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Light, Marble, and Miracle:
**Italian Art from
Giotto to Canova**

*Antonio Canova / Psyche Revived by Cupid's Kiss
Photographed by Eric Pouhier*

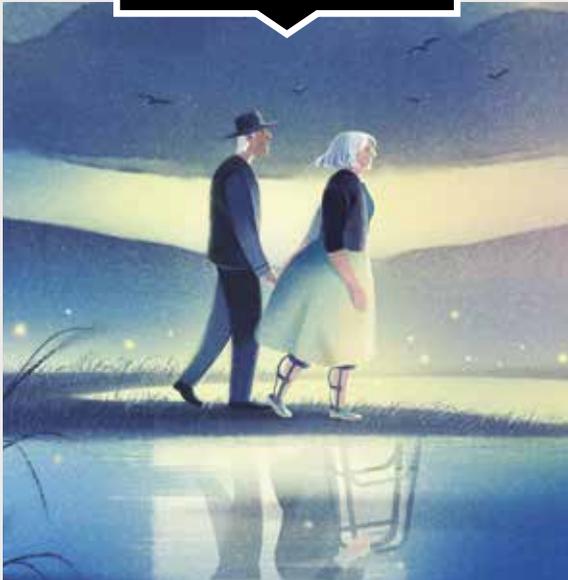


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FEATURES



Made at Stanford

Look back and you'll see: More than 100 years of innovation on the Farm lay the groundwork for genetic engineering, nanotechnology, the internet—and some other realms that might surprise you.

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The Odyssey

Pulitzer-winning author-professor Adam Johnson spends a lot of time doing research in his basement. But then he's off to gather fodder, from North Korea to New Zealand, and he brings readers along for the ride.

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Tech Support

"Caregiving is the critical societal problem robotics has to solve," says Steve Cousins, PhD '97, executive director of the Stanford Robotics Center. These four Stanford labs are up for the challenge.

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Dive In

Tamiko Thiel, '78, a pioneer of the augmented reality art form, finds meaning in the hidden layers she illuminates in the world around us—with camera-equipped devices and her own curiosity.

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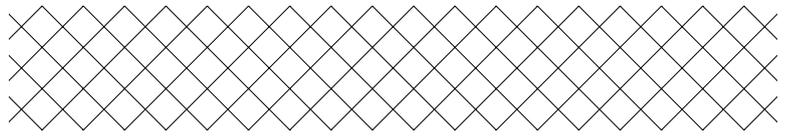
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Video of Paralympian Sydney Barta, '26



Stories by, for, and about students



Stopping Power

A Winter story chronicled the experiences of six undergraduate alums who took time off before graduating.



I am so proud of STANFORD for printing this article, particularly Arthur Alvarez's story. Stopping out; stopping out for mental health reasons; and stopping out for mental health reasons related to needed support for first-generation college students are not topics that prestigious universities bring forward for public education and discussion. I stopped out for five years. Friends who stopped out of Harvard and I have discussed the shame we had to overcome because of the lack of normalization and discourse, which made stopping out feel like a stigma.

Shout-out to my Stanford adviser in 1988—I wish I remembered their name. They gave me the best advice: Declare

your major before you stop out because it will make finishing straightforward and faster. I had no idea what I wanted to make my focus of study. But upon return, it didn't matter. I knew exactly which classes I needed to take to expedite a degree, and I supplemented with amazing courses that fulfilled my curiosity, passions, and identity at that time.

I'm smiling because during my freshman year I was part of the *Stanford Chaparral* collab with the *Harvard Lampoon*—a type of Big Game rivalry—and I bet you beat Harvard in bringing this discussion to the forefront.

Marcie Gilbert, '90
Pasadena, California



“Once a Tree, Always a Tree!”

A photograph of Léa Koob, '19, one of 380 “human trees” in the Super Bowl LX halftime show, captured the hearts of alums.

❤️ **1,189**

Snow Day

The Winter issue included a photo of campus from January 21, 1962, one of three times it has snowed on the Farm since the university was built.

A few months earlier, at an event for incoming freshmen, I had walked from Roble Hall all the way to Frost Amphitheater in my new, grown-up, high-heeled shoes. That walk bruised my heels so badly that I needed surgery on my Achilles tendons the next summer. In the meantime, the only shoes I could stand to wear were slingback sandals. So that's what I had to wear in the snow to get to class that day. Oh yes, I remember it well!

Sharon Fogleman Hockensmith, '65
McKinney, Texas

I was a grad student living in Escondido Village. Out the window that morning was

a wonder. I picked up my 6-month-old daughter and we drove up to the hills to enjoy the show. The thing that struck me

was golfers on the course hitting a red ball.

Roger Bourke, '60, MS '61, PhD '64
Alta, Utah



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Dialogue

Myth Buster

In a Winter essay, sophomore Chloe Shannon Wong mused about shifting her goal from living up to Stanford alumni legends to living for daily joy.

I am much older than you and therefore attended Stanford at a time predating the dot-com giants. I had the great fortune of having similar yet diverse frosh dormmates, and we came together over wanting to create a fun and forward-moving community, which I think is so important to everyone, everywhere. There are so many ways to mutually support others in their explorations and fulfillment of dreams, and sometimes our biggest contributions turn out to have begun almost by accident. Looking back with friends, our fondest memories are of the little kindnesses offered among us way back when. Like the time Anne loaned us her car to get to chemistry class on time, or how we all shared what our favorite things on campus were, so that everyone could get the most out of their precious time at Stanford. A mature bio lab student changed my life when he said I could study overseas and take the MCAT. So hang on to your integrity; keep being kind and curious. It seems like you're doing great already. (And stop looking up your classmates on LinkedIn.)

Tiffany Chow, '87, MS '88
La Jolla, California

Costs and Benefits

The Winter issue included a story on a Social Security policy proposal written by Andrew Biggs, a fellow at the Stanford Institute for Economic Policy Research (SIEPR), and John Shoven, a professor emeritus of economics and a senior fellow emeritus at SIEPR. Their brief detailed recommendations for closing half of the looming Social Security funding gap. We asked what you thought of their ideas, and what you would do to shore up the other half.



62%

expressed support for the policy brief

[Increasing the] retirement age to 69 is tough, not only for people with shorter life spans but also due to the nature of some jobs. Construction workers can't keep going as long as senators and upper management. To finish bridging the deficit, I'm with Willie Sutton: You've got to get the money from where the money is. I'd favor raising the tax cap to infinity and/or creating a wealth tax. High-end wealth is created by the whole society—inventors, investors, workers, and consumers. The society prospers best by sharing in that wealth. Please keep developing solutions and please promote them vigorously. Our nation needs its scholars to speak up.

Dan Greaney, '79
Redding, CA

Do these experts live in the same world as 90 percent of citizens? Not raising the top limit above \$184,500 because it "would make it politically tougher to increase taxes for other societal priorities" ignores the fact that those earning five to 1,000 times more are already "sheltering" their income from taxes—which never goes into other public infrastructure priorities, health care, or education.

John Rosenblum, PhD '87
Sebastopol, California

To ensure longevity of Social Security, the Old-Age, Survivors, and Disability Insurance (OASDI) rate—currently 6.2 percent for employee and 6.2 percent for employer—should be increased to 6.4 percent paid by each, and the earnings cap on which OASDI is levied should be increased. To appease business owners, employers’ cap on OASDI could be left as is, at \$184,500 with indexing.

Tushar Moorti, MS '94
Mountain View, California

Go ahead and raise the tax cap for high earners and increase the full retirement age, but do not alter the current income replacement percentages. Your proposal would unfairly penalize higher-income workers. We should be able to address the issue with reasonable adjustments to age and tax caps, starting with a phased approach beginning in 2030.

Ted Lawson, '82
Los Altos, California

Unfortunately, Biggs and Shoven failed to include a promising option: universal basic income as a replacement for Social Security.

Stephen Wiel, '60, MS '62
Incline Village, Nevada

I was an actor in Dallas for 30 years. Now, I’m a grocery store assistant manager at age 65. [Biggs and Shoven] need to get meetings with as many Democrat and Republican senators as they can and beg them to put this plan in place ASAP. At a minimum, send them petitions with the signatures of people

like me who want this to be put into place now, not later. Something is better than nothing.

Leticia Magana Graybael, '83
Dallas, Texas

You brainiacs rock! Let’s get it done. I just got paid Social Security Income today and can attest to the great thing it is to benefit from. Thank you for helping us sort out the fix for the dilemma we cannot escape.

Khadijeh Nabi, '80
Napa, California

There may also be employment for low- and middle-income earners that is low stress, keeps people active, keeps our country competitive, and replaces Social Security checks for two to five years. An attractive choice that retirees can make. All of the stops need to be pulled.

Stan Kaplita, MBA '89
Sammamish, Washington

I would gladly give up 30 percent of my Social Security check to ensure the program’s survival and reestablish fairness in benefits. Social Security is a societal compact; we need to restore the safety net to those most in need. Economic justice will make our country healthier and happier.

Matthew Messner, '77
Tucson, Arizona

CORRECTION

In Winter, the obituary for Ronald Nicholas Gibson, MD '90, should have said that he was known for his “reverence for life,” not “reference for life.”



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

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Game Changers

Inventions from the Farm's first century.

SURELY THE FIRST CENTURY of ground-breaking invention at Stanford must have included an athletic innovation or two. Or, at least, that's what I thought until the facts turned pesky.

West Coast offense? It's a long story, but if you mean the Bill Walsh short passing game, he developed that as the offensive coordinator for the Cincinnati Bengals, several years before he became Cardinal head coach. Starting blocks? Those were dreamt up at the University of Iowa (or maybe in Australia), although Stanford track coach Dink Templeton, Class of 1921, JD '24, did court intercollegiate controversy by having his athletes use them for their hands. (It didn't catch on.) Jump shot? Basketball star **Hank Luisetti, '38**, is sometimes credited with inventing it, but if he indeed had a true jumper—and he has been quoted saying otherwise—he was preceded by others in the early 1930s. It turns out that Luisetti, though, really did create something new at Stanford (details withheld here for the sake of suspense).

As I combed archives and publications, I bid a reluctant goodbye to many near-misses among the Eureka moments—things that were invented by Stanford's relentlessly innovative scholars and alumni, but not while they were here. For example: Bradford Parkinson, PhD '66, and his colleagues developed GPS under the auspices of the Department of Defense after he graduated and before he returned as a professor of aeronautics and astronautics. Graduate School of Business professor



emeritus William Sharpe was still on the University of Washington faculty when he published the Capital Asset Pricing Model, which explains the relationship between the risk of an investment and its expected return. And while engineer William Fair and mathematician Earl Isaac worked together at the Stanford Research Institute (SRI), they co-founded the Fair Isaac Corporation to launch their brainchild, the FICO score, known in the vernacular as your credit score. (Incidentally, we could have done a whole story on

inventions that emerged from SRI while it was still part of the university. Among them: the location of Disneyland—an analysis resulted in the recommendation of Anaheim, Calif.—and those squarish microencoded numbers on the bottom of checks, which revolutionized banking.)

Which is to say that Stanford has a proud history of innovation, and we had to get picky. The nine inventions we ultimately chose to showcase were all born on the Farm. As is almost invariably true, most were based on the work of others who came before, and some

were collaborations between Stanford scholars and other researchers. But in each case, at least one key inventor worked or studied here at the time of creation. Taken together, these innovations represent a collection of tools and devices that fundamentally changed how we treat disease, use computers, even make music.

I wonder what we'll think of next. ■

Email Kathy at kathy@stanford.edu.

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Summer Moore Batte, '99

CREATIVE DIRECTOR Erin Sonnenschein

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SENIOR EDITOR Jill Patton, '03, MA '04

SENIOR WRITERS Sam Scott; Tracie White

STAFF WRITER Kali Shiloh

PRODUCTION MANAGER Pam Gorelow

CONTRIBUTING EDITORS Nancy King, MA '97;
Evan Peng, '22, MA '23

INTERNS Georgia Allen, '28; Sidney Suh, '26

CREATIVE

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EDITOR Travis Kinsey

INTERNS Kaelyn Ong, '23, Addie Rahmlow, '28;
Hannah Walton, '22, MS '23

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ADVERTISING MANAGER
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Development Services
485 Broadway St.
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CONTACT THE MAGAZINE:
STANFORD magazine
Frances C. Arrillaga Alumni Center
326 Galvez St., Stanford, CA 94305-6105
Editorial: (650) 725-0672
stanford.magazine@stanford.edu
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'You Have to Be Able to Question Orthodoxy'

Creating an environment for teaching, learning, and scholarship.

STANFORD: What has the university been doing to foster constructive dialogue?

Jon Levin: We created ePluribus Stanford last year to collect a whole set of programs that strengthen the university's culture of curiosity and inquiry, including the COLLEGE first-year curriculum and the Stanford Civics Initiative. The ePluribus name came from an initiative at the Law School. That was a good choice—from many, one. A campus where not everyone sees things the same, but everyone is part of Stanford.

What are some examples of ePluribus programs?

A strong culture starts when students arrive, so we start right at the beginning. The provost and I write to the incoming freshmen about our expectations—our hope that they will use their time at Stanford to explore, be open-minded, and seek out different perspectives. Last year, the ePluribus faculty also started offering summer dialogues.

The COLLEGE curriculum is now in its fifth year. It's organized around questions. In the fall, "What does it mean to live a good life and what's the role of education?" And in the winter, "What does it mean to be a citizen in a democracy?" The students are in small faculty-led seminars. We have faculty teaching from every school, and from the Hoover Institution and the Freeman Spogli Institute for International Studies. The goals are substantive. The students read classic texts—Plato, Locke, Mill, the Declaration of Independence—and modern work. A big part of the class is to get students talking

and debating. When we survey students at the end of winter quarter about whether they feel comfortable raising contrary viewpoints and speaking their minds, a large majority of students say they do. That runs counter to a lot of the data that you see published these days about campuses.

Students have picked up on the importance of constructive dialogue. There are a bunch of debate societies, including one that's quasi-secret, so it's possible I'm not supposed to know about it. The Stanford Political Union, which was defunct for a long time, is thriving. They have a nontraditional format. Rather than hosting debates, they pose a hard question and put the students into small groups to talk and then report out. I love that design.

How is the university approaching issues of free speech?

The principles in my view are pretty simple. First, we have broad protection for constitutionally protected speech. That freedom has deep roots—you have to be able to question orthodoxy to advance knowledge. Second, there are boundaries: You can't disrupt a class; you can't disrupt a speaker; you can't disrupt the functioning of the university. That's necessary to protect the freedom of other people. One of our law faculty, Bernie Meyler [JD '03], led an effort to clarify those rules two summers ago. The clarity has been very helpful.

I think of those principles as establishing the foul lines. Of course, what matters is what's happening on the field—in classes

and seminars and dorms. That's why we've put so much focus on strengthening Stanford's culture of curiosity and fostering constructive dialogue.

What about support and protections for faculty?

Stanford has in my view an extraordinary policy on academic freedom, adopted in 1974 and reaffirmed at the beginning of the last academic year by the Board of Trustees on its 50th anniversary.

The key part reads, *Stanford University's central functions of teaching, learning, research, and scholarship depend upon an atmosphere in which freedom of inquiry, thought, expression, publication, and peaceable assembly are given the fullest protection. Expression of the widest range of viewpoints should be encouraged, free from institutional orthodoxy and from internal or external coercion.*

Think about what that captures: freedom of inquiry, expression of the widest range of viewpoints, the avoidance of institutional orthodoxy, protection from internal and external coercion. That's a north star when it comes to freedom and pluralism. And it's exactly the right set of principles for the current moment. ■



Do you have a question for a future column?

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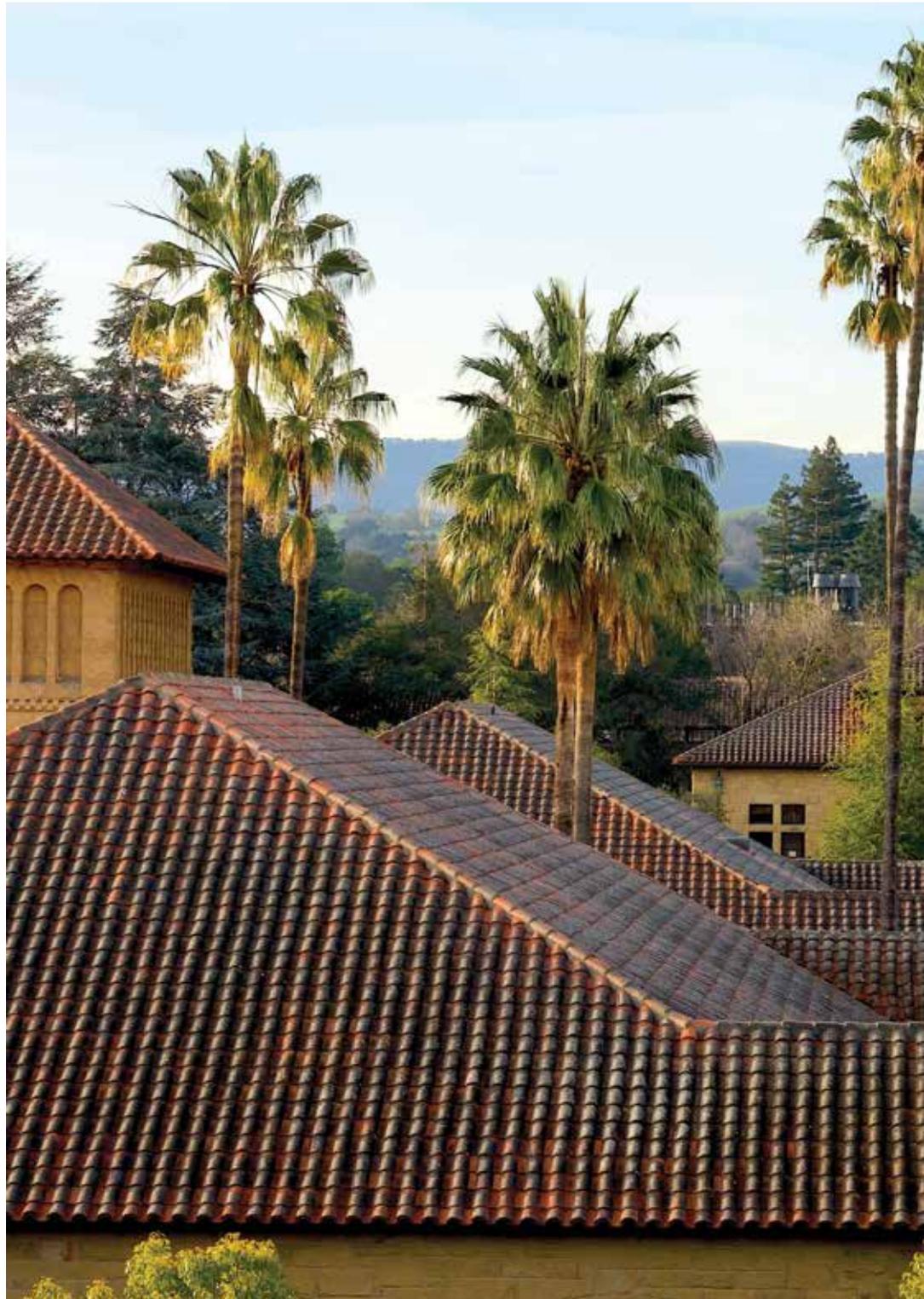
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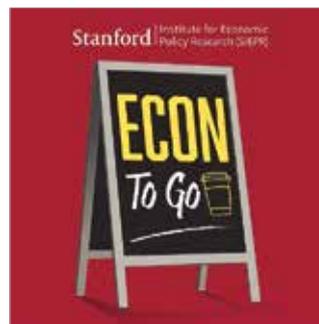
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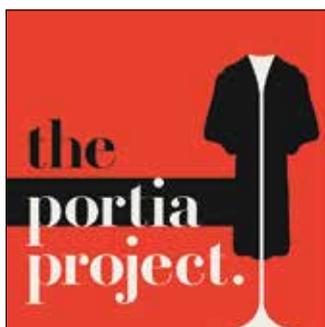
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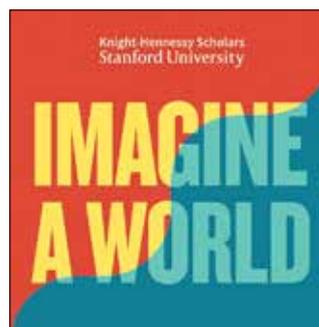


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“When something bad happens, you have to wring every single ounce of good from it that you can.”

WHO WE ARE

Meet Sydney Barta

A Paralympian, an optimist, and a role model for girl power.

SYDNEY BARTA IS A GIRLY GIRL. Just ask her and she'll tell you.

"I love pink," she says one day in her dorm room after track practice. She's dressed in running gear, wearing rows of gold earrings and sporting long fingernails painted white and adorned with sparkly red stars. She's got a fluffy pink bedspread that matches the pink Ugg boots on her shoe rack. She loves shoes. Her dorm room is filled with them.

"I only have one foot, but I have so many shoes," she says, laughing. Barta, '26, a sprinter, recently signed an endorsement deal with the Swiss sneaker brand On. She's got stacks of shoe boxes in her closet. She also wears heels, although she doesn't currently have a prosthesis that fits them.

"I duct tape them on," she says.

Barta is a five-time U.S. Paralympic Track and Field national champion and the first para athlete to run for Stanford. She's also a Rhodes Scholar who has applied to medical school and is looking ahead to the 2028 Summer Paralympics in Los Angeles.

And she hopes to be a role model for other young girls who have undergone amputations. When she was 6, her mother climbed into her hospital bed to tell her the news of her amputation and showed her a photo of a famous para athlete running on a blade. But he was a man and didn't look anything like her, she says.

"It wasn't feminine at all, and it wasn't me because I was a girly girl," she says. "I was a ballerina before the accident, and I love pink. That's the biggest thing I was upset about.

"I know that if I were a little girl going through something like that now, there would be so many people, maybe even including me, who they could pull up on a phone and be like, look at all these girls. Right?" ■



“

"The day of the accident, me and my twin brother were at a fun run. I was 6 and had just finished the race. I remember my mom looking up toward something behind me and she was really scared. I started running toward her. A big metal scaffold blew over in the wind and clipped my ankle. It could have killed me. I just feel so lucky that the only thing I lost was my leg that day.

"The summer before my junior year, I was running the last race before the [Paralympic] trials. I pushed over the finish line, and I felt my foot crack. I had broken it all the way through. I thought my Paralympic dreams were over. I realized then that it was my calling to be a doctor that understands the experience of an athlete—when an injury is so devastating because it can take away the sport that you love and that your identity is built on.

"When I broke my navicular bone—the [key] arch bone—in my only foot, it made me want to be a bone doctor, to do research on women and consider how hormones, stress, sleep, training levels, differences in biomechanics when you're talking about unilateral amputees, how that all comes together to form an injury. I feel like that's my unique mission.

"After I broke my foot, I thought I was done with track. I was really reinvigorated by the prospect of becoming a doctor. I thought, It's bad right now, but in September I'll go back to school. I'll still be able to have all the opportunities, just maybe not with track.

"I got a call from Coach [J.J.] Clark, the head coach of Stanford track, and he's like, 'I put you on the team.' I was freaking out, I was so excited. But that just goes to show, right? Like, you never know."



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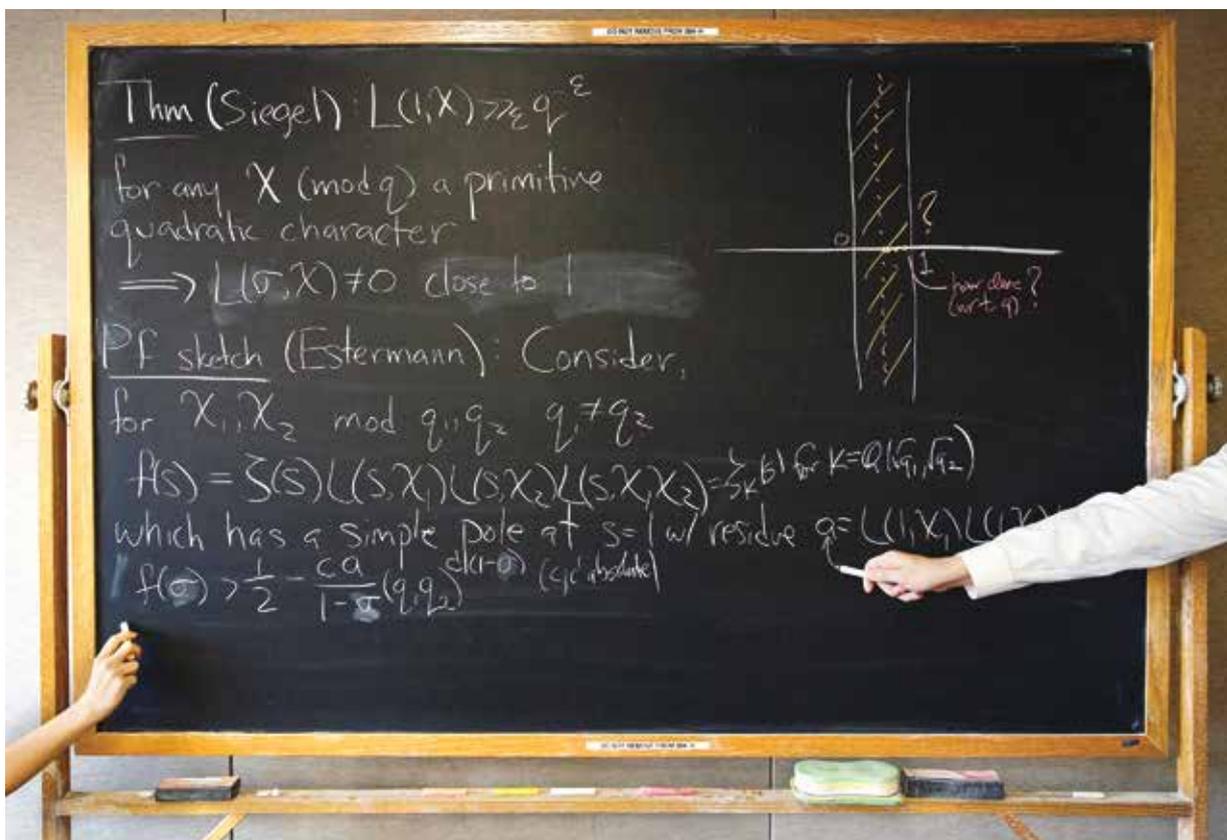
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Give Them a Clean Slate

For math faculty, modern writing surfaces are like nails on a chalkboard.

ON A CAMPUS colonized by novelty, the math department is a stronghold of ancient tech. Over the past two decades, Brian Conrad, a professor of mathematics, has watched classroom chalkboards give way to whiteboards and, more recently, laptop projectors. But in the northwest corner of the Quad, nearly all the faculty prefer good ol' porcelain enamel. "I like to say it's us and small children," says Conrad, though he adds that theoretical physicists, some chemists, and statisticians also dabble in calcium carbonate.

While whiteboards are sometimes considered easier to read from a distance and eliminate the dust factor (at the cost of marker fumes), chalkboards have their edges. Chalk—preferably the venerated Hagaromo Fulltouch—washes off hands and boards with plain water and

eliminates the frustration of marker roulette. "I was once assigned to a room with a whiteboard," says Conrad. "There were 12 markers in the room, the first 11 of which were dead."

Perhaps the biggest advantage of writing with a stick of powdered rock is that it takes time. "There was one problem with all my

"There were 12 markers in the room, the first 11 of which were dead."

COVID lectures," says professor of mathematics Jonathan Luk, who used an iPad to teach remotely during the pandemic. "They were much faster." Despite their best efforts, math professors tend to blaze through theorems

when not slowed by friction. For Luk, prepared slides come with similar drawbacks. "You already see the full sentence," he says. "I think it's often useful to see the full thinking process for the other person to digest." Using chalk as opposed to a whiteboard marker or iPad pencil, Luk says, benefits instructor as much as it does student. "It helps me not to go too fast and to think carefully, both in my computations and in instruction."

Stanford's math classrooms brim with chalkboards: green, brown, black; rolling, sliding, stationary. Those rooms are up for renovation this summer, and new boards are part of the deal. "We are likely looking for black CeramicSteel boards, which are the highest quality available," says Helen Chu, the assistant vice provost for learning spaces and support. That's an improvement over the brittle, slate chalkboards of the past, she says. In that way, the Math Corner will be positively futuristic. ■



Home Sweet Home

For a retired physician, a sappy new story.

BRUCE BECK didn't buy back his grandparents' Vermont farm to make maple syrup. He bought it because some places never let you go. The syrup was, well, the topping on the waffle.

Beck's Norwegian immigrant forebears purchased Elm Rock Farm, in Chelsea, Vermont, in 1918 with a \$300 loan secured by a few cows. It was once the center of family life, sustained by dairy cattle, maple syrup, and "sheer determination," says Beck, '70. His father worked extra jobs to keep the farm through the Great Depression. Even after the land was sold in the 1960s, Beck was able to visit regularly, walking the trails and soaking up the memories. "The history is important to me," he says.

The property came up for sale again in 2013, just as Beck retired from a career as a pulmonologist in the Bay Area. Sure, the house was run down and the barn needed work, but the bones—and the memories—were intact.

So were the maple trees. Maple sugaring happens when the sap runs—at the tail end of winter when temps are freezing overnight but warmer during the day. Each year, about 200 taps on Beck's trees feed sap via tubes to a sugarhouse. Beck has partnered with his neighbors to handle the long days of work

filtering, boiling, and finishing the syrup.

"There's a frenetic pace," he says, "because once it's started, you know that it's going to go quickly, whether it's a two-week season or an eight-week season." The color of the resulting syrup changes as the season progresses, from golden to amber to dark (Beck's favorite for its slight smokiness) and, finally, very dark, more commonly used

for cooking than for drizzling over French toast. It takes about 10 gallons of sap to make just one quart of syrup.

Beck's farm produces a few hundred quarts each year, which he shares with his neighbor-partners. His portion makes for a sweet gift for family and friends, but what's even sweeter to Beck is doing something meaningful with his family's land: first restoring the farm's 19th-century

house and barn, and now rebuilding its original sugar shack. "It was a good way for me to shift my interests when I left clinical medicine, to focus in on something new," he says.

Most years, Beck ends sugaring season with the long drive back to Los Altos, where he lives with his wife, Kathleen (Marini, '74). Packed beside him are quarts of sweet amber goodness to pour over pancakes for another year.

—Christine Foster



Natural Selection

Indoor greenery is good for you—just don't go full botanical garden.

RESEARCH SHOWS that natural design features—a potted Ficus here, an exposed wood beam there—are good for our well-being. But those studies compare greenery with no greenery, or measure subjective levels of nature. (What, pray tell, is a "medium" amount of succulents?) **Eva Bianchi**, PhD '25, and her adviser, professor of civil and environmental engineering **Sarah Billington**, decided it was time to stop beating around the bush and quantify the effects of indoor nature.

The researchers put participants in virtual rooms containing varying percentages of nature and natural materials, then introduced stressors such as asking participants to count backward from 1,022 by increments of 13. To Bianchi's surprise, participants experienced the highest stress increase with the biggest dose of nature—60 percent greenery and wood combined. Participants felt the greatest sense of restoration and belonging when about 20 percent of their indoor view was greenery. Wood furniture and features alone had no effect on well-being—but it's possible that could be chalked up to poor wood-grain simulation. The findings uproot the notion that more nature is always better. ■





Good Hair Day

A campus fixture gets a makeover.

BRIAN KLEIS NEEDED A HAIRCUT. But his longtime hairdresser was on an extended vacation. As he walked through Tresidder one day last June, the former resident fellow in Arroyo House happened upon Stanford Hair, the salon that had been operated by the beloved barber Carmelo Cogliandro since 1962. He popped in.

Jane Yoon was free. As she tamed his curly locks, she told Kleis that the salon would be closing.

Cogliandro was eyeing retirement, and Yoon—the sole remaining stylist—only worked two partial days. There was neither the leadership nor the money to keep it going.

“I thought, *It’s a shame to lose this. It provides a service to the campus community,*” Kleis recalls. He gave Cogliandro a call.

“Who on campus would want to run a salon?” Cogliandro mused. But Kleis had recently trimmed his child psychiatry practice in order to travel with his husband, professor of psychiatry and behavioral sciences James Lock, MS ’00, and to work on their home remodel. On a whim, Kleis gave Cogliandro an offer. And just like that, the salon was no longer history.

“As an RF, I fell in love with the undergraduate community and want to support them,” Kleis says. “I also like learning new things and multitasking in my life. This represented an opportunity to satisfy all of that.”

Stanford Hair reopened in September with a reshaped identity and modernized operations. Men’s cuts and straight hair had been the thing in Stanford Hair’s early decades, and all along it was cash and drop-in only. Kleis has focused on full service and a broader demographic, offering women’s cuts and natural hair services such as braiding, weaving, and relaxing. There’s now a reservation system and a way to pay by credit card

or Apple Pay. In keeping with its college-town setting, the salon even has an educational bent. “Did you know that no two hairs on your head grow at the same speed?” says master stylist David Quintana-Mueting during a recent ladies’ trim. (That’s why your new ‘do will eventually lose its shape.)

“We spruced it up a little bit,” Kleis says.



The staff, now counting six stylists, has even experimented with hair

events. For Halloween, two stylists outfitted Potter House students with wild color treatments, temporary hair weaves, and theatrical makeup, and for Reunion Homecoming, they had a special: *Get your hair cut for the price you paid when you were a student!*

Kleis, once an instructor in the department of psychiatry, jokes about his part-time pivot from the psychiatrist’s couch: “I kid the stylists that I’m getting new chairs.” ■

Caffeine Fix

Phillip Tran is mixing punch with crunch.

THESE CHIPS give you zip. As an undergrad, **Phillip Tran**, ’23, MA ’23, noticed a pattern. Whether he was noshing at the Axe & Palm or the Market at Munger, students—himself included—leaned on the same basics for an energy boost: a caffeinated drink and a bag of chips. When he spotted the same habit at his first job on Wall Street, a business idea was confirmed. Why not combine the two?

Behold Bangers Energy Chips, billed as America’s first caffeinated potato chips. The snacks come in barbecue, paradise, and hot mamba flavors, and each 2.5-ounce bag contains 200 mg of caffeine, roughly equivalent to two cups of coffee. “We say it loud and proud,” says Tran, founder and CEO of Bangers Snacks. “Energy does not have to live only in drinks.” Time will tell if consumers embrace the synergy, but the idea has given Tran’s profile a boost. *Forbes* recently named him to its “30 Under 30” list in the food and drink category. ■



FROM TOP: ERIN ATKISSON (2); ERIN SONNENSCHEN



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Strings Attached

How a class assignment turned into a half-century career.

WILLIAM EATON figured he'd be a banker, like his dad and uncles. But his lifelong love affair with stringed instruments would upend his more conventional career plans. While attending Arizona State University, he was on the hunt for a new guitar. He discovered the nearby Juan Roberto Guitar Works, a small shop in a Quonset hut run by guitar maker John Roberts. "John was teaching classes for people like me who come in off the street to make guitars," he says. "This place was another world. When you saw that Quonset hut, the smell of the rosewood impregnated your entire being." That's where Eaton, who started playing the ukulele at 7, built his first guitar.

For a Graduate School of Business assignment, Eaton, MBA '75, wrote a business plan for a guitar-making school. "I got this idea, but I thought, *There is no way am I going to run this school,*" he says. Nevertheless, he sent the plan to Roberts and Bob Venn, Roberts' new business partner, and a trio was born. Although his co-founders have since died, 50 years later, Eaton still directs the Roberto-Venn School of Luthiery in Phoenix—believed by the Guild of American Luthiers to be the longest continuously running guitar-making school in North America.

"I never would have imagined such a career," says Eaton, who handcrafts one-of-a-kind instruments, such as his

double-neck harp guitar.

Over the decades, 3,000 students have attended the school. Many have gone on to work for prominent guitar companies, including Fender, Gibson, and Taylor, or bespoke shops, such as the Santa Cruz Guitar Company. Other graduates build careers in guitar repair or start their own businesses.

Eaton, who is also a musician with four Grammy nominations (including two for Best New Age Album), has no regrets about his career pivot all those years ago. "My biggest satisfaction has been this beautiful thing—seeing how each student who comes here is transformed." ■

THE TICKER

It's the season of flying Eileens. **Eileen Collins**, MS '86, a retired Air Force colonel and NASA astronaut, received a 2026 Horatio Alger Award for leaders who have triumphed over adversity. She was the first woman to pilot, and later to command, a U.S. space shuttle. . . . **Eileen Gu**, '26, soared into the record books at the 2026 Winter Games, becoming the most decorated freeskier in Olympic history. She won silver medals in freestyle skiing big air and slopestyle, and a gold medal in freeski halfpipe, where she was joined on the podium by bronze medalist **Zoe Atkin**, '26. Speedskater **Brandon Kim**, '26, and cross-country skier **Sammy Smith**, '28—fresh from the soccer field—brought additional Farm flair to the Games. . . . Smith's Cardinal soccer teammate **Jasmine Aikey**, '26, was named Academic All-America Team Member of the Year and the winner of the 2025 Missouri Athletic Club Hermann Trophy, the top honor in NCAA Division I soccer. She's just the second player in history to take home both awards in the same year. . . . And speaking of high-level achievements, **Leonard Schein**, '71, was named to the Order of Canada for his work as a philanthropist and as the founder of the Vancouver International Film Festival.



FROM TOP: ROBERT DOYLE/CANYON RECORDS; LINDSEY WASSON/AP PHOTO



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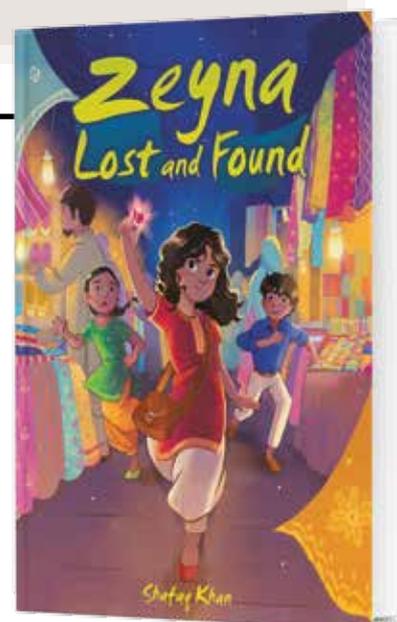
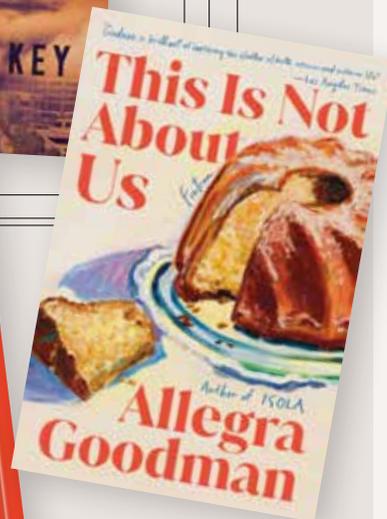
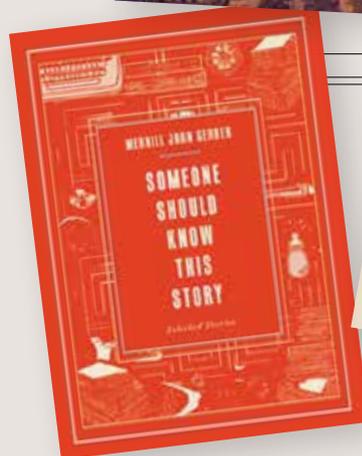
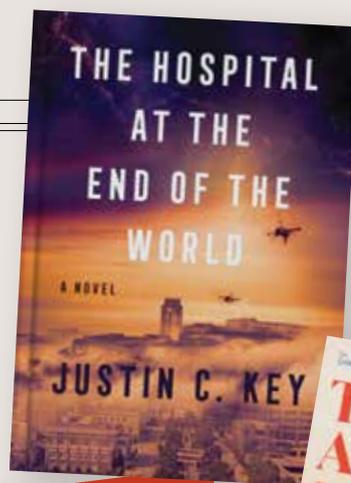
Biblio File

Novel Reads

» **THE HOSPITAL AT THE END OF THE WORLD** (HarperCollins), by **Justin Key**, '09, depicts a dystopia in which a global AI organization leads society and the medical system that underpins it. After enduring a rigged medical school admissions process and the mysterious death of his father, a physician's son seeks answers at the last university to insist on human-led medicine.

» **IN THIS IS NOT ABOUT US** (Dial Press), **Allegra Goodman**, PhD '97, creates a mosaic of family: feuds, grief, and love. Each chapter tells a new tale from the Rubinstein family, weaving together stories of misunderstandings about apple cake, marital strife, and college applications to reflect on what divides and unites those closest to us.

» **A WOMAN TRYING** to make sure her mother isn't buried in the wrong grave. A son-in-law irked by too much help with the baby. An overly flirtatious sister. These are among the characters in **Someone Should Know This Story** (Sagging Meniscus Press), by **Merrill Joan Gerber**, Gr. '63, an anthology of 25 short stories published over the course of the former Stegner Fellow's life.



Children's Corner

» **ZEYNA, A 12-YEAR-OLD BRITISH-PAKISTANI GIRL**, is a self-assured young detective with a quick wit and a proclivity for what her mother calls trouble. When in the summer of 1970 she observes a mysterious man following her family, and her parents subsequently go missing, she follows clues along the bustling streets of England and Pakistan. In **Zeyna Lost and Found** (Carolrhoda Books), **Shafaq Khan**, the executive director of the Levin Center for Public Interest Law and Public Service at Stanford Law School, creates a realm of magic and allure for middle-grade would-be sleuths.

» **NO ONE TOLD SANDRA DAY O'CONNOR WHAT TO DO** (Sleeping Bear Press) chronicles the life and perseverance of the first woman to serve on the U.S. Supreme Court. O'Connor, '50, LLB '52, journeys from an Arizona ranch to Stanford to the mahogany bench in this picture book by **Molly Golden**, MA '02, complemented with mixed-media illustrations by Julia Breckenreid.

New in Nonfiction

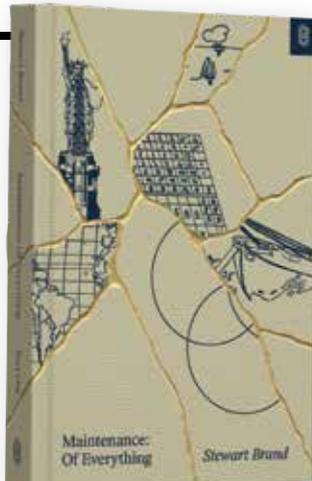
» **EVERYONE'S MIND IS ON AI:** In *The Emergent Mind: How Intelligence Arises in People and Machines* (Basic Books), Stanford professor of psychology **Jay McClelland** and San Francisco State University associate professor of psychology **Gaurav Suri**, MS '91, MS '93, PhD '15, explore how a mind may arise from patterns of activity, whether in brain or machine. Using academic research, personal anecdotes, and the occasional fictional conversation between Sigmund Freud and Adam Smith, the authors provide an accessible explanation of the neural network models that underpin our daily interactions. . . . There's much ado about the quality of chatbots' writing, but American University professor emerita of world languages and cultures **Naomi Baron**, PhD '72, points out that large language models are first and foremost readers. In *Reader Bot: What Happens When AI Reads and Why It Matters* (Stanford U. Press), she makes the case for why humans should not fully outsource that task. "Not everyone in the world is fortunate enough to be literate," she writes. "Those of us who are hold a special veritable light sword to help combat everything from ignorance to boredom." . . .



And in *AI and Assembly: Coming Together and Apart in a Datafied World* (Stanford U. Press), editors Toussaint Nothias, a clinical associate professor at New York University and **Lucy Bernholz**, MA '92, PhD '95, a founding co-director of Stanford's Digital Civil Society Lab, present a collection of essays about AI's

potential effects on the freedoms of assembly and association. "How, where, when, and with whom we come together, for a host of reasons—political, cultural, educational, artistic, religious, familial, or market-based actions—and who or what monitors or restricts those choices will be key chapters in the story of democracy in the twenty-first century," they write.

» **SOME 40 MILLION AMERICANS** feed pinworms, 11 million Germans host roundworms, and at least 10 million East Asians carry intestinal flukes. In *Our Bodies, Our Planet: A Parasite's History of Us* (Reaktion Books), environmental historian **Marcus Hall**, '81, seeks to "write parasites back into human history." By reckoning with the organisms that inhabit us, he contends, we can learn how to better care for the planetary host we inhabit in turn.



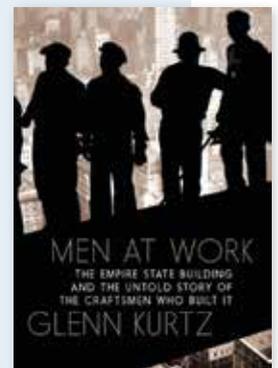
'Philosophers don't write extremely popular books about repairing cars, but two have about repairing motorcycles.'

—Whole Earth Catalog co-founder **Stewart Brand**, '60, in *Maintenance: Of Everything, Part One* (Stripe Press)

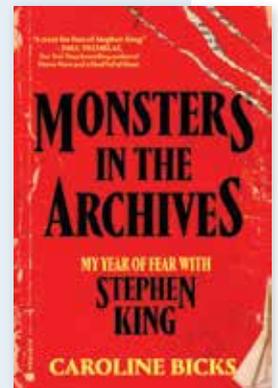
Life Stories

» **FORMER SAN FRANCISCO** firefighter **Caroline Paul**, '86, has long flown experimental aircraft, notably a bright yellow gyrocopter named Woodstock. *Why Fly: Seeking Awe, Healing, and Our True Selves in the Sky* (Bloomsbury Publishing) is Paul's meditation on why she—and so many others—take to the skies, penned as her long marriage comes in for a landing.

» **"THE SKY BOY"** is one of several artifacts **Glenn Kurtz**, MA '89, PhD '94, examines in *Men at Work: The Empire State Building and the Untold Story of the Craftsmen who Built It* (Seven Stories Press). The photo of a man perched on a wire several dozen stories above Manhattan gives up some of its secrets, but not all—much like the rest of the largely anonymous workers who built the iconic Art Deco edifice.



» **WHEN Caroline Bicks**, PhD '97, became the inaugural Stephen E. King Chair in Literature at the University of Maine, she figured she'd never meet the famous novelist for whom her endowed professorship is named. Instead, he phones; she invites him to class; and she ends up with unprecedented access to his and his wife's archives. Horror fans and writing aficionados—and those who are both—will all find moments of delight in the result: *Monsters in the Archives: My Year of Fear with Stephen King* (Hogarth).



BREAKTHROUGHS

Vision Quest

An eye prosthesis 20 years in the making restores sight in patients with a common age-related eye disease.

BY TRACIE WHITE

ONE OF THE THINGS Sheila Irvine missed most after she lost her sight was being able to read.

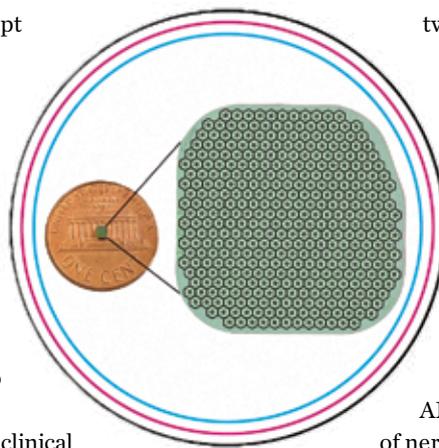
“Reading, that’s in my DNA,” says the 70-year-old, who lives in the small English town of Malmesbury, in the Cotswolds. “I am an avid bookworm. As a child I read a paperback every week.”

So when she heard about a clinical trial to insert a microchip in the back of her eye that could potentially help her see letters and words again, she signed up. “I was nervous, excited, all those things,” she says.

Irvine began noticing vision problems in her 30s and eventually lost her sight, slowly, from dry age-related macular degeneration (AMD), a disease that affects 1 in 227 people worldwide and is the most common form of incurable blindness in older adults. “At first, I noticed I couldn’t judge things when I was

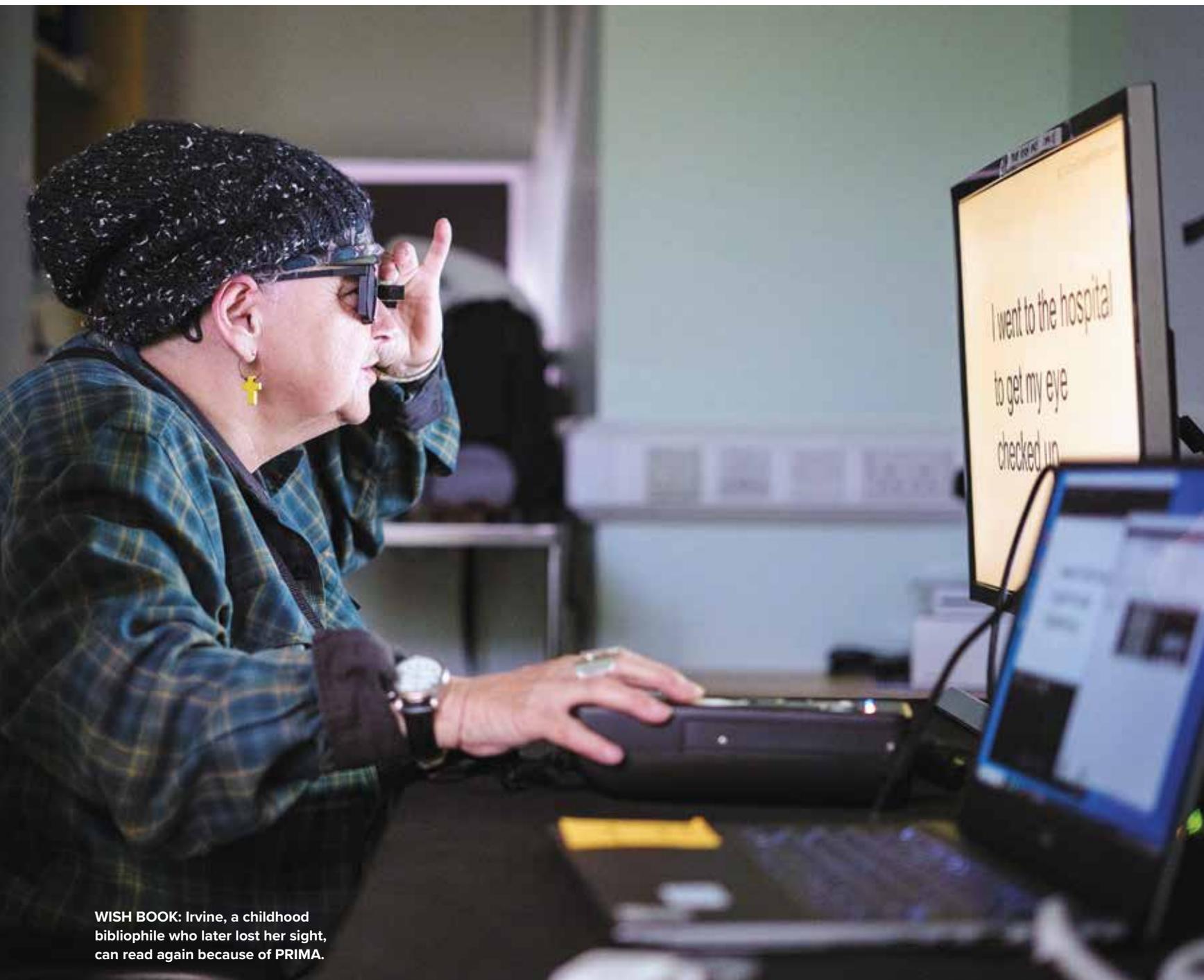
driving,” she says. “I kept hitting the pavement. I cried all day long when I sent my driving license back over 15 years ago, but then I said to myself, ‘Move on and get on with things.’” She values her independence and visits with friends at her local pub regularly, she says.

To participate in the clinical trial, Irvine took a two-hour journey on public transit to Moorfields Eye Hospital in London, where she was one of five patients implanted with the microchip, a device invented by Stanford ophthalmology professor **Daniel Palanker**. During the



two-hour procedure, surgeon Mahi Muqit inserted the microchip—shaped like a tiny SIM card—under the center of her retina, a spot called the macula. The trial included a total of 38 people across five European countries with geographic atrophy, an advanced stage of dry AMD that causes the death of nerve cells in the macula, creating blind spots for reading, driving, and recognizing faces.

Of the 32 patients who stayed in the trial for a year, 27 of them regained the ability to read letters, numbers, and words using a special pair of high-tech glasses. The results



WISH BOOK: Irvine, a childhood bibliophile who later lost her sight, can read again because of PRIMA.

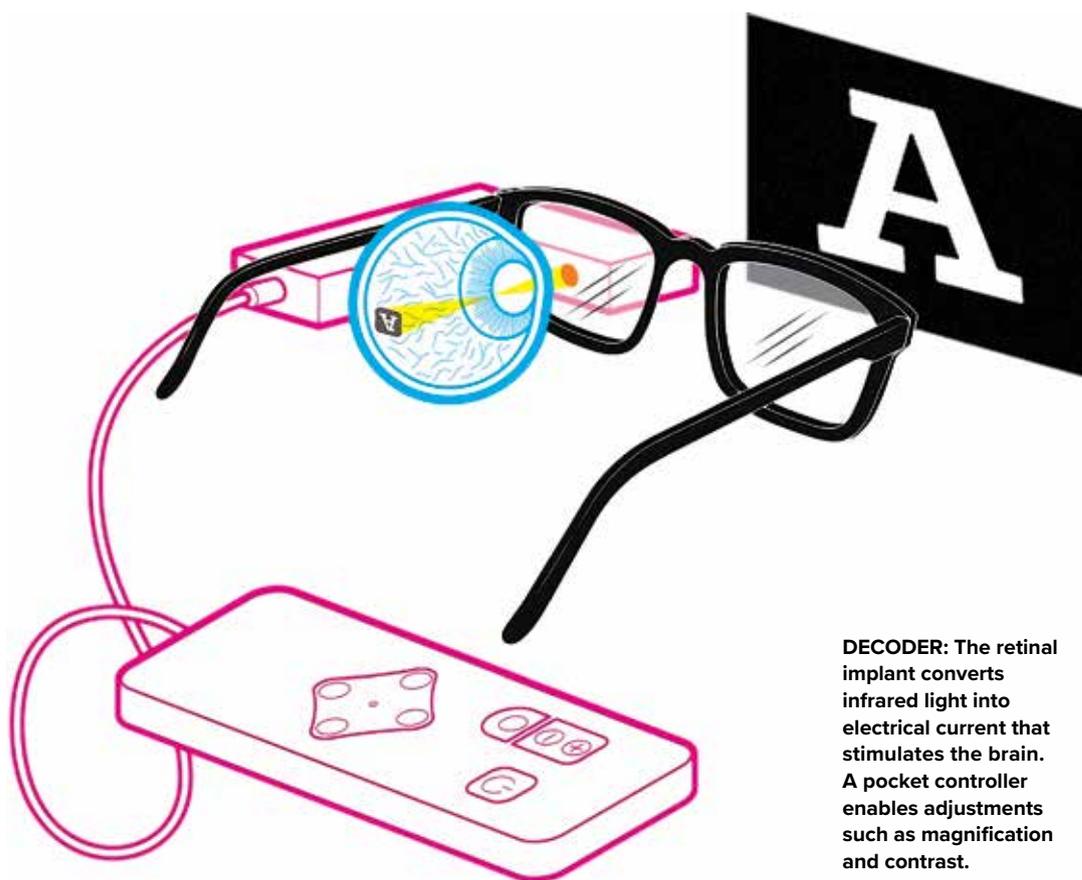
were published in the *New England Journal of Medicine* in October 2025. It was the first time a prosthesis restored functional vision to patients with incurable vision loss, giving them the ability to see shapes and patterns rather than just light, as past prosthetics have. With digital enhancements enabled by the glasses such as zoom and contrast, some patients were able to achieve the equivalent

of 20/42 vision after one year, and the researchers plan to continue enhancing the system's capabilities.

Irvine says the two-hour surgery, which was painless, has been transformative. "It was dead exciting when I began seeing a letter. Now I read most days. I read so much. I'm fascinated with Jack the Ripper and read all those books," she says during a recent

Zoom interview that includes her London surgeon, Muqit, as well as Palanker, calling in from California. During the interview, she's introduced to Palanker as the inventor of the microchip—called PRIMA, for photo-voltaic retina implant microarray—and her eyes widen.

"My darling man," she says, addressing Palanker. "Thank you so much for what



DECODER: The retinal implant converts infrared light into electrical current that stimulates the brain. A pocket controller enables adjustments such as magnification and contrast.

whole area where they are dead is a blind spot.” Most patients do, however, maintain some peripheral vision by retaining other retinal cells. And therein lay Palanker’s opportunity.

Palanker proposed a plan to help restore some of the lost central vision back in these patients. The idea was to build a wireless retinal microchip that would work as a prosthesis to replace the lost photoreceptors. It would rely on infrared light, which would be invisible to the photoreceptors in the periphery, so that patients could harness both their natural peripheral vision and prosthetic central vision.

Palanker designed the chip to convert light into electrical current that would then be sent to the brain to stimulate vision, just like photoreceptor cells. It was first manufactured at Stanford’s Nanofabrication Facility for testing and is now made by Science Corporation. The chip is made up of 378 light-powered pixels that use photovoltaic technology to convert light into

electricity. “It’s basically like solar panels,” Palanker says. “Every pixel is a little solar panel in the eye.”

The microchip works in tandem with augmented-reality glasses that have a small video camera mounted on the bridge, just above the nose. The camera captures images and converts them into patterns of infrared light that get transmitted to the retinal implant. A month after surgery, patients begin a training process that typically takes several months, learning how to interpret the new

light signals that are seen by them as visual patterns in black and white. Objects such as letters are placed in front of them while they practice positioning the glasses correctly and using the adjustments on a pocket controller.

you’ve done for me. You can imagine how I feel. It’s changed so much.”

Palanker first envisioned such a device 20 years ago, when he was working with ophthalmic lasers used to treat eye conditions. He figured that since the biological

cells at the macula, that central part of the retina that is densely populated with them. Photoreceptors are specialized cells that convert light into neural signals that get sent to the brain, enabling vision. People with

‘I met an architect recently in Rome who is using it for work, which is remarkable. He wants to complete the design of a church.’

vision system is transparent, he could build a chip that delivered information using natural light. The system would use glasses similar to virtual reality devices, he wrote in a 2005 paper.

Dry macular degeneration causes slow deterioration and death of the photoreceptor

the disease lose their central field of vision. (Irvine describes this as seeing two black discs in the middle.) “With dry macular degeneration, the photoreceptors just start dying,” Palanker says. “This causes irreversible damage. You lose vision. The



FROM TOP: MCKIBILLO; STEVE FISCH

“At first I thought, ‘I’m never going to get this,’” Irvine says. “You have to keep your head steady. That took some doing. You have to be patient with yourself.”

Palanker says the process is similar to learning how to use a cochlear implant, which requires routine practice to teach the brain how to recognize digital input. He wasn’t sure how user-friendly it would be. But according to the study, most recipients were using PRIMA at home to read a year after implantation.

“The fact that they use it daily to read, to play games and do things like crossword puzzles and cooking, that’s all very exciting,” he says. “I met an architect recently in Rome who is using it for work, which is remarkable. He wants to complete the design of a church that, because of his vision impairments, he couldn’t do until now.”

PRIMA is the culmination of decades of development, prototypes, animal trials, and

a small first-in-human trial. Frank Brodie, a former fellow in Palanker’s lab who is now Science Corporation’s medical director for vision and PRIMA, says the company is

‘It’s basically like solar panels. Every pixel is a little solar panel in the eye.’

expecting to get European approval to make the device available to the general public by summer and is working to get approval from the Food and Drug Administration for use in the United States.

Meanwhile, Palanker and his lab continue

working on new versions of the microchip, increasing the number of pixels for better resolution, and designing new software for possible facial recognition.

“Currently what we use in clinical trial is binary, like black and white, and that’s not great for faces,” he says. The next-generation chip may boost pixel density above 10,000, offering an increase in image quality, and the software will be adjusted to better represent faces in hopes that patients will be able to recognize other people. Color recognition may be possible further down the line, he says, adding that the system was designed to accommodate upgrades.

Irvine, for one, is excited about the potential for a new version of PRIMA. “People are still just silhouettes,” she says. “I can’t see faces. I’ll try it!” ■

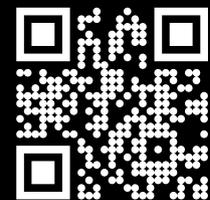
TRACIE WHITE is a senior writer at STANFORD. Email her at traciew@stanford.edu.



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STUDENT VOICE

Stem Education

Caring for my orchid is a lot like caring for myself.

BY EDMUND DYER-ESSIG

i CAN'T PINPOINT the exact moment I fell in love with the environment.

My home city of Toledo, Ohio, isn't quite known for its natural beauty. There were no looming mountains to hike, just flat, often-littered swamplands. I didn't go to lakes—the closest to me is the great Lake Erie, which is known by locals for its harmful algal blooms and pollution. And my family certainly couldn't afford to go backpacking in golden valleys whenever we wanted to.

In reality, my passion came from gardening with my mom—planting irises passed down from her great-grandmother in our front yard, decorating the grass around the shed with hostas, and finding worms, spiders, and toads. She taught me to care for life, for the plants and flowers that sustain bees and butterflies. As a kid, I was sure I'd become a wildlife conservationist.

One day when I was in my second year of high school, my mom came home with a gift for me: a pink moth orchid, with one flowering bud supported by two stems and a couple of wooden stakes. Every day, I'd go to my living room, where there was a pile of unfolded laundry we kept on the couch out of laziness. Along the windowsill was a cluster of plants, including my pink orchid,

and I'd spray its two big leaves until we were both satisfied.

For over a year, this was my ritual. Together, the orchid and I thrived. It was a safe partnership for me. Because at school, things were different. My friends would remark on how my clothes smelled like cigarettes. I'd tell them it wasn't my fault. "It's just how my family lives." Classmates ragged on me for my overbite and gapped, crooked teeth. Braces were too expensive. At the end of the school day, when I climbed into my grandma's Nissan Altima with no door handles, only two working windows, and a hole in the floor, my friends would tease me: "Have fun at your crack shack!" *Ugh. So embarrassing.* "Haha, OK! See you guys later!" Once I got back home, the home where it did actually smell like cigarettes, it was routine. I'd take off my school boots, and right before taking my daily power nap, I'd water my orchid.

Until, one day, I noticed a petal had fallen from its limbs. Day by day, more petals would fall. I couldn't understand what was happening. Watering turned into a futile act.

Over the coming weeks, my pink moth orchid became barren.

WHEN I WAS A SENIOR applying to colleges, I stumbled upon Stanford. I didn't know much about the university going in; my high school wasn't huge on college prep. The Farm's environmental programs through the Stanford Doerr School of Sustainability are what caught my interest—a perfect path to the career I wanted. My family encouraged me to apply. When I got in early decision through the Questbridge Match (a binding, early-admission program for low-

income high schoolers), I didn't tell anyone for two hours. I knew it would make my parents proud, but the distance from home wasn't exactly great news. Sure enough, the moment was bittersweet. I felt the warmth of my mom's hug surround my entire body, my dad joining in from behind, while my aunt gave a "Congratulations!" from a few feet away. I felt their joy, their pride, but my mom couldn't help crying. She already missed me. Nine months later, I moved to California, leaving a naked orchid on my windowsill.





ALDO JARRILLO

Coming to Stanford, I was sure my path was in environmentalism. The possibilities seemed endless: research, activism, environmental engineering—well, maybe not environmental engineering (I had *hated* chemistry). There was nothing I, a nature enthusiast, wanted more than to preserve the gift of life. As a wildlife conservationist, I could work to regenerate vegetation lost to human hands, helping at-risk species native to the Great Lakes like blue-spotted salamanders and purple fringed orchids. I entered my frosh dorm, West Lag, with high hopes and a motivated heart. I took engineering courses to build up my skills. I joined a club to make Stanford sustainable.

But there were feelings that never escaped me: worry, guilt, and loneliness. I was away from home, getting an education my family never had, where my food and housing were free. I felt guilty that the burden of getting by was lifted off my shoulders while

my family was left behind. I realized that whatever I got out of Stanford must circle back to help my family: my mom and dad, my two older brothers, my grandparents, aunts, cousins—everyone who I thank for getting me here in the first place.

One day in autumn quarter, I was sitting in the Eucalipto lounge writing for one of my classes when I overheard a conversation between two dormmates. One recounted making more than \$100 an hour at a start-up during his freshman fall. The moment really tested my passion. As a wildlife conservationist, I'd likely make a modest salary (about \$69,000, the internet predicts). It's not quite greed that took over but, in a way, necessity. *Do I pursue an education where I learn what I want, or one that almost guarantees I'll make enough to help my family—money for bills, food, to pay off the house?* For hours, days, weeks, my morals clashed with each other, my head lighter than my wallet. *Big*

tech—that's the way to go, I thought. *Study electrical engineering and land a job in Silicon Valley. Maybe then I can help my family.*

Fast-forward to the end of winter quarter. I had just gotten back from my math final. It was cloudy and raining. My roommates were gone, so I tossed my bags to the floor and hopped on my bed. I was so relieved to be done with everything—my courses were difficult, but I'd persevered. My busy quarter ensured I'd be ready to become an electrical engineer in the years to come. But as I thought back on how my quarter went, I recalled feeling sour almost every day. I recalled having to drag myself to classes. I recalled the heartbreaking feeling of being at Stanford while my family was stuck back home. Alone in my dark room, I started crying, quietly enough to make sure my roommates wouldn't notice, if they happened to enter.

I cried for my family back home, where the costs of food, my mom's medication, and



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Stanford Associates is pleased to announce this year's recipients of the Governors' Award and Award of Merit.

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- Mo-Yun Lei Fong, '95, MA '96
- Stefanie Huie, '94
- Vinita Kailasanath, '04, MS '04, JD '10
- Marc Mitchell, '99
- Leila Ettefagh Nami, '98
- Gabriela Franco Parcella, JD '94
- Eli Reinhard, '55
- Kit Rodgers, '96, MS '98
- Jeff Small, '95
- Carole Solomon, '88
- Delia Casillas Tamayo, '74
- Naomi Waltman, '85, JD '88

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Honoring a single and significant achievement in volunteer service

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- Jennifer Glueck Bezoza, '96
- T.J. Duane, MBA '14
- Jonathan Gifford, '95
- Fatima Hassan Ali, '09
- Zach Johnson, '09
- Edward Lee, '94
- Ethan Liang, MS '08, PhD '08
- Edward J. Loya, Jr., JD '05
- Courtney McColgan, MBA '12
- Charles Najda, '03
- Jim Oswald, '82
- Parag Patel, '89
- Jennifer Chavez Rubio, '96
- Tony Tong, '94
- Joseph Van De Water, '56, MD '60

AWARD OF MERIT GROUPS

- "Farm to Forty Acres Day of Learning" Leaders**
 - Jatzin Alvarado, '03
 - Wen Song, PhD '19
 - Ana Moreno VanDiver, '97
- GSB Alumni Catalyst Award Program Leaders**
 - Kim Chan, '92, MBA '97
 - Alan Chiu, MSM '11
 - Michelle Landrey Cline, '93, MBA '98
 - Senia Maymin, MBA '99, PhD '13
 - Anna Neverova, MSM '18
 - Valerie Shen, MBA '19, MS '20
 - David Yoon, MBA '00
- Stanford Alumni in Climate Tech Community Leaders**
 - Jonathan Lipman, '21
 - Katherine Moldow, '21
 - Lauren Nolen, '21
 - Amy Zhao, MBA '23
- Stanford Singapore Alumni Club Leaders**
 - Aaron Hallmark, '95
 - Edward Sylvanus Iskander, '05
 - Wei-Qing Jen, '04

other bills are too much to handle. I cried for the times I was teased and called poor at school, for the times my car was called trashy. I cried because I'd lost that version of myself I'd brought to Stanford—one who worked hard for myself and my family, who was motivated to be a conservationist and pursue what I felt was right.

I felt barren. Ugly. Petal-less. I had abandoned the kid who loved being outdoors, who loved animals and plants, the natural world. I was trying to morph into the people around me. I was chasing something I didn't actually care about because I felt like I had to. But what change could I make?

TODAY, A YEAR LATER, I'm still pursuing electrical engineering. Though it's a path I never expected, I'm learning to find myself through it. It's hard to say whether I'll pursue environmental work after graduating. When I preach to others to follow their dreams, I

feel like each word coming out of my mouth is more hypocritical than the last. Sometimes I feel like I haven't stopped chasing a version of me that never existed.

But lately, I've begun to water the little parts of me I brought to Stanford. I work with the low-income community on campus through a service group I founded last fall, Proyecto Vidas Valiosas. I lead it with the help of the Vida Valiente Foundation, which supports first-generation Stanford students. By surveying nonprofit leaders, together we've found that many nonprofits don't have the resources or knowledge to pursue their work effectively: Volunteer numbers are dwindling, funding is being cut, and it's hard for the organizations to keep up with technology. I saw an area where Stanford students could help local nonprofits, by modernizing their technology and websites, assisting with grant applications, and promoting their events.

I water myself by exploring nature in ways

I was never able to back home. I went on my first backpacking trip through SPOT, a pre-orientation program, and found a part of me that needed to explore mountains and forests. Now I live in Trancos, a dorm dedicated to outdoor exploration and sustainability through thought, play, and hands-on experiences to pursue this discovered self. I can't change who I am and what I care about.

I can't change who I am and what I care about. And it's up to me to water the parts I don't want to lose.

Over the summer, I went back home and visited my orchid. Yes, it's still there, waiting for me on that windowsill. It has one flower on it. It has lost its petals many times, but with enough water and care, orchids can always bloom again. ■

EDMUND DYER-ESSIG, '28, now keeps a white moth orchid on his dorm windowsill. Email him at stanford.magazine@stanford.edu.



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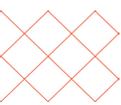
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IN MEMORY

The Lost Lineman

‘My turn came and I went straight for the dummy and it went straight for me,’
said Lowell Wilson about that fateful day on the practice field.

BY SAM SCOTT



LOWELL WILSON hadn't made varsity yet—in the 1960s, freshmen still played on their own team—but the lineman was a likely star in the making. In the 1962 “Little Big Game,” he'd recorded the most tackles in Stanford's 3–0 win over Cal's frosh, and expectations were high. But in five years of high school and college football, Wilson had never done a drill like the one he lined up for at that Friday spring practice in May 1963—and he was, according to later correspondence, apprehensive to take his turn.

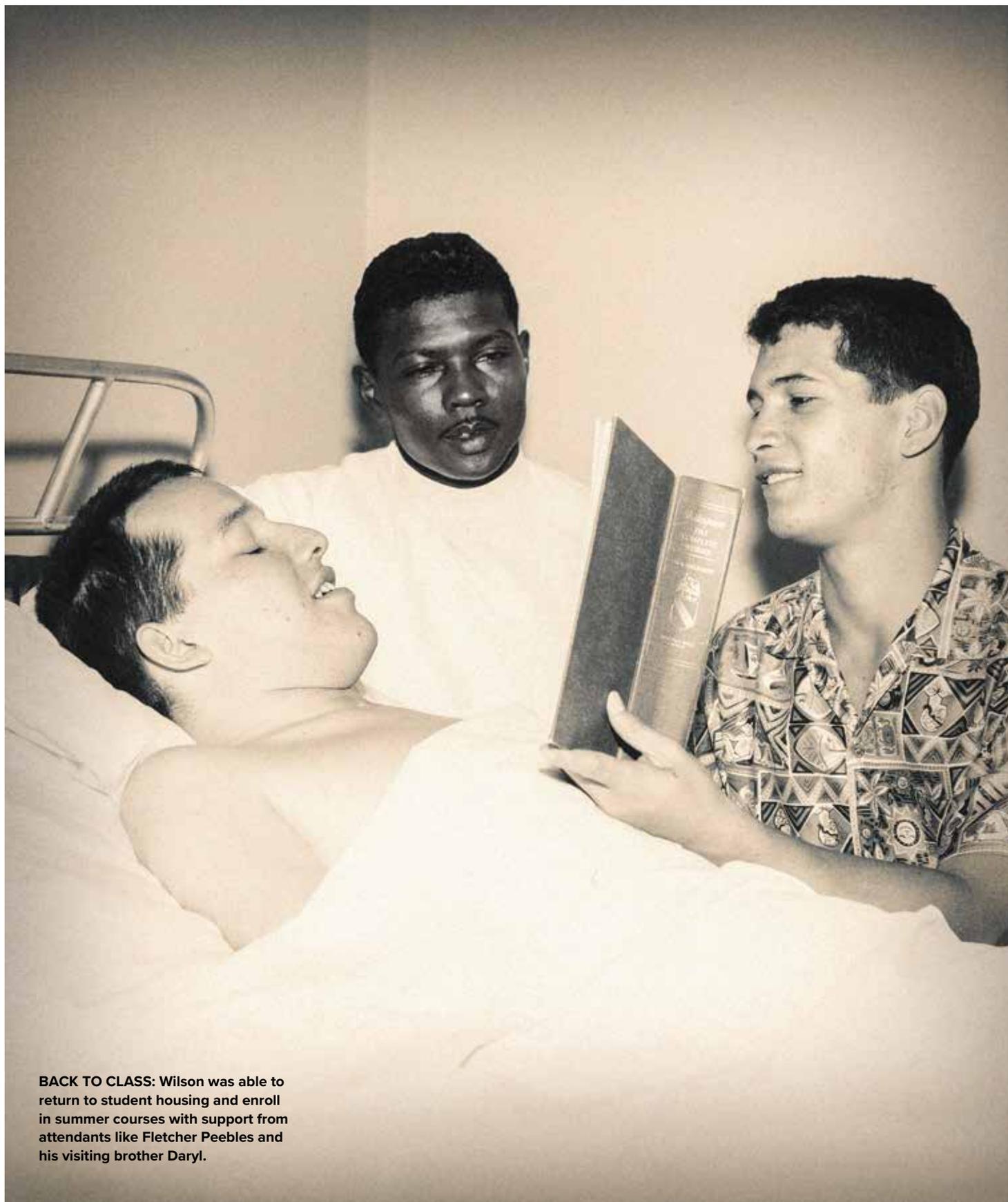
Each of the linemen was to tackle a sand-filled dummy hanging from a metal chain. It weighed, according to one teammate, hundreds of pounds, and after one player drove into it, the bag would swing back toward the next. “My turn came and I went straight for the dummy and it went straight for me,” Wilson said in a later letter. The players were

supposed to hit the bag with their shoulder. Wilson hit it with the crown of his helmet and collapsed. When he regained consciousness, he was on a hospital table, surrounded by surgeons who had just performed a tracheotomy to put him on a respirator. He was paralyzed from the neck down.

Chuck Kleymeyer, '66, recalls the intensity of visiting his classmate in the hospital. He had just gotten to know Wilson on a spring break service trip to the Round Valley Indian Reservation in Mendocino County, north of the Bay Area. While the otherwise preppy Stanford students in skinny pants struggled to find social footing with reservation residents, Kleymeyer says, Wilson, who was part Native Hawaiian, had an easy rapport built on jokes and his own Indigenous background. “He just easily went back and forth. It was as if he belonged in both groups,” Kleymeyer says.

“Lowell would look at you. He'd listen to you. He'd pay attention to you. Not everybody does that.” When Kleymeyer visited him in intensive care, Wilson's head was fixed in place, the respirator limiting his responses to clicking his tongue on his teeth. “It was a one-way conversation,” Kleymeyer says.

More than 60 years after answering the emergency call from Stanford, Lowell's older sister, Shirlene, still finds her voice catching when she talks about her brother. He'd been a star in so many ways: a champion debater, an all-state football guard, a school-best chess player, a Sunday school teacher, a student journalist, and a voracious reader. “He was like a library himself.” He attended Stanford on a scholarship, choosing it over Harvard for its relative proximity to their home on Oahu, she says. At Stanford, he studied Russian to prepare for his planned



BACK TO CLASS: Wilson was able to return to student housing and enroll in summer courses with support from attendants like Fletcher Peebles and his visiting brother Daryl.

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immediately following the accident but soon had to return to Hawaii to tend to their two younger children as well as their jobs—his dad, August, was a civilian shipfitter at Pearl Harbor; his mom, Annie, worked in the Hawaii State Tax Office. They were encouraged to sue by a celebrity lawyer, Shirlene Wilson says, and correspondence shows Stanford girding for a lawsuit. But Annie was a devout Christian who believed in God's will and in forgiveness, Shirlene Wilson says. "God is love," from 1 John, was her comfort. In 1967, she and August welcomed head coach John Ralston during his trip to Hawaii to coach the Hula Bowl.

Stanford was covering the costs of Wilson's medical care, and by October 1963, he was stable enough that the university offered to provide him with safe transport back to Hawaii on an Air Force medical plane. But Wilson believed he would receive better

care at Stanford, his sister says, where he began to wean from the respirator, surprising doctors by getting off it completely in the spring. He was also receiving social support from classmate Jane Bunker, '66, MA '80, PhD '85.

Bunker had had only passing encounters with Wilson before his injury. But her father, John Bunker, the founder of the medical school's department of anesthesia, was involved in his care, and he asked her if she'd like to visit him as many students were doing. Bunker agreed. As time went on, she became one of the only students coming regularly. "In the very beginning when I started going, it felt really scary," she says. "After a while it felt like home because that's where I went every day."

career in international law and diplomacy. "He said when he walked into a room with the Russians, he wanted to know exactly what they were saying—he loved anything that was challenging," Shirlene Wilson says. "This was an extremely unhappy and very sad circumstance, what happened to my brother."

The accident shocked the team. "You could break your arm, break your nose, tear up a knee," says classmate Craig Ritchey, '66, a defensive back and kick returner. "But that someone in the prime of his life could be in an instant rendered quadriplegic—that was a big, big shock to all of us. It was just heart-wrenching." Coaches responded with an added emphasis on safety, says Joe Neal, '65, MD '70, who had participated in the drill. The swinging

'If I never make a recovery, I will have to make the best use of what I have. Future prospects are that of a counselor of some sort, or a novelist.'

dummy had been new to them all that day. It was never used again.

Wilson's parents flew to Stanford

Bunker would read Wilson his mail, write letters for him, help the nurses, and feed him. Wilson loved spareribs from Stickney's Hick'ry House, across El Camino Real from campus, and Bunker would hold them up so he could chew on them. "Being with him always made me feel happy," she says.

In a letter from November 1963 to Daniel Akaka, later a U.S. Senator from Hawaii, thanking him for organizing a benefit football game, Wilson described life after the "freak accident" with matter-of-fact candor. He took about 22 pills a day, had lost about 60 pounds, and was missing island foods like mea ono puaa, poi, and saimin. "This past half-year I have been in the same bed, and in the same ward," he wrote. "I am beginning my seventh month and am sure to set a record that no one will equal for quite a while." He looked to the future with "mixed feelings." "If I never make a recovery, I will have to make the best use of what I have," he wrote. "Future prospects are that of a counselor of some sort, or a novelist."

He would leave the hospital for the first time since his accident on Christmas Day 1963. Dr. Bunker arranged ambulance transport to bring Wilson and his mother to the Bunker family home. Photos from the day show Wilson's smile. "That's really one of my highlights," Jane Bunker says. "And I think it was one of his highlights too."

By spring 1964, Wilson's condition had stabilized to the point he could move out of the hospital into university housing with 24-hour care. A story in the *San Francisco Examiner* on June 23, 1964, announced that Wilson was one of 3,600 students taking summer school at Stanford. An accompanying photo showed his visiting younger brother, Daryl, holding up *Shakespeare: The Complete Works* for him to read. "Paralysis No Bar to Study for Wilson," the paper declared. "Wilson, who must use a rocking bed to make breathing easier, plans to take a course in Shakespeare. He has learned to type with a rubber-tipped stick, and by rolling his head he can operate a page-turner or switch a tape recorder on and off."

The breezy tone belied enduring challenges. Bunker had recently left for a family vacation in Cape Cod before heading to Stanford in France. "I do remember him calling me and asking me to come back," she says. "And that was awful because I couldn't." Wilson was

struggling with the settling reality that his condition was not going to improve further, his sister says. In his final month, he had refused to use the rocking bed that aided his breathing. Still, his brother Daryl recalls leaving him in good spirits when he returned to Hawaii in July.

But shortly after Daryl's departure, Wilson was admitted to the hospital with "mental confusion." He died two weeks after his 20th birthday, the death termed "sudden and unexpected." An autopsy was inconclusive, but the role of the accident was plain.

It's a loss Kleymeyer often thinks about. The only Stanford student-athlete to die as a result of an accident on the playing field should be remembered, he says. Jane Bunker never forgot him. She was an art major at Stanford and later a painter. But her time with Wilson sparked an awareness that she was nurtured by service, and ultimately she became a therapist, providing mental health services in poor communities of color. She now uses her art to fund numerous scholarships for Black students in

Florida, where she lives. "Lowell showed me how important it was for me to be in some sort of a work focus where I was caring for other people," she says. "It wasn't just some little time in my life. It was pivotal."

For years, Wilson's death was a taboo topic within the family, Shirlene Wilson says. "When my dad was around, we could not talk about Lowell." Her dad put all his awards, photos, and mementos into a Chinese chest and kept it closed. Bolstered by faith, her mother was more open, she says.

Successive generations have honored his legacy. Not long ago, Daryl Wilson commemorated his granddaughter's graduation from high school with a family trip to his brother's grave, which is beside his parents' on Oahu. She had done a report on her great-uncle as part of her studies. Photographs show purple and white leis laid near his marker, its inscription worn but readable: God is love. ■

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



ON THE PITCH

Hat Trick

A Farm-raised triumvirate leads soccer in the three nations that will host World Cup 2026.



BY REBECCA BEYER

In JUNE, THE WORLD CUP—one of the biggest sporting events in the world—will begin in North America, and this time, it will be bigger than ever. For the first time in the men’s tournament’s 96-year history, three countries—the United States, Canada, and Mexico—are co-hosting the quadrennial event organized by soccer’s global governing body, FIFA.

And getting the assist in each of the host countries are three alumni who head up the sport in their nations: **JT BATSON**, ’05, CEO and secretary general of U.S. Soccer; classmate **KEVIN BLUE**, ’05, who holds the same position in Canada; and **IVAR SISNIEGA**, ’79, executive president of the Mexican Football Federation. Each oversees all organized soccer—men’s and women’s—in his respective country, including youth programs, national teams, and professional leagues (except Liga MX).

The tournament this year will be dramatically expanded, with 48 teams instead of 32 playing a collective 104 games, up from 64. Most games—78—will be played in 11 stadiums across the United States, while Canada and Mexico will host 13 games each. The super-sizing may continue: The 2030 men’s World Cup is planned for three continents, while the United States has submitted the sole bid

to host the 2031 women’s World Cup, which it plans to do jointly with Mexico, Jamaica, and Costa Rica.

Already, the modern World Cup has been drawing quite a crowd: In 2022, when tiny Qatar hosted the tournament, some 1.42 billion people watched the final match between Argentina and France. (For comparison, U.S. viewership of the 2026 Super Bowl peaked at 137.8 million.) Three of the 2022 games—including the final—tied for the second-highest recorded attendance for a World Cup game since 1994, with nearly 89,000 fans packing into a sold-out Lusail Stadium.

Sisniega says bigger is better. “There’s a huge hunger for watching fútbol around the world,” he says. “It’s just the sport that everybody in the world understands. When the national team plays in pretty much every country, activity stops that day. It’s a holiday, or people leave work early or get up in the middle of the night. People are very passionate about watching their national team.”

In the United States, soccer generally doesn’t command that level of attention. But 1994—when the country hosted its first World Cup—moved the ball up the field. The tournament broke attendance records, attracting 3.6 million spectators collectively, and more than 94,000 fans packed the Rose Bowl in

Pasadena to watch Brazil defeat Italy 3-2 in penalty kicks in the final. (Stanford also played a key role in that tournament, hosting six games at Stanford Stadium.) More recently, Batson led U.S. Soccer in launching Soccer Forward, a foundation created as U.S. Soccer’s legacy project for the 2026 FIFA men’s World Cup. It’s aimed at making the sport more accessible by providing more places to play in areas reachable by walking, biking, or public transit as well as digital resources about the game’s impact.

In the months leading up to the 2026 kickoff, Batson, Blue, and Sisniega—who will each attend every match their nation plays—spoke with STANFORD about their roles in the preparations and more.

STANFORD: What is the first World Cup you remember?

BLUE: The first World Cup that I really got immersed in was in 1994. The dramatic way it ended in penalties was unforgettable.

SISNIEGA: My life was very shaped by the 1968 Olympics, held in Mexico, and then the 1970 World Cup. I was 10 and 12 at the time. I think if they had been inverted maybe I would have been a soccer player and not a swimmer or an Olympic athlete, but I decided after 1968 that I would be an Olympian.





JT Batson

At Stanford:

Worked for the men's and women's soccer teams and men's basketball team as a student assistant

Previously:

Co-founder and CEO of advertising software company Hudson MX

Meet Cute:

Batson started in a volunteer role for U.S. Soccer in 2013—which included creating a fundraising arm for the organization—after meeting a former board chair on Amtrak. (For fiscal 2024-25, philanthropic contributions reached \$50 million, a sevenfold increase from the prior year.)

BATSON: I remember the 1990 World Cup, watching on television at one of my teammate's houses. I guess I was 7. And, of course, I distinctly remember the 1994 World Cup and how that swept America and pulled so many of us into the global game.

What has been the most challenging part of preparing to host?

SISNIEGA: We're a fútbol nation, so there's a real enthusiasm and frustration in the sense that not everybody will get to go to the stadium. That's always complicated. The government down here in Mexico is taking this as an opportunity to showcase its tourism. In the World Cup, fans go to a match, and then there are three to four days between matches, so they need to find things to do. The government has done a good job creating an alternative program so people can really get to know everything Mexico has to offer.

BLUE: I think that the demand for tickets in



Kevin Blue

At Stanford:

Captain of the varsity golf team

Previously:

Chief sport officer at Golf Canada

The Other Football:

Blue was a Stanford Athletics administrator when the Card nabbed its Orange Bowl (2011) and Rose Bowl (2013, 2016) wins.

the country—not only from soccer fans but also sports fans and general Canadians—is creating a scarcity that's unprecedented in Canadian soccer. The sport is not used to this overwhelming demand for tickets. That is both a positive thing and also a challenging thing in the sense that people are used to being able to attend and support the team if they want to. We're doing our best to make the event as relevant and accessible [as possible] across the country for people not in either Toronto or Vancouver—everything from community engagement opportunities to working directly with local youth soccer clubs to make sure [they're] equipped to do things like have watch parties and festivals.

BATSON: Fortunately, in the United States and Canada and Mexico you have the infrastructure to host large-scale events at any time, and so really the two big things are making sure our team is in the best position to be successful and making sure that we as a country are doing everything possible to benefit the legacy of what soccer can be in this country, leveraging big events like World Cup '26.

Kevin, at Stanford Athletics, you served as the university's project



Ivar Sisniega

At Stanford:

Varsity swimmer before leaving to represent Mexico as a pentathlete in three Olympics

Previously:

Secretary general of Panam Sports, where he led Olympic sports development in the 41 American countries

Like Father . . . :

One son, Carlos, '15, attended Stanford; another, Pablo, plays for Major League Soccer's San Diego FC.

manager for the Orange Bowl, Fiesta Bowl, and Rose Bowl. How relevant has that been to what you're doing in the lead-up to the World Cup?

BLUE: Those experiences are helpful in that they give you a sense of what to expect when ticket demand is very high and tickets are scarce, and there's a lot of focus and energy and buildup and anticipation. Having that experience is very comforting. Of course, the World Cup is global, and the intensity level of the World Cup is extraordinary, and so that isn't necessarily analogous to a U.S.-specific tradition like the Rose Bowl, but nonetheless, it's a similar dynamic in the sense of a major event and making sure your organization is ready to excel in all ways, competitively and on the business and operational side.

JT and Kevin, you knew each other at Stanford. What is it like to have a former classmate as a counterpart?

BLUE: When I was considering this job, [JT] had already taken his job, so I called him to talk about it. Obviously having a classmate bond and some familiarity with each other from 20 years ago is unique, and it's great. I

had some specific questions about the landscape of global soccer and the North American position in it. His insights have been super helpful. He's accomplished a lot and helped the U.S. federation significantly in his time there.

BATSON: I was incredibly excited about Kevin being in his role. He's doing great things for Canada Soccer. The success of Canada and Mexico is very important for the United States. Canada and Mexico are the teams we play against the most, so we want them to be in a very strong position because you want to play against good competition to prepare you for World Cups and other major tournaments.

What helped you two land your current jobs?

BLUE: Some of the experiences I had early in my career when I was in U.S. college sports were very applicable to what we're trying to do with the soccer federation in Canada. It's a highly commercial sports organization, but it's a nonprofit entity that's mission-driven rather than owner-driven, so there are a lot of similarities between the nonprofit structure and the philosophical underpinnings of the soccer federation as compared with U.S. college sports.

BATSON: One of my Branner dormmates sent me a note when I got this job saying, if we all had to write on a card and stick it in an envelope our freshman year what our dream job was, [this is] what you would have written. I got pulled into Silicon Valley and really had a wonderful career in the technology [and] media world, but soccer was always my passion. I was always trying to find ways to be involved, to support and help grow

the sport, and this was the latest opportunity to do that.

JT, the first software you ever worked on was for assigning youth soccer referees in Georgia where you grew up. Are there any exciting technology upgrades you've made at U.S. Soccer?

BATSON: We hired our first-ever chief product officer, Abe Geiger ['03]. He was captain of the Stanford men's soccer team. We've built out a number of proprietary systems focused on helping our teams win as well as helping to make soccer way more accessible across the country. We have technology and digital products that help players train, help coaches learn and develop, help referees learn and grow, help fans connect with the program. And there's a lot more that we'll be doing over the coming years there.

Ivar, you were born in the United States but grew up in Mexico. What does it mean to be representing one of your countries in this way?

SISNIEGA: I was born in Wisconsin. When I was a year old, we came down to Mexico. My father was Mexican; my mother was American, so I grew up with both nationalities. Anybody who's from a soccer nation knows: When you have two nationalities, who do you want to win when they play each other? That was very clear early on. I've always been a Mexico fan. I competed for Mexico in three Olympic games, so even though I'm half American, my heart, my feelings have always been with Mexico. Mexico is the first country ever to organize a World Cup three times—this will be our third. The opening ceremony

in Estadio Banorte [formerly Azteca] will be the first time the World Cup has opened in the same stadium for a third time.

What's been the most fun or exciting part of preparing for the World Cup?

BLUE: Just the opportunity to really build our team in preparation for the event. We've got our men's national team at its all-time best in terms of performance and excitement. We hired a new coach right after I arrived, and that's worked out beautifully. Really what this tournament is about for Canada on the men's side is fully establishing itself as a globally impactful footballing country.

SISNIEGA: I enjoy very much being close to the national team, meeting with the coaching staff, with the players, trying to figure out how we can get more out of them and get the best performance possible. When I got here, we had one national team coach, and we've had to change that person twice already, so that's part of the complexity of trying to figure out if you have the best fit for the team. Probably not so much in Canada and the United States, but in Mexico, the national team coach comes under a lot of scrutiny. Everybody at home is a coach. They know better.

BATSON: I think how excited everyone is at all levels, all across the country—really all across the world. To see their smiles and how much they're looking forward to it, that to me is—you get to be a little kid again. ■

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

In 1994, Stanford Stadium played host to six World Cup games, a milestone immortalized beneath the Quad in the Class of 1994 time capsule, which includes a World Cup poster.

A highlight reel:

In a July 4 group-stage match, eventual champion Brazil bested the U.S. national team 1-0.

In his team's 6-1 thumping of Cameroon, Russian striker Oleg Salenko scored 5 goals—a World Cup record for a single game.

The highest-stakes game was a quarterfinal between Romania and Sweden. After a 2-2 draw, Sweden advanced in penalties.



HISTORY CORNER

The Story Keepers

Fifty years since the Stanford Historical Society was founded, there's still plenty to uncover.

BY KALI SHILOH

For HENRY SEGAL, '26, the writing was on the wall. Soon after arriving at Stanford, he found himself routinely drawn to the sundry small plaques he spotted around campus. While enjoying the quiet ambience of a study room bearing the name of someone or other, he would think, *The least I could do is read who this is named after.* By the end of his frosh year, he'd read just about every plaque on the Farm and created a map of his favorites, from the pair of plaques in Memorial Court honoring the first Stanford community members to die in World War I to a marker for an avant-garde bike rack outside Cantor Arts Center indicating it was designed by David Byrne, lead singer of the '80s rock band Talking Heads. Each inscription Segal encountered offered a window into what had come before his time on campus—"the soul of the school," he says. "It's almost like a civic duty to just know about your environment."

That sense of obligation and fascination with bits of the past is characteristic among members of the Stanford Historical Society (SHS)—a brigade of history buffs who last year voted in Segal as the organization's youngest current board member. Established by a small group of faculty and campus loyalists 50 years ago, SHS now comprises 800 members and 200 volunteers who give their time to discovering and preserving the history of the university. From lectures to tours and from oral histories to a triannual magazine called *Sandstone & Tile*, SHS strives to explore, document, and celebrate every nook

and cranny of the Farm. And that means every nook and cranny. It was SHS member Donald Price, '53, MBA '58, for example, who researched the history of a pair of 4-foot, cast-iron griffins (or winged lions—the jury is still out on that) acquired by the university in 1931 and eventually relegated to a storage facility. Price's work led to the beasts' 2018 recovery and new posting outside of the Stanford Mausoleum. And it was Sol Martinez, '22, a student intern sponsored by SHS and the Centers for Equity, Community, and Leadership, who in 2021 combed through the papers of professor emeritus of history John Johnson—who helped build the field of Latin American history—and discovered his unpublished manuscript *Foreign Images of the U.S.: 1860-1992: A Cartoon History*, an examination of political cartoons about the United States. That work, hidden in plain sight since Johnson's death in 2004, is now available in Stanford's archives.

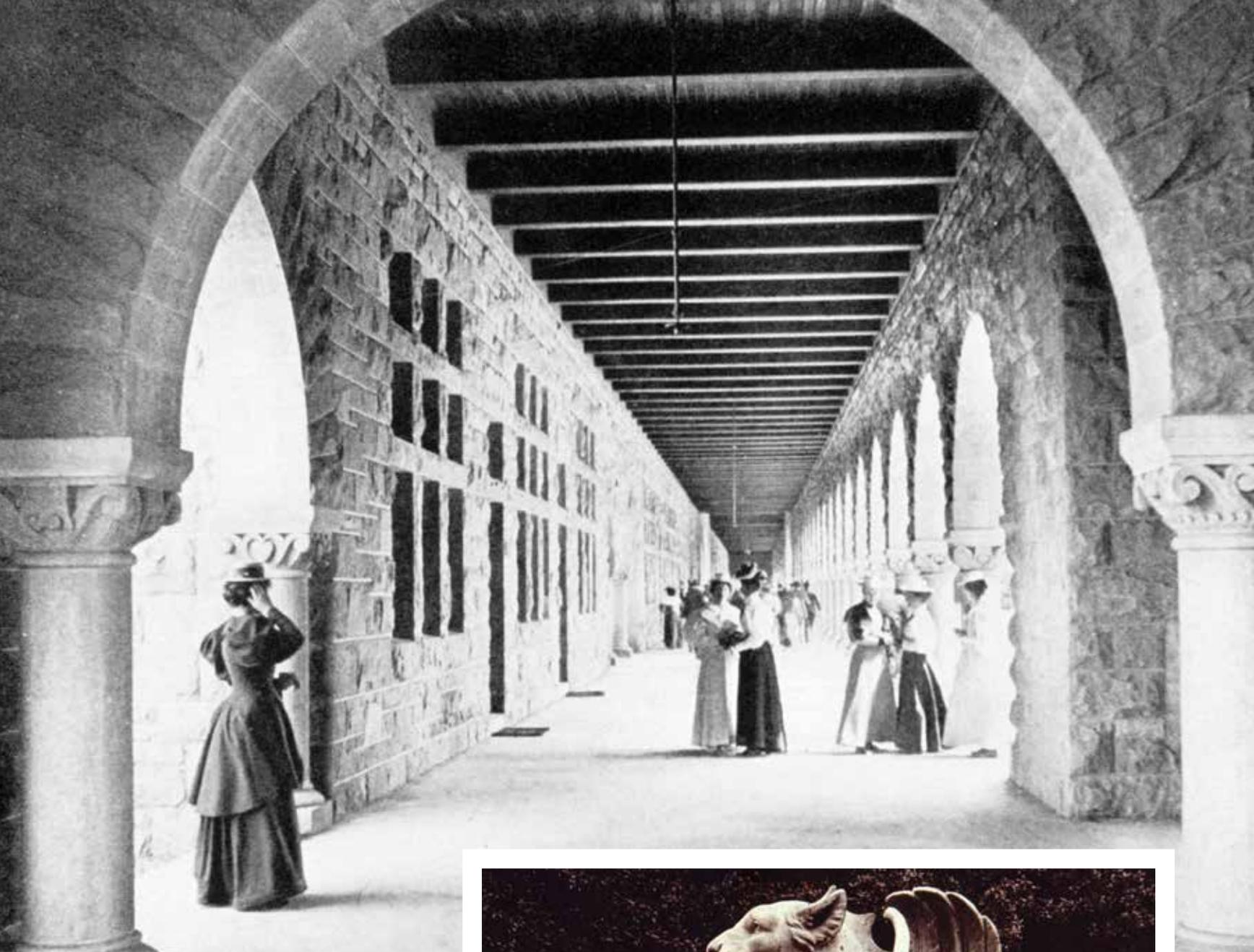
The particularized work of SHS often serves as a trove for anyone writing about the university (dozens of STANFORD stories include attributions to SHS). And it can complement work done by Stanford University Libraries, helping to build the historical record for researchers on campus and

beyond, says university archivist Josh Schneider. He points to SHS's Beyers Prize for Excellence in Historical Writing, which awards \$1,000 to up to two students per year for original research and writing. "They're often reinterpreting Stanford history through a more contemporary lens," he says, "and often the writing is fantastic and ends up being published."

Still, the compulsion to delve into such fragments of history is . . . niche. "I don't expect a historical society to be a mass popular society—it's for nerdy people," says Larry Horton, '62, MA '66, the SHS board president and a former Stanford administrator. But the mission of SHS is vital to a society built on knowledge passed down through generations, he says. "It's hard to enjoy the current reality if you don't know what came before."

And much of what came before is still up for discovery. "History at Stanford is a contact sport," says Segal. Whether scouring archival footage or tracking down sources, Segal often finds himself unearthing unwritten campus stories. Last year, Sairus Patel, '91, editor of the Trees of Stanford website, tipped him off to an obscure brass plaque—installed as a prank—under an oak tree on campus.



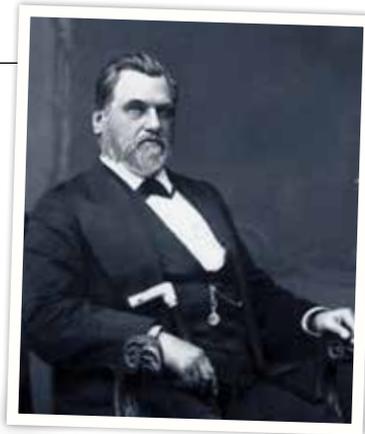


FOR THE RECORD: SHS examines the university's early stories and, through its oral history program (opposite), chronicles its more recent ones.

“There’s nothing about this on the internet,” says Segal. He spent 10 weeks investigating its backstory and ultimately created a Stanford Storytelling podcast episode about it. Those deep dives are one of the reasons Segal invites friends to attend SHS meetings and discover pieces of the past for themselves. Here, he says, “you’re *doing* history rather than *studying* history. It’s really exciting.”

In celebration of the 50th anniversary of SHS, test your knowledge of Farm history with trivia inspired by one of the society’s 30 published books and monographs, *A Chronology of Stanford University and its Founders*. —>





- The university's namesake chose to call himself Leland Stanford Jr., but he did not share the full name of his father. What was the elder Leland Stanford's legal first name?
 - Amasa
 - DeWitt
 - Frederick
 - Josiah
- Though it was difficult to persuade academics to join a nascent university on the West Coast, seven of the first 15 faculty members came from:
 - Cornell
 - Dartmouth
 - Indiana University
 - University of Chicago
- Put these firsts into chronological order.
 - The Stanford Linear Accelerator Center launched the first U.S. website.
 - Sally Ride, '73, MS '75, PhD '78, became America's first female astronaut.
 - Professor of cardiovascular surgery Norman Shumway completed the first adult human heart transplant in the United States.
 - Sandra Day O'Connor, '50, LLB '52, became the first woman on the U.S. Supreme Court.
- Which of these (all true) pranks resulted in students paying Stanford \$28.55?
 - Taping large black footprints up the length of Hoover Tower
 - Stealing cigars, wine, and whiskey gifted to a guest lecturer
 - Publishing and distributing a fake *Daily Cal* newspaper to convince Berkeley students they had lost Big Game
 - Stealing a local train's freight car and pushing it to Encina Hall
- Class of 1895 alumnus Herbert Hoover, a geology major, later became the U.S. president. Alumni have also become president or prime minister of all of the following, except:
 - Ghana
 - Greece
 - Guatemala
 - Guyana

Answers:

- Leland Sr. was Amasa Leland Stanford; his son was christened Leland DeWitt Stanford to honor one of the governor's younger brothers.
- A. Thanks to the recruiting efforts of university president David Starr Jordan, who graduated from Cornell.
- C. 1968; D. 1981; B. 1983; A. 1991. See page 48 for more on Shumway's transplant.
- B. In 1894, one or more Encina residents swiped the goods—gifts from Jane Stanford to former U.S. president (and temporary Encina resident) Benjamin Harrison.
- D. Guyana. Jorge Serrano Elias, MA '73, was president of Guatemala from 1991 to 1993; John Atta Mills, Gr. '71, was president of Ghana from 2009 to 2012; and Kyriakos Mitsotakis, MA '93, has been prime minister of Greece since 2019.

Many Voices



When a conversation at work is going well, **Natalie Marine-Street** doesn't talk much. Hired in 2015 as the first full-time staffer of the Stanford Historical Society's oral history program, Marine-Street, MA '14, PhD '16, is the engine behind the sometimes hours-long interviews of Stanford community members. "Your job as an interviewer is to turn your interviewee into a storyteller," says Marine-Street.

Since its inception in 1978, the oral history program has recorded and transcribed 1,468 interviews, most of them available online. Its interviewers have worked to capture the experiences—professional but also sometimes deeply personal—of Stanford's luminaries. You can hear, in the subjects' own words, about former university president John Hennessy's childhood in a large, Irish Catholic family; Hoover Institution director and professor of political science Condoleezza Rice's role as a White House Soviet specialist in the George H.W. Bush administration; and the early work of professor of mechanical engineering David Kelley, MS '78, who earned \$2 an hour demolishing building interiors with the Intergalactic Destruction Company prior to founding the design consulting firm Ideo.

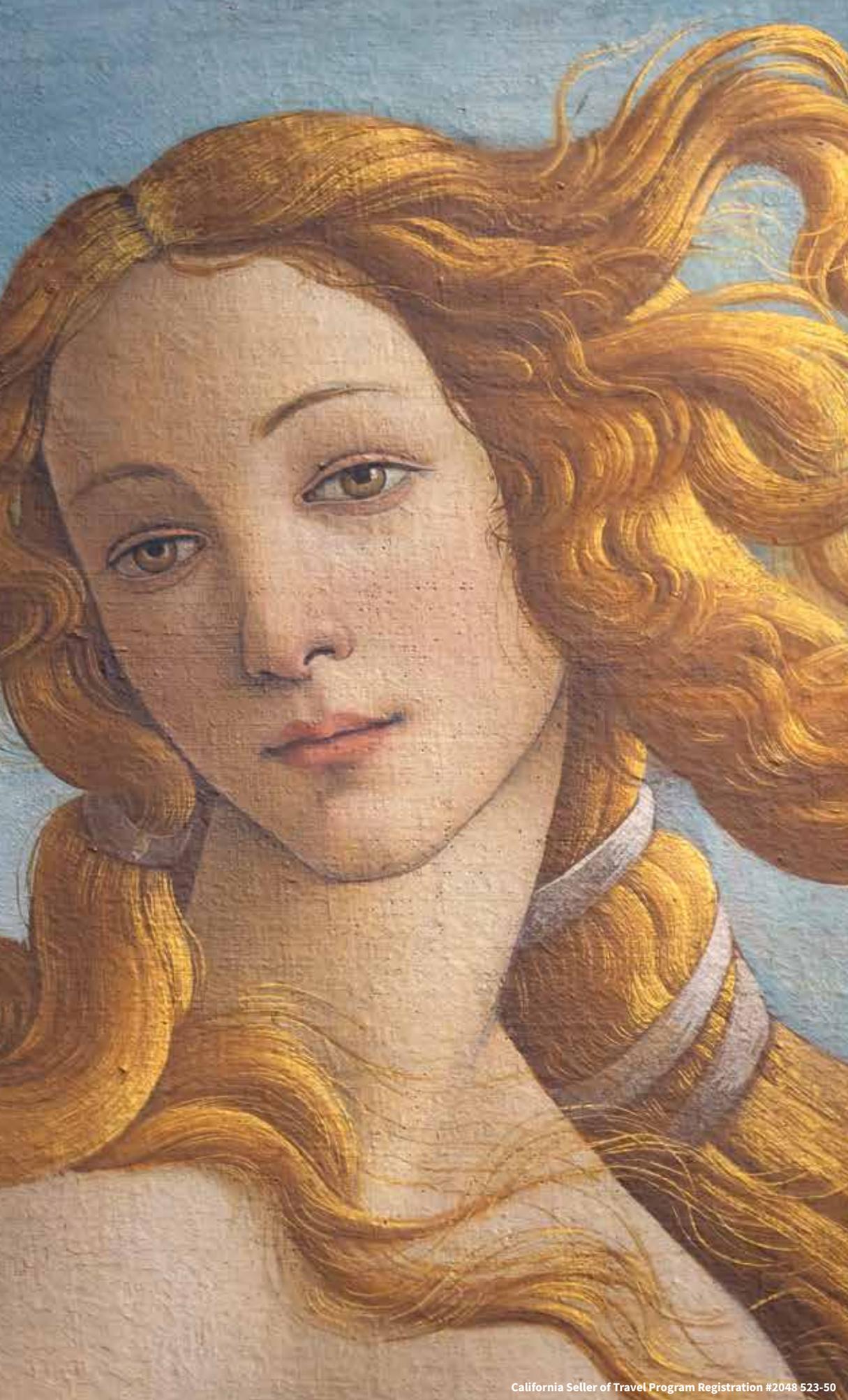
There are also hundreds of interviews with lesser-known figures: staff who restored the Arizona Cactus Garden; teachers of Shakespeare and of bioengineering; and a former Lagunita Court resident who recalls her undergrad days—everything from designing her dorm's T-shirt to witnessing the *Challenger* explosion. "Over the years, we've really tried to think about, *What are the many different histories of Stanford?*" says Marine-Street. She conducts or oversees about 100 interviews annually—40 with faculty and staff, 40 with alumni, and a couple dozen based on suggestions or theme projects. Those have included three dozen anti-Vietnam War activists; panels of pioneering female faculty members; and five deans of Humanities and Sciences representing 40 years of leadership. Many such projects are conceived in collaboration: Several years ago, an alum suggested Marine-Street capture the evolving experience of Stanford community members with disabilities. There are now 27 such interviews available online. ■

Stanford TRAVEL/STUDY



Tuscany: vine-covered hills; incomparable wines; masterpieces too numerous to name. Look closer.

Amidst the thrilling sunsets and fine cuisine, a story, a history emerges. Guided by a Stanford scholar, the Etruscan traditions that Romans will use to build a culture that births the Renaissance come to life. Look closer. Michelangelo, Botticelli, Dante—not as untouchable icons, but fully realized people within a dazzling context, place, and time.

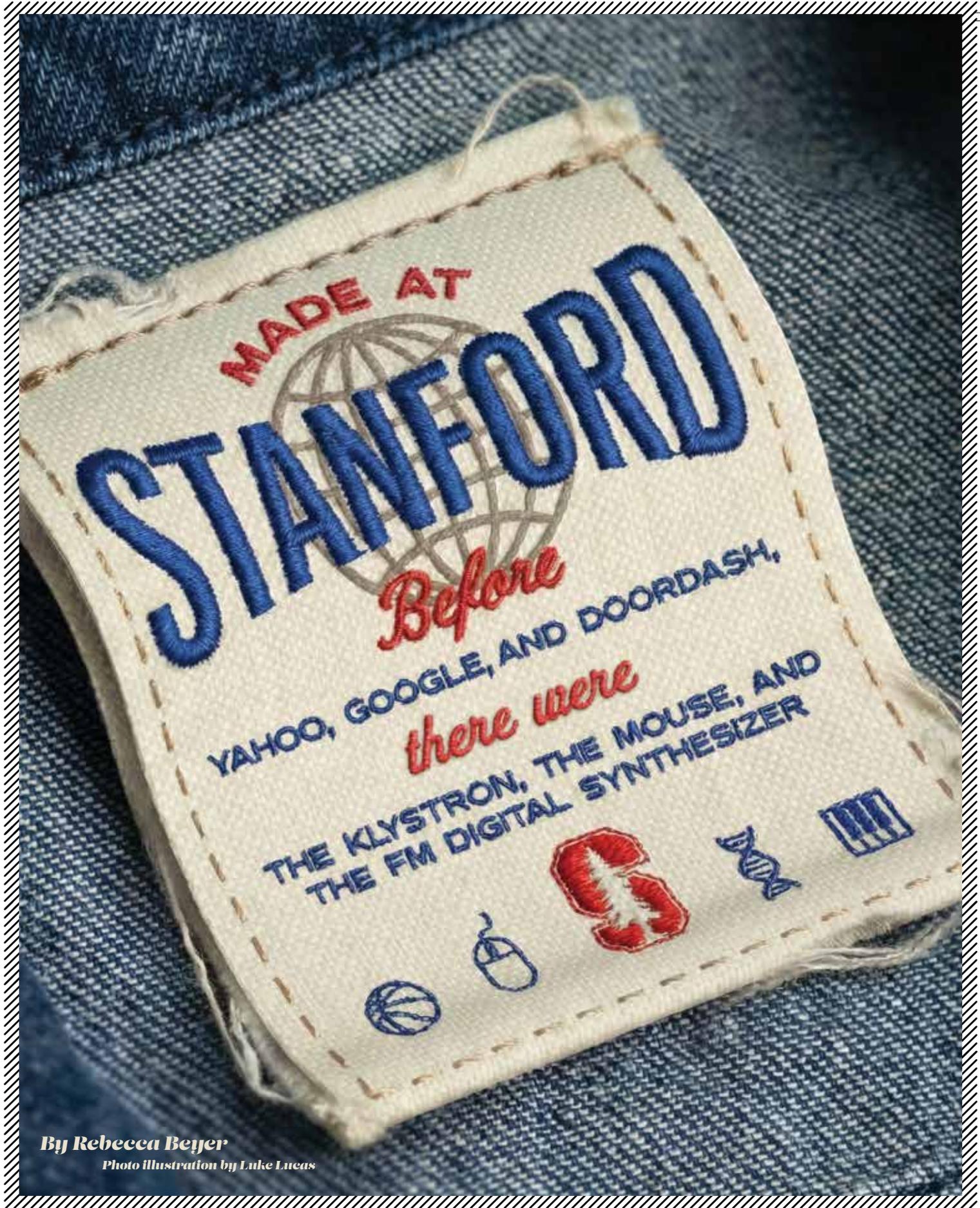


Look closer

With 50 journeys to 80 countries, there's no limit to what you can see. But with Stanford scholars and alumni as travel companions, what you'll see is only the beginning. Our trips allow you to examine and gain perspective... up close. Choose from a variety of extraordinary experiences including land journeys, river cruises, literary seminars, family adventures, walking trips, and more!

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California Seller of Travel Program Registration #2048 523-50



By **Rebecca Beyer**

Photo illustration by **Luke Lucas**

You probably know the Stanford origin story of Google, and, if you don't, because of Google, you can Google the Stanford origin story of Google. It begins in 1995, when two graduate students—Larry Page, MS '98, and Sergey Brin, MS '95—created a search engine ranking the importance of individual web pages (if their original name had stuck, you wouldn't Google things, you would Backrub them).

But Stanford's tradition of innovation starts about a century earlier. By 1893, two years after the university opened its doors, a member of the Pioneer Class of 1895 named Clyde Patterson had reportedly secured a deal with music giant Lyon & Healy to manufacture a new musical instrument he called the mandolin-guitar and for which he planned to seek a patent.

Long before the start-up era took hold, Stanford faculty and students were dreaming up inventions that transformed (and in some cases established) domains as far-ranging as genetic engineering, nanotechnology, organ transplantation—even the internet itself.

Here are snapshots of nine of them.



The Klystron

WHO: Physics research associates Russell, Class of 1925, MA '27, and Sigurd Varian

WHEN: 1937

LED TO: Precise weather forecasts, military defense systems, deep space communications

Cars traveling at different speeds and bunching into groups on a highway. That's the vision that came to Russell Varian as "an idea in the middle of the night." But the cars were only a metaphor for something much more powerful: the microwave tube, or a way to generate electromagnetic radiation. In 1937, Varian, Class of 1925, MA '27, and his brother Sigurd, with \$100 in funding from Stanford, built on the work of physics professor W.W. Hansen to construct a model of the technology that became known as the klystron: an organ pipe-like tube that produces electrons and bunches them into groups that emit microwave radiation waves, thereby powering instruments large and small, highly technical and everyday. National Weather Service radar relies on klystron tubes, as do air traffic control, television broadcasting, satellite communications, and radiation therapy equipment used to treat millions of cancer patients. (It's not the gizmo that powers your microwave oven, though; that's a *magnetron*.) "What's been around for half a century, looks like a piece of plumbing, can weigh a ton or be held in the palm of your hand, and makes life a lot easier?" quipped Rich Cartiere of the Associated Press on the occasion of the device's 50th anniversary.

The Varians adopted the name *klystron*—from the Greek *klyzo*, for the motion of waves breaking on the shore—on the recommendation of a Stanford classics professor. After patenting the device in 1939, Stanford sold the rights to a manufacturer. The United States and Britain later collaborated to use the technology for radar in Royal Air Force planes against Germany in World War II.

Klystron efforts have continued on and around the Farm ever since. Varian Associates, the company the Varian brothers founded in 1948 with Hansen, Russell Varian's wife, and others, would soon become the first tenant of the Stanford Industrial Park.

Hansen and two other Stanford faculty members produced the first multi-megawatt microwave technology—a klystron with a power output of 30 MW, exponentially higher than existing models—which paved the way for the manufacture of high-powered klystrons put to use in missile-detection systems during the Cold War. Today, klystron-powered research continues at the SLAC National Accelerator Laboratory, a partnership with the U.S. Department of Energy. The klystron gallery at the 2-mile-long building holds more than 150 of the devices, all accelerating electrons to nearly the speed of light.



TOTALLY TUBULAR: Clockwise from lower left: Russell Varian, Sigurd Varian, physics professor David Webster, Hansen, and graduate student John Woodyard, Engr. '37, PhD '41, with an early klystron.

The Human Heart Transplant

WHO: Professor of cardiothoracic surgery Norman Shumway

WHEN: 1968

LED TO: Hundreds of thousands of lives prolonged worldwide

When Stanford professor Norman Shumway performed the first successful human heart transplant in the United States on Stanford's campus in 1968, the chief resident assisting him at the time, Edward Stinson, asked if what they were doing was even legal.

"I guess we'll see," Shumway replied.

Eight years later, California passed the Natural Death Act, which provided a legal basis for what the surgeons had done: removed a vital organ from a patient with brain death so that another might live.

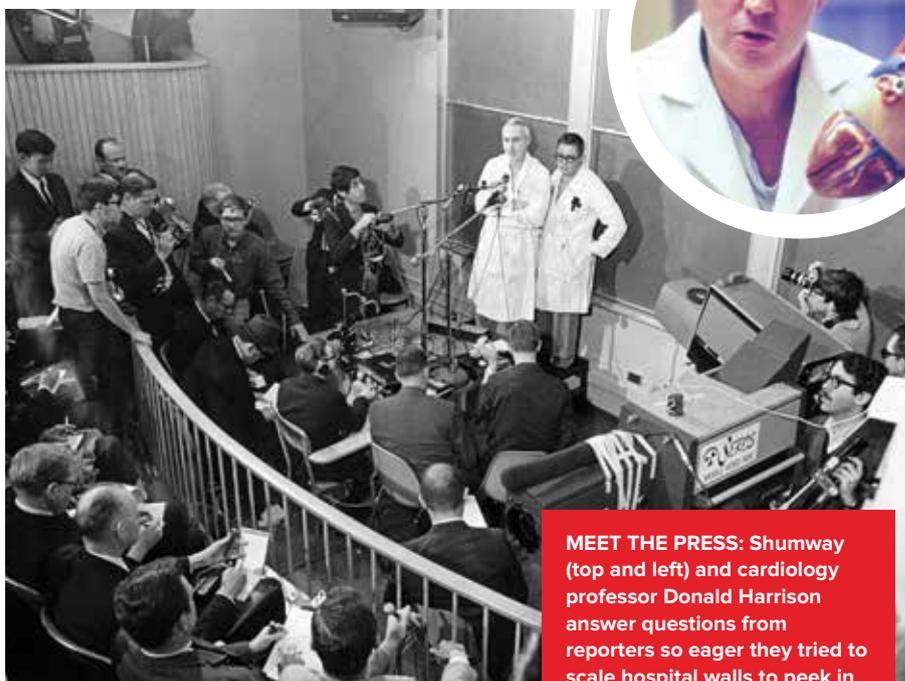
Building on preliminary experiments in animals by early-20th-century scientists, Shumway had developed the protocol for heart transplants, which he and then-Stanford colleague Richard Lower successfully deployed in dogs beginning in 1959. After Shumway announced he was ready to perform the procedure in a human, he got scooped by South Africa's Christiaan Barnard, a former colleague from their trainee days at the University of Minnesota. A month later, at Stanford Hospital, Shumway and Stinson transplanted a donor heart into retired steelworker Richard Kasperak. It took 25 minutes for the donated heart to start beating again.

"We put in the heart and nothing happened," Shumway said later. "There were slow waves on the EKG and then the heart began beating stronger and then, exuberance." Kasperak would live for two weeks.

A key part of Shumway's initial technique was to preserve the donor heart in ice-cold saltwater to reduce its metabolism, and he continued to innovate in ways that improved the heart transplant

process. To determine sooner whether the body would reject the new organ, he and his colleagues performed heart biopsies with tiny catheters. He also introduced the use of cyclosporine, an immunosuppressant that helps prevent rejection. In 1981, Shumway performed the first successful human heart-lung transplant alongside the man who would succeed him as chair of cardiothoracic surgery: Bruce Reitz, '66. In 2022, the current chair, Joseph Woo, performed the first transplant of a beating heart from a donor after cardiac death.

"Dr. Shumway is the father of heart transplantation," Woo said in 2025. Today, there are more than 4,500 heart transplants each year in the United States, and most recipients survive for more than a decade.



MEET THE PRESS: Shumway (top and left) and cardiology professor Donald Harrison answer questions from reporters so eager they tried to scale hospital walls to peek in Kasperak's window.

Modern Basketball

WHO: Junior Hank Luisetti

WHEN: 1936

LED TO: March Madness, Steph Curry, 74 alumni who have played in the NBA/ABA and WNBA (37 men, 37 women)

It's almost impossible to imagine, but when basketball was first invented in 1891 (as "Basket Ball") by James Naismith, a Canadian who later founded the University of Kansas program, the proper way to shoot was

standing, flat-footed, with two hands in front of your chest. If your team fouled three times consecutively, the other team got a point. You couldn't dribble, but you could "bat" the ball with one or two hands (no fists).

Things evolved rather quickly in ways that made the sport more exciting to play and watch. The jump shot—a 1930s innovation attributed to several players—was a literal game changer. So was Stanford's three-time All-American Angelo-Giuseppi

"Hank" Luisetti, '38, who invented the "running one-hander" shot. "Shooting two-handed, I just couldn't reach the basket," Luisetti once told the *San Francisco Chronicle*. "I'd get the ball, take a dribble or two and jump and shoot on the way up." The shot went the mid-century equivalent of viral—and the game of basketball changed forever—after a 1936 game at Madison Square Garden against Long Island University during Luisetti's junior year.



WEST COAST OFFENSE: Luisetti (No. 7) repeatedly put on a show at Madison Square Garden, here teaming up with the Laughing Boys to defeat City College of New York, 45-42.

The game pitted the undefeated Blackbirds—who played the traditional way with lots of passing and planned offensive plays—against the Stanford “Laughing Boys,” so called because they had so much fun playing together. Powered by Luisetti, they had the last laugh, defeating LIU 45-31 with their signature approach: playing much quicker on offense and defense, with fast breaks and full-court presses.

Media and opposing coaches

were skeptical of Stanford’s style before the game; afterward, they “climbed on the bandwagon,” wrote former Stanford sports information director Don Liebendorfer, Class of 1924, in his book, *The Color of Life is Red*. A *Sports Illustrated* writer said the game was “pivotal in the sport’s history, introducing the nation to modern basketball.”

Two days before the fateful game at the Garden, the *New York Times* described Luisetti as “the greatest shot basketball has produced.” He

also became the first college player to score 50 points in a game and perhaps the first to dribble behind his back. But his legacy—transforming a static, defensive game into a fluid, offensive one—transcends any individual accomplishment.

“Stanford played unlike any other team of its era because it had a player named Hank Luisetti,” wrote Ben Cohen of the *Wall Street Journal* in 2017. “Naismith was basketball’s inventor, but Luisetti was its innovator.”

The Computer Mouse

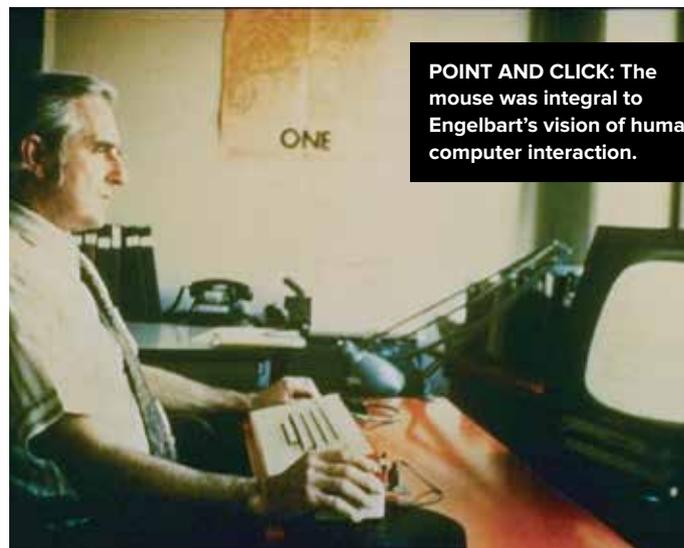
WHO: Stanford Research Institute engineer Douglas Engelbart

WHEN: 1968

LED TO: Your ability to scroll through this article online

In 1968, in what has been called “the mother of all demos,” Douglas Engelbart, an engineer working at the Stanford Research Institute (part of Stanford until 1970), demonstrated how to use his invention, the “X-Y Position Indicator for a Display System.” Before a crowd of about 1,000 computing professionals, he used the handheld device, which had two wheels and three buttons, to move his cursor about the screen. It was the world’s first glimpse of the computer mouse, which, by enabling pointing, clicking, and dragging, would change the way humans interacted with computers.

“If in your office, you as an intellectual worker were supplied with a computer display backed up by a computer that was alive for you all day and was instantly responsive to every action you have, how much



POINT AND CLICK: The mouse was integral to Engelbart’s vision of human-computer interaction.

value could you derive from that?” Engelbart said in the 90-minute demo, a sort of TED Talk of its time. He then proceeded to use the mouse to copy, move, and paste the word “word” over and over again before demonstrating other tasks (including manipulating a shopping list his wife had given him).

In fact, Engelbart was demonstrating far more than the mouse. For years, he had imagined and played a role in conceiving ways to collaborate using computers to increase “collective I.Q.” The mouse (“Sometimes I apologize” for the name, he said in his demo) was only

a small part of his grand plan to create a human-computer interface. The mother of all demos also featured hypertext linking, windows, and videoconferencing. Everything Engelbart demonstrated was later put into commercial—indeed everyday—use. The mouse made its mass-market debut in the mid-1980s at the behest of Apple’s Steve Jobs, who hired a Stanford-trained product design team to create a one-button version that could be manufactured for less than \$35, paving a path that ultimately led to modern touch screens like the one in your pocket.

The Fluorescence-Activated Cell Sorter

WHO: Assistant professor of genetics

Leonard Herzenberg

WHEN: 1969

LED TO: T-cell counts to monitor HIV, stem cell isolation for research, personalized cancer treatments

When most people’s eyes get tired after a long day of working, they close them. Not Leonard Herzenberg. When the then-assistant professor of genetics grew weary counting immunofluorescent cells under a microscope, he didn’t just call it quits for the night and start over again in the morning; he decided to find a more efficient way to do the necessary work.

He pestered scientists at Los Alamos National Laboratory into sharing the blueprints for a machine they used to sort mice and rat cells that had been exposed to atomic bomb testing. Then he worked with engineers in the Stanford genetics department to create what they initially called “The Whizzer,” which could separate cells based on certain characteristics by directing fluorescent-dyed antibodies to attach to specific molecules.

“Separation of large numbers of functionally different cell types from the complex mixtures found in such organs as spleen, bone marrow, lymph nodes, liver, or kidney would be useful in biological and biochemical investigations,” they wrote in the resulting 1969 paper.

That’s putting it mildly. Their machine eventually became the first fluorescence-activated cell sorter (FACS), commonly known as a type of flow cytometer. Herzenberg’s partner in life and work, Leonore Herzenberg,

was instrumental in enabling its practical applications, which today include modern cancer immunotherapies and personalized medicine, as well as stem cell research. It is used to monitor patients with autoimmune diseases, organ transplants, and HIV.

“Without the Herzenbergs, tens of thousands of people now alive would not be,” professor of pathology and of developmental biology Irving Weissman, MD ’65, a stem cell researcher and former student, told Stanford Medicine after Len Herzenberg, by then a professor emeritus, died in 2013.

The Herzenbergs—known as Len and Lee—operated a joint laboratory and continued to make major contributions to science for decades. They later created a series of monoclonal antibodies—lab-grown disease-fighting proteins that mimic the real thing—and

demonstrated how to use them with FACS, then made them available to other researchers to enable them to create new diagnostics and therapeutics. Lee Herzenberg, a research professor of genetics, still runs the lab where they worked together.

Before the FACS, cell counting was “just chaos,” Lee Herzenberg said in a 2013 interview. “It was not science as we wanted to do it.” In an interview for the 2006 Kyoto Prize—for which he insisted Lee receive recognition as well—Len Herzenberg said he “could not imagine that it would be so widely used, although I did think that it would be used in immunology and in cell biology.”

He estimated that maybe 100 instruments would be sold; today, there are more than 40,000 FACS machines in medical labs around the world.



WHIZZER KID: Herzenberg developed the FACS because his eyes got tired while counting cells.

Digital FM Synthesis

WHO: Assistant professor of music John Chowning, MA '64, DMA '66

WHEN: 1967

LED TO: '80s pop and its progeny

At first, John Chowning, then an assistant professor of music, thought the sound he was hearing in the Stanford artificial intelligence laboratory in the “wee hours” of a 1967 night was distortion. Chowning, MA '64, DMA '66, was studying reverberation, building on an earlier version of surround sound, when, while experimenting with vibrato, he heard “something different.”

Think, Chowning says, of a violinist moving their fingers on the strings of their instrument, creating a vibrato—or oscillating—effect to change the pitch of the tone. If a violinist could move their fingers (or arms) much faster, the effect would be greater. Chowning could manipulate a tone to make sounds reminiscent of bells, specific instruments, fog horns, and even, eventually, the human voice.

An engineering friend confirmed that the sound—made by frequency modulation—was not a mistake. “I had created, with two oscillators, complex tones that, by any other means, would have taken many, many simultaneous oscillators,”

Chowning recalls. “I had no idea of its final applications, but I knew it was a big win.”

It was a huge win—for Stanford and the music industry. Before Chowning’s discovery, which became known as digital frequency modulation (FM) synthesis, musicians used analog oscillators to produce novel sounds. “In the digital domain, the oscillators are basically program code,” he says. Stanford patented the technology and then—after several organ companies demurred—licensed it to Yamaha, which, with Chowning as a consultant, released the DX7 synthesizer for \$1,995 in 1983.

“It just took over the market,” says Chowning, who co-founded Stanford’s Center for Computer Research in Music and Acoustics and whose earlier forays into computer-assisted music could take 20 to 30 minutes to produce two seconds of sound. The DX7 had “all sorts of attributes that were nowhere near possible in any synthesizers of the day. I was very proud to be associated with it because it democratized computer music. Before then, computer music lived in huge labs with multimillion-dollar computers.”

Digital FM synthesis became the sound of 1980s pop music. Chowning associates it most with Toto’s “Africa,”

but other examples include Madonna’s “Like a Prayer,” Kenny Loggins’s “Danger Zone,” and A-Ha’s “Take On Me.”

In January, Chowning, who is 91 and continues to tour with his wife, the singer Maureen Chowning, received a Technical Grammy Award for his work as a “transformative composer and computer-music innovator.” He was honored at a merit awards ceremony alongside several music icons, including Carlos Santana, Cher, Chaka Khan, and Paul Simon.



PLAY ON: Chowning’s work led to the democratization of computer music.

Recombinant DNA

WHO: Professor of biochemistry Paul Berg; associate professor of medicine Stanley Cohen and UCSF’s Herbert Boyer

WHEN: 1971–74

LED TO: Medications for diabetes, hemophilia, and multiple sclerosis; today’s hepatitis B vaccine; GMOs

All the ingredients for the 1971 experiment that would lead to Stanford professor Paul Berg’s Nobel Prize win were in the refrigerator of the biochemistry department.

Berg was already a well-known researcher when his lab created a recombinant DNA (rDNA) molecule by combining DNA from two different organisms—*E. coli* and an animal virus called SV40—using a bacterial virus called lambda phage, which infects

E. coli, as a Trojan horse. He didn’t consider the work his most important, and, in fact, others at Stanford, including graduate student Peter Lobban, MS ’76, PhD ’82, were working on similar experiments at the same time.

That was the culture of the department, Berg explained in a 1997 oral history. That the ingredients were available in an open-access fridge was “a reflection of the kind of atmosphere we had in our department,” he said. “It wasn’t competitive. It wasn’t secretive.”

Berg then hit the pause button on the next rDNA study planned in his lab, an experiment by graduate student Janet Mertz, PhD ’75, to clone and propagate SV40 mutants in *E. coli*. On the one hand, he and others understood the potential benefits of rDNA experimentation, such as novel medications and

hardier crops. On the other hand, they worried that it could inadvertently create pathogens and toxins. In 1975, Berg organized the Asilomar Conference, which led to a voluntary, self-imposed moratorium on rDNA experiments “that were considered potentially hazardous” to public health, as well as strict guidelines for continued research.

Work with rDNA had continued to progress at Stanford, including in the lab of associate professor of medicine Stanley Cohen. He and UCSF biochemist Herbert Boyer (who later co-founded Genentech) became the first to clone DNA and to transplant genes from one living organism to another. Their 1973 and 1974 papers lay the foundation of genetic engineering.

“My goal wasn’t to clone DNA,” says Cohen, now a professor of medicine and of genetics. “I was interested in antibiotic resistance.” But in order to study genes, he says, “you need enough copies to study.”

After reading an article about the research in the *New York Times*, Niels Reimers, who founded the Stanford University Office of Technology Licensing in 1969, convinced Cohen and Boyer to patent it.

“I didn’t think of it as an invention,” Cohen says. “It didn’t occur to me to begin with that you could patent something that was basic science. That shows you how naïve I was at the time.”



PRESSING PAUSE: Berg was the first to create a recombinant DNA molecule. Then he called a halt.

The development—and the patents—proved to be transformative:

More than 400 resulting licensing agreements enabled major breakthroughs in science and medicine and brought hundreds of millions of dollars to the two universities (Reimers was inducted into the IP Hall of Fame, in part based on the Cohen-Boyer licensing program). Among the more than 2,400 products developed with the technology were drugs to treat heart and lung disease, HIV/AIDS, cancer, and diabetes.

Today, more than 8 million people in the United States rely on the first one: human insulin.

The Atomic Force Microscope

WHO: Professor of applied physics and of electrical engineering Calvin Quate, MS '47, PhD '50, visiting professor Gerd Binnig, and visiting scientist Christoph Gerber

WHEN: 1986

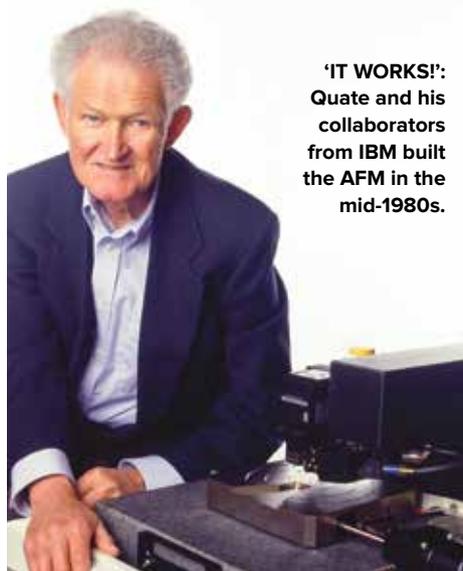
LED TO: Targeted drug delivery, modern water purification systems, smartphones

There aren't always specifically identifiable moments that mark when an idea becomes a reality, however we may yearn for cries of “Eureka!” But Professor Calvin Quate, MS '47, PhD '50, had at least one: In the mid-1980s, as his colleague Bob Byer, MS '67, PhD '69, remembered it in 2019, Quate rushed into his office to share the news that a powerful tool being developed in his lab—the atomic force microscope—was no longer just a drawing on a blackboard.

“It works!” Quate shouted.

Quate, a professor of applied physics, had already co-invented the scanning acoustic microscope in 1973. It used high-frequency sound waves to measure living cells without damaging them. The atomic force microscope, which Quate co-invented

in 1986 after persuading IBM's Gerd Binnig and Christoph Gerber to come to the Bay Area from Switzerland for a year to collaborate, used a nanoscale probe to create 3D images 1,000 times more detailed than existing microscopes could provide, on almost any material. The microscope laid the foundation for nanotechnology, which allows for the study of matter on the tiniest



‘IT WORKS!’: Quate and his collaborators from IBM built the AFM in the mid-1980s.

of scales (one nanometer is one-billionth of a meter, or less than 1/50,000 the diameter of a human hair). Nanoscience has since been used to watch chemical reactions, arrange atoms, and study proteins, among other previously unimaginable accomplishments. It enables precise drug delivery to tumors, the pink line on home pregnancy tests, and a whole lot of things that are “smart” (clothing, packaging, phones).

The probe of the atomic force microscope has been compared to a record player's needle, and, in fact, the first prototype was created from a diamond-tipped phonograph needle that Binnig and Gerber smashed. They then glued a tiny diamond shard on top of gold foil to create a cantilever. Quate later built even smaller cantilevers that allowed atomic forces to be measured.

Quate was “a perfect scientific manager,” Binnig said in a 2016 interview. “If one of the team members discovered something or got some nice results, all the others gathered around and wanted to know everything about it. They were all really happy for this one person. There was no jealousy. Zero, zero jealousy. Just a real team. I've never seen something like that again.”

The Architecture of the Internet

WHO: Assistant professor of computer science and of electrical engineering Vinton Cerf, '65, and DARPA's Robert Kahn
WHEN: 1974
LED TO: Do we really need to explain?

One day in 1977, Vinton Cerf and his team sent a message from a mobile radio van in the Bay Area to Cambridge, Mass., back and forth across the Atlantic Ocean, down the eastern coast of the United States, and then west to Los Angeles. The message traveled nearly 100,000 miles—counting two roundtrips to satellites in orbit—to make a trip of about 400 miles.

It was proof positive of the viability of a system—eventually known as TCP/IP, for Transmission Control Protocol and Internet Protocol—that became and continues to be the underlying infrastructure of the internet.

“That three-way network test was a very important milestone,” says Cerf, '65.

One of the three building blocks was the Advanced Research Projects Agency Network (ARPANET), a U.S. military-funded system by which computers on a shared network could communicate with one another that Cerf had helped create. The network test demonstrated that by using the new internet architecture model, communication could flow not just within ARPANET, but across three separate networks: ARPANET plus existing radio and satellite communications networks.

Cerf was working as an assistant professor of computer science and of electrical engineering at Stanford when he co-developed the model with Robert Kahn, who had recruited him to work on “internetting” at the Defense Advanced Research Projects Agency (DARPA) in 1973. They published a paper describing the theory

behind their solution to “internet-work” in 1974 before beginning to test transmission in real life. Cerf analogizes the design, which relies on so-called packet switching, to sending postcards through the mail—separate, small, addressable bursts that each arrive at their destination. And even though the speeds of transmission have gotten much faster and the number of networks has grown

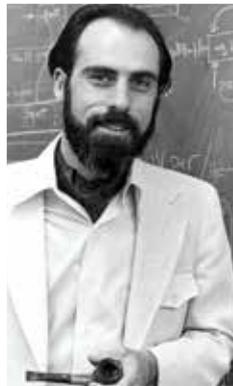
technologies that have ranged from AOL to Zoom and show no signs of stopping any time soon.

“It’s still going strong,” Kahn said last year. “I think we kind of nailed it.”

Cerf left Stanford for DARPA in 1976 and continues to work on internetting a half-century later. Since 1998, he has been a visiting scientist at NASA’s Jet Propulsion Laboratory, where he collaborates on an inter-



FOLLOWING PROTOCOL: The test transmission of a message among three networks, says Cerf (left), was “a very important milestone.”



dramatically, that analogy still holds true today. (In 1974, Cerf and Kahn guessed that 256 networks would be “sufficient for the foreseeable future”; today,

there are tens of thousands of autonomous networks around the world.)

“The whole idea was to try to put the internet protocol on any underlying transmission system that was invented, trying to future-proof the architecture of the internet,” Cerf explained in a 2007 oral history.

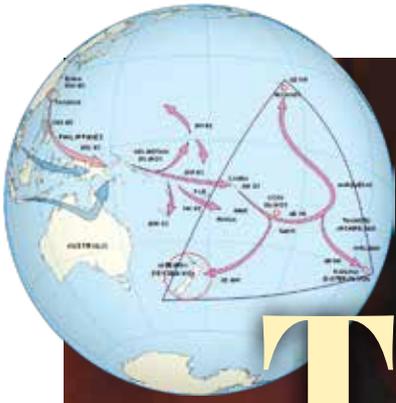
The implications of their simple but flexible protocol became clearer in the 1980s, when Cerf helped connect networks beyond the government and affiliated university researchers, ushering in an era of communication connecting every corner of the globe using evolving

planetary network that can handle the delays and disruptions associated with space travel. He’s also chief internet evangelist at a company that wouldn’t exist—and wouldn’t have been necessary—without his path-breaking work: Google. ■

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



How many of these did you know were created here?
ALU.MS/9INVENTIONS



The Odyssey

*Adam Johnson's latest novel
takes readers on an epic voyage.
But first his own journey was required.*

By Tracie White

Photograph by LiPo Ching





Adam Johnson can't seem to answer a question without telling a story. They crowd his head, tumble from his mouth, and fill books. Forbidden stories, lost stories, half-told stories—these, in particular, capture the English professor's imagination. The hidden lives of North Korea citizens, a teenage sniper, suicidal Polynesian princes. His stories—funny, brutal, apocalyptic, despairing, hopeful—are simply the result of his ongoing search for truths about himself and about our world.

"When I was a kid, my dad worked at the zoo," Johnson says. He'd been a night watchman. "One night there was a pregnant rhino having a difficult labor. No one wanted to shoot it with the tranquilizer gun. My dad said, 'Give me the gun.' I've never been so afraid in my life. He went in with an angry rhino and shot it." His dad had brought him to the zoo to learn about life, so Johnson kept his eyes wide open.

"I've just never been one to avert my eyes," he says.

Johnson, who came to Stanford as a Stegner Fellow in 1999 and has taught creative writing here since 2001, has received some of the highest accolades for his deeply researched fiction. The 2013 Pulitzer Prize for the novel *The Orphan Master's Son*, set in the secret, brutal world of North Korea, made him a celebrity author. In 2015, he won the National Book Award for his second published short story collection, *Fortune Smiles*—six stories that explore love, loss, and the impact of personal and historical trauma, about which novelist Lauren Groff warned in a *New York Times* review: "Each of these stories plants a small bomb in the reader's head."

And now, his novel *The Wayfinder*, published in October at a whopping 736 pages, takes readers on an epic voyage through the dangerous ocean waters of ancient Polynesia as Johnson recounts mythic tales of war, kidnappings, a rapist with a jellyfish tattooed on his hand, and a girl who believes in the power of stories to save lives. The plot loosely follows two storylines: one of Kōrero, an island girl destined to be a queen, whose family lives near starvation on an island bereft of natural resources; the other of a warmongering King of Tonga and his three sons.

The book was inspired by his chance encounter with a Māori storyteller 12 years ago

whose origin stories triggered in him a longing to uncover his family's own—those of his late grandmother, born and raised on the Cheyenne River Sioux Reservation in South Dakota, who went missing when his mother was 4 years old.

The Wayfinder took 10 years to write, during which Johnson disappeared for hours on end into his basement, researching and listening to podcasts. Then he traveled through the Tongan islands, talking to native Polynesians and gathering stories.

"When I wrote *The Wayfinder*, I was working out of the oral tradition," he says. He explored experimental methods of writing, weaving a narrative that moves back and forth through time, forgoing the chronological tradition of the western novel. It tells the story of a mostly forgotten world that few know anything about.

"I wrote a Post-it note that said, 'Forget the word *novel*.' I put it on my monitor, and it sat there till the sticky note didn't stick anymore."



Family Lines

"I come from a family of storytellers," Johnson says. He has tucked his 6-foot-4-inch frame into a chair at his dining room table. He lives in a house in the Haight district of San Francisco, within walking distance of Golden Gate Park, the Booksmith bookstore, where he's a regular, and the former home of the infamous cult leader and murderer Charles Manson. He tells you all this in one of his published stories.

It's a Monday, Mahjong Monday. He can chat for a while, until his wife, Stephanie Harrell, also a fiction writer, returns from walking their two dogs, Wally and Bubbles. Then the two will head off to the neighbors' for their weekly

rounds of the game. The couple chose this house in part for the three nearby parks—a boon for their three children, James, Jupiter, and Justice, all away at college now. Once, Johnson wrote about taking his kids to Golden Gate Park one evening for archery practice when he was struggling with the fear of losing his wife to breast cancer. But that's another story.

"My uncle was a great storyteller," he says, recounting his earliest exposure to oral storytelling. "My dad's a great storyteller. My grandfather is a great storyteller. And they would get in these storytelling circles, and someone would start a story and someone else would take it over. And they would tell tall tales about a giant catfish. And they would tell mythic stories about the founding of the prairie, and there would be war stories. And no one ever asked, are those true? I never did. Like, whether something was fiction or non-fiction seemed completely beside the point."

Johnson's own story begins 58 years ago when he was born in South Dakota, then moved to Arizona. His parents divorced when he was young, and he was raised by his mother, Patricia, while regularly seeing his father, Don, who lived nearby. It was in the summers, when he was sent to stay with relatives in South Dakota, that he joined the storytelling circles, with the catfish tales and war stories—those, in particular, stuck with him, so much so that he co-taught a fiction writing course for veterans at Stanford, to help them share their stories.

"What [my relatives] were doing was, like, honing the stories, making them sharper. You make it funnier, you make it more animated, and you also separate yourself a bit from that story so that the terrible things that you saw or did at war, you can hold in your hand and entertain people with. That's something I think about a lot as a writer and as an educator at Stanford: trauma narrative. How and why and which tools we use to tell a story, to sort of create a piece of art in some way about something that might be too terrifying to look at head-on."

His father's father, a jovial man named Bud who was a mechanic during World War II, told such a story, about how one of his duties was to clean out the tail of B-17s just returned from combat. Often a dead tail gunner was still inside, frozen. The space was so small, a body couldn't be removed until it was defrosted. As Johnson recalls it: "My grandfather would defrost them with a steam cleaner so they could get them out.

"I think what he was saying was, 'I want

you to know the whole me. Not just your happy grandfather.’”



Fact and Fiction

Johnson takes a break from his storytelling, getting up to walk around the dining room and adjoining living room. He points to row upon row of photographs covering the walls.

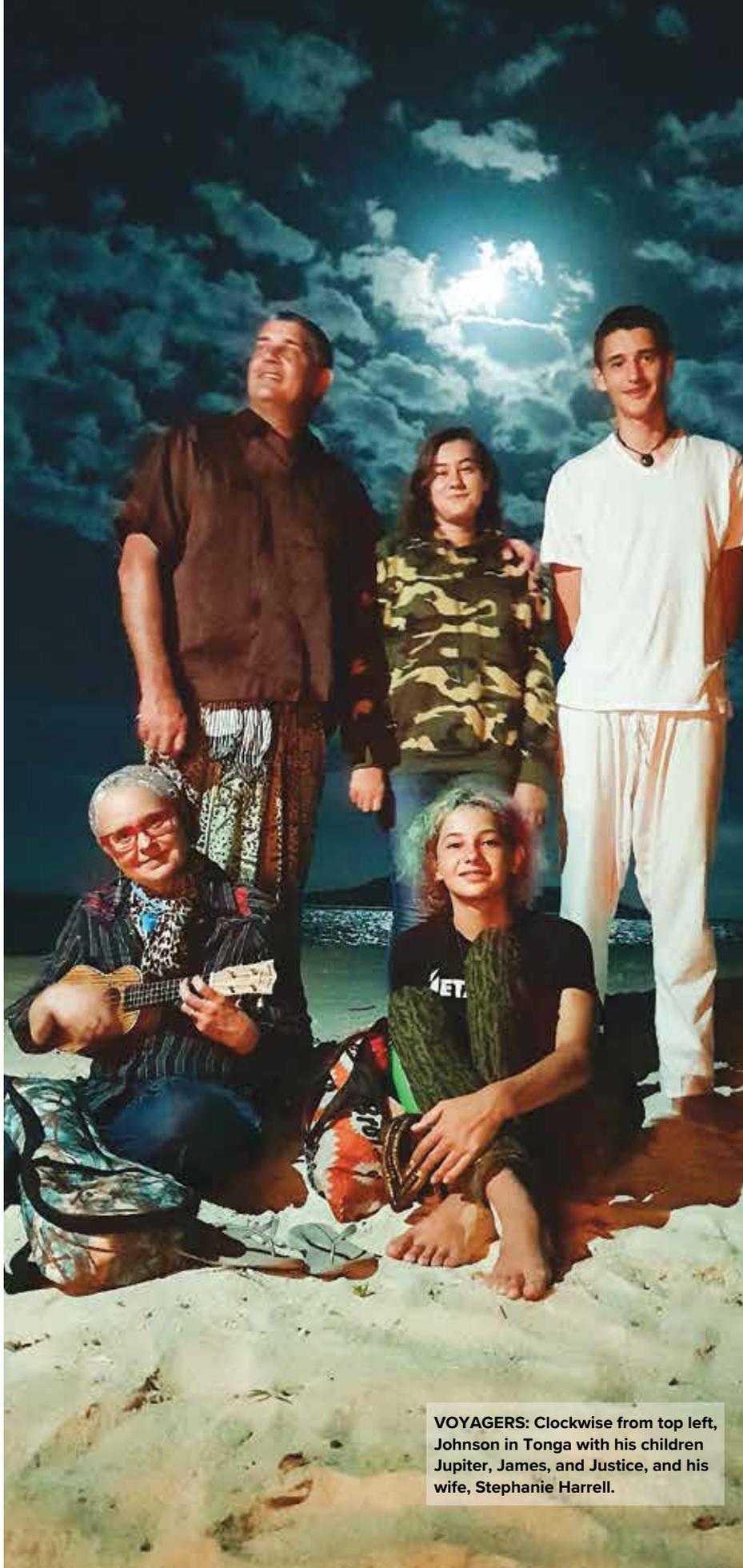
“It’s fun for me to frame pictures,” says Johnson, who keeps his frame-making tools in the basement, along with his computer and an exercise bike. “That way they never disappear, and I still see my kids at all their different ages.” There are photos of his mother, and lots of family vacation photos. There are also a framed *Godzilla* poster and a tour poster for Nirvana—the grunge band that was inspiration for a short story of the same name in *Fortune Smiles*.

“Here’s me,” he says, pointing to a photo of a smiling teenager wearing a hard hat. “My father had a small construction company when I was in high school. He would just tell stories all day long, building decks in the Arizona sun, sweating and telling stories.”

After high school, Johnson attended Arizona State University, earning a bachelor’s degree in journalism in 1992. He decided that fiction writing suited him better than non-fiction—facts, for him, were not sufficient. “I’ve personally felt that I could tell bigger, more important stories through relinquishing facts for human truth,” Johnson says. He went on to earn an MFA in fiction in 1996 at McNeese State University in Lake Charles, La., and a PhD in English from Florida State University in 2000.

One of his early mentors, Robert Butler, then a professor of creative writing at McNeese State, says Johnson contacted him before arrival to ask about Butler’s Pulitzer-winning book, *A Good Scent from a Strange Mountain*, told in the voice of Vietnamese exiles in Louisiana.

“From the first day, what Adam really wanted to know most was where to go to see cockfighting and the zydeco bands,” says Butler, now a professor at Florida State. “He wanted to immerse himself in the deep Cajun culture of Louisiana. That is so characteristic of him. And it’s what makes him a great writer. He’s ravenous for life experience, ravenous to understand the world as it really works away



VOYAGERS: Clockwise from top left, Johnson in Tonga with his children Jupiter, James, and Justice, and his wife, Stephanie Harrell.



from academia, away from structures, into the moment-by-moment experience of life. It's his way of answering the greatest enduring question, "Who the hell am I?"

It was one of Johnson's early published stories, *The Canadianaut*, about a team of Canadian weapons developers who send a small fur trapper named Jacques to the moon but can't bring him home, that garnered him a Stegner Fellowship, bringing him to Stanford. In 2002, he published his first book of short stories, *Emporium*, which was followed by his first novel, *Parasites Like Us*, an apocalyptic adventure tale of an anthropologist in South Dakota who mistakenly triggers the end of civilization. It won a California Book Award in 2003. Next came *The Orphan Master's Son*.



An Orphan's Life

Johnson didn't set out to write about North Korea. But when he read two books about the country—*The Aquariums of Pyongyang*, a memoir by Kang Chol-hwan, and David Hawk's *The Hidden Gulag*—they piqued his interest. "I couldn't believe this place existed," he says. "I wondered what was it like to be a dad in North Korea? Do you get to pick the person you love? What do you have for breakfast? What is normal life? I became obsessed about it in the same way I became obsessed about the Pacific."

For a year, Johnson read books about North Korea in his basement, but they only taught him about geopolitics, the military, and economics—not what he really wanted to know. So, he started reading online transcripts of interviews with North Korean defectors posted by NGO and aid workers, then began doing his own interviews. That's where he got answers to his questions about what it is like to live in North Korea, stories about falling in love and finding enough food to eat, about the hardship of daily life, about the choices people made to survive and how those choices tested families.

"I interviewed a man named Jang Jin-sung, and for his freedom, his brother and his uncle were tortured to death," he says. "His story

came out in little pieces, with missing parts. I came to understand that people wanted the catharsis of telling their stories, but when they told them, they were trying to minimize their story's power to hurt them, to debilitate them, so they told them out of order."

Several years into his research, he took a six-day trip to North Korea under strict state supervision. And in 2011, seven years after he'd begun probing, he finished the story of the fictional Jun Do (John Doe), an orphan raised to serve a state ruled by daily propaganda blasted from loudspeakers erected in homes and workplaces and the streets. It's a harsh story, with moments of dark humor, of lives spent in tunnels, in prison camps, and in poverty. The novel doesn't follow an expected structure. It bounces around, changing timelines and narrators. It's built upon the daily lives of citizens.

"When I wrote that novel, I realized I couldn't just write a simple beginning, middle, and end," Johnson says. "That would be a lie to the stories that I had inherited and been entrusted with. And so, I had to write a different kind of book. One that was a little more broken, a little more jangly, that changed point of view."

Johnson met up with Jang just after the North Korean poet had read *The Orphan Master's Son*. "He hugged me and said, in English, 'Your character Jun Do, he is me.' Then his translator explained all the ways in which Jang found parallels with his experiences living in Pyongyang."



Tales from Polynesia

Johnson was with his family in New Zealand for a writing event when he met the Māori storyteller who sparked *The Wayfinder*. At a pōwhiri, or welcome ceremony, she told the Māori myth of Rangi (sky) and Papa (earth) locked in an endless embrace holding the world in darkness until their children pried them apart, bringing light into the world.

"I don't know if I'd ever been in the presence of such a great storyteller," Johnson says. "It was an origin story. And it became personal. It had been orally transmitted through generations, and it had the weight and support of generations. For 40 or 50 generations it had been safeguarded like a tender flame.

"And I remember thinking, *She has*

something I don't have and how I want my stories to have this effect, and that I can be a better storyteller." Later, she told him the name of the canoe that brought her family to New Zealand, and she named all 26 people in that canoe. "And I thought, *Just because something was written down and saved somewhere in an archive, is it any more valid or confirmable or useful or meaningful or accurate than this story which had been attended to?* And I—I thought, *No.*"

And so, it was back to the basement (and frequently to Green Library)—this time to study the Tongan language, learn methods of ancient navigation, and research medicinal botanicals long used in Polynesia. Johnson visited more than a dozen Tongan islands and corresponded with Tongan scholars, eventually working with linguist Vasalua Jenner-Helu to write poetry in verse similar to that of the ancient Tongans.

"I would write my poetry with my Tongan dictionary, and then I would contact her, and she would help make sure it's right and change everything," he says. "Then we'd go back and forth. We wanted to try to construct the oldest version of Tongan verse that we could."

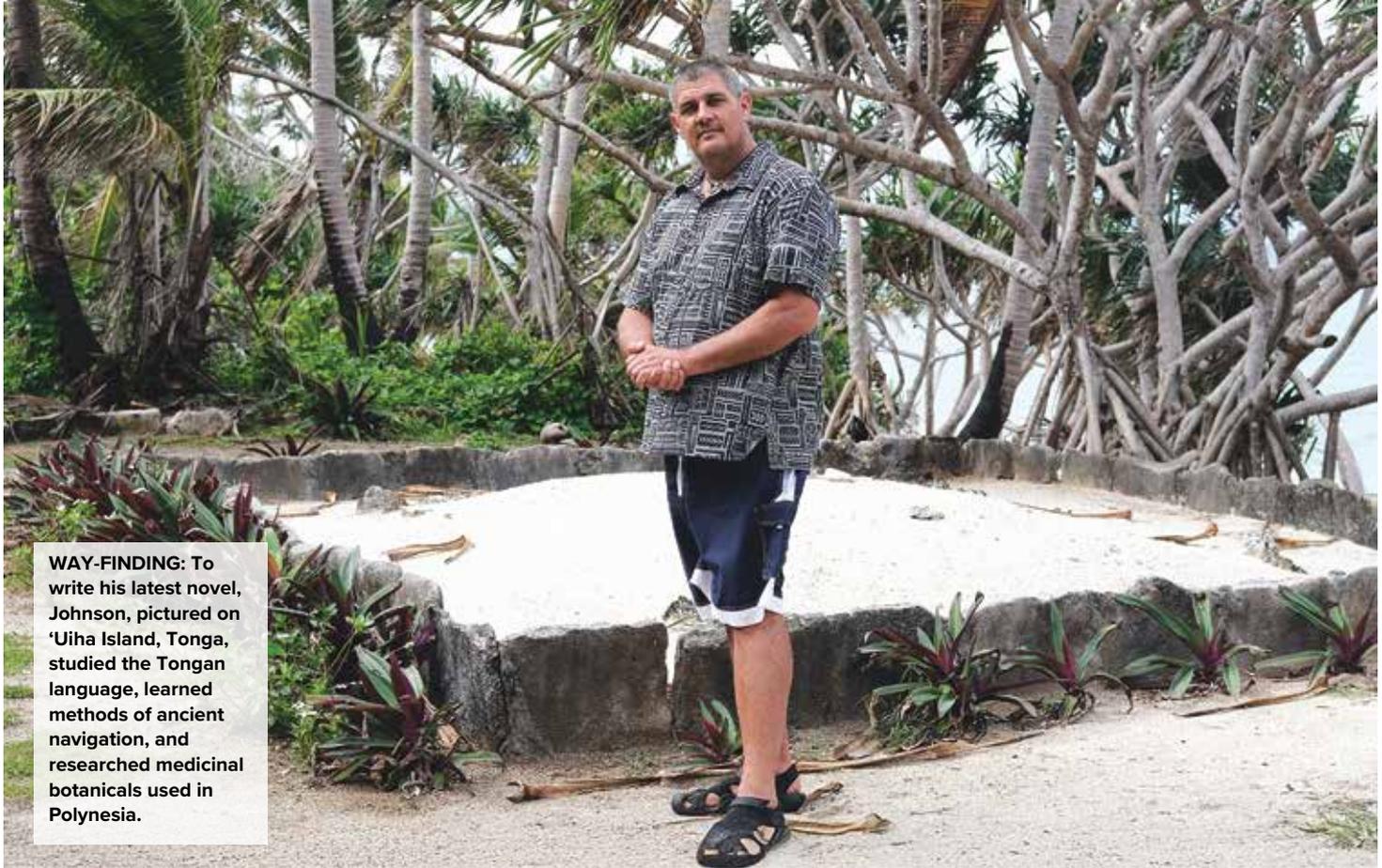
"I think Adam's book gave us an insight into what it was like during the nearly 1,000-year span of the Tu'i Tonga empire, of how life used to be," says Jenner-Helu, who lives in Mataika, in Nuku'alofa, Tonga's capital. "*The Wayfinder* gets to the nitty-gritty of life, of daily life."



The Translator

"So, there was this dude named Steve," says Johnson, who is telling stories about researching *The Wayfinder* to a crowd of fans at Kepler's bookstore in Menlo Park. Steve, he says, hears that there are very few navigators skilled in ancient navigation techniques left on Earth, so he flies to Micronesia, then voyages to the tiny atoll Satawal to track down the youngest one still living—a man in his 70s. "He found Mau Pailug, who knew the ancient ways of navigation, and he said, 'Mau, will you teach me.' Here's this white dude from the United States who shows up and says, 'Teach me your sacred knowledge.'" This is a true story, Johnson says, one he read about in Steve Thomas's memoir, *The Last Navigator*.

"In writing my own book, I often felt like



WAY-FINDING: To write his latest novel, Johnson, pictured on 'Uiha Island, Tonga, studied the Tongan language, learned methods of ancient navigation, and researched medicinal botanicals used in Polynesia.

Steve,” Johnson says to the crowd. “I went to these islands and I would say, ‘Do you know the story of the man with the jellyfish tattooed on his hand? Or the princess buried alive?’” In the book, he recounts stories of ancient methods of castration, of royalty using oyster shells to carve out the souls of the dying, and of an era of environmental destruction, when islanders faced extinction due to their misuse of natural resources.

“When I wrote *The Wayfinder* I was thinking, *You have to be true to your research. You have to be true to that storyteller I first met. And you have to try to capture a different kind of storytelling, one that’s alive.*”

Many critics have praised his efforts, some noting the unusual structure of the narrative. Both the *Washington Post* and the *Wall Street Journal* recognized it as one of 10 best books of 2025.

“Don’t hesitate to lash yourself to the mast of this remarkable voyage,” wrote Ron Charles in a *Washington Post* review of the book. “It feels less created than unearthed.” In a *New York Times* review, author Ian McGuire described it as “a sprawling novel that combines myth, poetry, and magical realism into a great roiling, oceanic mass.” He noted that the narrative at times “may lack focus and a clear direction, but it never wants for inventiveness or energy.”



Future Worlds

Johnson gets up from the dining room table on Mahjong Monday and disappears downstairs to the basement, returning with a weathered Tongan dictionary from the library and a black-and-white photo of the grandmother he never met. In the years since the Māori storyteller started him wondering about his own origin stories, he’s been able to learn more about his missing grandmother.

“It turns out that among my grandmother Lavina’s family of nine, the seven boys were sent to boarding schools,” he says. “But Lavina and her sister were sent to the mission schools. This one photo I have of her is on the reservation. There’s a nun and there are Singer sewing machines and they’re in a wooden house. She’s being taught to be a seamstress.” He worries over the photo—the young girls’ unhappy faces.

As an adult, Johnson’s mother, Patricia, discovered Lavina had other children after she left. “My mom is now close to those other siblings,” he says. “They’ve helped fill out this missing part of her life. Those siblings led to other relatives and other stories and led us

back to the reservation. We were on the reservation this summer, and I met some uncles.” Both Johnson and his mother have since become enrolled members of the Cheyenne River Sioux Tribe. He thinks he may write his grandmother’s story someday. But for now, he’s exploring the idea of writing a book about his newest obsession—quantum theory and black holes.

“When I work out and ride my bike in the basement, I watch YouTube videos, and that’s like hours every week. And I just watch video after video of people who have podcasts about black holes. And, like, what are the implications of consciousness, of reality, of time, of where we came from, of what the universe is?” he says. “What’s the future of the universe? What’s the past?”

Then the front door opens, and Johnson leaves his imaginary worlds and returns to his real life, the one with his family and dogs and social engagements.

“Here comes my wife, Stephanie, and there are two dogs that are going to come in,” Johnson says, and he wraps up his stories and goes to get ready for a few rounds of Mahjong. ■

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





As the
population ages,
robots are poised
to offer
a helping hand,
a leg up,
and a pep
for your step.

TECH

SUPPORT

BY SAM SCOTT

ILLUSTRATION BY JASU HU

DULL, DIRTY, and DANGEROUS.

For decades, the “Three D’s” were viewed as the ideal types of jobs for robots. A fourth D—domestic—was not so much in the discussion.

And for good reason, says **STEVE COUSINS**, PhD ’97, executive director of the Stanford Robotics Center. Early robots—like hydraulic arms—were dangers themselves. “For the first 40 years of robotics actually doing work in the world, robots were kept behind safety cages,” Cousins says.

“They were designed to be strong and precise, not to be around people. Safety wasn’t on the list.”

We live in a different era now, of course, one in which driverless cars and delivery robots roll down city streets with the artificial good sense to do their job while—mostly—giving wide berth to humans. And Cousins thinks we’re on the cusp of another transformation, one in which robots won’t just have the awareness to avoid people but also the sophistication to work in increasingly close physical quarters with us in our personal lives. The age of the domestic robot nears.

Cousins is not imagining a luxury fleet of e-butlers but rather essential tools to navigate a looming shift in society. The United States is an aging country. By 2050, the number of Americans 65 and older is projected to reach 82 million, up more than 40 percent from 2022. By 2030, the number of Americans over 65 is expected to surpass the number under

18 for the first time in U.S. history, a generational imbalance likely to test caregiving resources as new retirees outnumber new workers as well as put additional pressure on the supply of suitable housing. Robots that can help people move, toilet, bathe, dress, socialize, or do chores offer a potential path to “aging in place,” with greater independence. “When we talk about domestic robotics, we really talk about robots to support aging and disabilities,” Cousins says.

One upside of the demographic crunch is that it’s focusing thought and investment in ways that will help the senior citizens of the future, says Abby King, a professor of epidemiology and population health who has spent decades studying health and aging. “Everything that’s developed for the baby boomers is going to be a

wonderful asset for every other generation,” she says. In robots, she hopes for tools that preserve independence and social engagement to extend health as long as life. “Agency is so important as everyone gets older so that we feel we’re in charge of our lives and we don’t become infantilized.”

Cousins is inspired by a similar vision. A decade before returning to Stanford, he was CEO of a company that made a robot intended mostly as a research tool, but that a man named Henry Evans, MBA ’91, embraced. Evans, who sustained a stroke that left him paralyzed and unable to speak, used the robot to reclaim acts from shaving to playing games to scratching itches. Age will present many of us with physical challenges too, Cousins says. Some 46 percent of Americans aged 75 and older report having a disability, nearly four times the rate of those 35 to 64. Robots can help us adjust. “You look at Henry as this kind of extreme case,” Cousins says. “But the baby boomers are turning 80, and many of them will acquire disabilities as they age. Caregiving is the critical societal problem robotics has to solve.”

Here are four Stanford labs thinking about how.

RUFF TERRAIN

When **MICHELLE BALDONADO**, PhD ’98, takes Rosie—aka Robot for Outdoor Socially Interactive Exercise—out on campus, the experience is like going for a walk with her dog, Jasko, a fluffy white Coton de Tulear. They’re both attention magnets that follow her wherever she goes. The robot, an augmented version of a device made by Boston-based Piaggio Fast Forward that resembles a mini-cooler on wheels, probably turns more heads. “If I’m out walking, I’m on everybody’s iPhone footage,” she says.

But Baldonado, a research engineer at the Robotics Center, wants a robot with more than canine cute cred. She is leading a flagship project at the robotics center called SOAR—Stanford Older Adult Robotics—that aims to give robots capabilities similar to those of guide dogs that serve people with low vision. By adding lidar and 360-degree cameras—the hardware at the heart of autonomous vehicles—as well as



features like a raisable handle and a chatbot, Baldonado and her collaborators are seeking to enable companion robots to lead the way, warn about cracks, curbs, and uneven pavement, offer physical support, provide companionship, and even alert users if their gait looks unsteady. Rosie is the base for early navigation experiments, but the research team plans to build upon a four-wheeled quadruped, which can roll when practical and walk when needed.

Postdoctoral scholar Jing Liang, a researcher on the Rosie team working in collaboration with Stanford's Center on Longevity, had once imagined putting his expertise in robot navigation into delivery robots, but he thinks this project will have more societal impact. It's also an invigorating challenge. Compared with, say, an autonomous car, a robotic guide dog must be ready for more varied terrains, from stairs to grass to ornamental ponds. "We have a really specific group of people we can help," he says. "That's why I came here."

The researchers scoped the project by talking to residents at senior living facilities such as Channing House in Palo Alto, where they got a vivid sense of how the fear of falling shrinks people's lives, Baldonado says. Falls are the leading cause of injury for adults 65 and older, and simply the worry of them can be debilitating. "Even if they haven't fallen, that fear alone can stop them from going out," she says. "Once people stop going out and stop walking, you see a cascade of other health issues." (Walking's many benefits include decreased risks of cardiovascular and cerebrovascular disease.)

Rhonda Bekkedahl, CEO of Channing House, says she thinks at least a third of the facility's 250 residents would benefit from a robotic walking assistant. "If you want longevity, you have to maintain your mobility," she says.

Baldonado looks at the issue from a research perspective, not a business one, but she says commercialization may not take long. "It's realistic to imagine a next-generation outdoor walking companion robot becoming available in the next few years."

PEP WALK

As we age, challenges to walking can come even before we go outside. "A main reason for relocation into an assisted living facility is an inability

to navigate the stairs in your house," says **STEVE COLLINS**, associate professor of mechanical engineering, who develops wearable robotics and smart prosthetics to improve mobility. One of his lab's most promising prototypes—an "ankle exoskeleton" that straps on the lower leg—literally gives users an extra pep in their step that makes it easier to do things that can trouble older walkers, and others with mobility issues, like climbing stairs.

But syncing a machine with a human is much harder than the *Iron Man* movies would suggest. As a grad student at the University of Michigan, Collins spent five years developing and testing a prosthetic foot designed to make walking easier for amputees. Mechanically speaking, the device worked perfectly, and yet the outcome was the opposite of what was desired. "Our fancy new prosthesis actually increased the effort of walking," says Collins.

Indeed, the vast majority of robotic prosthetics and exoskeletons—wearable robots that help a person move—fail to deliver a boost, he says. It's fiendishly difficult to marry a machine with the movements of a highly complicated, incredibly individualized body. "Humans are very, very complex," he says. "Everyone is different, and they change over time. Even if we had devices that weighed nothing, had infinite power, and could produce as much



STEADY NOW: Rosie (opposite) and the ankle exoskeleton (right) both aim to help users improve their mobility.



torque and power as we wanted mechanically, we, in most cases, would struggle to help people.”

Once he established his own lab, Collins overhauled his research methods to better address this challenge. He moved away from building prototypes according to a set design only to discover flaws in the completed device, and toward a more iterative approach. Hardware and algorithms are constantly put through their paces under changing conditions by testers on a treadmill emulator and tweaked and retweaked accordingly. “We get more bad ideas quickly, until we stumble upon some good ideas,” he says.

The ankle exoskeleton is a fruit of that approach. The experimental device, which resembles a pair of leg braces around the feet and calves, uses a machine-learning model to adjust to a walker’s gait before providing a customized push as the user’s toes leave the ground. In outdoor tests on young adults, the exoskeleton allowed users to walk 9 percent faster with 17 percent less energy expended. Researchers likened the effect to taking off a 20-pound backpack. It was, they said, the first time an exoskeleton provided energy savings for real-world users. Treadmill tests on people in their 70s and 80s showed similar gains, Collins says.

Such assistance could give new range to older walkers worried about crossing intersections before the “walk” signal turns, fatiguing while away from home, or recovering from stroke. It could also help the 30 percent of Americans over 75 who have serious difficulty walking or climbing stairs.

The lab is working to develop other aspects of the exoskeleton, such as ways it can improve a user’s balance and reduce pressure on joints. Patrick Slade, MS ’17, PhD ’21, who was first author on a 2022 *Nature* paper about the device and who is now an assistant professor of bio-engineering at Harvard, is optimistic about how quickly a product with similar technology could reach market. “Honestly, I think in the next five years you’ll be able to go

to Target or Dick’s and buy a pair of these,” he says. “It’ll just be like a motorized pair of shoes.”

DRESS FOR SUCCESS

With a century’s worth of science fiction to draw on, many people imagine a robot to be a lot like a metallic human—say, C-3PO in *Star Wars*. And in fact, humanoids have lately made stunning leaps. Google “backflipping robot” for an example.

ALLISON OKAMURA, MS ’96, PhD ’00, tilts in another direction, especially in the realm of using robots to care for older people. “I’m a little anti-humanoid, actually,” she says. A mechanical engineering professor, Okamura subscribes to an idea espoused by roboticist Rodney Brooks, PhD ’81, that a robot’s appearance makes implicit promises about its capabilities. Today’s humanoids might flip like gymnasts, but they still struggle with tasks like emptying a dishwasher. “The way that kind of robot looks, people assume that it has human capabilities because it looks human—and they’re still very far from that,” she says.

By contrast, Okamura has an interest in smaller, task-specific robots designed to assist humans but not mimic them. Some scientists, for example, work on robot arms capable of dressing people. Okamura’s lab is rethinking the clothes themselves: What if the garments were the robots? One of her lab’s projects involves designing clothing made of self-assembling panels with automated zippers—a potential benefit for, say, someone with arthritic shoulders who has difficulty donning a shirt.

Okamura is a champion of “soft robotics” made with flexible, stretchable, and lightweight materials that can conform to the body and support it with a tenderness that’s difficult for traditional robotic components. “If the skin is soft, you don’t want to be pushing on it with something hard,” she says.



SMOOTH MOVES: Okamura’s lab has designed what she calls vine robots that can autonomously don and doff clothing.



FROM TOP: STANFORD SCHOOL OF ENGINEERING; NAM GYUN KIM (5)

Indeed, some of her robots are like balloons. Okamura is a pioneer in vine robots: inflatable plastic tubes that can grow from about 1 foot to more than 200 feet. Imagine a balled-up sock that rapidly unfolds to a length 25,000 percent its original size (and that can then be neatly retracted). They are toylike in appearance, but their ability to snake through small spaces, around obstacles, and under weights with minimal friction gives them an ability to slip around heavy but fragile objects such as human bodies. In recent research with collaborators at MIT, Okamura demonstrated vines to be effective at curling under people to lift them out of bed.

Her lab has also developed a “magic sheet” that grows under a supine person, making it easier for, say, a single caregiver to move a partner or client. She wants to extend that model into more diverse, three-dimensional forms. When someone falls, she says, getting the person back up can be the hardest part. An inflatable robotic chair, with a vine’s ability to gently insinuate itself under the body, could help a spouse get their partner on their feet without a 911 call, she says.

“Part of my mission is to get people to rethink what a robot is,” she says. “You need to design the right robot for the right job.”

AGAIN, WITH FEELING

When the Stanford Robotics Center opened in the refurbished basement of the Packard Electrical Engineering Building in the fall of 2024, one of the media stars was TidyBot, a prototype designed to put away clutter. The mobile, one-armed robot, co-developed at Stanford, Columbia, and Princeton, used AI to take simple commands like “Yellow shirts go in the drawer” to extrapolate where similar items—such as “light-colored shirts”—should go. In tests, it was able to correctly put away items from socks to snacks 85 percent of the time with much less data collection and training than required by other robots.

In the real world, we’re still waiting for a chore-bot that can fold the laundry, wash the dishes, or help someone get dressed as effectively as in the 2012 movie *Robot & Frank*, about a health-care bot sent to the home of an older man, says **MONROE KENNEDY III**, an assistant professor of mechanical engineering who directs the Assistive Robotics and Manipulation Lab. Navigating the



TOUCHY: Kennedy, center, and his colleagues have developed robotic fingertips that feel by seeing.

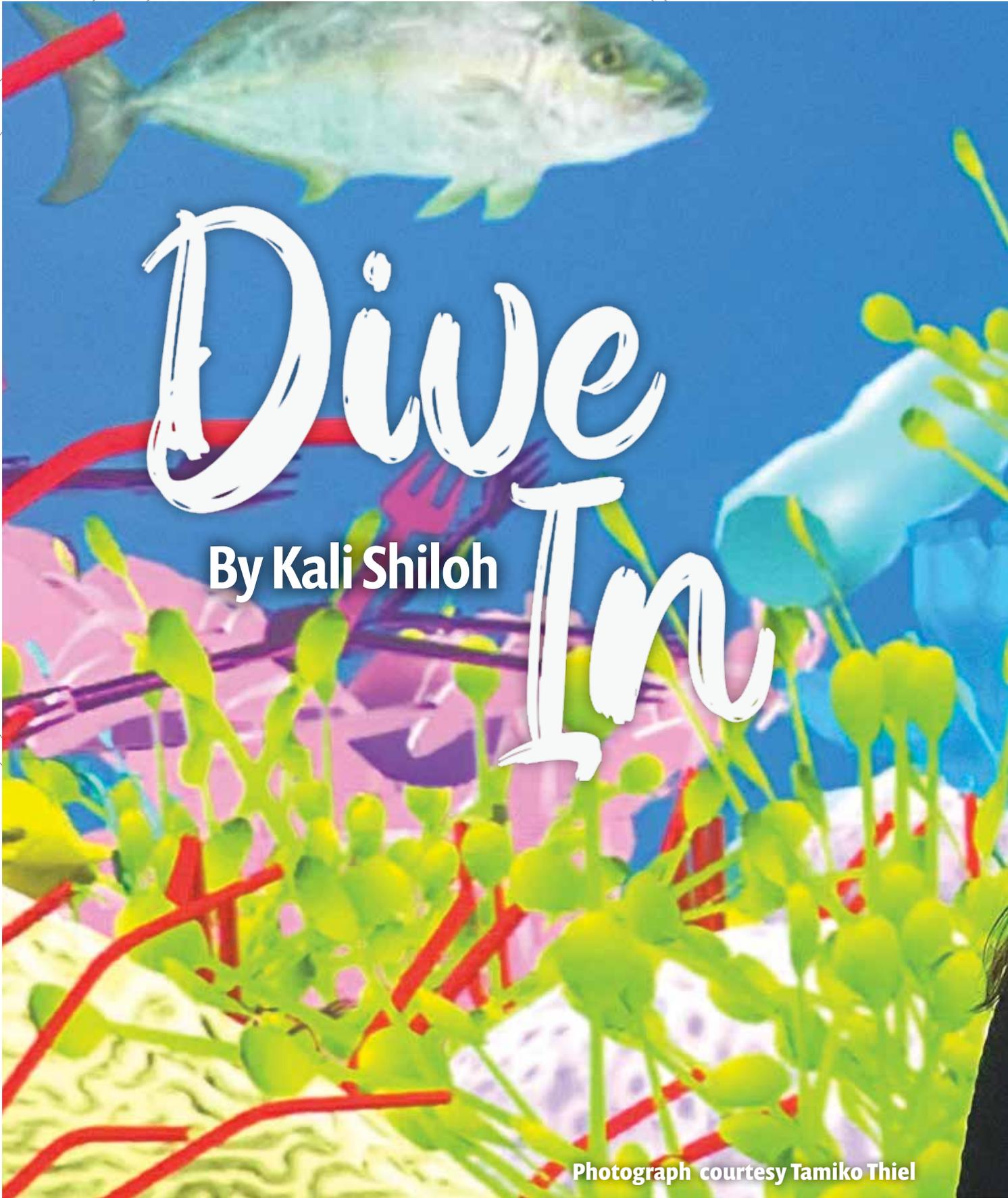
randomness of homes is part of the challenge. But so is the inimitability of the human hand, Kennedy says. Its 27 bones, 27 joints, and more than 30 muscles bestow a dexterity that remains hard to match. And it has sensitivity robots can’t equal. “Robots, to date, don’t really have the sense of touch that rivals the human sense of touch,” he says. It’s hard to trust a robot to bring you a glass of water if it can’t sense the glass slipping due to condensation.

Kennedy is working to change that touch deficit. His lab has developed robotic fingertips that use visual observation as a proxy for touch. Essentially, they feel by seeing. When the device picks something up with its soft, silicone tips, a camera inside each digit observes how much the fingertip’s surface distorts and, from that, detects the object’s texture and any tensions being applied to it, from twisting to sliding. The robot fingers are so sensitive that they can hold multiple strands of thread and distinguish how much each is being tugged, he says. They can pick up objects as small as basil seeds, which can challenge human hands. And they can handle fruit as fragile as blackberries without causing bruising. “With this fingertip we’re showing, well, we can actually do things now that were extremely difficult.”

There are many applications for such a technology, from agriculture to manufacturing. Kennedy thinks it could be a tool for older people in their homes. Its fine dexterity could help perform tasks like opening medicine bottles or picking up a dropped pill, and its gentleness could one day enable direct physical assistance in bathing or dressing. Progress requires more investment and more research, Kennedy says, but he’s optimistic we’re not far from a day when robots step in to make aging in place much easier. “We’re a lot closer than you think.” ■



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



Dive

By Kali Shiloh

In

Photograph courtesy Tamiko Thiel



**Tamiko Thiel invites
you to rethink reality.**

In the hands of Tamiko Thiel, technology has been a gateway to art.

In 1983, Thiel, '78, was the lead product designer on Thinking Machines Corporation's Connection Machine. A standout for its use of 64,000 "massively parallel" processors, it was among the fastest computers on the planet and heralded a possible future with artificial intelligence. So its creators wanted it to stand out among the beige, refrigerator-like supercomputers of the day. *How can I express the fact that this machine is different from anything else?* Thiel wondered. Inspired by the highly organized network of processors within the machine, she designed a sleek, matte black cube measuring 5 feet by 5 feet and constructed of eight smaller cubes. Blinking red lights on the cube faces indicated the status of each of the 4,096 chips within.



When the Connection Machine was released in 1986, its design dazzled. (A later model's twinkling array would even make a cameo in the first *Jurassic Park* film.) But Thiel had already left the company—and the country—for an artist's life. Her move could have been read as a sharp, techie-to-fuzzie career pivot. But in fact, it was the natural flow of a life that would trailblaze the fusing of digital technology and art—a life not destined to fit neatly into a box, or into eight cubes, for that matter. More than two decades later, in November of 2017, things came

full circle: The Connection Machine earned a spot in an exhibition at the Museum of Modern Art.

Thiel has been enchanted by mechanical forms since childhood. She had crossed the Pacific Ocean by freighter four times by age 11 as her mother, an artist, and father, an architecture professor and former naval ship designer, chased funding around the globe. Down in the engine rooms of those ships, her father talked shop while Thiel peered up in awe at the turbines thumping away. "It seemed like with math and science you could really understand the world in a very wonderful and almost mysterious way," she says.

She graduated from Stanford with a degree in general engineering, but while working at Hewlett-Packard, she found that each project eventually turned into months of tedium over whether one needed six No. 4 screws or four No. 6 screws. *That can't be all there is to life*, she thought.

At least, that was how she felt in Silicon Valley—able only to imagine being an engineer or engineering manager. Perhaps a change of scenery would help. She enrolled in a master's program on the other side of the country, at MIT. Although she studied mechanical engineering, it was during elective courses in computer graphics and visual imaging (in what would become the MIT Media Lab) that she found her place. Artists, she realized, "spend their time sitting around, thinking about the meaning of life and nature and humans' position in the universe." That's what Thiel wanted to spend the rest of her life doing.

Atmosphaerae

Photographed: 2026, TECHNE: Homecoming, Onassis ONX studio, New York. Originally created for DiMoDa 4.0: Dis/Location VR exhibition, Gazelli Art House, London

No need for smartphones here.

Atmos Sphaerae surrounded New York viewers with an immersive video displayed on three floor-to-ceiling screens. The nine-minute piece chronicles the Earth's atmosphere as it changes over billions of years, from a black void to gaseous clouds made of chemical compound symbols to oil jacks on a crust of desert releasing methane. In the Shinto shrines and Buddhist temples of Japan, the country where Thiel attended kindergarten, "there's gold and incense and chanting," she says. "It's a whole sensory experience. That sort of immersion is what I've always wanted to go for in my artwork."





CLOCKWISE FROM TOP: LOGG TANDY/WIKI COMMONS; TAMIKO THIEL; MIKHAIL MISHIN

‘If you have artistic ability, you’ve been given an incredible tool to investigate life.’

Plastocene Reef

Debut: 2025, art karlsruhe international fair, Rheinstetten, Germany

The 3-meter-by-3-meter flat wall installation becomes a moving 3D spectacle when viewed through a phone or tablet. Protruding from the wall are what at first appear to be corals, but upon closer inspection are “reefs” made of plastic garbage, representing the 91 percent of plastic waste that is not ultimately recycled. “A lot of adults say, ‘Don’t you think that’s a little obscure? People won’t understand,’” Thiel says. She likes to tell them about the 8-year-old who dawdled in front of the image while Thiel explained the life cycle of plastic waste. The next day, the boy’s father messaged Thiel to let her know that when his son had donned his flip flops later that afternoon, he proclaimed, “These are not going to go into the ocean.” “The 8-year-olds get it completely,” she says.

There was one more quick stop to make on the bridge between engineering and art. Three days after Thiel graduated from MIT in 1983, Danny Hillis, the founder of Thinking Machines, asked her to work directly with Nobel Prize-winning physicist Richard Feynman on what would become the Connection Machine. “I was like, ‘Where do I sign?’” she says. She jumped at the opportunity to work with Feynman, but months after she finished the computer’s look—before the product even launched—she moved to Germany, where she attended the Academy of Fine Arts in Munich and became one of the world’s early augmented reality artists.

Augmented reality (AR), sometimes called mixed reality, integrates digital information with the real, physical world by superimposing computer-generated content onto the view users see through camera-equipped devices. (Think of those apps that allow you to see how a piece of furniture will look in your living room, or games like *Pokémon GO*.) Thiel’s AR work is site-specific, so viewers typically see her art through the screen of their smartphone or tablet in a particular geographic location—say, while standing in front of a bronze statue of Juliet Capulet in Munich. But that makes it no less real, Thiel says. “We look through these tiny lenses in a microscope or in a telescope to see something that’s there,” she says, referring to the cells and galaxies that are imperceptible to the naked eye. From her view, smartphones are AR scopes that “allow us to see an invisible but real layer.”

Augmented reality art requires a distinctive combination of skills from people working across disciplines. Thiel is “a pioneer of that type of work,” says Camille Utterback, an associate professor of art and art history at Stanford who focuses on digital media and interactive installations. At a time when pagers still outnumbered cell phones and the majority of U.S. homes didn’t have a computer, Thiel was already working with developers to build the creative technology she envisioned. “That’s such an important space to have artists engaging in,” Utterback says, “because it changes the whole direction of what’s possible in the field.” Artists can push the boundaries of technologies beyond their commercial applications, she says. “Do we want something that’s all about productivity, or do we want something that has this more renegade potential to ask different questions?”

The limitations of physics don’t apply in the digital world, so AR artists can create at any scale, defy the laws of gravity—whatever they need to get their point across. “It’s a way to create these kinds of fantastical situations that would be impossible to do in the real world,” Utterback says.

To that end, Thiel frequently collaborates with her husband, Peter Graf, a software engineer who goes by the artist name /p. Thiel’s projects, which have been commissioned by museums and art studios around the globe, have taken on topics as diverse as plastic pollution, feminism, and invasive plants. “I want to somehow use [my skills] to make meaning,” Thiel says. “I want to make a difference. I want to create things that interact with the world and with people in the world.”

Two pieces that debuted this winter lean heavily on Thiel’s ability to translate scientific concepts, like elements of quantum physics, into something anyone can understand. “If you have artistic ability, you’ve been given an incredible tool to investigate life,” she says, “to make sense of the world to yourself, and ideally also help other people to make sense of the world.” ■

KALI SHILOH is a staff writer at STANFORD. Email her at kshiloh@stanford.edu.



ReWildAR

Collaborator: /p

Debut: 2021, Smithsonian Arts and Industry Building, Washington, D.C.

For its 175th anniversary, the Smithsonian Institution commissioned *ReWildAR* as part of its FUTURES exhibit, which encouraged artists to “imagine the future you want, not the future you fear.” Thiel created an AR garden inside the museum that reflected the native ecosystem of Washington, D.C. “I asked the Smithsonian Gardens people to give me an idea of what native and iconic plants for the Washington, D.C., area would be able to survive climate change,” she says. They explained that the ability of plants to thrive largely depends on the continued presence of their pollinators. “One can’t survive without the other,” she says. The result was a sprawling virtual garden of dogwood and the short-haired dogwood mining bee, columbines and the white-lined sphinx moth, and echinacea and the metallic green sweat bee.

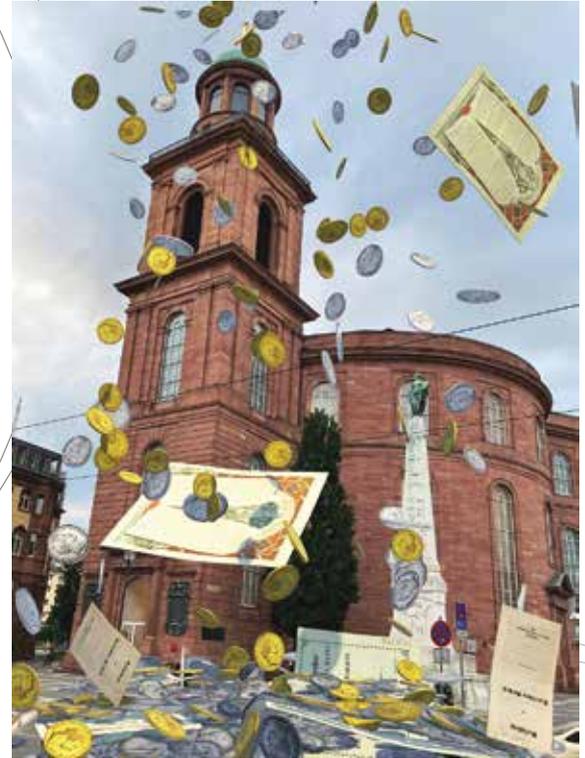




Unexpected Growth

Collaborator: /p
 Debut: 2018, Whitney Museum
 of American Art, New York

This AR piece was designed to take up the entire sixth-floor terrace of the Whitney. It was Thiel's first project to include the "plastocorals" also seen in *Plastocene Reef*. She designed them using Lindenmayer systems, originally developed by a biologist-botanist to capture the branching, fractal-like nature of growing plants. Today, L-systems can help computers model the repetition and variation found in plants and other natural shapes. Thiel harnesses them in service of a "stealth approach" to blend their realism with unlikely objects. "It's colorful, it's cheerful, it's bright," she says. "People run over to pick up the iPad and look at it, and then they realize it's garbage, and that they're being surrounded by garbage. You're doing this to creatures in the ocean and to human beings on other parts of the planet. How does it feel?"



Revolution and Return

Collaborator: /p
 Debut: 2023, St. Paul's Church,
 Frankfurt, Germany

"I often say augmented reality is the street art of the 21st century," Thiel says. Commissioned for the 175th anniversary of Germany's March Revolution of 1848, *Revolution and Return* was viewable in the public space outside St. Paul's Church (the meeting site of Germany's first parliament) and memorialized the series of protests calling for constitutional government in place of monarchy, as well as the suppression of those efforts. Users tap descending silver German coins, which burst optimistically into democratic documents. Then, unresponsive gold Prussian coins drop from the sky and cover the democratic documents, just as the Prussian government silenced revolutionaries.

CLOCKWISE FROM TOP: TAMIKO THIEL;
 BEN LIVNE WEITZMAN/WAVA; TAMIKO THIEL

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Farewells

FACULTY

Jonathan B. Bendor, of Stanford, November 6, at 75. During his 45 years at Stanford Graduate School of Business, he was a professor of political economics and organizations and a senior fellow at the Hoover Institution. He was known for highly original theoretical works on organizational norms, design, and performance. He fundamentally shifted thinking in his field by using psychologically grounded models of human behavior to understand how organizations and institutions function. He taught at the GSB and in Stanford's Public Policy Program and was a founding faculty member of the department of environmental social sciences, where he helped to create its PhD program. Survivors: his wife of 44 years, Linda; sons, Josh and Ben; four grandchildren; and brother, Daniel, MD '71.

Phyllis Irene Gardner, of Stanford, September 10, at 75, of a heart attack. She was a professor of medicine and the associate dean for education at Stanford Medicine. She was the first to discover that an ion channel gene that causes cystic fibrosis—CFTR—is present and functional in immune cells. Her research improved understanding of how the disease affects the immune system and helped lay the groundwork for a new generation of gene therapy programs for cystic fibrosis. She later guided the development of novel drug-delivery systems as a clinical pharmacologist and spearheaded an overhaul of Stanford's medical school curriculum. Survivors: her husband, Andrew Perlman; children, Nicola and Jay Perlman; four grandchildren; and two siblings.

Gerald Ernest Paul Gillespie, of Scottsdale, Ariz., July 20, at 92. He was professor emeritus of German studies and of comparative literature. He was a renowned scholar who published extensively about Germanic influences on some of the West's most formidable writers, including James Joyce, Thomas Mann, and Marcel Proust. His subjects ranged from how writers approached biblical teachings to classical tragic theater to great German works. He published or edited more than 20 books, served on the editorial boards of numerous academic journals, and earned prestigious fellowships, including those from Fulbright, Guggenheim, Mellon, and the National Endowment for the Humanities. Survivors: his wife, Adrienne; and brother, James.

Daniel Vernon Madison, of Pacifica, Calif., October 9, at 69. He was a professor in, and associate chair of, the molecular and cellular physiology department at Stanford Medicine. With an expertise in electrophysiology of the hippocampus, he measured electrical activity to study how cell connections change and what happens when the process goes wrong. His laboratory developed tools to record the signals neurons send to each other, and used that data to investigate how communication between neurons is affected by age and disease. He numbered among the world's most influential neuroscientists whose work led to groundbreaking discoveries in learning and memory. Survivors: his former wife, Sasha; children, Jessica Madison Piskatá and Eric; grandchildren; and three siblings.

Todd Iversen Smith, of Palo Alto, September 24, at 85. A member of the Stanford community for nearly 60 years, he was a professor (research) of physics, emeritus, who helped develop the free electron laser (FEL), a tunable laser capable of producing powerful, precise bursts of coherent radiation, a technology now used worldwide for purposes ranging from imaging proteins to conducting surgery. He published dozens of papers on FELs, superconductivity, and experimental acceleratory physics, and was a clever, playful mentor to generations of graduate students. Upon retiring, he volunteered with local repair cafés, fixing everything from clocks to heaters. Survivors: his wife of 55 years, Sandy; sons, Kevin and Alex; four grandchildren; and sister.

Nolan Ryan Williams, of Northern California, October 8, at 43, by suicide. He was a professor of psychiatry and behavioral sciences and the creator of the Stanford Accelerated Intelligent Neuro-modulation Therapy, or SAINT, which in clinical trials offered relief to 80 percent of patients with treatment-resistant depression. The FDA-approved, noninvasive therapy uses a device with an electromagnetic coil to stimulate neurons with rapid,

intermittent pulses to the targeted spot. He also led studies of Special Operations veterans with symptoms of PTSD and traumatic brain injury that improved through the use of ibogaine—a drug that is illegal in the United States. Survivors: his wife, Kristin Raj, MD '11; children, Autumn and Hendrix; mother; and brother.

1940s

Leonard James Levy, '44 (economics), of San Francisco, October 25, at 103. He served as a second lieutenant in the Army and worked as a licensed real estate broker for more than 40 years. A passionate fisherman, he fished wherever he could, from Mexico to Alaska, and devoted much of his retirement to enjoying the sport. He will be remembered for his warmth, curiosity, resilience, and love for his family and friends. He was predeceased by his wife of 53 years, Loretta. Survivors: his children, Katherine and Matthew; and three grandchildren.

Sabra Kranzfelder Driscoll, '47 (economics), of Palo Alto, July 19, at 100. She was on the *Stanford Daily* staff. She and her husband, who met hashing at Lagunita Hall, hosted hasher reunions at their home

Trailblazer of Computers that Learn

In the summer of 1956, 26-year-old Bernie Widrow drove from MIT, his alma mater, to Dartmouth, where a handful of preeminent researchers were holding a workshop of sorts. "They were talking about building machines that could think," Widrow said in a 2023 interview with the Computer History Museum. "It was like a monkey on my back. I couldn't get it out of my head—the idea of building a thing that thinks."

For three years on the faculty at MIT and for half a century at Stanford, Widrow devoted his career to modeling machines on the elegant machinations of human thought. His breakthroughs, which led to 21 patents, are at the core of technologies such as artificial intelligence, telephone modems, and heart monitors.

Bernard Widrow, a professor emeritus of electrical engineering and a pioneer of neural networks, died on September 30. He was 95.

Soon after Widrow arrived at Stanford in 1959, he and his first graduate student, Marcian "Ted" Hoff, MS '59, PhD '62, invented an algorithm that would become one of the most widely used learning tools in engineering. Their Least Mean Squares (LMS) algorithm enables machines to measure and quickly correct their errors step by step (the mathematical equivalent of a children's warmer-or-colder game). From telephone modems to mobile phones to seismic monitors, the approach "tunes" filters that equalize high and low frequencies, making it possible for data to travel swiftly and efficiently over noisy, shared lines, or to remove noise from data in the hunt for oil underground.

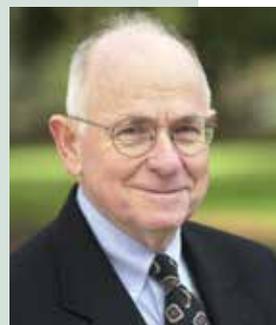
The algorithm "powered the world, basically," says professor emeritus of electrical engineering Gregory Kovacs, PhD '90, MD '92.

Within a year, Widrow had used LMS to train a black, shoebox-sized device with an array of knobs and switches called ADALINE, for adaptive linear neuron—essentially a single neuron of a neural network, able to recognize patterns after being trained by humans. In 1963, the California Academy of Sciences recorded a video of Widrow using ADALINE and its successors to do things like transcribe spoken words and forecast rain.

Widrow's career expanded far beyond neural networks—he published a seminal textbook on signal processing in 2002, for example—but the ADALINES have received perhaps the most attention.

"Mark my words, this will be in the Smithsonian one day," said the host of the 1963 Cal Academy video. That prediction came true in 2018: The Smithsonian is now the custodian of two ADALINES. An additional ADALINE model resides in Mountain View's Computer History Museum, in a new exhibition chronicling the history of AI chatbots.

Widrow was predeceased by his wife, Ronna. He is survived by his daughters, Leslie Derbin, '82, and Debbie Sklarin, '85, MA '87; two grandsons; and sister.



—Kali Shiloh

for over 40 years. Before having children, she attended graduate school at San Jose State and nearly earned a teaching credential. She was active in the Stanford Club, AAUW, PTA, Allied Arts Guild, and Grace Lutheran Church, and she enjoyed hiking, tennis, gardening, painting, and photography. She was predeceased by her husband, John, '48; and son Michael. Survivors: her children, Zoe Driscoll Schirmer, '73, MA '74, Will, Barb Larsen, and Mia; nine grandchildren, including Melissa Schirmer Egbert, '09, MS '09; and 11 great-grandchildren.

Jean Mary Robertson Jones, '49 (biological sciences), of Modesto, Calif., June 15, at 97. An extremely active community member, she belonged to Omega Nu and PEO, played bridge whenever possible, and volunteered widely, including reading with children at elementary schools and working in the garden at Centenary Methodist Church. She loved nature, birding, and her cabin in Pinecrest. She was predeceased by her husband of over 60 years, Jack, '49, JD '51, and daughter Shellie. Survivors: her daughters Linda Ewing and Dana Dempsey; six grandchildren; and nine great-grandchildren.

1950s

Hal Samuel Needham, '50 (social science/social thought), of Escondido, Calif., August 7, at 96. He earned several medals for valor as a Marine in the Korean War. During a successful career in business, he rose to vice president of investments at Dean Witter (now Morgan Stanley). He was a lifelong golfer and music lover who also enjoyed travel, cooking, and the arts. He was intelligent, kind, generous, and remarkably youthful in spirit well into his 90s. He was predeceased by his first wife, Nele. Survivors include his second wife, Carol; and stepdaughter, Anneke Seely, '80.

Wilma Marie Creps La Perle, '52 (economics), of Bakersfield, Calif., October 13, at 95. She grew up in a farming community and remained actively involved in her family's rice farm throughout her life. Nominated to testify before a U.S. House Armed Services Subcommittee in Washington, D.C., she helped effect the return of farmland taken from her family and other farmers to establish Beale Air Force Base during World War II. She loved holiday gatherings, spirited discussions, and traveling. She was predeceased by her husband of 46 years, George, '50, MS '52; and sons Stephen and John. Survivors: her children, Julie Bradford, Irene Wilkins, George, David, and Thomas; seven grandchildren; two great-granddaughters; and sister, Irene Creps, '56.

Margaret Adele Gairdner Snow, '52 (English), of Los Angeles, November 17, at 94. She opened the Johnson & Johnson Pharmaceutical Company's first West Coast sales offices in downtown Los Angeles and Palo Alto. She later enjoyed a career at Associated Students UCLA (ASUCLA), ultimately serving as the director of the UCLA Student Union and Student Support Services. She was a mentor to hundreds of UCLA undergraduates, graduate students, and administrators, many of whom became lifelong friends. She was a member of UCLA's Order of the Golden Bruin. She was predeceased by her husband, Clayton. Survivors: her children, Merian, '78, Margaret Sengstaken, David, '80, and John; and four grandchildren.

Marjorie Isabel Horchitz Telleen, '52 (education), of Altadena, Calif., October 12, at 95. She was in the ski club. Her green thumb and love of nature made her an exceptional gardener and a dedicated art and garden docent for more than

40 years at San Marino's Huntington Library. She was a gifted cook and warm hostess. She had a cheerful spirit and boundless energy and always provided a helping hand, especially at the Episcopal Church of Our Saviour. Survivors: her husband of 73 years, Sherm, '52, MBA '56; children, Kenneth Hnottavange-Telleen, '76, MS '76, Karen, '78, and Cindy; five grandchildren; and five great-grandchildren. She predeceased her sister, Annabelle Horchitz Dahl, '55, by one month.

Julie Evan Holway Pickrell, '53 (social science/social thought), of Indianola, Wash., September 2, at 93, of heart failure. She performed with the Stanford Chorus at the San Francisco Opera. After working as a dental hygienist, she became a lawyer with an expertise in labor and environmental law. While raising a family, she pursued a wide range of interests, from knitting and gardening to feminist politics. Stanford gave her a broad basis for understanding and pursuing social justice in her community, as well as numerous lifelong friends. She was predeceased by her husband, Keith. Survivors include her children, Mardie O'Connor, Emily, Gary, Jim, and Brian.

Jean Lea Reed Ward, '53 (art), of Palm Desert, Calif., August 23, at 94, after a long illness. She was on the crew team. She was an avid sailor in her youth, most famously racing against actor Humphrey Bogart. As an adult, she sailed with world-class Star boat and America's Cup skippers. She was deeply involved with philanthropic organizations in the Newport Beach area. In Southern California, she and her husband had a ranch with an orchard and animals. She traveled extensively, visiting six of the seven continents. She was predeceased by her husband, Edward, '53. Survivors: her daughters, Calene Fleurke and Lea Bobadilla; four grandchildren; six great-grandchildren; and brother, Thomas Saftig, '79.

Donald Herbert White, '53 (economics), MBA '58, of Medford, Ore., January 11, 2025, at 93, of congestive heart failure. He was a member of Alpha Sigma Phi. He served in the Navy. His career spanned leadership roles at the Northrop Corporation and the Hughes Aircraft Company in Southern California, where he served as president in the 1980s. He served on numerous corporate and civic boards and was honored with MIT's Corporate Leadership Award in 1984. He was an avid golfer and fisherman, skilled photographer, music lover, and storyteller. He is survived by his wife of 71 years, Jan; children, Marleigh, '80, and Spencer; four grandchildren; and three great-grandchildren.

Louis Ernest Jones Jr., '54 (biological sciences), MA '55 (education), of Roseville, Calif., September 14, at 92. He was a member of Kappa Alpha. He formed Jones Enterprises Inc., sold steel industrial buildings, and invested in real estate. After marrying, he became a teacher and then the assistant superintendent of the Grant Union High School District. He served for years on the Placer County Fair Board. He was a rugged individualist committed to his family, friends, and his beloved home in Roseville. Survivors: his wife of 68 years, Mary; children, Susan McAtee, Debbie Tarke, Louis III, and Jeff; 10 grandchildren; five great-grandchildren; and sister, Martha Jones Romero, '60.

Vera Alexei Maradudin Olmsted, '54 (international relations), of San Rafael, Calif., October 16, at 93. She was a member of Sigma Kappa. A gifted pianist and harpsichordist, she taught at the College of Marin, performed with chamber ensembles, and worked with Youth in Arts, the Marin Youth Orchestra, and the Marin Symphony. She was commodore of the Inverness Yacht Club. An avid reader and an

enthusiastic traveler, she fostered Russian-American cultural exchanges and was known as "Mama Vera" among poets and artists. She was predeceased by her husband, Richard, '52, MA '54. Survivors: her children, Katherine Shannon, Paul, and Nina; and twin brother, Alex Maradudin, '53, MS '54.

Richard Rimmel Rutter, '54 (biological sciences), of Emerald Hills, Calif., September 20, at 92. He was a member of Alpha Tau Omega and played water polo. He earned a dental degree from the University of the Pacific, practiced orthodonture in Palo Alto for 25 years, and taught at UOP for 52 years. He became the first chair of the UOP's Graduate Orthodontics Residency Program, shaping generations of orthodontists at a time when fewer than half of the country's orthodontics programs offered graduate degrees. He was an avid historian who made a tradition of inviting dental residents to see his vast Wizard of Oz and Sherlock Holmes collections. Survivors: his wife, Joanne; children, Karen Weber and Jim, '86; five grandchildren; and great-grandson.

Myles Renver Berg, '55 (physics), MS '56 (electrical engineering), of Palo Alto, July 28, at 92. Over the course of his career, he worked at San Diego Gas & Electric, SRI International, Aerospace Corporation, MIT Lincoln Library, and Lockheed Missile & Space. His contributions ranged from electromagnetic research and radar tracking to missile-defense systems and digital signal processing. During the Cold War era, he led teams developing technology to counter threats, briefed government officials, and pushed the boundaries of electronic warfare. For helping to advance national security and aerospace technology, he was recognized with Lockheed's highest honor, the Robert E. Gross Award for Engineer/Scientist of the Year. Survivors: his wife, Carol; four children; five grandchildren; and six great-grandchildren.

Annabelle Lee Horchitz Dahl, '55 (history), of Pasadena, Calif., November 8, at 92. At Stanford, she was an active Rally Com member who delighted in creating stadium card stunts. A lifelong learner, she passed the bar exam at age 50 and worked as an estate and family law attorney while dedicating significant time to the Legal Aid Society. Stanford connections remained vital, particularly through a 45-year membership in the Stanford Women's Book Club and collaborating on Class Notes. She and her husband skied and played tennis well into their 80s. She was predeceased by her husband, David, '53, MD '56. Survivors: her children, James, Susan, Gregory, and Janet; and seven grandchildren.

Herbert Dorsey Atkinson, '56 (education), of Exeter, Calif., June 18, at 91. He was a member of Alpha Tau Omega and played football and rugby. He served in the Army's 101st Airborne Division. He devoted his career to farming and helped lead farming business organizations by serving as a director of the Sierra Citrus Association and as a district delegate of the Cling Peach Association. Devoted to his community, he was president of the EUHS Booster Club and the Kiwanis Club and a Presbyterian church elder. He played golf and tennis, and loved to ski on water and in the snow. Survivors: his wife of 66 years, Nancy; sons, Kirk, David, and Troy; and eight grandchildren.

William Lander Tooley Jr., '56 (economics), of Ketchum, Idaho, September 20, at 91. He was a member of Alpha Delta Phi. He was a Naval Reserve communications officer. After earning an MBA from Harvard, he worked in his family's hotel operations—the Pickwick and Knox Hotels—before focusing on commercial real

estate development. He joined the Murdock Development Company; co-founded Ketchum, Peck & Tooley; and later established Tooley & Company, which managed millions of square feet of office space in Southern California and San Francisco. He was a jazz enthusiast and deep-sea fisherman who found his greatest joy in the outdoors. Survivors: his wife of nearly 60 years, Reva (Berger, '54); sons, William, Patrick, MBA '98, and James; and five grandsons.

Belinda Ricklefs Besag, '57 (history), of Oakland, November 7, at 89. She was a computer programmer at Lockheed and a bookkeeper for KPFA, and she worked on movement and dance with the New Shakespeare Co. of San Francisco. Beginning in 1975, she became a ballroom dance and Lindy hop instructor, founding Sunday Swing at the Lake Merritt Dance Center and Live Oak Park. She enjoyed writing stories about her life and family and caring for a series of beloved cats. Survivors: her step-siblings, James Somerville and Joyce Tombre; and nieces, Lucinda Mercer, '78, and Annette Mercer.

Mary Hasselle Robinson Bewley, '58 (French), '59 (education), of Eatonville, Wash., July 24, at 88, of congestive heart failure. She taught French in the U.S. Air Force dependent school in Japan for three years, and math and science to fourth graders in the Eatonville School District's gifted program for 26 years. She was a parishioner of Christ Episcopal Church of Puyallup, active with 4-H, a master gardener, a talented floral designer, and president of the Dogwood Garden Club. She loved playing bridge and traveling. She was predeceased by her son Sam. Survivors: her husband of 66 years, Dan; children, Deborah Price, Thomas, PhD '99, and Karen Bewley Trujillo, '98; and seven grandchildren.

Louis James Hopkins, '58 (electrical engineering), of Seattle, May 3, at 88. He was a member of Alpha Kappa Lambda and played baseball. He worked at the Ampex Corporation, capturing data related to early NASA and Department of Defense missions, and at Simmons Precision, seeking high-accuracy measurement data for Boeing. He founded Northwest Technical Corporation, a sales engineering business focused on optics and light measurement in service of the growing high-tech industry in the Pacific Northwest. He oversaw the family wheat and canola farming operations as well as family-owned apartment buildings in St. Louis. He was predeceased by his wife, Marilyn. Survivors: his sons, Randall and Jordan; five grandchildren; and companion, Jean Free Bolton, '58.

James Fredrick Kleerup, '58 (mechanical engineering), of Highlands Ranch, Colo., September 12, at 89. He co-founded Peripheral Business Equipment, which manufactured computer peripherals and went public as Pertec. He branched out into facilities development, construction, and management for several companies, then worked for the Los Angeles County Office of Education as the maintenance and operations officer for more than 100 facilities. He earned community service recognition from numerous organizations, including the Boy Scout Council of Orange County, Planned Parenthood, and Stanford. He was scoutmaster of Troop 850 for 21 years, guiding hundreds of boys and mentoring 62 Eagle Scouts. Survivors: his wife, Ginger (Austin, '59); children, Eric, '84, and Marjorie; and three grandsons.

Suzanne Marie Hardgrove Murchison, '58 (French), of Sacramento, Calif., September 24, at 89. As a mother with three young children, she moved with her husband to Hawaii, where she immersed herself in activities and became a

leader with the Boy Scouts and Girl Scouts. Returning to Sacramento, they built their forever home and opened a travel agency dedicated to student tours in Europe. She was fiercely devoted to family and providing opportunities to enrich her children's lives. She was predeceased by her husband, Donald, '58. Survivors: her children, Timothy, Allison Malecki, '82, and Andrea; six grandchildren; and four great-grandchildren.

Vicki Bever Cox, '59 (English), of San Francisco, October 11, at 88, of Alzheimer's disease. She received her teaching degree from Radcliffe College and taught in public schools in Boston and California. When the family moved to Paris, she embraced French culture and language and forged lasting friendships. After moving to Minneapolis, she was an active member of the Minnesota and national Planned Parenthood boards and supported other charities dedicated to women's causes. She loved traveling, piano bars, dancing with her husband, and reading to her grandchildren. Survivors: her husband of 66 years, David, '59; sons, Brian, '86, MBA '93, and Carson; and seven grandchildren, including Elena, '21, India, '22, and Sophia, '24, MS '25.

Patricia Gayle Engasser, '59 (basic medical sciences), MD '62, of Palo Alto, October 12, at 87. She was a clinical associate professor of dermatology at Stanford and at UCSF School of Medicine. She also practiced at Kaiser Permanente for 30 years. She published over 35 papers, earned numerous awards, served on the board and executive committee of the Academy of Dermatology, and was a renowned lecturer at conferences and universities in South America, Asia, Europe, and across the United States. In 1991, Stanford awarded her the Gold Spike, the university's highest honor for volunteer service. She was a trailblazer who paid it forward by mentoring many young doctors. Survivors: her daughter, Christina Rooke Jones, '90; and two grandchildren.

Grant Knute "Gary" Hagestad, '59, MS '60 (civil engineering), MBA '64, of Campbell, Calif., October 26, at 88. He was a member of Sigma Alpha Epsilon. He co-founded Estate Homes, a home-building business he expanded to include Estate Homes of Dublin, Estate Homes of Fairfield, and Estate Homes of Vacaville. The Estate Homes companies have built more than 1,500 single-family homes throughout the Bay Area. He loved hiking, traveling, and watching football. He was predeceased by his first wife, Patricia Graham Smith, '60; and son, Erik, '88. Survivors: his wife, Betty Nelson Gravidahl; daughters, Jeanne, '85, Colleen Carscallen, and Lori Poujoi; six grandchildren; eight great-grandchildren; and sister, Laura Hagestad Stallone, '63.

Emory McCrea Lee, '59 (biological sciences), MA '64 (history), of Cupertino, Calif., November 18, at 88. Choosing to devote his career to public service, he started by working with troubled youth in San Francisco's Chinatown before joining the U.S. Department of Health and Human Services (HHS). He spent the next 40 years at HHS, eventually serving as executive officer and acting regional director in San Francisco. He was a co-founder and board member of the Chinese Culture Center, Chinese for Affirmative Action, and the Stanford Asian Pacific American Alumni Club. He was inducted into Stanford's Multicultural Alumni Hall of Fame in 2014. Survivors: his wife of 65 years, Ayleen, JD '81; children, Randall and Marceline; and five grandchildren, including Maya, '25.

1960s

David Earle Smith, '60 (chemical engineering), of Princeton, N.J., and Palo Alto, December 28, 2024, at 86. He was a chemical engineer at FMC Corporation who was highly respected for his knowledge and problem-solving skills. He had many hobbies, including hunting, playing tennis, and riding horses. He also enjoyed skiing at Dodge Ridge, trout fishing in Pinecrest, fly-fishing on the Klamath and Eel rivers, and spending time at The Wooley Camp. He loved to travel, hike in the redwoods, and share meals with his friends. Survivors include his nephew, Douglas.

Jean Carr Trimble, '60 (nursing), of Red Bluff, Calif., October 4, at 98, of Alzheimer's disease. She was one of the first single mothers admitted to Stanford and later earned a master's in public health from the UCSF. She was a founding faculty member of the nursing department at De Anza College in 1966. She retired in 1990 having trained hundreds of nurses and contributed to the program's national reputation. After relocating to Red Bluff, she worked as a psychiatric nurse for Shasta County Mental Health. She was predeceased by her former husband, Lloyd; son Thomas Turkisher; and grandson. Survivors: her children, Bonnie Hale, Linda Turkisher, Edward Turkisher, Teresa Glynn, and Amy Carroll; seven grandchildren; and five great-grandchildren.

Robert William Hayward, '61 (biological sciences), of La Cañada Flintridge, Calif., November 8, 2023, of Alzheimer's disease. He was a member of Beta Theta Pi. After medical school at UCLA and an internship and residency at Yale, he completed a diagnostic radiology residency at Stanford and became an assistant professor of radiology. He later took a position at O'Connor Hospital in San Jose while continuing to guest lecture at Stanford. He and his second wife traveled and lived internationally for many years. He was predeceased by his first wife, Lana (Caffey, '62); and second wife, Ruth (Sutherland, '61). Survivors: his daughters, Erica and Wendy; stepsons, Gregory and Sean Finney; two grandchildren; and three stepgrandchildren.

Sheila Ann Wiese Kober, '62 (history), of San Mateo, Calif., August 31, at 84, of Alzheimer's disease. She earned a master's degree in design and owned her own interior design business, working on numerous embassies and private residences in the Washington, D.C., area. She enjoyed playing golf throughout her life. Survivors: her sons, Chris, '86, and Derek, '89; and four grandchildren.

Harry Luhn Sheehy, '62 (economics), MBA '65, of Chicago, August 24, 2024, at 92. His business career included roles at Standard Oil Company; Cresap, McCormick and Paget; and Citizens Savings and Loan Association, where he was vice president of human resources. In his 40s, he attended dental school at Northwestern University (NUDS). He opened a practice in Michigan but eventually returned to NUDS, where he spent 12 years as a dental professor. He also launched the university's dental practice management program, which became the Division of Practice Management. He was a lector and Eucharistic minister at Old St. Patrick's in Chicago, and founded the parish's first finance committee. Survivors include his wife of almost 50 years, Carolyn.

Robert Leroy Spence, '62 (mechanical engineering), of San Mateo, Calif., November 10, at 85. He was a member of Phi Kappa Sigma and played water polo. He served in the Navy on the USS *Blue* and taught at the Nuclear Power School in Vallejo.

He later joined the family real estate business and became general partner of Borel Place Associates. He was a board member, director, or president of numerous organizations, including Mills-Peninsula Hospital and the San Mateo Family Service Agency. He belonged to the Bohemian Club for 51 years. Survivors: his wife, Kristi (Cotton), '63, JD '81; children, Brooksley, Kimberley Shapiro, '98, Alexander, and Jonathan; five grandchildren; two stepgrandchildren; and two siblings.

Edward Spori Tucker, '62 (biological sciences), of Essex, Conn., March 7, 2025, at 84. He was a member of Delta Kappa Epsilon and on the *Chaparral* staff. He attended medical school before serving on submarines during the Vietnam War. Then he completed psychiatry and neurology fellowships at Yale and joined a small practice in Essex, where he remained for 47 years. He treated over 12,000 patients, driven by his love of medicine, kind nature, and sense of humor. He was a ranked tennis player in New England, ran 11 marathons, finished his first Ironman Kona in 1984, and founded a triathlon series in Connecticut. Survivors: his wife, Jeanne-Yvonne Ager; and son, Ike.

Charles Martin Hartwig, '63 (electrical engineering), of Livermore, Calif., in February 2025, at 83. He was a member of Alpha Tau Omega and played football. He worked in the aerospace industry at Lockheed Martin before earning a PhD in physics and electrical engineering at USC. He spent 35 years at Sandia National Laboratories working across a range of projects. He was a science lead on the Accelerated Strategic Computing initiative, which maintained some of the world's most powerful supercomputers. He loved road-trips throughout the West, hiking, camping, and cross-country skiing. Survivors: his wife, Doris "Khabira" (Allred), '64; children, Gunthar and Johanna; five grandchildren; and brother, Robert, '65, MS '67.

Robert John Burt, '64 (physical science), MS '66 (geology), of Menlo Park, September 19, at 83, of cancer. He played basketball and tennis. After doing mineral exploration with the Duval Corporation in Canada, he worked as a U.S. Geological Survey hydrologist for 30 years, with postings to Tacoma, Wash., Honolulu, Washington, D.C.; and Menlo Park. While in D.C., he collaborated with a project manager at the World Bank to show government officials in Assam, India, how to construct bamboo wells to irrigate crops during drought, a significant development for that region. Survivors: his wife of 57 years, Rebecca (Kendall), '69; children, Rebecca, Emily, '97, and Jeffrey; and six grandchildren.

Roger William Green, '64, MA '69 (history), of San Francisco, November 4, at 83. After attending Harvard Law School, he practiced law for 40 years, primarily in the civil service with the Navy. A passionate follower of the arts, he was a longtime season ticket holder of the San Francisco Ballet and frequently volunteered during Nutcracker season. He was also an avid collector of antiques, with more bright, colorful Handel lamps than tables on which to put them. Survivors include his cousins, Nita Carter, Kay Freeman, Joan Gill, and Carol Parkinson.

Nancy Van Dyne Fleming, '65 (nursing), of Westmont, Ill., January 19, 2024, at 80, of ovarian cancer. She earned a master's in maternal/child nursing at UCSF, and a master's in nurse midwifery and a PhD in women's health at the University of Illinois Chicago. She was a general practice nurse, educator, Lamaze instructor, researcher, author, and women's health counselor, and was most proud of her role as

a certified nurse-midwife (CNM), delivering almost 1,000 babies and leading the charge to secure hospital credentials for CNMs in Illinois. She loved to travel and shared her passion for adventure with her grandchildren. Survivors: her husband, Robert Smallwood; children, Kristin Danzinger and Karin Rohn; and four grandchildren.

Bernard Allan Mayer, '65 (statistics), of Chicago, September 12, at 82, of pancreatic cancer. He was in the marching band. He served in the Army. He worked in technology at the Northern Trust Bank for over 30 years. He spent many years preparing food for the Hope's Table ministry. A lifelong lover of baseball, he regularly attended Chicago White Sox games and maintained an impressive collection of baseball cards. He was an avid rock climber and skier in his younger years, and cherished traveling with his family (whether to a national park, Africa, or Europe). Survivors: his wife of 45 years, Kathryn; children, Laura Carter and Brian; and three grandsons.

Donald DeFraga, '67 (economics), of San Francisco, July 28, at 79, of heart failure. He was a member of Delta Chi. After graduating from Rutgers Business School, he became a consultant at Arthur Andersen & Co. He moved into real estate and property investment, first with Colonial Realty and later with Coldwell Banker, with detours he took along the way that included importing the "Skate-Cycle" and co-owning the bar-restaurant Greeley's. He was a film buff known for his generosity and infectious laugh. Survivors include his nephew, Matthew.

Roberta Marie Williams Robertson, '69 (music), MA '70 (education), of Los Altos, September 22, at 77. For 43 years, she worked across the Los Altos School District, teaching vocal music, orchestra, strings, brass, and guitar to more than 30,000 students. After retiring in 2012, she devoted herself to travel (including to Russia, China, and Scandinavia), gardening, ballroom dancing, playing piano, swimming, walking the neighborhood, and spending time with her grandchildren and friends. She was the life of the party, and her smile could light up any room. Survivors: her husband of 50 years, Frank, '65; children, Angela and Anthony; and three grandchildren.

Louis Edward Wolcher, '69 (history), of San Clemente, Calif., November 7, at 78. He was a member of Alpha Kappa Lambda and played baseball. He graduated magna cum laude from Harvard Law School. He was a distinguished scholar, philosopher, and professor of law at the University of Washington School of Law for more than 30 years. He lectured before the European court of human rights, earned Fulbright scholarships to teach in Slovenia and France, and was a visiting professor around the world. He published four books, loved golf, and had a wonderful sense of humor. Survivors: his wife, Susan (Haluk), '72; children, Sarah Wolcher Schneider, '96, and Edward; and five grandchildren, including William Schneider, '28.

1970s

Raymond John Anzenc, '70 (psychology), of Los Angeles, March 11, 2025, at 76.

Steven Anthony "Tony" Edwards, '70 (English), PhD '81 (religious studies and humanities), of Pittsburgh, May 5, 2024, at 75, of Parkinson's disease. He earned a master's degree from UC Santa Barbara. An emeritus professor of philosophy of religion at the University of Pittsburgh, he chaired the department for several years and was a faculty member of the Program in Cultural

Studies. Survivors: his wife, Lisa Kerestesi; son, Miles; stepson, Alec Kerestesi; and three siblings.

Richard Glenn Davito, '71 (biological sciences), of Brookfield, Wis., August 16, 2024, at 75, of lung cancer. He graduated from the University of Illinois Rockford School of Medicine and practiced general orthopedics in the Milwaukee area for 34 years. He was an avid fisherman, adventurous traveler, die-hard Green Bay Packers fan, and longtime Corvette owner. He loved entertaining friends and family in the summer on his pontoon boat at Okauchee Lake, Wis. Survivors: his wife of 52 years, Cindy; son, Brandon, '99; and two grandchildren.

Arthur Charles "Charlie" Hoffman Jr., '73 (history), MBA '76, of Fremont, Neb., November 23, at 74, after a short illness. He was editor-in-chief of the *Stanford Daily*. He founded and led five companies, including, for the last 34 years, Medical Armor Corporation, the second leading supplier of protective cut-resistant gloves for surgeons. A champion of the *Daily*, he served as board chairman of the Stanford Daily Publishing Corporation, board president of the Friends of the Stanford Daily Foundation (which he helped to found), and was in the inaugural class of the Stanford Daily Hall of Fame. Survivors: his wife of 44 years, Jane Martin-Hoffman; sons, A.C., John, Andy, and Joey; and six grandchildren.

Linda Pearl Hooker Pudalov, '73 (undeclared), of Parker, Colo., October 21, 2024, at 73, of pancreatic cancer. After suffering injuries from a motorcycle accident requiring extensive occupational therapy, she returned home and enrolled at Colorado State University. Inspired by the physical and occupational therapists who had helped her, she chose to major in occupational therapy. She worked as a therapist for head injury rehabilitation and eventually offered therapy to patients in their homes. A convert to Judaism, she was active in the temple as a sisterhood volunteer, assistant treasurer, and board member. She was an early environmentalist and loved boating and RV-ing with her husband. Survivors: her husband of 49 years, Mitch; children, Emily and Eric; and sister, Karen Hooker Michalak, '69.

Mary Kathryn Clarke, '75 (biological sciences and English), of Lehi, Utah, October 12, at 72, of Parkinson's disease. She earned an MD from the University of Texas Southwestern and practiced as a forensic and surgical pathologist. She had an abiding love for animals and was a nature enthusiast. She and her longtime partner were patrons of the San Diego Zoo and the Sierra Club. She was predeceased by her partner, Bruce Hauswirth. Survivors: her children, Carolyn Stevenson and James Wigginton, JD '13; seven grandchildren; sister; and former husband, Scott Wigginton, '75.

Ben Clark Scheible, '75 (political science), of Reno, Nev., April 17, 2024, at 71. He was on the track and field team. He attended McGeorge School of Law and practiced in California until 1995, when he left the law to become a teacher. He earned accolades from students and colleagues and was named Teacher of the Year multiple times. He loved history, abandoned buildings, dad jokes, TV marathons, buffets, exploring Nevada's ghost towns, and visiting the monuments in Washington, D.C. Survivors: his daughters, Melanie, '11, Kimmy Scheible Ambrose, '13, MA '13, and Danielle Lemke; three grandchildren; and two sisters.

David Lee This, '75 (economics), of Brea, Calif., September 23, at 72, of cardiopulmonary arrest. He spent his career in management and development with the Automobile Club of Southern California. In 1980, he rode his bicycle from his home

in Fullerton, Calif., to Washington, D.C. Survivors: his wife of 50 years, Carol; children, Evan and Alison; and two grandchildren.

Joan Elizabeth Trusty, '77 (English), of Birmingham, Mich., November 17, at 70. She was an accomplished attorney for over 40 years and, as the first female lawyer hired by EDS, a pioneer for other female lawyers. She was an avid gardener, interior decorator, reader, published author, teacher, mentor, leader, and traveler who visited all seven continents. She was a faithful member of Sanctuary Church in Birmingham, where she led Bible study classes, served in a variety of church leadership positions, and skillfully led the renovation of the church building and interiors. Survivors: her husband, Scott Moore; daughter, Paige Moore; and grandson.

Richard Metcalf Bowles Jr., '78 (mechanical engineering), of Coeur d'Alene, Idaho, July 9, at 68, of pancreatic cancer. He was on the crew team. He began his career at Hewlett Packard, then worked for over three decades at Intel, where he led some of the company's most important projects, including developing USB and Intel's first mobile processors. He was one of *EE Times*' Top 100 Most Influential People in Semiconductors. In retirement he founded bTech Ventures and co-founded the CARM Safety Foundation to make gatherings and schools safer. For 50 years, he honored veterans by playing taps. Survivors: his life partner, Barbara Schoeffler; children, Alexandra Crotty, Ryland, and Taylor; five grandchildren; and brother.

Patwin Eugene Peckham, '78 (human biology), of Aliso Viejo, Calif., September 2, at 69. He was on the sailing team.

1990s

Carl Alexander Wescott, '90 (symbolic systems), of San Francisco, July 7, at 58. He had an extensive career in technology and business, leading the creation of scalable, secure, highly available, mission-critical software systems that were intuitive to use. He was the founding CTO of GoingOn Networks, which provides an on-demand private

academic social network for students and faculty. Previously, he was a top executive at companies including ZoomSystems, CriticalArc Technologies, and Tritonic. The companies he worked with raised tens of millions of dollars in venture capital. He was most recently based in Dubai. Survivors: his sons, A.G., C.M., and D.; parents, Ward and H.M.; and sister.

Clarisse Beauregard Perrette, '91 (English and political science), of Chicago, January 21, at 55, of cancer. She was on the *Stanford Daily* staff. She worked as an associate producer on a film before moving to Washington, D.C., and joining AOL, where she helped launch one of the first match-making websites. After moving to New York and studying at the School of Visual Arts and the Art Students League, she became a full-time artist, making brilliant and colorful work about the struggle between everyday needs and the desire to create meaning. She was actively engaged with causes focused on the environment, education, and the arts. Survivors: her husband, Larry Freed; daughter, Adelaide Freed; parents, Virginia and Jean; and three siblings, including Virginie-Alvine, '89.

Sunil Kumar "Sonny" Singhania, '94 (computer science), of Los Angeles, June 26, at 52. He was in the Sanskriti Club. He was an accomplished physician and educator, a huge sports fan, and a devout husband, father, and son. He was a kind and patient teacher of many subjects, from clinical medicine to skiing, and was an active member of the Viennese Ball Opening Committee as an undergraduate. A group of his Stanford friends gathered over the alumni reunion weekend to remember him and celebrate the power of friendship. Survivors: his wife, Nupur Kumar; daughters, Prianna and Anya; and parents, Ram, MS '69, and Aruna.

2000s

Alison Kiehl Friedman, '01 (political science), of Kamuela, Hawaii, October 5, at 46, of colon cancer. She was in the 6th Man Club. She advanced civil rights at People for the American Way, navigated

national security issues as district director for Representative Jane Harman, and founded the Alliance to Stop Slavery and End Trafficking. Appointed by President Barack Obama to monitor and combat trafficking, she championed international anti-slavery efforts, launched SlaveryFootprint.org, and co-authored a U.S. executive order banning exploitative recruitment practices. Her leadership contributed to the resolution of a hostage crisis in Pakistan. Survivors: her husband, Mark Waner; daughter, Olivia; parents, Kristina and Robert; and sister, Anne, '05.

2010s

Daniel Aaron "Danya" Naroditsky, '19 (history), of Charlotte, N.C., October 19, at 29. He was a chess teacher and commentator who achieved the title of grandmaster at 17. At the time he died, he was ranked No. 22 in the world in bullet chess. He was a resident grandmaster and head coach at the Charlotte Chess Center and had more than 600,000 combined followers on his Twitch and YouTube channels, where he livestreamed games and guided viewers through notable plays. He published two books and was a chess columnist for the *New York Times*. Survivors include his mother, Elena Schuman; and brother, Alan.

BUSINESS

Jonathan Edwards Slater, MBA '62, of Santa Fe, N.M., January 21, 2025, at 88. He was a beloved and masterful English teacher. He was department chair and house dean at Newton South High School in Massachusetts, head of New York City's Little Red School House and Elisabeth Irwin High, and head of The Latin School of Chicago, Shady Hill in Cambridge, Mass., and Saint George's in Spokane, Wash. In retirement, he volunteered in high schools, guided graduate classes at Harvard, and helped Kitchen Angels deliver meals to homebound residents. He was predeceased by his wife, Karen. Survivors: his

'The Man on the Move'

Judged by wins alone, Mark Marquess's coaching career may have reached its apex during three months in 1988. After leading Stanford to a second consecutive College World Series title in June, Marquess, '69, didn't have time to go home before taking the helm of the U.S. baseball team ahead of the Olympic Games in South Korea. He returned to campus in September with that championship as well.

Marquess, however, had other criteria for success. In a 2021 oral history, he recalled a game early in 2017, his final season. It was attended by 250 of his former players, perhaps half the total he had coached over five decades. At the postgame barbecue, the reminiscing wasn't so much about wins and losses as about the program's culture of teamwork, academics, and hard work, including that Marquess asked players to maintain their section of the field. "We're not pro coaches. We're teachers," he said. "That, for me personally, was probably the highlight of my career." The leader of Stanford baseball for 41 years and a former star athlete himself, **Mark Edward Marquess**—known

widely as "Nine," his jersey number—died on January 30 of a stroke. He was 78.

Marquess grew up in Stockton, Calif., four blocks from the College of the Pacific, whose facilities enabled endless pick-up games, in multiple sports, that honed his athleticism. Neither of his parents had attended college, but they esteemed Stanford's academic reputation. For Marquess, a football star, Stanford's appeal was increased by its openness to his playing baseball as well.

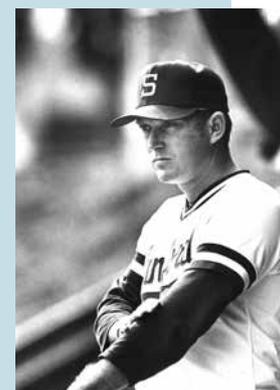
On the gridiron, Marquess was versatility personified. A 1968 *Stanford Daily* article dubbed him "the man on the move" for his ability to play everything from safety to quarterback. In baseball, by contrast, he was fixed at first base, an All-American whose .404 batting average in 1967 still ranks fifth in school history. After being drafted by the White Sox, Marquess was playing AA ball in Asheville, N.C., in 1971 when he got a call from Stanford head coach Ray Young, '56, MA '64, asking him to be an assistant coach. Five years later, Marquess was head coach. He was not yet 30.

Even as a young coach, Marquess was old-school. Team rules included traveling in coat and tie, even on red-eyes, no facial hair, and no hats while eating indoors. The team would even practice standing for the national anthem and running off the field.

Marquess was also deeply invested in players as people. On seven-hour bus rides to Southern California, he used to sit up front and call player after player to take the seat beside him. "Ninety percent of the conversations had nothing to do with baseball," says Dean Stotz, '75, his lieutenant for 37 years. "He just kind of understood what was important in life."

Marquess's survivors include his wife, Susan; his daughters, Bridget Dunnington, Anne Thomas, and Maureen Sullivan, '04; and nine grandchildren.

—Sam Scott



children, Kristin Slater-Huff, David, Melanie, and Andrew; and six grandchildren.

Robert Bostwick "Bear" Beim, MBA '70, of Ather-ton, Calif., August 26, at 82. He was a first lieutenant in the Army. He specialized in tax and financial planning at Arthur Andersen before co-founding Beim & James, a real estate firm that developed, acquired, and managed commercial properties across the western United States. He was later the managing director of Woodside Asset Management and continued his investment career at Osborne Partners Capital Management. Deeply committed to education and health care, he was on the board of directors at Lucile Packard Children's Hospital for over a decade. Survivors: his wife, Nancy Cummings-Beim; children, Tucker, Carter, and Margaret; six grandchildren; and brother.

John Robert Hardwick, MBA '70, of Los Altos, Sep-tember 25, at 84, of cancer. He served in the Air Force and worked on the camera for the U-2 spy plane. With an abiding interest in computer science, he spent much of his career as a self-employed computer software developer. An avid amateur ham radio operator, he erected a 30-foot ham radio antenna at his home. After business school, he took an 11,000-mile driving tour of Europe and eventually visited 70 countries during his lifetime. Survivors: his wife of 58 years, Gloria; daughter, Heather Hard-wick Rhodes, '97; and grandson.

Steven George Gillis, MBA '77, of Thousand Oaks, Calif., August 28, 2024, at 78, of kidney disease. He served in the Navy. He worked in medical sales for several major companies and opened and managed two major medical diagnostic facilities in Ventura County, Calif. He also worked as an inde-pendent consultant and owned and operated a staffing business. He was a longtime Amateur Radio Club member, teaching classes in Morse code and fostering interest in electronics. Survi-vors: his wife, Gail; children, Kristin Gillis-DeSanto and Andrew; and four grandchildren.

ENGINEERING

James Clifford de Broekert, MS '55, Engr. '57 (electrical engineering), of Cupertino, Calif., August 12, at 95. From 1955 to 1969, he worked as a research engineer and lecturer in systems techniques laboratories at Stanford, where he was responsible for research and development of programs for electronic military applications. He also taught courses in electronics and solid-state circuit design. He co-founded Argo Systems in 1969, founded Advent Systems in 1978, and was selected as one of 46 pioneers of the National Reconnaissance Office after 40 years of service. While working in the radar systems group of North American Aviation, he helped develop air-borne radar displays and range tracking comput-ers. Survivors: his wife, Maria, and a multitude of children, grandchildren, and great-grandchildren.

Gary Judson Smoot, MS '57 (civil engineering), of Yakima, Wash., October 21, at 95, after a stroke. He served in the Navy. As pioneers in controlled atmosphere cold storage, his family business, Smoot Brothers Construction, contributed to the livelihood of the fruit industry and the economy of the Yakima Valley. He also helped farmers in Chile construct warehouses to extend the longev-ity of their crops. He was an expert skier, moun-taineer, fisherman, golfer, tennis player, sports car driver, and small-plane pilot. He and his wife climbed all the major peaks in Washington state. He was predeceased by his wife of 61 years, Vir-ginia; and son, Gary Jr. Survivors: his daughter,

Kim Gasenica; three granddaughters; two great-granddaughters; and brother.

John Norton Stallard, MS '61 (mechanical engi-neering), of San Jose, September 6, at 88, of complications from Parkinson's disease. He was a captain in the Army, stationed at White Sands Missile Range in New Mexico. After his military service, he moved to San Jose and worked at IBM for 32 years. For a decade during his retire-ment, he worked at the local hardware store. He was active in the local neighborhood association and volunteered at the trolley barn in San Jose History Park as a repairman and host. Survivors: his wife, Sally; and children, Michael, Teri, Bar-bara, and Richard.

Barry Herman Schechtman, MS '64, PhD '69 (electrical engineering), of San Diego, October 5, at 82, of Parkinson's disease. During his career at IBM, he made significant contributions to the fields of magnetic recording materials, read/write head design, and device architecture. He then became the executive director of the National Storage Industry Consortium, an organization uniting leading U.S. companies and universities in storage research. There he oversaw ground-breaking collaborations on next-generation recording heads, media, tribology, and servo sys-tems. He found joy in travel and treasured gather-ing with friends and family. Survivors: his wife, Marjolaine Tourangeau; children, Christiane, Robert, and Andrew; and five grandchildren.

Claude Cordell Green, MS '65, PhD '69 (electri-cal engineering), of Los Altos Hills, February 12, 2025, at 85, of pneumonia. He was a pioneer of modern computer science and artificial intelli-gence. He helped create the ARPANET and was one of the first DARPA program managers for artificial intelligence and speech understanding. He earned the Grace Murray Hopper Award for establishing the theoretical basis for logic pro-gramming. In 1981, he founded the Kestrel Insti-tute to foster exploration and collaboration among scientific researchers. He also spear-headed the establishment of the annual New Directions in Software Technology conference. Survivors: his wife, Christine; children, Jeffrey, Laura, MFA '12, and Nicholas; four grandchildren; and sister.

Gerald B. Stringfellow, MS '66, PhD '68 (materi-als science and engineering), of Salt Lake City, October 3, at 83. After working in the Solid State Research Laboratory at Hewlett Packard, he became a pioneer in LED technology and dean of the college of engineering at the University of Utah. His research was key in developing light-emitting diodes, or LEDs. His numerous honors include election to the National Academy of Engi-neering and National Academy of Inventors, and he was especially proud to receive the presti-gious Frank Prize from the International Organi-zation on Crystal Growth. Survivors: his wife of 63 years, Barbara; children, Anne Brookman, Heather, and Michael; four grandchildren; and two siblings.

Donald Maurice Kaplan, PhD '68 (computer sci-ence), of Vancouver, British Columbia, November 20, 2024, at 84, of pneumonia. He taught at the University of Toronto and York University, con-sulted for Fortune 500 companies, and launched a tech company focused on thin-client computing before co-founding a publishing company cater-ing to the cruise line industry. A visionary in hos-pitality, he opened the original Mr. Greenjeans, Ginzberg and Wong, Hot Jam, and Bagel Nosh in

Toronto, and Malibu Jack's in Ottawa. He wrote a science fiction novel and loved classic cars, Bri-oni suits, a double Stoli with tonic and lime, and perfectly grilled steak. He believed in saying yes and saw adventure as a way of life. Survivors: his wife, Laura; children, Deborah and James; and stepson, Alexander Mullen.

Nicholas Philip Sands, PhD '93 (electrical engi-neering), of Sausalito, Calif., March 5, 2025, at 67, of glioblastoma. He earned his bachelor's degree in physics from Oxford. He enjoyed a distinguished career in electrical engineering and high-speed digital communications. Known for his hard work, dedication, and innovation, he made significant contributions to the industry and was granted 19 U.S. patents. He was pas-sionate about sailing, racing, and taking long voyages with his wife. He was actively involved with the Sausalito Yacht Club, where he served in various leadership roles and was well known as the emcee of Trivia Night. Survivors: his wife, Renee Linde; son, Robert; parents, Phil and Shir-ley; and sister.

HUMANITIES AND SCIENCES

Hall Leinster Crannell, PhD '64 (physical sci-ence), of Damascus, Md., September 8, at 89, after a long illness. From 1967 to 2001, he was a physics professor at the Catholic University of America. He was the principal investigator on numerous National Science Foundation grants, researching nuclear structure using intermediate- and high-energy electrons and photons. He was an American Physical Society fellow and served on several nuclear science advisory committees. He had a passion for equity and was a strong advocate for women in science. His travels took him all over the world, and he was an avid car-penter. He was predeceased by his first wife, Carol (Argus, PhD '67). Survivors: his second wife, Sue Seabold; and daughters, Annalisa, Francesca Garrison, and Tasha Jessup.

Thomas Leslie Sherman, MA '66 (English), of Philadelphia, August 28, at 84, of lung disease. After teaching literature at Antioch and Swarth-more, he changed careers and worked as a pro-fessional photographer, photography teacher, and writer, naming his business Words and Pic-tures. Later he worked in development and com-munications at nonprofits. Preparing healthy food was a central passion, and his dinner group met monthly for 20 years. He supported grassroots organizing for racial, social, and economic justice in the greater Philadelphia area. Survivors: his wife, Nancy Middlebrook; daughter, Rachel; and two siblings.

James Stephen "Steve" Taylor, PhD '66 (history), of Auburn, N.Y., May 22, at 89. He devoted more than four decades to teaching history, primarily at Wells College in Aurora, N.Y., and later at the University of West Georgia. During his academic career, he held multiple fellowships and pub-lished a number of scholarly books. He had a love for travel, good food, great books, musical theater, and the sharp wit of a well-crafted limer-ick. His heart was forever split between the rug-ged beauty of the Oregon coast and the tranquil charm of Aurora. He was especially fond of his dogs who were his constant companions. Survi-vors: his wife of 60 years, Marie; children, Laura, Mark, and Amy; and four grandchildren.

Richard John Meyer, PhD '68 (biological sci-ences), of Portland, Ore., July 7, at 85. He served in the Army Reserve as a medic. He was a

professor at Humboldt State University (now Cal Poly Humboldt) for 30 years, teaching biology, zoology, and microbiology sciences, and serving twice as the biology department chair. He and his wife co-taught the popular History of Biology course. Beginning in 1970, he wrote and illustrated a parody collection of scientific articles called *The Stomatopod: An Organic Journal of the American Stomatopod Society*. He was an avid runner and cyclist who operated a bicycle repair shop with his son. He loved cooking, gardening, and learning most of all. Survivors: his wife of 60 years, Paulette (Merrill, '66, MA '67); children, Erika and Rod, '94; granddaughter, Brook Thompson, MS '22; and two sisters.

Phillip Wickboldt Banda, PhD '69 (biophysics), of San Mateo, Calif., November 16, at 85. He pursued melanoma research at UCSF and then taught biochemistry, research methodology, and toxicology at Palmer College of Chiropractic and San José State. He later joined Applied Biosystems, traveling across the country to help laboratories set up peptide-synthesis systems, including at the National Institutes of Health. He was called out of retirement to establish a DNA analysis center for the federal government at Lawrence Livermore National Laboratory. He learned Spanish and French later in life, and loved wine-making and the mountains. Survivors: his wife of 59 years, Carolyn (Patten, '65); daughter, Margaret; and brother.

Randall Kenyon Bartlett, MA '69, PhD '71 (economics), of Northampton, Mass., October 8, at 80, of complications from Guillain-Barré syndrome. He was a professor of economics at Smith College for more than 40 years. He was a passionate outdoorsman and a talented musician, skilled with a piano, guitar, and banjo. His wonderful baritone voice filled his home and the halls of Smith College. He was devoted to his family, always striving to support them and offer a laugh or advice. He brought charm, wit, and a smile to everyone he encountered. Survivors: his wife of 53 years, Catherine (Payne, '69); children, Randall Jr., Ellika, and David; seven grandchildren; and three siblings.

Michael Lee Conniff, MA '69 (Latin American studies), PhD '76 (history), of San Jose, June 23, at 83. He was a professor of Latin American history. At San José State, he created the Global Studies Initiative and launched the university's short-term, faculty-led, study-abroad program. At the University of South Florida in Tampa, he founded the Center for Latin American and Caribbean Studies. At the University of New Mexico, he was the director of an NEH-sponsored program on "The Columbian Voyage and Its Legacies." He earned three Fulbright scholarships to Brazil and published textbooks, monographs, and two novels. He was a lifelong sailor. Survivors: his wife, Anne; three sons; stepson; grandchildren; and great-grandchildren.

Randy Roy Whitney, PhD '71 (physics), of Newport News, Va., November 18, 2024, at 79, of cardiopulmonary insufficiency. His career at accelerator laboratories spanned over 40 years and included Stanford's High Energy Physics Lab, Berkeley Lab, Los Alamos Meson Physics Facility, Bates Research and Engineering, and ENS Paris-Saclay. He was the first experimentalist awarded scientist emeritus at Jefferson Lab, where he set up the networking and computing infrastructure and served as associate director for administration, chief information officer, and chief technology officer. In retirement he established BNNT Materials, producing nanoscale ceramic fibers known as boron nitride nanotubes.

He held 17 patents. He was predeceased by his wife of 36 years, Destine Currier. Survivors include his brothers, Daniel, MS '70, and Brad.

Ward Frederick "Fritz" Schwenk II, Gr. '73 (chemistry), of Rochester, Minn., September 22, 2024, at 77. He attended medical school at McGill University and practiced at the Mayo Clinic for his entire career as a pediatric endocrinologist. He was beloved by patients and staff and known for his iconic dad jokes. He was a mentor to young people around the world through Destination Imagination, helping to develop problem-solving skills. A travel enthusiast, he visited over 100 countries on all seven continents. He loved theater, saw each of Shakespeare's 39 plays performed on a stage, and saw every Cirque du Soleil show around the world. Survivors: his wife of 46 years, Nina; children, Avery and Kelsey; and three grandchildren.

William Kent Gibson, MA '75 (communication), of Los Angeles, October 23, at 77, of a stroke and dementia. As a producer and sound designer, he won an Emmy in 1981 for his work on Carl Sagan's PBS miniseries *Cosmos* and was nominated for two additional Emmys. He worked on musical projects with performers such as Olivia Newton-John, John Lennon, Bing Crosby, and Fleetwood Mac, as well as numerous television shows. He was a founding partner of Rosebud Films, he owned the company Soundesign, and he was a forensic audio, video, and facial-recognition expert. He was predeceased by his husband, Millard Tipp. Survivors include his sister, Linda, and nephew, Jason.

LAW

Bernard Joe Phillips, JD '74, of Paris, May 23, at 77. He worked at the Federal Trade Commission in Washington, D.C., before moving to Paris to work at the Organization for Economic Cooperation and Development, where he became the head of the competition policy division. He enjoyed playing golf and traveling. Survivors: his wife of 30 years, Bénédicte Larre; stepsons, Romain and Hector; and six stepgrandchildren.

MEDICINE

Roy Johnson Riblet, PhD '72 (genetics), of Santa Cruz, Calif., May 6, at 82, of pneumonia. He earned a bachelor's degree in biological sciences from the California Institute of Technology. He completed postdoctoral research at the Salk Institute, then continued his research in genetics and biology at the Fox Chase Cancer Center in Philadelphia and the Torrey Pines Institute for Molecular Studies in La Jolla, Calif. Post-retirement, he was a visiting scholar at UCSD. Survivors: his wife, Edwina (Peters, '65); children, Abigail Riblet Hartman, '91, Andrew, and Christian; six grandchildren; and sister.

SUSTAINABILITY/EARTH

Otto MacKenty Schmidt, MS '58 (geology), of Avon, Conn., September 7, at 92. He served in the Army Corps of Engineers. He worked as an exploration geologist for ExxonMobil before becoming a certified financial analyst in the New York City area. He spent his career as an oil industry analyst at Paine Webber; Auchincloss, Parker & Redpath; and Bankers Trust. He earned respect for his financial research and predictions for the future of the petroleum and energy industries. He loved the mountains, hiking, fishing, and boating. He built beautiful fine furniture. Survivors: his wife, Pilar; children, Katherine Nickel and Otto; four grandchildren; and sister.

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Horse Sense

In the arena, we could all understand one another.

DURING MY YEARS at Stanford, I was the only deaf undergraduate on campus, and American Sign Language (ASL) empowered me to participate in my classes and extracurricular activities, including my perpetual favorite: riding with the Stanford equestrian team.

When I started college, I felt unsure of how I'd navigate such a hearing-centric world. I stopped by the Stanford Red Barn during New Student Orientation, wondering how to try out for the team, which is how I discovered that the head coach, Vanessa Bartsch, '99, had taken ASL during her own student years. She was entirely unfazed at meeting a prospective rider who was deaf. If anything, she seemed thrilled at the prospect of practicing her ASL again.

As I biked back to my dorm that day, I felt thrilled, too. I'd just glimpsed a place for myself on this actual Farm. Riding at Stanford had been a dream ever since I'd visited campus in high school, when I'd gaped at the Red Barn, with its brilliant red façade, white Victorian trim, and bronze statue of Leland Stanford's horse Electioneer standing sentinel. *Wow*, I'd thought. *I must come and live here.*

Once I made the team, live in the barn is indeed what I did, whenever I wasn't reading in Green Library. I started teaching Bartsch and my teammates some horsey vocabulary in ASL, including the improvised signs for "trot" and "canter" that I'd devised with my mother through her years of interpreting for my riding lessons. At Stanford, I brought ASL interpreters out to the riding arena, all of them arranged through the university's Office of Accessible Education.

Each time I showed up for riding practice, I'd fix my gaze between my horse's ears, then glance sideways at my interpreter as she signed the coach's instructions. Often-times, she'd be jogging to stay within my viewing range, interpreting while also trying to stay clear of oncoming hooves. I chuckled at how many forms of communication were transpiring at once, spoken and signed, human and horse.

Long before college, I'd felt enthralled by the nonverbal communication of horses, and my Stanford coaches helped me gain greater fluency with this language. Hitting the gym weekly with my teammates taught me the importance of cross-training, while routine

chores at the barn brought home how our equine partners were far more than pieces of sporting equipment. I was constantly biking out to the Red Barn between classes, rushing into my discussion sections smelly and manure-stained. Being an equestrian athlete is unlike participating in other college sports, not least because of the bonds that can stir from this mutual love for stinking like horse. My Stanford teammates and I did not always understand each other perfectly—but my time on the team showed me that human language isn't always essential for experiencing a deep rapport with another living being.

Today, I am an author. Good writing often feels like sitting astride a powerful horse, inhaling at the singularity of each gait, as sentence builds upon sentence and the words bound ahead with imaginative momentum. Sometimes, crafting these written cadences makes me recall the Red Barn, where rhythmic hoofbeats shaped my inner thoughts as much as any literature class ever did. ■

RACHEL KOLB, '12, MA '13, is the author of *Articulate: A Deaf Memoir of Voice*. Email her at stanford.magazine@stanford.edu.

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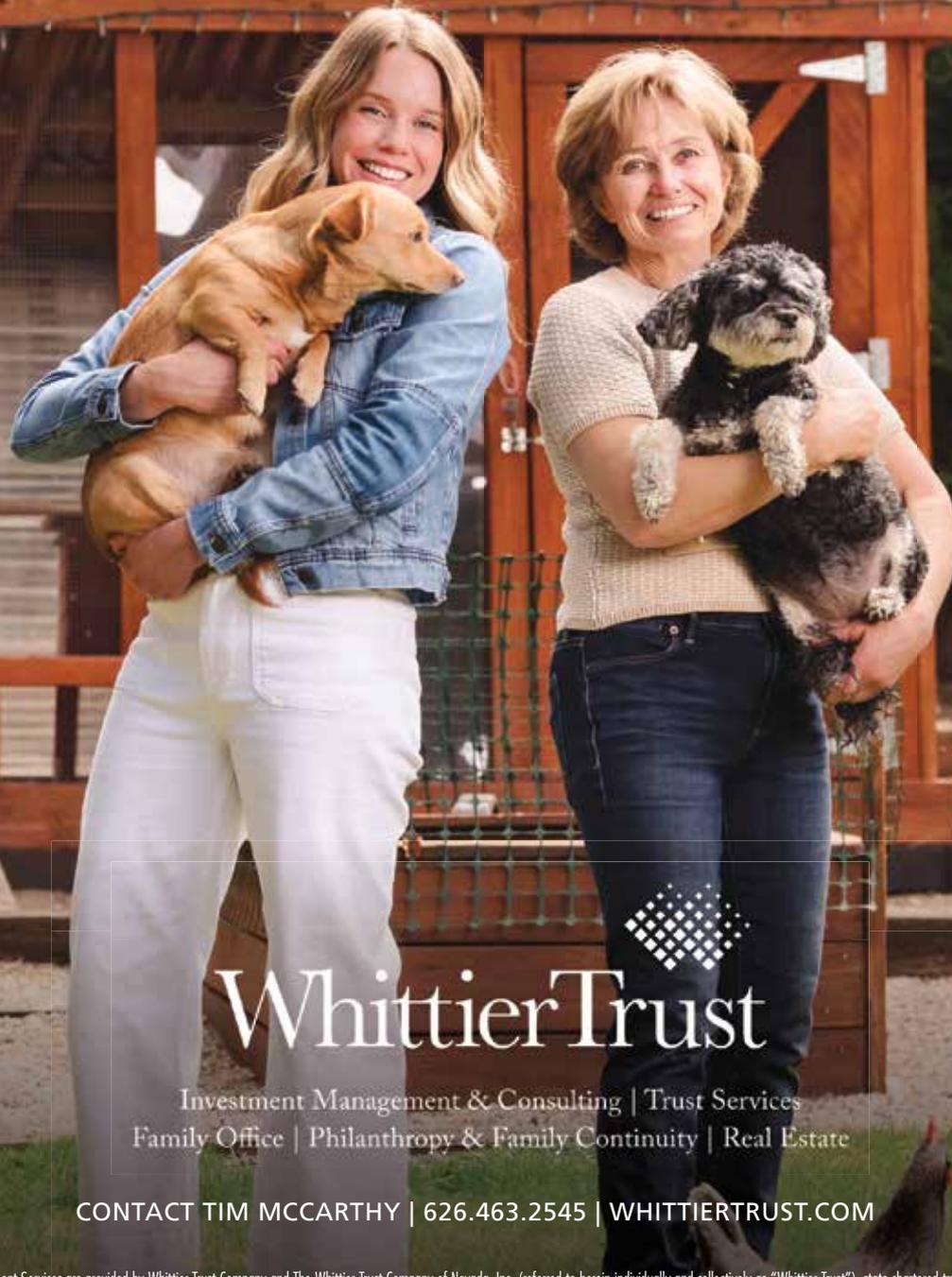
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