

SUMMER 2018

colloquy

HARVARD UNIVERSITY | THE GRADUATE SCHOOL OF ARTS & SCIENCES



Peace, Love & Light

How Samantha Hawkins
Is Preserving Urban Memorials

to note

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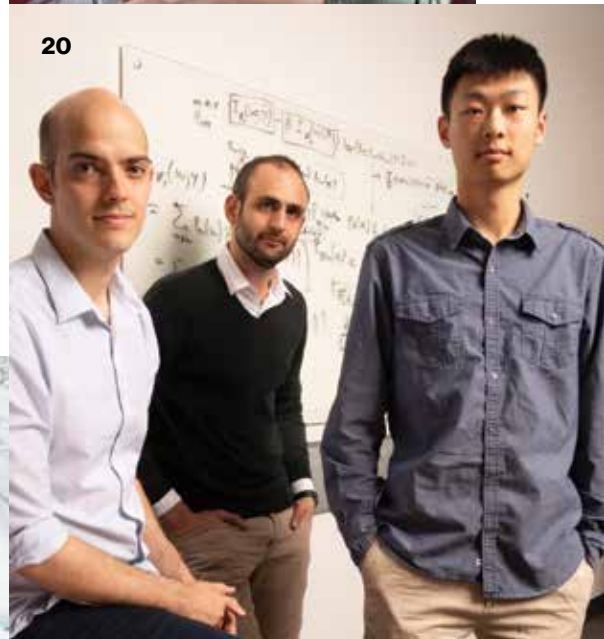
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PHOTOGRAPHER: CHRISTOPHER HARTING

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THE NEW ACADEMIC YEAR brings a number of new beginnings for GSAS and for Harvard. First of all, earlier this year Dean Xiao-Li Meng announced his decision to step down from the role as of June 30, and I was honored to be asked to continue serving GSAS students as dean. Over the past five years, Dean Meng has made important advances at GSAS, which include

the expansion of professional development resources for students and strengthened ties with our global alumni. I am eager to continue improving the graduate student experience and getting to know more of you, especially in learning about your time at GSAS and your professional lives as alumni.

While I take up the deanship, Harvard takes up new leadership with the appointment of Larry Bacow as president. In addition to holding a master's degree from Harvard Kennedy School (HKS) and a JD from Harvard Law School, President Bacow also earned his PhD in one of GSAS's interfaculty programs, in public policy with HKS. You can read more about him in Conversation, on page 8.

This academic year also marks milestones for two new programs at GSAS. First, GSAS and Harvard Business School have launched a new PhD in business administration that will accept applications beginning in September. This interfaculty PhD program will prepare students for careers in academia and at research institutions around the world by grounding them in disciplinary theories and methods for application in academic research.

Also, the new master's in data science will enroll its first cohort this year. While the program may engage students primarily with faculty at the Harvard John A. Paulson School of Engineering and Applied Sciences, it is by its very nature interdisciplinary, crossing many boundaries in its multiple applications.

While not specifically focused on data science, each of the three features in this issue of *Colloquy* relies in some way on data—whether in predicting the deterioration and movement of sea ice, informing algorithms that impact our lives, or preserving potentially ephemeral memorials—as well as the themes of continuity and change. As you will read, our students and alumni are not confined by the boundaries of their disciplines, but are open to whatever helps them advance their work.

—EMMA DENCH
DEAN

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SUMMER 2018

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Jon Pettitt director of alumni relations and events

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James Clyde Sellman, PhD '93, alumni books editor

2COMMUNIQUÉ creative direction & design

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Access current and back issues of *Colloquy*, as well as a range of other alumni services and information, at gsas.harvard.edu/alumni.

LETTERS TO THE EDITOR

We welcome your feedback and ideas. Write to: *Colloquy*, Harvard University Graduate School of Arts and Sciences, 1350 Massachusetts Avenue, Suite 350, Cambridge, MA 02138-3846; or e-mail gsaa@fas.harvard.edu.

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LETTERS

Flying in from Australia on my first day of graduate school, I had only a few hours to register and find accommodation. In Memorial Hall, I saw an ad: "Mr. J. Vincent" had a room for rent. "Mr. J. Vincent" was the famous John Carter Vincent, formerly of the State Department and posts all over China. Talk about luck. As Vincent's tenant, I got to know him and published the first-ever account of his ordeal in the Atlantic, "When America Lost China: The Case of John Carter Vincent."

In January 1972, I was advising Henry Kissinger on China, and he said, "Your *Atlantic Monthly* reports from China were the first thing I gave President Nixon to read in preparation for our trip next month." The boy from rural Australia was happily transformed by Harvard's quality and reach.

—ROSS TERRILL, PHD '70, GOVERNMENT

REMARKS

What is your favorite memory of field research?

—COLLOQUY, WINTER 2018

My dissertation research involved identifying community leaders in seven Southern cities and learning their positions on local recruitment of new industry and school desegregation; the latter had not yet occurred in any of the cities in 1960. Among the people I interviewed was an elderly Harvard graduate who willingly responded to all of my questioning and eagerly stated his adamant opposition to desegregating the schools. As an interviewer, I was obliged not to reveal my opinions on any of the research topics, but as an active participant in the civil rights movement, I still recall the feeling of discomfort and sadness after that interview with this fellow Harvardian.

—M. RICHARD CRAMER, PHD '62, SOCIOLOGY

My most thrilling memory took place in southwestern Luxembourg where the term "Indiana" comes from. In 1969 at the Iron Age hillfort Titelberg, we excavated a mint foundry



where the Treveri tribe coined money. We found coin moulds and dies, as well as coins of Germanus Indutillus, the chief of the western Treveri, who manufactured the money. Historical evidence confirmed that the term Indiana was associated with the Treveran area, but it was not known where the ancient "Indiana" Cavalry squadron came from until our find.

This was the thrill that kept on thrilling, because the name Indutillus gave the ultimate origin and clan affiliation of the then-director of Luxembourg archaeology, Dr. Gerard Thill, who was so thrilled that he recommended that the Grand Duke of Luxembourg dub me a knight! In the foundry remains we even found two unfinished dime-sized coins, so we could claim to have indeed established new paradigms.

—RALPH M. ROWLETT, PHD '68, ANTHROPOLOGY

**ENGAGE**

How did you choose your dissertation topic?



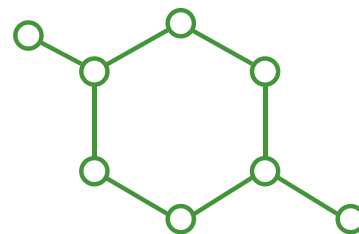
Have you ever wondered why birds are colorful? @McCordinator gives us the story in the very first episode of Veritalk—the new podcast from GSAS! <https://buff.ly/2H2zE1j>

—@HARVARDGSAS, FEB 9

••• Share your story with us! E-mail gaa@fas.harvard.edu. Or write Colloquy, Graduate School of Arts and Sciences, Harvard University, 1350 Massachusetts Avenue, Suite 350, Cambridge, MA 02138-3846.



Argyro Nicolaou discussed Mediterranean migrations



BACK TO BASICS

Sung Hoon Kang, PhD '12, received a grant from the Air Force Office of Scientific Research Young Investigator Program (YIP) for his research on bioinspired materials. YIP awards funding to scientists and engineers who earned PhDs or equivalent degrees in the last five years and demonstrate exceptional ability and promise for conducting basic research. Kang, an assistant professor at Johns Hopkins University, studies complex behaviors of material systems and structures with novel properties based on inspiration from nature.



SEEN ON TWITTER

APS, @PsychScience

Congratulations, @olsonista! APS Fellow Kristina Olson PhD '08 has received @NSF's 2018 Alan T. Waterman Award, the nation's highest honor for early-career scientists. [Http://bit.ly/2IPSHFM](http://bit.ly/2IPSHFM) #NSFwaterman

STAGE CRAFT

The annual Harvard Horizons Symposium highlighted the work of GSAS's PhD students, eight of whom delivered talks about their research from the stage of Sanders Theatre.

••• Read more and watch the symposium at gsas.harvard.edu/harvard-horizons-2018.



“Over many years, I have been fortunate to have worked with many hundreds of talented people throughout the world in a quest to collect plants and document knowledge of their traditional uses.”

—MICHAEL J. BALICK, PHD '80, UPON WINNING THE 2018 DAVID FAIRCHILD MEDAL FOR PLANT EXPLORATION, GIVEN BY THE NATIONAL TROPICAL BOTANICAL GARDEN IN RECOGNITION OF HIS FOUR DECADES OF PLANT EXPLORATION AND HIS EFFORT TO DOCUMENT AND PRESERVE TRADITIONAL USES OF PLANTS AMONG INDIGENOUS PEOPLE.

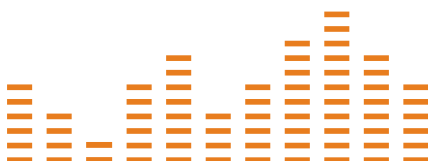
THE SCIENCE OF MUSIC

Back in the 1980s, Eric Sirota, PhD '86, took time off from his physics studies to attend a play based on Mary Shelley's *Frankenstein*. As he watched the performance, the notes of a song began forming in his head, music he would later write down and—much later—turn into a musical. Sirota's *Frankenstein: The Musical* premiered off-Broadway last year and has been extended through 2018.

But composing musicals isn't Sirota's day job: He's a scientist in one of ExxonMobil's research laboratories, studying the physical properties of organic molecules as a hydrocarbon physicist. "Science and music are indeed complementary, and the music and the musicals I write are very emotionally driven," he says. "While some aspects of *Frankenstein* resonate with me as a scientist, I wrote it to be about the human need for love and companionship."

While Sirota credits his wife and two children for their support in bringing his musical to life, he pays equal billing to the engineers, chemists, and fellow physicists at ExxonMobil who helped him work through his ideas, ultimately participating in an early performance in an office lecture hall. "I had a huge amount of support from my colleagues and our management, both in putting on the production and allowing such an event to take place, which was not typical in a corporate setting," Sirota shares. "Knowing that so many people were on board with doing the production motivated me to finish the script and the score."

Sirota continues to work on musicals, including one set during the early years of the biblical Sarah and Abraham. "Go, My Child" deals with xenophobia, infertility, leaving home and the search for truth. "I think my Abraham is a scientist and the truths he seeks are also the truths of nature," he says.



A NEW CHAPTER

The 367th Harvard Commencement took place on May 24.

●●● View highlights from the day at gsas.harvard.edu/commencement-2018-look-back.



STAR MATERIAL

Sara J. Schechner, PhD '88, David P. Wheatland Curator of the Collection of Historical Scientific Instruments at Harvard University, received the LeRoy E. Doggett Prize for Historical Astronomy from the American Astronomical Society (AAS), the most significant, international prize in the field. Schechner becomes the first woman to receive the honor, which is awarded biennially to individuals who have "significantly influenced the field of the history of astronomy by a career-long effort."

In January, Schechner delivered the prize lecture titled "Tangible Things of American Astronomy" at the AAS annual meeting in Washington, DC. "I am deeply honored to receive the foremost international prize in my field," she said, "and particularly proud to be the first woman to earn this award!"

Panayotis F. League, PhD '17,
played music from Lesbos
during Alumni Day.

INTELLECTUAL ENGAGEMENT

Alumni returned to Cambridge for two events during April. A reunion of former residents of Perkins and Conant Halls included two panel discussions, in which alumni and current students recalled their favorite moments in the residence halls. The next day, Harvard faculty and GSAS alumni shared big ideas and new innovations at Alumni Day. Both events highlighted the intellectual communities—academic and residential—that make the GSAS experience so powerful.

●●● Did you miss Reunion and Alumni Day? Read a recap at gsas.harvard.edu/intellectual-return.

New Leadership

ON JULY 1, Richard Ekman took on the role of chair of the Graduate School Alumni Association Council. Ekman, who earned his PhD in the history of American civilization in 1972, is president of the Council of Independent Colleges. He succeeds Mia de Kuijper, PhD '83.

The Graduate School Alumni Association Council is made up of more than 40 GSAS alumni/ae who share a strong commitment to Harvard and to graduate education. Council members meet at Harvard twice a year to represent and advance the interests of GSAS students and alumni.

• • • **Interested in nominating a GSAS alum for council?** Visit gsas.harvard.edu/alumni-association/alumni-council.



ALUMNI UPDATES



Cassandra Volpe Horii, PhD '02, has been elected president of the POD Network in Higher Education, an organization dedicated to improving teaching and learning in higher education. In 2012, she became the founding director of the Center for Teaching, Learning, and Outreach at the California Institute of Technology, where her efforts have resulted in faculty engagement of over 85 percent and the transformation of over 90 undergraduate and graduate courses.



Ana Miljački, PhD '07, has been promoted to associate professor with tenure in the Department of Architecture at MIT. Miljački's interests range from the role of architecture and architects in Cold War-era Eastern Europe, through the theories of post-modernism in late socialism, to the politics of contemporary architectural production. At MIT, she teaches the Architecture Core 2 Design Studio, directs the graduate thesis program in architecture, and leads advanced research seminars.



Fumiko Ikawa-Smith, PhD '74, received the inaugural Award for Lifetime Service to the Japan Studies Association of Canada (JSAC). The award recognizes exceptional service and commitment to the JSAC and to the study of Japan in Canada. Ikawa-Smith, a professor emerita in the Department of Anthropology at McGill University, studies archaeology, the Paleolithic, food and nutrition, complex hunter-gatherers, gender in prehistory, social contexts of archaeology, and East Asia, especially Japan.



Jessica Mar, PhD '08, received the 2017 Metcalf Prize for Stem Cell Research from the National Stem Cell Foundation of Australia in recognition of her leadership in stem cell research and its application to medical practice. An associate professor at the University of Queensland, Mar's research has revealed how some stem cells become forgetful while others are set in their ways. Mar also won the 2017 LaDonne H. Schulman Teaching Award from the Albert Einstein College of Medicine.



THE RIGHT PLACE

LAWRENCE BACOW, PHD '78, GREW UP INTERESTED IN HAM RADIOS AND SCIENCE FAIRS, ALL WHILE EXPECTING TO BECOME A LAWYER LIKE HIS FATHER. NOW THE 29TH PRESIDENT OF HARVARD UNIVERSITY, BACOW'S CIRCUITOUS ROUTE TO HARVARD'S TOP POST HAS TAKEN HIM FROM MATHEMATICS TO ECONOMICS AND PUBLIC POLICY.

Your academic interests have varied over the years. How did you end up seeking a PhD in public policy?

Most of our careers are a series of fortuitous accidents, and mine is no different. I always tell students: "A career is only knowable in retrospect."

I grew up as a math and science kid and thought I wanted to be a lawyer because my father was a lawyer. At MIT, I intended to study mathematics, but quickly discovered the difference between being good at math and being a mathematician—and I was in the former category. Along the way I'd taken an economics course and thought it would be a

good way to apply my modest mathematical aptitude. Midway through my junior year, I realized I could graduate early and save a year's worth of tuition, but I had missed the law school application deadline. So, I enrolled in a new public policy program at Harvard Kennedy School (HKS) and later was accepted to the joint degree program between Harvard Law School and HKS.

When I graduated, my wife was starting a two-year program in city planning at MIT, so I needed something to do until she graduated. Because I had already taken the relevant coursework, I decided to study for a PhD.

“Harvard lifts people’s sights and helps them raise their expectations.”

So, you were finishing up law school and thought: I’ll earn a PhD and see what I can do with it?

Essentially, I was in the right place at the right time. As I was finishing my dissertation, several universities were launching public policy programs modeled after HKS, and I started receiving inquiries about teaching jobs. I was offered a two-year teaching opportunity at MIT, and two years turned into twenty-four.

Your PhD dissertation concerned collective bargaining over occupational hazards. How did you make the transition to the environment?

That’s a very easy story. I was always interested in the intersection of law, economics, and policy, which is why I wrote about collective bargaining over health and safety issues. At MIT, I was asked to teach a course on environmental economics and policy, and I realized that what I’d already studied—how to regulate what is noxious and dangerous inside a workplace—was applicable outside the workplace, for example, how to regulate air quality and water quality.

Another theme of my work was the bargaining and negotiation process, which I looked at through the lens of collective bargaining in my dissertation. I went on to write about how to resolve disputes that arise when society tries to build things we need but that nobody wants to live near—prisons, airports, hazardous waste facilities, for example. People want access to cheap power, but nobody wants to live next to a power plant. I became interested in how to create siting processes that reallocate some of the benefits of these projects to compensate those who live near them.

But many issues can’t be resolved that way, and I became interested in the more general problem of how to resolve environmental disputes. Ultimately, through a very circuitous route, that work led to an interest in real estate capital markets.

But none of this was planned. It was where my curiosity led me.

You earned three graduate degrees from Harvard. How will that experience shape your vision for graduate studies at the University?

The relationship between graduate students and their teachers is very special because over time they become your colleagues. We do research and publish together and, eventually, we collaborate. As president, I hope to nurture and support those relationships.

Harvard changed my life. I did not expect to become an academic when I came to Harvard. But while I was here, I discovered that I love to teach and that I was capable of doing scholarship. Harvard lifts people’s sights and helps them raise their expectations. It makes everybody who works and studies here—myself included—better, because we are surrounded by remarkable people. I want to make sure that future students have that opportunity as well.

What are you most looking forward to in this new role?

I’m looking forward to getting to know Harvard in ways that I haven’t had a chance to before. This is a remarkable institution with many different facets. Everywhere you look, you can find somebody doing work that’s really special. 🌸

CURRICULUM VITAE

Harvard University
29th President

Tufts University
President

Massachusetts Institute
of Technology
Chancellor

Harvard University
PhD in Public Policy,
1978, GSAS
JD, 1976, Harvard
Law School
MPP, 1976, Harvard
Kennedy School

Massachusetts Institute
of Technology
SB in Economics, 1972

An aerial photograph showing a vast expanse of dark, open water. Scattered across the surface are numerous ice floes of various sizes and shapes, ranging from small, irregular chunks to large, jagged, triangular and rectangular pieces. The ice floes are bright white, contrasting sharply with the dark water. In the upper left corner, a large, textured, yellowish-brown mass, possibly a piece of ice or a large piece of driftwood, is partially visible. The overall scene conveys a sense of a rapidly changing and melting environment.

TRACKING THE
FLOW OF THE ONCE
MIGHTY ICE FLOES

Melting Away

BY STEVE NADIS





Previous spread: Ice floes that normally dam the Nares Strait broke into fast moving ice chunks, making transit by kayak too dangerous for researchers. Right: Declining sea ice is helping to warm the rest of the world.

IN THE SUMMER OF 2017, shortly after receiving a PhD in applied mathematics from Harvard, Christopher Horvat ventured to the Nares Strait—a narrow passageway between the world’s two northernmost landmasses, Greenland and Ellesmere Island. A sea ice expert, Horvat focuses especially on floating chunks of frozen seawater called “ice floes.” He’d made his way to this remote region—only about 700 kilometers from the North Pole—to get a close-up view of the objects he’d been studying, on an abstract basis, for about five years. The Nares Strait joins the Arctic Ocean to the Atlantic, and every summer powerful currents push sea ice southward past craggy peaks on both the eastern and western shores.

Horvat, a NOAA Climate and Global Change Postdoctoral Fellow and a Voss Postdoctoral Fellow in Environment and Society at Brown University, had come for research purposes, and his work was the main subject of the forthcoming documentary, “Enduring Ice,” which was being filmed that summer. The original plan was for Horvat and his colleagues to cover more than 500 kilometers by kayak in 30 days, traveling through what he calls, in view of the pronounced Arctic warming, “the last refuge for sea ice” or the place that such ice was expected to endure the longest. He figured there might not be many opportunities in the future because “our ability to see and feel the consequences of rapid Arctic change may be melting away.”

But the group’s ambitious plans were not realized. Large ice floes, up to tens of kilometers wide, normally clog the upper portion of the strait, leaving relatively uncluttered water below that’s suitable for kayaking. When the team arrived in 2017, the floes were too small to create a dam. Instead, the strait was filled with fast moving ice chunks, which made it too dangerous for transit by kayak, especially with the prevailing hurricane force winds. Horvat and the others had to pull their

kayaks, weighing about 1,000 pounds each, from the shore over the ice, snow, and pools of melting water. They could only manage a few kilometers a day, covering about 100 kilometers overall in a grueling portage. Horvat and the rest of the Enduring Ice team were victims, ironically, of ice that had not endured—a problem Horvat anticipated in the future, not realizing it had already happened.

FROM THE ETHEREAL TO THE TANGIBLE

The whole scenario—hauling kayaks far above the Arctic Circle, pitching tents on ice and snow—was rather implausible for anyone who knew Horvat before he’d arrived at Harvard. Prior to entering graduate school, he had no interest in ice and had never even gone camping. At the University of Pittsburgh, he was an undergraduate math major preoccupied with esoteric problems in number theory such as the “lonely runner conjecture,” which concerns the spacing of runners moving at different speeds around a circular track. He became a bit less ethereal in graduate school by entering an applied math program, taking a further step towards the tangible at the suggestion of his Harvard advisor, Eli Tziperman, who felt he might find an interesting research problem related to sea ice—a subject Tziperman had been looking into for more than a decade.

In the fall of 2012, at the start of his second year at Harvard, Horvat attended a sea ice workshop at the Woods Hole Oceanographic Institution. One lecturer cited the conventional wisdom, which held that Arctic melting depended solely on ice thickness; a floe’s size or width was deemed insignificant. The assertion was offered as a fact, with no evidence to back it up. “Given my training in mathematics, I distrusted statements made without any proof,” Horvat says. “I wondered if floe size might be significant after all, and I decided it would be worth looking at ice on a granular scale.” And that’s how

he came upon his thesis topic, “Theory, modeling, and impact of the sea ice floe size distribution.”

The Arctic Ocean is warming dramatically, with sea ice in rapid decline—decreasing in volume by more than 70 percent during the summers since 1972. This, according to Horvat, is “the fastest, most important change in the climate over the last 40-plus years,” and it is helping to warm the rest of the world, too. The general picture is rather simple: When sunlight hits ice and snow, almost all of its energy is reflected back into space. The open ocean, on the other hand, absorbs solar energy, warming surface waters in return. That contributes to even more melting—a self-reinforcing loop known as the “ice albedo effect.”

Horvat, of course, was seeking a more refined picture. Most global climate models treated sea ice as a uniform sheet when it’s actually a complex mosaic of pieces spanning a broad range of sizes and thicknesses. If you place a large block of ice in warm water, the ice will melt more quickly when you break it into small pieces, which increases the surface area, thereby facilitating heat transfer. This effect is well-known to earth scientists and thermodynamicists, as well as to bartenders. But it doesn’t have much

to do with the melting of ice floes (except for very small ones, less than 30 meters across, according to the conventional view) because the surface area on the top or bottom of the floe is generally so much greater than the area along the sides that it hardly matters whether the floe is 100 meters wide or 100 kilometers.

That argument, however, only tells part of the story. “In real life,” Horvat explains, “the way heat gets to the ice is through swirling ocean currents called eddies.” As to how eddies form, imagine an isolated floe that has undergone some melting. A layer of mostly freshwater will seep underneath (as most of the salt was already discharged into the ocean upon freezing), surrounded on all sides by warmer, denser seawater. The differences in temperature and density create an unstable situation, which drives a circular current running along the edge of the floe. Analyses by Horvat, working in concert with Tziperman and MIT researcher Jean-Michel Campin, showed that eddies transfer heat from the warmer open water to the floe edge, contributing substantially to the melting of floes of all sizes, with smaller ones melting more rapidly. They’d demonstrated, in other words, that floe size was important and should be factored into climate models.

Analyses... showed that eddies transfer heat from the warmer open water to the floe edge, contributing substantially to the melting of floes of all sizes, with smaller ones melting more rapidly.



CHALLENGING ASSUMPTIONS

Horvat's interests are not limited to ice. He studies links between ice, oceans, and life while trying to determine how the Earth's natural and human systems interconnect. Some big news came in 2012 when a team of researchers, led by Kevin Arrigo of Stanford, announced the discovery of a giant bloom of photosynthetic microorganisms called "phytoplankton"—about 30 meters deep and more than 100 kilometers across—beneath the ice-covered waters of the Chukchi Sea, just north of the Bering Strait. Until that time, people had likened the region beneath the ice to a desert, assuming that nothing would grow there because ice blocked the sunlight. That belief, Horvat says, turned out to be very wrong.

Unexpected ice floes meant that Horvat and his colleagues had to endure a grueling portage.

Several years later, he teamed up with Harvard applied mathematician Sarah Iams, David Rees Jones of Oxford, and colleagues at the UK's University of Reading to develop a model regarding

the timing and initiation of such blooms. Their computations showed that thinning sea ice was responsible for the blooms, allowing enough light to pass through to support photosynthesis. "The thinning of sea ice has led to the potential for sub-ice blooms that can extend as far as the North Pole in June and July, covering nearly a third of the Arctic Basin," Horvat says. Given that phytoplankton sits at the base of the food chain, this represents a dramatic change in "under-ice ecology," the full extent of which is not yet known.

Horvat acknowledges that almost all of his work related to ice thickness and floe size is based on mathematical modeling, drawing on observational data when available. "But none of this has been verified yet because it's very hard, and very expensive, to verify things in the Arctic," he says. "Icebreakers cost \$100,000 per day. You need to get a large number of instruments in place in extremely hard-to-reach settings. We're now pushing for that to be done, but it won't happen soon."

DRIVEN BY CURIOSITY

In the meantime, he's returning to the Nares Strait later in 2018 with the Enduring Ice team, where he'll pursue some modest research at much lower cost than an NSF-funded venture. "What we're doing is tremendously unsafe and wouldn't be supported by a government agency," Horvat says. "We're in the middle of nowhere and weather can be extreme. Plus, there's polar bears, and we don't have any guns."

Many of his peers have trouble picturing Horvat as a rugged Arctic explorer, given that he never was a hands-on, outdoorsy kind of guy. He was, instead, "distinctly egg-headed," someone who spent most of his time at a computer desk. On the other hand, he says, "Why shouldn't I do this? I'm young, curious, and have the ability to get up there. The work is interesting to me, and I'm hoping that, someday, it might change the way we think about sea ice."





Taking a Broad View of Life

The research of Leah Aronowsky, a historian of science, often revolves around one question: “How do scientists obtain knowledge of environmental phenomena that unfold on the scale of the entire planet?” Aronowsky is currently a Mellon Postdoctoral Fellow in Environmental Humanities based at the University of Illinois at Urbana-Champaign after having earned a Harvard PhD in the history of science earlier this year. Her dissertation was on the biosphere—a concept, she says, that “dissolves the boundary between organisms and environments to construe the whole of planetary nature in terms of chemical cycles and flows.”

Unlike another recent Harvard PhD recipient, Christopher Horvat (see accompanying article), Aronowsky doesn’t focus too much on present-day science, nor does she pay specific attention, for instance, to the size of ice floes or the thinning Arctic ice sheets. “But I’m trying to tell the history behind the work that scientists like Chris do,” she says. “And I’m fascinated by the process through which researchers gather data that can support claims about global phenomena.”

As an undergraduate at Wesleyan University, Aronowsky became interested in the history of medicine and assumed she would continue that line of inquiry in graduate school. But during her coursework at Harvard, she was drawn to large-scale environmental questions, which led her to the biosphere, perhaps most simply described as encompassing all places on Earth where life exists. Aronowsky, however, prefers a more dynamic definition, which recognizes that the various life-forms are, in some way, connected to each other and to the planet as a whole; life affects the planet just as the planet affects life. Oxygen, for example, makes up a significant portion of the atmosphere because organisms produce it. Oxygen’s presence in the atmosphere, in turn, sustains other organ-

isms that are dependent upon that molecule for survival.

It is perhaps not surprising that Aronowsky, as a historian, has a special interest in organisms of the human variety and the role they’ve collectively played in shaping the environment—for better or worse. A recent report by the United Nations Intergovernmental Panel on Climate Change, which cited a clear-cut human influence on the climate system, is, according to Aronowsky, “one of many documents that speaks to a question currently plaguing contemporary science: To what extent have humans impacted the Earth’s processes, and how can we document those impacts?”

One answer, she says, may lie in a newly proposed geological epoch called the “Anthropocene”—a term introduced in 2000 by the Nobel Prize-winning atmospheric chemist Paul Crutzen and the biologist Eugene Stoermer, indicating that the environmental effects of human activity may be imprinted on a global scale in the Earth’s rocky strata, ice layers, or atmosphere. There is a diversity of opinion within the scientific community as to whether the Anthropocene constitutes a genuine epoch and, if so, where the “golden spike” (or stratigraphic signal) lies. Crutzen and Stoermer suggested a start date of around 1780, marking the onset of the Industrial Revolution. Some suggest the beginning of the nuclear age in 1945, while others say none of the above.

Meanwhile, there is heated debate among social scientists regarding the value of the Anthropocene as an idea. Aronowsky approaches the issue cautiously. The discussion has become laden with politics, partly because not all of the world’s people contribute equally to environmental change or degradation. Still, she says, “anything that gets us to talk about the global climate is good.” And she’ll be there to document that talk and put it into proper perspective—historical, of course. 🌱

Leah Aronowsky, PhD '18, is interested in how researchers gather data to support claims about global phenomena.



SAMANTHA HAWKINS
IS PRESERVING
MEMORIALS THAT
HONOR VICTIMS
OF VIOLENCE.

A few years before Freddie Gray's death, Samantha Hawkins walked past a corner store near a Baltimore neighborhood center where she'd been volunteering. Overnight, in an impromptu memorial to a victim of violence, someone had spray-painted "RIP" and a name on the brick wall.



BY DEBORAH HALBER
PHOTOGRAPHY BY JOHN SOARES



Growing up in Ellicott City, Maryland, a leafy suburb 30 minutes from downtown, Hawkins knew about Baltimore's high per capita murder rate but had no personal connection to the violence that earned the city nicknames like "Bloodymore, Murderland." More than 90 percent of Baltimore's victims of violent crime are black and live in the inner city.

Within hours of a shooting or stabbing, impromptu shrines—balloons, stuffed animals, photos, scrawled messages such as "death before dishonor" and "soldier from the cradle to the grave"—similar to the one Hawkins passed, materialize on Baltimore's streets. Hawkins, now a PhD candidate in anthropology, believes these makeshift shrines and messages like the one on the corner store focus public attention on individual deaths more viscerally than a passing mention in *The Baltimore Sun*.

In February, Hawkins won a \$25,000 National Science Foundation (NSF) grant to analyze and document inner-city memorials in Baltimore. Working with her advisor Laurence Ralph, professor of African and African American studies and of anthropology, Hawkins is using the city as a case study to better understand the underpinnings of urban violence.

"If you were constantly seeing memorials on the same bridge where people were constantly dying in car accidents, one would think that there needed to be rethinking about the quality of the bridge, or the relationship between the bridge and the road, or an investigation into whether there's a blind spot," Ralph says. "By shedding light on the Baltimore memorials and the way they occur, this research has the potential to point to the structural issues underlying incidents that lead to memorialization."

GIVING VOICE TO STORIES

The first time Hawkins, then a college student, walked to the St. Francis Neighborhood Center—she would spend hundreds of hours there over two years tutoring and mentoring, playing kickball in vacant lots, and establishing a food program for low-income families—two girls jumping rope outside stopped to contemplate her. "You must be a volunteer," one observed.

Being called out as an outsider gave her pause. Later, when she started seeing coworkers—and kids—wearing T-shirts or tattoos commemorating friends and family who had died violently, the epitaphs made her wonder: Whom does society value? Who is worthy of remembrance, and how and why are they remembered?

At the point in history that spawned the Black Lives Matter movement, Hawkins wants to illuminate how black *death* matters. "There are so many different ways all these acts of violence are being remembered or commemorated, if they are being remembered or commemorated at all," she says of recent instances of racially motivated attacks on African Americans. By documenting how victims are remembered in death, she says, she's providing evidence of who matters in life.

The street memorials she documents are sources of ongoing tension between Baltimore officials and residents. Many consider the memorials vandalism, an eyesore detrimental to property values. "The way memorialization happens in Baltimore is very disruptive," Hawkins

says. "My job as an anthropologist is to give voice to other people's stories, and work with them in a collaborative way to get their experience heard. Because for the longest time, it has been silenced, or painted over, or whitewashed.

"Nobody would dig up a tombstone and take it away," she says.

Using software called NVivo, she codes and documents the memorials' colors, materials and objects, as well as observers' reactions. She looks for patterns in words, themes, and neighborhoods. "My interest is the people who are making these memorials, and the people who are seeing them and engaging with them," she says. "I do a lot of participant observation. I do tons of interviewing."


STRADDLING TWO WORLDS

Hawkins' LinkedIn profile lists her academic accomplishments: undergraduate degree magna cum laude, governor's citation for volunteerism, a fellowship at Harvard's Derek Bok Center for Teaching and Learning. Then there are the pageant titles.

At 19, Hawkins entered a beauty pageant on a whim. While at the University of Maryland, Baltimore County, where she majored in cultural anthropology and visual research methodology, she was named first runner-up to Miss Maryland. At the competition, she played an arrangement from *Pirates of the Caribbean* on the piano and strutted the stage in a bikini and high heels. She also talked about the inner-city poverty she'd witnessed.

In 2015, during her second year in the Harvard doctoral program, Hawkins tutored homeless kids in Cambridge and taught low-income parents techniques to help their children advance academically. In a bid to represent Massachusetts in the national competition, she entered the Miss America pageant (not affiliated with President Trump's Miss USA event) as Miss Cambridge. She was voted second runner-up.

A professional modeling agency website lists her stats: 5'6", size 2, red hair and green eyes. In her portfolio



“HOW ARE PEOPLE FINDING WAYS OF GENERATING LOVE AND LIGHT AND HAPPINESS—AND ACTIVISM—OUT OF THIS TRAUMA?”

pictures, she looks Vogue-ready, wind-blown, pouty. In person, Hawkins wears no makeup. She dashes into a coffee shop in a Harvard sweatshirt, jeans and flats, fretting about traffic and parking. Hawkins laughs when I bring up the pageants. She gets asked about them a lot. “I ended up getting almost \$17,000 in scholarship money,” she says. “This laptop was paid for by scholarship money.”

How does she reconcile the glitz of pageants with the grit of urban violence?

She does this, in part, by casting an anthropologist’s eye on pageants’ loaded assumptions about gender, sexuality, class, and race. In January 2017, Hawkins taught a Harvard class called “Competitive Beauty: Exploring Gender, Race, and Nationalism through Pageantry.” Among the topics covered were “the value and meaning of beauty and femininity,” and “how the interplay between national identity and beauty plays out on the female body.” Pageant titleholders attending as guest speakers were “interrogated,”

Hawkins says, on what inspired them to compete and their views on empowerment and objectification.

CLEAR MESSAGES

When Hawkins first opted to enter a pageant, she chose cultural diversity as her platform. An advisor tried to dissuade her, telling her, “You’re a white woman. Nobody’s going to believe you.” Hawkins persisted. Now, as she works in a primarily black neighborhood, she feels welcomed by her “informants,” as she calls them—friends and family of the deceased, police officers, funeral home directors, community activists, graffiti artists—who lead her to Baltimore’s makeshift memorials. “I have my informants tell me what is visible to them that I’m not seeing,” she says.

Ralph notes that in anthropological field work, there’s often a connection between who you are and what kind of information you get. The anthropologist doing this work has to be “extremely empathetic, caring and respectful” of the memorial

sites, he notes. “I think Samantha has all the qualities to do a great project.”

Hawkins hopes to create a means for Baltimoreans and others to access her data, perhaps through an online interactive oral history of acts of violence and resistance. On Hawkins’ laptop, we scroll through images of street memorials, including one on a brick building on Presbury Street where, on April 12, 2015, 25-year-old Freddie Carlos Gray, Jr., was shoved head-first into a police van.

“How are people finding ways of generating love and light and happiness—and activism—out of this trauma?” she asks. On the building, a street artist has painted a blue cloud with white wings. A gold halo envelops Gray’s name in ebullient script. “I don’t think the Freddie Gray memorials will ever be taken down,” Hawkins says, then falls silent. After a moment, she looks up. “There’s something good coming out, right?” she says of Gray’s death and all the others memorialized on city streets. ❁



HOW ALGORITHMS GO BAD—

JUST DATA

BY ANN HALL
ILLUSTRATION
BY JOHN HERSEY

AND HOW THEY CAN BE SAVED



EARLIER THIS YEAR, Facebook feeds filled with selfies alongside works of art, matched through the Google Arts and Culture app. While many enjoyed connecting themselves to famous portraits by Renoir or Rembrandt, others raised privacy concerns, citing the dangers associated with facial recognition software.

Still others pointed out that the dataset of art consisted mainly of Western, and predominately male, works, meaning that for persons of color, limited matches existed—some of which were inappropriate or offensive. Because the underlying data wasn't inclusive, the facial recognition algorithm was biased. But apart from the obvious insult, the fact that the algorithm didn't work in an optimal way isn't that big a deal, is it?

“Nobody’s losing their job because the wrong art is attached to a picture,” says Cathy O’Neil, PhD ’99, who discusses algorithms and their unintended consequences through her blog *mathbabe.org*. “But first of all, it’s insulting. Second of all, it’s careless. And third, it’s emblematic of what is happening with less visible algorithms making more important calculations.” O’Neil hopes that those who are paying attention to the fallout from the Google Arts and Culture app will ask themselves, if public-facing algorithms are this bad and so carelessly put into production, should we worry about algorithms that operate without scrutiny?



**“What makes something a
weapon of math
is a combination of
It’s important, it’s
and it’s**

TRAINING GROUND

Over time, more and more industries, impressed by the potential of Big Data, are relying on algorithms to do the work that used to be done by humans. Similar to the arts and culture app, the data used to train these algorithms can be equally biased: O’Neil calls these types of algorithms “Weapons of Math Destruction.” “What makes something a weapon of math destruction is a combination of three factors,” she explains. “It’s important, it’s secret, and it’s destructive.”

Before we talk about what can make an algorithm bad, let’s consider when it works well. Take *Moneyball*, for example, the bestselling book turned movie about the Oakland Athletics baseball team’s analytical approach to player selection. By reviewing player statistics instead of relying on a scout’s gut feeling about a player’s potential, the organization was able to assemble a team that performed at the highest level. What made their algorithm *not* a weapon of math destruction was that they updated their data as new player statistics came in, enabling them to refine their results and confirm

whether the player they’d picked met their prediction. The algorithm was able to learn, becoming a better predictor of which players would be most effective.

Not all algorithms are retrained using continuously updated data. The job market is one such example. In addition to using algorithms to evaluate resumes, many employers also look at applicants’ credit scores, assuming that a higher score will correlate with better employee behavior. Auto insurance quotes operate on the same assumption, meaning that someone with a perfect driving record but a lower credit score may end up paying hundreds of dollars more a year than someone with a poor record and excellent credit. It isn’t only that low credit scores can occur for a number of reasons wholly unconnected with employee behavior or safe driving: it’s that a mechanism to gauge whether these attributes accurately predicted the assumption doesn’t exist. And while the person involved will never know the real reason they weren’t called for an interview or learn that their insurance quote was higher than someone else’s, the company using the algorithm

also has no idea whether they missed out on the best employee for the job or if they are charging a great driver more than a poor one. The algorithm doesn’t learn. The data is biased.

DETECTIVE WORK

At the Harvard John A. Paulson School of Engineering and Applied Sciences, researchers are determining how to identify and—perhaps—correct for bias.

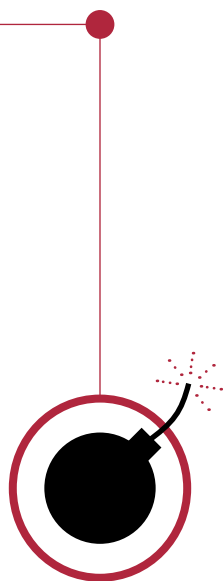
“One of the issues researchers have identified is that machine learning algorithms can reflect societal biases that exist in the data used to train these algorithms,” says Flavio Calmon, an assistant professor of electrical engineering. “This is particularly important because many of these algorithms are increasingly applied at the level of the individual, for example in recidivism prediction, loan approval, and hiring decisions.”

While algorithms aren’t creating outcomes that directly discriminate by race or by gender, they often use data containing proxies for those attributes, for example income or education level. Because these proxies can correlate strongly, the eventual output will still be discriminatory.

How the data is collected is key. A person of color living in a poor neighborhood, for example, is more likely to be stopped by police than, say, a white person in a more affluent area. If police find evidence of a crime, however minor, that person is likely to end up with a record while the more affluent person is either not investigated or let go. The data about who was arrested, for what, and where is used to inform algorithms designed to determine the probability that others arrested will go on to commit another crime—known as recidivism risk. And here’s where the bias comes in: If the data collected is predominately people of color living in poorer neighborhoods, then the algorithm will assume through proxies that a person of color living in that neighborhood will offend again.

**destruction
three factors.
secret,
destructive.”**

—CATHY O’NEIL, PHD ’99



Postdoc Berk Ustun and graduate student Hao Wang work with Flavio Calmon to identify proxies for discrimination.

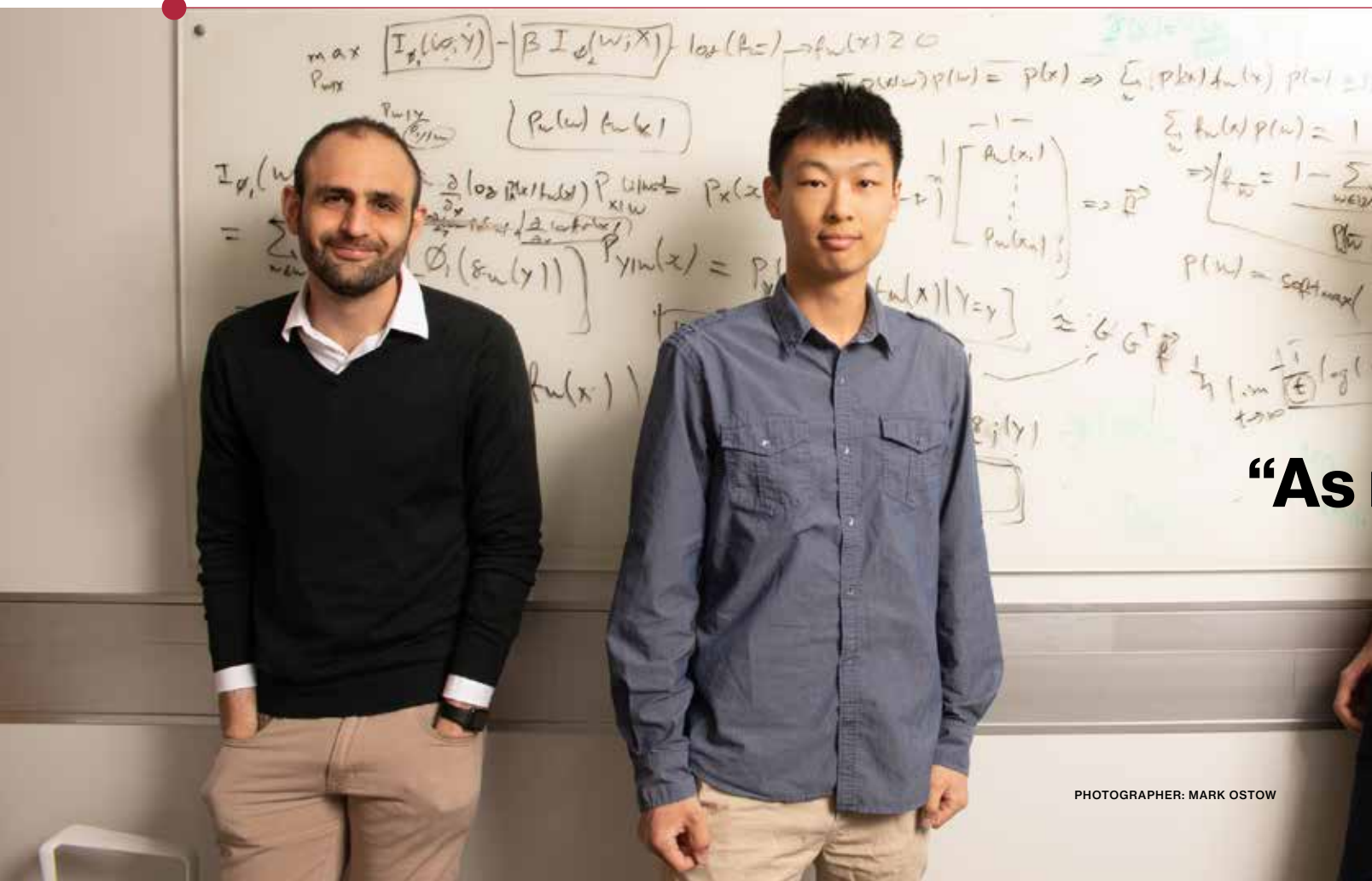
Intentional or not, the data is reflecting racial bias.

The nonprofit news organization ProPublica investigated how recidivism risk assessments are made throughout the country, focusing on risk scores given to individuals in Broward County, Florida, and tracking whether they later reoffended. While the software used to develop the risk scores does not take race into account, what the reporters found was shocking: black defendants were overreported as likely to reoffend while white defendants were underreported as recidivism risks. Something in the data was serving as a proxy for race, a phenomenon known as disparate impact.

“It’s a matter of detecting that a problem exists,” says Calmon. “For example, you use an algorithm that outputs

recidivism predictions and notice that the quality of the recidivism prediction is different for different races. Because you know that race shouldn’t be an input to the algorithm, you have to determine which attributes used by the algorithm are discriminating on race.”

Hao Wang, a graduate student in Calmon’s lab, has been working with Calmon and Berk Ustun, a postdoctoral fellow, to determine a way to address the issue. Wang is the lead author of “On the Direction of Discrimination: An Information-Theoretic Analysis of Disparate Impact in Machine Learning,” a paper co-authored with Calmon and Ustun. “Our knowledge of information theory inspired us to take on this project,” Wang explains. “In this paper, we are using tools from information theory



“As

to understand prominent disparate impact.” These are decades old and never before used for this purpose.

With the tools, Wang developed a way to identify the proxies creating the disparate impact by creating a correction function. He successfully tested the function by utilizing ProPublica’s dataset. The method is a major step forward in developing a tool to correct the training data, mitigate discrimination, and reduce disparate impact.

“Having well-founded auditing tools to detect disparate impact and explain how it occurs helps us make informed decisions as to whether an algorithm should be used,” says Ustun. “Even if you can’t correct it, you can stop using that algorithm and build one that mitigates disparate impact.”

THE MECHANICS

Calmon, Ustun, and Wang stress that while their work is important, it is only part of the solution. Discussions surrounding algorithms—how they are trained and how they are used—are very important and must involve people beyond computer science. “We’re more like the mechanics that build the engine in the car,” says Calmon. “Our role is to make sure that the algorithms and the mathematical tools that underlie it influence that discussion.”

Ustun believes that it is important for computer scientists to add their voices to the discussion. “Given that algorithms are used to make important decisions,” he says, “as mechanics we have an important role in pointing out when an algorithm isn’t fair, when it shouldn’t be used for a

particular decision.”

But ultimately, the issues are larger than those who study algorithms. “The definitions of discrimination and fairness are not in the hands of computer scientists or engineers,” says Calmon. “This should be discussed together with those in the legal sphere, and in the social sciences, philosophy, and so on.” He hopes that the methods he, Ustun, and Wang are developing will uncover proxies for discrimination and serve as an auditing tool, so that the output of an algorithm could be analyzed by experts and understood in a broader context.

O’Neil agrees about the importance of a broader conversation. In 2017, she wrote an op-ed for *The New York Times* in which she called on academia to take the lead in studying how technology is affecting our lives by bringing multiple stakeholders together to discuss and recommend solutions. By necessity, such an interdisciplinary effort must involve the creation of a new academic discipline dedicated to algorithmic accountability.

“It’s a really complicated, messy conversation and one solution won’t fit every problem,” she says. “But it absolutely must involve the computer scientists who build these algorithms. So, the answer is, it cannot happen in academia as it stands, but it must happen in academia—because it’s not going to happen anywhere else.”



mechanics we have an important role in pointing out when an algorithm isn’t fair.”

—BERK USTUN

AUTHOR PROFILE

ON FIRE: A CONVERSATION WITH CAROLINE FRASER



In *Prairie Fires: The American Dreams of Laura Ingalls Wilder*, **Caroline Fraser**, PhD '87, provides the first in-depth, scholarly biography of the pioneer girl who influenced generations of young children. The book, which earned her a Pulitzer Prize earlier this year, details the contrast between the trials and adventures portrayed in the *Little House* books with the real struggles faced by Wilder and her family.

Below is an excerpt from a longer interview Fraser gave to *Colloquy* magazine.

Colloquy Magazine: Your book is the first comprehensive historical biography of Laura Ingalls Wilder. Why do you think no one has undertaken such a study before?

Caroline Fraser: Once upon a time, children's literature was trivialized. Previous generations hardly considered it worthy of study, and they were the same generations that found women authors—especially those who wrote children's books—insignificant.

Contempt for children and the books they read dies hard, I think, and whiffs of superiority are still detectable. A few years ago, when critics reached for language to belittle Donna Tartt's novel *The Goldfinch*, their scorn was revealing. The *London Review of Books* condemned it as a "children's book" for adults, as if there were nothing worse. Whatever one thinks of that novel, it's interesting to contemplate how and why adult readers take themselves so seriously.

CM: Is what Wilder wrote decades ago relevant today?

CF: If you follow the plight of the American farmer from Wilder's day to the present, you can see how relevant her work remains. Small family farmers continue to feel threatened by federal policies and to be severely undercapitalized. Many lose money in any given year.

In a wider historical sense, Wilder's work helps us realize how skewed our narrow assumptions about homesteading and white settlement have been, how reflective of national prejudice and ecological ignorance. When we examine what happened to settlers in the 1880s and 1890s—foreshadowing the manmade catastrophe of the Dust Bowl—we can see how prone we are to repeating our worst mistakes.

●●● Read the full interview: gsas.harvard.edu/on-fire.

REVIEWS

A Language the Land Is Inventing (WorldTech Editions, 2017) is a collection of poems by **Ann Philips** (AM '73, Slavic languages and literatures). The title might suggest a focus on the environment, but Philips explores a far broader range of themes—from family bonds and identity to the infirmities of age. Particularly affecting are her explorations of place (including Missouri, Germany, and Poland), displacement, and loss. In "I Dream My Father," she imagines her father alive once more:

He is pale but walks on faster.
I ask my father how he can be
alive again.

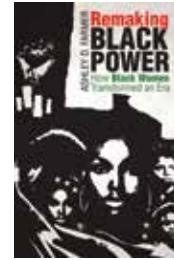
Make an effort, he says. Keep up.

Elsewhere Philips anticipates teaching a Palestinian poet, soon to arrive in Missouri, how to whistle a blade of grass held between two thumbs (something she learned from her father), while interweaving the exiled poet and the Osage peoples, who were similarly dispossessed. "Kennebec County, Maine: Losing a House" alternates vivid memories and the emotions surrounding the sale of a much-loved home. Her images are tactile, rooted, and, in a real sense, invented by the land.

The current refugee crisis has mainly been cast as an acute social challenge for recipient nations. **Patrick Ireland** (PhD '90, government) takes a different tack, investigating the long-term integration or assimilation of immigrants into new societies. In particular, *Migrant Integration in Times of Economic Crisis*

(Palgrave Macmillan, 2017) weighs the impact of the Great Recession of 2008 on distinctive immigrant communities. Ireland's study analyzes five roughly comparable "global cities"—Chicago, Toronto, Montreal, Barcelona, and Hamburg—which have comparable populations (1.6–2.7 million inhabitants) and numbers of immigrants (11–18 percent of total population). He focuses on five immigrant groups: Poles, Romanians, Serbs, Pakistanis, and Ghanaians. Immigrant enclaves face contradictory impulses from the larger society—celebrated, on one hand, as desirable signs of cultural diversity, yet faced with economic forces and assimilationist policies that challenge their very existence. Although the recession certainly continued the undermining of ethnic communities, the rate of change didn't noticeably accelerate. Ireland concludes that class is the more salient variable here: Gentrification pushed poorer residents out of newly desirable city centers regardless of ethnicity or nationality.

To an unfortunate extent, the Black Power Movement (mid-1960s–70s) has been framed



around its hyper-masculinity: Bobby Seale and Huey Newton with big guns and berets; sprinters Tommie Smith and John Carlos, fists raised, at the '68 Olympics; Eldridge Cleaver glaring from the cover of *Soul on Ice* (1968). **Ashley Farmer** (PhD '13, African and African American studies) challenges this approach, noting that many women participated in the movement. Moreover, they were instrumental in expanding the Black Power critique to encompass imperialism and sexism as well as racism. **Remaking Black Power: How Black Women Transformed an Era** (University of North Carolina Press, 2017) places the movement into its historical context. Black women activists drew on longstanding ideas of Black Nationalism, pan-Africanism, and anti-colonialism. They also identified with outspoken

working-class black women—for Farmer, “militant Negro domestics”—exemplified by the fictional Mildred Johnson, main character in author Alice Childress’s serialized column in the radical Harlem weekly, *Freedom*. Farmer also discusses illustrations by black female artists published in *Black Panther* and *Triple Jeopardy* (the “triple” here refers to racism, sexism, and imperialism).

A melding of literary analysis, biography, and artistic appreciation, **The Cambridge Companion to Alice Munro** (Cambridge University Press, 2016) collects 10 essays, edited by **David Staines** (PhD '73, English and American literature and language). Staines contributes an efficient introduction and one of two chapters on the importance of the Canadian setting in Alice Munro's short stories. Munro

herself is well-traveled, from the People's Republic of China to Scandinavia, but—like Faulkner and his fictional Yoknapatawpha County—her short stories unfold mainly in a microcosm, the rural and small-town world of Huron County, located in southwestern Ontario. What might seem a limited setting offers Munro, recipient of the 2013 Nobel Prize in Literature, a universe of emotional complexity and well-observed detail. Notable among the other contributors is Canadian author **Margaret Atwood** (AM '62, English), who focuses her discussion on Munro's 1971 short-story collection *Lives of Girls and Women*. Other essays address her writing style, the importance of her own mother in certain stories, and her use of varied cultural tropes, from Greek myths to Norse sagas to Celtic ballads.

POSTSCRIPT

Marianne Novy (AM '67, English and American literature and language), published *Shakespeare and Feminist Theory*, which considers how feminist theory can help analyze the dynamics of Shakespeare's plays. Feminist theory and the plays deal with issues such as likeness and difference between the sexes, the liberating possibilities of desire, what marriage means and how much women can remake it, and how women can have power through language.

Former Frank Knox Fellow **Stephen Banfield** (GSASP '76), has published *Music in the West Country: Social and Cultural History across an English Region*. Ranging over 700 years, the book explores the soundscape of England's West Country and examines music-making in tiny villages as well as in more populous areas. What emerges is both a study of the typical—musical practices which would apply to any English region—and a portrait of the unique features born of the region's physical isolation and charm.

••• **Would you like your book considered for inclusion?** Send it to Colloquy, Graduate School of Arts and Sciences, Harvard University, 1350 Massachusetts Avenue, Suite 350, Cambridge, MA 02138. Questions? E-mail gaa@fas.harvard.edu.



Lasting Contributions

GSAS AWARDS ITS HIGHEST HONOR, THE CENTENNIAL MEDAL

ON MAY 23, GSAS presented the Centennial Medal to four distinguished alumni who have made fundamental and lasting contributions to knowledge, to their disciplines, to their colleagues, and to society: Beth Adelson, PhD '83, founder of the 24th Street Sangha in Philadelphia and professor emerita of psychology and computer sciences at Rutgers University, for her teaching and research concerning Buddhist meditation; Guido Goldman, AB '59, PhD '70, founding director of the Minda de Gunzburg Center for European Studies, for his dedication to transatlantic relations; Harold Luft, AB '68,

**The 2018
Centennial Medalists:**
Choon Fong Shih,
Harold Luft,
Beth Adelson, and
Guido Goldman

PhD '73, director of the Palo Alto Medical Foundation Research Institute and Caldwell B. Esselstyn Professor Emeritus of Health Policy and Health Economics at the University of California, San Francisco, for his influential work as a health care economist; and Choon Fong Shih, SM '70, PhD '73, University Professor at the National University of Singapore, for his innovative research and for his leadership in higher education.

••• Read more about the 2018 Centennial Medalists at gsas.harvard.edu/lasting-contributions.



“Expanding the human bounds of knowledge is a noble endeavor and needs to be supported.”

—Roger W. Ferguson Jr. '73, JD '79, PhD '81, P'17

Support GSAS students with a gift to the Graduate School Fund.

alumni.harvard.edu/gsasgift

Roger Ferguson feels a deep connection and empathy toward graduate students today. “Having gone through the process of earning a PhD, I know what it’s like to take five or so years preparing to live the life of an academic,” he says.

He gives to help support future policy makers. “The development of first-rate professionals and the next generation of teachers and scholars is critical,” says the professional economist who likes to hear what GSAS students are doing now in the discipline.

Creating financial well-being for those dedicated to education is a priority for Ferguson, who is president and CEO of TIAA, the leading provider of retirement services in the academic, research, medical, and cultural fields. He’s grateful for the Harvard experiences that led him there. “Harvard created classroom opportunities that propelled me and have been the fuel in my career ever since,” he says.



HARVARD

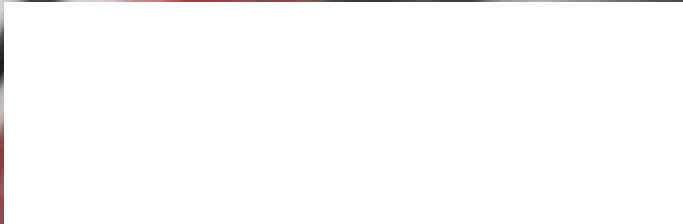
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ALSO IN THIS ISSUE:

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