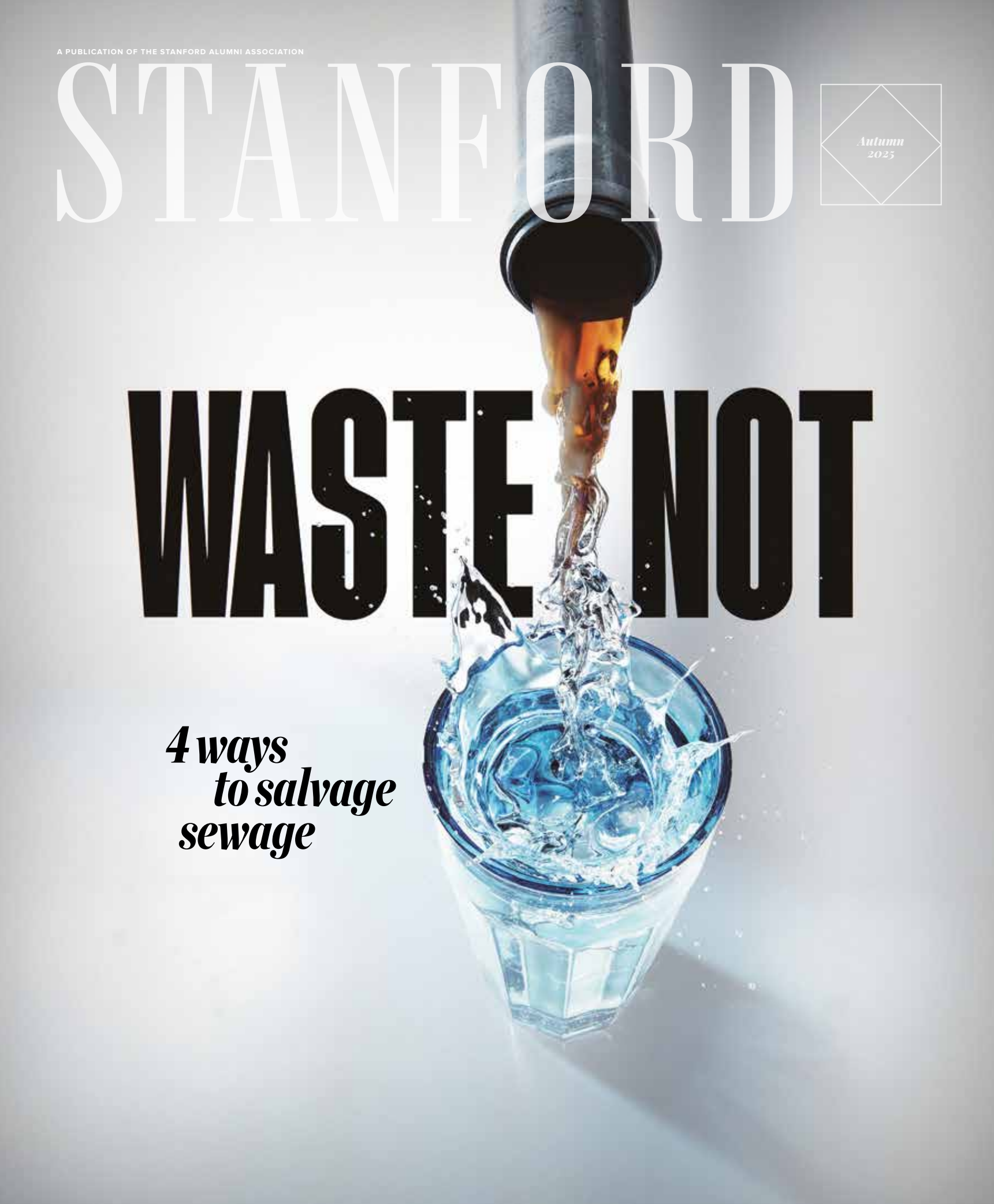
A PUBLICATION OF THE STANFORD ALUMNI ASSOCIATION

# STANFORD

Autumn
2025



# WASTE NOT

## *4 ways to salvage sewage*

# Your Next Chapter Matters, For You and For Society

**Deborah Bennett**
Stanford BA '77
UChicago LSI Fellow '25

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# STANFORD

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Former Stanford quarterback **Andrew Luck**, '12, MA '23, shared some thoughts about the future of Stanford Football. Then he was tasked with putting them into action.

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Out of sight, out of mind—that's the typical fate of our wastewater. But there's treasure in that trash. Here are four ways society can make the most of it.

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Neurologist Helen Brontë-Stewart's path to personalizing Parkinson's treatment started with a simple question: How does my brain know how to move my body without my thinking about it?

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For 100 years, the Stanford Graduate School of Business has taught future leaders to balance big-picture thinking with practical problem-solving. The results are found from Nike to Trader Joe's—and in the GSB's influence worldwide.

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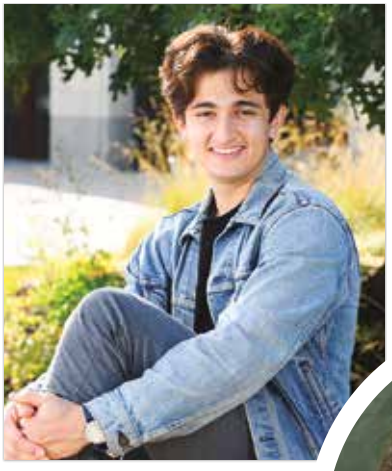


## stanfordmag.org

***How to be creative***

***So, you want to work in public service***

**COVER:** PETER CROWTHER; **THIS PAGE, CLOCKWISE FROM BOTTOM:** TIMOTHY ARCHIBALD; TONI BIRD (2); ANTHONY PECCHI/AIRBUS HELICOPTERS

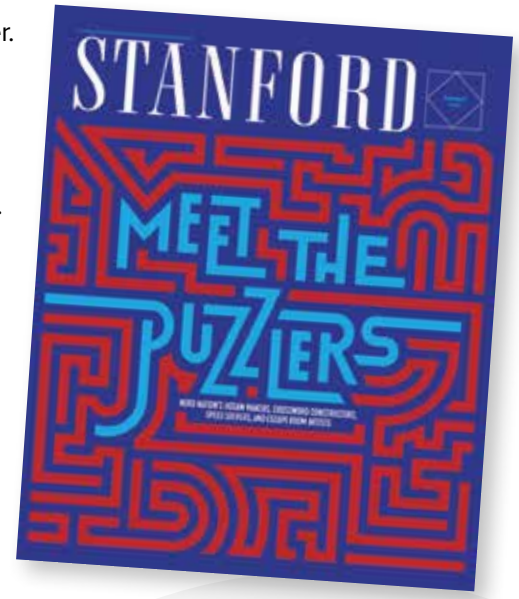
# Dialogue

# Brain Teasers

A collection of Summer stories featured Nerd Nation puzzle makers and solvers of all stripes.

As possibly the last Luddite in Silicon Valley, I have no use for any tech gizmos and thrive on pens, pencils, and words printed on paper. The *New York Times* crosswords are intelligent and addictive, and I thank [constructor] Jeff Chen, ’93, MS ’94, and his mentees for their contributions. For more cruciverbalist fun, and to exercise word “puzzle-solving genes,” I recommend the puzzle in *Harper’s Magazine*, which is modeled on the British version of puns and anagrams. One solver with a mailed-in correct solution is awarded a year’s subscription. In the 43 years I’ve been faithfully submitting, I have won three times. (Written on my Adler manual typewriter.)

**Margo Sensenbrenner, ’70**
**Menlo Park, California**




Your distinction between shape and color in solving a jigsaw puzzle (I love them!) made me wonder if any researcher has tested people on their relative puzzle-solving skills. What interesting things we might learn about vision, mental processes, and problem-solving skills.

**Carole Jean Howard Tremblay, ’65**
**Vaudreuil-Dorion, Québec**

## Sorted Out

***We asked what you puzzle through in daily life. Here’s a sampling of your responses.***

I am a legal and HR compliance executive, and I enjoy solving people/employment challenges and potential employment legal problems for a living.

***Canetta Reid, ’90***
***Katy, Texas***

The motivation and mind of our 16-year-old grandson.

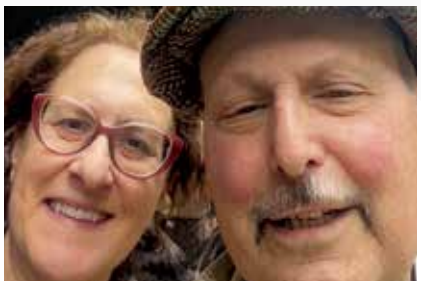
***Janis Cenedella, ’79, MS ’81***
***Laguna Niguel, California***

I’ve completed the *New York Times* mini crossword 2,765 days in a row, keeping track of my solve time each day in an ever-growing spreadsheet. My favorite new puzzle is Align from the *Boston Globe*, where a mini-like grid is full of scrambled letters waiting to be put in the right places.

***Ben Thier, MS ’22***
***New York, New York***

I wouldn’t say “puzzle.” I would say I’m a problem-solver, as I help people maximize their mobility and safety while leading and supporting an acute care rehab team to be more effective and efficient.

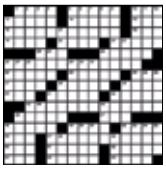
***Marissa Brooks, ’89***
***Charlotte, North Carolina***



## The Prizewinner

Congratulations to Martin, MS ’75, and Arlene Fogel, whose entry was randomly selected in our crossword contest. Martin will co-create a puzzle with Chen.

FROM TOP: LUKE LUCAS; MARTIN FOGEL



**333**

out of

**374**

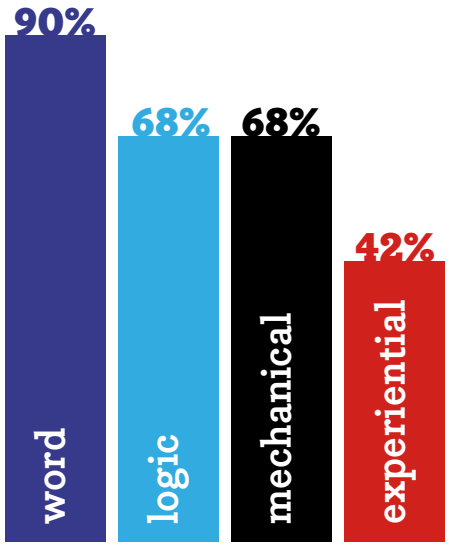
entrants submitted the correct answer

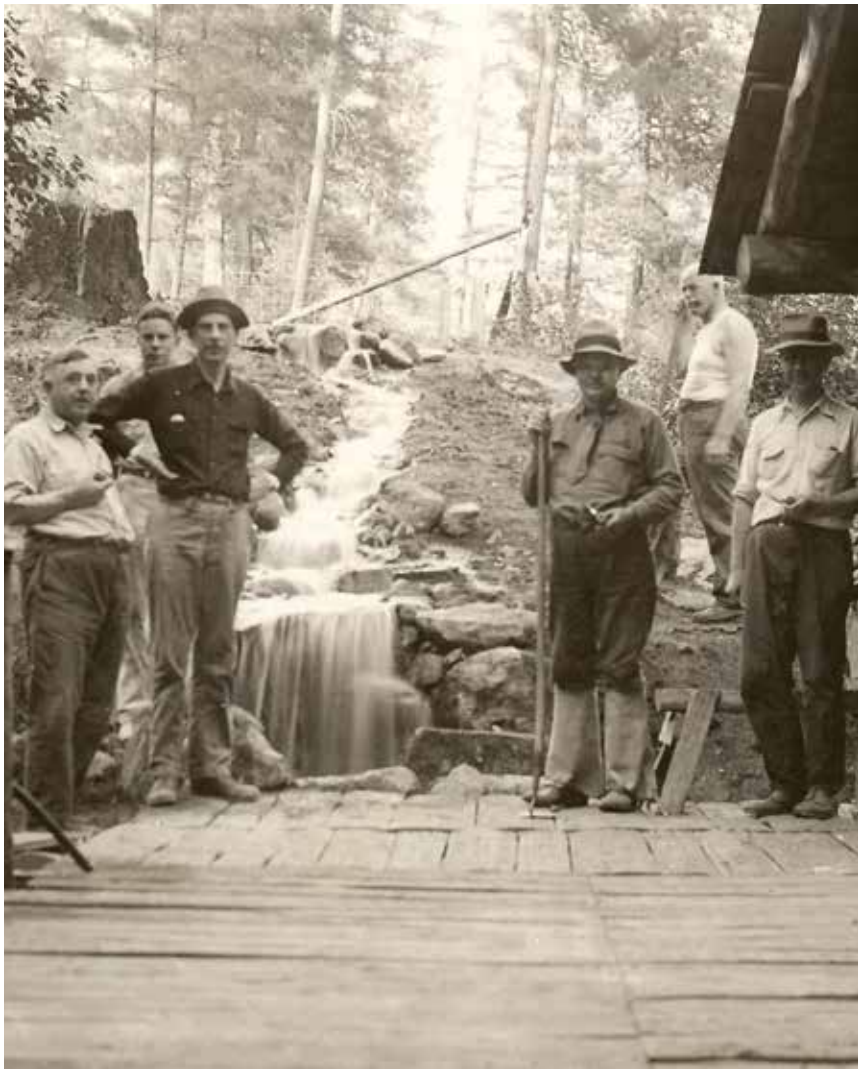
**–Wilbur–**

to our custom crossword puzzle by Jeff Chen, ’93, MA ’94

## Word Nation

*We asked which types of puzzles you like to do.*



## Weekenders

The Summer issue included a story on the four-year acting presidency of Robert Eckles Swain, Class of 1899. Swain held down the Farm fort while his friends Herbert Hoover, Class of 1895, third from right, and Ray Lyman Wilbur, Class of 1896, MA ’97, MD ’99, third from left, served as U.S. president and secretary of the interior, respectively. The story recounted how the three men enjoyed hunting and fishing at Wooley Creek in far northern California. Wilbur’s great-grandson, Bruce Wilbur Hart, ’73, MBA ’77, sent in a 1934 photo from the cabin at Wooley Creek and assures us that the Wooley Camp Association is still in operation today.

## True Spirit

***In the Summer issue, we profiled Bonobos co-founder Andy Dunn, MBA '07, who lives with bipolar disorder, and ran an obituary for Josephine King McNary, '01, who died of major depressive disorder.***



I think a lot of alumni, whether they have a clinical diagnosis or not, will resonate with the idea of how our traits and gifts can be tools for success and impact—and burn our mental health or inner circle to the ground. I hope my classmates take "A Ghost Story" to heart. And my heart goes out to the family of Josephine King McNary and is thankful to learn more about CalPsychiatry, the community she founded. Take care of yourselves and each other, Card.

***Caitlin Smith Sayegh, '09***
***Los Angeles, California***

## The Brothers Baseball

***A Summer story chronicled the sports broadcasting careers of Dave, '98, MA '98, and Will Flemming, '02.***

As a Giants fan, I am familiar with Dave, and I knew that his brother, Will, calls games for the Red Sox, but I did not know that they are Stanford alums. Great story.

***Shelley Correll, MA '96, PhD '01***
***Professor of sociology***
***Menlo Park, California***

## No Easy Goodbyes

***The Summer issue's Farewells included Dylan Johnson, '88.***

I was saddened to read that Dylan had passed away. He was listed as [having been] in the marching band. Dylan was not "in the marching band." He was a master of mischief, a leader of laughter, a merry musician. Dylan was drum major of the one, the only, the truly incomparable Leland Stanford Junior University Marching Band. Dylan, you bring back good memories, and you will be missed.

***Alex Camacho, '87***
***Seattle, Washington***

## Courting Critique

***The Spring cover story showcased the ways Stanford is teaching constructive dialogue skills.***

It is a worthy effort to build skills for productive disagreement. The requirement to find another who wants to talk about their disagreements seems to limit the program's potential. I sense a greater problem emerging these days with folks just not caring at all about what others have to say. I continue to send my draft manuscripts to colleagues before publication to get those cherished comments: "Never thought of it that way," "Not sure I understand what you mean," and "Do you really want to say that?" I fear a decline of interest in bothering to disagree. But I could be wrong.

***David Chambers, PhD '69***
***Sonoma, California***

A couple of years ago, I started doing alumni interviews for local applicants. One of the most common questions they asked me was what I liked about my time at Stanford. I would share a story that I vividly remember. It was the first day of Orientation, and we were told, "Sometime in the next couple weeks you will be sitting with a Catholic, an atheist, a Christian, and a Jewish student—probably past midnight. Soak up the conversation you have with them, because this is one of the special opportunities at Stanford. You will learn as much from one another as from your professors." Not three weeks later, I had to chuckle. It was right around midnight, and I was sitting in my dorm with an atheist, a Christian, and a Jewish student (I am Catholic), and I absolutely loved our open, honest conversation about a wide variety of topics.

That was the beginning of a wonderful four years of feeling so thankful for the opportunity to participate in such a special environment of discourse with such intelligent people eager to share their ideas. I thought it had vanished. I wasn't sure I could share that story anymore. So, I stopped interviewing. But now I'm thinking I want to start again, thanks to your article.

***Kim Nunley, '95***
***Reno, Nevada***

## Write to Us

**dialogue@alumni.stanford.edu**

*Letters may be edited for length, clarity, and civility, and may appear in print, online, or both.*



## *Editor's Note*

KATHY ZONANA, '93, JD '96


# Going Strong

Discoveries happen here, and we get to tell you about them.

**I HAD NO IDEA** the Strong Interest Inventory was invented on the Farm until I read our article on the 100th anniversary of the Stanford Graduate School of Business (page 72). Nor did I know it was named after the man who developed it, GSB professor Edward Strong Jr.

The SII was my favorite assessment in a career planning course I took in 1998, when I was casting about to transform myself into anything but an attorney. I was—and am—grateful that there are people who enjoy practicing law, but I was not one of them.

No matter what my SII results may have revealed, I spent most of the course trying to disabuse my classmates of the notion that I just needed to tweak my legal career—maybe join an NGO or go in-house. Then the instructor looked at me and said, "I'm going to try something on you, and I want you to just react." I nodded, and she unveiled her hypothesis: "'I want to work at Stanford even if I have to mop the floors.'"

And I said, "That's right."

Three months later, I became the editorial assistant at STANFORD. I've worked at the magazine for 21 of the past 26 years, taking a five-year break to hold three other jobs at the university.

The Strong Interest Inventory is just one of hundreds of useful Stanford-generated research insights I've gotten to learn about by working here. Over the years, stories in this magazine have changed or deepened my thinking about forgiveness. The placebo effect. Free will. Longevity. Virtual reality. Permafrost. Income inequality. Beauty. Autonomous driving. Archimedes. Rural nutrition. Concussions. Authoritative parenting. Cancer treatment. Ants.

Discoveries happen here, and my colleagues and I get to tell you about them. In this issue alone, you can read about a "pacemaker for the brain" that adapts to control Parkinson's symptoms (page 64), the potential of wastewater to produce drinking water, nutrients, materials, energy, and information (page 54), and the sex-linked genetics of orange cats (page 22). No matter your intellectual interest, odds are that Stanford scholars are shedding light on it.

The Strong Interest Inventory, by the way, said I should become a nursing home administrator. In hindsight, that does seem like something I would have enjoyed. Curiously, "magazine editor" was not on the list. But then again, neither was "lawyer." ■

*Email Kathy at kathyz@stanford.edu.*



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FROM LEFT: TIM O'BRIEN; ASHTON WORTHINGTON; PETER STRAIN

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*President's Column*
JONATHAN LEVIN, '94

# How It Started; How It's Going

President Levin on his first year in office.

**STANFORD: When you came into this job, what did you think was going to occupy your time?**
**Jon Levin:** I wanted to renew Stanford's distinctive spirit of excellence, openness, and optimism. The provost, Jenny Martinez, and I had three immediate priorities: to strengthen Stanford's culture of inquiry and curiosity, to advance Stanford's leadership in AI and data-driven discovery, and to make Stanford work better for its faculty and students. Stanford is an entrepreneurial place and it works best when there's not too much red tape.

I also wanted to get out and learn from faculty, students, staff, alumni, and others who care about the university. That was one of the great joys of the year.

**What took more of your time than anticipated?**
There's more uncertainty around federal support for universities than at any point in the past 80 years. The endowment tax, which Congress passed this summer, will have significant financial consequences for the funding of scholarships, graduate fellowships, and professorships. The federal government is taking a different posture on civil rights enforcement and international students. Support for research is far less certain. We have to navigate a path forward in all of those areas. I have spent a lot of time talking to people in Washington and around the country about the value of American universities: the innovation, the quality of education, why federal support is in the national interest, and why universities contribute so much to this country.

I have complete conviction that I could take practically anyone, walk them around the Stanford campus to see the range of things going on in classrooms, labs, faculty offices, athletics facilities, and the hospital, and they would come away a believer in research universities.

**Where's one place you could take them?**
We hosted the secretary of energy at the SLAC National Accelerator Laboratory to hear from faculty about battery research, where we've spun out probably a dozen companies, and to see the CryoEM facility, where we do ultracold imaging of molecules that has given rise to all kinds of scientific discoveries. He saw the first pictures from the LSST, which is the largest digital camera in the world and takes a picture of a third of the sky every night. It was built at Stanford and deployed this year at the Vera C. Rubin Observatory in Chile. That's an incredible example of partnership among the federal government, the university, and private philanthropy.

**Tell me about connecting with students.**
Reconnecting with undergraduates, who I'd been away from as dean of the business school, has been an unexpected joy. I emceed a pie-eating contest between the physics department and the math department on March 14th. Pi Day. That was memorable. And it has been fun to go running with the running club. It almost killed me in spring quarter. But I'm going to be back in the fall.

**What do you think is going to happen in year two?**
I want to spend considerable time on the undergraduate experience: residential education, where we need a renewed vision after the pandemic; the review and possible expansion of the freshman COLLEGE curriculum, which has been a great success; and the educational impacts of AI, where we need to wrestle with the advent of large language models. We modestly increased the number of undergraduates this year and have a task force looking at class expansion. We could admit more talented and deserving students while maintaining a transformative educational experience, and it would help reset the balance of undergraduates vis-à-vis the rest of the university, which has expanded. Particularly if other universities did the same, it could make a difference nationally to meet the demand for education at America's great universities. ■

Do you have a question for a future column?
**ALU.MS/ASKLEVIN**

TONI BIRD

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# Perfectly Seasoned

Alexander Calder:
"Look what I made."

Mother Nature:
"Hold my pumpkin spice latte."

**PHOTOGRAPH OF *THE FALCON***
**BY ANDREW BRODHEAD/STANFORD UNIVERSITY**

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WHO WE ARE

# Meet Diego Romero

An engineer, a baker, a friendship maker.

*"When I'm baking, I'm pretty much always tweaking stuff. Every kitchen is different. Every environment is different. If you're not always making changes for those little things, it's not going to be exactly how you want it."*

TONI BIRD

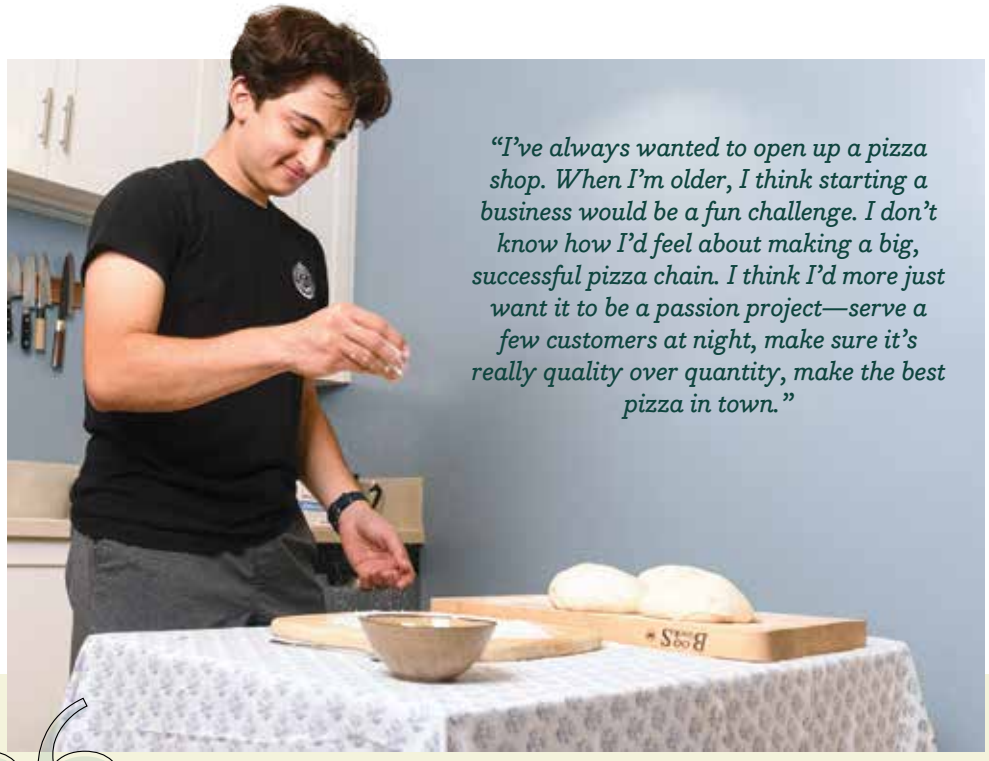
**DIEGO ROMERO GOT INTO STANFORD** with an assist from sourdough. When the pandemic began, Romero was 14 and quarantining at home in Portland, Ore., where he found the heralded cookbook *Tartine Bread* in his family's kitchen. Four years later, he'd spent so much time perfecting that golden brown crust that he chose the "Create your own prompt" option for his college admissions essay and wrote: *Is baking an art or a science?*

"The change for me—from making good bread to great bread—happened when I put away that recipe book," he says. (He now calls the book his "alma mater.") "There's more importance in just understanding the loaf, paying attention to the dough. Playing it by ear gets you to engineer how you approach the process."

For Romero, the creativity needed to improve any baguette, croissant, or pizza crust helps make the case for baking as an art. The same concept applies to his academic interests in math and electrical engineering. He says that although many people view the hard sciences as largely formulas and number-crunching, "the whole problem-solving process requires a lot of creativity."

Now a sophomore, Romero hopes to harness his creativity as an electrical engineer to solve problems created by climate change, perhaps using his love of circuits to address issues in battery storage or the energy grid. Or maybe he'll dig deeper into battery chemistry. "You get to really invent a solution," he says. "Nothing is purely just following a set of instructions." ■

SEE ROMERO ON VIDEO AT **ALU.MS/DIEGOROMERO**



*"I've always wanted to open up a pizza shop. When I'm older, I think starting a business would be a fun challenge. I don't know how I'd feel about making a big, successful pizza chain. I think I'd more just want it to be a passion project—serve a few customers at night, make sure it's really quality over quantity, make the best pizza in town."*

*"I took [Computer Science] 106A in the fall, and the professor talked about that big aha moment where you put that missing puzzle piece in. You're seeing the problem in a certain way that breaks it down and makes it super simple and satisfying for your brain to understand. Finding those moments is something that I really enjoy.*

*"I really like circuit board design. There's this very visual aspect to drawing all the little electrical traces on the board, making the perfect geometries. It's fun to play around to see which design is more efficient, which one is going to save you the extra couple cents to make the board a little bit smaller. I've got to put this component in just the right spot, make sure the trace is just thick enough to reduce the resistance but also look nice. It scratches that itch.*

*"The summer after my sophomore year [in high school], I got an internship at Portland State University designing and building a portable wind turbine. That was my first experience bringing math and science into the sustainability world. I was very confused for most of the internship—the math was above my pay grade; I did not have enough physics. But instead of feeling almost paralyzed, like,* Can I really do this? *it was, like,* I need to do this.

*"Before I went off to college, everyone was like, 'Yo, you need to keep baking because you'll make so many friends.' There's this birthday fairy role in the dorm, and I just remember thinking:* This seems like a way to do that. *Working with the other birthday fairy, we made a Google form, like, tell us which birthday cake you want. We got 20 boxes of chocolate and 20 boxes of vanilla. When you don't know anyone in your dorm yet, you just want to make that connection. I think it's really powerful."*

TONI BIRD (2)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# A Tall Tale

50 years ago, a Tree took root on campus.

**CHRIS HUTSON** had no idea she was doing anything that would endure past halftime, let alone for half a century. On the eve of Big Game 1975, Hutson, '76, MS '77, aided by her friend Jan Kraus Wolfe, '76, MS '77, pulled an all-nighter to craft a costume out of three reams of red construction paper, a scuba harness, a Styrofoam cone, and various random supplies. By lore, the last staple went in at 4:30 a.m.

Behold, the first Stanford Tree.

The concept of a tree mascot had originated two weeks earlier among members of the Band, who wanted to spoof the very idea of mascots. The Indian had been discontinued in 1972, and a student referendum on its replacement was drawing near, with "Robber Barons" an early favorite. Band members wanted their own candidate. They just needed a sufficiently inane idea to rally around. The answer came to seniors Bob Tiffany, '76, and Eric Strandberg, '76, on their drive to the USC game. "What could be a more absurd idea for a mascot than an essentially immovable, ubiquitous object?" Strandberg recalls.

Thus ensued plans for a Big Game halftime pageant featuring a tree queen on a wooden platform, laureled wood nymphs, and a Charlie Brown–esque Christmas tree on the back of a golf cart. And so it might have transpired if Hutson hadn't heard the plans and taken it upon herself to create something more animated. A studious senior with eyes on veterinary school, Hutson recalls going to just one football game in her previous three years. But she thought Robber Barons was an insult to Stanford history and that a tree would make for an honest, forthright mascot. Plus, she liked to boogie. "I'm a person where I hear the music, I want to dance," she says.

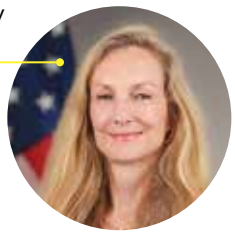
Her debut surprised the Band, but hardly tilted Stanford off its axis. Two weeks later, students voted for Robber Barons (and the administration ignored that vote). Trees—plural—finished third. At that point, Hutson's costume should have gone into the wood-chipper. But she'd had a blast and asked to come back. The Band was game.

Perhaps the most important thing Hutson did as the Tree was pass the costume to Robert Siegel, '76, MA '77, MD '90, a conga drum player in the Band (and these days, a teaching professor of microbiology and immunology), ensuring the Tree would endure. Fifty years and 47 Trees in, the mascot—still unofficial—is firmly planted in Stanford culture.

Early in her career, Hutson kept her Tree-ness on the down-low. It didn't seem in keeping with her role as a provider of veterinary care. These days, it's quick off her lips. "Now that I'm retired, I tell people all the time." ■

## THE TICKER

After 23 years as Stanford's CFO, **Randy Livingston**, '75, MBA '79, has retired. But don't fret: **Craig Carnaroli**, MBA '90, has arrived to take up the mantle after more than 20 years at the University of Pennsylvania.... Also packing a big suitcase is **Jennifer "DJ" Berinstein Nordquist**, '89. She's leaving the Council of Economic Advisers, in Washington, D.C., to become a deputy director-general of the World Trade Organization, in Geneva.... **Mitch Johnson**, '09, on the other hand, is stepping up by staying put. After six seasons as an assistant coach with the San Antonio Spurs, you can call him head coach. Forget packing a suitcase—he's got nothing but net.



CLOCKWISE FROM TOP: LORI GIBSON, '77; ABE MCNATT/WHITE HOUSE; CHARLES KRUPA/AP

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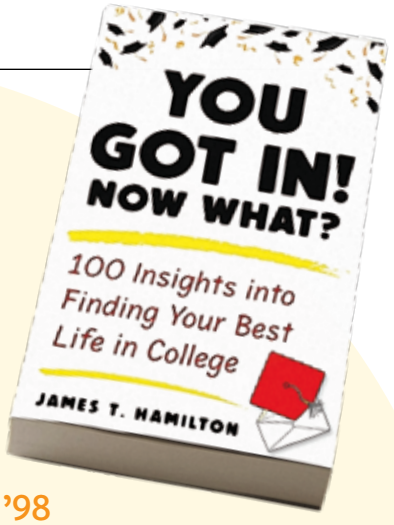
*You Got In! Now What? 100 Insights into Finding Your Best Life in College* by **James Hamilton**, a professor of communication and Stanford's vice provost for undergraduate education, is a frosh-friendly compass for navigating what's next. Its short, standalone entries won't add to the overwhelm. *Notes from the Farm: Stanford Stories on Finding Your Way* offers 51 missives by students and recent grads and is aimed at members of the Class of '29 (and obscured from the rest of us by way of minuscule font size). Each entry aims to either foster a sense of belonging or convey campus traditions.

From either vantage point, the books' message is singular: You belong here—go make the most of it. ■




How Socrates influenced the career of actor Sterling K. Brown, '98

Attack ideas, not people

It's your life—a lesson on choosing your path

Study what's interesting. Baboons are acceptable

Sometimes you'll be lonely; community takes time

**Don't focus so much on the degree that you miss the ideas, people, and experiences**


**Everyone has imposter syndrome**

Embrace rejection and failure

Prepping pasta for 60: life in a co-op

**If you go to virtual office hours, don't forget that your camera is on (and your clothes should be too)**

**Bring your own tradition: jazz concerts in a bathroom**

**What FLiCKS, fountain hopping, and Full Moon on the Quad are**

What advice would you give incoming frosh?
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# Sky's the Limit

Stanford Medicine Life Flight begins its fifth decade with a new, state-of-the-art helicopter.


## High five

The Airbus H145 D3 has five rotor blades, one more than its predecessors. That extra blade helps reduce vibrations—a welcome attribute in a space where nurses may start IV lines and place breathing tubes at 160 mph. Crews—two nurses and a pilot—practice in the back of an ambulance with speakers blasting the 85-decibel roar of rotors. "You do not last long if you cannot work as a team," says flight nurse Emily Otto.

## I see you

Stanford Life Flight is not so much a flying ambulance as a soaring ICU. The new ride has a larger cabin space, making room for everything from advanced heart pumps to a ventilator to a neonatal incubator.

## Ready for liftoff

Life Flight teams strive to take off from the roof of Stanford Hospital within seven minutes of a call. The aim is to be fast but not hurried, with everyone operating on ingrained habits. "Slow is smooth, smooth is fast," says program manager Lee McMurray.

## Tech driven

The new helicopter is a smarter ride, with all-digital displays and superior autopilot features that can adjust max speed as payload weight changes or air temperature increases. And it can fly lower than its predecessor in obscured conditions. "This aircraft will get us underneath that cloud layer to where we can pick up patients we couldn't previously," McMurray says.

## At the top of their field

The crew might land on a beach to reach a shark bite victim, or transport a cardiac patient with an open chest, or treat a premature baby—a span of care that calls for supergeneralists. Stanford's 13 flight nurses regularly rotate through the adult, pediatric, and neonatal ICUs, as well as the emergency department and labor and delivery. They're also trained in survival techniques—such as upside-down water exits (choppers are top-heavy)—and to assist in landings, sometimes wearing night vision goggles to spot obstructions. ■

## Go the distance

Life Flight covers a 300-mile radius, from Santa Barbara to far-north Crescent City, Calif., to Reno, Nev. One-fifth of calls come from on-scene 911 emergencies, including car crashes. But most transports take critically ill patients already in a hospital to facilities with higher levels of care.

ANTHONY PECCHI/AIRBUS HELICOPTERS


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# Start-up Stage

A hip-hop musical, Silicon Valley style.

**CONWAY IS A WANNABE TECHIE** from Pennsylvania, all sheen and no substance. Esata is an Oakland native, all hacker talent and no cultural capital. When they team up at a Bay Area accelerator to pitch a start-up to the venture capitalist Sandy Hill, odd-couple hijinks ensue. But perhaps Conway and Esata are not as different as they seem.

That conceit is at the heart of *Co-Founders*, a hip-hop musical co-written by **Beau Lewis**, '04, that premiered this summer at American Conservatory Theater in San Francisco.

*Co-Founders* has its roots in stress relief. In 2013, Lewis sold his viral media business, then immediately started working with his wife, Debbie Sterling, '05, to launch GoldieBlox, which aimed to close the gender gap in the construction toy aisle. By 2015, Lewis says, "I basically needed some sort of therapy." So he turned to one of his childhood comforts: freestyle rap. "Every Tuesday, me and three other guys, Jason Tan, Jodie Ellis ['03], and Brent Schulkin ['03], who were also founders, got together and put on a beat and let stories flow out of us: fears, admissions on our entrepreneurial journey." Their first staged reading was a hit with friends and colleagues, and Anthony Veneziale, who co-founded the improv hip-hop group *Freestyle Love Supreme*, provided Lewis with mentorship for version 2.0.

On stage this summer was version 13 of the musical, co-written by Ryan Nicole Austin, Lewis, and Adesha Adefela. "We're kind of the heart, which would be Adesha; the grit, which would be me; and the drive, which would be Beau," says Austin, who also portrayed Esata's cousin Kamaiyah. "That's why I think the show works—the three of us."

Version 13—which will get further upgrades in the coming months as its creators aim to take it to Broadway—pays homage to Bay Area innovation both technological and musical. "We asked this question as, does it take the same hustle to sell a tape out of a trunk as it does to sell a computer out of a garage?" Lewis says. Even the audience is invited to get into the act by pitching start-up ideas in the lobby; the winning concept is transformed into a battle rap and performed onstage. "We want those people in the audience to be reflected as entrepreneurs who might not have thought of themselves as such," Lewis says. "And if we build in that we can accept user-generated content in real time, then the show can refresh itself as well." ■

# Out of the Bag

How your cat got his fiery fur.

**CAT LOVERS,** you were right all along—the gingers really are special. While plenty of mammals have orange or red hair, only in domestic cats is the coloration correlated with sex. Now, researchers at Stanford Medicine have pinpointed the genetic mutation responsible: a small genetic deletion that increases activation of a nearby gene in cats' pigment cells. This rogue expression disrupts the color-making process, swapping out brown and black pigments for a marmalade shade.

The mutation—known as sex-linked orange—is located on the X chromosome, giving males the advantage: They need only one copy of the gene in order to go full ginger. Females, with their pair of X chromosomes, need two; having one will result in patches of pumpkin, as in calico or tortoiseshell coloring.

Sex-linked orange is an example of how genes acquire new functions that allow for adaptation, **Christopher Kaelin**, PhD '06, a senior scientist in genetics and lead author of the study, told Stanford Medicine. Studying it helps scientists understand the emergence of physical traits in various species. And while tangerine cats are known for being lovable goofballs, Kaelin suggests that's because most of them are male—there's nothing to show that personality has to do with hue. ■

FROM TOP: MIKIE SCHULZ; MICHELE MCCAMMON


# NEVER STOP *finding new paths*

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WHAT YOU DON'T KNOW ABOUT

# SPOT

These five-day excursions help new students find their way.

**BY SAM SCOTT**

**THE ORGANIZERS** of Stanford Pre-Orientation Trips—aka SPOT—emphasize that their five-day excursions into the great outdoors are suitable for any skill level. But having never so much as seen a sleeping bag, Avey Etaghene feared she was an exception. It was only on the last day of sign-ups that she steeled herself with the thought: *What better time to push out of my comfort zone than now?*

And so Etaghene, '27—a transfer student who grew up in Nigeria before moving to Houston in high school—arrived on campus a week before New Student Orientation last September in a state of unreadiness that makes her laugh to remember. She had no hiking boots, no backpack, no headlamp, and no jacket. No matter. SPOT leaders obtained what she needed. After a night sleeping in tents on Roble Field, she and 195 fellow "spotlets," along with 34 student leaders, fanned out to three locations: Point Reyes National Seashore, Pinnacles National Park, and Etaghene's destination, Plumas National Forest, high in the Sierras.

So has the SPOT tradition proceeded—with variations in details—every summer save 2020 since two Stanford students named Sarah latched on to the idea more than two decades ago.

Etaghene headed out as a skeptic—"My God, why do people camp if there's a chance there's a bear nearby?" she wondered—and returned as a partial convert. (She says she's probably more of a glamper.) Far away from air and light pollution, the views and the night sky were unlike anything she'd ever seen. "I was just staring up and just being like, 'Oh wow! I've come so far,'" she says. "'Look at me under the stars in the middle of a forest in Northern California.'" And she found a surprise satisfaction in PB&J, her refuge from more intimidating camp food, such as grits. "I'm still getting used to the American cuisine." What she loved most was the camaraderie of cooking on a tiny stove, sharing stories, and spontaneously dancing to no music around a campfire ring with no fire. "It was just a genuine place of meeting new people and connecting," Etaghene says. "We still have a group chat where we all keep up with each other."

### The point is to bond.

The program was not designed to teach how to pitch tents or to hone advanced backcountry skills, says co-founder Sarah Rubinfeld, MS '02, PhD '10, now an associate professor of environmental science at Carthage College, in Kenosha, Wis. It was about making Stanford a more welcoming, comfortable place. The outdoors has a way of bringing strangers together—being around one another day and night, sharing shelter and food, being far from distractions. "The way you get to know people in the woods is different, right?" she says. "Walking into New Student Orientation, walking into your first day of class, knowing there are people who like me even when I'm dirty and smelly—that's a confidence boost."

### Some credit is due to the Tigers.

The spark for the program was a conversation Rubinfeld had with fellow founder Sarah Shulman, '03, in the fall of 2002, when both were leaders in the Stanford Outdoor Education Program. On a Friday-night drive to the Sierras, they talked about Rubinfeld's undergrad experience at Princeton, which had begun with a six-day backpacking trip in southern Vermont. Other schools offered similar programs. Why not Stanford? Around the same time, Krista Zizzo, an administrator in charge of New Student Orientation, heard from a relative who raved about a similar trip. She found her way to the Sarahs to discuss it.

### Transfer students had first dibs.

Thirty participants joined the first SPOT trips in September 2003, in Desolation Wilderness, not coincidentally near Stanford Sierra Camp, where Shulman—now a rabbi in Denver—had worked as a hiking leader.

COURTESY EMILY DICKEY, '23, MS '25, AND NOAH BARTELT, '23, MA '24


CARL CELEDIO, '22

"We needed a way to plan routes that didn't require us to go out and spend days hiking," Rubinfeld says. "Sarah knew Desolation well enough that we could basically use her brain as our scouting." To keep headcounts manageable, enrollment was initially limited to transfer students. In 2004, SPOT expanded to frosh from the Northeast under the theory that those from farther away would need more help adjusting. The *Stanford Daily* was not impressed, titling an editorial "Pre-Orientation Trips Not Inclusive." By 2008, SPOT was open to all entering undergrads.

**Screen time is out.**

Participants break into groups of a dozen, with two student leaders certified as wilderness first responders who have taken a quarter-long course on outdoor leadership. They don't force participants to give up their phones and watches, but they highly recommend it. Questions about the hour are hence likely to be answered with "SPOT o'clock."

**Sharing your story is in.**

The emotional heart of the program lies in its "spotlights," protected times throughout the trip when each member of a group gets to talk about their life's journey for up to an hour. "I learned a lot of very personal things about people that I wouldn't learn about other Stanford people for months and months," says Creagh Factor, '27, who has been a SPOT participant and a leader. "It was a really great way for us to realize that we were all in college for the first time and very nervous about what that was going to be. It's a very special tradition."■

SAM SCOTT *is a senior writer at* STANFORD. *Email him at sscott3@stanford.edu.*

REVIEW

# Tell Me More

REVIEWER

**MICHELE ELAM**

*is a professor of English and a senior fellow at the Stanford Institute for Human-Centered Artificial Intelligence. Email her at stanford.magazine@stanford.edu.*

**LATELY I'VE BEEN LISTENING** to a lot of spontaneous, angst-ridden conversations between people about AI. Increasingly, those exchanges concern AI and creativity. Although few agree on just what creativity is, most nonetheless view it as one of the qualities that distinguish humans from machines, a putatively truer Turing Test for artificial intelligence. This is why many people feel existential nausea when they encounter some of the often deeply convincing chatbots that produce poems, novels, music, visual art, and so forth (a visceral unease described as the "uncanny valley" by robotics professor Masahiro Mori in 1970). What does this all mean for humanity—and, on a more intimate and immediate level, for our sense of self, both individually and collectively?

**Vauhini Vara**, '04, an award-winning novelist and technology reporter, puts her finger on the pulse of this vertiginous cultural moment in her most recent book, *Searches: Selfhood in the Digital Age*. Making sense of the moment you are living in as you live it is a near-impossible task. Vara, who grew up in Seattle, reflects on how her coming of age and career have been inextricably tied to the rise of the technology industry and Silicon Valley's influence. She came into her own sense of self with (and through) the rise and increasing penetration of AOL and Google, and later Amazon, into nearly all facets of daily living and social interaction. That technological saturation, she explains, shaped her maturation—the very formation of so much of her and her generation's identity.

Vara's perspective makes *Searches* a fascinating read. Neither a manifesto nor a guide to AI, the book is a genre unto itself: part memoir, part chatbot experiment, part meditation on the complexities of language and communication, part critique of the technology industry, part confession of her succumbing to its commercial lures. She writes of the guilty ease of frictionless buying, well understanding the ethical sins that enable such convenience: the monetizing of personal data, the privacy violations, the exploitation of human labor and natural resources.

I was particularly revisiting and then sharing the iterative process of rewriting "Ghosts," her experiment with OpenAI's chatbot to help her tell the story of her sister's death by cancer, which garnered public attention in print and social media. Some readers, she recalls, felt it proved AI could never replace writers, though, she writes, "in my opinion, GPT-3 had produced the best lines in 'Ghosts.'" Others hailed it as exemplary of the future of AI-human collaboration. Through her poignant rewriting of the essay, she recognizes that the machine-generated lines she'd once admired had alienated her from her own language, her own truth, her own experience—and, powerfully, her own consciousness. ■


**For me . . . writing is an attempt to put into language what the world is like from where I stand in it. The language doesn't exist before the attempt begins; it's the attempt itself that conjures the language into existence."**

*—Vauhini Vara, '04, in* Searches: Selfhood in the Digital Age*, Pantheon*

CLOCKWISE FROM TOP: LINDA A. CICERO/STANFORD NEWS SERVICE; BRIGID MCAULIFFE; JEN DOSTALEK

# Life of the Mind

**Pronoun Trouble:**
The Story of Us in Seven Little Words
John McWhorter, PhD '93; Avery. These unsung heroes stand in for nouns, are laden with linguistic precedent (see singular *they* back in the day), and punch above their weight in meaning, impact, and flexibility.

**The Mind Electric:**
A Neurologist on the Strangeness and Wonder of Our Brains
Pria Anand, MD '14; Washington Square Press. How our brains build narratives that drive us to do mad and wonderful things, in sanity and insanity.

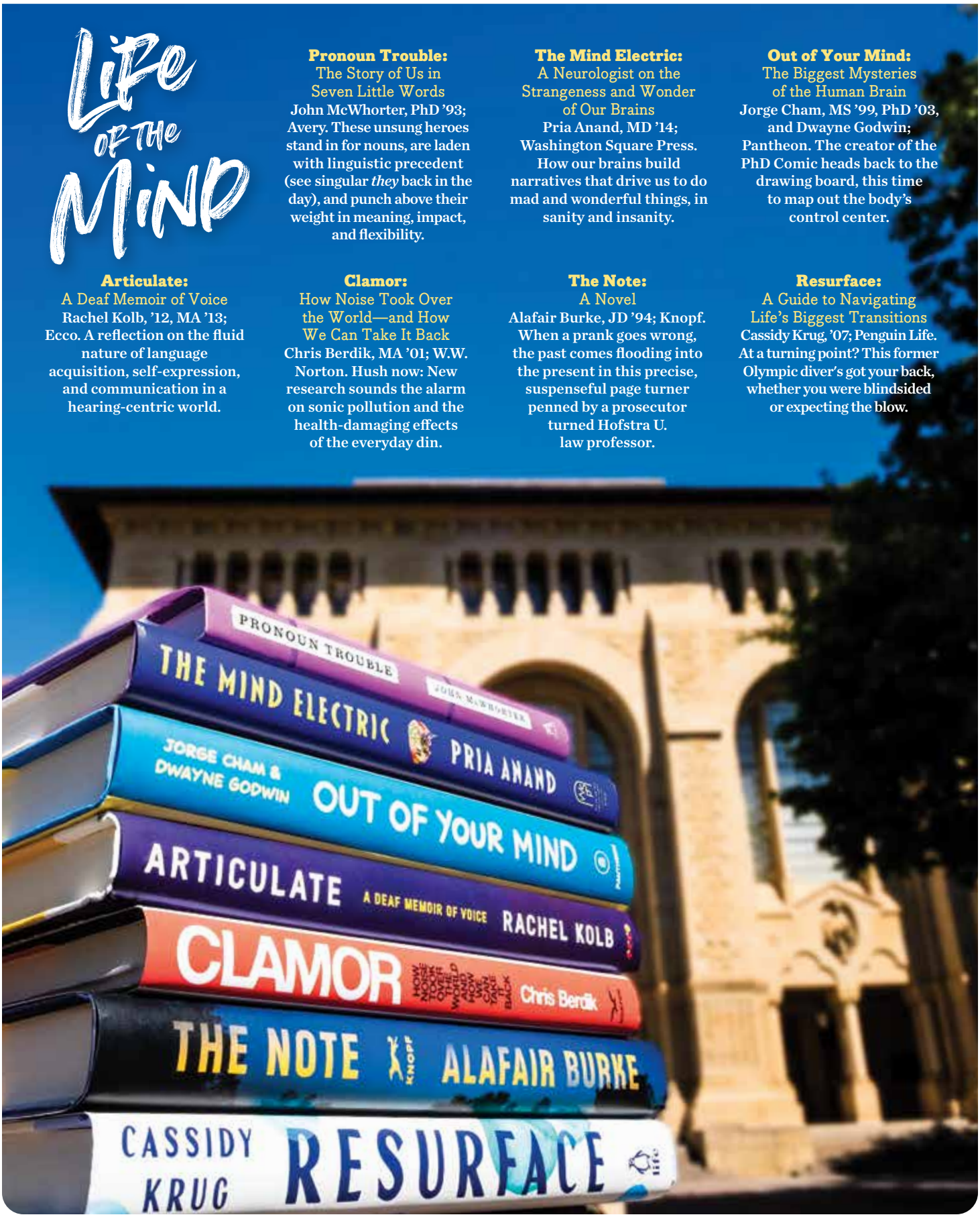
**Out of Your Mind:**
The Biggest Mysteries of the Human Brain
Jorge Cham, MS '99, PhD '03, and Dwayne Godwin; Pantheon. The creator of the PhD Comic heads back to the drawing board, this time to map out the body's control center.

**Articulate:**
A Deaf Memoir of Voice
Rachel Kolb, '12, MA '13; Ecco. A reflection on the fluid nature of language acquisition, self-expression, and communication in a hearing-centric world.

**Clamor:**
How Noise Took Over the World—and How We Can Take It Back
Chris Berdik, MA '01; W.W. Norton. Hush now: New research sounds the alarm on sonic pollution and the health-damaging effects of the everyday din.

**The Note:**
A Novel
Alafair Burke, JD '94; Knopf. When a prank goes wrong, the past comes flooding into the present in this precise, suspenseful page turner penned by a prosecutor turned Hofstra U. law professor.

**Resurface:**
A Guide to Navigating Life's Biggest Transitions
Cassidy Krug, '07; Penguin Life. At a turning point? This former Olympic diver's got your back, whether you were blindsided or expecting the blow.




JEN DOSTALEK

WORDSMITHING

# THE COPY EDITOR

## As the New Yorker turned 100, Andrew Boynton celebrated with a little italicizing.

**BY KAREN SPRINGEN**

Briefly, earlier this year, **Andrew Boynton**, '83, was famous, which is rare for a copy editor. But it was the *New Yorker*'s 100th birthday, and the magazine's head of copy was celebrating with a little italicizing. Among the legendary publication's style changes that generated a flurry of press coverage: using slanted letters to designate a person's internal thoughts. Traditionalists will be relieved that the centennial "reëxamination" of the style guide showed restraint; the diaeresis, indicating that adjacent vowels are pronounced separately, remains intact. Karen Springen, '83, chatted with Boynton about the changes—and the stetting—as he prepared to retire after three decades as a guardian of grammar.

*This interview has been edited and condensed from three conversations.*

**STANFORD: The changes you made include using one word, with a lowercase w, for *website* and one word for *cellphone*. The hyphen in *teen-ager* stayed. How did you decide?**

**BOYNTON:** One of the criteria we used in keeping things was that they reflected the personality of the magazine. There are people who love us for our quirks. The things we wanted to change were of more recent vintage, things in the technology world—like *Web site* and *cell phone*—that didn't have that long history with the magazine.

**How did it feel for a copy editor to be on the front page of the *New York Times*?**

Surreal. Most copy editors enjoy being in the background. Good copyediting isn't noticed. You notice if something doesn't have copyediting. It's sort of a stealth kind of operation.

**You also got national attention when you appeared on *Jeopardy!* in 1992. How was that brush with fame?**

I flubbed the Daily Double. The category was Famous Women. It was something like, "This educator was the first woman to receive a medical degree in Italy." I totally blanked. It turned out to be Maria Montessori.

I did get Final Jeopardy right. The category was The Elements. "It has the lowest melting point of any metallic element, -38° F." The answer was mercury.

**That wasn't enough to win?**

I came in second.

**Your first full-time job after graduation was as an editorial assistant at *Art & Antiques* magazine. Then you were a contemporary dancer for a decade with Susan Marshall & Company. What made you switch?**

When I moved to New York, I kept dancing on the side, and then I met Susan, somebody I respected and whose work I loved. I was 24. Dancing was not something I could come back to later. It was a no-brainer for me.

**You began to find your way back to editorial work nine years later, when one of your dance friends mentioned an opening for a night-shift freelance proofreader at the *New Yorker*. You joined the copyediting staff full-time in 2001. What do dance and copyediting have in common?**

You really do have to pay attention to the little things with both. The [dance] company's process was very collaborative. I wasn't just being told what to do. Even though copyediting is not thought of as creative, you're still having to craft something and think of a better way to do something, how to shape

COURTESY ANDREW BOYNTON (THIS PAGE); CHRISTOPH HITZ (OPPOSITE PAGE)

something. The collaboration is very important. It's a conversation between the copy editor and the story editor.

**The *New Yorker* is legendary for its copyediting. Would you explain how it works?**

When one of the senior copy editors, the OKers, starts working on the piece, it's pencil on paper, single column. It's in depth, trying to solve as many of the problems as possible at an early stage. The OKer will read it several times. It gets cleaner and cleaner. The copy editor is marking things that are clear errors and correcting those but also noting places where things could be misread and suggesting alternative phrasing. All of this is in service of, how is it going to make the reader's experience easier? There's a *New Yorker* custom whereby suggestions by a copy editor to an editor are suggested with question marks. It's respectful: "I'm not telling you to do this. I'm suggesting it. It's up to you as the story editor to decide." Often in these queries, even if the editor doesn't exactly like the fix you suggested, it can spark a recognition that there is a problem there. It can spark a quest to find the way to fix this problem.

**Would you talk about clarity, your holy grail?**

You're trying to maintain the ideas in the author's voice. You're weeding out the extra verbiage or convoluted logic or reasoning and filing it down a little bit without robbing it of life. You're trying to do it in a clean, concise way without making it sound like a dictionary.

It's peeling away the superfluous language—overused adjectives and adverbs.

**What is your copyediting pet peeve? I think it's the dangling modifier?**

It is. It's like this mystical animal. When you find one, it's just so satisfying to grab hold of it and fix it.

**You've copyedited everything, including the Shouts & Murmurs page and the cartoon captions. How do you keep a light touch so you don't get rid of the humor?**

You put on a different hat. Being too precise or too grammatical can be a distraction from the humor. In the early days, I would question whether something should be *who* or *whom*. The editor would say, "No, people don't talk like that." Also, in Shouts & Murmurs, a person inexperienced with working with humor can be too literal in wanting to know the identification of everyone who's mentioned. There's a breeziness to humor that you have to accept. With the cartoon captions, it's knowing the little tricks to make the speech sound natural. It's really the punctuation that makes it feel conversational. A semicolon in somebody's quote stands out as fussy, whereas a dash—people read over that much more easily.

'EVEN IF THE EDITOR DOESN'T EXACTLY LIKE THE FIX YOU SUGGESTED, IT CAN SPARK A RECOGNITION THAT THERE IS A PROBLEM THERE. IT CAN SPARK A QUEST TO FIND THE WAY TO FIX THIS PROBLEM.'

**What's the most memorable story you've ever copyedited?**

Lawrence Wright wrote a piece at the end of 2020 about the first nine months of COVID that we had lived through—this momentous event. I wanted to be a part of it because of the topic and because of the writer, who's an incredible investigative reporter, and the other personnel involved. It was 30,000 words. It took up the entire issue. The fact that it was so long was this challenge. Can I read what turned out to be 90 columns of type closely and attentively over and over again?

**Would you explain the closing meeting for that story?**

We meet and we go through the piece page by page. We do the same order for each page: writer, fact-checker, OKer, and then the editor. The editor is the arbiter of the questions. The editor on this piece is wonderful because he's very decisive. During this meeting, the OKer is basically the stenographer, noting all these changes on a physical paper proof. The back-and-forth for 30,000 words was very intense. There was a lot of information from nine months of COVID that had to be untangled. Everyone's interest is different. The fact-checker's interest is in the facts. My interest is in: How does this read? Are there infelicities? Is there confusion? The writer is interested in: How does it sound? Is this what I want it to say? The editor is giving changes that apply to all of those things and ruling on questions. We actually had two closing meetings. We wanted to get it perfect. The first meeting, I know we broke for a meal in the middle of it. It was probably six hours.

**What would you recommend for alums who want to develop a love of words in their kids or grandkids?**

Read quality publications and books. Reading is the best way that we've always had to acquaint ourselves with words and figure out what kind of writing we like and don't like.

**I know you love a good mystery novel.**

I'm obsessed with detective fiction now. I'm starting to read Agatha Christie's Poirot novels, in order. I'm going to read all 38.

**Any occupational hazards?**

I still kind of copyedit books that I'm reading for pleasure. It can distract me a little bit. I would like to get that out of my system so I can read like a normal person. ■

KAREN SPRINGEN, '83, *is a journalism professor at Northwestern's Medill School. Email her at stanford.magazine@stanford.edu.*

WHAT'S YOUR FAVORITE TENET OF GRAMMAR, USAGE, OR STYLE?
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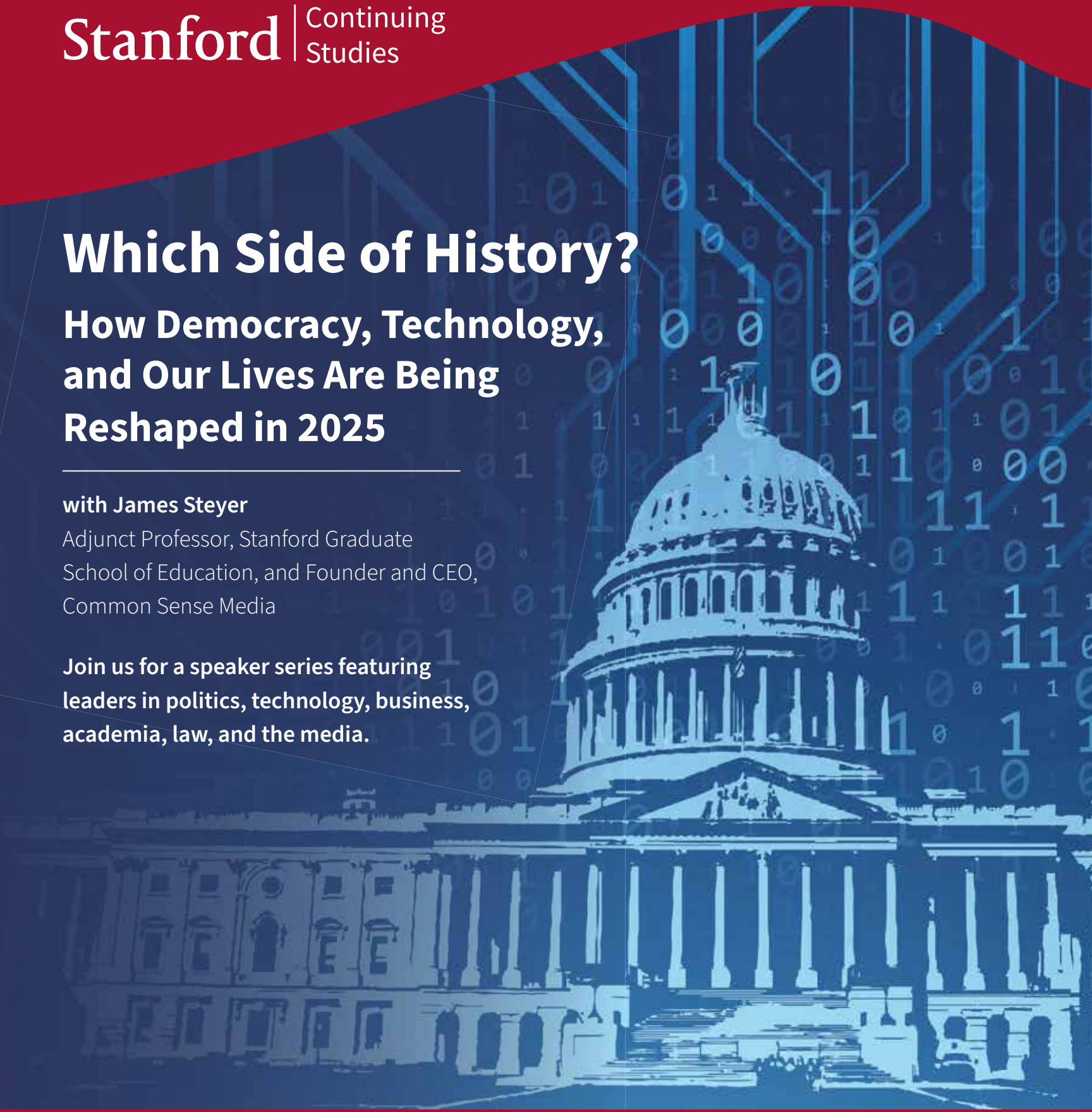
# Which Side of History?

## How Democracy, Technology, and Our Lives Are Being Reshaped in 2025



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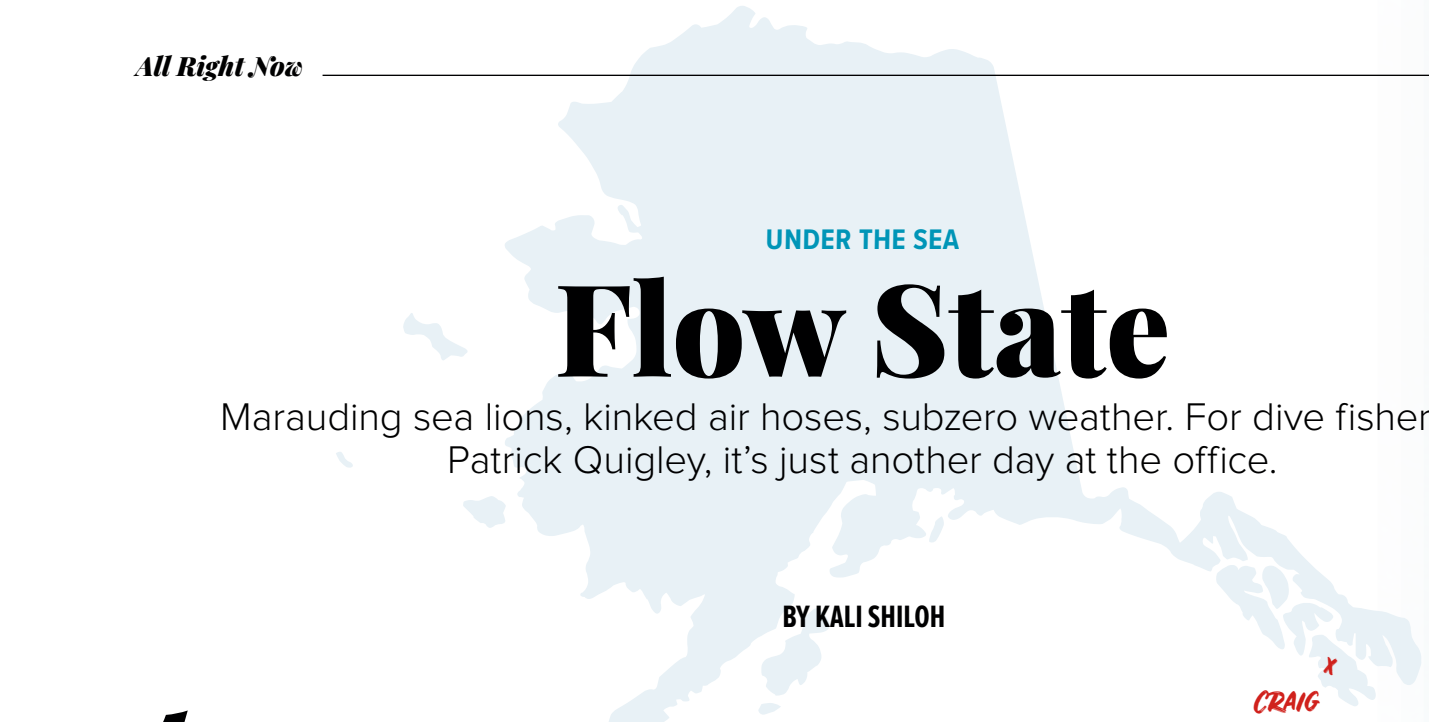
UNDER THE SEA

# Flow State

Marauding sea lions, kinked air hoses, subzero weather. For dive fisherman Patrick Quigley, it's just another day at the office.

BY KALI SHILOH




**PATRICK QUIGLEY'S WORKDAY** began like any other, on the ocean floor in the Gulf of Alaska. The commercial fisherman was in Kasaan Bay, 50 miles from his hometown of Craig, alone in the frigid water, diving for sea cucumbers.

Only he wasn't alone.

"I had half a bag of sea cucumbers, which is 150 pounds," he says. As he tossed cukes into his bag, a pack of sea lions, curious and hungry, approached. "These things are 1,500 pounds. They have very similar skulls to grizzly bears," he says. They're also agile, reaching speeds of up to 30 miles per hour. They zipped by Quigley, the water in their wakes pushing him side to side. Using his scuba suit radio, he called up to his dive tender—in charge of keeping him safe from the boat—and learned that the sea lions, numbering 9 or 10 in all, were going up and down from the surface.

Quigley, '14, was stuck. Racing up to his boat would give him the bends without necessarily keeping him safe from the sea lions. But down on the ocean floor, he was a sitting target. "I'm yelling at my freaking dive tender, like, 'Do something!'"

"What the hell do you want me to do?" the tender yelled back.

There wasn't time to figure that out. One sea lion broke from the pack and darted in. "I throw my bag in front of me, and it bites the bag," says Quigley. The animal "starts jerking back and pulls me probably 10 or 15 feet, and I finally pop [the bag] just right, and it rips a hole."

As soon as the sea lion realized the bag was full of sea cucumbers, it lost interest. While the slug-like creatures are a delicacy in East and Southeast Asia, sea lions, mercifully, don't have the same opinion of them. With his heart pounding, Quigley tied a knot in the net to keep his catch from slipping out, then made his way back to the boat as quickly as he could.

Sea lions aren't the only threat to Quigley's livelihood, let alone his life. From his 55-foot boat, the *Diana Jean*, Quigley spends most of his working life jumping overboard to harvest his catch—mainly sea cucumber and the large burrowing clam known as geoduck—from the seafloor by hand. His boat has lost power in 18-foot seas and he's been cut off from his air supply 50 feet below the surface.

But he loves it. "You've probably heard the term 'flow state,' right? For me, that is what diving is," he says. "When I'm diving, I'm 100 percent there. There's nothing else on my mind."

## OUT OF THE BLUE

Quigley began helping out on his father's boat as soon as he could walk. He spent his first full summer at sea when he was 2 years old, and later missed school to pitch in during the busy season, his alarm set for 3 a.m. to help his father pull in salmon. By the time he was 18, he wanted to be anything but a fisherman.

*I'm getting out of Alaska. I'm never going to do this*, he remembers thinking.

Yet there were early hints of his interest. By 11, Quigley was donning a scuba suit so he could swim under the hull of his dad's boat to scrape off barnacles. Afterward, they'd head to the open water of the nearby bay, where his dad, Jim, would let him dive for fun. "That was my payment for doing the work dive that he didn't really want to do," says Quigley. In the kelp beds, with crystal clear waters and the creatures of Alaska all around him, Quigley got his first taste of that flow state. "I didn't realize how rare that kind of moment is," he says.

In 2010, Quigley left Craig (population 1,201) for Stanford (frosh population 1,674). He spent summers fishing for salmon to earn money for school, majored in public policy, and set his sights on becoming a lawyer. Before applying to law school, though, he took a year off to travel with his older brother, Corbin. They spent a few months fishing in Alaska to save up money, then decamped to New Zealand, walking nearly 2,000 miles across its length.

"It's like, *Well, shoot. This was a lot of fun. I might do this again*," says Quigley. And so he did, again, and again, and again, always with law school just beyond the horizon. For four years, he and his brother spent the spring and summer months fishing in Alaska, pulling in halibut, black cod, and salmon, and the fall and winter months chasing the sun in the Southern Hemisphere. Slowly, accidentally, fishing had become a choice rather than a chore.

In 2015, they were scuba diving in the Gulf of Thailand when a docile, spotted whale shark—an animal the size of a school bus—came within five feet of the group. The wonder unlocked a passion in Quigley. On his next trip, he spent seven months diving recreationally in every country in Central

ONDŘEJ PROS

GEODUCK = "GOOEY DUCK"

SEA URCHIN

THE DIANA JEAN

SEA CUCUMBER

ME

MY BROTHER, CORBIN

COURTESY PATRICK QUIGLEY (4)

'I'm not actually swimming when I'm diving. I'm wearing big Sorel hiking boots and catcher's knee pads, and I have a hose attached to me.'

America. During his two-month stay in Honduras, he dove four or five times per day.

*Wow, I really love doing this,* he remembers thinking. *How can I make this more of a career?*

The answer was back in his hometown.

## A SEA CHANGE

Southeast Alaska has three main dive fisheries: sea cucumber, geoduck, and sea urchin. The creatures sit nearly motionless on the seafloor, so fishermen jump overboard in scuba gear to grab them one by one, like children at a competitive underwater Easter egg hunt. Quigley tried it the next chance he got.

"It is *so* much fun," he says. "I fell in love with recreational diving, and then I got into [commercial diving], and it's just like, *Yes, this is so much better*." In 2017, he tossed the idea of law school overboard and decided to go all in as a dive fisherman. He needed money for the commercial permits—almost $200,000 in total—and for his own boat, so he fished year-round for the next five years, averaging between 285 and 320 days at sea per year.

Since 2022, he has focused on the dive fisheries, which are active from October to March. It's not exactly a temperate workplace. "They're out in the Gulf of Alaska, diving in the middle of winter," says Kate Sullivan, the executive director of the Southeast Alaska Regional Dive Fisheries Association, where Quigley is vice president of the board. "We have huge tidal ranges, huge currents, huge water flows, big bodies of water."

"I'm not actually swimming when I'm diving," says Quigley, who has been known to venture out in minus-10-degree weather. "I'm wearing big Sorel hiking boots and catcher's knee pads, and I have a hose attached to me." All three fisheries require similar gear: a 7-millimeter-thick dry suit that keeps out the icy water, a long rubber air hose that connects divers to their oxygen supply on board, and a giant mesh bag that holds up to 300 pounds of catch. Flood lights attached to Quigley's helmet help him see, and a 70-pound weight around his waist keeps him on the seafloor, up to 90 feet below the surface.

To keep species populations healthy, the state limits the number of days and hours each fisherman can dive, which means Quigley is always moving as fast as he can. "I don't get wet because I wear a dry suit, but I'm soaked by the end of the day just from sweat," he says. He especially loves the athleticism of sea cucumber diving. "It's like a triathlon down there," he says. He runs across the sand, scales 20-foot outcroppings, jumps off rocky ledges, and dashes through kelp beds while searching for the next patch of cucumbers.

"He's a beast underwater," says Corbin, who has been diving alongside him since the early days. The Quigley brothers are among the Alaska permit holders—about 150 for sea cucumber and 50 for geoduck— who hit their quota every week, catching the maximum amount allowed. "He works incredibly hard, and he's really good at what he does," says Corbin. "He's intelligent enough to make the right calls and the right moves."

Self-reliance and calm under pressure are essential, because beneath the fun is an undercurrent of risk. Most years, Quigley says, at least one diver in Southeast Alaska drowns. Air hose emergencies are especially common, and Quigley just went his first season without experiencing one. A wrong turn underwater or a strong current creates a kink in the thick, rubber hose, or moist, frigid air freezes inside of it. When the oxygen cuts off, Quigley says it's like putting your lips inside an empty cup and inhaling to suction it to your mouth, except that feeling encompasses his head as his ears pop and he sucks every ounce of air out of his mask.

He always carries a 20-cubic-liter bailout tank on his back that buys him time to ascend, but the ocean is creative when it comes to danger. Fortunately, most of Quigley's coworkers are more courteous than a certain gang of sea lions. Ducks sometimes dive into the water alongside him. Octopuses like to follow him and grab the scraps he leaves behind. So do flounders, lingcod, and snapper. And while sea lions lack some tact, he loves when their pups stop by. In diving down to get food for people, he's both witness to and participant in a small ecosystem of wildlife. He enjoys the front-row seat.

"It's the most beautiful office in the world, right?" he says. "You're out in total wilderness—orcas and humpbacks and eagles, and everything is just gorgeous." He now hopes to fish for the rest of his life. While he may not push himself quite as hard as he gets older, he says, his ideal retirement doesn't look much different than his life does now.

With his permits paid off, Quigley is back to traveling several months a year, and while he still enjoys it, he also has a newfound appreciation for Craig. "We call it our Alaska vacations even though we live in Alaska," he says. When Quigley's not fishing, he and his wife, Melissa Peavey, a fellow Craig native, like to go hiking, power boating, and camping. "I'm a small-town kind of guy," he says, "but I didn't know that when I had only been in small towns." ■

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COURTESY PATRICK QUIGLEY

# Podcast Spotlight

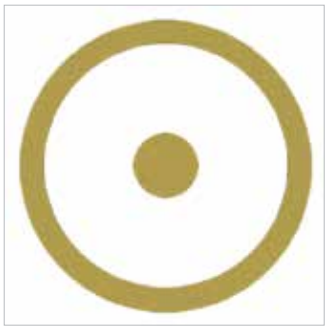

## Know This

**The MLA Podcast**

**Grace Harryman, MLA '26**
Available on Spotify

KNOW THIS is the official podcast of Stanford's Master of Liberal Arts (MLA) program, where big ideas meet real lives. Each episode features conversations with MLA students, alumni, and faculty exploring everything from literature, history, and art to politics, science, and bioethics. Whether it's a reevaluation of Toni Morrison's legacy, reflections on environmental justice, or creative projects inspired by archival research, KNOW THIS showcases the curiosity, passion, and rigor that define the MLA community.

Come for the insight—stay for the stories.



## Entitled Opinions

**Robert Harrison, Faculty**
Available on Apple Podcasts, Spotify, Amazon Music, Pandora, Stitcher, and Audible

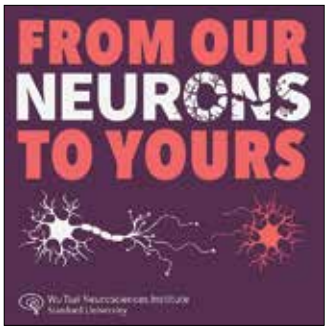
With its high-powered, long-form conversations, Entitled Opinions has fans around the globe, from Australia to China, Mexico to Russia. Its host, Robert Pogue Harrison, has interviewed some of our era's leading figures in literature, philosophy, science, and cultural history for over a decade. One blogger called these intellectually expansive exchanges "the most fascinating, engaging podcasts in any possible universe." In an era that favors the tweet, Harrison refuses to dumb it down: "This show offers the narcotic of intelligent conversation. … There's plenty of room at the table, and everyone is welcome, but be warned: the bread of angels is not your ordinary snack.


## Yellow-Eyed Cats

**Bernie Roth, Rodney H. Adams Professor Emeritus of Mechanical Engineering**
**Krista Donaldson, MS '98, PhD '04**
Available wherever you get your podcasts

"You can't fix the world unless you fix yourself." —Bernie Roth

Recognizing barriers in our lives and solving them with wisdom is a muscle—a muscle we can all strengthen with greater self-awareness. And a few tricks. In this podcast, Stanford faculty Bernie Roth, former student Krista Donaldson, and guests share the insights and tools from Bernie's legendary class "The Designer in Society" that has transformed so many people's lives since the 1960s. Yellow-Eyed Cats draws from a design mindset and creative problem-solving to help us all realize our power to finally do the things we've always wanted to do. Come prepared to be challenged, have a laugh, and think about the world differently.




## From Our Neurons to Yours

**Your passport to the future of brain science.**
**Nicholas Weiler, PhD '14**
Available wherever you get your podcasts

This award-winning show from **Stanford's Wu Tsai Neurosciences Institute** is a field manual to the new science reshaping how we learn, age, heal, and make sense of ourselves—and the three pound universe between our ears. Each episode, host **Nicholas Weiler** sits down with leading scientists to unpack big ideas from the frontiers of the field—brain-computer interfaces and AI language models; new therapies for depression, dementia, and stroke; the mysteries of perception and memory; even the debate over free will. You'll hear how basic research becomes clinical insight and how emerging tech might expand what it means to be human. **If you've got a brain, take a listen.**

LESSON PLAN

# The Promise

Gina Sudaria aims to make Ravenswood a turnaround district—for every student.

BY KALI SHILOH

**ON A BRISK THURSDAY MORNING** in December 2023, a group of 22 people boarded a dark gray charter bus idling next to the Ravenswood City School District office in East Palo Alto. They sat side by side—parents, teachers, community leaders, and the district's superintendent, **Gina Sudaria**, '98. After traveling more than 200 miles, the group arrived in Lindsay, Calif., a small agricultural town in the Central Valley. They were there to visit classrooms, talk to parents, and hear from administrators. They were there to see what was possible.

Back home, in East Palo Alto and the Belle Haven neighborhood of Menlo Park, their students were struggling. The Ravenswood school district has some of the lowest test scores in the state, with just 8.6 percent of students reading at or above grade level and 6.1 percent of students testing at or above grade level in math, according to the California Assessment of Student Performance and Progress for 2023-24. Ravenswood educates students who face significant challenges outside the classroom: 50 percent are homeless or housing insecure, 56 percent are English learners, and 88 percent are socioeconomically disadvantaged. Lindsay Unified, whose student body shares similar demographics, had equally dismal academic achievement in 2007, but it's become what some refer to as a "turnaround district," with score distributions now close to the state's as a whole, attendance rates as high as the 99th percentile, and graduation rates that have climbed from 67 percent to 98 percent.

Sudaria and her team wanted to know how they'd done it.

"It's not unusual for scores to be persistently low in high-poverty districts, but it's not inevitable," says Deborah Stipek, the former dean of Stanford's Graduate School of Education. However, when it comes to school reform, "you can't do it without strong leadership."

With Sudaria at the helm, a change is underway in Ravenswood. In part inspired by the progress in Lindsay, she and her team have created a new plan for the TK–8 district to improve students' academic outcomes, including their performance on those state tests. "There are all different ways of charting success; I want to acknowledge that," says Sudaria. "And we have to ensure our students are literate."

At the final 2024–25 school board meeting in June, Sudaria and her team presented their student progress metrics, hoping the Ravenswood community would continue to support the big changes that have already been made, as well as those on the horizon. Proficiency scores for third to eighth graders—the grades assessed by the state—had barely budged, but internal monitoring showed that the highly focused efforts of the past 18 months were working, with students across the district beginning to close multi-year gaps in knowledge. "I wish that we could move more quickly," Sudaria said at the board meeting, with i-Ready reading scores displayed on a

TIMOTHY ARCHIBALD

large screen to her right, "but we had to lay the groundwork, change mindsets, change practices that we're accustomed to doing.

"We finally have a clear plan."

## THE BACKSTORY

Stability has been elusive in Ravenswood for most of the past half century, with district families facing a longstanding pattern of turmoil, especially in the superintendent's office.

In the '70s and '80s, Ravenswood churned through 11 superintendents in 10 years. More recent superintendents have had longer tenures, but those have been marred by dysfunction or conflict. Two were accused of nepotism. In 2018, the mayor of East Palo Alto summed up community sentiment in a public letter, accusing district leadership of fostering "a culture of corruption, intimidation, and cover up." When a new board took office in 2019, it ousted the superintendent and appointed Sudaria as interim superintendent.

> 'We couldn't have this stance—being able to really trust the district and the vision and the strategic plan that they're implementing—with different leadership.'

TIMOTHY ARCHIBALD

Sudaria, who grew up in Southern California, fell in love with Ravenswood as a Stanford senior volunteering with Barrio Assistance, a student-run tutoring program. She applied for a job as a first-grade teacher in Ravenswood as soon as she graduated, in 1998. She's been in the district ever since, working as a teacher, vice principal, principal, and director of human resources and student services. She became a Ravenswood parent in 2012, when her son began first grade at Costaño Elementary.

"All those years, fulfilling those roles, I never thought I would pursue the role of the superintendent," she says. But when the board approached her, "I knew it needed to be done, and I knew I would be able to rely on the support of the community, the expertise of team members."

Sudaria inherited a seven-figure budget deficit and declining enrollment. In her year as interim superintendent (she was appointed to the permanent post in 2020), she made the difficult decision to close two of the district's five elementary schools.

She didn't do it alone.

"I held 29 community meetings," she says. At those meetings, she invited parents and anyone else interested in Ravenswood's future to listen as she described the challenges: Student enrollment had declined from 5,085 in 1998 to 2,048 in 2019 (last year it was 1,449), and insufficient funding was spread too thin. Then she asked people to weigh in. She and her team brought chart paper with questions like *Does your child walk to school?* and *What are your current school's greatest strengths?* Attendees were given dot stickers to mark their responses, and the charts were displayed and discussed at the end of the meetings.

"This work moves at the speed of trust," says Héctor Camacho, MA '07, executive director of equity, social justice, and inclusion at the San Mateo County Office of Education, which oversees the district. "We needed this collaborative leader who really understood that this wasn't going to

be something that a superintendent alone could do."

## CHANGE AGENTS

One day last year, Sudaria got word that a Ravenswood middle schooler had completed a core academic program at school. "I'm like, 'What program? That's fantastic!'" But when she found out, her heart sank. It was a foundational literacy program. "That's kindergarten through second grade material," she says. The student had been unable to sound out words like *cat* and *dog*. Sudaria discovered that of the 50 or so students at Cesar Chavez Ravenswood Middle School who lacked foundational literacy skills, five of them—including the one recent literacy graduate—had spent their entire academic lives in the district.

"As the superintendent, I'm responsible for those five students," she says. "What we're doing is not serving all kids, and that's our job."

In her early years as superintendent, Sudaria had used what she calls a "cookie-cutter" strategic plan to guide decision-making, full of spreadsheets, templates, and benchmarks. "There wasn't room for creativity," she says. "There wasn't room to make it truly owned by the community and the district."

As that plan's timeline drew to a close, Sudaria saw an opportunity. In the summer of 2023, she launched the Ravenswood Promise, a listening tour and collaborative process for creating a new strategic plan. The trip to Lindsay came that winter, and in the months that followed, a plan took shape around what Sudaria calls the three rocks: literacy, teacher talent, and attendance—each foundational to student learning. Fixing these areas, she believes, will enable the district to accomplish its overarching goal: to improve student academic outcomes.

## PARTNERING UP

On their trip to Lindsay, Sudaria and her team discovered that the district's leadership had succeeded by amplifying the voices of parents and working in partnership with teachers and community leaders. Even so, the night the Ravenswood group arrived in Lindsay, they sat down to dinner and listened as district staff explained that the turnaround had required polarizing choices.

"They were quite honest and said, 'You know what, not everyone wanted to stay on board,'" Sudaria says. Ravenswood leaders, she adds, were coming to a similar realization: "Gosh, maybe not all of us are going to be part of this at the end."

Take Ravenswood's Teacher Talent Initiative, which began in 2021 with a sit-down between teachers' union representatives and district office staff. "There was no *our* side and *your* side. It was all together," says Jessica Cox, who taught for 23 years before becoming one of the district's instructional coaches last year. The group developed a plan that allows teachers to move multiple rungs up the pay ladder each year by participating in an intensive professional review process that involves observations by principals and conversations with instructional coaches. Through efforts that include the Talent Initiative, base pay has risen from $51,823 in 2019-20 to $70,064 for 2024-25, while the maximum salary has increased from $96,818 in 2019-20 to $156,418 in 2024-25, a number now on par with neighboring districts.

But some teachers left the district, perceiving that the initiative was laborious and tied pay to their popularity with administrators. Other staff members saw this turnover as necessary, or at least unavoidable.

"The folks that we've lost over the Talent Initiative are teachers that didn't really fit our culture," says Alejandro Quezada, '97, MA '08, the principal of Los Robles-Ronald McNair Academy. "They would not have been able to thrive in this kind of environment, where you're being asked to really be creative and innovate." That means not just following a curriculum's structure but also bringing it to life in original ways—as his third-grade teaching team did by designing a science unit in the school garden that involved hands-on work, observation, and journaling. Last year, Ravenswood appeared to have gotten past the spike in turnover, retaining 80 percent of its high-performing teachers.

The Talent Initiative is possible because of a powerhouse nonprofit that fundraises nearly 20 percent of the district's budget. The Ravenswood Education Foundation (REF) funded the initiative with $3 million per year for five years, enough to cover 10 percent of all 106 teacher salaries. All told, the foundation fully supports 34 teacher salaries.

In exchange for transparency and good communication, the foundation gives Sudaria a wide berth to put its money to work. "We couldn't have this stance—being able to really trust the district and the vision and the strategic plan that they're implementing—with different leadership," says Jenna Wachtel Pronovost, '06, MA '07, the executive director of REF and a former Ravenswood teacher. A key part of Sudaria's leadership style, Wachtel Pronovost says, is her focus on partnership. "I see it because I'm down the hall," she says. "People just show up, like, 'Do you have a minute?' And Gina always does make time for them, because she knows that that is the critical part of having buy-in." When Wachtel Pronovost assumed her role six years ago, REF was raising $3 million to $4 million per year. This past school year, she led an effort that raised $10 million.

The attendance and literacy rocks are also reliant on REF. About 41 percent of Ravenswood students were chronically absent in 2023-24, roughly double the state average. Sudaria taps REF funds to underwrite offerings that make kids excited to go to school—for example, annual field trips for middle schoolers to Washington, D.C., Yosemite National Park, and the Bay Area redwoods. The district has also put art and music teachers in every school, and it offers special classes and clubs, such as robotics. (In 2024-25, chronic absenteeism dropped to 34 percent, in keeping with a statewide trend.) The literacy programs aimed at increasing that 8.6 percent proficiency rate include the ambitious Universal Tier 2 Time (or UT2T): individualized reading intervention for all 1,449 students every day of the week with the help of teachers, reading specialists, and hundreds of carefully coordinated volunteers.

With the three rocks in place, Sudaria says Ravenswood is on track to see 30 percent of third through eighth graders scoring proficient on state reading tests three years from now and 70 percent proficient 10 years from now. Though some community members are critical of that timeframe, others feel hopeful based on the interim results. "I'm very proud of where we are," said board vice president Samuel Tavera at the June school board meeting. "This isn't the Ravenswood of the past, and even of last week." ■

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SPOTLIGHT

# Found in Translation

Keegan Livermore takes his love for language to the Yakama reservation.

BY TRACIE WHITE


**ONE DAY** during his senior year, **Keegan Livermore**, '16, took a break between classes to go to Green Library in search of a dictionary of a little-known, nearly extinct language spoken by his ancestors on the Yakama Indian Reservation in central Washington.

"I couldn't really believe this dictionary for this relatively small language could even be there," says Livermore, a comparative literature major who was planning to be a teacher. "To think that the Yakama Nation was even on Stanford's radar was very surprising to me." After finding the dictionary listed in the catalog, he made his way up the stairs to the third floor and started rummaging between the narrow-aisled stacks piled high with books.

There it was, an unassuming 576-page dictionary of what linguists call Sahaptin, known as Ichishkíin in the language itself. Excited to see the written language for the first time, Livermore flipped through the pages, noting the modified Latin alphabet with extra marks and accents. It was totally unfamiliar to him, and yet learning it seemed vital—at the time, only a few dozen people still spoke the Yakama version of Sahaptin fluently. "*Well, of course,* I thought, *this is what I'm going to do next.*"

He returned to his dorm and set about figuring out how to read, and someday even speak, this language that has been evolving for 4,000 to 5,000 years in what is now the Northwest United States. Two years later, Livermore had graduated and was living on the Yakama reservation in the town of Toppenish, studying the language and making good on a goal that had begun to form that day in the library: to help save the Sahaptin language and bring it back to life on the reservation.

## FIRST, LEARNING

Livermore grew up in Portland, Ore., roughly 100 miles from the tribal community where his great-grandmother—a Yakama elder who died when Livermore's mother was 2 years old—was born and raised. Cecelia Sohappy grew up speaking Sahaptin as her first language, but she never taught her children, and the language died out in his family. Livermore learned little about his Native culture growing up—his father is white, of European descent, and his mother is Filipino, Yakama, and European.

"I wanted to explore it when I got to college," he says. As a sophomore, he chose to live in the Native ethnic theme house, Muwekma-Tah-Ruk, and volunteered to help organize the annual Stanford Powwow. As an entering Stanford student, he thought he'd major in physics but after his junior year switched to comparative literature. "I was in a class where I was reading a lot of books in translation and learning the joys of reading something in its native language," he says. "I had the idea, since I'm doing this a lot with Western literature, maybe I could do a version of that for my tribe."

He found his way online to Virginia Beavert, a Yakama elder and a linguist at the University of Oregon. She'd co-authored the Sahaptin dictionary Livermore found in Green that day, and she was one of a group of linguists studying and teaching its newly written form. Livermore began learning everything he could about the language. It was spoken by tribes across the Northwest and had multiple dialects. And it had been nearly

BESSIE BILL

wiped out by the federal government's Indian boarding school policies, which stretched from 1819 until 1969 and caused tens of thousands of Native children to be removed from their homes and sent to boarding schools to assimilate. "They were extinguishing their home languages and replacing them with English, making them wear uniforms, cutting their hair, converting them to Christianity, abolishing Indigenous religious practice," says Gregory Ablavsky, a Stanford law professor and an expert on the history of federal Indian law.

But in the 1970s, on the heels of the Civil Rights Movement, a nationwide effort was afoot to save endangered Native languages. Preservationists such as Beavert's stepfather, Alex Saluskin, reinvigorated efforts to develop a written version of Sahaptin. Beavert carried forward his efforts for many years. When she died in 2024 at the age of 102, the *Wall Street Journal* called her the woman "who preserved a language the U.S. tried to erase."

His comparative literature degree in hand, Livermore embarked on his first master's degree—in language arts and linguistics—at Heritage University, a private college on the Yakama reservation where Beavert had once taught. He also started eating deer meat and salmon at ceremonies (he had been a vegetarian at Stanford), hanging out with his grandmother's cousins, whom he calls his "aunties," and going to dig for roots, a traditional food. For his thesis, Livermore chose a project that involved dissecting the parts of Beavert's memoir that were written in Sahaptin. (She wrote the memoir as her PhD dissertation, which she completed at the age of 90.) He examined word order, the structure of the sentences, and the syntax, while conducting a word-by-word translation. "I was figuring out how the word order was chosen," he says. "I'm a grammar person. There was a lot of translation, which helped build my translation muscle, though I felt a bit like I was building the train tracks while riding the train," he says, laughing.

Like many Native languages, Sahaptin is a highly synthetic language that can convey complex ideas within a single word—what other languages might do in several words or a short sentence. These long words contain many prefixes and suffixes used in various orders to create new meanings. Sentences differ from English's structure of subject, verb, object. Livermore's thesis helped show that what appears to English speakers as random word order actually follows specific patterns. For example, whether the subject gets repeated in a sentence depends on how long ago it was mentioned.

In 2019, Livermore left the reservation and went to the University of Oregon to earn a second master's degree, in language arts and teaching, and to create a portfolio of work to support a teaching credential. He received some of his training there from Beavert and found the in-person instruction to be pivotal.

Ákwkwiɬ nam wíwanikta shúkwaatyaw, kútyaam áshapnita tíinnan tɬ'áaxwki túkin tiináwitki.

**"You can only ask a book so many questions, but you can ask a person pretty much anything under the sun,"** Livermore says. "Learning from someone who had dedicated their life to preserving and sharing this language, in addition to getting a PhD in her 90s—that's pretty inspiring." It helped solidify his knowledge of Sahaptin. "Two master's degrees later, I'm pretty good at reading it and I can speak it," he says. "I'm a solid intermediate."

"There is nothing like these languages," says Janne Underriner, a research associate professor who was one of Livermore's instructors at the University of Oregon. "Their morphology is complex; there's a freeness to the word order. It takes changing your mind about learning a language. You have to live in ambiguity and be comfortable with it. It takes considerable devotion. It's why Native language teachers, like Livermore, are heroes."

## THEN, TEACHING

When Livermore started studying Sahaptin, only about 35 of his tribe's 11,000 enrolled members spoke the language fluently, a number that has since declined further. "A number of fluent speakers have passed away since I've been here," he says.

During his second master's program, Livermore developed a curriculum framework for teaching high school language classes, which was convenient because he had already accepted a position to teach Sahaptin to eighth through twelfth graders on the reservation. Livermore taught for two years, from 2021 through 2023, soaking up information about the culture from the children of the tribe while at the same time developing new teaching materials and sharing his technical knowledge of—and passion for—the language. "I was teaching six classes a day at the tribal high school, where Sahaptin is a requirement," he says. "These kids come from all over the reservation. Some had learned bits and pieces of Sahaptin. Some wanted to learn more of their Native language and cultural education.

"I was trying to bring in a lot more conversational practice into the classroom," he says. "I tried to be creative—like, I translated a couple of games, including *Guess Who?*" The class would play together, learning vocabulary, grammar, and conversation along the way.

There isn't a set curriculum that Sahaptin teachers use—they all have to create, curate, and adapt materials to fit their needs, says Allyson Alvarado, a fellow Sahaptin teacher on the reservation. "A lot of times, elders who were not familiar with technology or creating teaching materials taught these classes. When I first met [Livermore] and learned he was going to be involved in teaching language, I thought, *thank goodness.* He's super organized and gets things done, and he's tech savvy." He even developed a cell phone keyboard for Sahaptin that she and other teachers now use regularly for texting.

"He created one for iPhones and Androids, which is crazy," she says.

In late 2023, Livermore transitioned into a position that had become his dream job: strategic planning manager for the Yakama Nation Language Program, which supports reservation-wide efforts to revitalize Sahaptin. He commutes 30 miles each day to his job in Toppenish from his home in Yakima, which he recently bought with his partner, Adam Wilson.

Bringing a language back to life is not an easy thing to do, but that is literally his job description. And yet, by its nature, it's a team effort with many others across the reservation.

"In my current role, I take a step back," Livermore says. "I'm working on the planning side with seven different school districts that have [Sahaptin] language teachers." He helps create cultural activities in the community as well as translations for learning about Native practices. Activities include bringing students out into the hills to dig up bitter root and bread root while speaking about it in Sahaptin, and translating public health posters—how to wash your hands, for example—into Sahaptin and posting them in public spaces. He also works with several outreach coordinators to sift through the tribe's archival materials and make recordings of them in Sahaptin to share with the reservation's residents. The idea is to bring the language into the community, into homes, and to make it fun and accessible, he says.

"I'm excited now to hear people use the language more in public, with each other," he says. "I'm excited to hear people joke around with each other in the language, really reconnecting with it and taking it into their hearts and enjoying it." It's especially vital, he says, for children, whose knowledge of Yakama culture provides a sense of pride and self-worth.

Alvarado, too, is beginning to see this reemergence of the language on the reservation. "It's teaching us a lot about our tribe and our ancestors, the animals, the landmarks," she says. "I have a 1-year-old. It's so important to teach our babies, our kids." ■

TRACIE WHITE *is a senior writer at* STANFORD. *Email her at traciew@stanford.edu.*

# Stanford Authors' Showcase

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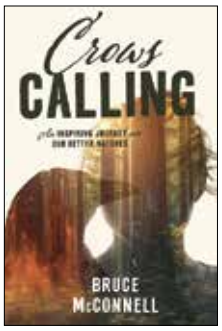


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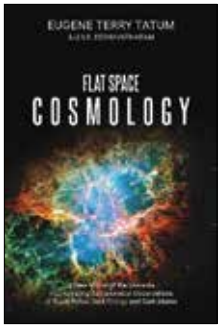


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### A New Model of the Universe

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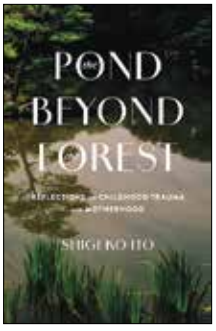


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### Reflections on Childhood Trauma and Motherhood

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Fans of Stephanie Foo's *What My Bones Know* will connect with this memoir of a middle-aged Japanese immigrant mother's struggle to raise her teenage son and save her marriage while forced to confront the painful memories of her own childhood trauma.


## The Glass Pyramid
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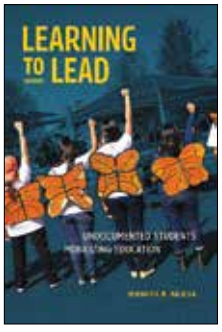
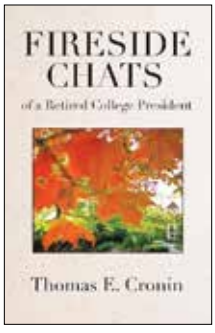



## Learning to Lead
### Undocumented Students Mobilizing Education

By Jennifer R. Nájera, '97, MA '98

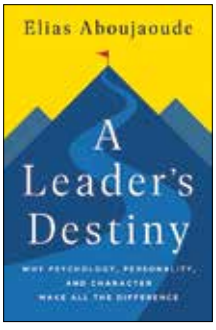
In *Learning to Lead,* Jennifer R. Nájera examines how undocumented students at UC Riverside turn their college education into activism. By building community and political knowledge, they broaden access to college for other undocumented students, advocate for structural change in the university and beyond, and, ultimately, assert their humanity.




## Fireside Chats of a Retired College President

By Thomas E. Cronin, MA '62 and '64, '69 PhD

"Masterfully crafted essays" on leadership, higher education and making the most of college. "Some of the best essays on leadership I've ever read." Cronin "nails it on so many points." "Icing on the cake—they are so well-written that they provide pure reading enjoyment." "Should be required reading for college presidents and trustees." Amazon.com




## A Leader's Destiny
### Why Psychology, Personality, and Character Make All the Difference

By Elias Aboujaoude, MD '98, MA '98

In this bracing take on a classic subject, a psychiatrist puts leadership "on the couch," providing new insights into how psychology interfaces with the requirements of effective and happy leadership. The result is to empower us to understand ourselves and step up if we have what it takes to lead—or find equally rewarding, often superior, ways to achieve fulfillment if we don't.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### Sex and Deceit

By Robert Jim Berrier, '69

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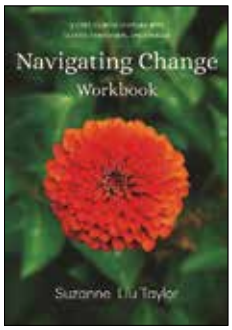
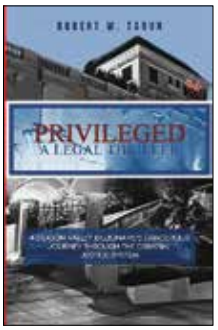



## Navigating Change Workbook

### 9 Steps to Move Forward with Clarity, Compassion, and Courage

By Suzanne Liu Taylor '85, MBA '90

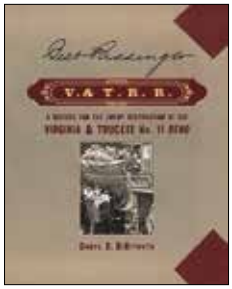
Did you know the average person goes through one life disruption every 12 to 18 months? This workbook starts with the 3-part change foundation by William Bridges, and offers frameworks and tools to navigate change. Gain clarity, compassion, and courage to move forward and navigate the next bend of the river.




## Privileged—A Legal Thriller

By Robert Tarun,'71

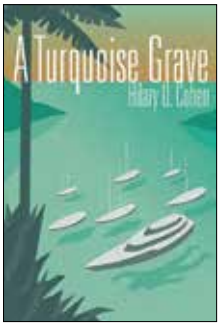
You will never look at a white collar criminal trial the same again. Award-winning, former federal prosecutor Tarun provides a first-rate thriller. An accused Silicon Valley billionaire must rely on his underdog defense attorney and his own wits to survive a harrowing journey through the criminal justice system. Memorably corrupt and deadly characters maintain the suspense through the final chapter. Amazon and www.privilegedbook.com. Now available in audiobook by SAG actor Bolton Marsh.




## Best Passenger

By Daryl D. DiBitonto, '74

This seminal work presents the first research-based determination of the livery appearance of America's most famous steam locomotive, the 1872 Virginia & Truckee No. 11 *Reno*, based on newly available archives from Stanford. The overall aesthetic appearance of these period locomotives was stunningly beautiful and recalls a period in late 19th-century American railroad technology when hand craftsmanship was celebrated in functional yet artistically graceful works of art such as the *Reno*. info@vandtenterprises.com




## A Turquoise Grave

### A Caribbean Island Murder Mystery

By Hilary U. Cohen, '69

An exhilarating tale of political intrigue, love and murder. Set in the sailing paradise of the remote Grenadine Islands. Risking her safety and her heart, former lawyer turned charter boat sailor Maggie Mullaley races to find the real killer before it's too late. hilaryucohen.com


## The Magic of Sports

### The Journey to Becoming a Complete Athlete

By George Selleck, '56, MA '57

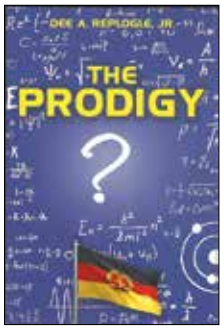
*The Magic of Sports* blends memoir and motivation as George Selleck, PhD, shares wisdom from a lifetime of basketball. From Compton to Stanford All-American, NBA draft pick to youth mentor, he inspires athletes to rediscover the joy, purpose, and transformative power of sports amid today's high-pressure culture.

## The Money Adventures of Grandma Deer and Her Grand Deer

### Penny Learns About Pennies

By Patricia Davis, MBA '73

Through the wise guidance of her beloved Grandma Deer, in Book 1 of the series, Penny learns the basics of currency, the importance of saving, and the value of financial wisdom. The story uses vibrant and animated animal characters to transform complex financial concepts into approachable and enjoyable lessons for children. Signed books are available directly from Patricia Davis by calling 301-908-3038.

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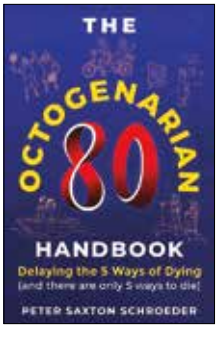
The East German parents of a mysteriously intelligent two-year-old boy discover a plot by the head of the State Security service to seize the boy and kill the parents. The family desperately tries to escape amidst the chaos of the final days of East Germany. An assassin who may not be what he appears to be, a confrontation on the high seas, along with efforts to recover a mysterious Swiss account add to the suspense.




## The Octogenarian Handbook

### Delaying the Five Ways of Dying (and there are only 5 ways to die)

By Peter Saxton Schroeder, MBA '70

How can you steer your life towards longevity? By changing a number of lifestyles from your middle years and avoiding pitfalls that lead to each of the five ways to die … there are no alternatives. Each way is described as a single word beginning with "A," easy to remember, hard to forget. Written in an upbeat style, the book is not morbid as it describes this inevitable outcome we all face. Go to Amazon.com.

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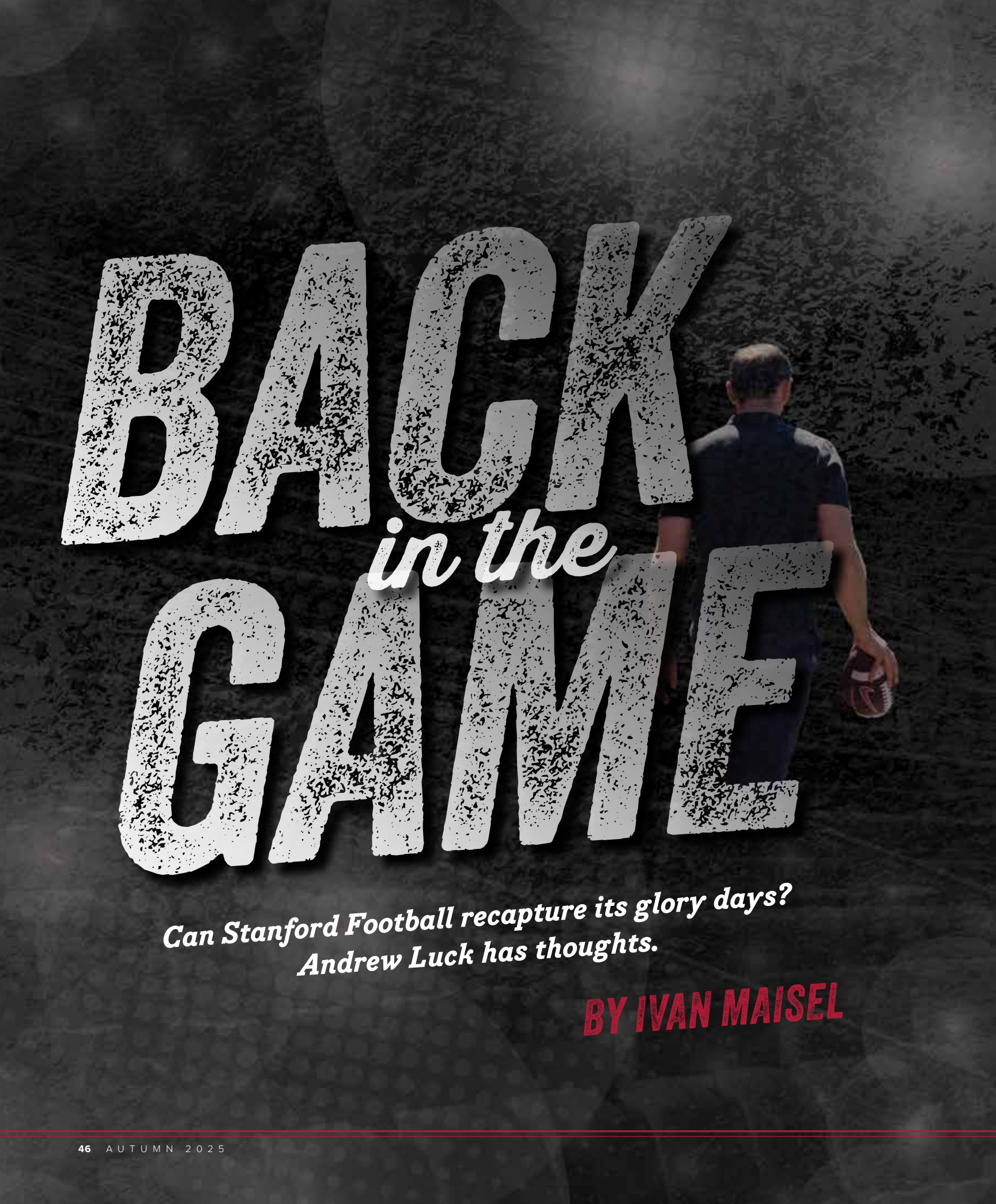
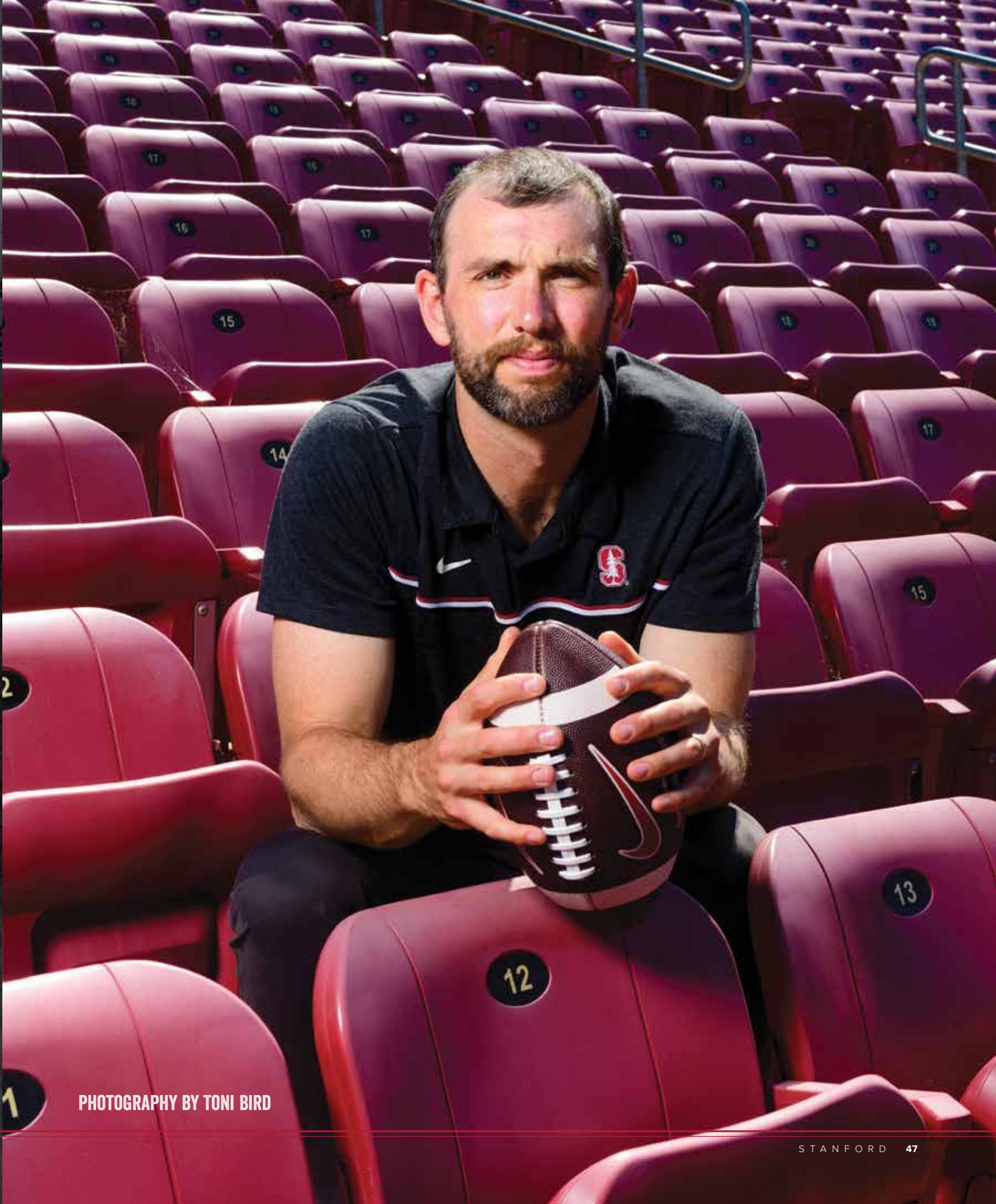


# BACK *in the* GAME

***Can Stanford Football recapture its glory days? Andrew Luck has thoughts.***

BY IVAN MAISEL



PHOTOGRAPHY BY TONI BIRD

# One day last October,

**former Stanford All-American quarterback ANDREW LUCK and his wife, former Cardinal gymnast NICOLE PECHANEC LUCK, had just about put the finishing touches on the first chapter of their post-football life. Andrew's sudden retirement from the NFL in 2019 following years of fighting injuries**

had left both of them emotionally spent, so they had decamped to their bungalow a short bike ride across El Camino Real from the Stanford campus.

After five years in which Nicole, '12, gave birth to two daughters while establishing herself as an NBC Sports and ESPN producer and Andrew, '12, MA '23, earned a master's degree at the Graduate School of Education while caring for Lucy and Penelope, they had decided to move closer to family. Andrew would coach high school football, for the second time leaving Stanford to begin a new career.

Before he left, though, Luck wanted to weigh in with new university president Jonathan Levin, '94, about the state of the Stanford football program, which has followed 10 seasons of feast with six seasons of famine. While the numbers may not hew to the standard seven-and-seven in Genesis, anyone with an emotional stake in the fate of the Cardinal will tell you the disaster feels biblical in proportion. Stanford has won a total of 20 games in the past six seasons (2019–24) after having won 102 in the previous 10 (2009–18). The Cardinal also won three Pac-12 Conference championships and went to five major bowl games in that decade, a decade that began with the emergence of a young quarterback named Andrew Luck.

Every athlete who succeeds at the highest level of sports has a congenital case of competitiveness. The condition persists long past retirement. Luck had been feeding his hunger by getting involved with the collective Lifetime Cardinal, raising and distributing name, image, and likeness (NIL) money for Stanford athletes. But the Cardinal's lack of success on the field gnawed at him. Luck winced as Stanford struggled to adjust to unfamiliar, faraway opponents in the Atlantic Coast Conference after the collapse of the Pacific-12 Conference. He watched the Cardinal play football in a nearly empty stadium. He believed that even in the new world of intercollegiate athletics, in which the players followed dollars instead of coaches and chose quality of contract over quality of education, there remained athletes who want all of the above.

"I was not embarrassed, but sort of ashamed that we couldn't deliver more for them," he says.

Not every concerned alum can arrange a meeting with President Levin. But if you threw for 9,430 yards and 82 touchdowns in three seasons while leading Stanford to a cumulative record of 31-7, you have some cred when it comes to the football team. Luck arrived at Building 10 with a page of notes.

"It was a bit of, 'Hey, if I'm moving, I probably should let our new leader know, just make sure he's aware of the existential threat football is under,'" Luck says. "I don't mean to sound dramatic, and college football isn't going away, but it's going away as we knew it."

FROM LEFT: DON FERIA/ISI PHOTOS; ROB ERICSON/ISI PHOTOS

Levin immediately put Luck's mind at ease. The president considered Stanford Football a problem that must be fixed. "He got it," Luck says. "He already knew it."

Not long into the discussion—20 minutes?—Levin shifted the tenor from theoretical to practical: Would Luck want to run Stanford Football?

It had been five years since Luck had faced an unexpected blitz. He may not have seen it coming, but once a quarterback, always a quarterback.

"There was a part of me that immediately reacted, 'You don't have to say anything else. I get what you're putting down, and I'll take all of it,'" Luck says.

Then he jolted back to reality. He had a wife, they had a life, a life they had decided would no longer be in Palo Alto. Luck told Levin he would get back to him. He called Nicole. She was putting her horse, Ovour, in a trailer for the move.

"So, I just got out of a meeting with President Levin, and I think he offered me a job," Andrew told her.

"I'm like, 'Do I load the horse or not?'" Nicole says.

She loaded the horse, even as she knew she wouldn't be following it.

A month later, Stanford announced its new head of Stanford Football.

"College football has a very special characteristic because there are just not that many times when you can get 50,000 people in one place cheering for your school," Levin says. Luck's charge is to "have a successful team, have them be successful academically as well as athletically, and to build strong community support that's essential to sustain the football program. And he's a natural leader. I have incredible confidence that he's going to be successful."

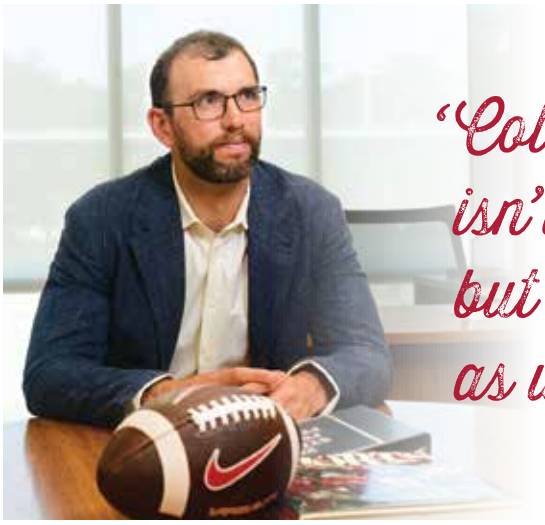
His athletic skill and probing intellect (he earned an engineering degree with an emphasis in architectural design) make Luck "the epitome of the 'Stanford athlete,'" says Professor Condoleezza Rice, the director of the Hoover Institution and former U.S. secretary of state who has been a guiding force for Stanford Athletics throughout her three-plus decades on campus. Luck remains firm in the belief that Stanford can compete at the highest level of intercollegiate athletics without sacrificing its academic soul. They called it "intellectual brutality" during his playing days.

"I think it differentiates us from our academic peers in many ways," Luck says. "It's part of what makes Stanford Stanford. We compete with everybody in whatever arena it is, whether it's academics, competing with the Ivies and MIT, or athletics, going toe to toe with Texas and Michigan and Ohio State. That's what we do, traditionally what this place always did."

College football has undergone radical change in the last several years. Court cases have determined that student-athletes should have freedom to hop from one campus to another and should get a greater share of the billions flowing into the college game. Stanford, with its emphasis on both sides of the hyphen in *student-athlete*, was slow to adapt to the new rules, recalcitrance that manifested itself in a whole bunch of 3-9 records. Luck believed that the university had to a) accept that paying players is table stakes and b) commit to continuing competition at the highest level of athletics, which meant c) accepting more transfers into the football program, at least in the short term. (Stanford—and virtually all of its athletic peers—have announced that they will share revenue with student-athletes under the June settlement in *House v. NCAA*.)

Luck's title is general manager, a longtime NFL position that arrived in college football when players started getting paid. Most college football GMs manage the roster, deciding how to dole out X amount of resources to Y number of players. Most college football GMs aren't four-time Pro Bowl quarterbacks and the most popular player at their school in a generation. In addition to the typical duties, Luck has immersed himself in marketing the team, selling season tickets, and even taking part in a few spring practice drills. His self-assessment? He may have lost a step.

"They needed someone to hand off, so I did it and I had way too much fun. *Way* too much fun," Luck said. "I'm not [taking snaps] under center with our guys, though. I can't move fast enough to get away."



*"College football isn't going away, but it's going away as we knew it."*

TONI BIRD

President Levin also granted Luck the power to hire and fire the head coach. Luck used the latter authority in March to dismiss Troy Taylor after two seasons. Luck cited the need for change and referred to the university's two investigations of Taylor's behavior as an administrator. He had never fired anyone before.

"I didn't sleep very well for a few days," he says. "But I felt full agency and ownership over it, and the decision was what I believe was best for where we were going."

A young, inexperienced boss might have been forgiven for dithering. Luck saw a problem and dealt with it. "Andrew is showing

great talent as an administrator and a leader," Rice says. "Quarterback in the NFL is absolutely a leadership position. He was admired and followed—even as a rookie—by veterans." Or as Nicole puts it, a smile on her face, "He's very good at telling people what to do."

Given that it was March, and most college football head coaches are hired sometime in the last six weeks of the previous calendar year, Luck asked a good friend to be a placeholder. Frank Reich's first year as an NFL head coach, with the 2018 Indianapolis Colts, had been Luck's last as the Colts' quarterback. The longtime pro coach hadn't participated in college football since he played quarterback for the 1984 ACC champion Maryland Terrapins.

"I didn't say these words," Reich says of Luck's phone call to coax him out of retirement, "but I know I at least thought them: 'You have flat-out lost your mind. What would ever make you think that could be a good idea?'

"But if there's one thing I knew about Andrew, [it's that] before he called me, this is something he thought long and hard about. And so, because it was Andrew, because it was Stanford, I just think there was a curiosity and hey, life is about experiences. This can be an incredible experience, doing something you love to do with a friend that you love and appreciate and respect at a unique place, an elite academic university."

Reich is 63 years old. Luck is 35, still younger than NFL star quarterbacks Aaron Rodgers, Matthew Stafford, Russell Wilson, and Kirk Cousins. Luck's hairline has taken a three-step drop from where it used to be, but he weighs 14 pounds less than his Stanford playing weight of 234.


On the second floor of the Arrillaga Family Sports Center, approximately 50 feet from the door of the Stanford Football offices, there is a display honoring Luck. A large color photo of him looking downfield is accompanied by a list of his accomplishments headlined "Quarterback for the Ages." Sitting in front of the photo is a display case in which is enshrined a Stanford helmet. On the case is printed a tribute to his classroom achievement (Academic All-American). On either side of the case are receptacles filled with books, a nod to the book club that Luck conducted while playing for the Colts.

But to enter Luck's office itself is to be reminded that he has never bought into his own celebrity. The first piece of memorabilia Luck hung on the wall sits above his computer: a framed *New Yorker* cartoon he received from his mother, Kathy. Two men are seated in front of a TV screen that shows a football player in uniform, laying on a couch, his arm lifted mid-sentence. A psychiatrist, seated nearby, has legs crossed, notepad open.

"Sometimes," one viewer says, "I think all this postgame analysis has gone too far."

Sitting at a conference table, Luck turns and looks at the wall behind him. There hangs a framed, signed jersey of quarterback Jim Plunkett, '70, next to a framed poster from the 1991 season, the Stanford centennial. Stanford Football, Luck says, "feels like it's a Gordian knot worth picking at." (According to legend, Alexander the Great solved the riddle not by picking at the knot, but by slicing through it with his sword. Intellectual brutality, indeed.)

"We've won two national championships [1926, 1940]. We've been to the fifth-most Rose Bowls in the history of college football [15]. The quarterback history here is unparalleled. The coaching history is filled with luminaries and folks who helped redefine eras of football, like Pop Warner, Clark Shaughnessy, Bill Walsh. So part of what I'm reminding myself, and I think our community, is that football has mattered here, and it's mattered for a long time, and it's been a part of the fabric of this university since four months after the doors opened."

He laughs in disbelief, the enthusiasm in his voice reflecting why he was such an easy mark for President Levin.

"Part of what I view as my job is reminding people, starting with our most proximal community, that we've got to keep playing football at that top level. Look, we're not Alabama or Michigan or Texas or Georgia or USC, but we've never tried to be them, right? We're also not like a footnote in college football, which is what it has felt like."

With an interim coach and no stars to speak of on the team, Luck has dived into becoming the face of the program. In the winter and spring, he traveled from coast to coast to speak to alumni groups. He enlisted the Alumni Association to hold get-togethers before road games this fall from Honolulu to

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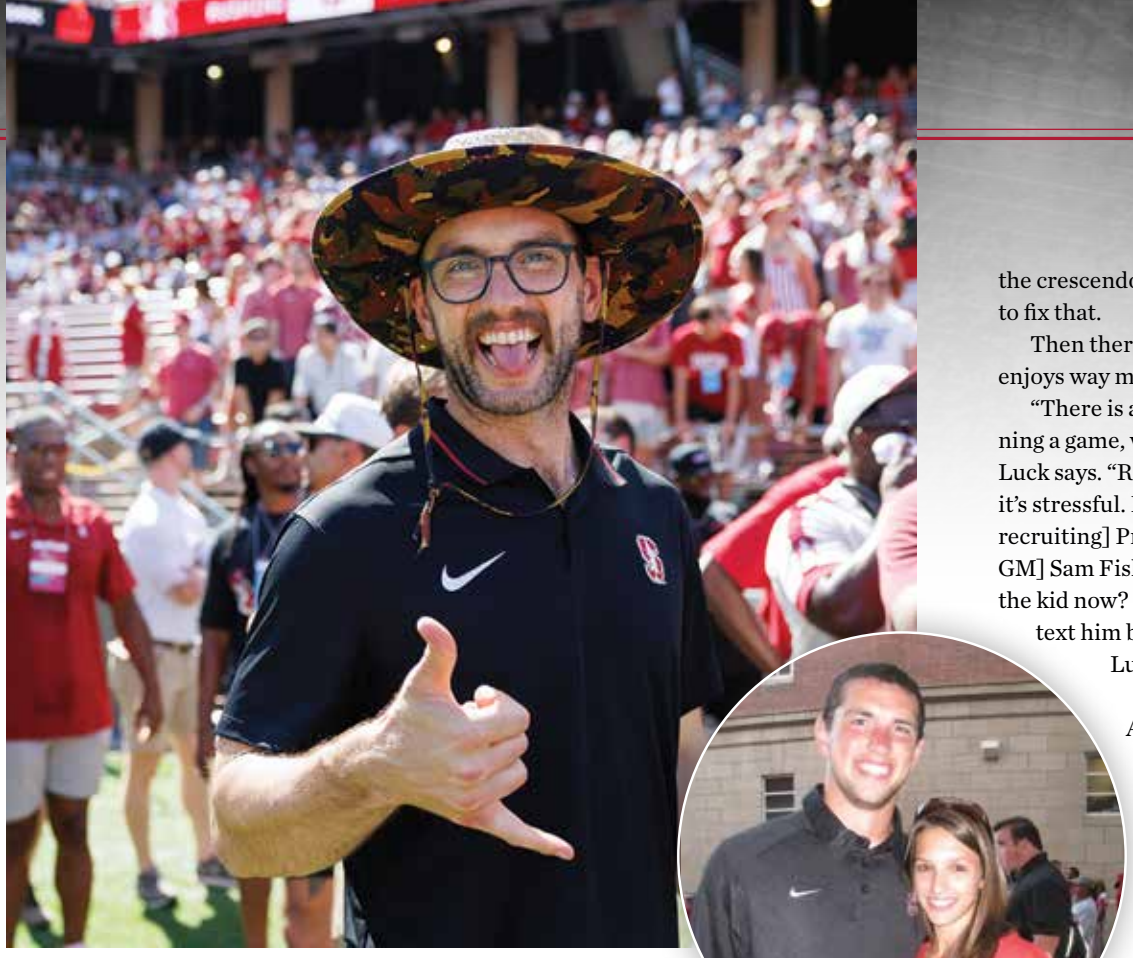



**THE MORE THINGS CHANGE: Luck, above at Stanford's ACC home opener against Virginia Tech in 2024, and at right, with Nicole before his first start for the Cardinal, at Washington State in 2009, is again the face of the program.**

Miami. "There are many challenges associated with the East Coast," Luck says—15 of 18 ACC teams are in the Eastern time zone—"but maybe one of the few lemonades-out-of-lemons can be the fact that we're in neighborhoods that we haven't traditionally been."

When Luck thinks of the 2011 Orange Bowl, a 40-12 Stanford rout of Virginia Tech that ended his 12-1 redshirt sophomore season, he doesn't think of the four touchdowns he threw as much as the scene at the hotel afterward.

"It felt like there were 35,000 alums, just full of Stanford alums celebrating," Luck says. "We are committed to doing an alumni event attached to every away game. In many ways, our team exists for our alums. It's their team as much as anybody's."

Luck leapt into the efforts to sell season tickets, cold-calling prospective buyers the same as others in the athletic department. "Yes, this is really Andrew Luck," he said to one. "No, this is not an AI robot, although I wouldn't be surprised if that starts happening here soon."

He does not hesitate to ask people for money, perhaps because he has seen it done. His father, Oliver, also a former NFL quarterback who became a collegiate and professional sports executive, once served as general manager of the Houston Dynamo in the MLS. "We'd be driving, we'd pull over, and he would walk into a business, do whatever we needed to do there, and then sell season tickets to them. What I think I internalized as a middle-school, high-school boy who idolized his dad, is that everybody sells season tickets, especially if you happen to be in charge of the thing. You just do it."

He has met with leaders from the Stanford Band and New Student Orientation to strategize how to get students to return to Stanford Stadium. The combination of COVID and poor results have snuffed out student attendance, and now, as Luck puts it, "some of the links of ritual and tradition had been severed." He remains appalled that not all students jump when the LSJUMB reaches the crescendo of "All Right Now." He intends to fix that.

Then there's recruiting, which Luck enjoys way more than he expected.

"There is a bit of the same emotion of winning a game, when a young man says, 'Yes!'" Luck says. "Recruiting feels existential, and it's stressful. I'd sit and ask [director of recruiting] Preston Pehrson and [assistant GM] Sam Fisher ['14, MBA '19], 'Should I text the kid now? He hasn't responded. Should I text him back?'"

Luck starts to chuckle.

"Sam said, 'Oh! You didn't date, Andrew. You've never dated, huh? You have to go through what we all went through in our 20s.'"

Andrew didn't "date" at Stanford. He and Nicole lived next door to each other as freshmen in Roble Hall. If it wasn't love at first sight, it didn't get much past second sight. On the day they met, he conned her into giving up her phone number by telling her he couldn't find his phone and asking her to call it.

It's hard to imagine two people better suited for each other. Nicole, the daughter of Czech immigrants, left home at age 12 for gymnastics training; by 17, she was competing for the Czech National Team. Nicole, like Andrew, received an engineering/architectural design degree. "If we were a company, he'd be the architect and I'd be the GC [general contractor]," Nicole says, "and that's how our lives work. He has the big ideas, and I execute efficiently."

Nicole, like Andrew, retired early from her athletic career because of physical pain. For her, it was her back and knee. For him, his ankle. The psychic pain they endured in private, after the spotlights trained their wattage elsewhere, can be just as arduous to combat.

"I think it's so hard because it's your identity," Nicole says. "I started when I was 2. I don't remember not having gymnastics in my life, but I also understood it's more than just physically ending."

Seven years after she went through her withdrawal, her husband retired because of

FROM TOP: BOB DREBIN/ISI PHOTOS; COURTESY NICOLE PECHANEC LUCK

# A NEW KIND OF ATHLETIC DIRECTOR

## *Donahoe takes over at a 'pivotal and tumultuous time.'*

The hiring of **John Donahoe**, MBA '86, as the Jaquish & Kenninger Director and Chair of Athletics is both a departure from precedent and a recognition of the formidable task ahead for Stanford Athletics.

Donahoe's résumé is what most of his fellow alumni of the Stanford Graduate School of Business dream of: a long career as CEO and/or board chair of successful entities such as Bain & Co., eBay, ServiceNow, PayPal, and Nike.

What his résumé does not include is coaching, administration, athletics fundraising, or as much as one step on the traditional path to becoming an athletic director. Of course, these are not traditional times. That the university added "and Chair" to the job title is indicative both of his strengths and the boardroom acumen that President Jonathan Levin, '94, and the rest of the search committee believed the university needs.

"John knows Stanford, and he has a unique blend of leadership at the highest levels along with deep business experience and relationships, most notably in sports, technology, and media," said Stanford trustee and NBA executive Amy Brooks when the university announced Donahoe's appointment. Brooks, '96, MBA '02, co-chaired the search committee with law professor emeritus and faculty athletics representative Jay Mitchell, '80.

For all of the Farm's considerable success in athletic competition—best described by 138 NCAA championships (14 more than second-place UCLA)—the unmapped future of American intercollegiate athletics regarding student-athlete compensation and conference realignment calls for someone who can keep Stanford in the same conversation as the USCs and Michigans and Alabamas. To do so requires someone comfortable raising not a boatload of money but a whole fleet's worth. The $20.5 million that each Football Bowl Subdivision school may share with its student-athletes annually is merely the ante.

When Stanford began searching for an athletic director earlier this year after the resignation of Bernard Muir, Donahoe seemed like a perfect fit: JV basketball player at Dartmouth, MBA from the GSB, long career as a CEO, most recently at Nike, where Donahoe counted founder and Stanford benefactor Phil Knight, MBA '62, as a close friend and mentor.

Perfect fit, yet Donahoe initially demurred. He had resigned from Nike in October 2024 after a challenging four years that included the buffeting of retail during the pandemic. Donahoe, who had returned to the Bay Area from Oregon, still wanted time to decompress.

The more his head cleared, the more he realized he didn't want another conventional CEO job. Conversations with several search committee members—including Levin, Brooks, professor and Hoover Institution director Condoleezza Rice, investor Jesse Rogers, '79, and former women's basketball coach Tara VanDerveer, who came in clutch with a mid-July phone call—helped bring the deal together by the end of that month.

"My north star for 40 years has been servant leadership, and it is a tremendous honor to be able to come back to serve a university I love and to lead Stanford Athletics through a pivotal and tumultuous time in collegiate sports," Donahoe said when his appointment was announced. "Stanford has enormous strengths and enormous potential in a changing environment, including being the model for achieving both academic and athletic excellence at the highest levels. I can't wait to work in partnership with the Stanford team to build momentum for Stanford Athletics and ensure the best possible experiences for our student-athletes."

Stanford is not alone in its approach. Oklahoma has enlisted former AT&T CEO Randall Stephenson as "executive advisor" to its president and athletic director. Hiring a business executive to run the athletic department is not a guarantee of success. But it does illustrate that Stanford will continue to pursue athletic excellence, a tradition nearly as old as the university itself. *—I.M.*

injuries, giving up football a few weeks short of his 30th birthday. Not that understanding it made living with it any easier. "I joke that dealing with a retired 30-year-old was a lot harder than dealing with a newborn child, and I had to deal with them at the same time," Nicole says.

Sport is a shallow partner. It may pretend to love the athlete, engage his or her intellect, reward hard work and devotion with fame and fortune. But in the end, no matter how deep an athlete's love for his sport, no matter the devotion to her craft, the sport throws over the athlete for someone younger.

"I'm still in pain. His ankle still hurts. But it's also so special, and it's given both of us so much, and that's why we love these athletes on campus," Nicole says. "They are truly what makes Stanford special, and just giving them the resources, obviously, but also just believing in them, I think means a lot."

A university deputizing one of its former athletes to come to its athletic rescue is an American trope. In theory, a former athlete understands the university, its mission, and its community in a way that the typical prospective coach or administrator does not. In reality, the sports world is littered with the carcasses of stars who returned to their alma maters and failed.

"I don't want to lose my love for Stanford," Nicole says. "But when you love something, you also have to be willing to lose it. It's possible that it won't work. So that is a little scary. It also means we are all-in."

That is the GC talking. The architect doesn't merely acknowledge that there is no guarantee of success. He embraces it. Luck committed to attend Stanford following the 2006 season, when the Cardinal went 1-11. Four years later, with Luck at quarterback, they went 12-1 and finished fourth in the nation.

"It's sports," he says. "That's what's beautiful about it." ■

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IVAN MAISEL, *'81, is a writer in Connecticut. Email him at stanford.magazine @stanford.edu.*

COURTESY STANFORD ATHLETICS

ALUMNI EXCELLENCE IN EDUCATION AWARD

Stanford Graduate School of Education proudly announces the recipients of the

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**MA ’07, PhD ’19**

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The 2025 honorees will be formally recognized on Friday, October 17.

Illustration by Rui Ricardo

Illustration by Rui Ricardo

**Scan to learn more about this award and our honorees**

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Stanford GRADUATE SCHOOL OF EDUCATION


*Illustration by Peter Crowther*

# *Today's drain is tomorrow's mine. How to tap the treasure in wastewater.*

**BY SAM SCOTT**

# WASTEWATER

is 99.9 percent water, but boy, that last little bit. Not that we need to dwell on it. To flush and forget is one of the great privileges of life in the developed world. Take the United States, where more than 80 percent of households connect to sewers. (Most of the rest have septic tanks.) A lift of a plug, a push of a lever, or simply the tug of gravity, and our wastewater is gone from our lives forever.

Unless you're, say, Stanford assistant professor of chemical engineering William Tarpeh, whose research pursuits include harvesting ammonia for fertilizer from wastewater. Occasionally, at dinner parties, someone misinterprets his job and regales him with stories of gastrointestinal woe. He has to interrupt. "I'm not a poop doctor," he says. "I am a person with a doctorate who studies poop and pee, and I don't want to talk about your poop. That's gross." But writ large, he says, wastewater deserves our collective attention. It is replete with treasure, including nutrients, pharmaceuticals, minerals, and metal cumulatively worth billions of dollars. It is, he likes to say, a modern mine.

Tucked away on the east side of campus, the Codiga Resource Recovery Center offers a door to that mine. A demonstration site for a new way to treat sewage, the center is built on the idea that wastewater is not garbage to eradicate so much as ore awaiting refinement. Moreover, the center gives researchers rare access to "raw material" from a sewer running under Serra Street. "Anytime I tell my academic counterparts at other schools about Codiga, they're literally jealous," says Tarpeh, '12. "I can take a golf cart there and have a tap that gives me sewer water, different types of sewer water, immediately. There's something beautiful about it being on campus."

His colleagues have also picked up their pails. "Wastewater is ore," says Sebastien Tilmans, MS '10, PhD '14, Codiga's former executive director and now a strategic adviser. "It's five ores. It's water, it's energy, it's materials, nutrients, and information. You have to remove the impurities, and then you have a valuable material."

Here are four ways Stanford faculty are making the most of it. Hold your nose and jump in.

INFOGRAPHICS BY McKIBILLO

## *Water*

If you're ever near Disneyland and want to visit a real Tomorrowland, the Orange County Water District is just 10 miles away. The utility runs the world's largest water purification system for potable reuse. Each day, the district takes more than 150 million gallons of treated wastewater—which once would have flowed out into the Pacific—and puts it through three rounds of purification: microfiltration, which screens out bacteria larger than 1/300th the breadth of a human hair; reverse osmosis, which filters through pores a hundred times smaller than the average virus; and disinfection using ultraviolet light with hydrogen peroxide, which destroys trace organic compounds. The cleansed water is then mostly left to seep into Anaheim's vast sandy groundwater aquifers, resurfacing months later at more than 200 wells that serve the area's 2.5 million customers. You can try a sample on a tour of the facility. "It's very pure," says Megan Plumlee, MS '04, PhD '08, the district's director of research. "I happily drink it."

It's just a taste of what's on tap as the arid West looks to recycled wastewater to help quench a thirsty future. California's Department of Water Resources estimates the state could lose up to 10 percent of its water supply by 2040 due to hotter and drier weather. "In the 21st century, we've come to a realization that we're at the limits of what our water supply systems can provide," says **Richard Luthy**, a professor of civil and environmental engineering. Purified wastewater, he says, makes an attractive backup. It's local, it's plentiful, it's drought-resistant, and it's economical relative to options like desalination. "We can't conserve our way out of this."

COURTESY RICHARD LUTHY

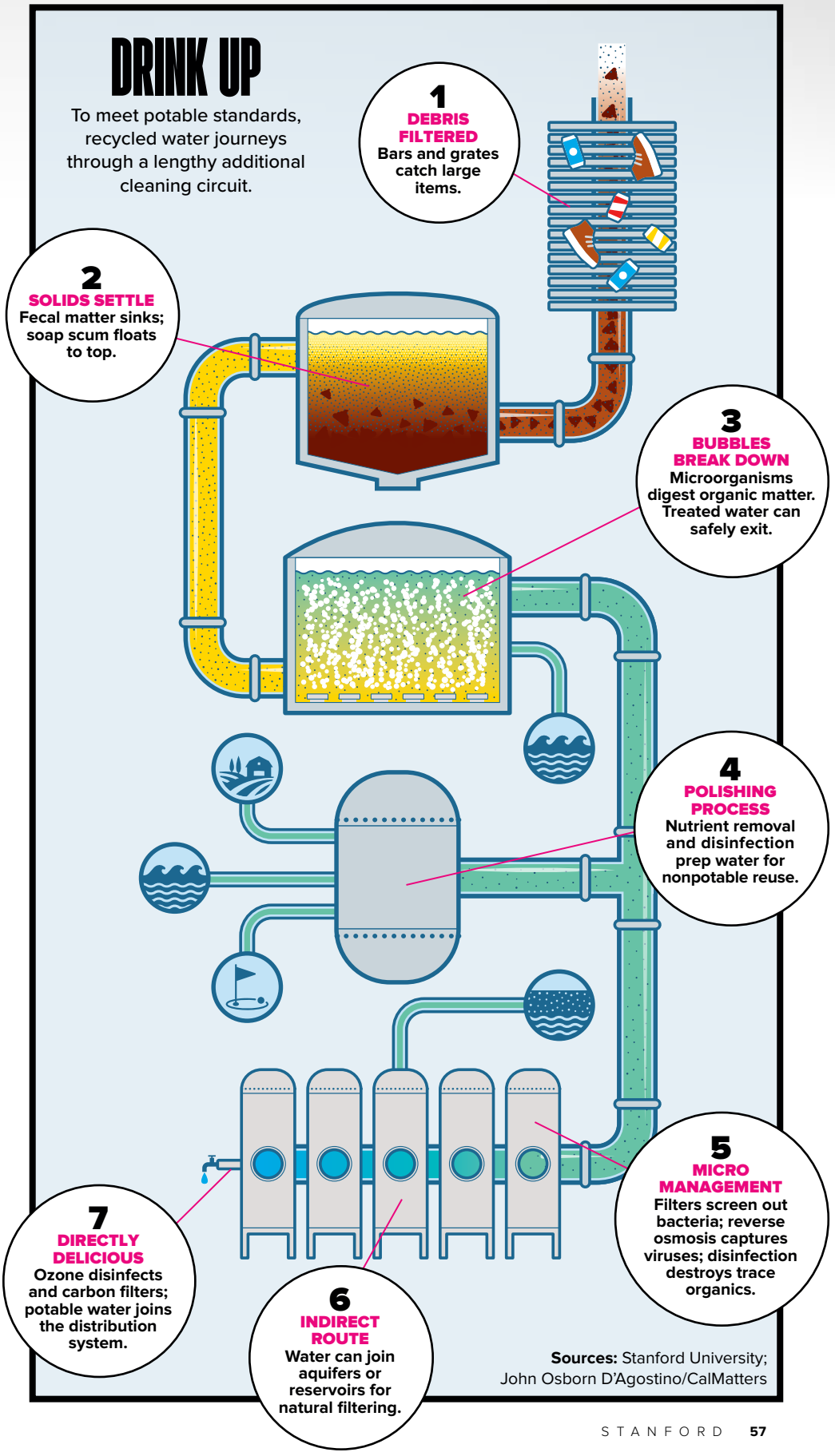
It's tempting to think of drinking water and wastewater as opposite ends of the pipe, never the twain to touch. Drinking water treatment plants take in water from rivers, lakes, and below ground, bring it to potable standards, and send it to homes and businesses, where people drink, bathe, clean, and flush with it before sending it down the drain to sewage treatment plants for safe release into the environment. But these ends connect more than we might prefer to think. Texas provides a classic case of de facto water reuse. Dallas-Forth Worth discharges treated wastewater into the Trinity River, which,

200 miles later, provides Houston with its drinking water.

What's newer are deliberately engineered ways to connect the ends. Orange County's is an example of *indirect* potable reuse, where wastewater is cleansed to 99.9999999999 percent free of pathogens before it goes to an environmental buffer like a reservoir or aquifer for further natural filtering and then to homes. Many areas lack the geography to accommodate this pit stop; not everywhere has Anaheim's sandy aquifers. So, we come to the latest frontier in water reuse, enabled in California last year: *direct* potable reuse, via which utilities can skip the environmental buffer. After treating the water to even higher standards—demonstrating a 99.999999999999999999 percent removal rate of viruses and similarly high removal rates of protozoa—they may send the cleansed water directly into the water distribution system.

The San Francisco Public Utilities Commission, which provides Stanford with snowmelt from Yosemite's Hetch Hetchy Valley (about as far from recycled wastewater as you get), is considering both indirect and direct reuse projects. The first would add purified wastewater to the general drinking supply in Crystal Springs Reservoir, visible from Interstate 280 in the northern Santa Cruz Mountains. The second would pipe it directly to the distribution system in San Francisco. "New water supplies ain't growing on trees," explains Steven Ritchie, '76, MS '77, the commission's assistant general manager for water. "You've just got to find a way to live with what you've got. In the back of my mind, I'm always carrying around the notion of, *What if we get into a biblical drought?* There was a short period of time in 2014 where I was scared."

Over the decades, the public has grown accustomed to reusing wastewater for irrigation on places like golf courses. (This requires a distribution system specifically for nonpotable recycled water, an expense that limits its benefit.) But people have found it harder to swallow the idea of recycled water coming out of their own taps. In a 2015 survey of 1,500 Californians by Stanford political science professor Bruce Cain and research colleague Iris Hui, only 11 percent



of respondents said they were willing to drink recycled water.

The yuck factor appears to be only in our heads. In 2022, **William Mitch**, a Stanford professor of civil and environmental engineering, was the senior author on a paper in *Nature Sustainability* that compared groundwater, surface water, and recycled wastewater treated to potable standards. Given its intense treatment, Mitch had expected recycled water to be cleaner than drinking water derived from surface water—i.e., the rivers, lakes, and reservoirs that supply 70 percent of American tap water. Such bodies are often exposed to run-off, pesticides, and, as with Houston, the upstream discharge of other municipalities' treated wastewater. And surface water treatment is typically not as thorough as the standards require for potable reuse. But Mitch was surprised to see how well recycled water compared with groundwater, which filters through protected basins. "Potable reuse water is in many cases comparable to groundwater, which is about the highest-quality water you typically have," he says. "I'm convinced that it's certainly safe from a pathogen point of view, and the toxicity is lower than conventional tap water."

The dawning era of direct potable reuse does raise new questions, which Mitch is studying with Luthy and others. Ironically, one such question centers on whether the recycled water is essentially too clean. The treatment denudes the water of its microbiome, the untold number of microbes found on and in everything, says Kara Nelson, a professor of civil and environmental engineering at UC Berkeley who is working on the project. A typical glass of tap water, for example, might contain a million microorganisms. Recycled wastewater treated to potable standards has virtually none. While that's not a problem by itself, it creates a void that will inevitably be filled by new bacteria, just as new plants will grow in a dug-over garden. The question is whether these newcomers will be friend or foe.

In the case of a system like Orange County's, the microflora in the surrounding groundwater simply populates the purified wastewater, Nelson says. Something similar might occur in direct reuse when conventional water and recycled water mingle. It's also possible the bacterial blank in the recycled water creates room for opportunistic pathogens. Nelson thinks that's unlikely—the water is too low in nutrients—but it's an important question to vet. The study will examine how differing ratios of conventional water and recycled water react when piped together. "This is a new practice," she says. "We should be applying all of our best science to make sure that nothing unusual is going to happen."

Ideally, results will help utilities integrate direct potable reuse with as little controversy as Orange County provides its recycled water. When people take the tour of the Orange County recycling facility, they end at the tasting sink, Plumlee says, where cups feature a motto inspired by the most common reaction. "Tastes like water . . . because it is water!"

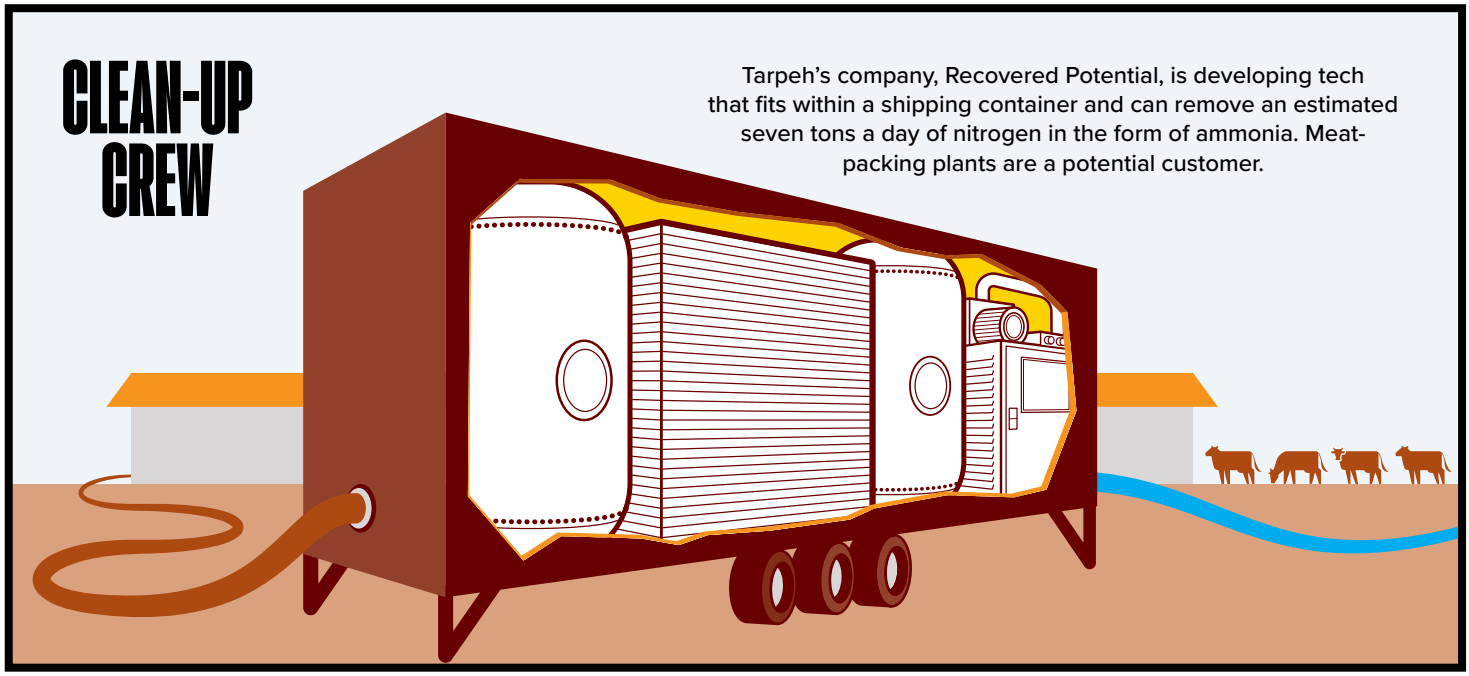
## Nutrients and Materials

To Tarpeh—a chemical engineer—the difference between a product and a pollutant so often comes down to its placement. Ammonia provides the perfect example. As the primary ingredient in commercial fertilizer, it's what keeps half the planet fed. Each year, factories around the world spend billions of dollars on the high-pressure, high-heat reactions necessary to force nitrogen and hydrogen together to make it at scale.

Our bodies also produce significant amounts of ammonia as a byproduct of protein breakdown, which we purge as urea when we urinate. But when that ammonia ends up in our waterways—often via a wastewater plant's discharge—it becomes a nuisance, or worse. It can overstimulate the growth of algae, depleting the water's oxygen with deadly results. For a month in 2022, a red-tide algal bloom in the San

### CLEAN-UP CREW

Tarpeh's company, Recovered Potential, is developing tech that fits within a shipping container and can remove an estimated seven tons a day of nitrogen in the form of ammonia. Meatpacking plants are a potential customer.



NANCY ROTHSTEIN

Francisco Bay caused a massive fish kill, leading to new regulations requiring Bay Area treatment plants to vastly reduce their nitrogen discharge at substantial cost.

But what if we could harvest that ammonia—and other chemicals—from wastewater? It's the core challenge in Tarpeh's mission to reimagine wastewater not as waste at all, but as a "modern mine" full of constantly replenishing resources, from phosphorus to pharmaceuticals, waiting for the development of the right science to efficiently siphon them from the soup.

There are many ways to capture materials from wastewater. Mango Materials, a company co-founded by Allison Pieja, MS '05, PhD '11, and Molly Morse, MS '04, PhD '09, for example, converts methane created by the decomposition of solids in wastewater into biodegradable plastics. Tarpeh's focus is on using chemistry and electricity to select nutrients from the liquid waste.

It's a potentially lucrative endeavor. Tarpeh estimates that, around the world, municipal wastewater contains some $30 billion in chemicals annually, about a fifth of that ammonia. His main motivation, though, is to enable circular economies that reduce waste and ease environmental stresses. Industrial manufacturing of ammonia, for example, is responsible for some 2 percent of the planet's carbon emissions, and it worsens nitrogen pollution. Tarpeh also wants to help the developing world. Farmers in sub-Saharan Africa pay dearly for fertilizer from faraway factories, but anywhere there are people, there's pee.

To that end, Tarpeh has developed a method of "electrochemical stripping" that uses electrical charges to pull ammonia out of urine and other wastewaters, resulting in an ammonium sulfate solution usable as fertilizer. It's the centerpiece technology of a company called Recovered Potential that's spinning off from his lab.

Recovered Potential is developing tech that fits within a shipping container that can be brought on site to remove an estimated seven tons a day of nitrogen in the form of ammonia—an alternative to building a treatment system from the ground up, says co-founder Kindle Williams, a postdoc in Tarpeh's lab. "Being able to ship that in, rather than deal with siting, excavation, pouring lots of concrete—it's like a couple of weeks versus three years of work," she says. "We've found a lot of folks who were pretty compelled by that vision."

Potential customers include meat-packing plants, which have high levels of ammonia in their wastewater due to protein degradation in blood and renderings, Williams says, and who anticipate new EPA regulations will require them to remove far more nitrogen than they presently do. Recovered Potential would then offer the removed ammonia as a low-cost fertilizer to city groundskeepers or local farmers.

**Tarpeh** sees further. Nitrogen was just a start, in part because of its abundance. But there are many more chemicals in wastewaters to focus on: potassium, phosphorous, lithium. Think of a pollutant, he likes to say. Can you turn it into a product again? Why not try?

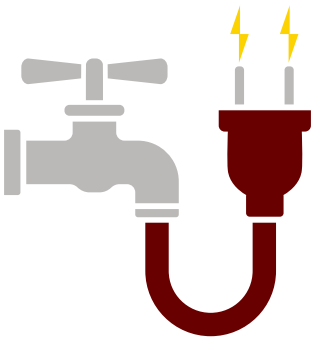
## Energy

Poop, the saying goes, rolls downhill, which explains why wastewater plants are almost always found on the lowest-lying land available. Better to let gravity do the work than to pay for pumping.

But the free ride soon ends with a squelch at the treatment plant. Sewage treatment is one of the most energy-intensive sectors in the United States. "Oftentimes it's one of the single biggest energy users on a municipality's energy budget," says Tilmans, the Codiga strategic adviser. Stanford researchers want to flip that picture on its head. "Traditionally, a wastewater treatment plant is this thing that uses lots of energy," Tilmans says. "We're saying, 'What if it was a power plant?'"

The proposed solution, like the problem, has much to do with bacteria.

When sewage arrives at a typical treatment plant, larger solids—yes, lots of that—are left to settle while soaps, oils, and other surface scum are skimmed off. The remaining water is sent into aeration tanks where it is set upon by "activated sludge," a time-tested technique that uses aerobic bacteria to feast on the dissolved organic material still clouding the water, essentially eating it clean. But to keep these



***The water and wastewater sector account for 3%-5% of annual electricity consumed in the United States.***

ROD SEARCEY

***Estimates indicate the plant could go from* CONSUMING *the same power as about 770 average American households to* EXPORTING *enough power to supply about 630 homes.***

oxygen-loving bacteria thriving, treatment plants use bubblers, blowers, and other devices—energy hogs all—to force air into the water as if they're aerating giant aquariums.

The settled solids, meanwhile, head to a different bacterial fate. They are sent to airtight digesting tanks to be consumed by anaerobic microbes, which thrive in the absence of oxygen and convert the waste into biogas, mostly methane, a fuel similar to natural gas that can generate electricity on site or be delivered to the gas grid.

Which raises a question. Since these anaerobic bacteria produce energy, don't need costly oxygen blowers, and are part of a process that uses less electricity, why not simply use them to consume both the solid and the dissolved waste? Alas, anaerobic bacteria make for dawdling decomposers. Their slow growth makes them tenfold less efficient at digesting organics than their aerobic kin, says Mitch, the civil and environmental engineering professor. That slower pace is fine for consuming the concentrated solids that are removed from the wastewater. But anaerobic bacteria are far too slow to take on the organics dissolved through the millions of gallons of remaining water. "Historically, we've used aerobic bacteria because you can get the job done in a reasonable time, and your treatment plant doesn't need to take up the entire city," Mitch says.

For more than a decade, Stanford researchers have been working on getting around this conundrum via technology pioneered by the late Stanford civil engineering professor Perry McCarty. The researchers grow anaerobic bacteria on grains of activated carbon—the stuff you see if you crack open a Brita filter. The grains operate like a vast flotilla of tiny bacterial bases, which collectively provide the surface area for the microbes to grow far beyond what would normally occur. As the wastewater circulates within enclosed tanks, the bacteria are present in such numbers that their plodding pace is offset by their increased population. "If you grow a dense enough anaerobic biofilm on these activated particles, you make up for the inefficiency of anaerobic bacteria, because you essentially have 10 times the biomass," Mitch says.

After a promising test at Codiga, Stanford researchers opened a multimillion-dollar pilot operation, largely funded by the California Energy Commission, within Silicon Valley Clean Water in Redwood City. Since 2021, the pilot has been using anaerobic bacteria to treat 24,000 gallons of sewage a day. According to a report released last year, the anaerobic pilot treated wastewater in less time, with an 82 percent smaller carbon footprint, than a conventional aerobic system. And it not only used less electricity but also created methane to generate much more power than it used. If a plant the size of Silicon Valley Clean Water adopted the technology, estimates indicate it could go from consuming the same power as about 770 average American households to exporting enough power to supply about 630 homes. It's the world's most energy-positive treatment plant, **Tilmans** says.

The process is not perfect. The anaerobic treatment, for example, did not remove nitrogen. It was also a tiny demonstration relative to municipal needs. Silicon Valley Clean Water treats an average of 13.5 million gallons of wastewater a day, more than 500 times the pilot's capacity. In a world involving public health regulations, public money, and extremely expensive infrastructure investments, Stanford's results were more an intriguing proof of concept than an invitation to follow suit.

"Wastewater sectors are typically conservative in their decision-making when adopting new technologies," says Chungheon Shin, Codiga's research director. They need to meet regulatory standards and also stay within a confined budget. He says researchers are partnering with private industry and federal agencies to create larger demonstrations—say, 1 million gallons per day—to strengthen proof of concept.

The system's long-term appeal may only increase with the rising interest in recycling wastewater, Tilmans says. Cleaning wastewater to drinking standards is, he says, an energy suck that will only worsen the already considerable electrical demands of wastewater treatment. It's much easier to absorb that jump if you're also a power plant.

COURTESY SEBASTIEN TILMANS

## *Information*

In June, amid concerns about a national surge in measles, Yolo County in California's Central Valley confirmed just its third case in the past decade. It was worrying news but not surprising. A week before the patient walked into the ER, officials had issued a call for vigilance. Wastewater surveillance had already detected the disease nearby.

Five years ago, the idea that sewage would inform public health was barely a pipe dream. Wastewater-based epidemiology—using sewage to track community pathogens—had been used in a limited way for decades, mostly to monitor global polio outbreaks. But even many health experts knew nothing about it. "I don't think I'd heard about it," says Sara Cody, '85, who retired this year after more than a decade as Santa Clara County's health officer. "It was not on my radar."

That would change quickly during the pandemic, largely thanks to research led by Alexandria Boehm, a Stanford civil and environmental engineering professor. Boehm is the principal investigator of WastewaterSCAN, which tracks more than a dozen infectious diseases at nearly 150 treatment plants across the country, including the Sacramento Regional Wastewater Treatment Plant that detected measles the week before the Yolo County case was confirmed.

Before 2020, **Boehm** wasn't much more versed in wastewater-based epidemiology than Cody. She was more attuned to sewage's risks to public health after, say, a spill, than on its potential benefits as a community diagnostic. But as reports of a troubling new disease kept coming out of China, she and Krista Wigginton, a University of Michigan professor of environmental engineering at Stanford on sabbatical, applied for a rapid-response grant from the National Science Foundation to look for signs of the virus in wastewater. They were initially turned down on grounds that the research wasn't domestically relevant. That soon changed.

By March 2020, Boehm and a group of students and postdocs were sending email requests for wastewater samples around the country, the replies stacking up outside the front door of Boehm's home. (Campus was closed to FedEx.) As they waited for deliveries, the group was also able to sample from the

***'We would have been* FLYING BLIND *had it not been for wastewater.'***

## *There's an AI for That*

WASTEWATER PLANTS have always run up big power bills, but they're getting even steeper, especially in California, says **Meagan Mauter**, an associate professor of photon science at the SLAC National Accelerator Laboratory and the research director of the National Alliance for Water Innovation. Not only has the price of electricity in the state soared in recent years, but many treatment plants—including those in the Bay Area—need more of it, due to factors that include new environmental requirements. "We're seeing the power demands for wastewater treatment plants skyrocket," she says.

While Stanford colleagues are looking at overhauling the treatment process to make it energy positive, Mauter's lab is studying a more immediate solution: using artificial intelligence to better manage energy use in the existing system. Working with the Silicon Valley Clean Water treatment plant in Redwood City—a recurrent collaborator with Stanford researchers—Mauter's lab has run a virtual pilot that seeks to find the ideal times to consume outside energy versus creating and storing its own, a potentially big deal when there's a fourfold difference between peak and off-peak market rates.

Silicon Valley Clean Water runs generators on the biogas created by decomposing solid waste, including infusions of fats, oils, and grease from food waste. It makes sense to burn those energy-rich items when electricity from the grid is at its most expensive, Mauter says, just as it makes sense to charge the plant's battery packs and, when possible, run operations like aerators at cheaper times. Sounds simple, but on a second-by-second basis across multiple operations, with variables like temperature affecting outcomes, it's not, she says. "The consumption and the generation of power is so dynamic throughout the day that it is absolutely impossible to heuristically control these complex interacting processes," she says. "You need a machine to do it."

Results from the virtual pilot suggested the AI could have saved the treatment plant 23 percent on electricity during the winter and even more in the summer, when differences between peak and off-peak rates are greater, she says. The bigger test in the year to come: Mauter's AI will start directing energy management at the plant.

FROM TOP: SAUL BROMBERGER AND SANDRA HOOVER PHOTOGRAPHY; NANCY ROTHSTEIN

***'Wastewater represents this COMMUNITY BIOLOGICAL SAMPLE that has all sorts of INFORMATION in it about the health and well-being of a community.'***

Codiga Resource Recovery Center, which taps Stanford's sewer, giving them a steady supply of material to test their methods, Boehm says.

The prevailing belief was that enteric diseases—i.e., those affecting the gut—would show up in wastewater; respiratory illnesses, like COVID, would not. That proved incorrect, but a larger question loomed about the project's viability. Sewers are not methodical collection systems. People shed viruses in differing amounts. Thousands of small pipes flow into one big pipe. Some "deposits" travel miles, others come from right next door. Those varying journeys result in exposure to different temperatures. How could anyone draw reliable, actionable information from such a soup? Boehm expected big variances in the readings.

But as the researchers honed their methods, they found that pea-sized samples of solids—accumulated in tiny samples of untreated influent at treatment plants over 24 hours—consistently mirrored data from clinical testing, even in sewer systems that serviced hundreds of thousands of people. As clinical cases rose or fell, the levels in the sewage responded in lockstep. The researchers weren't finding the actual virus, which doesn't survive long outside the body, but telltale fragments of nucleic acids. "This really shouldn't work as well as it does, right? Because there are so many factors along the way," says WastewaterSCAN co-principal investigator Marlene Wolfe, '11, an assistant professor of environmental health at Emory University who was a Stanford postdoc when the project started. "But we find it gives us this really clear picture of what's going on in a community over time, from our smallest sites that serve just over 10,000 people, up to 4 million, with the same techniques."

The system went public in November 2020 with results from eight wastewater treatment plants in the Bay Area and Sacramento. Cody was an early believer. "You can see the case data and the wastewater data—and they're exactly the same." It proved crucial after the rise of home testing dramatically reduced publicly reported clinical testing. "We would have been flying blind had it not been for wastewater." On December 16, 2021, ahead of the holiday travel season, Cody gave a forceful public warning about an impending "deluge" of the Omicron variant. At that point, there had been just 10 confirmed Omicron cases in Santa Clara County. But tests showing its presence in all four of the county's wastewater plants convinced her of the brewing storm. An explosion of new COVID cases followed in the county, reaching a peak for reported cases during the entire pandemic in mid-January. "I felt very confident sounding the alarm," Cody says.

It was, says Boehm, a huge moment in public awareness of wastewater's powers.

As concerns about COVID have ebbed, WastewaterSCAN has developed tests for more diseases, including mpox after the global outbreak reached California in 2022. Cody again used wastewater data to guide Santa Clara County's response. Disease-causing bacteria—with larger, more complex genomes—have been harder to track, but WastewaterSCAN has had a run of success identifying viral diseases, from RSV to norovirus to measles. The researchers post the data for their sites—spanning from Hawaii to Maine—online. "I don't think I could have possibly imagined where we'd be at now at this point," Wolfe says.

Their success is rooted in many factors—from philanthropic support to the incredible sensitivity of genetic-detection tools. It is also a reflection of the wealth of information within wastewater, a vastness Wolfe and Boehm have both come to better grasp over time. A virus may or may not shed in a person's feces, but that same person is also likely flushing skin cells into the system when they bathe, saliva when they brush their teeth, blood cells when they rinse a wound, and more. It adds up to treasure in the trash, a window on our collective health now and perhaps in the future. Boehm and Wolfe have also used wastewater data to map out areas in the country with the most antibiotic resistance.

Wastewater is not something we as humans want to be around or even to think about, Boehm says. But it's important. "We don't like it. We don't want it close to us," Boehm says. "But wastewater represents this community biological sample that has all sorts of information in it about the health and well-being of a community. Who knows where this technology will take us?" ■

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### Gayatri Datar, MBA ’14

Gayatri Datar is co-founder and CEO of EarthEnable, a social enterprise that provides affordable, sustainable flooring in East Africa. Inspired by a d.school course and a visit to Rwanda, she launched the venture to replace dirt floors—which can cause serious health issues—with safer earthen alternatives. EarthEnable has reached over 250,000 people and created more than 1,000 jobs.

*(Photo: Courtesy Gayatri Datar)*

### Pamela Ronald, MS ’84

Pamela Ronald is a plant geneticist whose research has advanced global food security. Her work on rice genetics led to disease-resistant and flood-tolerant varieties now used by more than six million farmers in Southeast Asia. A professor at UC Davis, she also champions science communication and public understanding of genetic engineering.

*(Photo: Debbie Aldridge)*

How neurologist Helen Brontë-Stewart is personalizing Parkinson's treatment.

# Pace Setter

By Tracie White

DAVID JUNKIN (ILLUSTRATION); TODD HOLLAND (PHOTOGRAPH)

Keith Krehbiel was just 42 when he was diagnosed in 1997 with early-onset Parkinson's disease. At first it had been a sore hand that concerned him. In time he realized his pinkie finger often trembled. On the drive home from the doctor's office, he stopped at the Stanford Shopping Center to pick up a book on the disease that his physician recommended, even before he told his wife. He wanted to know more to help calm his fears.

"I wasn't scared I was going to die soon, but I did want to know if I was going to die sooner," he says. "My goal was to live long enough for my daughters to graduate from college and high school."

Parkinson's—a progressive neurological disorder without known cause or cure—may shorten lifespan in severe or untreated cases, but there's no medical consensus about its effect on lifespan. While the disease's progression varies from person to person, it tends to advance more slowly in early-onset patients. For the first two decades after he was diagnosed, Krehbiel, now a professor emeritus at the Graduate School of Business, took medications to treat his growing symptoms—the tremors, the rigidity, and the imbalance that resulted in three emergency room visits, two of them after he fell on campus and one after a fall at home. He stopped driving a car, sensing his wife's concern for him, and began bicycling to the GSB. When two-wheeled transport grew precarious, he bought a more stable recumbent tricycle.

"I did get to see my daughters graduate, and now I've got three grandchildren," he says.

But, as often happens in Parkinson's patients, Krehbiel's medications became less and less effective over time at controlling his motor symptoms. As the medications wore off, his head would bob and weave—one of a category of involuntary movements known as dyskinesia. And when he increased his doses, he experienced nausea and brain fog. For a professor, that changed the calculation. He decided it was time to pursue a surgical approach to managing his symptoms—namely, deep brain stimulation (DBS).

DBS is a technique developed in the 1980s and 1990s in which a surgeon inserts electrodes deep into areas of the brain that are affected by Parkinson's, then connects them to a small, battery-powered device implanted in the chest that sends electrical pulses back to the brain. The stimulation helps modulate the electrical activity in the targeted brain area, reducing abnormal brain signals and, thus, symptoms. Krehbiel reached out to a neurologist who was conducting research on DBS: **Helen Brontë-Stewart**, a professor of neurology and neurological sciences who has spent much of her career seeking to understand, measure, and improve the brain's control of movement in the body.

At the time, Brontë-Stewart was leading a multisite global clinical trial for a new and improved version of DBS called adaptive DBS (aDBS). In the original DBS system, the neurostimulator sends a steady stream of electrical pulses to either the subthalamic nucleus or the globus pallidus internus, two brain structures in the basal ganglia key to motor control. But with Parkinson's, patients' motor symptoms change as they go through their daily activities, from waking to walking to driving a car, and as the effects of medication wax and wane.

So, the aDBS neurostimulator varies the amplitude of the electrical charges it sends to the basal ganglia in keeping with the patient's need for them. "Like a cardiac pacemaker that responds to the rhythms of the heart, adaptive deep brain stimulation uses a person's individual brain signals to control the electric pulses," Brontë-Stewart says. "This makes it more precise and more efficient than older DBS methods." The treatment didn't promise to cure the disease; instead, the goal was to improve quality of life, which, for Krehbiel, included his ability to play with his grandchildren and to continue his research on legislative politics.

Krehbiel signed up for the trial and, in 2020, after two months of DBS treatment, he became the first person to receive experimental treatment with aDBS. "He's a special case," Brontë-Stewart says. "He's been on adaptive DBS longer than anybody in the world." Krehbiel acknowledges the fortune more than the fear in that fact. "I mean, the technology kind of blows me away, but the process doesn't strike me as being extraordinarily risky," he says. "I don't feel like I deserve any heroic status or anything for getting in line first and doing it."

In the trial, surgeons at 10 sites worldwide connected participants with existing electrode implants to the new and improved neurostimulator. Brontë-Stewart's lab focused on understanding how the device needed to respond to the brain—and enabling it to do so. "Our contribution was to identify these relevant neural signals, then develop the algorithms used to determine when and at what levels to send out the electrical charges," she says. In February, the FDA, which had access to data from the primary cohort of 68 patients, approved the use of aDBS, delivered via a state-of-the-art Medtronic neurostimulator, for people with Parkinson's.

Although the trial results have not yet been made public, participants have told Brontë-Stewart that they experienced fewer side effects with aDBS than they had

'He's a special case. He's been on adaptive DBS longer than anybody in the world.'

with the original DBS treatment, also called continuous DBS because it doesn't modulate its levels of stimulation. They also reported that aDBS provided more effective therapy than continuous DBS did.

For Krehbiel, it's clear that deep brain stimulation—potentially both approaches—has helped, even as some symptoms persist or worsen. "My tremor is much better—all but gone," he says. He still falls frequently due to low blood pressure and poor balance. He can't make the nuanced facial expressions he'd like to, which affects his social interactions. But, he says, "I was able to reduce my medication significantly, and the nausea and brain fog are gone. Consequently, in my day-to-day life, my attitude is just better."

## The innovator

Before Brontë-Stewart became a neuroscientist, she was a ballet student growing up in Glasgow, Scotland. At 14, she took a Royal Academy of Dance exam as she prepared to one day audition for the Scottish Ballet training school. She well remembers that exam. The instructors, their white hair pulled back in tight buns, stood before her moving their hands in complicated motions. The dancers were expected to mimic the motions with their feet, and they could do so immediately and without thought. Brontë-Stewart passed the exam, then headed home, pondering.

"On the train ride home, I began to wonder how it was possible to do this," she says. "How did my brain know how to move my feet without me thinking about it?" It's a question that has guided her career.

The brain is a supremely complicated electrical organ with about 86 billion nerve

**HELPING HANDS: Brontë-Stewart sees Krehbiel regularly in the clinic and monitors his symptoms closely.**

TODD HOLLAND

cells. These nerve cells, or neurons, are like current-carrying wires. They interact and link together to create distinct brain regions with specific functions and complex circuits that control movement. In a healthy brain, a movement request begins in the command center in the cortex, gets sent through the basal ganglia to the midbrain along circuits that connect to the brainstem, then to the spinal cord, and, finally, to the nerves that connect to the muscles, resulting in a leg lifting or an arm waving. Movement disorders such as Parkinson's disease reflect disordered electrical activity in circuits in the basal ganglia. Within that region, dopamine-producing cells die off and the levels of dopamine—a neurotransmitter—become inadequate to send movement signals.

Brontë-Stewart followed her curiosity by earning a bachelor's degree in physics and mathematics at the University of York, then a master's in bioengineering, a medical degree, and a neurology residency, all at the University of Pennsylvania. During a fellowship at UCSF, she trained in making microelectrode recordings of the neural circuits in primate brains. Afterward, she went to work as a neurologist at Kaiser Permanente in San Rafael, Calif. Soon, she made a connection that sped her path to DBS.

The modern era of deep brain stimulation was underway, and researchers—led, in the United States, by Emory University—were uncovering precise spots within the brain to target for Parkinson's treatment. Neurologist Jerrold Vitek, now chair of neurology at the University of Minnesota, was on the Emory team that first used electrical stimulation to target the globus pallidus and subthalamic nucleus in the basal ganglia for DBS.

"I met Jerry Vitek at a medical conference, and we sat down on the floor and started mapping out brain circuits," Brontë-Stewart says. Invigorated, she asked if she could come to Emory to study their methods. The Emory team agreed, and she began making training trips to Atlanta. "With her background in electrophysiology, she learned the process very quickly and understood the methods and approach we had developed," Vitek says. "She wanted to learn how we mapped, how we used the physiological recordings to determine where we were in the brain to define where to make the lesion. She was so excited about these surgeries."

When Brontë-Stewart participates in DBS surgeries, it's as if the patient's brain is talking to her. The different structures make varying sounds from which she can build a 3-D image of the patient's brain that helps her provide input to the surgeon.

Brontë-Stewart used her training at Emory in DBS to help set up the first surgical center for movement disorders at Kaiser. Then, in 1999, she was recruited to Stanford to help establish the movement disorders clinic and the DBS surgical program.

Brontë-Stewart launched her new lab at Stanford with an effort to develop tools to quantitatively measure motor symptoms in patients with Parkinson's. She believed this was the first step toward understanding which brain signals were relevant to abnormal movement, knowledge that would help them build a better DBS system. One of her early tools, called quantitative digitography, involved patients alternating tapping their index and middle fingers on two custom-engineered piano keys attached to a spring. The device then recorded measurements of amplitude and timing.

Today, the technology has been developed as a remote-control device that patients can use at home to provide real-time metrics about the changes in their motor symptoms, via an iPhone, to health care providers. Brontë-Stewart took a partial sabbatical last summer and fall to help it earn an FDA Breakthrough Device designation, and this summer she did the same to help move the device further along its regulatory path.

"For my patients who have used it, they can come into the clinic, and I already know their motor function," Brontë-Stewart says. "The health care provider can monitor them and intervene when they see a problem, rather than waiting the typical three to six months between appointments."

The focus on measurement laid the groundwork for aDBS. In 2013, Medtronic developed a neurostimulator that, in addition to targeting brain signals, could record them—a sort of "brain radio," Brontë-Stewart calls it. Previously, the only time neural signals deep in the human brain could be recorded was during surgery while the brain was open. Using Medtronic's new design, Brontë-Stewart's lab became the first in the United States to collect data from brain recordings made in clinic while patients were asked to do different tasks, such as walk around, stand up, or sit down.

"So, we have a person who can move, but their brain is telling them to move abnormally," Brontë-Stewart says. "We needed to be able to record the arrhythmias, then write some algorithms to return them to normal." Being able to control the amplitude of the stimulation that the neurostimulator emitted in real time—that would be key.

"Once we had figured out the relationships between symptoms and brain signals, we were able to create algorithms based on the incoming brain signals that would determine how stimulation should change, increasing or decreasing the stimulation as needed," says Kevin Wilkins, a research scientist in Brontë-Stewart's lab. That technology is embedded in the aDBS neurostimulator.

The updated device can respond dynamically and in real time, like a pacemaker. For Brontë-Stewart, the new system is something of a lifetime of work come to fruition. Most importantly, it may mean better treatment for her patients who choose to have brain surgery as a treatment for Parkinson's.

## The procedure

The lights are dimmed in the Stanford operating room when Brontë-Stewart enters, wearing blue scrubs. A neurosurgeon has just finished drilling two holes into either side of his patient's skull and has threaded two thin wires with electrodes down each hole toward the subthalamic nucleus. It's essential to get the electrodes positioned on that exact spot, an area

roughly the size of a pencil tip. Brontë-Stewart's role is to help guide the surgeon in his placement of the electrodes. It's a skill, honed over decades, that she now teaches to her neurology trainees. Not every center uses neurologists to help during DBS or aDBS surgery (the surgeries are the same), but Stanford almost always does—the surgeons insist it improves outcomes due to more exact placement of the electrodes.

("This is when the magic happens," Brontë-Stewart says later in an interview.)

Brontë-Stewart moves around the surgical bed, giving instructions for the patient to think about while she moves his fingers, elbows, thighs, feet. "Now move your leg up and down, up and down," she says, all the while listening intently to the corresponding sounds coming through her headset.

"I'm literally mapping the brain, moving the arms and legs and calling out what I'm hearing to the surgeon," Brontë-Stewart says. "If you move the limbs, you get a sensory volley. That means the brain is firing away. It makes a noise that's picked up by amplifiers. If you know what you're listening to, it can really sound like a melody.

"For me, it's just beautiful to listen to the brain," she says. "It's such a privilege. I mean, how could you ever imagine listening to the brain and helping somebody?"

Professor of neurosurgery Jaimie Henderson has performed hundreds of these surgeries. "After drilling two holes in the skull, I use computer guidance to find the best spot in the target region," he says. "We also check from the recordings of the neurons, listening to those brain cells. Helen helps us to interpret those signals." The surgeons link Brontë-Stewart's—or another neurologist's—interpretations or directions with the real-time imaging of the brain.

KIM RATCLIFF

He stopped driving a car, sensing his wife's concern for him, and began bicycling to the GSB. When two-wheeled transport grew precarious, he bought a more stable recumbent tricycle.

"You have to have someone really good at this to verify the location," Henderson says. "Helen is one of the world's best."

Brontë-Stewart says being part of DBS therapy from the beginning has been one of the most rewarding aspects of her career. "It starts in the operating room when the person's tremor rigidity and bradykinesia melt away," she says. "Some patients start to cry; others look at me in amazement that their symptoms could go away in a flash. I get to be the person right up close to experience this with them in real time and to assure them that this is a sign of the improvement to come."

Krehbiel remembers coming out of the anesthesia and listening to Brontë-Stewart's commands. "They put me to sleep; they drilled holes in my head, and then before they sewed me up, they woke me up. So I'm lying there waking up, and Helen is there. She was awesome. She just took charge," he says. Today, he leans forward to show beneath his hair the outline of the two holes, now capped, that his surgeon drilled into his head. Then he traces the electrode wires snaking from his brain along his neck. He can feel them ducking under his collarbone as they extend a few more inches to the neurostimulator's battery pack in his chest, its perimeter almost that of a playing card's.

Krehbiel still sees Brontë-Stewart regularly in the clinic. She has monitored his symptoms closely since his aDBS treatment and documented the results. These days, he worries about the specter of cognitive decline, a symptom of Parkinson's that tends to develop later in the progression of the disease. Available treatments—mainly medications meant for Alzheimer's patients—aren't very effective for Parkinson's, but Brontë-Stewart has launched a pilot study targeting circuits in the brain that her lab has shown are linked with cognitive decline. Perhaps that will benefit the next generation of patients.

Over the five years since his surgery, some of Krehbiel's symptoms have worsened. He realizes that his illness will continue to progress. But his quality of life is better, he says, because of aDBS. "I think that's going to be the case over the course of my remaining life. I'll be better off with it than I would have been without." ■

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# TAKING CARE OF BUSINESS

## The GSB at 100

By Rebecca Beyer

**In 1925,** the very concept of the Stanford Graduate School of Business needed to be explained to students via articles in the *Stanford Daily*. A quarter-century earlier, the teaching of business subjects had just found its way into schools. That education was highly vocational, a "natural outgrowth of the traditions carried over from the apprenticeship system, which had existed for centuries," wrote author Neill Wilson in a 1930s overview of the GSB. The MBA itself still had that new-degree smell; it had only been established in 1908, at Harvard.

Thus were articles written and informational talks held to encourage undergrads to, one, consider getting an MBA; and two, not abandon the West for it. The fledgling school would teach not the how of business but the why. The Stanford business student would learn to "observe keenly, discriminate intelligently, to use his imagination profitably, to judge evidence correctly, and to concentrate," wrote Wilson, Class of 1912. The business executive of tomorrow was "to be able to take a given business situation, and, by a process of straight thinking, arrive at a sound and practical solution."

A century later, the MBA degree is solidly rooted in society. GSB alums have innovated, transformed, and founded, from Nike to Electronic Arts, Sun Microsystems to Capital One, Charles Schwab to Trader Joe's. And the GSB's vision—and influence—is decidedly global. Its motto is *Change lives. Change organizations. Change the world.* Here are a few of its signature moments and milestones over the past 100 years.

## How the West Was Won

A strong economics department and some encouragement from a future U.S. president helped launch the Stanford Graduate School of Business in 1925. Herbert Hoover, Class of 1895, then the U.S. secretary of commerce and a member of the university's Board of Trustees, advocated for the GSB. **Willard Eugene Hotchkiss**, PhD 1916, had helped found business schools at Northwestern and the University of Minnesota and was recruited to be the GSB's first dean. The school was created with a simple goal: to give Stanford undergraduates an option to pursue graduate education in business on the Pacific Coast.

"Once in the East, many of these young people remain there and the West loses their services," Hotchkiss told the *Daily*.

The school, first housed in the Quad's Jordan Hall, opened its doors on October 1, 1925, with 16 students. Murray Shipley Wildman, head of the economics department at the time, was credited with helping lay the foundation for the GSB by tripling enrollment in the economics department between 1912 and 1920. The GSB graduated its first MBA class—two men, both of whom ultimately became ranchers—in 1927.

> **"The University proposes to build a graduate school of the first rank in which young men and women may be trained for business leadership."**
>
> **ANNOUNCEMENT OF THE GRADUATE SCHOOL OF BUSINESS, 1925**

## All About Interest

One of the GSB's founding faculty members was professor of psychology Edward Strong Jr., an expert in vocational psychology. The work that would define his career became available shortly after the GSB opened: the Strong Interest Inventory, a questionnaire to help people determine their aptitude for certain careers—40 for men and 18 for women. "I'm not interested in financial success," said Strong, who had helped assess soldiers' suitability for Army roles during World War I. "I'm concerned with personal happiness." In 1943, after analysis and follow-ups with test-takers, Strong concluded that interest was a better predictor of professional success than ability. Versions of the test are still used today, by the Myers-Briggs Company.

## DINING IN

The GSB graduated its first women—Helen Carpenter and Gertrude Benedict Lasher—in 1930. But the school's first female matriculants, Etta Howes Handy and **Christine Isabelle Ricker**, arrived in 1926. Neither completed her graduate degree, but both made their careers at Stanford. Handy was director of the student union (now Old Union) and the university's dining halls for eight years. She later authored two books, *Furnishings and Equipment for Residence Halls* and *Ice Cream for Small Plants*. Ricker succeeded Handy in those two roles, holding the positions for 28 years. Sterling Quad's Ricker Dining is named for her.

**$40,000**

to launch the GSB—about $730,000 today.

The GSB "had a specific aspiration that was consistent with Stanford's regional nature at the time. Fast-forward a hundred years and the school, like the university, has become a national and global institution. People come from everywhere, and the amount of innovation and leadership that has come out of the GSB is extraordinary, world-changing."

***—Jonathan Levin, '94, university president and former dean of the Graduate School of Business***

STANFORD NEWS SERVICE (2)

# 1930s

## INVESTED

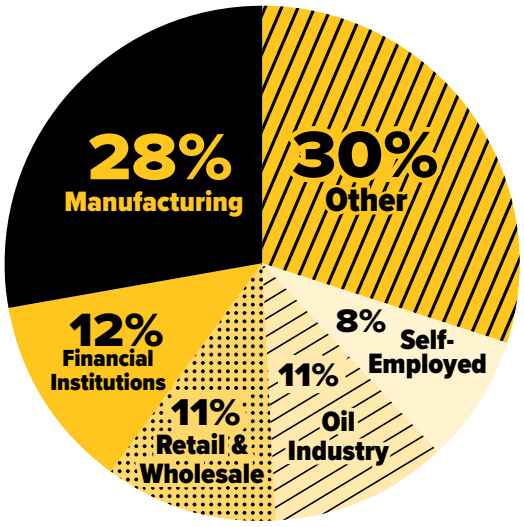
In 1931, accounting expert and GSB professor **Jacob Hugh Jackson** became the school's second, and longest-serving, dean. He served through the Great Depression and World War II, and into the economic boom of the 1950s. During his 25-year tenure, he established a focus on "scientific management," a theory centered on industrial efficiency and standardization (and often criticized for draining workers) that still reverberates in society today.

In 1937, the GSB relocated a few doors down the **Main Quad to the History Corner**. The school gained five classrooms—and left behind the wafting dogfish odor of its biology lab neighbor in Jordan Hall.

## 1933

The Stanford GSB Library opens with 7,000 books.

## Manufacturing for the Win




The school's first alumni employment and salary survey was published in 1939. In it, GSB professor Paul Holden showed that manufacturing work dominated and that **graduates were indeed staying on the Pacific Coast.**

**79%** PACIFIC COAST

> We visualized ourselves in high-paying, responsible positions in a relatively short period of time. As matters turned out, we were rapidly deflated, and I suppose we were lucky to have stayed off the [Works Progress Administration] rolls during the '30s.
>
> **ELDEN SMITH, MBA CLASS OF 1930, ALUMNI BULLETIN, 1948**

# 1940s

## War Arrives

In 1941, a few months before the bombing of Pearl Harbor, Stanford was doing what it could to prepare for the country's possible entry into war. Eliot Mears, one of the GSB's three pioneer professors, oversaw the university's summer quarter in 1941 and noted the "greater seriousness evident in every aspect of university life." (Mears, an expert in international trade, went on to join the War Shipping Administration the following year.)

At the GSB, efforts included expanding offerings so that students could complete graduation requirements as quickly as possible and "further the program of national defense." After the attack on Pearl Harbor, typing and shorthand classes at the GSB were opened to undergrads as a "war-time training measure," and, for a few years, the school offered a bachelor's degree in business.

**7**

students in the MBA Class of 1944. Enrollment plummeted during World War II but surged afterward. In June 1947, the GSB celebrated 164 graduates—its largest class up to that point.

By 1942, the GSB was offering war-specific courses, including Occupational Hygiene in War Industries and Industrial Relations in War Industries, and had created an intensive, four-quarter graduate program that led to the degree of Industrial Administrator.

## Behind the Scenes

In the summer of 1943, special certificates were offered to female students who sought employment in war industries. One of the women's instructors, **Lillian Owen**, was the GSB's executive secretary. The first female faculty members wouldn't be hired until 1972, but Owen was, according to one report, "the person who really ran the school during its first two decades."

SPECIAL COLLECTIONS & UNIVERSITY ARCHIVES/ STANFORD LIBRARIES (3)

# 1950s

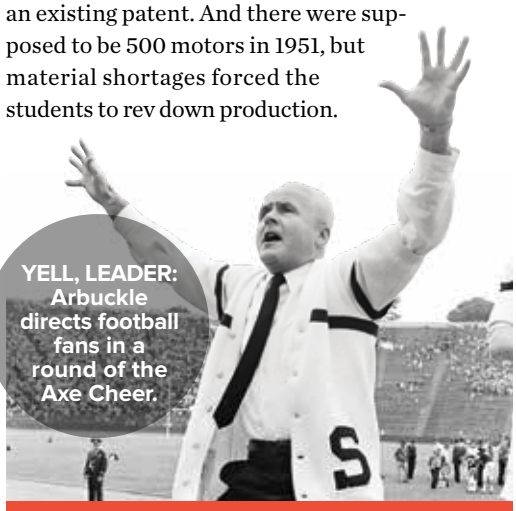
## CAPTAINS OF INDUSTRY

It's been more than four decades since the manufacturing industry ran on all cylinders in the United States. It peaked here in 1979, when the sector employed nearly 20 million people. But as a share of overall employment, manufacturing was highest in 1953, when 32 percent of the nation's non-farm-employed people made their money making things.

The GSB was in manufacturing then as well, running an "industrial laboratory" out of two small rooms on campus. The lab, reportedly the only one of its kind at a business school, produced a limited run of new products each year (50 circular saws in 1950; 250 tiny motors in 1951). Some failed: A "food chopper" designed by a student had to be, well, chopped, after it was found to infringe on an existing patent. And there were supposed to be 500 motors in 1951, but material shortages forced the students to rev down production.

**1,630**

MBA degrees awarded in the GSB's first 25 years. As of September 2024, 25,376 MBAs had been awarded, along with 14,477 PhD, MSx, and Stanford Executive Program degrees.



YELL, LEADER: Arbuckle directs football fans in a round of the Axe Cheer.

"If the private enterprise system as we know it is to survive, we must instill in our students attitudes that accept integrity, rooted in the bedrock of principle, as more important than operational competence."
***–Ernest C. Arbuckle, '33, MBA '36, dean of the Graduate School of Business from 1958 to 1968***

# 1960s

## A Revolution

In 1959, a bombshell report by UC Berkeley's Robert Gordon and GSB professor James Howell dropped into the world of university business education. The Gordon-Howell Report was sponsored by the Ford Foundation to improve business school education, and its economist authors argued for a more intellectually rigorous approach, drawing more from disciplines including economics, psychology, and statistics.

Howell profoundly changed how management education was taught around the world, inspiring greater emphasis on fundamental disciplines and on knowledge creation in the form of faculty research. His efforts are considered core in the GSB's rise to national prominence. "It's hard to imagine where Stanford Graduate School of Business would be today if not for the vision and work of Jim Howell," said then-dean Levin in 2019. "He is considered one of a handful of catalysts responsible for the management revolution of the 1960s."

"Many people foresee greater changes in the practice of management in the next 20 years than in the past 2,000, with the computer playing a catalytic role. Some view the anticipated changes with great enthusiasm for the efficiencies they will bring and the new vistas they will reveal. Others worry about what will happen to their jobs. Will some machine 'displace' them? Is their present skill obsolescent?"

***–GSB Bulletin, 1965***

**1966**

The GSB and Stanford Law School announce a joint LLB/MBA (now JD/MBA) degree. Today, the GSB also participates in five joint master's programs, in education, public policy, computer science, electrical engineering, and environment and resources.

## 'Touchy Feely'

Twelve students took Interpersonal Dynamics when it was first offered, in 1966. Over time, the elective course gained the nickname *Touchy Feely* and became one of the school's most popular offerings. The course's hallmarks are intense introspection, experiential skill-based learning, and the use of coaches to teach students how to create relationships that can make them better managers. In the 2024–25 academic year, 432 students took the course.

## Going Public

When **Arjay Miller** was offered the deanship of the GSB in 1968, he was president of Ford Motor Company. He had two full-time secretaries and two full-time chauffeurs, and was second in line for the use of 12 private airplanes (after Henry Ford II). But he had also seen the need for effective management and leadership in the public sector and made his acceptance of the deanship conditional on training leaders for it.

Miller had chaired the Economic Development Corporation of Greater Detroit, where he was charged with bringing jobs to the city following urban unrest and deadly riots in 1967. The organization raised $7 million to develop businesses in the city but was, as Miller recalled in a 2008 interview, "a failure."

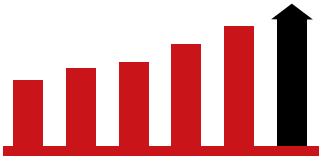
"I came to the conclusion, first, businesspeople really didn't understand the political process or know what to do and how to respond to the new demands being placed on them," he said in a GSB oral history. "And secondly, the government sure didn't understand business. The mayor had no plan, no money, nothing. And third, nobody anywhere was doing a great deal about this." Stanford's public management program, launched in 1971 and now known as the certificate in public management and social innovation, was the first of its kind.

## Changing the Culture

100:1. That was the ratio of men to women on the GSB faculty when **Joanne Martin** was hired in 1977. Two women had come before her, including influential labor economist Myra Strober, who went on to become a tenured professor at the Graduate School of Education.

"The amount of prejudice against the idea that a woman could be a first-class intellectual was intense," Martin said in a 2015 oral history. MBA students walked out of her class in protest (only to be sent right back in by Dean Miller), and the two colleagues she admired most told her after she became pregnant that she would never earn tenure. They were wrong. Martin, known for her research on organizational culture, became the first tenured female faculty member at the GSB in 1984. Since 2008, the leading professional association for her field—organizational management—has presented the Joanne Martin Trailblazer Award.

## RETURN ON INVESTMENT



George Leland Bach, a professor at the GSB and in the department of economics and an expert in the causes and effects of inflation, retired in 1983 after 45 years in academia. As a teacher, textbook author, and task force chair, he influenced the economics education of millions of K–12 and college students nationwide.

In the mid-1980s, GSB students began organizing international trips. Today, all MBA students are required to participate in a global experience program to explore challenging issues facing the world, such as changing social demographics, sustainability, or AI.

CLOCKWISE FROM TOP: STANFORD NEWS SERVICE; STANFORD GSB ARCHIVES (2)

# 1990s

# 2000s

## NOBEL WINS

In 1990, professor **William Sharpe** became the GSB's first winner of the Nobel Memorial Prize in Economic Sciences, along with two other economists, for work that led to the creation of the Capital Asset Pricing Model, which evaluates the pricing of securities to assess potential investment returns as well as potential risks. Since then, five additional GSB professors have won the prize. The latest, in 2021, was awarded to **Guido Imbens**, who is also a professor of economics, and his MIT colleague Joshua Angrist for their work to discern causation from real-world situations—such as with questions that can't practically or ethically be studied with randomized controlled trials. The pair's methodologies have been used to deliver insights on the implementation of economic and social policies, as well as those in medicine and epidemiology.

## A Giant Leap for MBAs

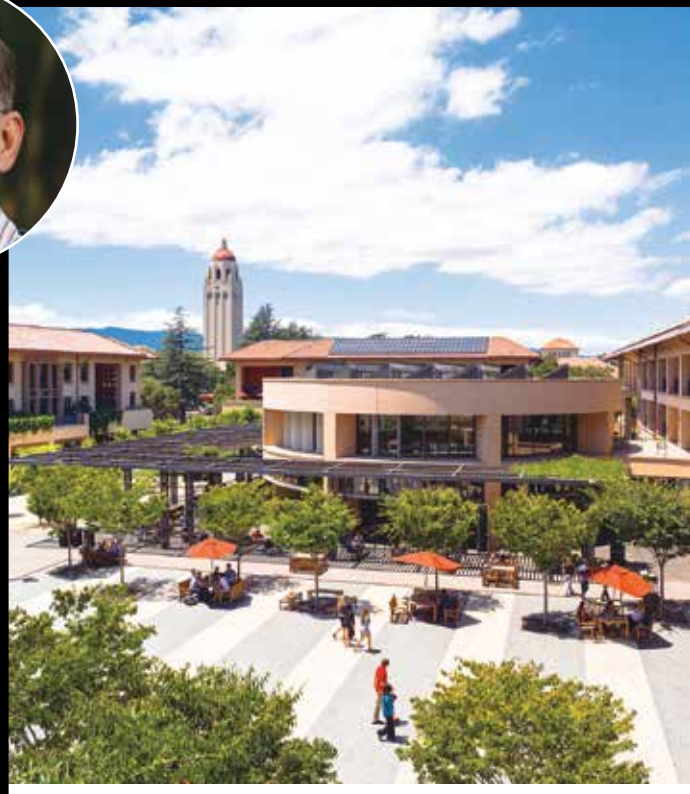
**Steve Smith**, '81, MS '82, MBA '87, is to this day NASA's only astronaut with an MBA. In 1994, he embarked on his first of four space shuttle missions, which included seven spacewalks. He also served as deputy chief astronaut, the second in command at the U.S. Astronaut Corps.

## Good Behavior

In 1997, GSB professor Margaret Neale, an expert in bargaining and negotiation, helped create what became known as the school's Behavioral Lab, or B-Lab, where GSB faculty and PhD students have run human experiments to explore concepts ranging from happiness and reciprocity to inequality and power.

## The Boom

In 1999, professors Haim Mendelson and Garth Saloner, MA '81, MS '82, PhD '82, a future GSB dean, launched the Center for Electronic Business and Commerce. When others were predicting that "electronic firms" would destroy corporations, Mendelson and Saloner saw the future differently. "We didn't heed the calls to establish electronic business as a separate field of study," Mendelson said in an interview with the GSB. "Instead, we integrated it with the school's traditional teaching and research programs." Two years later, they predicted that electronic business would continue to create value and, over time, transform industries. The center created 54 research papers, seven business courses, and 130 teaching cases that were used worldwide. Over time, the professors' predictions came true. They shut the center down, as planned at its founding, in 2005.

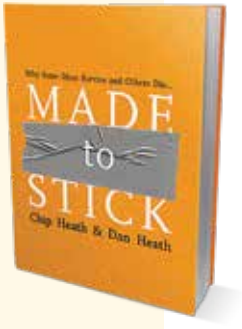


## *Home Sweet Home*

After nearly 30 years in the Quad, the school headed up Lasuen Street to a new building, later dubbed GSB South. Littlefield Management Center was added next door in the mid-1980s. In 2008, ground broke on the **Knight Management Center**, a 360,000-square-foot business school campus. The school relocated there in 2011.

## STICKY STUFF

Urban legends about kidney theft; a wildly successful anti-littering campaign slogan ("Don't Mess with Texas"); Sony's "pocketable radio." The research and writing of GSB professor Chip Heath, PhD '91, revealed six principles that make for successful messages and how those traits can make people better communicators.




CLOCKWISE FROM TOP: STANFORD GSB ARCHIVES; ANDREW BRODHEAD/STANFORD UNIVERSITY; ELENA ZHUKOVA/STANFORD GSB ARCHIVES; NASA

# 2010s

## Worldwide Webs

In 2011, the GSB launched the Stanford Institute for Innovation in Developing Economies, or Stanford Seed. Today, it delivers business training and resources to founders and CEOs in 43 countries and, according to surveys, has created nearly 50,000 jobs and added $1.7 billion in revenues to local economies. In 2023, the GSB and the Stanford Doerr School of Sustainability launched the Stanford Ecopreneurship program to accelerate work on climate solutions in private, public, and nonprofit entities.

**In general, you're far better off making decisions in the morning.**

**PROFESSOR BABA SHIV, WHOSE MARKETING RESEARCH REVEALS THAT IN THE AFTERNOON, LOWER SEROTONIN LEVELS MEAN WE'RE MORE LIKELY TO POSTPONE DECISIONS.**

## Tech for More

GSB professor Susan Athey, PhD '95, launched the Golub Capital Social Impact Lab so that students from CS, engineering, education, and economics can work together to help organizations develop digital tools and expertise that are generally unavailable or unaffordable for all but the largest technology companies. The lab has studied how to increase charitable donations; evaluated methods to speed the delivery of health care; and built a tool to help people compare the benefits of government-funded training programs.

## Rise of the Entrepreneurs

The Center for Entrepreneurial Studies was created in 1996 as a one-stop shop for students interested in pursuing their own ventures. Today, the GSB offers more than 50 courses on entrepreneurship and innovation—including the popular Startup Garage, launched in 2013 by the GSB and Stanford's Hasso Plattner Institute of Design. The course aims to give students hands-on practice designing and field-testing new business concepts that address real-world needs.

'Ask yourself: "Who is my audience and what is my goal in engaging them?"'

***—Professor Jennifer Aaker, PhD '95, on using storytelling in business***

# 2020s

## Power Points

Professor Jeffrey Pfeffer's research on power aimed to unveil the forces that shape our workplaces. Pfeffer, PhD '72, wrote *7 Rules of Power: Surprising—but True—Advice on How to Get Things Done and Advance Your Career* to help leaders change organizations.

Professor **Brian Lowery**, a social psychologist, studies social identities. In his book, *Selfless: The Social Creation of "You,"* he argues that the "self" as we know it—that "voice in your head"—is created through our relationships and social interactions.

## Looking to the Future

In its 100th year, the GSB appointed **Sarah Soule** as dean. A member of the school's faculty since 2008, Soule has focused her research on organizational theory, social movements, and political sociology. As dean, she plans to build on two platforms launched by Levin: the GSB's business, government, and society initiative, which funds cross-disciplinary thinking and research aimed at solving the world's most pressing problems; and the school's investing initiative, which includes a new summer finance course for incoming MBA students interested in investment careers. "I see them both as directly tied to the idea that democracy, capitalism, and the rule of law are important institutions that, when functioning well, lead to great economic prosperity," says Soule.

## Fresh Faces

In 2023, the GSB launched Pathfinder, a pilot program that offers courses in finance, entrepreneurship, and other business topics to college juniors, seniors, and co-terminal master's students.

**55%**

proportion of U.S.-based GSB alums who live on the Pacific Coast. (About 3/4 of alums are U.S.-based.)

REBECCA BEYER *is a freelance writer in the Boston area. Email her at stanford.magazine@stanford.edu.*

FROM TOP: ANDREW BRODHEAD/STANFORD UNIVERSITY; LINDA A. CICERO/STANFORD NEWS SERVICE; NANCY ROTHSTEIN

# IN ALUMNI WE TRUST

## APPLY TO JOIN THE STANFORD BOARD OF TRUSTEES

**LEAD STANFORD INTO THE FUTURE** as a member of the Stanford Board of Trustees. The Alumni Committee on Trustee Nominations (ACTN) is seeking four extraordinary alumni leaders to serve at the university's highest level of volunteer service.

**HELP SET THE DIRECTION FOR THE UNIVERSITY** as a custodian of the endowment and all properties of Stanford. Together, trustees share responsibility for guiding the university's course, ensuring Stanford's continued well-being and working to sustain and build upon its foundation of excellence.

**THIS COULD BE YOUR CALL TO SERVICE** if you are a proven leader with professional achievement and civic involvement, and have demonstrated a commitment to Stanford with an outstanding record of volunteer service and consistent financial support.

**NOMINATIONS ARE OPEN TO ALL STANFORD ALUMNI** Applications must be submitted online by November 1, 2025. To explore the selection process, understand the ideal attributes and experiences of a Trustee, and apply or nominate a fellow alum, please visit the Stanford Alumni Association website.

ALU.MS/TRUSTEENOMINATIONS

Stanford | alumni

# Welcome the New SAA Board Members

*Stanford Alumni Association Board Chair David Hornik, '90, reports that seven alumni representatives have agreed to serve on the SAA Board of Directors.*

**The following alumni began their terms on September 1, 2025.**

**ANDY BERKE, '90**
**Washington, DC**

For the last two decades, Andy Berke has led progress at the federal, state, and local levels. In 2022, he became the Administrator of the Rural Utilities Service, where his work led to more than $4.5 billion for high-speed internet projects and seeded more than $40 billion of new clean energy developments. Berke also served two terms as mayor of Chattanooga, Tennessee, the first universal broadband city and the first to make the internet free for needy families. *American City and County* magazine named him Municipal Leader of the Year, and *StateScoop* awarded him City Executive of the Year. Berke was elected twice to the Tennessee Senate. He currently works with clients to advance their energy and broadband goals.

**WARD BULLARD, '00**
**Menlo Park, CA**

Ward Bullard is the Founder of 31st Ventures, a strategic advisory firm. Ward previously held leadership positions at Decathlon, Verizon, SAP, Google, and Harrah's Entertainment. He co-founded the NWSL's Bay FC. Ward co-chaired his past four Stanford reunion campaigns and is a founding member of Stanford's LEAD Council. Ward taught at the Stanford d.school and developed the course Testing at Scale. Ward chaired the Stanford Athletics Board and co-founded the DAPER Technology Committee. He is a graduate of Harvard Business School and lives in Menlo Park, California, with his wife, Becky,'00, MA '00, and their children Jack, Gracie, and Lorraine.

**LIZ JENKINS, '99**
**Encino, CA**

Liz Jenkins is the chief business officer at NBCUniversal Entertainment & Studios, where she oversees strategy and business operations across the company's Film and Television Studios. She plays a key role in supporting NBCU's unified content hub, which includes Universal Pictures, Focus Features, DreamWorks Animation, and multiple television studio groups. Prior to NBCU, Liz was COO at Hello Sunshine, where she helped grow the company's content and direct-to-consumer businesses and led major acquisitions and its sale to Candle Media. She has also held senior roles at PlayStation and Media Rights Capital. Liz earned her BA from Stanford and MBA from Wharton. She lives in Los Angeles with her family and serves on the Boards of Snap Inc., GLAAD, and Baby2Baby.

*The Stanford Alumni Association is a division of Stanford University. Under authority delegated by the university's Board of Trustees, the SAA Board is responsible for setting priorities for Stanford's alumni affairs and for ongoing relations between alumni and the university.*

**ANDREW KWAN, MS '02, MS '06**
**Hong Kong**

Andrew Kwan is the founder and CEO of Delight Labs, a voice assistant software company. Previously, he founded Outwhiz and worked in engineering at Yahoo and SugarSync. A graduate of computer science, he is passionate about alumni community building and broadening access to introductory CS education. Andrew serves on the Bing Overseas Studies Program and Stanford Digital Education advisory councils, co-founded Stanford Angels and Entrepreneurs Southeast Asia, and led Stanford Club of Hong Kong. He loves music, plays piano, and sang in the Chamber Chorale. He and his wife Erica Ma, '02, MA '04, have two daughters, Sophia and Zoe.

**FRED LOPEZ, '86, CRT '95, MF '98**
**New Orleans, LA**

Dr. Lopez is the Richard Vial Endowed Professor and a vice chair of the Department of Medicine at the Louisiana State University School of Medicine in New Orleans. A native of New Orleans, Dr. Lopez received his undergraduate degree from Stanford University and his MD from the LSU School of Medicine-New Orleans. Thereafter, he returned to Stanford where he was an intern, resident and chief resident in Internal Medicine, and a fellow in Infectious Diseases. He subsequently returned to LSU-New Orleans to join the faculty in the Department of Medicine. Fred lives in New Orleans with his wife, Nora Oates, '86, MD '95. They have two children, Emma and Andrew.

**KHARA RAMOS, '01**
**New York, NY**

Khara Ramos is a neuroscientist who has built a career around the idea that science is an incredible engine for well-being and civic advancement. She is currently VP for Neuroscience & Society at the Dana Foundation, leading the N&S strategy and programs aimed at aligning neuroscientific progress with societal goals and human values. Previously, she worked at the National Institutes of Health, having made the leap from academia to science policy as an AAAS Science and Technology Policy Fellow. Khara is an avid traveler currently residing in New York City.

**TROY STEINMETZ, '07**
**Louisville, KY**

Troy Steinmetz has dedicated his career to improving and advancing education. As director of Partner Success at GiveCampus, he leads a team that supports fundraising efforts for over 1,000 colleges, universities, and schools nationwide. Previously, Troy spent ten years working at Stanford, first in Student Affairs and then Development, and served as president of the Stanford Historical Society. While he has since returned to his native Bluegrass State, he remains deeply connected to the Farm, something he wishes for all alumni. Outside of work, he's an avid trivia fan, game master, and poker player.

# Farewells

**FACULTY**

**Andreas Acrivos**, of Stanford, February 17, at 96. Born and raised in Athens, he came to the United States for college and graduate school and eventually was recruited to join Stanford's chemical engineering department. A preeminent expert in fluid mechanics, he was recognized for his notable accomplishments in microhydrodynamics, a once-esoteric field that is now central to lab-on-a-chip technology. He received the National Medal of Science, edited the *Physics of Fluids* journal, and was a member of the National Academy of Engineering. Survivors include his wife, Juana; and sister, Acrivy Stavropoulos.

**Richard Monson Christensen**, of Walnut Creek, Calif., April 12, 2024, at 91. He was a research professor emeritus of aeronautics and astronautics and of mechanical engineering, and an expert in the field of the mechanics of materials. He helped revolutionize aircraft through his work on "failure criteria," creating theories and mathematical methods to assess how advanced composite structures accumulate damage, respond to damage, and eventually fail. He wrote three groundbreaking books and was elected to the National Academy of Engineering. He was predeceased by his wife, Kristy. Survivors: his children, Lori Enright and Kurt Christensen; and six grandchildren.

**Michael Lee Friedman**, of Portola Valley, Calif., March 24, at 77, after a long illness. A prize-winning expert on Immanuel Kant, he joined the philosophy department at Stanford in 2000 and left an indelible mark on the history of philosophy, the philosophy of science, and Kant studies. The author of several books, he won the Fernando Gil International Prize in Philosophy of Science for *Kant's Construction of Nature*, which probed the deepest, most technical details of Kant's reconstruction of Newtonian science. He was predeceased by his wife of 40 years, Graciela de Pierris, who also taught philosophy at Stanford. Survivors include his mother and sister.

**George Mitchel "Bud" Homsy**, of Lake Forest Park, Wash., March 12, 2024, at 80, of cancer. He was a professor emeritus and former chair of the chemical engineering department. In addition to pioneering research in fluid mechanics and transport phenomena, he helped create *Multimedia Fluid Mechanics*, a groundbreaking work (originally in CD-ROM form) in interactive education that set a new standard as a learning resource for students in the field. His work in viscous fingering, which deals with fluid displacement in porous mediums, influenced oil recovery, hydrology, and filtration. Survivors: his wife of 59 years, Barbara; and sons, George and Robert.

**Jean Snookes Lythcott**, of Palo Alto, March 1, at 86, of cancer. She was a clinical professor of science education at the Graduate School of Education. A master pedagogue, she co-founded a charter school, worked with teachers internationally, and spent many summers teaching for the Peace Corps in Africa and Polynesia. At Stanford, where she mentored teacher candidates, she was known for her devotion to education as a tool of liberation and evangelizing her love of science. She was predeceased by her first love, Ian Forrester; and husband, George Lythcott. Survivors: her children, Ian Forrester and Julie Lythcott-Haims, '89; stepchildren, Ngina, George, and Michael; eight grandchildren; four great-grandchildren; and two sisters.

**Robert John Moffat**, MS '66, Engr. '66, PhD '67 (mechanical engineering), of Los Altos, May 10, at 96. He was a professor emeritus of mechanical engineering. An expert on heat transfer, he was also known for co-designing an infant incubator-transporter that saved the lives of thousands of critically ill neonates. He was a sought-after consultant for jet-engine manufacturers due to his understanding of convective heat transfer in engineering systems. He later adapted that knowledge to introduce the adiabatic heat transfer coefficient, a revolutionary concept that improved the cooling of electronic systems. Survivors: his wife, Karina Nilsen; and son, John.

**Inder Perkash**, of Los Altos, February 28, at 91. He was an emeritus professor of urology and the first professor of Indian origin to have tenure and an endowed chair. He joined Stanford in 1972 to head the spinal cord injury program at the VA Medical Center in Palo Alto. As a urologist with advanced surgery skills, he pioneered new ways to treat and care for veterans with spinal cord injuries. He was one of the first doctors to use lasers to stimulate the bladder nerves and use laser surgery for ureteral strictures. Among numerous honors, he received a Presidential Award for Medical Excellence. Survivors: his wife, Arun; sons, Rajan, '90, and Sunil, '91; two grandchildren; and sister.

**David Alfred Thompson**, PhD '61 (industrial engineering), of Paso Robles, Calif., November 25, 2023, at 94. He was a professor emeritus of industrial engineering and an expert in ergonomics. He studied the physical and mental toll of the modern workplace and sought to design products and technologies to help people be more productive. He studied the physical demands of bus driving, computer workstations, and prolonged periods of staring at screens, guided by a belief that technology should adapt to people, not vice versa. Survivors: his daughters, Lynda and Diane; stepchildren; grandchildren; sister; and second of four wives, Leeya.

## Founding Father of Neonatology

In the mid-1960s, it was routine for hospital nurseries to bar parents, and even limit visits from doctors, to prevent infection in vulnerable infants. At Stanford's neonatal intensive care unit, pediatric gastroenterologist Philip Sunshine would change that.

He listened as nurses lamented over a mother who, every evening, would peer through nursery windows to see her sick infant. Sunshine and his team not only let the mother in but also conducted pioneering research that showed that allowing parents to visit neonates at the bedside did not increase rates of infection.

The research transformed neonatology into a field centered not just on babies but on families. Over the past 60 years, the survival rate for preemies has increased from less than 50 percent to more than 90 percent, in part due to newborns receiving the physiological benefits of skin-to-skin contact. Today, nearly all U.S. NICUs—which care for about 8.4 percent of newborns—are open to parents.

**Philip Sunshine**, a professor emeritus of pediatrics and one of the founding fathers of neonatology, died on April 5. He was 94.

Sunshine grew up in Denver as an only child, a motivating factor in his and his wife's later decision to have five children in five years. "He wanted a huge family because he just loved people," says his daughter Diana. "He especially loved babies." Sunshine earned his undergraduate and medical degrees at the University of Colorado, then interned at Sinai Hospital in Baltimore. As a medical resident at Stanford, he met Louis Gluck, who designed the modern NICU and sparked Sunshine's interest in the emerging field of neonatology.

"Babies are just wonderful people. People think they're just babies, but each one has a different personality," says close friend David Stevenson, a professor of pediatrics and one of Sunshine's early trainees. "Isn't it a wonderful thing," he recalls Sunshine saying. "We're basically giving a person a life, which could be as long as 90 years."

As a Stanford faculty member, Sunshine took charge of the Premature Research Center, one of the first of its kind in the country. He refined neonatal ventilation techniques, improved intravenous infant nutrition, and diagnosed and treated metabolic and gastrointestinal disorders. He also worked with Stanford children's hospital benefactor Lucile Packard, '35, to bring obstetrics and the NICU under one roof in 1991.

His equal respect for each of his colleagues—whether doctor, nurse, or receptionist—shaped generations of physicians, and his jokes echoed down the hallways until his retirement at 92. "He lived up to his surname," says Stevenson.

In addition to Diana, Sunshine is survived by his wife of 63 years, Beth; children Rebecca, Sam, '86, Michael, and Stephanie; and nine grandchildren.

*—Kali Shiloh*

**1940s**

**George Alexander Jedenoff**, ’40 (general engineering), MBA ’42, of Orinda, Calif., May 11, at 107, of a heart attack. He was a member of Phi Kappa Psi and played rugby. He served in the Navy. He was the general manager of three U.S. Steel plants before becoming the company’s vice president of operations. He later served as president and COO of Kaiser Steel Corporation. He was a passionate skier until age 103 and made a point to serve his communities, which included the Stanford Alumni Association. He was predeceased by his wife of 75 years, Barbara (Cull, ’43). Survivors include his children and grandchildren.

**Verna Belle Maroney Reintjes**, ’44, MA ’45 (psychology), of Morehead City, N.C., January 20, at 101, of complications from COVID-19. In North Carolina, she was a clinical psychologist for the Department of Social Services and for the Neuse Mental Health Center until her retirement in 1985. She loved traveling, especially to Ireland, Greece, and Hawaii, and she was a member of the Coastal Fellowship Unitarian Church for over 30 years. She was predeceased by her husband, John. Survivors: her children, Anne Krouse, Christine Martin, Susan, and Peter; four grandchildren; and four great-grandchildren.

**Meryle Eleanor Swift Thompson**, ’46 (economics), of Menlo Park, April 1, 2024, at 99. She presided over the family rice growing business in Colusa County and supported the Lucile Packard Children’s Foundation, Stanford, the Allied Arts Guild, and the Peninsula Family Service Agency. She read the *San Francisco Chronicle* every day and was an ardent fan of Stanford sports. She loved watching and playing tennis, public television, dominoes, and cooking dishes from her Danish heritage. She was predeceased by her husband, John, ’45. Survivors include her son, Charles.

**Jane Woodruff Smith Foster**, ’48 (geography), of Chico, Calif., April 4, at 98, of lung cancer. She was a librarian in Modesto, Calif., and in Palo Alto. She enjoyed playing bridge and tennis while at Stanford. She was predeceased by her husband, Myron, and son John. Survivors include her son Kemper.

**Elizabeth Clark Wellington O’Neill**, ’48 (social service), of Denver, January 15, at 98. She was an accomplished oil and watercolor painter. Later in life, she earned a master’s degree in psychotherapy with an emphasis on art therapy. She counseled families experiencing childhood cancer and advised staff at related summer camps for 15 years. She was involved with the Girl Scouts for over 90 years and worked as a kindergarten assistant. She was predeceased by her husband of 55 years, Donald, ’45, MS ’48; and a grandson. Survivors: her children, Mary O’Neill Christ, Donald, and Laura; five grandchildren; and two great-grandsons.

**Culton “Cully” Ingram**, ’49 (speech & drama), of Palm Desert, Calif., November 7, at 96. He was a member of Phi Kappa Psi and played golf. He served in the Army. He worked at Chevron for 41 years in marketing and public affairs, a job that entailed 78 assignments and 23 household moves. He was a lecturer at Stanford, San José State, Menlo College, and various community colleges. He was a philanthropist and a director or board member of numerous civic organizations. He loved swimming, cocktail hour with friends, and traveling. Survivors: four children, nine grandchildren, and five great-grandchildren.

**Lois Mae Condee Seed**, ’49 (education), of Carlsbad, Calif., March 13, at 97. She was a teacher at Raymond Avenue Elementary School, a U.S. Army school in Germany, and the Brentwood Presbyterian Church Preschool. She was active in Ebell Juniors, the National Charity League, and the American Association of University Women. She loved theater, classical music, reading, and listening to audiobooks and KUSC. She was predeceased by her husband, Albert, ’50, and son James. Survivors: her children, Marie Seed Lichauco, ’76, John, ’79, Alison Seed-Araujo, Pamela Kimbrough, and Janet Balekjian; 13 grandchildren; and five great-grandchildren.

**1950s**

**Austin McLain Case**, ’50 (biological sciences), of Seattle, May 26, 2020, at 90. He was a member of Sigma Chi. He served as a flight surgeon in the Air Force. He was a psychiatrist, University of Washington professor, and co-founder of the Center for Object Relations. He founded Secure Beginnings to serve high-risk mothers and infants and was a founding member of the Washington Association of Infant Mental Health. He was predeceased by his daughter Debby. Survivors: his longtime partner, Lucy Hadac; children, Stan, Margot, and Charlie; five grandchildren; four great-grandchildren; two siblings; and first wife, Carol (Truman, ’52).

**Beverly June Bond Childs**, ’50 (Spanish), of Newport Beach, Calif., April 19, at 96. She had an abiding curiosity about the world and its people—one she carried across continents while adventuring with her husband. The cornerstone of her family, she was a steady presence known for her patience and caring nature. She prioritized health and exercise and enjoyed beach volleyball and, later, spirited tennis matches. Her sense of adventure never faded. She was predeceased by her husband, Robert, ’50, MBA ’52. Survivors: her children, Gail Omohundro, Blake, and Michael; four grandchildren; and one great-grandchild.

**Richard H. Overman**, ’50 (basic medical sciences), MD ’54, of University Place, Wash., February 1, at 96. He served in the Air Force Medical Corps. Initially drawn to medicine, he felt a spiritual calling to theological studies. He earned a master’s degree from the Southern California School of Theology and a PhD in theology and philosophy of religion from Claremont Graduate School. He joined the University of Puget Sound in 1965 as a professor of religion and taught for 28 years. His was a life dedicated to faith, family, education, and service. Survivors: his wife, Phyllis; children, Leah Wegener and Robert; and five grandchildren.

**John Wilbert Abouchar**, ’51 (mining & mineral engineering), of Kailua Kona, Hawaii, October 18, 2024, at 95, of Alzheimer’s disease. He served in the Navy. He was an inventor, patent- holder, and technology business developer whose companies made microscopic parts for defibrillators, gyroscopes, mass flow controllers, and automated soldering machines. He worked for North American Rockwell on unmanned non-Earth orbital studies. He enjoyed gardening, traveling, and church service work. Survivors: his wife, Marilyn (Bree, ’52); children, Susan Creighton, JD ’84, John, Jan Marie Abouchar Calle, ’85; stepchildren, Elizabeth Wilson and Wendell Sechler; eight grandchildren; seven stepgrandchildren; and eight step-great-grandchildren.

**Robert August Johnson**, ’52 (economics), of Pacific Grove, Calif., May 1, at 94. He was a member of Theta Delta Chi. He founded Old Stage Farms in the Salinas Valley, working there for over four decades. He was a past president of the California Farm Bureau and an early adopter of new agricultural technology, and he helped expand access to higher education for local students and advance agricultural programs at CSU Monterey Bay. He was predeceased by his wife of 52 years, Sue; and grandson. Survivors: his daughters, Roberta Rhodes, Cindy Shaw Johnson, ’80, and Terri Yost; granddaughter; and brother, Richard, ’57, MA ’59.

**Elisabeth Anne “Liddy” Hawkins Napper**, ’52 (education), of Sonora, Calif., February 24, 2024, at 93, of acute respiratory failure. She met the man she would marry at Roble, where she lived and he worked as a hasher. She taught elementary school in Virginia and California. She was an accomplished seamstress, sold more than 40 of her watercolor paintings, and celebrated her 50th wedding anniversary by cruising the Mississippi on a steamboat. She was predeceased by her husband of 58 years, Lowell, ’49, MS ’49. Survivors: her three daughters, Melanie Napper Reel, ’79, MA ’80, Cheryl Birkholz, and Susan Campbell; six grandchildren, including Jessica Reel, ’08, MS ’08; and 12 great-grandchildren.

**Audrey Ann Bojanower Cochran**, ’54 (nursing), of Bakersfield, Calif., March 21, at 93. She was a member of the choir. She was a professor of gerontological nursing at Cal State Bakersfield. She loved the Lord, writing, hiking, and her nursing career. She was predeceased by her husband, Robert; and son Ross. Survivors: her sons Lewis and Brian; and three grandsons.

**Mary Allene Wicks Brucker**, ’55 (political science), of Mercer Island, Wash., June 5, 2023, at 90, of dementia. She was one of the few women to attend law school at the University of Washington in the 1950s. She worked at the King County prosecutor’s office and in private practice before becoming the district court judge on Mercer Island. She later was appointed and elected to the King County Superior Court. She was a member of Soroptimist, served on the Seattle Ethics and Elections board, and supported the Mountaineers Foundation. She was predeceased by her husband, Tom; and daughter Sydney. Survivors: her children, Allison, Christopher, and Rachel; and two granddaughters.

**Hamilton Robert Harris**, ’55 (civil engineering), of Seattle, January 20, at 90. He served in the Air Force. He worked for Hiller Aircraft in Palo Alto, then for Boeing in Seattle. He worked on the engines for the 737, the failed SST project for supersonic jets, the hydrofoil project, and the stealth bomber project. He was predeceased by his wife, Nancy (Laverty, ’55). Survivors include his daughter, Cindy Lucangioli.

**Marilyn Valerie Sanchez-Corea Knight**, ’55 (psychology), of Tiburon, Calif., May 24, at 91, of breast cancer. She earned a master’s degree in early childhood education from the University of San Francisco. From 1968 to 2004, she was a director, executive director, and educational consultant of the Belvedere-Hawthorne Nursery School, where she introduced the first pre-kindergarten program in southern Marin. She helped launch *The Ark*, a weekly community newspaper, and was a longtime parishioner of St. Hilary’s Catholic Church. She was predeceased by her husband of 42 years, Geoff. Survivors: her children, Jocelyn Knight Cacciatore and Geoffrey; two grandchildren; three great-grandchildren; and brother.

**Lois Ann Blemer Lippincott**, ’55 (English), of Orinda, Calif., May 24, at 91. She was a dedicated docent at the California Academy of Sciences, where she shared her passion for marine life during tours of the Steinhart Aquarium. She also embarked on adventurous journeys around the

globe, collecting unique fish species for the aquarium and contributing to its vibrant displays and educational mission. She was predeceased by her husband of 55 years, Alan; beloved partner, Bob Gledhill, ’55; and daughter Abby. Survivors: her daughter Lisa and grandson.

**Maryann Jones Patterson**, ’55 (music), of Walnut Creek, Calif., July 11, 2023, at 90. She sang in the choir. Inspired by her faculty mentor, a devotee of French Romantic organ music, she played it with enthusiasm and skill throughout her life. She loved the history of ancient instruments and notation and was a devoted student of Latin who taught her daughters to sing “Twinkle, Twinkle, Little Star” in Latin. She practiced her organ craft wherever she could—including a Coast Guard base—and played everything from Bach to Buxtehude to Hindemith. Survivors include her daughters.

**Elizabeth Burgess Dempster Stahr**, ’55 (history), of Newport Beach, Calif., April 29, at 91. She tirelessly supported charitable causes, especially those focused on children, libraries, and the arts. She led the fund-raising efforts to build the Newport Beach Central Library, was an advocate for Pacific Symphony Youth Ensembles, and strongly supported Stanford—in recognition of her contribution to help renovate the Hoover Tower carillon, one of the bells bears her name. She was predeceased by her husband, John, ’54. Survivors: her children, Walter, ’79, Fritz, ’81, Gretchen Stahr Breunig, ’86, and Karen; and five grandchildren, including Clancey, ’15.

**Barbara Lee Horne Tiernan**, ’55 (undeclared), of Saratoga, Calif., August 3, 2024, at 91. After raising children, she helped expand Airrigation Engineering Inc.—a developer and supplier of chemical root control systems—around the world. As company president, she established a subsidiary called Foam Innovations. She loved sports, made the DeAnza College tennis team in her 40s, and played in contract bridge tournaments across the country. She was predeceased by her children, David, Dane, and Christine. Survivors: her husband, Frank, MBA ’72; sons, Rick and Brian; stepchildren, Jim, Jo Anne, Dave, Vince, Chris, and Frank Jr.; and sister.

**Ardath Harrison Wightman Jr.**, ’55 (biological sciences), of Fullerton, Calif., July 23, 2023, at 90. He was a member of Kappa Alpha and on the crew team. He committed his life to his family and his medical practice, which he approached with a deep sense of empathy and understanding. His unwavering devotion to his family and his patients was evident to all who had the privilege to know him. He was best known for his calm demeanor and gentle soul. Survivors: his seven children; 13 grandchildren; two great-grandchildren; and two sisters.

**Charles Carlin Kerwin Jr.**, ’56 (undeclared), of North Bend, Ore., May 27, at 91. He was on the crew team. He served in the Marine Corps. A graduate of UC Berkeley’s Haas School of Business, he worked first as an investment banker in Los Angeles. With a passion for financial management and growing his clients’ portfolios, he started a Seattle-based investment firm, Kerwin Beley & Associates, that operated for over 40 years. He was an avid fisherman who enjoyed spending summers in Alaska on his boat. Survivors: his wife of 58 years, Nancy.

**Brenda Jane Sorey Miller**, ’56 (history), MA ’57 (education), of Palo Alto, March 20, at 91, of Alzheimer’s disease. She began a teaching career, sharing her love of learning with young minds, before dedicating herself to raising three sons. She was a steadfast presence in their lives, instilling in them the values of curiosity, kindness, and perseverance. She had a deep love for travel, was always eager to explore new places and cultures, and found great joy in the companionship of dogs, especially her final companion dog, Max. Survivors: her children, Charles, William, and Richard.

**Virginia Kay Vinson Ruhland**, ’56 (geography), of Oakland, March 31, at 90, after a short illness. After being a stay-at-home mom, she worked at Heald College for 16 years. In retirement, she traveled the world and particularly enjoyed Europe, riverboat cruises, and Asia. She was a strong supporter of the East Bay performing arts with subscriptions to Berkeley Repertory Theatre and the Oakland Symphony. Survivors: her children, Kurt, Eric, Lisa, and Elizabeth; eight grandchildren; and nine great-grandchildren.

**Herschell Stephens Thomas Jr.**, ’56 (basic medical sciences), MD ’69, of Phoenix, April 10, at 90. He was a lieutenant commander in the Navy. A general surgeon in Phoenix for over 45 years, he was the chief of surgery at St. Joseph’s Hospital, president of the Maricopa County Medical Society, president of the Phoenix Medical Club, and founder and president of the Mamakai, a medical society. He was a 50-year Rotarian and recognized as a Distinguished Eagle Scout. Survivors: his wife of 63 years, Anne (Smoyer, ’60); children, Winston, Lynne Carpenter, and Laura Thomas Mitchell, ’93; eight grandchildren; and four stepgrandchildren.

**Suzanne Griffin LaTourrette**, ’57 (Pacific-Asiatic-Russian studies), MA ’61 (education), of Los Altos, April 15, at 88, of dementia. She taught English as a second language for the city of Mountain View before returning to school and launching a 20-plus-year career as an agent at All Horizons Rancho Travel, specializing in Hawaii. A great lover of the outdoors and nature conservation, she was active in the Los Altos Mountain View Community Foundation, Peninsula Open Space Trust, Green Foothills, and Environmental Volunteers. Survivors: her husband, Peter, ’56, MS ’57, Engr. ’59; sons, Jeff, Tom, and Dean; and six grandchildren.

**Anna Dale Lyon Silliman**, ’58 (education), of San Diego, May 25, at 88. She enjoyed a brief career as a school teacher in Watsonville, Calif., before raising her daughters. She was a member of the Junior League, Thursday Club, Point Loma Association, and ARCS Foundation. She treasured many years at the Zoological Society, administering the popular Speakers’ Programs, and served on the San Diego County Grand Jury. She was predeceased by her husband of 39 years, Ray, ’56. Survivors: her daughters, Lynn, ’81, Lauri, and Terri, ’89; nine grandchildren; seven great-grandchildren; and sister.

**Albert Rene Martin**, ’59 (biological sciences), of Greenbrae, Calif., May 21, at 87, of complications from Parkinson’s disease. He was a member of Theta Xi. A graduate of Harvard Medical School, he worked on the efficacy of cholera vaccines with the U.S. Public Health Service and developed neighborhood health centers in Cambridge, Mass., before becoming a medical director at the Harvard Community Health Plan and later at Blue Shield of California. He helped design the California Healthcare Foundation Leadership Program. Survivors: his wife, Diana Richmond; daughters, Lauren and Susannah; stepdaughter, Kavana; two stepgranddaughters; sister; and former wife, Helene.

**James Robert Ukropina**, ’59 (history), MBA ’61, of Pasadena, Calif., April 8, at 87. He was a member of Beta Theta Pi and played rugby and football. He served in the Air Force. A graduate of USC Law School, he was a partner at O’Melveny & Myers, an executive at Santa Fe International and Pacific Lighting, a member of the Stanford University Board of Trustees, and a dedicated philanthropist. He was predeceased by his wife of 15 years, Margaret Duckhorn. Survivors: his former wife, of 40 years, Lois (Brandenburg, ’62); sons, Mike, David, ’90, and Mark; five grandchildren; and twin sister, Jo-an Ukropina Barnett, ’59.

**1960s**

**John Shelton Lawrence**, ’60 (philosophy), of Berkeley, January 2, at 86, of complications from Parkinson’s disease. He earned a PhD from the University of Texas, then spent most of his career at Morningside University in Sioux City, Iowa, where he taught philosophy and photography, authored several books, and oversaw a curriculum change process. He chaired the board of the Sioux City Art Center, enjoyed attending the Berkeley Repertory Theater, and was an active community volunteer. Survivors: his wife, Nancy (Cummings, ’61); children, Eric, ’90, and Jennifer; four grandsons, including Bradley, ’20; and brother.

**Priscilla Lord Cowles Cowell**, ’61 (psychology), of Portland, Ore., March 20, at 84, of brain cancer. She sang in the choir. She earned a master’s degree from the Harvard Graduate School of Education. With a specialty in literacy, she worked in developing countries on projects funded by USAID and the Ford Foundation. She helped develop national school curricula in Chile, American Samoa, Venezuela, and Namibia, and taught in Indonesia, Nepal, and Pakistan. In Portland, she was a learning specialist at the Catlin Gabel School. She was predeceased by her son Nicholas. Her husband, Nick, died two months after she did. Survivors: her son Christopher and two grandsons.

**Ted Lane Kromer**, ’61 (political science), of Redding, Calif., March 31, at 86. He was a beloved father, grandfather, entrepreneur, professor, world explorer, and friend. Survivors: his daughters, Karen Foster and Kristen Mcgee; and four grandchildren.

**Franklyn Rehm Atkinson**, ’62 (history), of Belmont, Calif., April 14, at 83. He was a member of Zeta Psi and played football and rugby. He was drafted by the Pittsburgh Steelers as their first pick in round 8 and later played for the Denver Broncos. After attending business school at UCLA, he worked in venture capital and finance. From 1974 to 1980, he and his family lived in Beirut; Dusseldorf, Germany; and London. Survivors: his wife, Linda (Beardwood, ’62); daughters, Patricia, ’87, MBA ’92, Gunhild Atkinson Jordan, ’89, and Robin Fox; and five grandchildren.

**Douglas Howard McAulay**, ’62 (psychology), of Oakland, July 5, 2024, at 83, of congestive heart failure. He was a member of Sigma Alpha Epsilon. He was in the second Stanford class to study abroad in Beutelsbach, Germany. While there, he drove his motorcycle to Munich, spent the night in a park before applying for a job at the foreign workers’ bureau. He was hired by a ball bearing plant and spent the summer there, perfecting his German. Survivors: his partner, Helen DeVol; son, Michael, ’88; and two grandchildren.

**Bruce Frederick Schaefer**, ’62 (industrial engineering), of Saratoga, Calif., April 24, at 84. He was a member of Chi Psi and managed the golf team. He earned an MBA from the University of Washington and spent most of his career in senior IT management at various Silicon Valley tech firms. He and his wife loved to travel, visiting each country in Europe and vacationing on the East Coast and in Canada, Mexico, Alaska, Hawaii, Singapore, and the Bahamas. He was predeceased by his wife of over 20 years, Louise. Survivors: his daughters, Kim Nicols,

Kari Mullan, and Jodie; four granddaughters; and longtime partner, Sandra Spivak.

**John Wesley Goddard**, '63 (industrial engineering), of Danville, Calif., October 28, 2024, at 83. He enjoyed a long and distinguished career in the cable television industry and was the CEO of Viacom Cable from 1980 to 1996. His biggest passion was duck hunting, and he owned and managed a family hunting property in California's Central Valley. He also loved snow skiing and fly fishing. In retirement, he took annual fishing trips to Alaska and traveled often to New Zealand. Survivors: his wife of 43 years, Joan; son, John Jr.; two grandchildren; and ex-wife, Susan (Ehrhart, '62, MA '63).

**Edward T. Engle Jr.**, '64 (history), of Mill Valley, Calif., April 26, at 82, of amyloid polyneuropathy. He was a member of Sigma Chi. He earned an MBA from Columbia University and co-founded a college textbook publishing company. After selling it, he worked at the Fine Arts Museums of San Francisco and spent 10 years as chairman of the business administration department at Dominican University. Later, following the collapse of the Soviet Union, he worked for a small nonprofit, creating training programs for Russian entrepreneurs. He loved traveling to obscure places, from Borneo to subarctic Russia. Survivors include his partner, Celia; his caregiver; and many cousins.

**Tessa E. M. Morelli Lepper**, '64 (English), of Walnut Creek, Calif., March 25, at 81, of cancer. A gifted middle and high school teacher, she served on the Walnut Creek School Board, was an integral part of the development of the Walnut Creek Youth Educator program, and supported initiatives to fund the city's middle and high schools. She shared her love of nature as the educational coordinator at the Lindsay Wildlife Museum. She enjoyed skiing, golfing, playing bridge, and traveling. Survivors: her husband of 59 years, Gary, '65; daughters, Caitlin Ryan and Meghan Martin; and four grandchildren.

**John Thomas Studebaker**, '64 (anthropology), of Sacramento, Calif., January 22, 2024, at 81, of congestive heart failure. He was on the *Stanford Daily* staff. He was an attorney for the Legislative Counsel Bureau of California for more than 30 years. He worked on important litigation related to the renovation of the California State Capitol Building. He was an accomplished pianist and jazz buff who also loved history, photography, hiking, flying gliders, and target shooting. He was a longtime member of the Sacramento Stanford alumni monthly book club. Survivors include his sister, Stacy.

**Marilynn Jean Cason**, '65 (political science), of Evanston, Ill., March 18, at 81. After law school at the University of Michigan, she worked for Dawson, Nagle, Sherman & Howard; Kraft Foods; and Johnson Products, where she was corporate vice president for manufacturing and marketing in Africa. She was later the lead attorney and VP of human resources at DeVry University. She had a deep love for visual and textile arts of West Africa and supported struggling artists and an array of museums. She was predeceased by her husband, Wes Kriebel, and a granddaughter. Survivors: her stepchildren, Linda Foltz, John, Paul, and Jeffrey Kriebel; five grandchildren; great-granddaughter; and sister.

**Nancy Jean Caling Fosmire**, '65 (electrical engineering), of Seattle, May 3, at 82. She was the first woman in Stanford's electrical engineering department. During her varied career, she worked as an electrical engineer for Boeing, a technical writer in the United States and Denmark, and the owner/operator of a guest house near La Push, Wash., and rentals in Seattle. She founded and ran Opera Plus, a group whose members enjoyed previews for each production of the Seattle Opera. She nurtured a lifelong interest in music and folk dancing. She was predeceased by her husband, Russell.

**Margaret Alice Ferguson Gibson**, '65 (political science), of Los Alamos, N.M., March 31, at 81. She was in the symphony orchestra. She earned a master's degree in political science from Northwestern University and two more—in computer science and biomedical sciences—from the University of New Mexico. She began her career as one of the first computer scientists to work for the Southern Pacific Railroad; after moving to the East Coast, she worked for the Computer Sciences Corporation. She was active in the First United Methodist Church of Los Alamos. Survivors: her husband of 56 years, Benjamin, PhD '66; sons, James, Michael, and Stuart; four grandchildren; and two sisters.

**Susan Adair Roberts Persson**, '65 (English), of Lafayette, Calif., March 17, at 81. She earned a PhD in English literature from the University of Colorado Boulder, an MSW from DePaul University, and her diploma in analytical psychology from the C.G. Jung Institute. She enjoyed a 30-year career as a psychoanalyst, practicing in Santa Fe, N.M., and Evanston, Ill. Survivors: her husband, Jan; and children, Erik and Cynthia.

**Mary Elizabeth Rolfs McDevitt**, '66 (history), of Mill Valley, Calif., March 3, at 80. With a master's degree in counseling psychology from Dominican University, she worked at Family Services Agency of Marin, then led a successful private practice in San Rafael for over 36 years. She was a professor in Dominican's counseling psychology graduate program for 26 years and helped develop its curriculum. She enjoyed gardening, pampering her cats, socializing with friends, and reading. Survivors: her husband of 58 years, Ray, '65, JD '69; daughters, Devon Marvel and Jessica; four grandchildren; and brother.

**Elizabeth Jean "Penny" Trimble Buckley**, '67 (art), of Oakland, July 24, 2024, at 79, of complications from dementia. She earned a master's from UC Berkeley and a PhD from UCLA with a specialty in Renaissance art. She was a docent at the Getty Museum and authored guides to the collections. She later taught at UC Santa Cruz before earning a degree from UC Law San Francisco. She retired from the California Court of Appeals in San Francisco. She was a traveler, scholar, gardener, and chef. She was predeceased by her husband, Mike. Survivors: her daughter, Kay.

**David Roger Lipson**, '67 (history), of Sausalito, Calif., May 4, at 79, from influenza A. His distinguished legal career spanned more than five decades. After graduating from Harvard Law School, he clerked for Justice Sullivan and Judge Weigel of the U.S. District Court for the Northern District of California. He worked for the state public defender and for various law firms, where he earned the respect and admiration of colleagues and clients for his integrity and keen mind. Survivors: his wife, Una Ryan; daughter, Christina; two stepdaughters; and grandson.

**Robin Jane Coats Walther**, '67 (mathematics), of Pasadena, Calif., February 8, at 79, after a long illness. With a PhD in economics from UC Berkeley, she taught economics at USC, among other schools. She also researched and wrote about gerontology. After leaving academia, she spent more than 20 years as an executive at the Southern California Edison Company, working on electric utility regulation. She was predeceased by her daughter, Danielle Walther Rangel. Survivors: her husband of 55 years, James, '67; and siblings, Betty Coats Heian, '66, Robert, '71, MBA '74, JD '75, Frank, '72, and Tom.

**Kevin Beedy King**, '68 (political science), of Palo Alto, February 16, at 78. He was a member of Beta Theta Pi. He earned a degree from UC Law San Francisco before pursuing a career in education, working for school districts in Southern and Northern California. He was passionate about tennis. Survivors: his siblings, John, James, and Katharine.

**William Carl Hobbs**, '69, MA '71 (English), of Durango, Colo., March 31, at 77. He was on the *Stanford Daily* staff. He taught reading and English at junior high and high schools in Colorado before becoming a full-time author of young adult fiction. His 20 novels won many awards, and two were included among the American Library Association's "100 Best Books for Young Adults." He was an avid outdoorsman with an intimate knowledge of the mountains, rivers, and canyons of the American Southwest, Alaska, and Canada. He was predeceased by his wife of 51 years, Jean. Survivors include his siblings, Barbara Hobbs Morrissey, Edmund, MS '69, and Joseph.

**Lura Marie Smith**, '69 (psychology), of Mercer Island, Wash., May 17, at 78, of pancreatic cancer. She spent three summers working at Stanford Sierra Camp. After a brief sojourn in Yosemite Valley, she lived in Alaska and Northern Idaho for 10 years. She earned a JD at Gonzaga University at 41 and spent more than two decades clerking for the chief judge of the Western Washington Federal District Court. She loved hiking and traveling to mountain destinations. Survivors: her husband, William Schubach, '66; sons, Matt Ginzton, '98, MS '01, and Nate Ginzton, '01; stepdaughters, Sarah and Julia Schubach, '14; four grandchildren; and sister, Erin Atwater, '78.

### 1970s

**Maureen Barbara Jenks Querio**, '70 (history and nursing), of Oakland, May 20, at 76. She worked as a nurse before raising a family. She was the primary caregiver and advocate for her second son, born with special needs, and zealously supported him and his fellow residents when he moved to the Sonoma Developmental Center. She was a devoted Catholic, community volunteer, and director on the Bay Island board. She was predeceased by her son Philip. Survivors: her husband, Don, '69, JD '72; children, Cynthia Querio Barthold, '07, and John, JD '03; five grandchildren; and two brothers.

**Kathleen L. "Taffy" McNellis**, '71 (psychology), MA '72 (education), of Redwood City, November 26, at 75, of syringomyelia. She taught at San José High School before earning a PhD in cognitive psychology at Cornell University. After giving birth to her children, she worked as a school psychologist at a public high school in Middletown, N.J.—a job she loved. She enjoyed cooking, family dinners, reading, caring for plants, traveling with her family, and giving advice to anyone who would listen. Survivors: her husband of 43 years, James Cunningham, '72; children, Erin and Michael; grandson; and three siblings.

**Melanie Phelps Bean**, '73 (music), of New York, June 3, at 73. She earned a master's degree in piano and performed in San Francisco and Chicago before moving to New York. She played chamber music and accompaniment, and taught piano both privately and at the Hoff-Barthelson School. She was a gifted writer and composer who found inspiration in musical theater. A longtime member of the Riverside Clay Tennis Association, she served as one of the organization's

more influential presidents. Survivors include her partner of 43 years, Ira Bauer, and two siblings.
**John Heardcouch Minott Jr.**, '74 (history), of Philadelphia, February 21, at 73, of a heart attack. He attended Stanford in France and became fluent in French. After working in the University of Oregon archives, he enrolled at the university and earned a master's degree in international studies. He worked at the historic Masonic Temple in Philadelphia for over 30 years. A skilled spokesperson and history buff, he brought the past to life with a quick wit and sense of humor. He took great pride in giving tours in English and French to visiting dignitaries and tourists. Survivors include his siblings, Joseph, Geoffrey, Owen, and Elizabeth.
**David Merle Orchard**, '74 (anthropology), of Houston, January 7, at 72, of Alzheimer's disease. He was a member of Kappa Alpha and on the crew team. He earned a master's degree in geology from the University of Texas at Austin and worked in oil and gas exploration at ERG and ConocoPhillips. He started Manzanita Alliances, a prosperous industry services company, and the Foundation for Quaternary Paleontology of Venezuela, in support of a fossil excavation project. Survivors: his wife of 51 years, Marie; children, Emily Orchard Kilbride, Phillip, Ellen, Samuel Holmes, and Abraham Kamara; 10 grandchildren; and sister.
**Michael Carleton Wood**, '74 (political science), of Mill Valley, Calif., April 10, at 72. He was a member of Delta Upsilon and played rugby. He earned a JD from Hastings Law School and an MBA from UC Berkeley. He became a partner at two law firms: Reed Smith and Cooley. While teaching his 3-year-old son to read, he realized the importance of phonics in early childhood reading and comprehension. He left his legal career and founded LeapFrog Enterprises, maker of the LeapPad, a computer tablet that would influence a generation of young readers. He later founded Smarty Ants, an educational software company. Survivors: his wife, Leslie Harlander; son, Mat; three grandchildren; and two brothers.
**Simon Ming Yeh**, '74 (chemistry), of Walnut Creek, Calif., April 28, at 72. He earned a PhD in chemistry from UC Davis and enjoyed a long career in the agricultural and pharmaceutical industries, first as a scientist and then in senior management. A devout Christian, he was active in his church community, teaching Sunday school and serving on various committees. He was an avid runner who completed 17 full marathons and many more half-marathons. He will be remembered for his faith, kindness, and strength of character. Survivors include his wife, Elizabeth (Seet, '75); and daughter, JoAnna.
**Beverly Antoinette Anderson**, '75 (human biology), of Denison, Texas, February 19, at 72. After graduating from the Albert Einstein College of Medicine, she dedicated her life to pediatric medicine in New York, providing compassionate care to countless children and families. Her commitment to the well-being of her young patients left a lasting impact on the community. She was predeceased by her son, Lawrence Brown III.
**Suzanne Marguerite Austin**, '76 (biological sciences), of Los Gatos, Calif., May 8, at 70, of cancer. She earned her MD at Case Western University and completed a fellowship at Stanford Medical School. She and her husband renovated a building for her own medical practice, which she opened in San Jose in 1992 and filled with many of her mother's paintings. She loved to swim and spent her honeymoon and two wedding anniversaries in Hawaii. Survivors: her husband, William Drennan; and sister, Melissa, '73.
**Donald James Brunsten**, '76 (economics), JD '79, of Los Angeles, March 10, at 70, of cancer. He was on the *Law Review* and received the prestigious Writer's Award during his second year of law school. He began his legal career with the Century City law firm of Pacht, Ross and went on to practice law for over 40 years in Los Angeles. He was humorous and had a great love for sports and animals. Survivors: his siblings, Bill, Pat, and Barbara; and dear friend, Barbara Levin.
**Karl Lee Schoenberger**, '76 (Japanese), of El Cerrito, Calif., April 8, at 71, of complications from a stroke. He was an award-winning reporter who spent a significant part of his career in Tokyo covering the global rise of the Japanese economy in the 1980s and early '90s, working for publications like the Associated Press, the *Asian Wall Street Journal*, *Fortune* magazine, and the *LA Times*. He was fluent in Japanese, a Nieman Fellow at Harvard, and the author of a book about the Levi Strauss company. Survivors: his daughters, Chelsea Rose, Sonya, and Hannah; former wife, Susan Kuramoto Moffat; and brother.
**William Archibald Langewiesche**, '77 (anthropology), of North Salem, New York, June 15, at 70, of prostate cancer. Dubbed the "Steve McQueen of journalism," he was among the most prominent long-form nonfiction writers of recent decades, winning two National Magazine Awards and reporting for *Vanity Fair*, the *New York Times Magazine*, and *The Atlantic*. A former commercial pilot, he often wrote about high-stakes, calamitous topics like aviation disasters, the recovery efforts after the 9/11 terrorist attacks, and the Iraq War. Survivors: his wife, Tia Cibani; children, Matthew, Anna, Archibald, and Castine; and sister.
**Christopher Michael Sperberg-McQueen**, '77, MA '77 (German studies), PhD '85 (comparative

# Microsoft's First General Counsel Had a Signature Style

In 1998, when the United States sued Microsoft in one of the largest antitrust cases of the century, Bill Neukom stood at the center, cutting a recognizable figure at 6 feet 4 inches with ramrod posture and signature bow tie. He told the court and the world that the company was "pro-competitive and pro-consumer"—an argument that led to a 2001 settlement and still resonates in antitrust law today.

**William Horlick Neukom**, LLB '67, longtime Microsoft attorney, former CEO of the San Francisco Giants, and Stanford Law School benefactor, died on July 14. He was 83.

L.A. CICERO

Neukom was raised in San Mateo, Calif., by parents who encouraged him to engage with his community as a useful citizen. As a lawyer, he "felt we were obligated to work in the public interest and hold out high values," says friend and mentor Llewellyn Pritchard.

While at Shidler McBroom Gates & Baldwin (now K&L Gates), Neukom was tapped by senior partner Bill Gates Sr. to "keep an eye" on his son's new company. Neukom began representing Microsoft in 1978, when there were just 12 employees, and became its first general counsel in 1985. "We were really on the forefront of an evolution of the law of intellectual property and how it might apply to computer software," Neukom recalled in an interview with Microsoft last year. "Part of our job—both within the company and within the industry—was educational."

After retiring as executive vice president in 2002, Neukom served as chair of K&L Gates; president of the American Bar Association; and CEO and managing partner of the San Francisco Giants, when, in 2010, the team won its first World Series since moving to California in 1958. "Bill and I shared the same philosophy that operating a major league baseball team is akin to managing a public trust," law school classmate Chuck Armstrong, former president of the Seattle Mariners, told *Stanford Report*. "One is the caretaker for all the fans and the community in which the team plays."

In 2006, Neukom founded the World Justice Project, an organization committed to advancing the rule of law globally. Each year, the WJP's Rule of Law Index harnesses data from more than 200,000 household surveys to highlight how people experience the law in their everyday lives—from checks on government power to freedom from corruption to fundamental rights—in 142 countries. "He was a fierce defender of our legal traditions and institutions," Diego Zambrano, a professor of law and the faculty director of the Neukom Center for the Rule of Law at Stanford, told *Stanford Report*. "And he had a passionate interest in how courts could deliver for everyday people."

In 2020, Neukom was awarded the ABA Medal, the American Bar Association's highest honor, for his lifelong commitment to public service.

Neukom is survived by his wife of 29 years, Sally; former wife, Diane McMakin; children, Josselyn, Samantha, Gillian Neukom Toledo, and John, JD '04; 14 grandchildren; and brothers, Davidson, '66, and Daniel, '71, MA '72.

*—Kali Shiloh*

literature), of Española, N.M., August 16, 2024, at 70. He was a medieval German philologist and markup language specialist. The co-editor of the Text Encoding Initiative, he helped develop guidelines for the encoding and interchange of electronic text, which underpins most digital humanities scholarship. He was the first humanities computing consultant at Princeton University, worked for the World Wide Web Consortium, and founded Black Mesa Technologies, an IT consulting firm. After the 2016 election, he devoted himself to progressive politics in New Mexico. Survivors: his wife, Marian, MA '76, PhD '81; stepmother, Elvira; and eight siblings.

**Thomas Hamilton Bedecarré**, '78 (political science), of Woodside, Calif., March 29, at 69, of brain cancer. He earned an MBA from Northwestern University and became a renowned entrepreneur and advertising executive. He worked at Ogilvy & Mather, was vice president of Hal Riney & Partners, and formed Atlas, Citron, Haligman & Bedecarré—later CHB—the largest independent ad agency in San Francisco. He took great pride in serving as a bridge between Madison Avenue and Silicon Valley, building relationships that reshaped marketing. He was an adjunct lecturer in Stanford's School of Engineering. Survivors: his wife of 40 years, Maggie; children, Kate, Madeline, and John; two grandchildren; and five siblings, including William, '80.

**Jane Alison Zack Simon**, '79 (international relations), of San Mateo, Calif., March 29, at 67, of complications from cancer. She earned her JD from the University of San Francisco and spent over 30 years at the California Department of Justice helping to shape the legal frameworks around public health, healthcare reporting, and physician accountability. Her greatest joy was her family, and she gracefully balanced her career with her home life. She formed lifelong friendships at Stanford, and a scholarship fund is being established in her name for a law school student committed to public service. Survivors: her husband of 34 years, Rick; children, Nick, '15, and Alison; and three siblings, including Kathy Zack, '80.

### 1980s

**Kevin Edward Solliday**, '85 (political science and urban studies), of San Francisco and Monterey, Calif., January 30, at 61, of complications from lymphoma. He served as chair of the Axe Committee He earned a JD and a master's of city and regional planning from UC Berkeley, practiced at several law firms before transitioning to a 24-year career at Gap Inc. He started as associate general counsel and later became an executive overseeing corporate facilities and shaping Gap's real estate footprint. He was a master negotiator, whether navigating a complex business transaction or coordinating a social gathering, and left an imprint on his close friends and the cities he loved. Survivors: his wife, Amy.

**Karen Joy Goedewaagen Knetter**, '87 (applied earth sciences), MS '88 (civil engineering), of Madison, Wis., September 7, 2024, at 59, of cancer. She played basketball. She worked for Resource Systems Group, an environmental consulting firm in New Hampshire, before moving to Wisconsin. In Madison, she was active in the local schools, churches, Girl Scout troops, youth sports teams, and nonprofits. She was admired as a mother, friend, artist, athlete, yogi, cook, gardener, listener, teacher, and believer in love and compassion above all else. Survivors: her former spouse, Mike, PhD '88; daughters, Maxine and Lillian; father, Tom; and two siblings.

### 1990s

**John Justin Davis**, '93 (human biology), of Paso Robles, Calif., March 17, at 53, of a heart attack. He was a member of Sigma Chi and on the rugby, fencing, and wrestling teams. He attended medical school at Oregon Health & Science University. He proudly practiced medicine and always made himself available to patients, friends, and family with understanding and compassion. He was a member of the Rotary and worked with local middle and high school teachers to offer advice to young scholars interested in the health sciences. Survivors: his wife, Lisa; children, Skye, Sloane, and Jack; parents, Carolyn and John; and sister.

**Miguel Hernandez**, '93 (public policy), of Piru, Calif., and London, March 5, at 53. He played lacrosse. He attended the Kellogg School of Management and worked in venture capital and private equity, most recently as a vice president for Lazard, a global financial services company. He met his wife while working in Japan; he also spent several years living in Poland and the United Kingdom. He was known for his tremendous warmth, geniality, and utmost devotion for his family and friends. Survivors: his wife, Miki Nozawa; children, Lucas and Erika; and four siblings.

**Karen Iris "Kaz" Brecher**, '97 (psychology), of Los Angeles, May 17, at 49, of ovarian cancer. She was in Ram's Head Theatrical Society. Through her work with Civic Collaboratory and Made by Us, she developed strategies to engage youth in the future of democracy through a deeper understanding of the past. She held innovation faculty positions at the THNK School of Creative Leadership in Amsterdam and Vancouver and at Experience Institute, where she transformed how people think about learning, leading, and living. She was especially proud of co-founding Sirius Enigmas with her father. She was a cheerleader and wise adviser to an uncountable number of friends and loved ones. Survivors: her daughter, Birdie; parents, Aviva and Kenneth; and brother.

### BUSINESS

**Dean Fay Collins**, MBA '50, of Benicia, Calif., February 4, at 101, of cardiopulmonary arrest. He enlisted in the Army Air Forces, was stationed in New Guinea, and later participated in the post-WWII Air Force Reserve program. He worked as an accountant for over 50 years, many of those for himself after he opened a public accounting business in Benicia. He was an avid walker and fan of the Giants, 49ers, and Warriors. He enjoyed gardening, the beach, and Dixieland jazz. Survivors: his wife of 61 years, Joan; children, Kelly Moulis and Scott; and four grandchildren.

**Donald Henry Bueermann**, MBA '55, of Gearhart, Ore., February 10, at 95. He worked as a stockbroker for many years. After retiring, he and his wife built a house in Gearhart overlooking the Pacific Ocean. He served as president of the homeowners association for six years and was the chairman of the finance committee at Lighthouse Christian Church. Survivors: his wife, Carolann; sons, Brad, '79, and Mark; stepchildren, Alan and Cheryl Gunderson; two granddaughters; stepgrandchildren; and great-grandchildren.

**James Givens Ingram**, MBA '63, of Harrodsburg, Ky., August 25, 2024, at 88. He worked for Arthur Andersen in Indiana and C&S Bank in Atlanta before becoming president and CEO of Mercer County National Bank in Harrodsburg. He was a devoted member, elder, and former chairman of the board of Harrodsburg Christian Church (Disciples of Christ). He was chairman of the board of the James B. Haggin Hospital from 1988 to 2017. He was predeceased by his wife of 61 years, Janet. Survivors: his daughters, Dianne Oliverio, Dawn Olive, and Debbie Souder; eight grandchildren; three great-grandchildren; and sister.

**Sue Sevilla Douthit O'Donnell**, MBA '76, of Atherton, Calif., May 27, at 80, after a short illness. She worked in public accounting, earned a CPA, and then joined a real estate syndication firm. She was instrumental in helping to renovate the library at Denison University, her alma mater, and received an Alumni Citation. She supported libraries at UC Berkeley and Stanford's Hoover Institution. Later she developed an interest in medical research and wrote patient reviews for the *British Medical Journal*. She was predeceased by her stepdaughter Katharine O'Donnell Hamer. Survivors: her husband, Bob, MLA '16; stepdaughter Heather; and two grandchildren.

### EDUCATION

**Erika Sander**, MA '67 (education), of Milwaukee, March 1, at 83. She earned a PhD in education from UC Berkeley. She was an assistant professor in the School of Education at the University of Wisconsin-Milwaukee, where she mentored young faculty members and was the first women's basketball and field hockey coach. She was the chair of the department of human kinetics (now kinesiology) for a decade and also served as interim dean of the School of Allied Health Professions, assistant vice chancellor for personnel, and interim director of human resources. Survivors include many close friends.

**Janet Hogan Brigman Larkey**, MA '68 (education), of Dallas, December 26, at 85, of long COVID and chronic myeloid leukemia. She was an artist, jeweler, art teacher, color consultant, and keynote speaker. She was the first guest host on QVC and appeared on *CBS This Morning*. She wrote *Flatter Your Figure*, a bestseller that sold half a million copies, and the Trophy Award-winning autobiography *Mom, Mania, and Me* about living with a bipolar mother (published under the pseudonym Diane Dweller). Survivors: her husband, Patrick, '69; children, Stephanie Phillip, William Brigman, and Jana Johns; and four grandchildren.

**Jo Ann Kohnstamm Intili**, MA '77 (sociology), PhD '77 (education), of Oakland, April 22, at 79. Having served in the Peace Corps in Afghanistan, she spent more than a decade providing technical support and data reporting services for AmeriCorps. In 2003, she returned to Afghanistan to collaborate in USAID-funded efforts to bring education to thousands of rural villages. Through continual, strategic philanthropy, she supported organizations dedicated to social justice, community development, responsible media, immigrant equity, and community well-being. Survivors: her husband of four decades, Edward Kissam; stepchildren, Cassady and Kyra; and three grandchildren.

### ENGINEERING

**Jerome Boris Gilbert**, MS '54 (civil engineering), of Greenbrae, Calif., May 13, at 94. He was a defining figure in California water management, shaping decades of policy in one of the country's most complex environments. He led public agencies, authored critical state and national legislation—including the EPA Clean Water Act and California's

Porter-Cologne Act—and served as the first executive officer of the State Water Resources Control Board. He later founded J.B. Gilbert & Associates, which took on major sewage control system and water quality plan projects. Survivors: his wife, Judy, ’55; daughters, Victoria Quintanilla, Jean Smith, and Tania Scheer; and four grandchildren.
**Jerry A. McLellan**, MS ’63 (civil engineering), of Kalamazoo, Mich., September 13, 2024, at 86. He was a quality control engineer and chief engineer at Precast Schokbeton in Kalamazoo until 1974. He then joined Walker Parking Consultants as a project manager and eventually became the vice president. His responsibilities included structural design, quality control, and risk management of bridges, parking garages, and other civil projects. He loved sailing, skiing, and biking. He was predeceased by his wife of 38 years, Nancy. Survivors: his daughters, Pamela Thomas and Barbara Kesler; three grandchildren; six great-grandchildren; and sister.
**Kenneth Gordon Paulsell**, MS ’63, Engr. ’65 (mechanical engineering), of Glen Mills, Pa., January 6, at 88. He worked for Creole Petroleum, a subsidiary of Standard Oil, in Maracaibo, Venezuela. After graduate school, he was hired by the DuPont Company in Wilmington, Del., where he enjoyed a 30-year career. He practiced quiet philanthropy and instilled the values of kindness and giving in his grandchildren. He was a dedicated gardener at his farmette in Chadds Ford, Pa., and achieved the title master gardener with Penn State. Survivors: his wife of 61 years, Pamela; children, Katherine Matson, Hilary Mameniskis, and David; nine grandchildren; and two siblings.
**Darrell Whitman Neily**, MS ’71 (applied mechanics), of Adelphi, Md., August 25, 2023, at 74, of cancer. After conducting engineering research for the Harry Diamond Laboratories, he managed research and development for the U.S. Coast Guard. He later became the CFO for the Coast Guard’s National Pollution Funds Center, which provides funds to remove, restore, and compensate for damages from oil spills in navigable waters. In retirement he served on church committees and as president of the Cherry Mill homeowners and the Maryland Volkssport associations. Survivors: his wife of 52 years, Margaret; sons, Joseph and Jeffrey; and two siblings.

## HUMANITIES AND SCIENCES

**Edwin Burke Parker**, MA ’58, PhD ’60 (communication), of Portland, Ore., February 8, at 93, of lung cancer. He was a professor of communication who contributed to the early development of the internet, bringing satellite communication to rural Alaska, founding the satellite data network industry, and starting the Oregon Health Network, which improved the quality of health care delivery throughout the state and eventually expanded to all 50 states. He was a co-founder of Equatorial Communications, a start-up that developed the first small commercial satellite terminals for data communications. He was predeceased by his first wife, Shirley-Ann, and second wife, Fran. Survivors: his children, Karen and David; two granddaughters; and the love of his life for the past 10 years, Anne.
**Robert King Waits**, MS ’58 (chemistry), of Sunnyvale, Calif., January 24, at 92. His career spanned R&D, integrated circuit production, and technical writing. He worked on the team that developed the first integrated circuits, and he patented the processes (still in use today) for manufacturing low-power integrated circuits. He was a member of the American Vacuum Society for over 40 years. He was a voracious reader, researcher, and collector who authored several books in retirement. Survivors: his wife of 60 years, Susie; daughters, Janine Penney and Jennifer; and three grandchildren.
**Myles Hollander**, MS ’62, PhD ’65 (statistics), of Tallahassee, Fla., January 27, at 83. As part of his 42-year career at Florida State University, he was named the Robert O. Lawton Distinguished Professor and made substantial contributions to areas including nonparametric statistics, reliability theory, survival analysis, biostatistics, and probability theory. The American Statistical Association honored him with the Gottfried E. Noether Senior Scholar Award. He was a member of numerous national statistics associations and an editor of several academic journals. He was predeceased by his wife of 61 years, Glee. Survivors: his sons, Layne and Bart, ’90; and five grandchildren.

## MEDICINE

**Camellia Marie Ware Adams**, PhD ’93 (genetics), of Bristol, Va., March 20, at 80. Prior to Stanford, she earned a bachelor’s degree in chemistry from Mary Washington College, studied at Case Western Reserve, and earned a master’s degree in microbiology from San José State University. She and her husband, a Navy lieutenant, were stationed in Italy and Spain for several years. She worked at Genentech and contributed to the development of drugs still used today to treat cancer, macular degeneration, and multiple sclerosis. She retired in 2010. Survivors: her former husband, Richard; sons, Kirk and Scott; brother; and her partner, David McFarlane.

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# Home Truths

The landlord was delighted to hear from us—until we met her in person.

**AFTER FIVE DAYS** on a cross-country bus, I arrived in Palo Alto carrying my possessions in a suitcase. It was September 1960. I had been accepted as a doctoral candidate in Stanford's sociology program and needed to find a place to live.

As I looked through a box of index cards with listings for off-campus lodging, I was not surprised that some specified "white only." I did not know that East Palo Alto was the local Black enclave until I rented a room in the home of an elderly churchgoing woman. She reminded me of one of my aunts.

It was a fine arrangement. Perhaps I reminded her of one of her nephews. But I had no car, and after a few months of making the commute, I began looking for a place closer to campus. This time, I had a prospective housemate—another graduate student, named Tom.

We found a place in Menlo Park that seemed to fit our needs. The owner, Mrs. G, lived in San Francisco and sounded delighted to hear from us—graduate students, older and more mature. We made an appointment to meet at the residence.

She looked to be in her mid- to late 50s. Prim. Carrying a little handbag. We made small talk, and Tom and I looked around. It was nice. There was even room for a third tenant. But when we told Mrs. G that we would like to rent the place, she demurred.

Then she said it: She could not rent to a Negro. Given that Tom was white, I assumed she was talking about me. She was worried about the neighbors, but, on a deeper level, she also seemed to feel it was simply not right that Blacks and whites should live in proximity as equals.

Mrs. G's pronouncement gave Tom, who was from Kansas, his first glimpse of the day-to-day racism that Black Americans encounter. It offended his sense of decency and fairness. We returned to campus and spoke with sociology professor William McCord, who in turn made a phone call. We wound up speaking with Franklin Williams, a state attorney who would later join the Kennedy administration. He promised that his office would look into the matter and call us back.

A few days later, we heard from Williams. He had spoken with Mrs. G about California's new antidiscrimination laws. He was of the opinion that she had followed conventional thinking about race all her life but hadn't given it much thought. She did not want to wind up in court; she didn't want any trouble. She agreed to rent the place to us.

Williams's assessment was probably correct. In September 1961, nine months after Tom and I had moved in, Mrs. G asked to discuss something with me.

She was getting old, she said, and tiring of her monthly trip down the Peninsula to collect the rent. She wanted someone reliable to manage the place—see to any work that needed to be done, screen new tenants, and the like. Would I be willing to assume that role? It would be in exchange for a rent reduction, of course.

For a moment, I considered it, even though I knew in my heart that there were certain roles I was not cut out for, landlord being one of them.

I thanked her, and I passed on the offer. ■

JOHN HOWARD, PHD '65, *lives in Mount Vernon, N.Y. Email him at stanford.magazine @stanford.edu.*

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