches National Park, Hedden feels "an access to some higher dimension of the spirit," he says, "It's so old and quiet. But you have to slow down and just be

here." Southern Utah holds only a fraction of "our 640-million-acre common inheritance": the public lands spread across a third of the continental United States. Most of it is astoundingly beautiful, and deeply connected to

Awards for Exceptional Service

SIX ALUMNI were recognized with HAA Awards for outstanding service to the University during the HAA board of directors' fall meeting.



Leila T. Fawaz

Lelia T. Fawaz, Ph.D. '79, of Cambridge, was a member of the Board of Overseers from 2006 to 2012, where she served on its executive committee, chaired the social-sciences committee, and was elected president for the 2011-2012 term. Appointed an Overseer member of the HAA board of directors' committee to nominate Overseers and elected directors from 2009 to 2016, she ultimately served as committee chair. In 2014, Fawaz received the Harvard Arab Alumni Association's Lifetime Achievement Award.

Catherine A. "Kate" Gellert '93, of New York City, has co-chaired the Harvard and Radcliffe College Class of 1993 reunion-campaign committees since her fifth reunion, led the Harvard College Fund as co-chair from 2006 to 2009, and was president of the HAA for the 2013-2014 term. A current member of the Dean's Advisory Council at the Radcliffe Institute, she is also a trustee of the American Repertory Theater and an active member of the Harvard Club of New York City.



Timothy P. McCarthy

Timothy P. McCarthy '93, of Cambridge, has held numerous positions on the HAA board of directors, including secretary and vice president for College alumni affairs from 2010 to 2013. As class secretary, he has served on each of his class's reunion-program committees, and as president of the Association of Harvard College Class Secretaries and Treasurers from 2009 to 2011. He has also contributed

America's practical wealth and historic sense of "New World" identity. "These are our gathering grounds," he adds, "where we can come together to experience something much bigger than watching television." □

to other projects associated with the Harvard Gender and Sexuality Caucus and the Phillips Brooks House Association.

Carlos A. Mendoza '88, M.P.P. '90, of Panama City, Panama, established and became founding president of the Harvard Club of Panama in 2006, and served as a director and treasurer until last year. At his urging, the HAA began holding Latin American regional meetings to develop clubs and foster Harvard communities in the region. On the HAA board of directors, he has served as both a director for Latin America and as a committee member; in 2011, he received the HAA clubs and SIGs committee's Outstanding Contribution Award.



Carlos A. Mendoza

Grace C. Scheibner, A.L.B. '90, originally from New York and a former resident of Mexico and India, began at Harvard as an administrator at the program committee for the International Conferences on AIDS and STD World Congress. In 1992, she became Harvard's first Commencement director, in charge of the planning, execution, and management of the Morning Exercises. She retired last year. From 2006 to 2010, she also served as president of the Harvard Extension School Alumni Association.



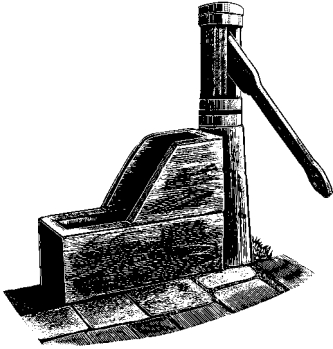
Grace C. Scheibner

Kenneth G. Standard '58, LL.B. '62, has long been active in the Harvard Club of New York City. As president from 1999 to 2002, he led the planning, financing, and building of an eight-story addition, and as chair of the club's athletics committee in the 1970s, he appointed its first female members. He is also a former director of the club's foundation and a longtime alumni interviewer for the College admissions office, and has served on his College class's reunion-campaign committees.



Kenneth G. Standard

Flaunting It



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

IN THE SUMMER OF 2016, Primus was ascending Widener Library's steps, in pursuit of some tome or other, where he met a visiting family disappointed that they could not enter the famous heap. Primus directed them around the corner to Houghton, where a vitrine of art for the Babar ABC book was then on display; happiness ensued, especially among the younger set.

Primus then inquired about the usefulness of putting up a sign at Widener's entry, pointing around the corner to Houghton's (often wonderful) displays, and was told that The Authorities had vetoed such a measure: not very gracious to well-intentioned tourists, he thought, and squandering potential goodwill.

So he was very much in favor of the July 24 installation of printed netting, advertising Houghton's treasures and inviting passers-by inside, on the railing around the Pusey Library light court. Though some purists may find the very notion coarse, the banner is informative, welcoming, and useful—as the signage on light standards around Harvard Yard rarely is. (It is the Divinity School's bicentennial—yes, and...? And where is the Peabody, for anyone interested in seeing the sesquicentennial exhibition on notice?)

This suggests a larger point. The Common Spaces project has encouraged visitors to lounge and lunch in the Old Yard.

But the University makes no effort to tell them what buildings are what, or where to find the Harvard Art Museums (smartphones notwithstanding, how many confused visitors have asked the way from the T stop in the Square?), or what is on offer at the Collection of Historical Scientific Instruments (perfect for gadget-obsessed youngsters, some of them scientists-to-be; see page 104), or where the glass flowers are (so to speak) rooted. This is an opportunity for the University to strut its stuff, with simple, clear, tasteful, uniform signage and directions. Harvard could do better—and with museums, exhibition experts, and a Graduate School of Design (GSD) at hand, it can do this well.



ARCHITECTS ANONYMOUS. For all the building Harvard does, it hasn't procured a whole lot of stunning, stimulating new architecture. Yes, Renzo Piano did the Fogg/Harvard Art Museums renovation and expansion; the interior staircase and handrail details are characteristic. But outside, the result feels committed-up: witness the meticulously designed and crafted, but monochromatic and featureless, new façade along Prescott Street. It is premature to tell how the textured exterior of the Allston science and engineering complex, and the vast atrium within—all the fruits of Behnisch Archi-



tekten—will turn out (see images in John Harvard's Journal, September-October, pages 14-15). But even if successful, it is far from any pedestrian-frequented area.

So it was surprising to learn that the renovation of a frame building on Sumner Street into "HouseZero" (the energy-yielding, non-emitting new quarters for the GSD's Center for Green Buildings and Cities) was designed by Snohetta: about as high-profile, international, and modernist a crew as one can find. The *interior* schematics appear to live up to the firm's Scandinavia vibe (see renderings at harvardmag.com/housezero-17). Because the house is in a Cambridge historic district, however, the 1924 *exterior* remains unchanged; the pyrotechnics within will not carry over to the experience of passersby, alas.

Finally, Primus understands that *another* jazzy firm, Barkow Leibinger, based in Berlin and New York (albeit with acceptably Cantabrigian roots: Frank Barkow, M.Arch. '90, and Regine Leibinger, M.Arch. '91), is on assignment for Harvard. No details yet, but their portfolio appears happily free of red brick. Hope springs eternal. ~PRIMUS VI

Eye on the Cosmos

Miss Bruce's telescope and Leavitt's Law



Clockwise from far left: the lenses of the Bruce telescope mounted for display; the telescope when in use at Harvard's observatory in Arequipa, Peru; Henrietta Leavitt; and a heavily annotated print from a glass plate negative showing the Spiral Nebula, enlarged six times

of the universe.

But the telescope itself, if not its contributions to scientific discovery, might have

been lost if not for Sara Schechner, Wheatland curator of the Harvard Collection of Historical Scientific Instruments, who recently stumbled upon its lenses while doing reconnaissance at the Harvard Smithsonian Center for Astrophysics's decommissioned Oak Ridge site in Harvard, Massachusetts. (The scene,

she says, with trees growing up around abandoned buildings and garages, was right out of *Planet of the Apes*.) The telescope had been shipped from Peru to South Africa in 1927, but its fate after the 1950s was undocumented until Schechner found the lenses, wrapped in flannel and padded with pillows of hair and straw (inhabited by mice), still in the wooden crates shipped back from South Africa. Once she realized what they were, she

located the rest of the telescope in a building nearby. Now restored, the lenses and their original brass and cast-iron holders (called "cells") are on display, destined for the permanent collection she oversees, where the contributions of Catherine Bruce and Henrietta Leavitt will long be remembered.

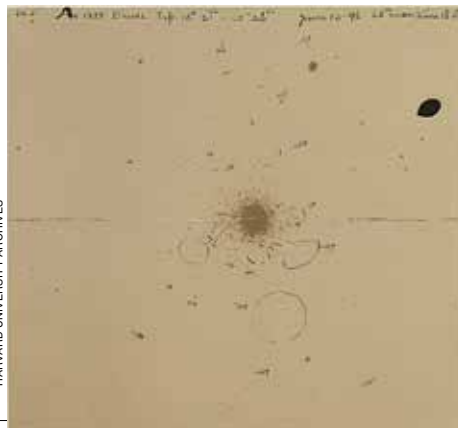
—JONATHAN SHAW

IN 1895, Harvard deployed the most powerful photographic telescope in the world to a high-altitude observatory in Arequipa, Peru, where it played a seminal role in discoveries about Earth's placement in the cosmos, and ultimately, the expansion rate of the universe.

The Bruce telescope owes its name, fame, and subsequent rediscovery, respectively, to three women. Miss Catherine Bruce, a wealthy, unmarried New Yorker, donated \$50,000 to have the telescope built, and thus gave the instrument its name. (The lens blanks, ordered from a French glass manufactory, took three years to arrive). It owes its place in history to Henrietta Leavitt, an 1892 Radcliffe graduate employed at the Harvard College Observatory, who in 1908 published her ob-

servation that the peak brightness of certain pulsing stars called Cepheids was related to the length of their pulsing cycle, or period. Later astronomers realized that this fundamental insight could be used to calculate the distances to these unusual stars, by comparing a Cepheid's observed brightness from Earth to what its brightness *should* be based on its period. Edwin Hubble used Cepheids in the 1920s to establish that the Milky Way was just a single galaxy in a universe of many, while John Huchra, the late Doyle professor of cosmology, used them in 1993 to help calculate

the Hubble constant, the expansion rate



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Visit harvardmag.com to see more images of the telescope and its rediscovery.

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Chevron	CVX	17.17%
Schlumberger	SLB	7.51%
ConocoPhillips	COP	4.66%
EOG Resources	EOG	4.24%
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