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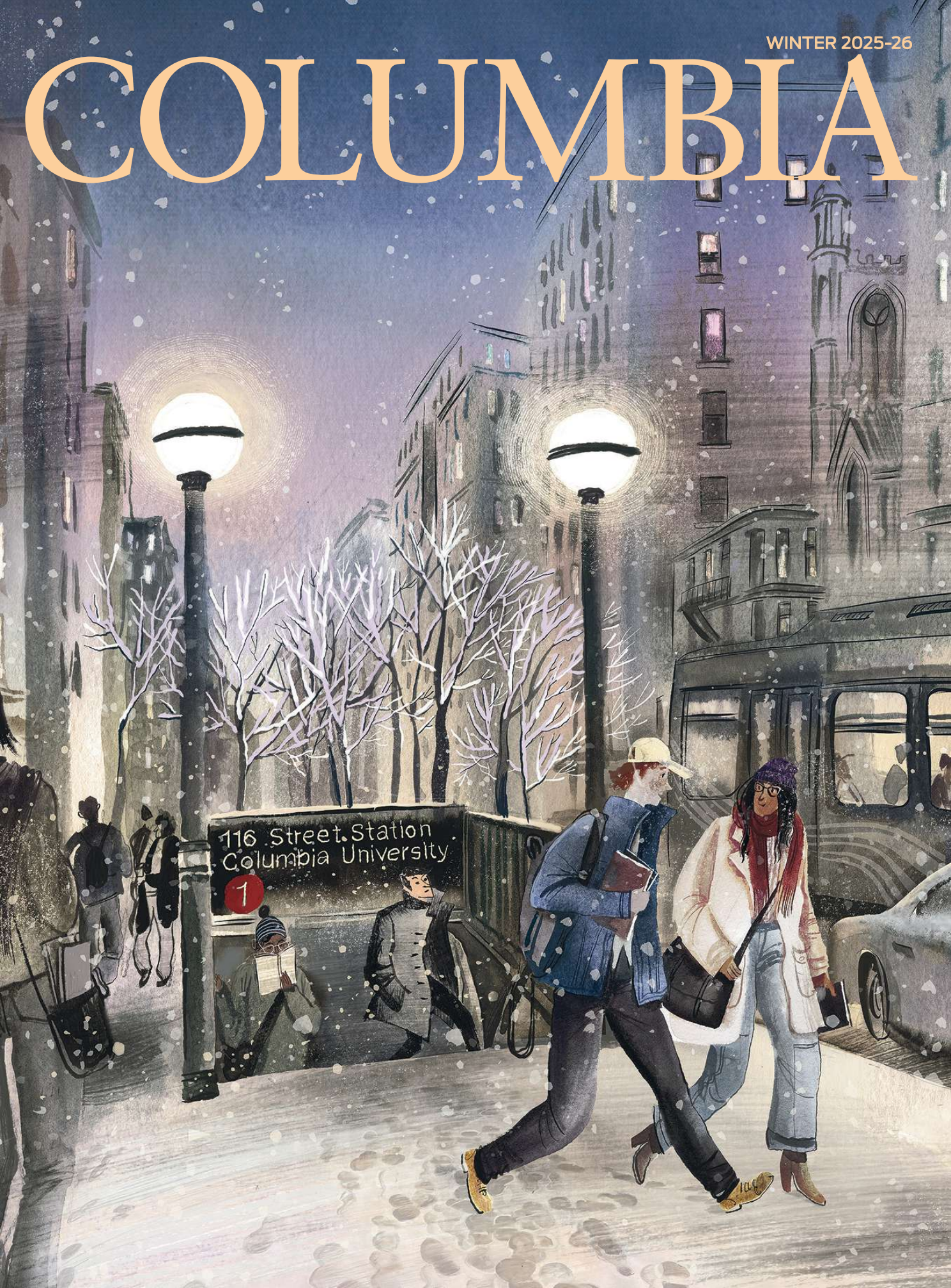

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A Columbia University College of Dental Medicine professor helps students hone their skills in preparation for their clinical training. Photo Credit: Sirin Samman

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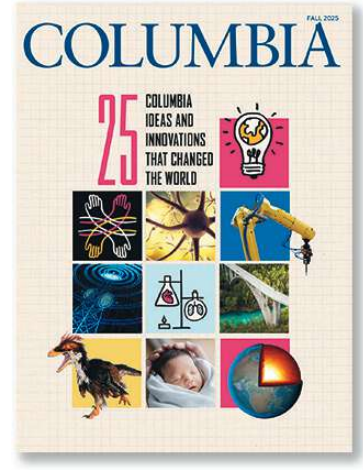

A WORLD OF IDEAS

Your latest issue, with the cover story “25 Columbia Ideas and Innovations That Changed the World” (Fall 2025), is easily the most informative and eye-opening issue in the history of the magazine.

Manfred Weidhorn
’54CC, ’63GSAS
Fair Lawn, NJ

What an incredible list of meaningful, life-changing research. *Columbia Magazine* is best in class.

William A. Taylor ’70GSAPP
Christiansted, VI

To your list of Columbians whose ideas changed the world I’d add two CUIMC physician-researchers who discovered and developed Rh immune globulin (RhoGAM) in the 1960s to prevent hemolytic disease of the fetus and newborn (immune hydrops fetalis). Vincent J. Freda, an attending obstetrician-gynecologist (and 1948 Columbia College alum), and John G. Gorman, an Australian-trained clinical pathologist who ran the Columbia-Presbyterian blood bank at the time, were joint recipients of the Lasker–DeBakey Clinical Medical Research Award in 1980 for their pioneering work. It has been conservatively estimated that four to eight million lives have been saved worldwide since 1968 by the development and use of RhoGAM.

Robert DiGiacinto
’64CC, ’68VPS
Somers, NY

There is no gainsaying the monumental contributions of Robert K. Merton to sociology, but among the core concepts he contributed, “reference group” was not among them, even though he made significant and creative use of that concept. The coiner of the term was Merton’s Columbia colleague Herbert H. Hyman in his dissertation, *The Psychology of Status*.

Robert Dreeben ’54GSAS
Chicago, IL

I greatly enjoyed the recent edition with “25 Columbia Ideas” — and particularly No. 5, “Blood Banks,” because I know Charles R. Drew’s daughter Charlene Drew Jarvis. I

sent the entire magazine to her, and she responded with the following:

"Note that Dr. Drew did not leave the Red Cross because of the segregation of blood. He left because Howard University permitted him to be away from his surgical and teaching duties for a specific time period. That time had expired, and he returned to Howard. Dr. Craig A. Miller has written a new book, on which I collaborated, titled *Genius Unbroken*, which clarifies Dr. Drew's reason for leaving the Red Cross."

Leanne Wagner '82BUS
Lafayette Hill, PA

BODIES AND SOULS

Having just retired as deputy chief of forensic odontology at the Miami-Dade County Medical Examiner Department, I sympathize with and admire the work of Barbara Butcher ("A Life After Death," Fall 2025). I too would dream of many cases, and I too spent many strange days at the New York medical examiner's morgue following September 11. And then there was Hurricane Katrina, the ValuJet crash, and so many others.

KEY TO ABBREVIATIONS

CODE	SCHOOL	CODE	SCHOOL
BC	Barnard College	LS	School of Library Service
BUS	Graduate School of Business	NRS	School of Nursing
CC	Columbia College	OPT	School of Optometry
CS	Climate School	PH	Mailman School of Public Health
DM	College of Dental Medicine	PHRM	College of Pharmaceutical Sciences
GS	School of General Studies	SEAS	Fu Foundation School of Engineering and Applied Science
GSAPP	Graduate School of Architecture, Planning, and Preservation	SIPA	School of International and Public Affairs
GSAS	Graduate School of Arts and Sciences	SOA	School of the Arts
HON	(Honorary degree)	SPS	School of Professional Studies
JRN	Graduate School of Journalism	SW	School of Social Work
JTS	Jewish Theological Seminary	TC	Teachers College
KC	King's College	UTS	Union Theological Seminary
LAW	School of Law	VPS	Vagelos College of Physicians and Surgeons

My motto has always been, "I cannot bring the body back to life, but I can bring a life back to the body."

Bill Silver '55DM
Coral Gables, FL

Thank you to writer Paul Hond and investigator Barbara Butcher for the insightful article. The analysis of the trials and tribulations of dealing with daily public tragedies was amazingly revealing and sympathetic. It all started with Butcher's willingness to share the behind-the-scenes trauma commonly experienced by responders. Her bravery in opening up to the reader on initial reactions was surpassed only by her willingness to describe the long-term effects on her, which are all too common in others in similar circumstances.

Francis Roudiez '71CC, '77BUS
North Augusta, SC

THE WAGES OF FOOD

As the CEO of Hunger Free America, I greatly appreciated the detailed article on how the industrialized US food system harms public health and threatens the environment ("A Fork in the Road," Fall 2025). But it failed to highlight two other glaring deficiencies in our food system: that many agricultural workers are paid poverty wages and that healthy food remains unaffordable for tens of millions of Americans. In 2023, even before Republicans implemented the latest round of cuts to the federal food assistance safety net, forty-seven million Americans, including more than one million New York City residents, lived in households characterized by USDA as food insecure, meaning they were unable to afford adequate food.

Yes, we need a food system that produces healthier foods in more environmentally sustainable ways, but such food must be affordable to the masses and produced by workers paid a living wage.

Joel Berg '86CC
Brooklyn, NY

CLOUDED FUTURES

"Would You Want to Know If Alzheimer's Were in Your Future?" (Fall 2025) ends with this: "If people want to know if dementia may be in their future and prepare for it," [Maryam Zolnoori] says, "they should have that choice."

Those who do not want to go through the death process of Alzheimer's should have that choice and legally prepare a plan for their death on their terms.

Sam Bonham

Growing old ain't what it used to be. I might live to be 110 thanks to modern medicine and good diet. But planning for such a lengthy life is hard. They tell you that you should wait until seventy to collect Social Security and expect to be retired for as long as thirty years. What they don't say is that medicine has advanced unevenly — and now there are illnesses like measles that we thought we had eradicated but seem to be coming back. American prosperity is likewise distributed unevenly, with the rich getting much richer and the rest of us treading water or falling behind. *Columbia Magazine* can't solve these problems in our country, but it can spotlight them.

Robert Leslie Fisher '76GSAS
Voorheesville, NY

Your article on Alzheimer's is happy to focus on the breakthrough idea that led to the research, its follow-through, the patient-doctor relationship, and more, but it ignores the radical consequences of AI's ability to analyze voice recordings to predict dementia. It talks about the well-trained AI's accuracy but ignores that other groups can replicate the training. Now that the genie's out of the bottle, AI can be used, responsibly or not, to declare that a politician is not up to governing or that an employee should be hired or fired; or to decide, in the absence of universal health care, whom to insure; or to guide banks in adjusting credit scores; and so on.

The responsible thing to do would be to study the intended and the unintended consequences of Professor Zolnoori's creative research. The ethical and social consequences go far beyond the accolades the immediate research deserves.

Eda Malenky '81NRS
Brooklyn, NY

QUESTIONS? COMMENTS?

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DAVID PLUNKERT

COLLEGE WALK

Speak Up, Speak Out

In a series hosted by Columbia Law School's Human Rights Institute, four pro-democracy activists share stories of repression and resilience

Autocracy, a form of government in which power is concentrated in the hands of a single ruler, is a spectrum: no two autocracies are exactly alike, but their similarities are stronger than their differences. This was evident on a recent afternoon at Columbia Law School, where Tejal Jesrani, an instructor at the Human Rights Clinic at the law school's Human Rights Institute, welcomed four activists from four different countries, who recounted their struggles under despotic regimes.

The panel, part of a series called Legal Machinery of Repression, included Evgenia Kara-Murza, a Russian activist whose husband, the journalist Vladimir Kara-Murza, was poisoned and jailed for opposing Vladimir Putin and the war in Ukraine; Francisco Pineda, a Salvadoran farmer and environmentalist who led a citizen movement against a proposed gold-mining operation that threatened the local water supply; Tania Bruguera, a Cuban artist who was arrested and jailed for her satirical performance-art pieces calling for free expression; and Marcel Gomes, a Brazilian investigative journalist who linked the world's biggest meatpacking company to illegal deforestation in the Amazon.

The panelists' stories together provided a kind of composite sketch of authoritarian control. Pineda told of El Salvador president Nayib Bukele's desire to open up land to industrial gold mining, which requires enormous amounts of water and toxic chemicals. Pineda's fight began two decades ago, when the government granted the mining company Pacific Rim an exploratory permit. He faced death threats, and four of his colleagues were murdered, allegedly by people with ties to Pacific Rim. But the campaign was successful, culminating in a 2017 law, passed unanimously by the Salvadoran legislature, banning metal mining in the country.

Bukele was elected in 2019 on a platform of ending gang violence, and he promptly began consolidating his authority, expanding police powers and eroding civil rights. In 2024, the legislature reversed the mining ban. Bukele has promised jobs and economic growth, but Pineda contends that he wants to enrich himself. "Those that are hoarding the money want even more," Pineda said through a student interpreter. He accused

PHOEBE O CHOU

Bukele of criminalizing activists by branding them as terrorists. "As people," he said, "the only thing we have left is to scream."

That same scream can be heard all around the world. "In today's Russia, white is called black and black is called white," said Kara-Murza, who is the advocacy director for the nonprofit Free Russia Foundation in Washington. She spoke about her husband's two poisonings (he survived both and is out of prison) and described a climate of fear under Putin, with thousands of arrests and "prison sentences for high treason for refusing to bow down and be silent."

In Cuba, too, said the artist Bruguera, the government criminalizes activists. "Dictators are not creative," she observed. And yet, she warned, the longer they are in power, the easier it is for them to stay there. One of the biggest challenges to enacting reforms in Cuba, she said, is that after sixty-six years of communist dictatorship, "the memory of freedom has been erased." This erasure has produced a nebulous discontent: "You feel that something is wrong, but you don't know what it is, because there's nothing to compare it with."

Brazil's situation is very different. In 2018 the country elected Jair Bolsonaro, a far-right populist, to the presidency. As the journalist Gomes explained, Bolsonaro dismantled environmental protections, leading to a spike of illegal burning and clearing in the Amazon rainforest. Gomes traced some of the destruction to the meatpacking giant JBS, which was grazing cattle on the cleared land. He organized an international boycott and got six major European retailers to stop selling JBS products.

Bolsonaro, meanwhile, served one term before being voted out in 2022 and was later convicted of plotting a coup to remain in power. In September 2025, the Brazilian Supreme Federal Court sentenced him to twenty-seven years in prison.

Gomes joined the other speakers in lauding, in Kara-Murza's words, "the resistance, resilience, and incredible courage" of justice-seeking activists living under autocracy. And he ended on a pragmatic note: All dictators, he said, "end up dead or in jail. The important thing is to stick together."

— Paul Hond

Big Brain Theory

The Zuckerman Institute celebrates twenty years of theoretical neuroscience at Columbia

The field of theoretical neuroscience, which uses computational models to predict neural activity in the brain, is relatively new. Twenty years ago, there were just a handful of practitioners scattered around the globe, and Columbia had two of them: Ken Miller and Larry Abbott. In 2005, Miller and Abbott started the Center for Theoretical Neuroscience (CTN), a collaborative research hub for unraveling the mysteries of the human brain.

The event, moderated by Daphna Shohamy, director of the Mortimer B. Zuckerman Mind Brain Behavior Institute, was part of the second annual ZIFest, a two-day fair of talks and presentations by students, postdocs, and faculty, who shared their latest insights into the neuronal underpinnings of sensation, problem-solving, movement, memory, decision-making, and more.

From left: Larry Abbott, Ken Miller, and Daphna Shohamy

At first, no one studying the brain at Columbia — not even professors Eric Kandel and Richard Axel '67CC, whose work on memory and olfaction, respectively, had earned them Nobel Prizes — really understood what Abbott and Miller were up to. Now, two decades and many algorithms and fruit flies later, the CTN founders sat together in a roomful of students and postdocs in the Jerome L. Greene Science Center in Manhattanville to reflect on their creation.

Zuckerman may be a world-class neuroscience institute, but what really sets it apart is the CTN: just as physicists use mathematical models to predict the behavior of celestial bodies and elementary particles, Abbott and Miller — who both trained as physicists before turning to neuroscience — create data-based computer models to predict the behavior of neurons. This allows researchers to test and refine their theories and to riff on new concepts. "The model," Miller said, "is a scaffolding for ideas."

Ideas and collaboration are the heart of the CTN. Just as neurons stimulate each other and form

networks, Columbians in neuroscience, cell biology, physics, mathematics, statistics, psychiatry, and engineering interact with each other at the CTN, exchanging ideas and scribbling on whiteboards in a free-flowing space devoid of social hierarchies.

The audience in the Greene Science Center heard descriptions of some of the CTN's greatest hits: how neuroscience professor Stefano Fusi, who studies the brain's computational mechanisms, and Daniel Salzman, a professor of neuroscience and psychiatry, created a model that can predict whether the brain has learned something new; how Fusi and Abbott, exploring memory storage in the brain, devised a model that allowed synapses (the gaps between neurons where information is transmitted) to absorb new memories while preserving old ones; and how Miller built a mathematical model that showed that the process of "inhibition" — when one neuron deactivates another — is essential for proper brain functioning.

Theoretical neuroscience has exploded since Miller and Abbott came to Columbia. "When we started this, I knew everybody in the field," said Miller. Not anymore. Today, there are nine principal investigators and eighty people working at the CTN. The proliferation of big data and the sheer complexity of the brain have created a demand for theoreticians, many of whom employ AI to further their understanding of the workings of the brain, then apply their discoveries, in turn, to the improvement of AI.

Algorithms, neurons, and the mysteries of the mind: It can all get pretty obscure, and both Abbott and Miller confess that the work of their young trainees sometimes goes over their heads — and they love that. "We have to maintain the ability to be the stupid one in the room," Abbott told the crowd with a smile, "when many of you are explaining your experiments."

That's how it was at the inception of the CTN, when the center's purpose eluded even Eric Kandel. "But after about a month of being here," Miller said, "I was in my office, and Eric came down all excited, and he said, 'I figured out what you guys do. You create ideas.' It's the best thing anyone could have ever said."

— Paul Hond

BRANDON VALLEJO / COLUMBIA ENGINEERING

WHAT FLOATS THEIR BOATS? Cardboard, duct tape, and waterproof spray were the only materials students were allowed to use to build their vessels for the second annual Engineering Student Council cardboard-boat race, held in the Dodge Fitness Center. Thirty-five teams competed, paddling back and forth across Uris Pool, and, in a "floato finish," an all-Barnard crew of five, calling themselves The Hopeful Puffin, beat runner-up Boatox by less than half a second. The event caused a splash — hundreds of students attended — and promises to become a wave.

Let the Sunshine In

Climate writer Bill McKibben helps students shed light on science — and solar energy

"Do not write like an academic," says science journalist Claudia Dreifus. "Do not write like a businessperson. Do not write like a policy person. We're going to teach you how to write like a journalist." Dreifus has taught her course Writing About Global Science for the International Media for the past seventeen years, mainly at the School of Professional Studies. A former science writer for *The New York Times*, Dreifus believes that science literacy is essential to a healthy democracy. And having found long ago that most scientists have trouble making themselves understood to nonexperts, she decided to create a journalism course for science and sustainability students — one of the first such courses in the nation.

To supplement the class, Dreifus also started a series, open to the public, called Creator's Night, in which she speaks with science-focused journalists, editors, and artists, giving students a chance to ask questions, meet people, and with any luck get an article placed in the *Times* or a video posted on *Scientific American*'s website. On a recent Friday in Uris Hall, Dreifus hosted a talk with *New Yorker* writer and climate activist Bill McKibben, whose nineteen books, she says, are "models of what effective science communication can be." McKibben, wearing a blue shirt and an SPS-issued olive baseball cap, was promoting his latest book, *Here Comes the Sun: A Last Chance for the Climate and a Fresh Chance for Civilization*, and shared his Twain-like mix of humor, social criticism, and plain American horse sense.

"We've got a period of years — numbered, if we're lucky, on the fingers of both hands — to make huge progress," said McKibben, framing the climate crisis in terms of possibility rather than doom. As the cofounder of 350, a global climate nonprofit working to "end the fossil-fuel era," McKibben has lately turned his attention to that cheap, limitless energy source burning reliably above. "Ninety percent of new energy generation around the world last year came from the sun," he said. But in the US, a dark cloud is blocking the light of progress — the country is "trying to squeeze the last dollars out of the fossil-fuel industry," including coal ("subsidizing eighteenth-century technology is almost too comical for words were it not also tragic").

LEN SMALL

McKibben sees America's retreat from solar as wrongheaded and mind-bogglingly self-defeating: "If you were setting up to destroy the economic and technological future of the United States and with it its political influence around the world, you would do exactly the things that we have decided to do on energy."

But he has also found silver linings. "One of the reasons that I'm now writing as much about clean energy as I am about climate is because it's actually much easier to get people to have that conversation," he said. "Turns out that people like solar power across a wide variety of ideologies." McKibben described his part of rural Vermont as dotted with houses with "Trump flags on the mailbox and solar panels on the roof."

Yes, China has taken command of the solar market, he said, but the difference between buying oil and buying solar panels is that with oil, you burn it and have to buy more, whereas with the panels, you buy them once, and then you "don't depend on the Chinese. You depend on the sun, which heretofore has come up each morning."

Not that solar is perfect: McKibben acknowledged the environmental impact of mining the metals — mainly lithium — to make grid-scale solar batteries ("mining is always a scourge on the planet"), but he emphasized that renewable energy requires far less extraction than fossil fuels, and he expressed excitement over the boom in non-lithium battery technology. As for the lower costs, he lauded an initiative in solar-forward Australia that will provide three free hours of electricity for citizens every afternoon. "There's been a lot of academic talk about abundance and affordability," McKibben said. "That's what abundance actually looks like in practice."

McKibben's audience included Dreifus's students as well as people from other SPS programs and the climate school. "Bill has the secret sauce," Dreifus told them. "He manages to make the very difficult interesting."

It's a skill that Dreifus, who received the 2023 Dean's Excellence Award for teaching, strives to help her students develop. Not that she wants them to abandon academese entirely: "We're going to teach you how to write like a journalist, but we don't want you to fail your other courses," she says. "When you're in the academic mode, you write their way. But here, you park it outside the door." — *Paul Hond*

LETTING IT GO

How filmmaker Jennifer Lee '05SOA got her Disney ending

By Rebecca Shapiro

DISNEY

In many a classic Disney movie, there's a princess and there's an obstacle — something seemingly insurmountable that she'll have to overcome to get the life she wants. For Cinderella and Snow White, it's a wicked stepmother; for Sleeping Beauty, an evil fairy. Prince Charming doesn't usually come easy.

Frozen, the 2013 mega-blockbuster (at its peak, the fifth-highest-grossing film of all time), is in some ways no different. Queen Elsa of Arendelle has spent much of her life in isolation — first locked in her bedroom, then cloistered in an ice palace on top of a snowy mountain — away from the people she loves and unable to rule her kingdom. But Elsa's exile is self-imposed. Born with magical powers that can turn things to snow or ice, Elsa doesn't know how to control her gift and believes she has to suppress it to avoid hurting the people around her. Mired in insecurity, she sequesters herself, becoming her own worst enemy.

It's hard to see how Jennifer Lee '05SOA, the enormously successful writer and codirector of *Frozen* and its 2019 sequel *Frozen 2*, has anything in common with her now famous heroine. A visionary and revered filmmaker, Lee has been defined by the glass ceilings she has shattered — she won the Academy Award for best animated feature for *Frozen* and was the first female director of a Walt Disney Animation Studios feature film and the first female director of a film that earned more than a billion dollars at the box office. She's the creative force behind Disney hits like *Wreck-It Ralph*, *Zootopia*, and *A Wrinkle in Time*. And she's also the first woman to lead Disney Animation Studios, serving as chief creative officer from 2018 to 2024.

But like Elsa, Lee was almost stymied by self-doubt. Ostracized as a kid for her wild imagination, it took her a long time to realize that what she saw as a flaw was actually a superpower. Finding a way to harness it was what led her to greatness.

Lee grew up in a big Irish-Italian family in Barrington, Rhode Island, a picturesque New England town just south of Providence. Her neighborhood was close-knit — "I feel like I knew someone on every block" — but Lee was a dreamy kid, often lost in her own world.

"They didn't test for things like ADHD back then, but I had every marker of it," she says. "I was always reading or drawing. I lived in my head."

When Lee was a young child, she was given a Cinderella doll ("I know this will sound almost implausible now," Lee says, "but I was a huge Disney fan"), and she began to make up elaborate stories about it. Other favorite gifts were an easel and paints and a Disney how-to-draw book, which Lee used to illustrate her stories. School was tough for her; she had a hard time focusing and went through a period of being severely bullied.

"I was a little bit of a mess, in hand-me-down clothes, with my hair all over the place, always daydreaming," she says. "It made me an easy target."

But Lee says the torment only intensified her imagination. Lying in bed at night, she'd burrow into her fantasy life, creating epic adventures where wrongs were righted and bullies avenged, where good things happened to good people and where she had control.

"Even then, I was focused on the underdog," she says. "It was important to me that there was justice and fairness in my stories."

Lee idolized her older sister, Amy, a responsible high achiever who sometimes helped motivate her whirligig of a sibling — a dynamic that might sound familiar to fans of the *Frozen*-verse.

"She was the Elsa to my Anna," Lee confirms.

After graduating from high school, Lee followed Amy to the University of New Hampshire, where she majored in English. But her college years were also marred by tragedy. When Lee was just twenty, her boyfriend died in a boating accident. The loss was incomprehensible, but Lee says it gave her the courage to make bolder choices in her life.

"When you wake up so young with such loss, there is no doubt, only grief," Lee said in a 2014 keynote speech at UNH's commencement. "In that grief, you see clearly. The world drips with color. Death exaggerates the significance of your life. And for a brief moment, you know better than to waste a single second doubting."

For Lee, that meant making the leap after graduation to again follow her sister — this time to New York City, a place she had always loved. The two shared an apartment and spent their free time enjoying all that the city had to offer.

"I went to every museum, every gallery. I was hanging out with performance artists and bands in Williamsburg," she says. "The way the city just takes over and gets you into things you never would have imagined … Moving to New York was the best decision I could have made at that point."

Lee landed a job at Random House, as a graphic designer for the audio-

book division. Being in the publishing world gave her nearly unlimited access to books, which she says she hoarded and read voraciously, and which made her aware of the kinds of careers she might flourish in.

"I think as a kid, when I was making up those stories in my head, I had no sense that this was something I could actually do for a living," Lee says. "Working in publishing made it feel more concrete."

During a meeting at Random House, Lee overheard a conversation between two colleagues that caught her attention. "It was nothing earth-shattering," she says. "The meeting had sort of turned away from business into life, and there was something about the nuance of these two colleagues opening up about their families that stuck with me." She wrote down the conversation and then kept going, making it into a scene. It was the first screenwriting she ever did.

She enrolled in a screenwriting class at NYU, where she wrote her first complete script, and then started thinking about full-time film programs. Right away, Columbia stood out. She didn't know yet whether she wanted to focus on writing or direction, and the Columbia program would give her experience in both, as well as in producing. But Lee, the scrappy kid from Rhode Island who used to daydream through class, didn't think she had any business at an Ivy League school.

"Never in a million years did I think I was going to get in," says Lee, who was honored this past November at the School of the Arts' sixtieth-anniversary gala. "Getting accepted to Columbia was my first big moment of validation — the first accomplishment that really aligned with this deep passion that I had inside of me. I remember getting in and distinctly feeling like my life was going to change."

At Columbia, Lee experimented with different genres, though animation didn't emerge then as a serious possibility. "It wasn't because I didn't love it," Lee says. "I've been pretty obsessed with animation since I was a kid. It just ended up not being a focus during film school." Instead what Lee got was a master class in the fundamentals of filmmaking — what makes any movie great, whether it's a supernatural romance (yes, that was one of her Columbia projects) or a period drama.

"The first thing you study is character. You learn that insecure characters, characters that don't think they're good enough, aren't very interesting. They're not inspiring or hopeful, and nobody wants to watch them," Lee said in her speech at UNH. "The only characters that are worse are perfect characters. They are lifeless and generic and boring, and they never feel authentic. The best characters, the ones that we want to remember, are flawed and one of a kind."

Lee says that she would not be the filmmaker she is today without the instruction and mentorship of her Columbia professors. Three that stood out were Eric Mendelsohn, for directing, and Malia Scotch Marmo '88SOA and Andy Bienen '96SOA, for screenwriting. Mendelsohn, she says, gave her a "perfect, bold, really thoughtful introduction to direction." On the writing side, Scotch Marmo taught her how to build narrative structure. ("Even now I see so many promising screenwriters who don't know how to end a film," Lee says. "I never have that problem, because Malia taught me.") And Bienen was instrumental in helping her learn how to effectively revise; Lee appreciated his rewriting class so much that she petitioned to take it a second time.

"The greatest revelation from his class was to never be precious about your work," Lee says. "Which has been enormously freeing. I used to be afraid of revision; now I can't wait until I'm done with a draft so that I can rewrite it. And that's what lets me take creative leaps."

Clockwise from left: scenes from *Frozen*, *Ralph Breaks the Internet*, and *Wish*.

Bienen remembers Lee as being warm, upbeat, and truly excited to learn.

"When I look back on my most successful students, they all have one thing in common," he says. "They were eager to make themselves better, to make their craft better. They volunteered for every opportunity to do so. And Jenn is no exception to that."

Aside from the essential work in the classroom, Lee says that she tried to

take advantage of all that Columbia had to offer. She was an older student, in her early thirties — in fact, her daughter, Agatha, was born during her second year at Columbia — and she says that perspective made her value the time and resources in a way she might not have if she had come straight from undergrad.

"When I look back at my time at Columbia, the best thing for me was that I was just working constantly, getting ideas constantly," she says. "I could completely play, try all sorts of different things. I could make mistakes and ask the hard questions without any real-world consequences."

> "*Frozen* was one of the first movies that really put the princesses at the center of the action."

In 2004, Lee won the Ezra Litwak Award for Distinction in Screenwriting at the Columbia University Film Festival for her first feature screenplay, *Hinged on Stars*, about a boy who loses his parents. She says that win was pivotal to her career: it helped her to secure an agent, which in turn led to production companies optioning two of her early screenplays, *The Way Between* in 2006 and *The Roundup* in 2008.

Columbia also introduced Lee to someone who would become a crucial figure in her life and career: Phil Johnston '04SOA, another older student, whom she met on the first day of orientation. "I think we both just came to Columbia with a little more life experience than our classmates," Johnston says. "We clicked immediately."

Lee and Johnston got in the habit of meeting regularly to read each other's work, which Lee says was a "great collaborative experience." While they shared similar taste and sensibilities, Johnston says, they had different styles; his work tended to be more comedic, while Lee's was more dramatic.

"She's just really smart and thoughtful and had, even then, an acute understanding of complex characters," Johnston says. "She was interested in so many things — dreams, metaphysics, *actual* physics. I could go on forever."

Johnston also helped Lee finally tackle some of her deep insecurities.

"I think every artist wrestles with self-doubt, especially when you put so much of yourself in your work," he says. "She wasn't sure if what she was doing was good or interesting. And I think she needed someone from the outside to tell her that it absolutely was."

After the two graduated, Lee cobbled together several freelance projects, while Johnston wrote the 2011 comedy *Cedar Rapids*, starring Ed Helms and John C. Reilly. From there, Johnston moved to Disney to work on *Wreck-It Ralph*, an animated comedy about an arcade-game villain with superhero dreams. Johnston worked on the film for about a year and a half before he had to leave to start another job. He recommended that Lee join the team.

"We knew we needed another writer to come on, and honestly Jenn was the only option for me," Johnston says. "She's so smart with structure, and I knew that she would be able to handle the pressure and manage all of the big personalities in the room."

Lee came to Disney for what was supposed to be an eight-week assignment. But it was extended to full-time and ultimately earned her a cowriting credit on the movie — which turned out to be a critical and commercial success, earning Oscar and Golden Globe nominations for best animated feature.

After *Wreck-It Ralph,* Lee started writing for *Moana*, another Disney animated project in development. But then she was approached by another team that had been working to adapt Hans Christian Andersen's 1844 fairy tale "The Snow Queen." Lee watched an early version and wasn't convinced.

Jennifer Lee and Phil Johnston

ALBERTO E. RODRIGUEZ / WIREIMAGE

She initially turned the project down because she was excited about *Moana*. But the team persuaded her to spend a week with them in the writers' room. By the end of that time, she was sold.

Lee is credited with changing the direction of *Frozen* in ways that surely contributed to its success. At its inception, it was much more of an action-adventure film, and she wanted to go more musical, with more comedic elements. "You can't just do a straightforward story anymore," she says. "People get bored. You have to add layers to it. It has to be evocative."

Twelve years, one sequel, and one Broadway musical later, the world that Lee created and her complex,

beautifully flawed characters live on in a way that most children's movies don't. Open the door to any preschool classroom today and you're bound to hear "Let It Go" blaring from the speakers and see kids in powder-blue Elsa dresses sprawled on the rug. Trick-or-treating routes this past fall were nearly as littered with goofy Olaf snowman suits as they were a decade ago. What is it that made *Frozen* resonate so deeply?

"No matter how hard I try to answer that, I can't," Lee says. Still, she concedes that one reason may be that she and her colleagues were committed to forging their own path, to "flipping tropes" of the typical princess movie.

"There's an archetype of the Disney princess that doesn't do anything," Lee says. "She just waits around for something to happen to her. *Frozen* was one of the first movies that really put the princesses at the center of the action."

Another nontraditional element is that rather than starting with an ordinary girl who wants to become a princess, we learn from Elsa and Anna, born royal but orphaned at a young age, that inheriting a throne can be a mixed blessing. "I wanted it to be about how you deal with your responsibilities in life," Lee says. "Being royalty didn't just give Elsa and Anna luxuries, it gave them responsibilities."

And while many classic Disney movies are love stories, Lee said she wasn't interested in the classic prince-meets-princess tale. There is romance in *Frozen*, but as in life, it's complicated: What Anna thinks is love at first sight turns out to be anything but. "Elsa is crippled by fear," Lee says. "But Anna is held back by a love that she doesn't understand." As in many fairy tales, true love prevails and restores the kingdom to glory. But it isn't romantic love that breaks Elsa's spell — it's the love between the two sisters.

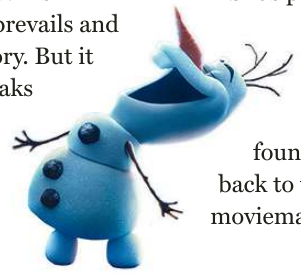
"That was our true north," Lee says. "We really wanted to see another kind of love represented."

It's unusual in animated films to start out as a writer and become a director — most directors start out as animators. But after writing *Frozen*, Lee was asked to codirect it (alongside Chris Buck), becoming the first woman ever to direct a Disney animated feature film. Lee says that she thinks her unusual combination of experience contributed to that decision; she didn't come from a strict screenwriting background. And the collaborative approach, she says, is consistent with the Disney ethos. "When Walt Disney worked, the story artist would be drawing simultaneously. They would craft it together."

In addition to the monumentally successful *Frozen* and its 2019 sequel *Frozen 2* (which she also codirected), Lee has contributed to many of the other successful Disney films of the past decade. She wrote for *Zootopia* as well as *Moana*, and she shared screenwriting credit for the 2018 adaptation of Madeleine L'Engle's *A Wrinkle in Time*.

In 2018, Lee broke another barrier when she took over as Disney Animation's chief creative officer, becoming the first woman to hold that role. In her six years as CCO, she oversaw the production of *Ralph Breaks the Internet* (the sequel to *Wreck-It Ralph*), *Raya and the Last Dragon*, *Encanto*, *Strange World*, *Wish* (which she also cowrote), and *Moana 2*. Lee says that while she had never envisioned herself in the top role, she's enormously grateful for the time she spent there.

"You're in the room every day, helping others bring their vision forward," she says. "You have a hand in every project. You find new patterns, new tools. Without a doubt, it made me a better filmmaker."



She's proud of the work the studio did during her tenure, particularly the difficult pandemic years. But in time she found herself itching to get back to the hands-on work of moviemaking. When the studio started to plan for two more *Frozen* movies, Lee "started to think about where I fit best in the equation." In 2024, she stepped down as CCO to concentrate on *Frozen 3* and *Frozen 4*.

"What I've heard people say is that I'm smiling a lot," she says about getting back to writing.

Lee isn't sure what the post-*Frozen* future holds for her, aside from a long vacation. She's committed to spending some of her time and resources giving back — helping open doors for young artists like the one she once was. To that end, she has recently decided to establish an endowed fellowship fund at the School of the Arts that will make it possible for film students to receive the same kind of financial-aid package that allowed her to attend Columbia.

But Lee also hopes to have time to devote to her own insatiable curiosity — a value that she says Columbia nurtured. "I love the concept of chapters of life. In my next chapter, I want to spend some time learning and absorbing something new from the world," she says. "And if and when I write again, it will be with some of that new knowledge."

Johnston thinks the question isn't whether Lee will write again but what. He hopes that she will move beyond animation and tackle something totally different.

"She has so many interesting ideas and a sensibility that I feel like could make a perfect tiny indie film just as successfully as she could make the next billion-dollar franchise," he says. "There are so many layers to her that the world hasn't seen yet."

Bienen agrees.

"There's a reason why *Frozen* and *Frozen 2* are loved all over the world, and it's not just the great storytelling, and it's not just the amazing songs," he once said. "In my view — and I'm not alone — the *Frozen* movies are luminous films, and they express something profound and wonderful about being human. All of that luminousness and insight comes from Jenn."

DISNEY ENTERPRISES

The Babymakers

Columbia physicians are racing to find new treatments for infertility and recurrent miscarriages. But how far can they push the biology of reproduction?

By David J. Craig

Illustrations by Sophi Miyoko Gullbrants

For as long as she can remember, Lauren Citro has wanted to be a mother. "One of my earliest memories is of running around my yard when an older relative asked me what I wanted to be when I grew up," she recalls. "And I shouted, 'I'm going to be a *mom*!'"

Her dream seemed to be taking shape in 2010, when during her last semester of nursing school, Lauren met Andrew, a young technology consultant who shared her love of children and family, in her hometown of St. Louis. "We talked about kids on one of our first dates," says Citro, who is now thirty-eight. "The desire to be parents was a big part of our bond."

The couple married in 2011 and set about planning a family with the same optimistic sense of purpose that had brought them professional and personal success. They rented an apartment with an extra bedroom suitable for a child and strategized about exactly when to conceive — autumn, they agreed, to ensure a summer birthday. "At first, we used contraception, to give ourselves time to get ready," Lauren remembers. "And then, right before our second anniversary, we decided, 'OK, we're ready to do this. Let's make our family now.'"

The Citros expected to be celebrating within weeks. But the positive pregnancy test never came. "I knew on a rational level that even young, healthy people don't always get pregnant right away, but it was still an emotional blow," Lauren says. "I'd always assumed that I'd get pregnant when I was ready."

After almost a year of trying to conceive, Lauren spoke to her primary-care physician, who prescribed her Clomid, a drug that stimulates the ovaries to release more eggs than usual each month. When this didn't lead to pregnancy, Lauren started seeing fertility specialists. They recommended intrauterine insemination, or IUI, one common type of artificial insemination, in which sperm is inserted directly into the womb. When that too failed, the Citros moved on to in vitro fertilization, or IVF. The most powerful fertility treatment available, IVF involves surgically removing eggs from a woman's ovary, placing them in a petri dish with eager sperm, incubating the resulting embryo for a few days in the laboratory, and then implanting it into the uterus. It is expensive, time-consuming, and physically grueling. Women endure weeks of hormone injections that cause bloating and mood swings, followed by invasive egg-retrieval procedures that may leave their bodies bruised and sore. Yet IVF is also highly effective, with healthy women under the age of thirty-five typically succeeding in having a baby within a few tries. Lauren's case proved unusually challenging, though. Doctors struggled to find mature eggs in her ovaries, to coax those eggs to become healthy embryos, and to get those embryos to implant properly in her womb. She finally became pregnant through IVF in 2016 but miscarried within a few weeks. The next year, the same thing happened.

"When IVF didn't work for me, it was a whole different level of heartbreak and confusion," she says. "I started to feel like I had no control over my body, over my life."

Lauren and Andrew were hardly ready to give up, though. Like so many couples who experience multiple miscarriages, they only became more determined, moving from clinic to clinic, drawn by promises of better odds. Over the next several years, they visited four different fertility centers on the West Coast, where they'd relocated for work, spending more than $100,000 on IVF-related procedures. All of them ended in disappointment. Along the way, doctors ran tests for the most common causes of implantation failures and miscarriages — hormonal imbalances, immunological issues, genetic abnormalities — but found nothing unusual. "Everyone reassured us there was nothing to worry about and that we'd get there eventually if we just kept trying," Lauren says. "They said it was a numbers game and that persistence would pay off."

By 2021, after a third miscarriage, Lauren was physically and emotionally drained. "The grief I went through every time was unbelievable," she says. "We lost all of our pregnancies early, but they were still babies to me." Her pain was intensified, she says, by a fear that she was somehow to blame. "I'd heard that miscarriages could be triggered by psychological stress and all sorts of other factors, from gluten to processed foods to too much exercise to not enough. And I realized that I'd eaten fried food on the day of my last miscarriage. So for a while I was convinced that's what did it."

Then one evening, curled up on her couch with a cup of tea, Lauren opened her laptop and clicked on a series of informational videos recommended by a nursing colleague who knew what she was going through. On the screen appeared Zev Williams, a reproductive endocrinologist who directs the Columbia University Fertility Center (CUFC). He discussed his team's research on recurrent miscarriages, a problem that he said affected tens of thousands of couples in the US every year but had long been overlooked by the medical establishment. Williams explained that while doctors only identified the cause in a fraction of such cases, many more could be diagnosed and even prevented. A woman's own behavior, he emphasized, was almost never to blame. "It was the first time I'd heard that miscarriages like mine weren't just bad luck or something you could fix yourself," Lauren remembers.

The next day, she reached out to Williams's office at Columbia and scheduled a telehealth appointment with him, thinking of it as a last-ditch effort to find answers before giving up on fertility treatments for good. A few weeks later, she found herself speaking with Williams over Zoom and engaging in the longest, most thorough medical consultation she had received in her eight years of treatment. Williams spent more than an hour asking open-ended questions about every aspect of her health history — her energy levels, digestion, menstrual cycles, weight fluctuations, even childhood illnesses. "He asked me different questions than other doctors," she says. "It was more about my whole-body health rather than just my reproductive system."

Drawing on that conversation and his encyclopedic knowledge of risk factors for miscarriage, Williams ordered a battery of tests that no other physicians had thought to run. Among them was a blood test to measure insulin levels and a uterine biopsy to check for a particular type of viral infection. "Sure enough, the results came back showing that my insulin was high — which nobody would have guessed, since I'm pretty small," Lauren recalls. She also harbored a long-dormant infection in her womb. Both were treatable with cheap, safe medications that Williams prescribed. Lauren completed several courses of treatment under the oversight of Columbia nurses and then, in December of 2021, underwent a new embryo transfer at a clinic in California.

Soon after, they saw a plus sign on a pregnancy test. "Of course, we'd been there before," Lauren says. But the next month, during an ultrasound examination, she witnessed something new: images of a small dark sac forming in her belly, and within it a pea-sized embryo just beginning to pulse with electrical activity. A few weeks later, a tiny body appeared, its spine curled in on itself, with delicate arms and legs starting to bud. "I talked to my baby in bed after that," Lauren says. "I'd say, 'I'll take care of you, I promise. My body is a safe place. Please stay with us this time.'"

Columbia doctors have become internationally renowned for taking on the most difficult cases of infertility.

Today about 15 percent of American couples who are trying to conceive will be unable to do so after a year. Another few percent will get pregnant but endure repeated miscarriages. The causes of such reproductive challenges, scientists say, are split about evenly between male and female factors. Some couples will find an easy solution, perhaps learning to

time intercourse around ovulation or to cut back on alcohol, drugs, or smoking. Others will manage to get pregnant after receiving treatment for underlying conditions like endometriosis or blockages of the reproductive tract. Women with autoimmune conditions — which can cause the body to mistake a fetus for a foreign invader — are often able to carry a baby to term with the help of immunosuppressant drugs. In fact, most people who find it difficult to have children will ultimately succeed without the help of "assisted reproductive technologies" like artificial insemination or IVF. But for those who continue to struggle, IVF is a powerful last resort, now accounting for nearly 3 percent of all US births, or about a hundred thousand each year.

"In vitro fertilization is one of the great triumphs of modern medicine," says Williams, seated in his office on a crisp fall day at CUFC. "It's given millions of people who wouldn't otherwise be able to have biological children the chance to do so."

Indeed, since IVF first became widely available in the 1980s, it has evolved from a niche procedure intended mainly for women with uterine malformations into a versatile tool for addressing many forms of infertility. Used in conjunction with other advanced technologies, IVF can now help people with poor egg quality, low sperm count, and dangerous genetic mutations to have kids. Combined with egg freezing or donor eggs, it can effectively extend women's fertility window by several years. The procedure has also become affordable to more Americans — one in four now have health insurance that covers it — and success rates have risen, with more than half of all couples who turn to IVF eventually bringing a baby home.

But what about those who don't find success? How far should doctors be expected to go to help couples who, like the Citros, experience only anguish? This question is at the heart of a debate that has been simmering in the field of fertility medicine for years and that has intensified recently as IVF has grown into a billion-dollar industry. It involves not only scientific uncertainties about how to diagnose and treat infertility but also ethical concerns about whether administering the same costly IVF procedures to some couples over and over again, without knowing why they're failing, risks exploiting their hopes. *The Lancet*, in a recent issue focused on fertility science, pointed to the corporatization of the US fertility sector — where about one-third of IVF cycles are now done at clinics owned by private-equity firms — as a major point of tension. The journal warned that as fertility centers have been snapped up by profit-driven entities, financial incentives may have begun to influence clinical decisions, encouraging doctors to promote expensive, emotionally wrenching treatments without fully assessing patients' needs. "The fertility sector," its editors wrote, "has now spawned an entire industry that risks exacerbating rather than alleviating the psychological toll of infertility."

As this debate has swirled, Williams and a dozen other physicians at the Columbia University Fertility Center have been pioneering a different model of fertility care, one that prioritizes in-depth medical investigation and patient well-being over volume or profit. Devoting extraordinary amounts of time to patients and utilizing an array of novel clinical methods, the Columbia doctors have become internationally renowned for taking on the most difficult cases of infertility. Their reputation for providing creative individualized care — extended even to patients who are just beginning to try to get pregnant — recently earned CUFC the top spot in *Newsweek*'s list of America's best fertility centers.

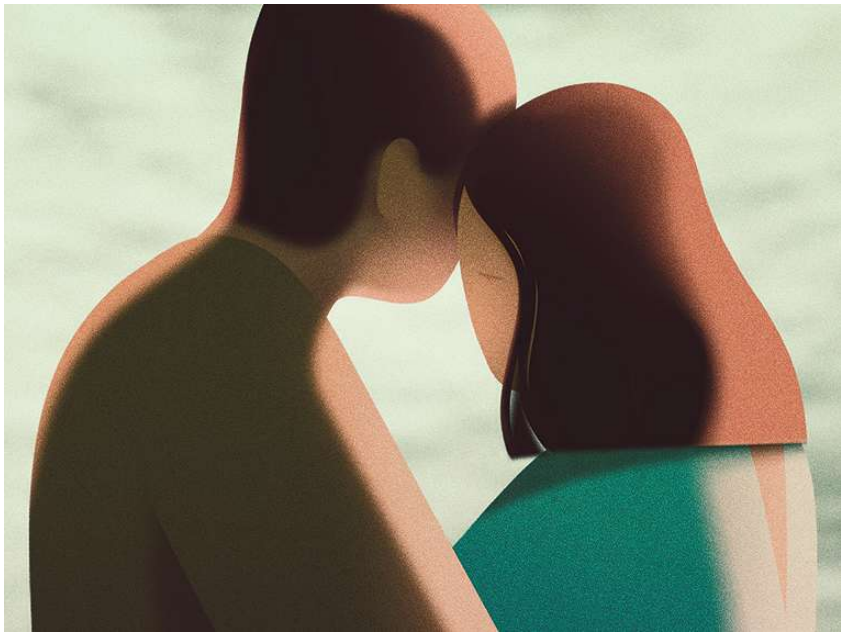
Zev Williams at the Columbia University Fertility Center.

"What's unique about our approach is the level of attention we're willing to devote to every patient," Williams says. "Whether someone has been trying to conceive for a few months or years, we tailor our strategy to their unique situation." The Columbia physicians also make a point of attending to the psychological strain of infertility, taking time to explore how grief and anxiety may be affecting a patient's experience. "We might offer counseling or just take a few minutes to chat with people at the end of an appointment," he says. "It's important that they feel seen and heard."

LEN SMALL / COLUMBIA MAGAZINE

The most difficult part of the doctors' work is figuring out why someone isn't conceiving or carrying a baby to term. "But if you can identify the reason, there's often a way forward," Williams says.

In their quest for answers, CUFC physicians have become prolific researchers as well as inventors, developing an arsenal of new clinical tools. Some of the technologies they've created in recent years include a portable device for rapidly detecting chromosomal irregularities linked to miscarriages; an ultrasensitive genetic test for evaluating the health of sperm cells; and an AI-based system for identifying and gathering viable sperm from semen samples collected from men previously thought to have none. The last example, called the Sperm Tracking and Recovery system, or STAR, was recently named one of the best inventions of 2025 by *Time* magazine. "We're finding that many men who've been told they are completely sterile can actually become fathers," Williams says, noting that the technology is designed to be used in conjunction with IVF.



Even with these high-tech tools, Williams says, the real work of addressing patients' fertility issues often begins the old-fashioned way, with careful medical sleuthing. This is especially important, he says, in treating patients who have experienced repeated miscarriages, preterm births, or implantation failures. Such cases, which are notoriously complex and often involve numerous overlapping causes, make up a large share of CUFC's caseload. "Many of the people who come to us are at the end of a long and painful journey," Williams says. "They've been to multiple clinics, known only frustration, and feel they've run out of options." Conventional wisdom among fertility specialists, he says, is that clear medical explanations can be found in no more than half of such cases. "So when standard tests don't reveal a cause, women are just told it's a fluke and to keep trying."

Physicians at CUFC take a different approach. Rather than accepting that many cases of recurrent pregnancy loss are inexplicable, they are willing to push beyond the boundaries of traditional practice, probing risk factors that have been described in emerging research but not yet included in official clinical guidelines. "If you only look at those risk factors that have been corroborated by large studies, you won't be able to help significant numbers of people," says Eric Forman, a Columbia physician who serves as the clinic's medical and laboratory director.

More than once, CUFC doctors have identified new risk factors that have later proved useful in helping their own patients. For example, two years before Williams diagnosed the problem in Citro, he led a Columbia study that revealed that elevated insulin levels can damage placental cells. "We showed how the biology works on a molecular level and how it could be treated," he says. Since his team's findings were published, a number of other fertility clinics have started testing for insulin levels as well, Williams says. "I know because patients referred to us now sometimes show up with those test results already in hand."

Despite the demanding nature of the cases that the Columbia center attracts, its results are remarkable. Each year, hundreds of couples with previously unexplained cases of infertility and recurrent pregnancy loss seek treatment at CUFC, and Williams says that he and his colleagues are able to help more than 80 percent of them have babies.

The field of fertility medicine is still young. As recently as the mid-nineteenth century, many scientists still believed that sperm cells contained fully formed miniature humans — homunculi. It wasn't until the 1870s that they observed that sperm and egg cells must merge to create an embryo, which then grows, step by step, into a new organism. Columbia biologists Edmund Beecher Wilson '29HON and Thomas Hunt Morgan added a crucial piece of the puzzle around the turn of the twentieth century when they showed that genetic instructions inherited from both parents, via their gametes, guide a person's development. Researchers then began describing the wider physiological processes involved in

human conception and gestation. By the 1950s, they had developed drugs to stimulate the maturation of eggs in women whose bodies produced too few of them and had begun conducting animal experiments to see if eggs might be fertilized outside the body — say, for the benefit of women whose fallopian tubes were blocked — and safely returned to the womb.

In 1978, the birth of Louise Brown in the United Kingdom, the world's first baby conceived through in vitro fertilization, set off a race among top medical centers to refine the method and make it accessible to more patients. Columbia's fertility center opened in 1983, becoming one of the first academic clinics in the US to offer the procedure. In the ensuing years, its physicians helped to define standards for assisted reproductive techniques, showing how scientific advances in egg retrieval, hormonal stimulation, embryo handling, and egg freezing could be safely implemented at scale.

Zev Williams, a fifty-year-old native of Ottawa, became interested in recurrent pregnancy loss during his residency at Brigham and Women's and Massachusetts General Hospitals in Boston in the early 2000s. What struck him first was the sheer complexity of the human reproductive system and how mysterious so much of it remained. "The number of things that must go right for a baby to be born, the number of physiological systems that must be coordinated — all with exquisite timing — is just extraordinary," he says. "And I was astonished by how much we still didn't know about it. The opportunities to contribute, both as a scientist and doctor, bringing empathy and comfort to people in pain, seemed limitless."

Williams began treating people for infertility during his fellowship training at Weill Cornell Medical Center in 2008. He found the work deeply rewarding. "To help bring new life into the world, and all of the joy that accompanies that, is profound," he says. "You're thinking about not just that particular baby but also the children he or she might eventually have, and their children, and so on. It's a remarkable thing to be involved with."

Equally powerful, though, was witnessing the sorrow people felt when fertility medicine fell short. Williams says he can still recall one couple he cared for, early in his career, who had lost nearly twenty pregnancies. "I was part of a team that couldn't figure out what was going wrong," he says. "The couple was determined to keep trying, and all we could say was, 'We're sorry. We're unsure how to help you.' And that struck me as a terrible failure on our part. I thought, We have to learn to do better than this."

Soon Williams was accepting patients who had been turned away by other doctors who told them that they would never be biological mothers. He also began applying for grants to study infertility and recurrent pregnancy loss. One study at a time, Williams and a circle of collaborators began filling in the gaps of knowledge that had long stymied the field. Several of their papers revealed that embryos communicate with the uterus in ways that scientists had never realized before, and that the timing and intensity of this molecular chatter could influence a pregnancy's chances for success. Taken together, the studies helped to validate an idea that was still controversial at the time: that recurrent miscarriages weren't just a matter of statistical chance but had biological roots that could be identified and treated.

At the same time, Williams grew troubled by how his patients often spoke about their losses. "It seemed clear that in the absence of medical explanations, they were turning inward for answers, punishing themselves with self-criticism." So Williams began to study cultural perceptions of pregnancy loss, revealing how silence around the subject often leaves women to grieve alone. In one 2015 study analyzing national survey data, Williams found that American men and women wrongly assume that miscarriages are rare (in fact, 15 to 20 percent of pregnancies end in one) and that women who suffer miscarriages tend to feel guilty, ashamed, and socially isolated afterward. In lectures and writings that followed, Williams argued that doctors needed to show more empathy to patients, in addition to improving treatments for recurrent pregnancy loss.

Women who suffer miscarriages tend to feel guilty, ashamed, and socially isolated afterward.

By 2017, Williams's research and advocacy had begun attracting national attention, including from Mary D'Alton, the chair of Columbia's obstetrics and gynecology department. Under D'Alton, the department had already become known for providing innovative care to women with high-risk pregnancies, and she was then reimagining CUFC as a destination for similarly complex cases of infertility. When she met Williams, she says, their connection was immediate. "We agreed that by combining cutting-edge science and compassionate care, we could create the best fertility center anywhere," she recalls. "And Zev was quietly confident about how to go about that. He had a real clarity and ambition of vision. I knew within minutes we'd found our new leader."

On a Friday afternoon at the Columbia University Fertility Center, perched at the top of a Beaux Arts office tower in Midtown Manhattan, Zev Williams greets a visitor with the enthusiasm of a proud homeowner giving a tour. The space, which CUFC has occupied since 2018, feels more like a wellness spa than a medical facility. All the details, Williams explains, were chosen with care: the muted earth-tone walls that diffuse the natural light pouring in; the front desk, set at the right height for the average woman; the midcentury couches, voluptuous sculptures, and classic paintings that soften the usual clinical austerity of such places. Every element, he says, is meant to soothe and reassure. "Fertility care has such an emotional aspect," he says. "We wanted to respect the vulnerability that so many people feel when they come in here."

The front lobby is bustling, with patients checking in, nurses ushering them to egg retrievals and implantations, and couriers arriving with fluid samples. On one counter sits a stack of discreet white boxes: at-home semen-collection kits for men, who no longer need to provide samples in sterile clinic rooms, and pain-free home blood-collection kits for women, which are designed to spare them the daily in-office pricks once required to monitor hormone levels. This technology, Williams notes, grew out of CUFC's research-and-development program, which aims to make fertility treatment not only more effective but more humane. "Women told us that they dreaded the constant needle jabs," he says. "When we made that part of the process easier, more stayed in treatment, and success rates actually went up."

On the floor above, the atmosphere shifts. Standing at lab benches, groups of scientists in white coats are pipetting, labeling, and loading samples into spinning centrifuges and imaging machines. This is the heart of CUFC's research-and-development operation, where biologists, geneticists, endocrinologists, and others conduct experiments alongside lab technicians and clinical scientists who handle routine analysis of patient samples. "Having everyone in the same space sparks creativity," says Williams. "The scientists get ideas about how to improve our procedures by observing and talking with the clinical staff." At one station, a young lab worker named Yejin Bann sits before a computer monitor as black-and-white images flash by too quickly for the human eye to follow. She's overseeing the STAR system — the AI-powered platform that analyzes semen samples, two thousand frames per second, to identify healthy sperm cells. Every so often, a blue box flashes on her screen, marking one that the algorithm has spotted. Bann pauses the feed to confirm. "We need to make sure it's actually a sperm and not some debris," she says. "But this is definitely a sperm. It looks like a strong one."

Once cleaned and prepared, these sperm will be injected into eggs down the hallway in the state-of-the-art embryology lab. If all goes smoothly, this will make a father of a man who was previously told that his low sperm count made this impossible. In the past, his only option would have been to undergo a painful operation to remove tissue from one of his testicles in hopes that sperm could be extracted from it. But testicular biopsies don't always succeed, and the Columbia team has shown that STAR works better. Williams and his colleagues recently made international headlines when a New York City couple who had been trying to have a child for eighteen years succeeded in getting pregnant using STAR.

"Usually a semen sample contains two to three hundred million sperm cells, but these patients may only have one or two. We only need one," says Williams, who oversaw STAR's development with Hemant Suryawanshi, a Columbia assistant professor of reproductive sciences.

STAR is perhaps the clearest example yet of CUFC's mission to make infertility a curable condition. But just a few steps away, Williams's colleagues are testing the next wave of ideas. One group is experimenting with a novel type of light therapy, called photobiomodulation, to see whether it can repair the oxidative damage found in certain embryos, including those derived from eggs of older women. Another is studying whether the drug rapamycin, a common immunosuppressant, might be used to slow the pace of ovarian aging and thereby delay menopause and extend women's fertility a few years. Preliminary research indicates that this is safe and may even provide other health benefits, according to Williams, who is now enrolling participants in a large clinical trial with fellow Columbia medical researcher Yousin Suh. "The ovaries are endocrine organs that influence aging processes throughout the body," says Suh, "so it seems that when you slow their aging, you slow aging everywhere."

Of course, these experiments raise deeper questions about how we define infertility and how far medicine should go to try to extend the biological clock. As women and men age, the quality of their eggs and sperm declines, and studies have shown that children born to older parents — whether naturally or through IVF — face modestly increased risks of genetic and developmental disorders. Partly for this reason, most fertility centers set firm age limits: typically around forty-five for women using their own eggs and fifty for those using donor eggs. (Egg quality deteriorates much faster than sperm quality, making a woman's age the more important factor.) Columbia's center, by contrast, avoids rigid cutoffs, treating age as just one consideration among many in assessing a woman's ability to carry a pregnancy and her prospects for having a healthy child. The Columbia clinicians say that being embedded within a major academic research

hospital helps them to navigate these risks more thoughtfully and to work with patients to determine what is appropriate for them. "We're in close contact with leading experts in many departments — from cardiology and nephrology to maternal-fetal medicine and genetics — who help us evaluate these cases on an individual basis," says Forman, CUFC's medical and laboratory director. The center also assesses the health of sperm, eggs, and embryos using some of the most sophisticated genomic-screening technologies available, including several of their own invention. And Williams is involved in efforts to develop new molecular methods of assessing women's physical capacity for pregnancy. "A person's chronological age is hardly a precise measure of their overall health," he says. "Thanks to advances in genetics and epigenetics and our close collaboration with colleagues across Columbia's obstetrics and gynecology department, we can now more accurately assess each patient's risks and manage them before and throughout pregnancy."

The cost of fertility treatments is another challenge. Each new molecular test, genetic screen, or advanced embryo assessment can add thousands of dollars to an IVF cycle that already costs $15,000 or more. And while a growing number of US health-insurance plans now cover IVF, they typically do not pay for the kinds of novel technologies that Williams's team is developing. He hopes that will change as insurers recognize their long-term value. "If these tools reduce the number of IVF cycles that couples must go through to have a child," he says, "it will lower the total cost of treatment and make it affordable to many more people."

To date, most of the new diagnostic and treatment methods that Williams's team has developed are used only at CUFC, but he expects that in time they will spread to other clinics and become part of standard fertility care.

Lauren and Andrew Citro are grateful for the Columbia care they received. In the summer of 2022, they welcomed their first son, Everett — a golden-haired boy who loves planets and asks endless questions — and two years later they brought home his little brother, Atlas, who is equally bright, with an adventurous spirit that delights and amuses his parents. "To say they are my pride and joy doesn't cut it," Lauren says. "They are my gems, and I'm obsessed with them both."

Lauren and Andrew Citro with their sons Everett and Atlas.

No one can say for sure why the Citros' story ended the way it did, given that the science of fertility is so complex. But Lauren followed the same multifaceted treatment that Williams recommended before conceiving both of her boys, and she soon plans to repeat the regimen in anticipation of what she hopes will be her third successful embryo transfer.

Asked what she might have done if Everett and Atlas hadn't come along, Lauren pauses. "It's hard to imagine. There would have been so much grief. But I've seen other people work through that pain and build fulfilling lives, and I think we would have been able to eventually." She says it helped that Williams never promised her a baby. "That was ironic, because other doctors had given me false confidence, which made me feel like it was my fault when I lost my pregnancies."

Williams says that one of the most difficult parts of his job is helping patients decide how long to keep trying to have biological children. Some will decide rather quickly — perhaps after an IVF cycle or two — to shift course. They may decide to use donor eggs or sperm, or a surrogate carrier, or they may choose instead to adopt or to devote themselves to nephews and nieces. But others will persist for longer than anyone around them can fathom, longer than reason alone can explain, searching for children they seem to feel already exist, if only they could reach them. And inevitably, in the course of that journey, some well-meaning friend or family member will gently suggest, perhaps only insinuating: Maybe nature is trying to tell us something — that it isn't meant to be?

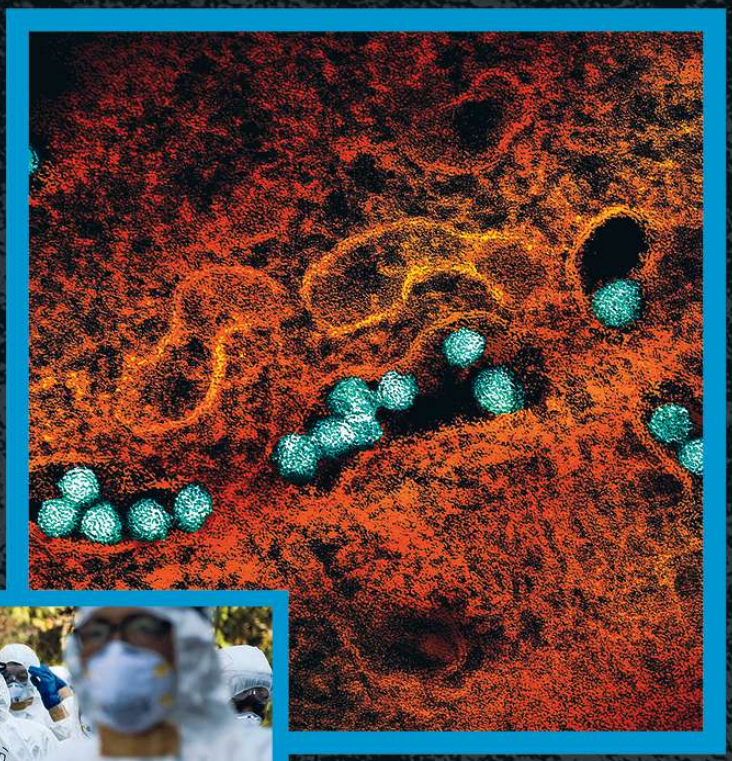
"And I totally reject that notion," Williams says. "I don't see infertility as nature's way, or God's way, of signaling that some people shouldn't have children. The message isn't 'Give up.' The message is, 'Here's an imperfect world. Here's a person who *is* meant to be a parent, but something isn't working the way it should. It's our job to fix it.'"

CHRISSY WALTHER

Night of the Virus Hunters

Hit with budget cuts, Columbia's Global Alliance for Preventing Pandemics is doing all it can to stop the next mass outbreak By Paul Hond

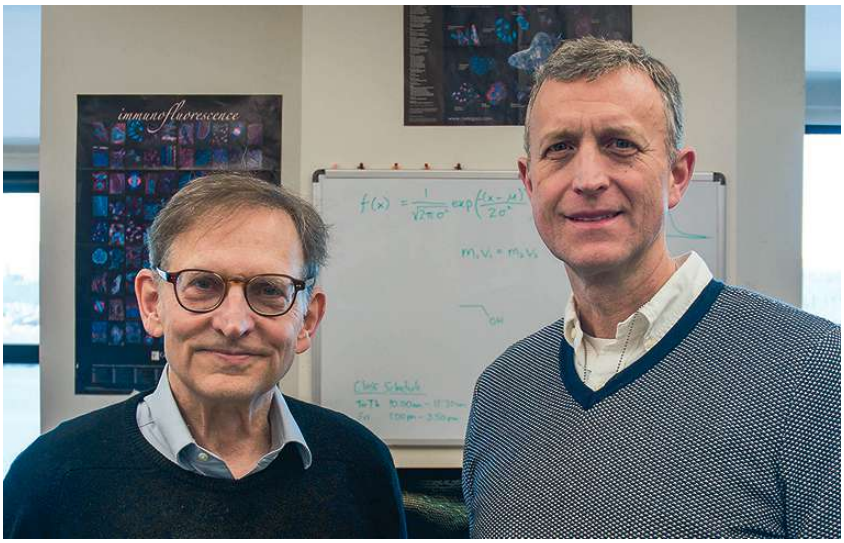
It was the week when Iceland's first mosquito was discovered and when authorities confirmed that a Long Island resident had contracted the mosquito-borne and typically tropical chikungunya virus; when an outbreak of Rift Valley fever (mosquitoes) killed dozens of people in West Africa; when Missouri reported three deaths for the year from West Nile virus, California identified three cases of mpox, and Arizona and Utah counted more than a hundred cases of measles; and when influenza was spiking in Japan and Taiwan and climate denial, anti-vaccine sentiment, and funding cuts for public health were endemic in Washington. Which is to say, it was just another week in the fall of 2025 and as good a time as any to ask Ian Lipkin, renowned "virus hunter" and epidemiologist at Columbia's Mailman School of Public Health, what keeps him up at night.




no
flu shot
mandate

On the top floors of the Allan Rosenfield Building at Haven Avenue and West 168th Street, Lipkin presides over the Center for Infection and Immunity (CII), which he founded in 2008 to track infectious diseases, identify pathogens, and trace the virological causes of chronic illnesses. CII scientists have worked in hot zones all over the world and identified more than 2,500 viruses.

"Our focus is always on: Why are people sick?" Lipkin says. "What is the agent causing the sickness? How can we detect its presence, and what insights can that give us into what drugs might be useful and what vaccines should be made?"



Ian Lipkin and Ken Wickiser

To help answer these questions, Lipkin in 2015 introduced an innovative technique in virus diagnostics. Called the virome capture sequencing platform for vertebrate viruses, or VirCapSeq-VERT, the method can quickly identify any virus that infects mammals, birds, fish, reptiles, or amphibians. Almost immediately, Lipkin began thinking about how to efficiently bring VirCapSeq-VERT to the places — mainly in Africa and Asia — where most viruses emerge. This was public-health common sense, since viruses readily cross borders and oceans, but it also spoke to Lipkin's commitment to his ethical obligations as a medical doctor. In 2019 — wanting, as he says, to "teach people to fish" and build diagnostic proficiency and independence — Lipkin conceived of the Global Alliance for Preventing Pandemics, or GAPP, a training program that would teach clinicians around the world how to use CII's signature diagnostic tool.

But just as Lipkin was getting GAPP off the ground, a new respiratory virus appeared in Wuhan, China. The virus, which caused coronavirus disease 2019 (COVID-19), killed thousands of people in Wuhan and spread to every continent. By the spring of 2020, New York City had become the first US epicenter of the pandemic, recording hundreds of deaths each day. Lipkin, locked down in Upper Manhattan, plowed ahead with GAPP. What he needed was the right person to run it.

Around that time, fifty miles north of the city, biochemist Ken Wickiser, a tenured professor and associate dean of research at the US Military Academy at West Point, was torn. A former Army pilot, Wickiser was focused on keeping West Point operational during the pandemic. But the images of the mobile morgues in New York were like a call to action. "I thought, I need to be in this fight," he says. He had heard about Lipkin's idea of teaching the VirCapSeq-VERT method to people in virus-vulnerable regions and could think of no better way to respond to a pandemic than to stop the next one. "So I contacted Ian and said, 'Let me do this. Let me lead GAPP,'" Wickiser recalls. "And he did."

Wickiser arrived at Columbia in 2021, and he and Lipkin crafted a training curriculum. Wickiser then hired Jack Collins, a student intern at GAPP, as a lab technician and technical instructor and recruited Samuel Yingst, an American veterinary microbiologist based in Cape Town, South Africa, to manage international projects. (Yingst and Wickiser had overlapped as cadets at West Point but didn't know each other.) With funding from the Skoll Foundation, a philanthropic institution headed by eBay's first president, Jeff Skoll, as well as grants from the National Institutes of Health (NIH), GAPP held its first training session in 2021 and was poised to play a crucial role in virus detection and global public health.

Viruses are submicroscopic particles consisting of genetic material (DNA or RNA) encased in a protein shell. They proliferate — and make us sick — by invading a host cell, hijacking its machinery, and replicating itself. The difficulty with identifying a pathogen in a given diagnostic sample — blood, mucus, urine, feces, tissue, or wastewater — is that viruses are minuscule in size and number in proportion to the host material (DNA, cells, bacteria). In traditional diagnostic methods, the entire sample is analyzed, including the hundreds of millions of irrelevant gene sequences. That makes virus identification arduous and time-consuming — and that's where Lipkin's method comes in.

VirCapSeq-VERT separates out the viruses by harnessing the biological law that a single strand of DNA will always bond with a complementary strand. In Lipkin's analogy, VirCapSeq-VERT

LEN SMALL / COLUMBIA MAGAZINE

acts like a magnet that draws needles from a haystack. The key to the method is the process of "capture enrichment," in which clinicians use synthetic, single-strand DNA and RNA virus "probes" to attract the targeted viral DNA and RNA in the sample. Once they isolate the viral strands, they fragment them, "amplify" or copy them, and give each strand a unique DNA "barcode" for identification. Then they place them on a glass slide and feed them into a machine called a sequencer, which reads the order of a strand's DNA bases (adenine, thymine, cytosine, and guanine) and expresses this code as a string of letters (A, T, C, G). Because the sequencer reads only the viruses and not the other genetic sequences in the sample, it takes hours instead of days.

The clinicians then run the lettered sequences through a database to determine whether the pathogen is a known virus, a variant, or something entirely new — giving them a better chance at keeping it from spreading.

"We're trying to identify a virus at the early stages," explains Collins, "before it ever becomes a pandemic."

GAPP has taught the VirCapSeq-VERT method to clinicians from Africa (Mali, Zambia, Liberia, Kenya, Zimbabwe, South Africa, Nigeria, the Democratic Republic of the Congo), Asia (Bangladesh, Sri Lanka, Taiwan), Europe (the UK, the Netherlands, Germany), and the Americas (Mexico, Ecuador, Nicaragua). "I don't care where we go," Lipkin says, "as long as we can figure out the origin of a problem and help people solve it."

For the first couple of years, GAPP brought over public-health counterparts in Africa for a three-week training program at Mailman. Then, in 2023, GAPP began going abroad: Yingst, from Cape Town, would assess the labs in partner countries to let his New York colleagues know what was needed and what to expect, and then Collins would fly over and do the training. In 2025, for instance, Collins traveled to the Democratic Republic of the Congo (DRC), a country of 109 million people in Central Africa, where scientists were trying to get a handle on the mpox outbreaks that began in 2022 and the perpetual threat of an Ebola outbreak (there have been sixteen in the DRC since the virus was discovered in 1976).

In a lab in the capital city of Kinshasa, the GAPP team tested different types of samples to see if there were any other viruses circulating that caused a similar type of disease to mpox. Such surveillance is critical: in any outbreak, people get sick from other pathogens, but without good diagnostics, their symptoms may be wrongly attributed to the dominant illness. That means many patients don't get proper treatment — and many die.

"The DRC commonly has outbreaks of unknown origin," says Collins. "There have been a couple lately that have required the World Health Organization to respond. They will collect samples of what they suspect is a viral hemorrhagic fever, and we'll do testing for the most likely and concerning viruses, such as Ebola and Marburg. And if those test negative, we can use our method for investigating other potential viral causes that might not be suspected."

In Mali, a West African country of twenty-three million people, GAPP has helped scientists sequence samples that tested positive for the dengue virus (mosquitoes) and analyze the geographic and temporal transmission of different dengue virus types throughout West Africa.

"We go to places that other people either aren't invited to or are afraid to go, whether due to political instability or health risks, and Mali is one of them," Wickiser says. "Mali suffered a huge dengue outbreak and many people died, including one of our collaborators. But the people there are completely trustworthy, top-notch clinicians and scientists, and they have taken what we have taught them and made it so routine that they can train more and more people."

GAPP wants desperately to continue this progress, but Lipkin has had to scale back. In March 2025, the Trump administration canceled $400 million in federal research grants and contracts to Columbia. The Mailman School relies on these grants, and Lipkin had to let go a quarter of his staff of highly trained virologists. He publicly warned that without government grants, Columbia would not survive as a research institution — an untold cost that weighed heavily on the University community.

"I don't care where we go," Lipkin says, "as long as we can figure out the origin of a problem and help people solve it."

In the end, Columbia negotiated with the government to restore funding, but Lipkin says that CII has recovered only 60 percent of what it had: not all the federal money has returned, and private funding has also been stretched thin as demand has grown.

"So many of the resources that we've counted on have dried up — from NIH, from CDC, and from philanthropy," Lipkin says. "We're not whole."

"Before, we never said no to people," says Wickiser. "Now we have to say no. It's hard and heartbreaking. People are dying, but I can't send supplies or staff I don't have."

PREVIOUS SPREAD: MOSQUITO: ACHKIN / SHUTTERSTOCK; SLIDE OF WEST NILE VIRUS: NIH-NIAID / IMAGE POINT FR / BSIP / ALAMY; AVIAN-FLU WORKERS: KYODO NEWS VIA GETTY IMAGES; MPOX-INFECTED HANDS: CDC / IMAGE POINT FR / BSIP / UNIVERSAL IMAGES GROUP VIA GETTY IMAGES; SIGN: SCOTT EISEN / GETTY IMAGES

Lipkin's career was shaped by one of the worst viral outbreaks of the twentieth century. In 1981, the Chicago-born Lipkin, who had studied theater and philosophy at Sarah Lawrence College and earned his medical degree at Chicago's Rush Medical College, was a twenty-nine-year-old neurology resident at UC San Francisco. There he saw men — mostly young, gay, and otherwise healthy — come into the clinic, one after the next, with unexplained symptoms: fevers, respiratory failure, strange rashes, brain tumors.

Many doctors refused to see these men for fear of stigma or contamination. Not Lipkin: Wanting to learn as much as he could, he saw hundreds of patients and identified symptoms that he showed could be treated with plasmapheresis, a procedure in which harmful autoantibodies induced by the infection are removed from a patient's blood by separating the plasma from the blood cells.

"It took so long to figure out why people were sick, and in the interim, because there were no diagnostic tests, millions of people became infected and millions of people died," Lipkin says of the HIV/AIDS crisis. "At that time, people were using very cumbersome, relatively slow methods for identification of infectious agents, and it was clear to me that we needed a faster diagnostic tool capable of working anywhere in the world."

Lipkin had found his life's work. He got a fellowship in molecular biology and neuroscience at the Scripps Research Institute, where he started using a molecular-biology technique called "subtractive cloning" to isolate viruses. Lipkin would mix two samples of DNA — a control and a target — and remove all the material common to both, leaving only unique single strands in the target sample: the genes, presumably, of the virus. These strands could then be cloned and studied. Lipkin used this method to make key advances in virus isolation, and the Pew Charitable Trusts, taking notice, gave him money to develop his diagnostic tools.

That investment yielded dramatic results. In the late summer of 1999, a cluster of meningoencephalitis cases turned up in the New York City area. There were also a lot of dead birds around, though at first no one made a connection. Ultimately, fifty-nine people fell ill, and seven died. Lipkin, then director of UC Irvine's Emerging Diseases Laboratory, was intrigued and offered his help. His team analyzed tissue samples from three human victims and found that they had contracted West Nile virus: Mosquitoes had bitten infected birds (themselves infected by mosquitoes) and then passed the virus to humans. It was the first time the virus had been found in the Western Hemisphere. The discovery made Lipkin's name in the field of epidemiology, and Columbia hired him in 2001.

> "We have to enable every country on the planet to be able to quickly identify novel pathogens within their borders, by themselves."

Lipkin was just settling into his lab at Mailman at the time of the terrorist attacks of September 11, 2001. A week later, envelopes containing anthrax spores turned up at the US Capitol, the first in a monthlong string of mail attacks that would kill five people and sicken seventeen. This triggered a new national fear: bioterrorism. "At that point, there was a big concern that people would weaponize infectious diseases like smallpox," Lipkin says. Anthony Fauci, then the director of the National Institute of Allergy and Infectious Diseases, called for a biodefense initiative that would bring together the best minds in the country to study the risks. The US government established the Northeast Biodefense Center, a consortium of twenty-eight medical schools and research institutes, including Columbia, Yale, Cornell, Rutgers, and NYU. Lipkin was director for eleven years.

"Billions of dollars went into it, and we are still reaping those benefits, because we wouldn't have been able to respond as rapidly as we did to SARS or SARS-CoV-2 or mpox or many other things," Lipkin says. "All the platforms you need to make vaccines, to do diagnostics, were jump-started by this investment."

Over the next two decades, Lipkin and his team were on the virus front lines. Lipkin was in China in 2003 during the first SARS outbreak, sharing his diagnostic methods to help contain the spread. He tested samples from Angola during the Marburg outbreak of 2004–05 (Marburg is a hemorrhagic fever spread through bodily fluids), and found that cases of malaria were being mistaken for Marburg and going untreated. Another time, in Gorakhpur, India, near the Nepalese border, where thousands of children were dying every year of encephalitis, Lipkin saw sick kids who were crowded two or three to a bed. Everyone assumed the cause would be a viral infection. But Lipkin's analysis showed that it wasn't a virus at all: it was a bacterial infection that could be treated with tetracycline.

The deadliest virus Lipkin ever encountered was in Lusaka, Zambia, in 2008. Five people in Zambia and Johannesburg, South Africa, got sick with fever, headache, and muscle pain, and four died within days of

the initial symptoms. A CII team led by epidemiologist Thomas Briese quickly identified the new pathogen, now called Lujo virus (for Lusaka and Johannesburg). The team also found an effective treatment that saved the fifth victim — and stopped the outbreak in its tracks.

Now, with CII's VirCapSeq-VERT method, Columbia researchers have an even greater ability to stop deadly pathogens before they spread. Yingst says that VirCapSeq-VERT "is exactly what I always wanted as an Army veterinarian" — he spent twenty-five years tracking pathogens in animals in Central Asia, Africa, the Middle East, and Southeast Asia — "and is pretty much everything that you could ever want in a diagnostic tool."

Had the tool been available in Wuhan in the fall of 2019, Yingst says, COVID-19 could have been contained. "It was a completely novel pathogen never encountered before," he says. "So unless you had access to this tool, which would have quickly identified it as a type of coronavirus, you were stuck."

Yingst, like everyone at GAPP, believes that to prevent pandemics, there must be universal access to advanced detection and sequencing. "We have to enable every country on the planet to be able to quickly identify novel pathogens within their borders, by themselves. Otherwise it's pointless and silly to imagine that we could control a pandemic."

So what keeps Lipkin, the virus hunter, up at night? It's a tantalizing question to ask a scientist who was an adviser on the 2011 medical thriller *Contagion* and who, over his forty-five-year career, has helped contain or prevent many outbreaks in real life. But that week, Lipkin had other preoccupations.

Health workers examine suspected mpox patients in the Democratic Republic of the Congo, 2024.

REUTERS / ARLETTE BASHIZI

"What keeps me up is something very different," he says. "You can probably guess. I'm trying to figure out if there will still be a Voting Rights Act. I'm worried about the fact that we no longer have a balance of powers. We live in a very different world."

Fair enough. But what about, for instance, the avian flu that's been in the news — the H5N1 virus — which has appeared in dairy cattle in the US?

"H5N1 has popped up periodically ever since it was first detected in 1997 in Hong Kong," Lipkin says. "Yes, if you get infected with this virus it can be lethal. Yes, it is probably going to be in animals other than birds. But do I think it's going to be the next pandemic for humans? No, because the receptors it uses are in the lower respiratory tract, not the upper respiratory tract, which means it doesn't really have the capacity to spread widely. So this is not the one."

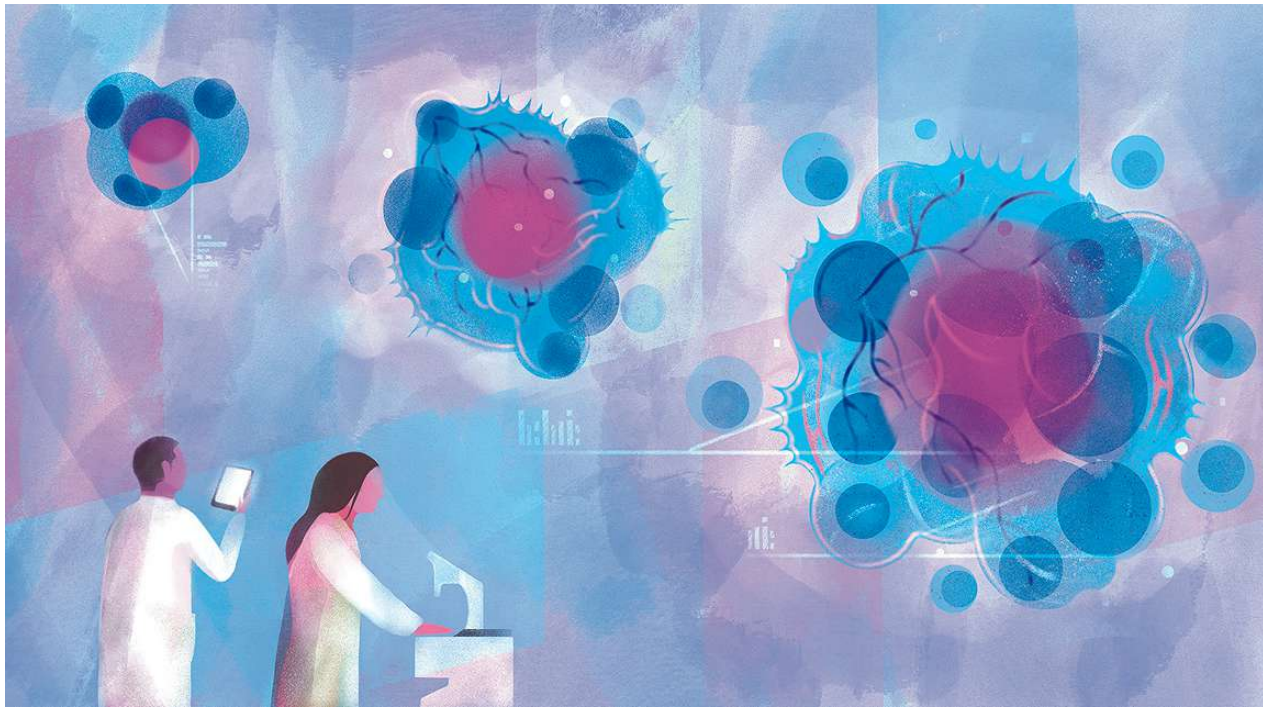
Not that there's any shortage of candidates. But as Lipkin makes clear, it takes money to develop tests and vaccines, money to send people to Zambia or Taiwan or Malaysia or Zimbabwe. And it will take money — Lipkin estimates $10 million a year — to fulfill his vision of producing a portable, fully automated diagnostic system that can function outside a laboratory, empowering clinicians anywhere to take any type of clinical or environmental sample and test it for not just viruses but also bacteria, fungi, and parasites and get a result within hours. Lipkin calls it "Mercury." If funded, he says, "it will change the whole approach to clinical medicine as well as enable rapid detection of health threats that could become global pandemics."

Wickiser, meanwhile, has a weather eye on the Oropouche virus, which has been inexorably migrating toward the US.

"We definitely will be dealing with Oropouche virus in the very near future," Wickiser says. "It's an arbovirus, meaning it's carried by insects and is transmitted through insect bites. It came out of the Amazon basin and has spread up throughout the Caribbean. And so much is unknown about it. Is it from a mosquito? A sand flea? There are open questions. But what is absolutely known is that it is moving north, up through Mexico, and has already hit the coast of Florida."

It turns out that viruses travel regardless of the political winds, and Lipkin's diagnosis is blunt: "If we don't find a way to fix this funding problem," he says, "there will be another pandemic."

EXPLORATIONS



JEREMY LEUNG

The scientist teaching cancer to self-destruct

On a cloudy Wednesday morning, Columbia biology chair Brent R. Stockwell peers at a computer in his laboratory at the Northwest Corner Building to see how many cancer cells survived the previous night. He is pleased to find that few have. "What's interesting is *how* they died," he says. "They essentially destroyed themselves, after a nudge from us."

The idea that cells are programmed to self-destruct under certain conditions has been a cornerstone of biology since the 1970s. That's when scientists first described apoptosis, a tightly orchestrated process in which old or damaged cells dismantle their internal components, shrink, and chop themselves up into minuscule pieces to be cleared away by the immune system. The excitement that discovery generated is hard to overstate. Until then, most scientists assumed that cells wore out as machines do — gradually and without much rhyme or reason. But if cell death were highly organized and regulated, this suggested that the process could be predicted, influenced, even controlled.

In 2001, Stockwell, then a thirty-year-old research fellow at the Whitehead Institute for Biomedical Research in Cambridge, Massachusetts, became convinced that he was witnessing an altogether different form of programmed cell death. While studying the effects of various chemicals on cancer cells, he noticed that one novel compound caused cells to deteriorate in ways he'd never read about in textbooks. "It wasn't quite as neat and orderly as apoptosis, but it still seemed to follow a distinct progression," says Stockwell. The major difference was that the cells he was working with, rather than collapsing in on themselves, swelled up until their outer membranes stretched and leaked. "And then they'd basically explode," Stockwell says. After repeating the experiment with multiple cell types and observing the same pattern, he felt a jolt of exhilaration. "I was also a bit nervous, to be honest," he recalls. "I thought, If this really *is* a new type of cell death, convincing the scientific community is going to be a huge undertaking."

In fact, validating his discovery would prove to be more difficult and time-consuming than Stockwell could have imagined. Colleagues initially dismissed his results, insisting that he was seeing either a variation of apoptosis or its opposite, necrosis, a chaotic form of cell death that follows sudden injury or trauma. His grant

applications were denied. Emails to potential collaborators yielded nothing. "People said that cell death was already thoroughly understood," Stockwell says, "and to look for other versions was outlandish."

His luck turned around only after he landed a faculty position at Columbia, with a joint appointment in chemistry and biology, in 2004. "I'd described my plans to explore this phenomenon during my interview, and to my surprise, the science leadership here was enthusiastic," Stockwell says. With a startup package of funding provided by the University, he set about investigating the strange new form of cell death he thought he'd observed. The initial breakthroughs came a couple of years later, and more have been coming ever since. Stockwell and his colleagues first showed that cells in their experiments were dying as a result of an overaccumulation of oxidized fats in cellular membranes. They next demonstrated that the oxidation was catalyzed by iron stores within cells. Then, in a landmark 2012 paper in the journal *Cell*, they established that this process was distinct from apoptosis. They named it ferroptosis, from the Latin word for iron, "ferrum," and the Greek word for falling, "ptosis."

Today, hundreds of academic laboratories around the world are studying ferroptosis, with more than twenty-two thousand papers published on the topic to date. Researchers across the life sciences are exploring the finer points of its mechanisms, as well as how ferroptosis is involved in medical conditions ranging from cancer and heart disease to autoimmune and neurodegenerative disorders. A new journal devoted to the subject, *Ferroptosis and Oxidative Stress*, launched this past fall. Its inaugural issue contains the latest discovery by Stockwell's team, revealing new clues about how ferroptosis could be harnessed to defeat some of the deadliest cancers, including those of the brain, lung, and kidney. Specifically, the Columbia researchers show that cancer cells that manage to evade traditional chemotherapy drugs often do so by undergoing metabolic changes that, paradoxically, make them exceptionally vulnerable to ferroptosis.

"We're now developing compounds to further destabilize their metabolism and tilt them toward self-destruction," Stockwell says.

That work is in its early stages, but one experimental compound that the Columbia scientists have designed kills drug-resistant cancer cells in a petri dish, and it is now being tested in animal trials.

Stockwell and his colleagues are also exploring whether a specialized food missing two key amino acids, administered in tandem with their novel compound and traditional chemotherapy drugs, might help to induce ferroptosis in cancer cells.

"Some people say that treating cancer with engineered food that primes cancers to be even more susceptible to ferroptosis is a crazy idea and will never work," Stockwell says. "But we're determined to try. It's like I always tell my students: You can't play it safe and expect to make a difference. You have to be willing to take risks, to dive into the unexpected, to discover something new."

Seeing danger that isn't there

It happens all too often: A police officer shoots a Black man, believing he is armed, only to discover that he was holding an ordinary object like a cell phone or wallet.

New laboratory experiments using advanced brain imaging may help explain why such tragedies occur. Columbia psychologist Jon Freeman found that adults asked to quickly identify harmless, everyday objects frequently mistook them for weapons when also shown a picture of a Black man's face. Imaging data revealed

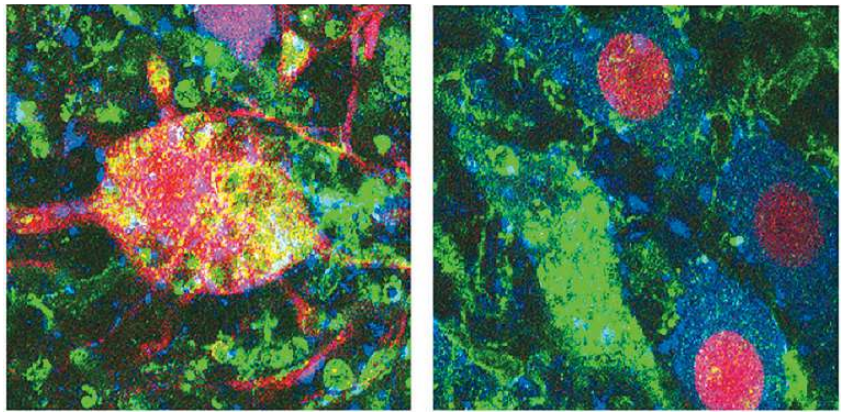
that the miscalculations occurred not in brain regions responsible for deliberate decision-making but rather in the brain's visual-processing centers, suggesting that racial stereotypes can actually alter what a person sees.

Freeman says the results could have implications for police training programs: In addition to helping officers recognize their racial biases, such programs may need to incorporate psychological exercises that subconsciously retrain the brain to perceive certain types of visual information more accurately. "We're eager to build on this research by exploring new interventions that might recalibrate biased visual perceptions," he says. "If we can change split-second perceptual distortions, we may be able to mitigate these kinds of consequential misjudgments in high-stakes situations under stress and uncertainty." — *Christopher D. Shea '23JRN*

JENYA / ALAMY

Study Hall

The latest findings from Columbia University



Neurons damaged by ALS, at left, and those restored to a healthier state, at right.

New views on ALS

Two groups of Columbia researchers have achieved striking new insights into amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig's disease.

One team, led by neuroscientist David Sulzer '88GSAS, has uncovered the strongest evidence yet that ALS is an autoimmune disorder. Working with colleagues at the La Jolla Institute for Immunology, the Columbia scientists found that inflammatory cells mistakenly target proteins in neurons, and that the intensity of this attack determines how quickly the disease progresses. The researchers argue that ALS might one day be treated with medications that dial back the body's immune response.

Meanwhile, a second Columbia group, led by pathologists Emily Lowry '07BC and Hynek Wichterle, has shown that neurons can be restored to a more youthful state and thus made more resilient to ALS. In a study on mice, the scientists report that a gene therapy they've developed rejuvenated neurons and delayed the onset of symptoms.

Lowry and Wichterle, who are codirectors of Columbia's Project ALS Therapeutics Core, point out that the disease often takes decades to emerge even in people with the strongest genetic predisposition to it, highlighting the potential benefit of slowing neuronal aging. They hope their research will also reveal strategies for treating other age-related neurodegenerative conditions, such as Parkinson's and Alzheimer's.

"Everyone is looking for the fountain of youth," Lowry says.

Could AI detect concussions?

People who have suffered concussions exhibit subtle swaying head movements that are indiscernible to the human eye but detectable by artificial intelligence, according to a team of Columbia physicians led by Thomas Bottiglieri. The team is developing software to recognize these movements — which appear to be caused by temporary damage to the brain's cerebellum — in order to identify athletes who are concussed but either unaware of their injury or reluctant to report it.

The hidden profits in cheap housing

Conventional wisdom holds that investors shy away from affordable-housing projects because they're not sufficiently profitable. But a new study coauthored by Columbia Business School finance professor Stijn Van Nieuwerburgh finds that low-rent apartments actually deliver the strongest risk-adjusted returns in the US, in part because during economic downturns they remain fully occupied. The real reason many investors avoid them, the researchers conclude, is that they see reputational risk in owning cheap properties. They say that expanding access to capital for such projects, such as through low-interest loans to smaller landlords, could help to solve the country's housing crisis.

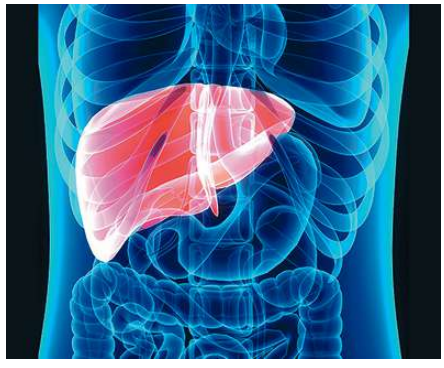
How blocking the sun could backfire

A small but growing number of scientists have begun supporting the idea of spraying sunlight-reflecting particles into the earth's atmosphere to combat global warming, but a new Columbia study warns that the proponents dramatically underestimate how risky this would be. The study, led by atmospheric chemist V. Faye McNeill, finds that so-called "stratospheric aerosol injection" could alter the jet stream and disrupt the patterns of air movement that circulate heat across the earth, in addition to damaging the ozone layer.

TOP: COURTESY OF EMILY LOWRY, PROJECT ALS THERAPEUTICS CORE, CUIMC; CENTER: BEAUTIFUL LANDSCAPE / SHUTTERSTOCK; BOTTOM: ISITSHARP / ISTOCK

Pesticide linked to brain abnormalities

Prenatal exposure to the widely used pesticide chlorpyrifos appears to put children at risk for structural brain abnormalities and poor motor skills, according to a new study by Columbia public-health researcher Virginia Rauh. The study is the first to demonstrate enduring molecular, cellular, and metabolic effects of chlorpyrifos, which activists have been pushing the federal government to ban for decades.



An organ donor's perfect run

Several teams of Columbia transplant surgeons recently carried out a rare "domino" procedure, in which one organ donation set off a chain of additional life-saving operations. First, an altruistic donor gave up half their liver, which was given to a patient whose own liver was not working well for them because of a metabolic disorder but was otherwise functional. Once removed, that person's original liver was divided and transplanted into two other recipients. More than thirty clinicians, spread across four operating rooms, took part. Because the liver can regenerate, the donated portions are expected to regrow to full size.

TOP: FOTOKOSTIC / ISTOCK; CENTER LEFT: SCIENCEPICS / SHUTTERSTOCK; CENTER RIGHT: YUGANOV KONSTANTIN / SHUTTERSTOCK

Now streaming: The American dream

Americans enjoy less economic mobility today than they have in decades, and far less than people in Canada and Western Europe. Yet we still believe in the American dream, with large percentages saying that anyone in the US can get ahead by working hard and playing by the rules.

In a new book that collects her recent research on the topic, *The American Mirage*, Kim argues that scholars who study US public opinion tend to overlook the influence of popular entertainment and overemphasize issues like partisanship suggests that our choices of TV shows and movies may be even more important.

One reason for the disconnect, according to Columbia political scientist Eunji Kim, is the television we watch. Her research shows that watching TV programs built around underdog success stories — especially reality shows like *American Idol*, *MasterChef*, and *Shark Tank*, which collectively draw tens of millions of viewers each season — is associated with having an inflated sense of your own economic prospects.

Past studies have shown that Americans' beliefs about our chances for success are most strongly influenced by where we live. But Kim's data, gathered in a series of large empirical studies, in the news media. Most Americans don't follow the news closely, she notes, but we do spend hours each day watching shows that shape their perceptions of the world.

"These are not the chronicles of seasoned journalists but entertaining stories curated for prime time — stories of ordinary Americans succeeding due to their hard work and talent through powerful vocals, mesmerizing dance moves, or some other entrepreneurial talent," she writes. "The appeal of these rags-to-riches stories easily bypasses entrenched partisan loyalties, serving as a heavy counterweight to public understanding of economic reality."

NETWORK

ALEX MAIOLI

Fashion Forward

Online-retail pioneer Federico Marchetti ’99BUS looks to the future of sustainable style

Back when most people still associated online shopping with books and Beanie Babies, a recent Columbia Business School graduate came up with an innovative idea: selling off-season designer clothes at discounted prices through a single website. Yoox, founded in 2000 by Federico Marchetti ’99BUS, went on to become a leading marketplace for online fashion, merging with British competitor Net-a-Porter in 2015. Three years later, the conglomerate Yoox Net-a-Porter Group was sold to Swiss luxury-goods giant Richemont for a total of nearly $6 billion — the highest-valued sale for an online retailer in Europe.

Now, with the stress and responsibility of running a global e-commerce business behind him, Marchetti has time to focus on more philanthropic — and personal — endeavors. Since 2021, the retired CEO has chaired the fashion task force of King Charles III’s Sustainable Markets Initiative, a global effort to improve environmental practices across the private sector. “I have a young daughter, and I want to leave her a better world,” says Marchetti, who is based in Milan. “I’m doing it pro bono, just for the pleasure of giving back.”

In 2023, Marchetti shared his life and career in a memoir, *The Geek of Chic*, whose English translation was released in the United States this past September. “I wanted to help give others the courage to leave a job, start their own project, and follow their passion,” he says.

Marchetti’s own success, as he relays in the book, can be attributed to sharp entrepreneurial vision and good timing. Raised in a modest home in the Northern Italian city of Ravenna, Marchetti describes feeling the pull of the American dream as a child, gazing at the bright lights of skyscrapers on a poster in his brother’s bedroom. He started his business career at age ten, selling Mickey Mouse comics on the beach. Later, after graduating from Bocconi University in Milan, Marchetti moved to New York City and got a job on Wall Street with Lehman Brothers.

“I knew in my heart that I was not a banker,” he says. “I worked at Lehman to learn as much as possible as quickly as possible.” While getting his MBA at Columbia — Giorgio Armani, for whom he had done some consulting

work, wrote one of his recommendation letters — Marchetti took courses in retail and entrepreneurship, which helped plant the seed for his billion-dollar idea. "I had a vision that soon fashion brands would be looking at the internet in a much different way, but at the time they were two different worlds," he says. "I thought, Let me put them together." An Italian well-versed in design and craftsmanship with the training of an American businessman, Marchetti had a unique advantage, and he used his Wall Street connections to raise the capital for his startup.

Today, working with King Charles, Marchetti draws heavily on his experience running Yoox. "In 2000, we were selling end-of-season clothes, which is basically what's now called circular fashion," he says, noting that the company also introduced hybrid delivery vehicles, recyclable packaging, and other sustainability upgrades under his leadership.

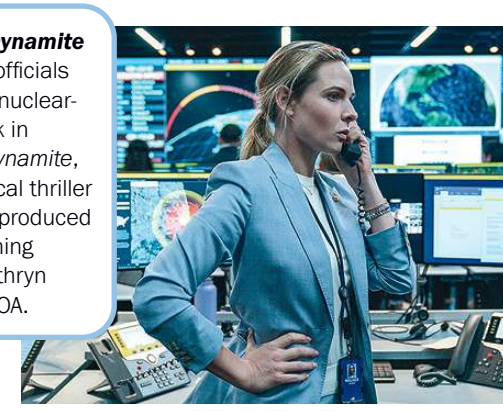
The fashion task force's first major project was the "digital passport," a way for high-end brands to share information about a garment's environmental footprint through QR codes, NFC tags, and blockchain. "If you go to a Chloé boutique in Paris, you can use your phone to find the history of the material and how you can recycle, resell, or repair it," explains Marchetti. The task force has also partnered with Armani to integrate sustainable cotton grown in Puglia, Italy, into the brand's supply chain, and with Brunello Cucinelli to source sustainable cashmere from the Himalayas.

Marchetti acknowledges that environmental standards are more difficult to implement outside the luxury market, especially in the realm of "fast fashion," which depends on the high-volume production of low-quality goods. Still, he hopes the digital passport and other initiatives will have a "spillover effect" into mass-market retail. "I think the revolution will come from consumer demand, bottom up," he says.

Though it's the industry that made his career, Marchetti's advice for aspiring entrepreneurs interested in online fashion retail is: Stay away. "It's too mature, too crowded," says Marchetti, who previously taught a course called Creating a Startup in the Digital and Sustainable Economy at Bocconi University, his first alma mater. "You need to invent something that nobody's doing, not that everybody's doing." He sees potential for artificial intelligence in fashion and in reducing environmental impact across industries. "In the magic intersection of sustainability and innovation, there's still a lot of work to do." — *Julia Joy*

4 New Movies from Alumni

A House of Dynamite
Government officials respond to a nuclear-missile attack in *A House of Dynamite*, a tense political thriller directed and produced by Oscar-winning filmmaker Kathryn Bigelow '81SOA.

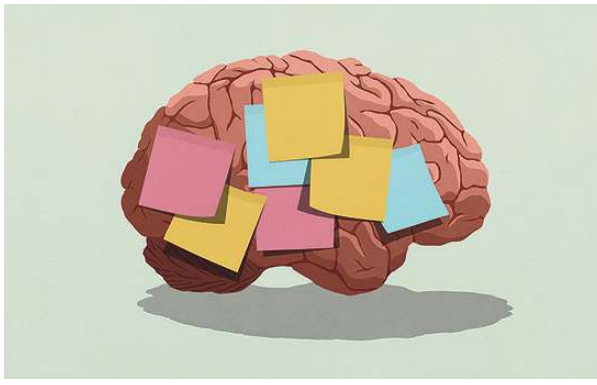


Father Mother Sister Brother
Indie icon Jim Jarmusch '75CC won the Golden Lion at the 2025 Venice International Film Festival for *Father Mother Sister Brother*, which he wrote and directed.

Good Boy
Director and screenwriter Ben Leonberg '15SOA recently made his feature-film debut with *Good Boy*, a supernatural horror flick starring his own dog, Indy.

The Twits
Known for his work on Disney hits like *Wreck-It Ralph* and *Zootopia*, Phil Johnston '04SOA cowrote and directed *The Twits*, an animated adaptation of Roald Dahl's 1980 children's book.

FROM TOP: EROS HOAGLAND / NETFLIX; FREDERICK ELMES / VAGUE NOTION / MUBI; IFC / SHUDDER; NETFLIX



ASK AN ALUM: WHY YOU CAN'T ALWAYS TRUST YOUR MEMORY

Erin Kendall Braun '09GS, '18GSAS, a cognitive neuroscientist and memory expert, brings her insight to the courtroom and beyond.

What do you do as a memory expert?
Most of my work is in the legal space, helping lawyers, jurors, and others understand how memory works in the service of justice. I've worked on everything from environmental to criminal cases, often serving as an expert witness. I've also done consulting for apps that involve learning and memory, and I once worked with a novelist to make sure the science in their book was accurate. I'd love to branch out into film and TV projects to improve how memory science is portrayed in pop culture.

How do you explain the science behind memory?
Most people think that their memory operates like a video recorder, replaying events as they originally happened. But memories aren't static and objective like a recording. Instead, they're associative: our brains link together the relevant details of experiences to store and later recall.

I often use my eighth birthday, which was celebrated with a gold-and-purple-themed party, as an example. At the time, my brain encoded the event by creating associations between different elements: gold and purple streamers and balloons, a cake in the middle of the table, and a banner over the window. As an adult, when I recall this day, I reconstruct the memory by reactivating these associations. But this reconstructive process can lead to errors. In the case of my eighth birthday, photos show a glaring mistake in my memory: I always remember the party happening in my family's dining room after it was renovated, but the party actually occurred two years before the renovation. I was erroneously superimposing the right details onto the wrong space. Interestingly, there were no clues that I was misremembering anything; the memory feels real and vivid.

How is memory unreliable in criminal investigations?
Information learned after an event can retroactively change what a person remembers. When investigators ask leading questions — for example, "Was the man wearing a baseball cap?" instead of "What was the man wearing?" — this can make a witness incorrectly remember false details. Children are particularly susceptible to suggestion: If an adult they trust tells them something, they'll often incorporate that information into what they remember.

Research also shows that interrogating someone in an emotionally charged way — maybe the police are yelling at them for hours until they break down and confess — can make their memory conform to what the interviewer believes. We've all learned from crime shows that you shouldn't touch anything at a crime scene because the evidence is fragile, but what most people don't realize is that eyewitness memory is just as fragile, and it should be documented as immediately as possible to avoid outside influence.

Is there any way to tell if a witness's memory is trustworthy?
There are no foolproof clues that guarantee if a memory is real or altered. Jurors typically try to figure out if a witness is telling the truth or lying — they're thinking about eyewitness testimony in a binary way, which is how movies and TV usually present the judicial system. My job often involves explaining that a witness may have sincerely held memories that for whatever reason have been distorted. The Innocence Project has looked back at the records of overturned convictions and found that in around 70 percent of cases, eyewitness testimony played a significant role in the defendant being wrongfully convicted. It's likely that many of those witnesses weren't deliberately lying but that memory distortions changed their testimony.

Any advice for sharpening memory?
Get enough sleep: Tired people don't encode information as effectively, and sleep is critical for consolidating our experiences into long-term memories. Cardiovascular exercise helps improve neuroplasticity and protect new brain cells. Avoid chronically high levels of stress, as this has been shown to damage the hippocampus, which is the part of the brain that forms associations.

When friends worry that their memory isn't perfect, I reassure them that memory isn't supposed to preserve the past exactly as it happened. When we receive new information, our memories shift to incorporate that information in a useful way. Flexibility in memory can hinder eyewitness accounts in legal cases, but in daily life, it's meant to help us make better decisions for the future.

— *Julia Joy*

MALTE MUELLER / GETTY IMAGES

Mixed Signals

A new app sheds light on Spanish-language radio's disinformation problem

Martina Guzmán

Artificial intelligence is now used for everything from coding to customer service. Martina Guzmán '08JRN, a Detroit-based independent journalist who covers immigrant communities, has devised yet another helpful purpose: monitoring disinformation and conspiracy theories blasted over foreign-language radio.

Verdad (Spanish for "truth"), a free app Guzmán founded in 2024, uses AI to scour dozens of radio stations — most of them Spanish-language broadcasters in the US — twenty-four hours a day, recording and transcribing segments that may contain false or misleading messaging around vaccines, immigration, foreign conflicts, and other hot topics.

"The problem of disinformation on Spanish radio has been an absolute blind spot for journalists," says Guzmán, who is also the founder of the Race and Justice Reporting Initiative at Wayne State University Law School's Damon J. Keith Center for Civil Rights. "People underestimate radio's impact among Latinos. It's how many of them get basic information, how they hear music from their home countries, and how they connect culturally to the greater diaspora. It informs how they look at issues and how they vote."

Aimed primarily at investigative journalists and researchers studying the spread of disinformation, Verdad automatically translates broadcasts into English and allows users to filter past radio segments by station, region, language, subject, and right-wing or left-wing bias. "There have been tools for monitoring social media and WhatsApp, but nothing for radio," says Guzmán, who is working on expanding Verdad's reach to more stations and regions while improving the tool's accuracy and precision. "Once you hear something on the radio, it disappears immediately. There's also a barrier for people who don't understand that language. Verdad is meant to help reporters and academics get a clearer picture of what immigrant communities are actually hearing."

SNOW QUEEN When she isn't studying for her master's degree at the Columbia School of Social Work, Olivia Giaccio '25CC is cruising down slopes, twisting around bumpy snow mounds, and flying through complex aerial tricks as a mogul skier. In 2022, Giaccio — whose last name derives from the Italian word for "ice" — finished sixth at the Beijing Olympics, and in 2024, she became the first woman to land the highly acrobatic "cork 1080" jump in a World Cup competition, an achievement that earned her a third World Cup win. This winter, the Utah resident has her eyes on the Italian alps, where she is expected to compete for Olympic gold.

TOP: BIANCA CUEVAS; BOTTOM: DUSTIN SATLOFF / US SKI AND SNOWBOARD / GETTY IMAGES

Compassion in Action

Joseph Fedora ’96JRN, a priest with a degree from Columbia Journalism School, offers hope, prayers, and healing for Peru’s most vulnerable citizens

Father Joseph Fedora ’96JRN doesn’t have a traditional pulpit. The shantytowns of Lima, Peru, are his parish. Here the poor live in flimsy houses along unpaved roads, with inadequate sanitation, health care, and food — a stark contrast to the nearby gated communities of mansions overlooking the Pacific, not far from bustling boardwalks lined with tourists.

Usually dressed in a T-shirt and jeans with a silver cross around his neck, Padre José, as the locals call him, pays regular visits to homes, hospitals, and prisons to offer spiritual guidance as well as material help. “I rarely wear a collar,” he says. “It scares people. When they see a priest, they think, ‘I’m about to die.’”

Fedora leads the Lima ministry of Maryknoll Fathers and Brothers, a Catholic missionary organization headquartered in Westchester County, New York, that supports impoverished communities in sixteen countries, in part by providing health care. Since relocating to Peru full-time in 1998, Fedora has lived among the poor and worked primarily with people suffering from HIV and AIDS, including gay men, transgender women, and sex workers. “I don’t judge them, because I haven’t walked in their shoes,” he says. “The virus doesn’t discriminate, but the most affected here are poor gay men rejected by society. We show that the Church is present and walking with them.”

While more than a hundred thousand people in Peru are living with HIV or AIDS, Fedora estimates, that number is a fraction of the cases that existed when he began his ministry. The antiretroviral “triple cocktail,” introduced in the US in 1996, became available in Peru in 2004, thanks in large part to Fedora’s advocacy. “We protested for access to these drugs,” says Fedora, who lobbied government officials and participated in demonstrations with health-care and AIDS advocacy groups, as well as families of victims.

Still, the virus has devasted communities. Fedora recalls offering the sacrament of anointing the sick to a farmer emaciated by AIDS and disfigured by leprosy who had traveled from the jungle to seek solace and acceptance. “My job is to alleviate the suffering,” says Fedora.

To honor dead parishioners, he jots down names and a few words in a notebook he calls “the litany of saints.” The book has hundreds of entries. Some are for children. He remembers one man, half paralyzed from an AIDS-related stroke, forcing his left hand to move his right hand to make the sign of the cross. “Those bedside visits were some of the most powerful moments for me,” Fedora recalls.

Raised in Pomona, California, Fedora grew up with seven siblings. His mother managed their home while his father, a former boxer, ran a shoe store and later worked as a stockbroker. An altar boy, Fedora felt a calling to the priesthood when he was ten and went on to spend eight years in seminary, including four at St. John’s Seminary College in Camarillo, where he majored in philosophy. A 1972 trip to Mexico to build canals for Indigenous people led him to humanitarian work. “That experience changed my life,” he says. Joining Maryknoll in 1975, Fedora took courses there in theology and Spanish before being dispatched to Peru to work with poor farmers. Father Robert Francis Prevost — known today as Pope Leo XIV — was also stationed in Peru at that time, with the Order of Saint Augustine. “If we were to meet, we’d have a lot in common,” Fedora says.

Fedora returned to California in the 1990s to promote Maryknoll’s missions while serving as chaplain for the nonprofit AIDS Project Los Angeles. A colleague noticed Fedora’s strong communication skills and urged him to apply to journalism school, where he could hone the art of

SEAN SPRAGUE / MARYKNOLL

interviewing and reporting and channel it into his work at Maryknoll. He resisted at first but ultimately came to Morningside Heights. "My time at Columbia was challenging," he recalls. "I was forty-two years old and learning something totally new. During the first semester, students from other disciplines presumed I was a professor." After graduating in 1996, Fedora put his journalism skills to work in a new position, serving for several years as the associate editor of *Maryknoll* magazine — a century-old publication that covers the organization's missions — and then reporting for the magazine part-time while focusing on mission work.

In recent years, with the AIDS crisis fading, Fedora has expanded his ministry in Lima to serve other communities in need, including victims of abuse and sex trafficking. During the COVID-19 pandemic, he led Mass and retreats virtually and sent daily messages of hope via WhatsApp.

In 2023, Fedora was diagnosed with lymphoma, which he says his doctors now consider cured. During his illness, the compassion he has spent a lifetime showing others was returned. "I had an army of people in Peru praying for me," he says. Now seventy-two, Fedora is contemplating retiring in the next few years. The number of AIDS deaths has dwindled. So have his journal entries. "It's rare I add to the book now," he says.

— Arlene Schulman '22JRN

TOP LEFT: STEPHEN JAFFE / ALAMY; TOP RIGHT: CHRISTOPHER PAYNE / ESTO; BOTTOM RIGHT: EVELYN FREJA.

NEWSMAKERS

● Three Columbians were finalists at the 2025 National Book Awards: **Karen Russell '06SOA** in the fiction category for her novel *The Antidote*, **Gabrielle Calvocoressi '00SOA** in poetry for *The New Economy*, and **Kyle Lukoff '06BC** in young people's literature for *A World Worth Saving*.

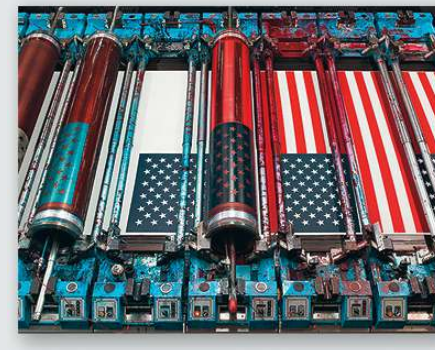
● **Bari Weiss '07CC**, cofounder and CEO of the digital-media outlet *The Free Press*, was named editor in chief of CBS News. **Tony Dokoupil '06GSAS** was promoted to anchor of the network's evening-news program.

● Alumni showrunners launched several new TV series this past fall, including *Boots*, a Netflix military dramedy created by **Andy Parker '11SOA**; *It: Welcome to Derry*, an HBO adaptation of Stephen King's novel *It* co-created by **Jason Fuchs '09CC**; and *The Sisters Grimm*, an Apple TV animated fantasy series led by **Amy Higgins '06SOA**.

● **Joshua Pennise '24BUS** was elected president of the Association of Language Companies, a trade group for organizations that provide interpretation and translation services across the United States and beyond.

● At the 2025 Hedgeweek US Awards, which recognize achievements in the hedge-fund sector, **Kenton Kilmer '20GS** won the "new solution product of the year" prize for his investment-management platform, Addigence.

● **Jordi Alonso '23GSAS** discovered a complete, previously unknown seventeenth-century Latin manuscript by Jesuit poet Ubertino Carrara in the archives of Rome's Pontifical Gregorian University. Alonso is now translating the work, titled *De arte poetica*, along with Carrara's epic poem *Columbus*.



● *Made in America*, a solo exhibition featuring over seventy works by industrial photographer **Christopher Payne '90CC**, opened at the Cooper Hewitt museum on the Upper East Side in December. It runs until fall 2026.

● *Forastera*, a Spanish film written and directed by **Lucía Aleñar Iglesias '21SOA** and produced by **Marta Cruañas Compés '20SOA**, won the International Federation of Film Critics (FIPRESCI) Prize at the Toronto International Film Festival. The drama, about a grieving family visiting Mallorca, is the evolution of a short film Aleñar made as a Columbia student.

● **Colby Xzavier King '22CC** received a 2025 David Prize, a $200,000 grant for New York City "visionaries" with solutions to social issues, for the Kiki Arts Collaborative, a mentorship and support network he is founding for young LGBTQ+ artists of color.

● **Aimee Ng '12GSAS**, a member of the curatorial department at the Frick Collection since 2015, was promoted to chief curator of the museum.

● Poet **David Lehman '70CC, '78GSAS** received the New Criterion Poetry Prize for *Ithaca*, a collection of poems that will be published this winter. Lehman was the founding and longtime editor of the annual *Best American Poetry* anthology, a post he retired from in 2025.

BULLETIN

RUDY DIAZ

DENNIS A. MITCHELL NAMED DEAN OF DENTAL COLLEGE

Dennis A. Mitchell '97PH, a Columbia professor and longtime senior administrator, has been named dean of the College of Dental Medicine, a role he had been fulfilling on an interim basis since February 2025.

A clinician and scholar whose academic work has focused on the oral-health needs of underserved populations, Mitchell has been a member of the Columbia faculty since 1991. He earned his doctorate in dental surgery from Howard University and his master's in executive health-services management from Columbia's Mailman School of Public Health.

In medical circles, Mitchell is best known for conducting research on the oral manifestations of HIV. He also co-created and helped to launch Columbia's Community DentCare Network, which since 1996 has provided dental services to residents of Harlem and Upper Manhattan regardless of their ability to pay.

While maintaining his faculty appointment at the dental college, Mitchell joined Columbia's Office of the Provost in 2014 as senior associate provost for faculty diversity and inclusion, rising to vice provost for faculty advancement in 2019 and senior vice provost for faculty advancement in 2021. He was then appointed executive vice president for university life and the University's interim provost before assuming the roles of senior adviser to the president on inclusion and belonging and senior vice provost for faculty advancement. In those most recent roles, he oversaw the University's efforts to create and enhance faculty development programs.

Mitchell's priorities for the College of Dental Medicine, he says, include facilitating the creation of new knowledge through research; expanding access to dental care by broadening the reach of the college's clinics; and preparing students to become clinical and academic leaders.

"As one of the leading dental schools in the country, it is our mission and responsibility to both train the next generation of oral-health-care leaders and to develop leadership and vision in our faculty," Mitchell says. "I look forward to supporting our students, faculty, alumni, and staff as we work to extend and enhance the culture of excellence that is evident in every facet of our work."

MELANIE BERNITZ APPOINTED EVP FOR UNIVERSITY LIFE AND WELL-BEING

Melanie Bernitz '12PH, a primary-care physician who has held a number of senior leadership positions at Columbia, has been appointed executive vice president for university life and well-being. She had been serving as interim EVP since last winter.

In her new position, Bernitz oversees both University Life, a unit that supports all students by cultivating an inclusive campus environment, and Columbia Health, a network of more than two hundred health-care professionals that serve the University community.

A member of the Columbia faculty for more than two decades, Bernitz is an associate clinical professor in Columbia's Center for Family and Community Medicine. Before being named interim EVP in late 2024, she had overseen Columbia Health since 2016. Before that, she was the executive director of the Student Health Service at Columbia University Irving Medical Center.

A native of the United Kingdom, Bernitz received both her bachelor's degree in psychology and her medical degree at University College London. She then received her master's degree in public health at Columbia's Mailman School.

LI LU GIVES $15M FOR LAW LIBRARY

Columbia Law School has opened a fully renovated library, supported by a $15 million naming gift from Li Lu '96CC, '96LAW, '96BUS.

The Li Lu Law Library, spread over three floors of Jerome L. Greene Hall, was officially dedicated on December 5. It is one of the most significant capital projects in the school's history, encompassing fifty thousand square feet. Its open, light-filled design by lead architectural firm Perkins Eastman features a two-story reading room, striking views across Revson and Ancell Plazas, and more than six hundred study seats — an increase of 60 percent from the pre-renovation layout.

Li Lu, the founder and chairman of the global investment firm Himalaya Capital, grew up in China during the Cultural Revolution and was a prominent student activist who helped lead the Tiananmen Square protests in 1989. Soon after, he was invited to speak about his experiences at Columbia, where he later enrolled. He went on to become the first Columbia University student to earn three degrees simultaneously. "Columbia has been foundational to my life," he says. "When I came to the US in 1989 as a refugee, it was this university that gave me an emotional and intellectual home and provided an enormous opportunity that I could not imagine before I arrived here."

Li Lu served as a member of the University Trustees from 2017 to 2024. He received the John Jay Award from Columbia College in 2012 and the Distinguished Leadership Award from Columbia Business School in 2025.

Li Lu tours the newly renovated law library that bears his name.

He says that he hopes the new library becomes "a symbol, a gathering point, a platform for Columbia to lead in legal thinking for years to come."

In total, more than fifty alumni and friends of Columbia made donations to support the library's renovation.

LEFT: EILEEN BARROSO; RIGHT: COURTESY OF COLUMBIA LAW SCHOOL

INSTITUTE OF GLOBAL POLITICS LAUNCHES AMERICAN DEMOCRACY INITIATIVE

The Institute of Global Politics at the School of International and Public Affairs has launched an initiative aimed at generating new ideas for strengthening democratic norms and institutions in the US.

The American Democracy Initiative, led by Columbia political economist Alexander Hertel-Fernandez, will convene outside scholars and practitioners to collaborate with Columbia faculty to conduct research, facilitate high-level dialogue, and translate their insights into actionable solutions for lawmakers, civil-society groups, and the wider public.

Hertel-Fernandez, who previously served at the US Department of Labor and the White House Office of Management and Budget, emphasized the initiative's commitment to real-world impact: "Our goal is to ensure that the best ideas reach the people who can put them into practice."

The American Democracy Initiative will host public events, commission original research, and publish policy-relevant analysis. It will focus on the connection between government, markets, and democracy, including the role that economic-policy design and implementation plays in sustaining support for democracy; how business and labor can defend and deepen democratic norms and institutions; and how government agencies and programs can underpin a more responsive, inclusive, and resilient democracy.

"This work could not be more urgent," said Secretary Hillary Rodham Clinton '22HON, a professor at SIPA and chair of the IGP faculty advisory board. "American democracy is facing serious threats, and it will take rigorous research, fresh thinking, and broad and bipartisan coalitions to meet them."

The new initiative is supported by the Reynolds Foundation, which recently also announced gifts to help finance Columbia's Obama Foundation Scholars program and a fellowship that brings journalists from Latin America to campus for professional-development programs.

MICHAEL MULLER / SHUTTERSTOCK

COLUMBIA LEADS NEW MATERIALS INNOVATION HUB

Columbia University has launched a materials innovation hub, Gotham Foundry, where students, faculty, and private partners can come together to develop new types of environmentally sustainable materials for use in the fashion, construction, and health-care industries.

Supported by $45 million from the NYC Economic Development Corporation, Gotham Foundry will operate in partnership with CUNY's Advanced Science Research Center, SUNY's Fashion Institute of Technology, and the nonprofit biolab Genspace. For now, the facility is located at Harlem Biospace, a technology incubator on West 127th Street, but it will eventually be housed in a new Columbia Engineering building that is expected to break ground on the Manhattanville campus in 2027.

Gotham Foundry is directed by Helen Lu, a Columbia professor of biomedical engineering and dental and craniofacial engineering, along with codirectors Kate Ascher, a Columbia professor of urban development; Theanne Schiros, a Columbia researcher and FIT professor of materials science; Rein Ulijn, a CUNY chemistry professor; and Genspace executive director Casey Lardner.

Designers inspect a fungi-based garment at the opening of Gotham Foundry.

KALANIYOT CHAPTER OPENS AT COLUMBIA

Columbia is partnering with the nationwide program Kalaniyot to bring Israeli researchers to the University and promote further understanding and inclusion of the Jewish and Israeli academic community on campus. The program, which originated at MIT, was created in the aftermath of the October 7, 2023, attacks. Columbia joins Dartmouth, Penn, and Harvard Medical School in opening chapters; more are expected to launch soon across the country.

Columbia's Kalaniyot chapter is a nonsectarian, nonpartisan effort to bring a diverse population of postdoctoral research fellows and visiting faculty from Israeli academic institutions to Columbia to engage in scholarly inquiry and civil dialogue on a wide variety of topics in STEM, medicine, law, and business. "These scholars will include alums of Israeli universities of various religions and nationalities," says Jacob Fish, a professor of civil engineering and the founder of Columbia's chapter.

Kalaniyot at Columbia aims to bring ten new postdoctoral fellows every year, each staying for one to three years. (The program is designed specifically for postdoctoral fellows, rather than undergraduates or graduate students.) An additional goal is to host one or two visiting faculty scholars annually, for six months to a year.

At the outset, the focus will be on five schools and divisions: engineering, medicine, business, law, and the natural sciences division of Arts and Sciences. Over time, Kalaniyot at Columbia plans to expand the initiative to include additional schools across the University.

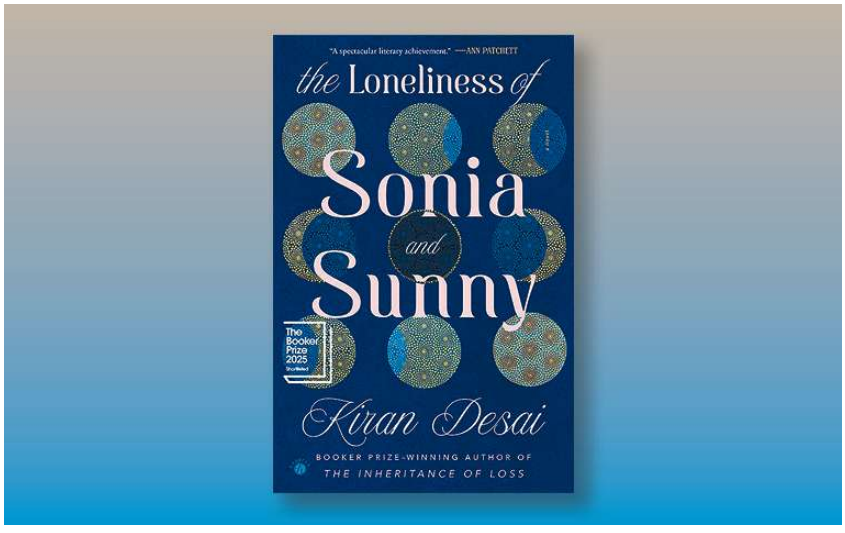
FIVE COLUMBIANS AWARDED RHODES, MARSHALL SCHOLARSHIPS

Five Columbians will soon be pursuing graduate studies in the United Kingdom as recipients of prestigious Rhodes and Marshall Scholarships.

Columbia College seniors Fatima AlJarman AlNuaimi and Stanley Davis have been awarded Rhodes Scholarships, which fund two to three years of graduate study in any field at the University of Oxford. AlJarman AlNuaimi, a native of the United Arab Emirates who was the editor in chief of *Quarto* and founded a journal that publishes the work of women from Southwest Asia and North Africa, will pursue an advanced degree in world literature. Davis, a psychology major from Tennessee who oversees fifty other undergraduate researchers in Columbia's CyberPsych Lab, will study experimental psychology and comparative social policy.

Fellow College senior Joseph Karaganis and recent graduates Theo Taplitz '25CC and Brianna Przywozny '25SEAS have received Marshall Scholarships, which fund graduate study at any UK institution. Karaganis is a native New Yorker who has taught political science to high schoolers and incarcerated individuals and will study philosophy at Oxford. Taplitz is an LA-raised director and writer who plans to pursue scriptwriting at the University of East Anglia and filmmaking at Goldsmiths, University of London. Przywozny, a native of New Jersey who has already earned a master's degree in biomedical engineering from Columbia and conducted research on how gravity affects biological systems, will pursue a doctorate in engineering at Oxford.

TOP: CHRIS TAGGART / COLUMBIA ENGINEERING; CENTER: SIRIN SAMMAN / COLUMBIA UNIVERSITY



The Loneliness of Sonia and Sunny

By Kiran Desai '99SOA (Hogarth)

The Loneliness of Sonia and Sunny, by Kiran Desai '99SOA, is a novel so oceanic in its scope and depth, so protean in its modes, that the reader's first delicious plunge feels astonishingly direct. We begin with Mina Foi, a middle-aged aunt at once defined by loneliness — returned to her parents' home after a disastrous marital experiment — and bound to relentless company in a family and city (Allahabad, India — today's Prayagraj) that "had no patience" for the feeling. Thoughts of Wordsworth's wanderings "lonely as a cloud" produce fits of laughter from her father.

Though we are introduced to Mina first, it is the loneliness of her niece Sonia that becomes the novel's principal concern, a condition that surpasses the family's understanding so entirely that every remedy they suggest — from jumping jacks to desserts to the prospect of an introduction — seems clownish, bound to isolate Sonia even more during her last college winter in Vermont.

At first, Sonia, an insightful reader and writer, appears to find her own way forward. She tumbles into an affair with an older painter, Ilan, who offers Sonia various initiations — sushi, sex, shopping — alongside more dubious ministrations: a gallery job in New York that solves the problem of her visa but puts her firmly in his power, as well as glib advice about writing, which makes her doubt her own work. When his narcissism tips to abuse, Sonia learns another kind of loneliness, a loss of self so devastating that "she was simply not there." Eventually she consents to her grandfather's idea to meet the grandson of his chess rival.

The proposed introduction is to Sunny Bhatia, a night-shift copy editor and "brooding type" whose nickname has not succeeded in lightening his spirits. Sunny is coping with loneliness of his own — in his relationship with his Midwestern girlfriend, Ulla, whom he has kept secret from his family; in the uncertainties he feels as a journalist, a career that has left him mystified by both India and the United States; and most powerfully in his uneasy position as an immigrant: "His life now seemed at a remove, … sometimes unrecognizable to himself. … He became an impostor, a spy, a liar, and a ghost." He rejects the introduction, forwarded to him as a bit of sly comedy by his mother (who reports that they are "the target of an intrigue") but received by Ulla as a blow, disrespectful both to her and to the "poor girl who is being marketed." When Sunny and Sonia finally encounter each other on a train to Allahabad, it's by chance, although Sunny's friend Satya might insist, "Fatalistic life!"

This is Desai's first novel in two decades, since she won the 2006 Man Booker Prize and the National Book Critics Circle Award for fiction for *The Inheritance of Loss*. Now she has given us a novel so magnificent that it might contain every kind of loneliness: the loneliness of a woman who loved only once and wonders if "it was too much to ask to be loved all the way through life"; the loneliness of a widow who never loved her husband but bargains with his spirit to love him after all if he will remain; the loneliness of a mother who heads for the hills, thinking, "Loneliness could mean abiding peace." The loneliness of servants and cooks, of writers and mystics, of anonymity and celebrity, of the betrayed and the abandoned. The appalling, often dangerous loneliness of men who are not the center of attention. The loneliness of an immigrant whose patient prefers to die waiting for a white doctor and the

loneliness of the emigrant who tries to return. There is the loneliness of modernity, of receiving a green card and feeling unable to tell a soul. There is a loneliness so profound that a man does not wander as a cloud but becomes one, disappearing forever, leaving a cloud demon in an amulet to serve as his granddaughter's guide.

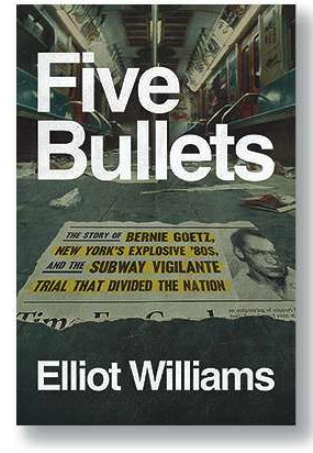
Not every character summons the courage to overcome such loneliness. But there is boldness in abundance, both in the lives of the characters and in the writing itself. Desai never resorts to the stylistic conventions of loneliness: threadbare language, restrained elegance. Her language is as exuberant as the teeming world of the novel, which flows from romance to ghost story, from the mythic to domestic drama, from crimes to glorious meditations on art and literature. When Sunny describes "the exhilaration and fear of hundreds and thousands of stories crossing paths with his," readers will feel the triumph of Desai's accomplishment; through the miracle of this novel, dozens of those stories already belong to us all.

— Nalini Jones '01SOA

Five Bullets

By Elliot Williams '00JRN, '01LAW (Penguin Press)

Three days before Christmas 1984, aboard a No. 2 subway train, Bernhard Goetz, a thirty-seven-year-old white electrical engineer and Manhattanite who was obsessed with the city's crime problem, opened fire on four Black teenagers from the Bronx. Though the teens were acting rowdy, they had not mugged or assaulted Goetz or any other rider. After Troy Canty asked him for five dollars, Goetz pulled his Smith & Wesson .38 revolver out of a quick-draw holster and shot him. He then shot Barry Allen in the back and James Ramseur in the arm and chest. Finally, Goetz shot Darrell Cabey twice, severing his spine and leaving him paralyzed from the abdomen down.



Despite this carnage, sympathy flowed primarily to the perpetrator. The *Daily News* called the subway shooter "a big-city folk hero, a living legend with a list of names that would insure him a permanent place in the city's Crime Hall of Fame: The Avenging Angel, the Death Wish Gunman, the Subway Vigilante," and rival rag the *New York Post* was equally effusive. The tabloids were reflecting the prevailing public sentiment; the New York Police Department's tip line was flooded with messages of support for the shooter.

"To many, this guy wasn't a violent criminal: he was Batman," writes CNN legal analyst Elliot Williams in his fascinating new book *Five Bullets*, an examination of the shocking incident and the divisive trial that followed.

Williams, who was born in Brooklyn to Jamaican immigrant parents in the 1970s and who recalls learning about the "subway vigilante" on the nightly news, makes sense of how Goetz became a cause célèbre by contextualizing the case. In the 1980s, the city was confronting an ever-rising violent-crime rate and austerity budgets that hampered the police and the courts. It was a "powder keg," Williams writes, primed for "the right person — who was most likely a white man — to be embraced for stepping outside the law." *Five Bullets* explores how a wide variety of organizations and figures — many still active today — used the case to further their own goals. The National Rifle Association paid $20,000 toward Goetz's criminal-defense fund, using the case to push back against New York's concealed-carry laws, which Goetz had violated. Curtis Sliwa, founder of the civilian patrol group the Guardian Angels (and 2025 mayoral candidate), embodied Goetz's worldview "that leaders had failed to make the world safe and that it fell to individuals to step in," Williams writes; they provided security at the trial. For preacher and civil-rights activist Al Sharpton, who argued that the reaction to the case would have been completely different had the victims been white and the shooter Black, "the precedent to me was more important than the individuals involved," as he told Williams. "A kid might have been rowdy on a train and said something threatening. And therefore you got the right to blow their brains out?"

By meticulously reconstructing the shooting and trial through court transcripts, archival newspaper reports, and interviews with key figures — including Goetz himself — Williams lays bare how the case became a "Rorschach test about what safety meant in America and who even has a right to feel safe in the first place." He's at his best when weaving commentary on the criminal legal system into

his replay of the trial and offering insight into how key decisions by the prosecutor, defense lawyers, judge, and jury shaped the ultimate verdict: Goetz was acquitted on all counts related to violent crime and convicted only of third-degree criminal possession of a weapon.

Five Bullets presents a deeply researched, richly detailed portrait of how a racially divided city came to excuse potentially deadly white-on-Black violence. It also offers an opportunity to reflect on what has and has not changed in New York City in the past

forty-plus years. Though the city's rate of violent crime has dropped precipitously — for instance, there were 1,459 homicides in the city in 1984 and 377 in 2024 — the Goetz case remains eerily relevant. We see its echoes in the 2023 subway killing of Jordan Neely, a Black man experiencing homelessness and mental illness, by Daniel Penny, a white man who was ultimately acquitted of criminally negligent homicide. As Williams writes, "We are still afraid, still haunted by America's racist past (and present and future), and still very quick to kill strangers."

— *Kristen Martin '16SOA*

READING LIST

New and noteworthy releases

TWICE

By Mitch Albom '82JRN, '83BUS The beloved, mega-best-selling author of *Tuesdays with Morrie*, Mitch Albom, is known for his inspirational messaging, and his new novel is no exception. In it, a man discovers that he has the power to relive any moment in his life once. But if he uses that power to try to change a romance, the relationship will be lost for good. It's a charming read and an important reminder that in love you don't always get a second chance.

ACROSS THE UNIVERSE

By Natan Last '21SIPA
Even in the age of Wordle and Spelling Bee, nearly twenty-three million Americans are still turning every day to the old standby of puzzling: the crossword. In his new book, *New Yorker* crossword contributor Natan Last tells the often surprising history of crossword puzzles, makes a compelling case for why they matter, and speculates on their future in an increasingly tech-dominated world.

FLAT EARTH

By Anika Jade Levy '23SOA
Grad students and frenemies Avery and Frances are aspiring artists — Avery wants to be a writer and Frances a filmmaker. Anika Jade Levy's sharp, often hilarious debut novel follows their triumphs and missteps (for Frances, a return to her hometown and an early marriage; for Avery, some light sex work and a short-lived job at a right-wing dating app) while deftly portraying the kind of complicated, competitive friendship all too common in young women.

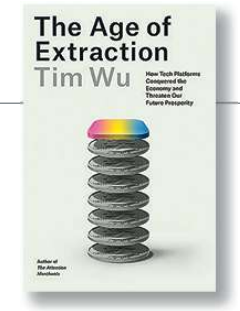
THE ELEMENTS OF POWER

By Nicolas Niarchos '13JRN
As the world rushes to move from fossil fuels to green energy, certain natural resources have become increasingly essential — cobalt, lithium, copper, tin, tantalum, and tungsten, to name a few. But while China leads the charge on mining (with the US racing to catch up), most of the resources are found in desperately poor, war-torn countries, such as the Democratic Republic of the Congo. Journalist Nicolas Niarchos's revelatory new book covers the fight to control these valuable materials and the people caught in the middle of it.

PRAGUE

By Cynthia Paces '98GSAS
The writer — and native of the Czech capital — Franz Kafka once wrote, "Prague does not let go; this little mother has claws." In her epic new book, a comprehensive history of this majestic, complicated city, historian Cynthia Paces examines Prague's unique staying power. Starting around the year 885, when Slavic dukes built the first church on the site that is now Prague, she traces the many forces that have shaped the city over the course of the next eleven centuries. It's fascinating fodder for European-history buffs and important context for the millions of tourists that flock to the city each year.

Escaping the Convenience Cocoon



In his new book, *The Age of Extraction*, Columbia Law professor Tim Wu warns about the unchecked power of tech platforms — and offers a way for society to adapt and move forward

MICHAEL LIONSTAR

Columbia Magazine: The concept of "wealth extraction" is at the heart of your book. What do you mean by that?
Tim Wu: "Extraction" refers to the ability to capture wealth and other valuable assets like data, attention, and time. Essentially, it means having the power to extract more money and value than people would otherwise be willing to pay in a competitive market.

CM: And can that happen without someone knowing?
TW: It depends. Sometimes you're aware when you're paying more than you want to — like for an airline ticket or rent — but you still do it. That's the visceral feeling of extraction: "I don't want to pay ten dollars for bottled water, but I guess I will." It's a kind of coercive taking, though it's not robbery. It's different from someone pointing a gun at you but also different from paying a fair market price. One phrase I use in the book is "the extraction imperative": the sense that business leaders see it as their job to use whatever power they have to get as much money as possible out of people.

CM: You describe how tech companies have built "convenience cocoons" in which everything we do happens inside their ecosystems. Can you explain that, and do you think there's any real way for people to step outside of these cocoons?
TW: The ideal business model for a company now is to create a space where almost everything a consumer wants is available so that person never has to leave. Amazon is perhaps the clearest example of this. Of course, it's not impossible to leave Amazon's cocoon and to buy things elsewhere, but the small frictions — like typing in credit-card numbers or creating new accounts — make a huge difference.

This model isn't fully coercive; it's not forcing you to stay. But the careful cultivation of monopoly power tends to keep us inside the system once we're in.

CM: You write about the danger of emotional reliance on AI — how we might start forming personal relationships with technology. That's already starting to happen. Are companies crossing an ethical line by allowing it to happen?
TW: As I mentioned, the key to the cocoon business model is convincing people not to leave. And emotional attachment is a powerful tool for that. It's already happening, and it's a natural evolution: as platforms mature, manipulating emotional attachment becomes an obvious business strategy.

Is it ethical? No, it's not. It's manipulative. There's something dark about designing AI to become a friend or lover for the purpose of extracting money or data. It's not as overt as a scam, but it's a softer version of emotional exploitation.

As for what can be done? Well, it's uncharted legal territory. We might eventually need laws against emotional manipulation by AI. For now, it's mostly a philosophical and ethical challenge.

CM: You draw parallels between today's tech giants and economic systems through history, like feudalism or fascism. What would it actually take to rebalance that kind of power today? Is there a digital-age version of the New Deal that could work?
TW: First off, it's important to understand that feudalism isn't just ancient history. It's always possible to slip back toward it. The existence of a middle class isn't guaranteed. It's easy to imagine a system where a small elite controls most wealth while everyone else struggles to move upward.

A digital New Deal could help rebalance things. We've faced moments like this before, like when railroads or trusts became too powerful. Those eras led to reforms, antitrust action, and the New Deal itself.

We may be in another such moment now, and dissatisfaction is growing across the political spectrum. The danger is real, but so is the opportunity for reform.

CM: You end the book by talking about fairness and the idea that in the future we might be able to create a world that is less unequal than it is today. What gives you hope that we can move toward something less sinister?
TW: One thing that gives me hope is that the public is fed up. Economic dissatisfaction is widespread. History shows that concentrated power eventually provokes a reaction — the American Revolution, the Progressive Era, the New Deal. There's a recurring cycle where people push back against excessive economic power.

I believe people still want a society with a strong middle class and fair opportunity. We've built that before, and we can again.

— Josie Cox '22BUS

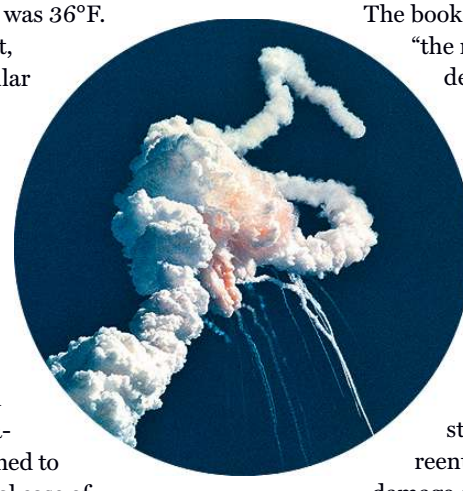
This Is Not Normal

How Columbia sociologist Diane Vaughan turned the *Challenger* disaster into a case study of organizational decision-making

At 11:38 a.m. on January 28, 1986, at the Kennedy Space Center near Cape Canaveral, Florida, the space shuttle *Challenger* lifted off. In the hours before the launch, engineers at Morton Thiokol, the company that built the shuttle's solid rocket boosters, warned that cold weather posed a structural risk to the "O-rings," the rubber seals between booster segments that prevent hot gases from escaping. Using data from prior flights, the engineers advised that the launch should not proceed in temperatures below 53°F.

That morning, with the country glued to coverage of a flight that would take the first civilian, a schoolteacher, into space, managers at Morton Thiokol, pressured by NASA, overruled their engineers, and NASA gave the green light. At liftoff, the temperature was 36°F.

Seventy-three seconds into the flight, *Challenger* disintegrated in a spectacular fireball. All seven crew members were killed. A federal commission was formed to investigate.



Like many Americans, sociologist Diane Vaughan was transfixed by the *Challenger* tragedy. But her interest was also professional. She had long wanted to explore how the dynamics of group decision-making can lead to deviations from established norms and was looking for a case in which an organization had violated rules. NASA seemed to fit the bill. "This appeared to be a typical case of misconduct," Vaughan says. "There were production pressures and rules violations, and NASA was continuing to fly despite knowing about the flaws in the system. Based on the commission's report, it looked like you had amoral, calculating managers who threw caution to the wind."

But when Vaughan went to the National Archives to examine the documents that formed the basis of the report, "I found something completely different," she says. "Reading the dialogue between a commission member and a NASA manager who was pushing for a launch, I discovered that the commission did not understand the language that the manager and others at NASA were using — and therefore didn't understand the decision-making process."

As Vaughan pored over the records, some things became evident. One was that NASA had a clear decision-making structure that it consistently followed. Another was that engineers could only *predict* how a flight would go — they couldn't get real-time readings of the condition of the O-rings during the flight and therefore couldn't understand anything until the vehicle returned. "Then they would determine what had gone wrong," says Vaughan, "and fix it so it didn't happen again."

To solve the O-ring problem, engineers used a heat-resistant putty as an additional sealant. Because their repeated fixes seemed to work — the shuttle kept returning — NASA came to view the O-ring issue as an acceptable risk. And though engineers warned of low temperatures leading up to the doomed flight, they did not have enough data to persuade the NASA managers that it *wasn't* safe to fly.

Vaughan published *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA* in 1996. The book popularized Vaughan's concept of "the normalization of deviance," which describes the process by which deviations from norms — in this instance, safety protocols — become ingrained in organizations through a mix of production pressures, poor communication, and workplace culture.

The study was both revelatory and prescient. In 2003, during the launch of the space shuttle *Columbia*, a piece of foam insulation from the vehicle's external fuel tank fell off and struck the left wing. When *Columbia* reentered Earth's atmosphere, the wing damage caused the shuttle to break apart. This crew of seven was also lost. Vaughan was asked to sit on the *Columbia* Accident Investigation Board.

After the board released its report, which echoed the *Challenger* findings, Vaughan attended a NASA luncheon in Washington. "I was at a table, and I was scared — not everyone at NASA loved my book," she recalls. "But then people came up to me and thanked me or brought books to be signed. One woman broke into tears and said, 'I can't believe we did this again.'"

Forty years after the loss of the *Challenger*, Vaughan's analysis remains relevant. As she writes in her book: "The *Challenger* disaster was an accident, the result of a mistake. What is important to remember from this case is not that individuals in organizations make mistakes, but that mistakes themselves are socially organized and systematically produced." — *Paul Hond*

SCIENCE HISTORY IMAGES / ALAMY

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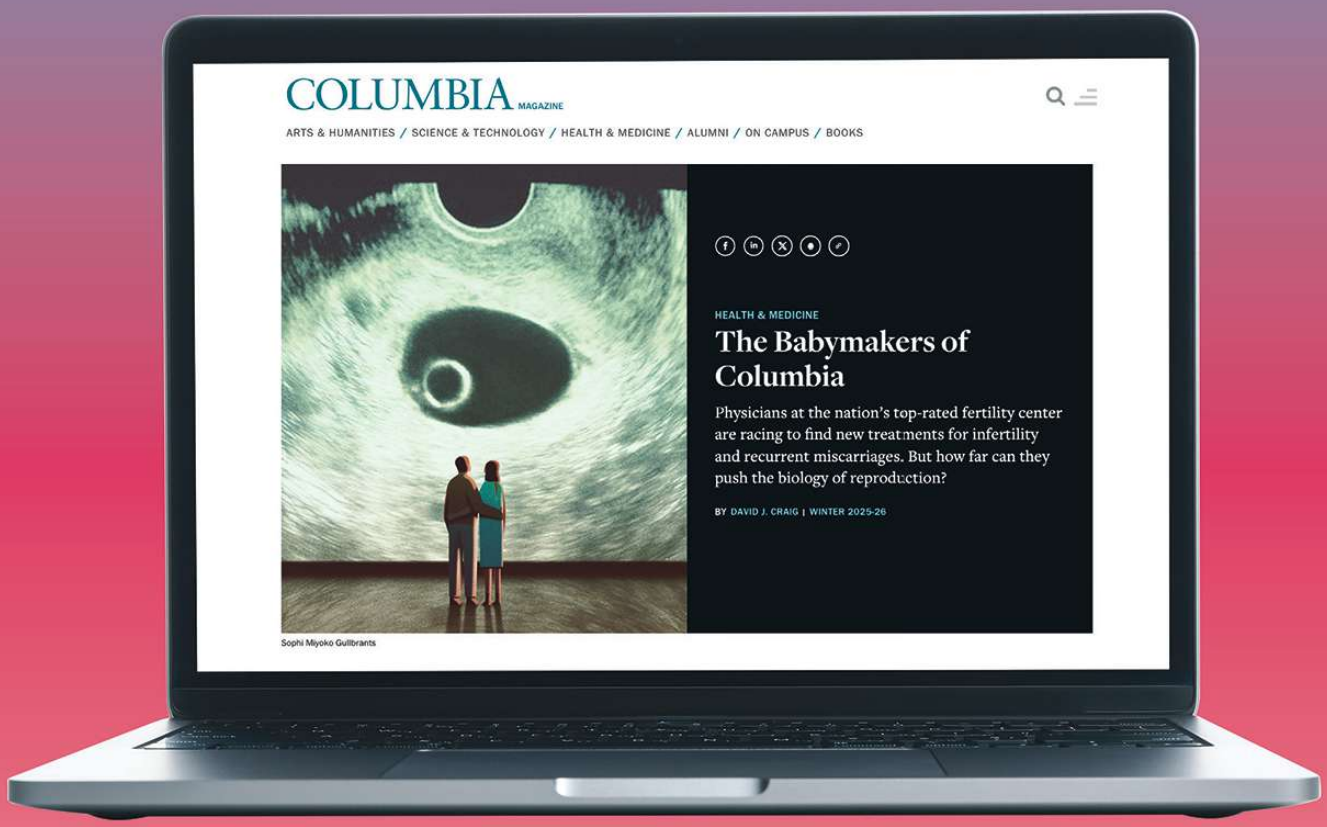

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