The New York Times Magazine
July 10, 2022

THE TIME OF YOUR LIFE 'Circadian medicine' researchers are trying to figure out the right hour of the day to do everything. Can their studies sync us up with better health? By Kim Tingley

The New York Times

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Photograph by Benjamin Lowy for The New York Times

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On the Cover *Photo illustration by Bobby Doherty. Concept by Pablo Delcan.*

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Kim Tingley	*"The Time of Your Life," Page 26*	Kim Tingley is a contributing writer for the magazine and has been the Studies Show columnist for the past three years. She was a fellow at the Nieman Foundation for Journalism at Harvard University in 2016. Her article for the magazine about wave-piloting in the Marshall Islands is anthologized in "The Best American Science and Nature Writing 2017." For this issue, she writes about circadian-clock genes. "I was surprised that circadian rhythms were controlling so many bodily processes," Tingley says. "I love the idea that we and other creatures that aren't here for very long have evolved these biological clocks that reflect a cosmic relationship between Earth and the sun."
Mark Binelli	*"Magic Act," Page 20*	Mark Binelli is a contributing writer for the magazine. He last wrote a feature about a biker shootout in Waco, Texas.
Jake Bittle	*"Liquid Gold," Page 32*	Jake Bittle is a reporter who lives in Brooklyn. His book about climate migration is forthcoming from Simon & Schuster.
Pablo Delcan	*Cover*	Pablo Delcan is a graphic designer and an art director from Spain. In 2014, he founded Delcan & Company, a design studio based in New York.
Bobby Doherty	*"The Time of Your Life," Page 26*	Bobby Doherty is a photographer based in Brooklyn who focuses on studio still-life photography. His first book, "Seabird," is a collection of moments observed between 2014 and 2018.
Virginia Eubanks	*"His Trauma, and Mine," Page 36*	Virginia Eubanks is a journalist and teaches at the State University of New York, Albany. She is working on a memoir about community violence, PTSD and caregiving.

Behind the Scenes

Gail Bichler, creative director: "For our cover story in this issue on circadian medicine, we worked with the designer Pablo Delcan on concepts to illustrate time's relationship to our health. If you've heard of circadian rhythms, you probably think about their relevance to our sleep schedules. This article dives into how most cells in our body operate on some kind of internal clock, and into medicine's attempt to leverage that revelation. To depict this abstract concept, we decided to use literal clocks. We relied on Sophia Pappas, a regular contributor as a prop stylist for our Eat column, to track down a whole bunch of clocks for this shoot with the photographer Bobby Doherty. She only had a few days to figure out a solution. For such a bizarre request to illustrate time, she really didn't have much time. She's a real pro."

Photograph by Lidia Moore

Readers respond to the 6.26.22 issue.

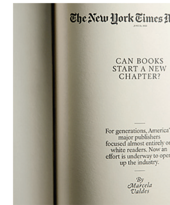
RE: DIVERSITY IN PUBLISHING
Marcela Valdes wrote about the industry's efforts to open itself up to more readers.

Most of the publishers called out by name (Roger Straus Jr., Bennett Cerf, Donald Klopfer) in the story were actually Jews of German descent, who dedicated significant portions of their family money to improving America's literary culture. Granted they should've published more minority writers and women, but then they were men of a certain generation, and wary members of a minority themselves, publishing what they would, and what they could, while the Europe of their forebears burned, and burned their co-religionists. Among the survivors of that carnage was Schocken, the publishing house that helped to introduce America to Franz Kafka, Sholem Aleichem, Isaac Babel, Hannah Arendt, Walter Benjamin, Martin Buber, Franz Rosenzweig, Gershom Scholem, Claude Lévi-Strauss, S.Y. Agnon, Aharon Appelfeld, Elie Wiesel, Primo Levi, Mendele Moykher Sforim and I.L. Peretz, to name just a few, along with landmark translations into English of Torah, Talmud, Midrash and Kabbalah.

The department-store magnate Salman Schocken founded the eponymous press in Berlin; it was forced out of Germany only a few years later and moved to Palestine and then to the United States, publishing in English. In 1987, Schocken Books was acquired by Random House, and in 1998, when Random House was acquired by Bertelsmann A.G., the crown jewel of Jewish publishing in America found itself owned by a German conglomerate that, during the Shoah, profited from Jewish slave labor and leveraged its connections to Nazi and even Schutzstaffel leadership to become among the largest, if not the single largest, supplier of propaganda texts to the Nazis. Currently, Schocken Books is one of the imprints for which Ms. Lucas is responsible, and yet Ms. Valdes mentions this only in passing. Perhaps this is because Schocken, in the past few years, has been quietly wound down: publishing fewer and fewer books each season, and not attending to reprints of its back catalog. By my count, Schocken published seven books in 2020, three books in 2021 and in 2022 it will publish two. I have not been able to find any plans at all for 2023, beyond the promise of a novel by the estimable Jonathan Wilson.

If Bertelsmann intends to shutter Schocken, people like myself would appreciate an announcement (and maybe a Zabar's-catered shiva party) — really anything besides this unofficial silence, punctured only by a profile's avoidance of the Jewish contribution to this country's publishing. If diversity is indeed Ms. Lucas's mission, her employer would do well to remember that it was originally Schocken's: to put the writing of the historically marginalized at the center of American life. I wish Ms. Lucas the best of luck in her new position, with the hope that the future will be more generous to the books she puts out than Bertelsmann has been to the sad, neglected legacy of Salman Schocken.
Joshua Cohen

Today's publishing industry certainly needs to continue to diversify, but the important work of Black writers and editors with mainstream houses since the 1950s ought to be fully recognized, too. It is true that, as this article notes, major Black authors such as Gwendolyn Brooks and Amiri Baraka worked with independent Black publishers in the late 1960s and 1970s — but don't forget that Brooks had already published with Harper, and Baraka (known as LeRoi Jones) with William Morrow, both mainstream houses. Malaika Adero's editing of the jazz musician Miles Davis's 1989 autobiography, co-authored by Quincy Troupe for Simon & Schuster, is duly recognized here — but it came several years after Count Basie's autobiography, as told to Albert Murray and edited by Erroll McDonald, appeared with Random House. In 1990, McDonald, who is Black and whose name curiously appears nowhere in this article, began a 30-year stint as executive editor at Pantheon, long before Lisa Lucas's recent appointment as the imprint's publisher.
Ben Givan, Saratoga Springs, N.Y


The New York Times Magazine

CAN BOOKS START A NEW CHAPTER?

For generations, America's major publishers focused almost entirely on white readers. Now an effort is underway to open up the industry.

By Marcela Valdes

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'They were men of a certain generation, and wary members of a minority themselves, publishing what they would, and what they could.'

RE: TALK
David Marchese interviewed John Grisham.

I'm a longtime fan and I've read most, if not all, of Grisham's books. But over the years, some of the racist undertones — the ones that feel less intentional to me as a reader — have been harder to swallow. I think twice now about picking up one of Grisham's novels because I know these moments will dampen the experience for me. I sincerely appreciate the context this article provides about his "ongoing, gradual transformation" in this area and his honest reflection about his continuing struggle with racism and living in a racist society. Myself, and most likely many others, can identify with this struggle as well.
Renee, Michigan

Send your thoughts to magazine@nytimes.com.

Illustrations by Giacomo Gambineri

Cooking

Make prep time the new playtime.

Explore curated collections like Recipes to Cook With Your Kids.

nytcooking.com

Shop Talk

The rise of the professional-athlete podcast. ● *By Jeremy Gordon* ● Postgame analysis is an integral part of the sports experience. After the final buzzer, fans take to the internet, television and radio to learn what their teams did to win (made their shots, played defense) or lose (missed their shots, didn't play defense). Even the sports-averse can easily picture what this traditionally looks like: four men

(maybe three men and one woman), seated behind a long desk, offering sage insights like "I thought they struggled with catching the ball," to solemn nods of agreement. And yet, for the entirety of the recently concluded N.B.A. Finals, won by the Golden State Warriors over the Boston Celtics, this kind of analysis was also delivered by a more intimate source: the Warriors' own Draymond Green, who, following every contest, left the court to analyze the game he'd just played, as the host of a podcast called "The Draymond Green Show."

Podcasts run by current and former athletes have boomed in recent years, but Green's is made singular by his insatiable appetite for talking. Most of his active N.B.A. peers will release new podcast installments every few weeks; Green, over the two-month duration of the playoffs, released 23, somehow carving out *more* time to chat as the Warriors closed in on the title. This habit came in for some scrutiny after Game 3 of the Finals, which the Warriors lost, and in which Green played especially poorly, scoring 2 points and registering only 3 assists. Afterward, he retreated to his hotel and sat in front of a laptop, his back against the curtains — today's popular podcasts tend to also be released as video streams — to share his thoughts, sounding both humbled ("Tonight may have been one of the worst nights of my career") and defiant about the insinuation that his attentions were divided ("This podcast ain't going nowhere"). One representative reaction came from the ESPN anchor Stephen A. Smith: "All of that talking — 2 points."

Many podcasts are oriented around a very basic premise: 'Here are some people talking.'

Some of the backlash felt territorial. Pundits like Smith make their living off the idea that they can analyze what's going on with players like Green, but such opinions seem irrelevant when Green himself offers direct access to his thought process. Some also felt like moralizing. It's not as though Green's teammates locked themselves in the gym after that loss; they presumably ate with their families, texted friends, maybe unwound in front of the television. Green's podcast is more public, but he talked for less than half an hour, hardly an all-night distraction.

Opening page: Screen grab from YouTube. Above: Maddie Meyer/Getty Images.

Photo illustration by Mark Weaver

My own resistance to the podcast came on other grounds: It wasn't very interesting. Green is a brilliant tactician whose ability to describe his own play is often astute, but here his performance seemed a bit exhausted; after all, he'd just played 35 minutes of competitive basketball, and lost. He took long pauses. He offered rote observations about his teammates ("Steph and Klay both shot well") and how he could improve his own play ("For me, the biggest adjustment is just coming out and being Draymond Green"). He did not sound like a high-level player sketching out the strategic and emotional nuances of his profession. He sounded like a guy who, much as the critics said, could actually benefit from just getting some sleep.

Even podcasting's most ardent evangelizers would have to acknowledge that many podcasts are oriented around a very basic premise: "Here are some people talking." The format's simplicity makes it easy for almost any known figure to get involved. The actresses Jenna Fischer and Angela Kinsey, for example, host "Office Ladies," in which they rewatch and comment on "The Office," the NBC comedy in which they starred. One of the most successful podcasts ever, "WTF With Marc Maron," has the host inviting other comedians to discuss their work and their histories in interviews whose sincerity and breadth can resemble therapy sessions. In each show, and others like them, part of the appeal is simply to hear from familiar voices, but the real attraction is how they demystify what these people do, allowing talented figures to break down their talent-utilization processes. This is the premise of so many athlete-run podcasts: Draymond's, or "The Old Man and the Three" (in which the former N.B.A. players JJ Redick and Tommy Alter trade stories and discuss the modern league), or "All the Smoke" (the former N.B.A. journeymen Matt Barnes and Stephen Jackson trade stories and discuss the modern league), or "I Am Athlete" (the former N.F.L. receivers Brandon Marshall and Chad Johnson trade stories and discuss the modern league).

Location from which Green recorded his podcast after the Warriors won the N.B.A. championship:

The press room of Boston's TD Garden arena.

But the demystification process can, at times, be *too* thorough. I, and many

others, watch sports in large part to be awed: Sometimes it seems truly unbelievable that someone like Steph Curry can do what he does, and the experience of witnessing it in real time, the act of creation right in front of you, provides inexplicable joy. Surprisingly, though, it turns out to be deeply enervating to hear these athletes talk about it. Sports, for them, is mostly a fun job they have, or used to have; they tend to have thoughts about every aspect of it besides the magic of the game itself.

Sports, for them, is mostly a fun job they have, or used to have.

I wonder what it's like for Green to know, a split second before throwing a pass, where Curry will materialize, or what it's like to mentally calculate how quickly to backpedal to the rim to reject an incoming dunk. But on these podcasts, we mostly get the usual punditry: "Steph and Klay shot well," "Boston's a very physical team." Occasionally the hosts reveal their emotions, but never for long. Over time, they often ease into a strange blend of opacity and transparency: The tone suggests we're hearing something uniquely honest, but the content is indistinguishable from what an educated outsider might guess. Much of the players' perspective, you begin to realize, is rooted in being themselves. They know their co-workers and what happens in locker rooms and what the game looks like up close; we don't. The more they offer their perspective, the clearer they make it that we can never totally understand their experience. Listening to them begins to feel like eavesdropping on a stockbroker walking his client through a series of trades — both mundane and exclusive.

There is, to be fair, something bluntly true about a statement like "The biggest adjustment is just coming out and being Draymond Green." Green can speak this way because millions of fans know exactly what "being Draymond Green" represents on the court. What podcasting offers, as he enters the back half of his career, is a space where he can *continue* to "be Draymond Green," even after retiring from the court, untrammeled by the strictures on television's talking heads. Listening to him across the length of the playoffs, I didn't understand anything more about how he experiences his career, or what it's like to be a hyperathletic human surrounded by others, all moving and reacting at the speed of thought. But I came, I think, to understand a bit about how he sees himself. I imagine it's a reality-reshaping experience to have your athletic skill earn you an outsize presence in our culture. Many players struggle when the spotlight is yanked away. Now Green, and others, have a whole new means of remaining their iconic, spotlit selves for as long as possible. If that sounds like an act of ego, I can't pretend it's a unique one in contemporary society. At least this way I'm less in awe of him, a more appropriate way to feel about a guy who, like anyone else with a podcast — like anyone else in the world, really — is just talking. ◆

Poem Selected by Victoria Chang

The ghazal is a formal poem that has roots in seventh-century Arabia and was often sung by musicians. The poet Agha Shahid Ali introduced the form to America. "Ghazal" literally means "the cry of a gazelle" as it is being chased and about to die. Like many formal poems such as the sonnet, the ghazal, with its restrictions, can paradoxically illuminate and parse difficult emotions. In López's poem, the emotion is grief — a longing for and memory of a murdered brother. This poem mostly follows the parameters of a ghazal with its repeated end word, "song," and the inside rhyme of "forever," "far," "marred," etc., as well as the poet's name or reference to the poet ("Sister") in the final line. One way this poem breaks the rules is that each couplet doesn't stand alone as if it were its own poem. Instead, the end of the couplets often bleed into the next stanza, linking the narratives.

Sister Song

By Casandra López

I am not much more than a promise of a song,
that Brother never asked me to sing, our forever song,

but the crack of streets is sometimes a prison.
It wasn't always this way, me swallowing a far song.

Once your neighbor friend chewed a lightbulb and didn't
cry. His child-mouth smiled, a glass cracked marred song,

close to lips. On the 4th of July you used to like to light
the streets on fire, we'd become bright — a North Star song.

These days I stay inside when there is too much noise,
shattered bottles or loud aerial dances; I become a scarred song

remembering Brother, a street number tattooed to your arm
you can't rub off. It inks my own, a tarred song,

that never feels clean. Once you trucked a load of fireworks across
borders. Mother forbid it, not wanting you to become a guarded song,

an imprisoned light. Sometimes I tire, all the singing, want to witness
the sky boom, flare and burn, want to hear you call me *Sister* again.

Victoria Chang *is a poet whose new book of poems is "The Trees Witness Everything" (Copper Canyon Press, 2022). Her fifth book of poems, "Obit" (2020), was named a New York Times Notable Book and a Time Must-Read. She lives in Los Angeles and teaches in Antioch University's M.F.A. program.* **Casandra López** *is a writer and poet. She is the author of a collection of poetry, "Brother Bullet" (University of Arizona Press, 2019), and a founding editor of the literary journal As/Us: A Space for Women of the World. She will begin teaching at the University of California, San Diego in fall 2022.*

Illustration by R.O. Blechman

Krista Tippett on the need to counter the dysfunction of our time. 'I talk about hope being a muscle. It's not wishful thinking. It's an imaginative leap.'

Photograph by Mamadi Doumbouya

During her 20-plus years as host of public radio's "On Being" show — which aired weekly on some 400 stations across the country — Krista Tippett and her beautifully varied slate of guests explored profound and inexhaustible questions about theology, ethics, science, the soul and what it means to be a human. While the questions were inexhaustible, the format, it turns out, was not. Late last month, "On Being" broadcast its last episode as a weekly radio program. Beginning this autumn the show will start afresh as a seasonal podcast, part of Tippett's effort to find new ways — including mining the "On Being" archive for material and conducting smaller public conversations — for her mind- and heart-expanding work to flourish. "Power for any media project is being on as many platforms as possible," says Tippett, who is 61. "But does it have to be that way? What if growth means that you step away from the powerful platforms and go deeper into the quieter things? That's a risk, but it's one we needed to take."

The conversations you have on your show are always so alive with empathy and understanding and mutuality. But do you ever want to have more oppositional conversations? Ones where the ideas could be tested and sharpened by friction or debate? If you were at a dinner party with me you'd find me to be a very opinionated person who has edge to what I say. But one of the things I've been attentive to from the very beginning is how, in this culture, what we often praise as a great question or a hard question is a question that makes the question-asker look smart.
I'm not familiar with ever doing anything remotely like that. [Laughs.] Right? There are times and places where you need to say the hard thing to someone. The thing we need to do *more* of is getting at an understanding — even with people who are mysterious to us.
Do you think the kind of conversations you have for your job have changed who you are? Absolutely. But it's hard for me to get enough distance from that to articulate it. Sometimes people will say to me — and maybe they say this to you too — "You have the best job in the world. You get to spend time in conversation with these amazing people." I spend 95 percent of my time in admin and human drama. I don't go around all the time thinking deep thoughts. The truth is that I use these conversations like therapy. I am in it to get some wisdom. But something I'm aware of, which feels like a responsibility, is that these conversations that I've had have been far-flung but they're in conversation inside me. I have this feeling that the conversation in my head has a lot to say to this world we've entered, which is a hard, hard place.
It's clear that your self-identity is pretty closely wrapped up with your work. Are there parts of yourself that *aren't* expressed through the show? Here's an honest answer: Part of my role is drawing out voices that deserve to be heard and shedding light on generative possibilities and robust goodness. I talk about hope being a muscle. It's not wishful thinking, and it's not idealism. It's an imaginative leap, which is what I've seen in people like John Lewis and Jane Goodall. These are people who said: "I refuse to accept that the world has to be this way." That's a muscular hope. So, to your question, I don't always feel robustly hopeful. But I don't feel like there's a place in my work for my despair.
You just used the phrase "generative possibilities," which reminds me of a favorite phrase of yours: "the generative landscape of our time." What exactly does that mean? I'm contrasting it with the dysfunctional landscape of our time, which is very well publicized. All over the place in every community and field of endeavor, there are people who are working generatively with the challenges before us; creating new possibilities and realities. That landscape is as real and important as that landscape of everything we can point out as failing and corrupt and catastrophic.
But what about politics and power? Where do they fit into creating the landscape you'd like to see? It's a really good question. A simple answer is that the civilizational challenges are also happening at the personal level. We are capable of such beauty and goodness. But it's so complicated now. The places of power are broken. I don't know what we do about Jeff Bezos or Elon Musk. The power that very wealthy companies and people wield is our new wild card. And this is the third level of my answer: Our very last show was with Adrienne Maree Brown.[1] She's one of these people who I think is the evolution of our species. She's queer, she's biracial and she is deep in what she calls "emergent strategy."[2] She's an example of something that I'm watching now:

Below: Krista Tippett interviewing Claudia Rankine in 2018 for her public-radio program "On Being." Opposite: Tippett receiving the National Humanities Medal from President Obama in 2014.

David Marchese *is the magazine's Talk columnist.*

We are learning about the true nature of vitality, which is modeled on the natural world. It's ecosystem-based. It's not hierarchy-based. It's about mutuality and reciprocity. It's an incredible time to be alive. It's terrible in a lot of ways and also full of unbelievable possibilities.

So what's a new possibility you're inspired by? I love your questions. You're pushing in the really important way. Here's what I think of: I see the broken power structures. I see the damage and the pain. I also see people tending to that. At the heart of some of these national-level or community-level conflicts, there is space to move below the radar and start stitching together relationships and quiet conversations at a very human level. We're going to work on quiet conversations that will not be publicized.[3] That feels to me like a power move in this world.

When you're having one of these conversations, do you have an ideal flow or structure in mind for how they should go? I'm thinking about a narrative arc. There has to be a beginning, and the beginning is not just about the listeners' experience. It's in some ways more about the guests' experience — about getting them planted in the place I want them, in order to talk about the things I want them to talk about. That question I often ask about spiritual background[4] — what that gets people in touch with, in addition to memories, is questions. That's an interesting thing, because religion is associated with answers and certainties, but that part of us is full of big searching questions that really don't have answers. I also prepare by trying to get a sense of how someone thinks, and part of that is not just for the quality of the conversation but so they will relax. Because we've all had this experience — I had this experience with you — when you know somebody gets you. You relax. You breathe. The other experience that we have all the time is when we're with someone and we know we're going to have to explain ourselves or defend ourselves. To strip that away and just have them be who they are. Some of my questions are about that. Often that takes 10 to 15 minutes. So I am definitely guiding and getting to an interesting middle and a satisfying ending.

I sometimes wonder if it's even possible to have someone be truly comfortable and open during a conversation with a stranger that's intended for the public, let alone get them to that place in 10 to 15 minutes. Don't you think there's some implicitly mutually agreed-upon artifice going on during interviews like these? I'm engineering their comfort, is that what you're saying?

I think one can do that, yeah, and if you're aware of doing that and building a narrative arc, then what's happening probably isn't quite the same thing as a natural, stripped-away conversation like you're describing. Oh, I understand what you're saying. But you have a different platform. The New York Times Magazine is a place people go to be respected. That is shaping how people turn up with you. So you're right. But, maybe it's living in Minnesota,[5] I just assume that nobody has heard the show. I also think that when we are with somebody who truly sees and appreciates us, that has an effect. We don't walk around the world having that experience a lot. I'm also in this position where I only invite people to be on the show whom I think the world needs to know and see more of. I hold them in esteem. There's a human reaction to people feeling that, an animal thing. We know whether we can be trusting. Occasionally, we're wrong. But I think a conversation is an adventure, and I treat it like that.

Why are you so drawn to conversations? I feel a sense of calling. I'm attending to the pain in our world. I'm attending to the human. I realize that this thing I do is not something that everybody does, which is to ask what is happening at a human level. Can we see how fear works in us? Can we attend to the power of love and joy, which actually do move things? That's what I'm attending to, and that has to flow into how I run my business. It doesn't have to be the biggest thing, but maybe it has to be as beautiful as I can make it.

A lot of people worry about finding their calling. Do you have any advice for them? I want people to liberate the idea of their calling from what they're being paid to do for a living. Your calling may be something that you do that gives you joy but that you're never going to get paid for. It can be how you show up through your day, how you treat strangers. It's the things that amplify your best humanity. I don't think I have to define that, because we all intuitively know what it is. I talk so much on this show about Rilke —

I know where you're going: "Living the questions."[6] Yes! The notion of living the questions in a world that is in love with answers. I've been reading Rilke since I was in Berlin almost 40 years ago,[7] but what I feel coming back to our world is this idea that to do justice to a question means that you cannot rush to an answer. What you're called to do is hold the question itself, dwell with the question respectfully, and love the question. Live your way into the answer. If you hold a question, if you're faithful, the question will be faithful back to you. ◆

This interview has been edited and condensed from two conversations. A longer version is online at nytimes.com/magazine.

Opposite: Travis Magee, via On Being. This page: Alex Wong/Getty Images.

1 Brown is a co-host of multiple podcasts, including "Octavia's Parables," about the science-fiction author Octavia E. Butler, as well as a prolific nonfiction writer who has written fiction too. She also edited and wrote for the New York Times best seller "Pleasure Activism: The Politics of Feeling Good."

2 Brown has described emergent strategies as "informed by complexity, by learning from nature how to be in right relationship with each other and the earth."

3 Tippett told me that in addition to moving to a 10-to-12-episode-per-season podcast format and holding smaller public discussions, she and her team are creating something called the Lab for the Art of Living, which she described to me as "a kit for better conversations."

4 Tippett frequently begins conversations by asking, "Was there a religious or spiritual background to your childhood, however you define that now?"

5 "On Being" has long been based in Minneapolis.

6 From Rilke's "Letters to a Young Poet": "And the point is, to live everything. Live the questions now. Perhaps you will then gradually, without noticing it, live along some distant day into the answer."

7 As a young woman, Tippett worked in Berlin as a stringer for The Times and as an ambassador's aide. She later earned a master's degree from the Yale Divinity School.

My Wife and I Lied About Our Son's Death. Can I Come Clean if She Won't?

A few years ago, my son died from an accidental overdose when he took a fentanyl-laced pill. When we got the autopsy report, his mother (we are divorced) wanted to keep the cause of his death a secret. I was reluctant, but in the throes of grief did not make a stand for the truth. We lied and said his death was due to a bad heart.

Recently, I read an article about the plague of fentanyl overdoses, and it broke my heart (again); I decided we must tell the truth. My son's sister agrees. But his mother and stepfather prefer to maintain the lie.

I believe we are morally obligated to speak out, even if belatedly, because it may save another family from tragedy. I am ashamed it has taken this long. Can I ethically go public with the real cause of my son's death when his mother and stepfather are against it?

Name Withheld

Lying was wrong here, I agree, and it's good to own up to our moral misjudgments. The issue is how you should think about your earlier agreement with your ex-wife. When you joined with her to propagate a lie, it was at least implicitly understood that you'd stick to the story. You'll be breaking that commitment. You'll also be revealing not just that you lied but that she did. This may not do much damage to her reputation — people will understand why she wanted to cover up the truth when she was grieving — but it will be unpleasant for her.

Still, the commitment was to do something plainly wrong. Not revealing how your son died could be defended as protecting your family's privacy. Actively lying about his death goes beyond the defensible. Given that the deception was wrong — and that setting the record straight will harm your wife only insofar as it reveals her to have done this wrong — she is not entitled to hold you to your earlier commitment.

It would be better, all the same, if you could get her to agree — to release you from that commitment. Because you're no longer a couple, it may be harder to work together toward telling the truth. At the very least, however, you and your daughter can explain to your ex-wife what you plan to do and why.

Your explanation shouldn't hang on the possibility of protecting other families, though. Unless you're planning to take part in a documentary or publish an article, the chances of anyone changing paths as a result of your change of story are surely slim. It's clear that lying never sat well with you. Explain what you want to do as a matter of coming clean for its own sake. Not every act need be defended ethically by appealing to its consequences for others.

My wife and I recently took a trip to Morocco. We went with a well-known travel company that we've used previously. We had a guide and driver for one week. Unfortunately, the guide was surprisingly uninformed about issues of interest to us: history, economy, architecture, the political system, etc. He knew the bare minimum. Maybe we had been spoiled by our last three guides — in Ireland, Scotland and Turkey — who seemed to know everything about everything and were constant sources of facts and anecdotes throughout the trips.

The guide in Morocco was a nice person who took good care of us. We liked him and always felt safe and in good hands, and we gave him a good tip. But he spent an inordinate amount of time chatting with the driver, paying little attention to many of our questions.

The issue is what to tell the travel company in its evaluation survey. I would like to be honest, mentioning what we liked but being clear about our disappointment and offering suggestions on how he could improve. My wife prefers not to say anything negative. Before our trip, because of Covid, he hadn't worked for two years. She is afraid a critical appraisal may result in him losing his job. I say it is unfair to the company and future travelers to be dishonest.

Richard, New York City

Your wife's concerns have some basis. In Morocco, where college graduates have an even higher unemployment rate than nongrads, there are likely highly qualified candidates who could replace him on the company's referral list. In your desire not to harm the prospects of someone you got on well with, you're focusing on the effects

Bonus Advice From Judge John Hodgman

Grace writes: My husband's car has a bumper sticker that reads: "Please don't fart around my kids." I drive this car often and am *mortified* when I see people looking at the bumper. My husband loves the sticker, and I believe a lot of his enjoyment comes from my hating it so much. Can you please order him to remove it?

————

I don't even get the joke this bumper sticker is trying to make. Unless it's not a joke and he genuinely wants exclusive farting rights around your children — which does track with the kind of "fun" dad who enjoys embarrassing his family. The car is not "his." It is shared by you. If he gets pouty and won't remove it, you can simply cover it up with a magnetic strip whenever you use it. Or add your own bumper sticker with an arrow that says: "My husband thinks this is funny. He laughs at my discomfort, and this is how we talk now."

To submit a query: Send an email to ethicist@nytimes.com; or send mail to The Ethicist, The New York Times Magazine, 620 Eighth Avenue, New York, N.Y. 10018. (Include a daytime phone number.)

Illustration by Louise Zergaeng Pomeroy

Illustration by Tomi Um

your candor would have on him alone. But by keeping your misgivings to yourself, you may be denying a more competent person the chance to deliver a better experience to the company's future clients.

I recently took a three-hour domestic flight, and the woman seated next to me spent the entire flight using a vape pen. Despite wanting to remind her that vaping on a plane is a federal offense, I didn't say anything. I can see the argument for speaking up (vaping is prohibited on planes because the lithium batteries pose a fire risk) and the argument against (it wasn't bothering me, and a larger conflict could have ensued from my speaking up). People have been behaving especially aggressively since we came out of Covid isolation, so who knows how this woman might have reacted. And because flight attendants have endured so much harassment lately, I hesitated to involve them. Was I wrong not to speak up?

Jenny

The scofflaw in the next seat has always presented a quandary. It's not as if you can have a tense exchange and then go your separate ways. And so, like you, I tend to bite my tongue. Still, I hope you and I would both speak up if someone were doing something that posed a serious danger.

She probably wasn't. The federal ban on vaping on commercial flights, instituted in 2016, was meant to protect passengers from unsought exposure to aerosols. Lithium batteries are found in almost all personal electronic devices. What's true is that the T.S.A. is antsier about some of these batteries than others, and so you can take vape pens in your pocket or as carry-on luggage, but not as checked luggage. The bigger worry with poorly designed lithium batteries is that they might cause a fire buried away in the hold. If you can feel them overheating in your pocket — or in your hand — you can do something.

The fact remains that what this passenger was doing was inconsiderate, even if you weren't bothered by it. Violations of reasonable social norms are everybody's business, and, in any case, she was exposing you, willy-nilly, to the aerosol of a poorly regulated fluid — an aerosol that, research suggests, contains more toxic metals than even cigarette smoke does. Besides, nicotine addicts have options (lozenges, patches) that don't produce effluents.

Part of what makes people comply with rules is that other people call them to account. A disapproving look, a calm but firm reproof: these sort of norm-reinforcing interventions ultimately help everyone who travels, including those of us who shun confrontation in pressurized cabins. In this sense — if, alas, only in this sense — you and I are free riders.

Violations of reasonable social norms are everybody's business.

My wife and I are selling our house, which is far too big for us, and getting rid of a lot of stuff accumulated over a lifetime. We've had it all appraised, and most of it is virtually worthless (area rugs, silver-plated cutlery, cheap souvenirs, etc.). We could donate it to charities or simply throw it away. However, our middle-aged daughter has begged us not to get rid of our junk but instead to give it to her to put in her storage unit. The trouble is that she has a hoarding problem (she is the first to admit it), and that storage unit is already full of things that she has been meaning to sell for decades but simply can't bear to part with. Do we give her our stuff, thereby enabling her hoarding addiction, or donate it, thereby presuming we can make choices for our adult child?

Name Withheld

Donating the stuff — and accepting a tax deduction of its fair market value, however small — would solve your problem without adding to your daughter's. Taking her wishes into consideration doesn't mean capitulating to them. This isn't a matter of making choices for her; it's a matter of not letting her make choices for *you*. ◆

Kwame Anthony Appiah *teaches philosophy at N.Y.U. His books include "Cosmopolitanism," "The Honor Code" and "The Lies That Bind: Rethinking Identity."*

Green Boat (Annecy), 2022, 18 x 26 inches, oil on linen. © 2022 Mitchell Johnson.

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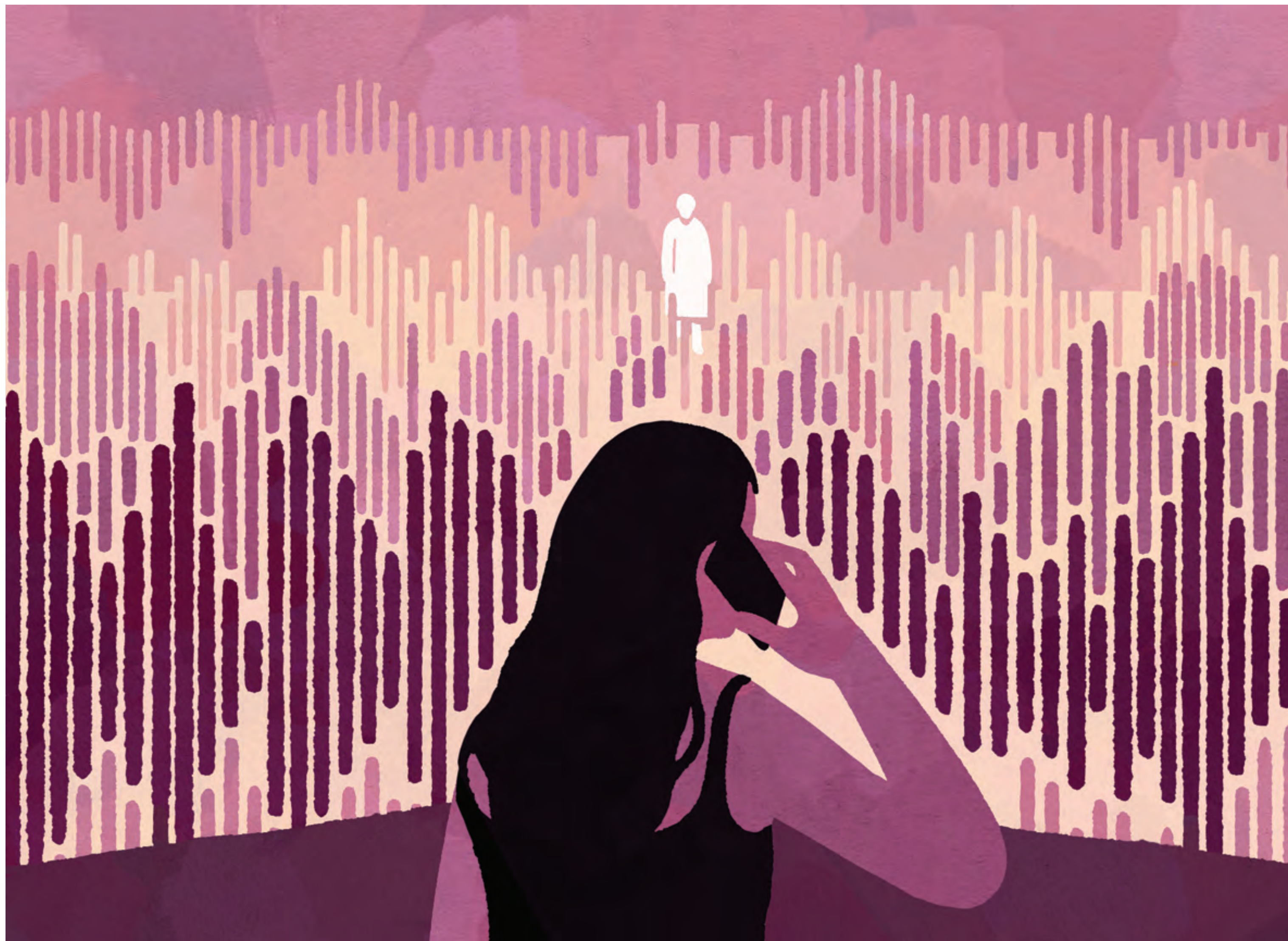
Talking to the Dead

By Maggie Jones



Voice mail helps a daughter cope with her mother's death.

I began leaving voice-mail messages for my mother about a month after she died. It was February last year, during some of the darkest days of the pandemic for my family. My teenage daughters were mourning their grandmother while largely cut off from their friends and school. My husband and I were also struggling, drifting apart while cooped up in the same house together. And in my determination not to crumble in front of my girls when their worlds were already spinning out, I couldn't, or wouldn't, open the door for my own grief. It's as if it were stuck deep in my chest, unable to find the space to surface.

Just after my mother died, my younger sister reminded me that my mom's voice was still on the outgoing message of her cellphone, which no one had yet disconnected. So, one afternoon while walking my dog in an open field, I dialed the number and heard her say, "Please leave me a message after the tone." They were typical words, of course. But also so much my mom — her voice clear, steady, to-the-point. And when the phone beeped, I began talking, and then sobbing for the first time since her funeral.

I filled the two-minute voice mail, talking until it cut me off about how much I missed her, how much I needed her. There was something about the physicality of speaking aloud — rather than internally as I had done with my father, who died almost two decades earlier — that dislodged some of my sorrow. The air pushed out from lungs, my vocal folds vibrated, I heard my own words in my

Illustration by Franco Zacharzewski

ears. It worked like a spoken prayer: slowing me down, giving sound to my pain and loss and, in the process, making me feel more connected to the person I could no longer see or touch.

After that first message, I called every few weeks or so. Sometimes I would tell her small things. That my oldest daughter kept a photo of the two of them on her desk at college. That my youngest had become fierce on the soccer field. Occasionally I phoned her from my home office, in the afternoon, after I met a deadline: "This is just the time I'd usually call, Mom. I'd try to have a funny story for you. We'd talk about the lousy weather." As I spoke, I imagined her looking out her bedroom's sliding glass doors, as I looked out my window, 380 miles apart. On walks, I would sometimes talk about more serious things — my marriage, my worries. I spoke cryptically, as if she already knew what was going on and I just needed her to be my sounding board.

My messages were inspired, in part, by the Wind Phone near Otsuchi, Japan, which I read about years ago. The white phone booth with a disconnected black rotary phone was created by a landscape architect in 2010 to help him cope with his cousin's death. And when the tsunami hit Japan a year later, tens of thousands of people began visiting the phone, sending words to their dead loved ones in the wind. In the years since, people have recreated the concept, sometimes in reaction to other tragedies — a deadly warehouse fire in California or Covid-19. There are replicas on the Appalachian Trail and on a Colorado ski slope. So many people in mourning — telling a spouse, a sibling, a friend that they miss their voice, that the kids are doing well, that they doubt time will ever heal them.

Eventually I realized there was a pattern to my messages: They often reflected how I thought my mom would reply to me or the advice she would give. Like when I bought a piano and restarted lessons. "I just know," I said into the phone to no one on the other end, "what your reaction would be: 'Oh, I'm so thrilled for you, honey. That's just the right thing to do.' " After I suggested to my siblings that it would be too painful to replicate Mom's Christmas traditions, I left a message channeling my mom's pushback: " 'Don't be so sentimental,' you'd tell me." And after a hard week when I felt exhausted and my kids were struggling, I told her: "I know you would say get a massage and stop taking on everyone's emotional stuff. It's not all your problem." Without being fully aware of it in those moments, I was invoking her words to internalize her guidance, something I'd done most of my life.

When the phone beeped, I began talking, and then sobbing for the first time since her funeral.

My private Wind Phone wouldn't last forever, though. The bills for my mom's flip phone were about $100 a month, and spending more than $1,000 a year just to maintain a voice-mail inbox didn't make sense. But once it was gone, there would be no changing my mind. It was one more step — like selling her house, donating her clothes — in letting her go.

Late last year, I told my older sister, who was in charge of my mother's bills, to close the account. Voice mail had worked as a transitional object in those early months after her death, helping me shift away from my mom's physical self and toward a different kind of presence, in which her wisdom, her warmth, her common sense flowed like a quiet stream within me. And I knew I could keep the practice of sporadically speaking aloud to my mom without the phone. Still, I wasn't sure if the line would go dead immediately or in a few weeks, and I didn't want to experience hearing: "This number is no longer in service." So, I left her one final message: "I will miss this, Mom. But I know what you would say: 'It's OK, darling. Time to move forward.' " ◆

Maggie Jones *is a contributing writer for the magazine and teaches writing at the University of Pittsburgh.*

Tip By Malia Wollan

How to Ask a Stranger For Help

"Asking for help is hardly ever as bad as you imagine it will be," says Vanessa Bohns, a social psychologist and associate professor of organizational behavior at Cornell University. For research purposes, she and colleagues have sent help-seekers out into cities all over the world to request things from 15,000 strangers. Appealing for assistance "feels socially risky," Bohns says. Ask anyway. When asked for help, most people are happy to comply. "We are a social species," Bohns says. "We default to being agreeable rather than disagreeable."

Keep your request simple and direct. "Don't offer a million excuses and apologies," she says. To avoid potential rejection, you might feel inclined to passively hint at what you need rather than saying it outright. Don't do that. Ask directly for what you need, and if someone says no, move on and ask another person. Whether you're approaching a stranger or a friend, it's always more effective to ask for help in person. "Be face to face," Bohns says. "It's more emotional."

Assume the stranger will help you. In one study, Bohns and a colleague had undergraduates approach people they didn't know and say, "Can I use your cellphone to make a call?" Before starting, the undergrads had to predict how many people they would have to ask to get three to agree; they overestimated by more than 60 percent. It turned out that about half the strangers shared their phone. The help-seeker tends to believe people will weigh the time and financial costs associated with offering assistance, but it turns out saying no is awkward, and most people would rather just say yes, even when the request feels ethically questionable. In another study, Bohns had people ask strangers to write the word "pickle" in a library book. Many were reluctant and uncomfortable, but ultimately some 65 percent of them vandalized the book anyway.

Try not to seek help from strangers in a location where others are simultaneously approaching them with requests. The only place that Bohns found where strangers mostly refused to help was a busy street in Toronto frequented by canvassers and petitioners. People steel themselves in those kinds of scenarios. "It's easier to say no when you know what's coming," she says. ◆

Illustration by Radio

Bring On the Biscuits: The homey breakfast classic gets a punch up from kimchi and sharp Cheddar.

Photograph by Chris Simpson

Food stylist: Maggie Ruggiero. Prop stylist: Sophia Pappas.

At the heart of it, you're looking to make a dish that makes your people feel good.

A good biscuit is a miracle. Its own holy ritual and a hangover cure-all. No matter how foolproof your recipe may be, or how many generations have passed it down, the moment a biscuit departs an oven follows a familiar pattern: expectation, followed by suspense, before the elation payoff. Success is immediately recognizable, weightless in your hands. You know it when you see it. You remember it when you taste it.

My first encounters felt routine. As a kid, I ate buttermilk biscuits after church, beside runny eggs, cheesy grits and fried catfish. Even if I wasn't stoked to face a pulpit for four hours, the thought of biscuits in the back room was enough to tide me over. And long after I fell out of religion — disturbed by the homophobia — the thought of those biscuits lingered. They were light where they needed to be, and soft to the touch, and you could run through maybe four before you realized they were gone.

But regardless of where you're eating a biscuit, the chemistry's the same. A little flour, a little liquid, your freezing butter, a pair of deft hands and an oven to bring them home. (As Edna Lewis has noted in "The Taste of Country Cooking," "biscuits brown more beautifully on a bright, shining pan than on a dull one, and a thick bottom keeps them from browning too much on the bottom.") A biscuit can be the epigraph to your meal, or it can be the vehicle for your protein, whether that's bacon, ham, sausage or beyond.

The dish is an exercise in many different perfections. I think of every biscuit I ate in New Orleans's Cake Cafe (R.I.P.), a bakery that sat a short walk from my old apartment, where after months of ordering the same thing a waitress asked me why I didn't simply order two at a time. There were the miso-butter-topped biscuits split among friends after our all-nighters in Osaka, Japan, entirely hung over the following morning, alongside chipped mugs of tea. There's the litany of biscuits I've eaten in Austin, Texas, from Bird Bird Biscuit — a sandwich shop whose Manor Road location on that particular day seemed to be largely run by other queer boys — to Little Ola's Biscuits, where, after an hourlong wait and one bite, I immediately found myself in line again, and the cashier laughed and laughed.

And then, years later, in Portland, Ore., my boyfriend stumbled into a diner during a heat wave, where a deeply tattooed lady in an apron recommended biscuits laden with Cheddar and kimchi (with the caveat that it was a lot). By the handful, these pastries became the most delicious thing I'd eaten in the city.

A good biscuit, in many ways, is an act of generosity. At the heart of it, you're looking to make a dish that makes your people feel good. And what really makes a great biscuit are the hands behind it: It's the accumulation of memory and desire and experience. So sometimes I'll add kimchi from my local Korean spot, Korean Noodle House, and some Cheddar to my biscuit batter, stirring it with buttermilk. Or I'll bake a batch of biscuits alongside karaage, saving the leftovers to be dropped off to friends. Or I'll freeze an extra set of buttermilk biscuits to reheat in the oven, when it's late and I just don't feel like cooking or picking up anything at all.

The labor behind biscuit-making — hell, behind cooking — is an extension of care that I've received myself. If we're lucky, we can only hope to find ways to redistribute it. And this idea of care feels particularly queer, and crucial among queer folks as we find ways to support our communities. Whether it's supporting trans kids navigating cultures of harm throughout the country, finding hyperlocal resources for creating community within queer hubs or creating beacons for folks who might feel isolated in their own situations, a vision of queer futures feels inseparable from a practice of care. And it's care that takes many different forms — accepting folks as they are, alongside whatever they bring to the table.

Case in point: Just before our current pandemic's outset, after a week in Baton Rouge, La., for work, I was staying downtown and taking stock of breakfast options when I passed through Cafe Mimi, a homey breakfast joint. A Vietnamese couple met me at the door, and after I ordered a biscuit with eggs, a little automatically, I'd made it through the entire meal before I realized just how delicious they were. So I went back the next morning. And then the next. For the next few days, I ate every breakfast at the cafe. Eventually, the owner asked me where I was from, and when I said Houston, he told me the city was home to his favorite Vietnamese food in the United States. If I liked pho (I love it), he'd make it for me if I showed up in a few mornings (I did). And so the days spent in a sleepy, unfamiliar city were, all of a sudden, full of care in an unfamiliar place. A revelation and a reminder all in one.

Kimchi-Cheddar Biscuits

Time: 55 minutes, plus chilling

- ¾ cup/145 grams drained kimchi, finely chopped
- 2 cups/258 grams all-purpose flour (see Tip)
- 1 tablespoon baking powder
- ½ teaspoon baking soda
- 2 tablespoons brown sugar
- ¾ cup/66 grams shredded sharp Cheddar
- 6 tablespoons/85 grams cold unsalted butter, plus more for baking sheet
- 1 cup/240 milliliters cold buttermilk

1. Stir-fry the chopped kimchi in a stainless-steel pan over medium heat, until the juices have evaporated and the kimchi smells even more fragrant, about 3 minutes. Transfer to a plate, and allow to cool completely.

2. Combine the flour, baking powder, baking soda and brown sugar in a bowl, breaking up any lumps of sugar. Add the cheese and the cooled kimchi. Stir to combine; it's all right if the dough is scraggly.

3. On the large holes of a grater, grate the chilled butter over the other ingredients. You want the butter to be around the size of peas. Stir to combine. Gradually add the buttermilk, and continue stirring until combined. Be careful to handle the dough as little as possible.

4. Drop the dough in 6 mounds onto a greased baking sheet. (If your baking sheet is nonstick, line it with parchment paper instead.) Pat the mounds gently into squares.

5. Put the biscuits on their baking sheet in a freezer to chill for at least 1 hour. Heat the oven to 425.

6. Bake the biscuits until golden brown, 18-20 minutes. Remove the biscuits from the oven, and allow them to sit for several minutes before serving hot.

Tip: For more delicate biscuits, use 1⅔ cups/214 grams all-purpose flour and ⅓ cup/42 grams pastry flour.

Yield: 6 biscuits. ◆

YUVAL SHARON IS SEEN BY MANY AS THE FUTURE OF OPERA. SO WHY DID HE TAKE HIS RADICAL VISION TO A MIDSIZE COMPANY IN DETROIT?

Magic Act ● By Mark Binelli ● Photographs by Dan Winters

LAST SEPTEMBER,

as cultural organizations began their fall seasons in a state of crisis, unsure if audiences would venture from their homes in the midst of a pandemic, Yuval Sharon, the artistic director of the Michigan Opera Theater, decided to mount a show called "Bliss." A restaging of a marathon piece by the Icelandic performance artist Ragnar Kjartansson, "Bliss" requires its performers to replay the final three minutes of Mozart's "The Marriage of Figaro" without pause for 12 hours.

Sharon's production took place in what was once the Michigan Building Theater, a former Detroit movie palace that closed in 1976; infamously, when architects determined that demolishing the theater would make an adjoining office building structurally unsound, the interior was gutted and transformed into a multilevel garage. The sight of cars parked beneath moldering Renaissance-style plasterwork and traces of long-gone balconies has long proved irresistible to Detroit ruin photographers, but no one before Sharon had ever staged a live performance among them. The production was pay-what-you-like, and those of us in the audience reached the performance space by walking up a ramp. Looking over its edge, I spotted a dusty Jeep parked on a lower level with the words LIONS SUCK traced on the windshield. A pair of low stages, minimally dressed to set a banquet scene, had been assembled, and the rest of the space was hauntingly lit, with an orchestra on the same level as the audience, whose members were free to sit or orbit at their leisure, entering or leaving at any part of the show, which began at noon and ended at midnight. Sharon paced the perimeter in a bow tie, a colorful jacket and yellow sneakers.

Now 42, Sharon is the most visionary opera director of his generation. He founded an experimental company, cheekily named the Industry, in Los Angeles in 2012, and was met with near-immediate acclaim for stagings so wildly inventive they often dispensed with stages altogether. A 2013 production of "Invisible Cities," the composer Christopher Cerrone's adaptation of Italo Calvino's imaginary travelogue, took place in Los Angeles's Union Station, one of the busiest passenger railroad terminals in the country; performers moved around the space as concertgoers listened on wireless headphones (and commuters raced for their trains). A 2015 opera inspired by Julio Cortázar's "Hopscotch" — a novel whose chapters can be read sequentially or by "hopscotching" around the book — recreated the format in Los Angeles traffic: Audience members would enter one of 24 limousines, each of which also contained performers, and proceed along one of three routes, occasionally changing cars or stopping at key landmarks to witness vignettes. Other Sharon productions have combined live singers with green screens and digital animation, stuck performers inside a giant glass vitrine and redeployed defunct air-raid sirens to broadcast music onto city streets. In 2017, Sharon was awarded a MacArthur Foundation "genius" grant; the following year, he became the first American to direct at Bayreuth, the Wagnerian opera festival founded by Richard Wagner himself in 1876. The conductor Gustavo Dudamel — the music and artistic director of the Los Angeles Philharmonic, where Sharon served a three-year residency as artist-collaborator — told me in an email that Sharon was a "creative genius" who "understands the heart of every piece and takes us there through a vision that is incomparable."

And yet Sharon's boldest venture may have been the announcement, in 2020, that he would be accepting a position as artistic director of the Michigan Opera Theater — since renamed, at Sharon's insistence, Detroit Opera. It's hard to overstate the unlikelihood of a director as innovative and internationally celebrated as Sharon taking the reins of a decidedly regional (and in certain respects conservative) opera company like Detroit's. But today, nearly two years into his five-year contract, Sharon has already radically elevated Detroit Opera's status in the larger cultural ecosystem. His first production in Detroit — a drive-through, socially distant version of Wagner's "Götterdämmerung" in a downtown parking structure — received a rave from Alex Ross in The New Yorker: The piece "would have been a triumph in any season," Ross wrote, but it "felt borderline miraculous" in 2020, during the first wave of the pandemic. Sharon went on to commission a revival of the Pulitzer Prize-winning composer Anthony Davis's "X: The Life and Times of Malcolm X," which had never received a full revival since its premiere at New York City Opera in 1986. Davis told me he'd taken meetings at the Metropolitan Opera over the years to discuss possible productions, but nothing had ever come of the talks; after the Detroit production was announced, though, "Yuval said the Met called *him*," and arranged to bring the production to New York in 2023.

I came early to "Bliss," then returned again closer to the finish, grabbing a chair near Corey McKern, the baritone playing the philandering Count Almaviva. For the last 11 hours or so, the count had been begging forgiveness from his wife, and now McKern sat slumped on some steps at the edge of the stage. Kjartansson originally staged "Bliss" in 2011, but a decade later, its purgatorial repetition had become a perfect metaphor for our daily lives during the pandemic; the endless loop of penitent toxic maleness also had an amusing new resonance. On a personal level, more than whatever conceptual power the piece held, more than the ways in which repetition deepened and complicated the beauty of Mozart's music, even more than the athleticism of the singers or the novelty of hearing them, unamplified, from only a few feet away, I was struck by the space itself. I'm a former resident of the city, and Detroit's ruins were not new to me; to be frank, I'd been skeptical of the decision to stage the performance in the former Michigan Building Theater at all. So I was surprised to find myself tearing up during the final burst of applause at midnight. Had it been the amazing feat of endurance I'd just witnessed? The fact that this was one of the first live musical performances I'd seen in over a year? Or was it because we hadn't been invited into this space simply to gawk at a memento mori, but rather to transform it into something transcendent, or at least to try?

Mark Williams, the chief executive of the Toronto Symphony Orchestra, told me that when he heard about Sharon's move to Detroit, he was not surprised. He and Sharon had worked together at the Cleveland Orchestra, where Sharon directed a pair of acclaimed opera productions. But Sharon's ambitions, Williams said, were bigger than guest directing; he was "the sort of person who would want to come into a space where he could really effect change, rather than going into a more established space and becoming more of a caretaker. So when he told me about Detroit, I thought, Gosh, that makes perfect sense. I believe that Yuval and Detroit Opera could really become the company that is showing America what opera can be."

As a deep partisan of the city, I say with all fondness: The future of American opera unfolding in Detroit was not a plot twist I saw coming. And yet, Sharon countered, Detroit might actually be "the perfect place to really push for what for what the future of opera can be." He is not interested in a universalist, one-size-fits-all approach, where

"La Bohème" ends up the same in Detroit as it does everywhere else: "No, it's got to be totally *of* Detroit in the end. That, to me, is the path forward." Couldn't — *shouldn't*, Sharon insisted — opera in Detroit look and feel and sound like nothing else in the country?

IN PERSON, SHARON has the air of a convivial host. Boyish and elfin, with a slight frame and probing blue eyes, he's a hugger, an easy laugher, a hoarder of both apt quotes by heavyweight European thinkers (Brecht, Barthes, Adorno, Kierkegaard, Peter Sloterdijk) and gossipy anecdotes (e.g. the one about the famous opera diva who phoned her agent in Europe so he could call the driver of her limo and have him lower the air-conditioning) — someone who "knows what he wants but is very polite, the opposite of an authoritarian director," according to Matthias Schulz, the director of the Berlin State Opera, who sounded, when we talked, at once impressed and slightly puzzled by this approach.

Earlier this year, Schulz invited Sharon to Berlin to revive his production of Mozart's "The Magic Flute," which he first presented in 2019. "The Magic Flute" is Sharon's favorite opera, and in his staging the singers are puppets dangling from strings in a children's theater, with Tamino, the hero, costumed to resemble the manga character Astro Boy. ("The original version had tons of flying," Sharon says. "We're cutting that back.") A few days before that revival opened, I met Sharon in front of Berlin's KW Institute for Contemporary Art, where he arrived on a lime-green rental bicycle. He spent time in the city in the early aughts, when the KW, housed in an abandoned margarine factory, was among his favorite haunts. "I didn't even check what was on," he said as we entered, pulling a black N95 mask from the pocket of a sharp coat assembled from expensive-looking shingles of rough-hewed wool. "I always love what they do here." It turned out that in the first gallery we were greeted by a quartet of stylized marionettes by the Austrian artist Peter Friedl. "Wow," Sharon said. He pulled out his phone and snapped a photograph. Critics of his "Magic Flute," he noted, didn't like the marionette concept. He chuckled. "They thought of it as childish. I think it's child*like*. There's a distinction!"

The original 2019 production was plagued with difficulties. The flying devices barely worked, and the original conductor, Franz Welser-Möst, dropped out three weeks before the opening for an emergency knee surgery. Audience members booed at the premiere. A zero-star review in The Financial Times began: "There are natural catastrophes, such as floods and earthquakes. And then there are man-made catastrophes, such as Yuval Sharon's new production of Die Zauberflöte at Berlin's Staatsoper." Sharon has since acknowledged that the opening was "a disaster" — but the production did find its footing, and actually became popular, hence Schulz's desire for the streamlined revival, which has become part of the Staatsoper's repertory. "Matthias told me it became a cult favorite," Sharon said, "which I think is a nice way of saying critics hated it but audiences like it."

I'd been scheduled to attend a rehearsal two nights earlier, but just before I left my hotel, I received an apologetic email saying one of the cast members felt uncomfortable having a journalist in the house. I would only be allowed to watch an hour of the proceedings from high in a balcony, far from everyone. Later I learned the context of my banishment from Sharon, who arrived in Berlin the day before: After a quick stop at his hotel he headed straight to the opera house, where the first thing he heard, from the same cast member who objected to my presence, was: *This production is [expletive]. What are we doing?* Sharon recounted the story with good humor, but he was obviously annoyed. "I was like, OK, you go sing your part, and I'll deal with people who *want* to be here," Sharon said. He sighed. "You can't win 'em all. A big part of being a director is realizing that. And you know, watching it again? I thought, *I still like all of this!* If you asked me to do 'The Magic Flute' today, this is the production I'd do."

On opening night, I sat next to a girl who couldn't have been older than 10 and had brought along a pair of opera glasses. The technical and conceptual audacity of Sharon's productions tend to reap the most attention, but I've often come away from his work remembering smaller moments, funny or surreal, that grasp the emotional heart of the operas he's deconstructing. In the case of "The Magic Flute," one such moment came near the end, after Tamino rescues Pamina — and then, suddenly, the pair re-emerge in modern dress, the setting having shifted to a pristine replica of a 1960s suburban kitchen, jarringly rerouting the lovers' fable-like quest narrative into a scene from a David Lynch movie, a version of Ever After both sinister and deflatingly mundane.

The standing ovation the show received would seem to justify Sharon's self-confidence. But the skeptical cast member's question gets at a nagging tension that hovers in the background whenever a provocateur like Sharon enters a more tradition-bound establishment — and there are few arts establishments more tradition-bound than opera, an endeavor that, perhaps for this very reason, seems perpetually in crisis. Devotees fret about aging audiences (the average Metropolitan Opera subscriber in the last season before Covid-19 was 65), cultural irrelevance, overdependence on wealthy donors, elitism, lack of diversity and of course the challenges of presenting what's known as the "inherited repertoire," which can make major opera houses feel more like museums displaying beautifully lit but familiar versions of beloved masterpieces. According to Marc Scorca, president of Opera America, many opera houses are financially healthy at the moment, thanks to recent federal stimulus packages — but "underneath that," he says, "is huge concern about how the audience will rematerialize once Covid is behind us."

Sharon recognizes these challenges as being even more fraught in Detroit, where an already lean budget became leaner during the pandemic — and where, he told me, "the old metrics were, you have a 90-percent-white audience in a city that's 80 percent Black." He went on: "They lured

Above: The tenor George Shirley in rehearsal for "La Bohème." Page 21: Detroit Opera's artistic director, Yuval Sharon.

Photograph by Dan Winters for The New York Times

me in with the sentiment that said, 'We absolutely need to change.' And I said, 'Well, if change is *really* what you're interested in, then, I mean — continuation is not what I'm here to do.' "

THE JOB IN Detroit has been a return of sorts for Sharon, who grew up nearby, in Chicago. His parents, both Israeli, came to the United States when his father, Ariel, a nuclear engineer, attended Northwestern University. After Chernobyl, Ariel started a company that made nuclear-plant emergency simulators, a job that kept him on the road — often to Germany, where, "kind of the way American businessmen would go golfing together, clients there would take him to the opera," Yuval told me. Ariel had always been an amateur music lover, noodling around on the family's piano and insisting that Yuval (but, for some reason, neither of his siblings) stick with lessons. The pattern repeated itself with opera: As Ariel became more of a buff, his son, who thought the swords and dragons in Wagner were cool, would become his regular companion at the Lyric Opera of Chicago.

The first opera Yuval saw, a production of "La Traviata" on a visit to Germany when he was 12 or 13, didn't speak to him, but he still remembers a single, dreamlike moment from the otherwise traditional staging. In the final act, as Violetta lay dying in bed while a chorus sang offstage — party music, Sharon says, the moment where the woman realizes the world outside doesn't care — a clown holding a balloon emerged from beneath her bed and sneaked out a window. "It was the only moment in which the reality of what was happening onstage was broken," he says. The rest of the production rapidly faded, leaving little impression. But the image of the clown stuck in his mind.

By middle school he'd become a self-described "loner kid"; by high school he was watching Bergman's "Persona" for pleasure. He attended the University of California at Berkeley, majoring in literature but hoping to get into film or theater directing. After graduating he moved to Berlin, living in a flat with a coal stove and teaching English part-time. Living in the city was so cheap that he could afford to go out to plays, concerts and operas. Opera had never struck him as the sort of endeavor in which he could play a part; it felt fixed, like going to a museum or reading the Great Books. But in Berlin he saw opera directors with the freedom, thanks in part to state funding, to be wildly experimental, and realized an opera production could be more than a re-creation of something from the past.

Sharon moved to New York in 2002. He helped found an experimental theater company, but he soon realized that all of his shows had musical elements. He was becoming more excited about his day job at New York City Opera, where he would eventually run a new-music program called Vox. Meeting composers and workshopping their operas with the orchestra, he found himself most enthusiastic about the pieces that didn't feel as if they would make sense framed in a normal theater — those composed specifically for amplified voices, say, or incorporating electronic components. But starting a company to produce new opera seemed impossible in New York, and none of the cramped black-box theaters he could afford to rent felt like exciting visual spaces. In 2008 he began spending time in Los Angeles, working as an assistant director to Achim Freyer, a student of Bertolt Brecht's and one of the avant-garde directors whose work he found inspiring in Berlin. Sharon says he got the job, working on a monumental staging of Wagner's "Ring" cycle, because "they needed someone who could speak German and who loved Wagner enough to make a two-year commitment." Scorca, of Opera America, remembers the transplanted Easterner raving about how Los Angeles had a special freshness, an absence of cynicism and an openness to the arts. The Los Angeles Opera had been around only since 1986; Freyer's production was to be the first complete "Ring" cycle ever performed in the city. "There was a whole arts infrastructure really being birthed," Scorca says. "The Broad Museum hadn't been built yet. Disney Hall was still relatively new. Something very special was happening, and there was a receptivity to the new that Yuval liked." And unlike New York, Los Angeles had space to accommodate the scale of Sharon's creative vision.

"We were the *new* New York," chuckles Cedric Berry, a bass-baritone who performed in the Industry's first production, "Crescent City." Set in a fictional city based on New Orleans after Katrina, the opera, by the Louisiana native Anne LeBaron, had been a favorite of Sharon's since it was workshopped at Vox, and in some ways became his impetus for starting the Industry. He raised $250,000 from donors and grants and rented a warehouse in the Atwater Village neighborhood. "The music was the hardest piece I've ever done," Berry told me. "But in addition to being an opera, it was an art installation" — Sharon had invited local visual artists to design immersive sets — "so the audience was on the stage, around the stage, you walked through them. My character was building a house. And they had cameras in your face, projecting video onto screens, so you had to be a smart actor, period."

The dancer and choreographer Benjamin Millepied, who was starting the LA Dance Project around the same time, recalls looking at a synopsis of the show "and thinking, This is the sort of thing very unlikely to work." But by all accounts it did. The staging was high-concept; "I never make things easier, I make them more complicated," Sharon admitted to me, while Berry says that "if it's not something anyone in their right mind thinks is impossible, Yuval wouldn't want to do it." But Sharon remained laser-focused on performance and traditional technique, rooting out what Berry called " 'smacting,' a kind of mock-acting, what people think of when they think of musical theater." In a rapturous review, the Los Angeles Times classical-music critic Mark Swed described the Industry as "potentially groundbreaking" for the city. Millepied came away such a convert that the LA Dance Project collaborated with the Industry on its next project, "Invisible Cities."

For Sharon, Wagner's theory of *Gesamtkunstwerk*, a "total work of art," makes opera the "ultimate collaborative art form and the ultimate multimedia art form" — even if for Wagner himself the term "meant 'everything comes from my brain, and it's all unified.' " Sharon's own concept for a 21st-century *Gesamtkunstwerk* is "multivoiced, a polyphony rather than a monotony." The 2020 Industry production "Sweet Land," for instance, had two directors, two composers and two librettists. And the polyphony of public space came into play during site-specific Industry productions like "Hopscotch," injecting some degree of anarchy into the pieces. Berry, who performed the role of Kublai Khan in "Invisible Cities" in

Sharon's 2019 production of "The Magic Flute" at Berlin State Opera.

Detroit Opera's "Bliss" in the former Michigan Building Theater, which is now a parking garage.

street clothes and a wheelchair, told me he was often mistaken by commuters at Union Station for "some random homeless person" who happened to be singing; during one performance, when Berry paused during one of his arias, a woman who had been listening took the opportunity to start belting her own song.

One of the composers for "Sweet Land," the Pulitzer Prize winner Du Yun, told me that Sharon, from the outset of their unorthodox collaboration, encouraged the artists to let their imaginations run wild "as if there were no financial concerns." Normally, she said, the artistic director of an opera company would be the one raising practical questions: "They'll say, 'We can't do this, and here are a hundred reasons why.' At the early meetings for 'Sweet Land,' that was *me*. It's the first time I thought, Wait, am I conservative?"

There's an element of directing that's practical, Sharon told me — "basically, managing time. But then you need another level, where you're tapping into the realm of the impossible, what can barely be imagined. *Sing in a moving car! Play violin while crossing a busy street!*" In "Hopscotch," an actor on a motorcycle pulled alongside the limousines in moving traffic to deliver lines sent to the vehicles' speakers via wireless mics — after which, Sharon said, audience members would "start to wonder what else might be part of the show. A helicopter flew by and they assumed that was us!" Bringing the fictional into the everyday world highlights, for Sharon, the porousness of those boundaries, allowing witnesses to imagine transformative change in what might have seemed like an immutable reality.

THE SPACE HOUSING the Detroit Opera celebrates its 100th birthday this year. Originally called the Capitol Theater, it operated as a movie palace and live venue — Louis Armstrong, Will Rogers and Duke Ellington all performed there in its heyday — until 1985, when it was closed and left abandoned and unguarded for four years, with homeless people taking up residence inside and looters carting off one of the crystal chandeliers. When the Michigan Opera Theater purchased the building for $600,000 in 1989, its section of downtown Detroit had become so ruinous that "everybody thought we were really insane," the company's charismatic founder, David DiChiera, told The Times in 1999. But DiChiera started the company only four years after the 1967 Detroit riot, when businesses and residents were fleeing to the suburbs, and he'd made sustaining an opera company in a blue-collar town his life's work. He cannily tapped automakers, among others, for funding, including for the restoration of what became the Detroit Opera House, which reopened in 1996 with a performance featuring Luciano Pavarotti. His programming leaned to the classical, but he also worked to reflect the demographics of the city, becoming an early advocate of colorblind casting (Kathleen Battle made her professional operatic debut at M.O.T.) and helping commission the 2005 premiere of "Margaret Garner," an opera with a libretto by Toni Morrison based on the true story that inspired her novel "Beloved."

DiChiera stepped away from the institution in 2017 and died the following year, leaving the company in what the critic Mark Stryker described in The Detroit Free Press as an "artistic holding pattern." In 2019, Stephen Lord, the principal conductor, resigned following allegations of sexual harassment at other companies. (Lord denied the accusations at the time.) Sharon, meanwhile, was planning to use a portion of his MacArthur grant to take a yearlong sabbatical in Japan; he'd been studying Japanese and had purchased a plane ticket for April 1, 2020. ("I know," he said, after telling me the date. "It's funny. It was like, *April Fools!*")

Gary Wasserman, a Detroit philanthropist and longtime supporter of the Michigan Opera Theater, had been following Sharon's career for years; he told me he considered "Hopscotch" one of the most memorable theatrical experiences he'd ever had, comparing its intricacy to a fine watch. He caught a performance of "Sweet Land" before the pandemic, hoping he could lure Sharon to bring it to Michigan. After the pandemic arrived and the possibility of upcoming productions vanished, an M.O.T. board member asked him if Sharon might consider coming on as artistic director. Sharon flew to Detroit in June. He knew that if he accepted the job, he wanted to announce a fall production immediately — but performing inside the theater remained impossible. It was only when Sharon asked about the company's other assets that he was told about the parking structure across the street.

"Twilight: Gods," mounted that fall, was Sharon's drive-through abridgment of the final opera in Wagner's Ring cycle — normally five or six hours, pared by Sharon to a slim 65 minutes or so, with groups of eight cars at a time moving from level to level to watch different scenes unfold while listening to the music via FM radio. It was an unambiguous triumph. "The last part of the Ring cycle is about a world order that's collapsing, and the need, in a way, for it to collapse," Sharon told me. Brünnhilde throws fire into her father's hall "to literally burn it down, with the hope that a future humanity will arise that will be better. It's, on one hand, pessimistic. On the other hand, I felt like it was what we were living through anyway." The great dramatic soprano Christine Goerke came onboard to sing Brünnhilde; her steed, appropriately enough, became a Ford Mustang. Sharon and M.O.T.'s chief executive, Wayne Brown, personally greeted each car. Some theatergoers arrived in jeans or sweats, others in evening attire. Brown told me one group of attendees hung a chandelier in their car and brought flutes of Champagne.

One thing that made Sharon's work at the Industry so exciting was the way in which it seemed to exist in dialogue with the sprawling, messy history of the city around it. It's still too early to say how Sharon's vision will intersect with Detroit, but there have been strong hints. He tapped a local writer, Marsha Music, to narrate "Twilight: Gods" and give the story a Detroit voice. The production of "X," of course, had resonance thanks to Malcolm (a.k.a. Detroit Red) and the Nation of Islam's Michigan roots. "Blue," a 2019 opera by the composer Jeanine Tesori and the librettist Tazewell Thompson about police violence, was performed last year at the riverfront Aretha Franklin Amphitheater, which Marsha Music called "historically a Black performance space," marveling that, at least on the night she attended, "When the people walked up in there, it looked like Ebony Fashion Fair." The nearly sold-out run of "X" was especially popular; three-quarters of *(Continued on Page 44)*

Opposite: Monika Rittershaus. This page: Noah Elliott Morrison.

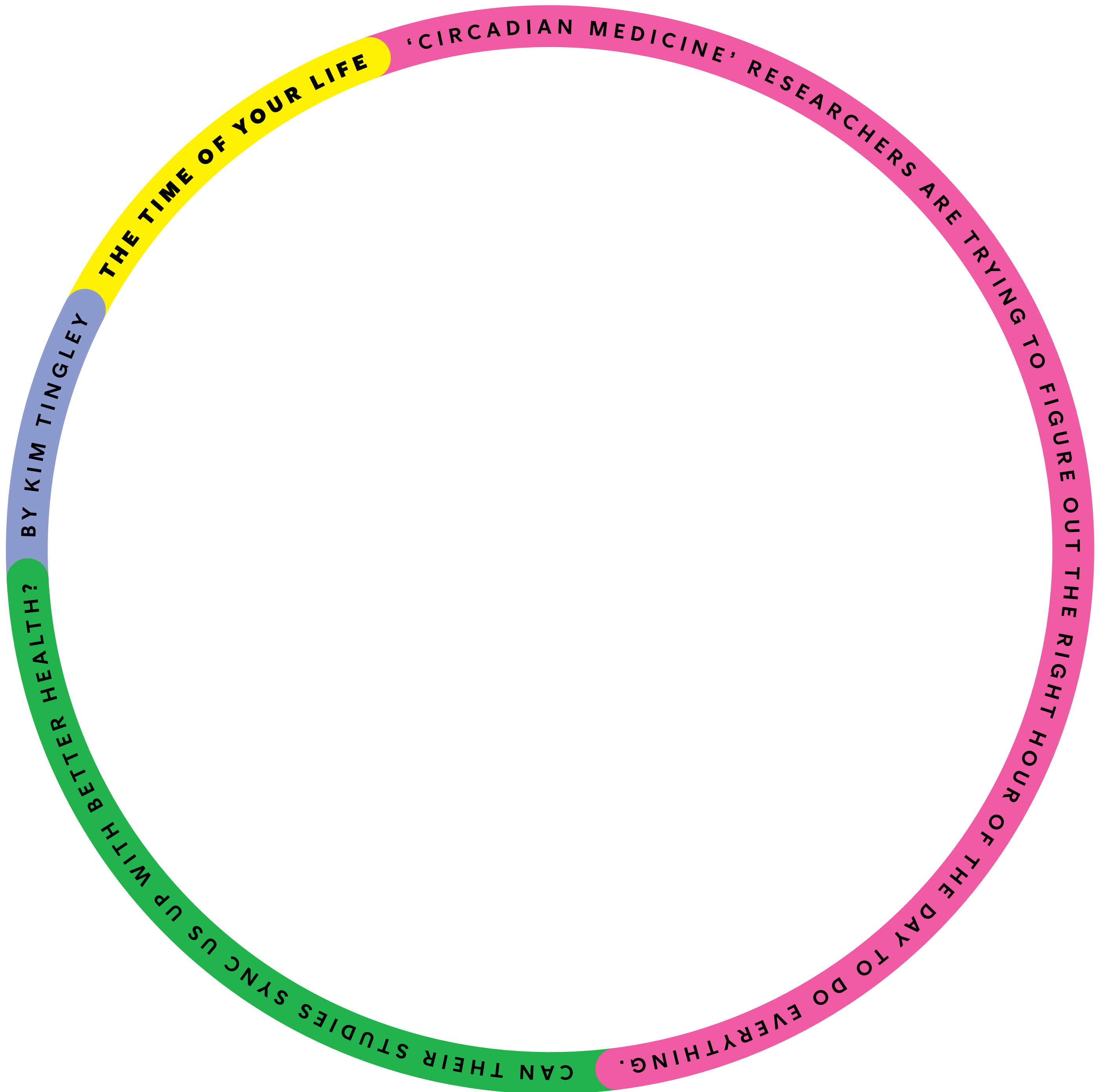


PHOTO ILLUSTRATIONS BY BOBBY DOHERTY ◦ CONCEPTS BY PABLO DELCAN

“Time,” when we give it any thought, tends to strike us as extrinsic, a feature of our landscape: We track our passage through it as if traversing an invisible geography, our progress charted by wristwatch, clock, calendar. Humans didn’t invent time, of course, but you might reasonably argue that because we invented the units we use to keep track of it — hours, minutes, seconds — we have every right to tinker with them when we want to. This, at least, was the position the Senate took on March 15, when in a surprise, and surprisingly uncontested, vote it passed the Sunshine Protection Act. The new law would, if the House concurs and the president signs, make daylight saving time permanent, beginning on Nov. 5, 2023.

The change has long been a desire of the retail industry because it is convinced that shoppers spend more money when it stays light out later. But lawmakers also seem to have regarded the annual rolling back of the clock as a personal affront: the groggy mornings that result from turning 6 a.m. into 5 a.m., the morale killer for Boston and Billings alike when darkness abruptly descends shortly after 4 in the afternoon. When the yeas prevailed, there was bipartisan applause, as if a particularly hostile foreign adversary had been defeated.

What most of those lawmakers very likely didn’t realize was that the enemy was not just outside us — a social agreement about how to label every moment of our existence relative to the sun — it was also inside us, where our internal organs are keeping time, too. In fact, most of our physiological functions are governed by an untold number of carefully synchronized biological clocks that each complete one cycle about every 24 hours. Those cycles are known as circadian rhythms, after the Latin for “about” (*circa*) and “day” (*dies*).

Many of us are passingly familiar with circadian rhythms as a way to refer to our sleep cycle. In 1972, scientists discovered that that cycle is mediated by an area in the brain’s hypothalamus called the suprachiasmatic nucleus. This structure coordinates the release of hormones — among them dopamine — that lower body temperature and blood pressure and make us feel sleepy; in the morning, cortisol and other hormones restore our alertness, make us warmer and increase blood pressure. The a.m. surge in blood pressure is believed to be one reason heart attacks occur more often then than in the p.m.

In the past two decades, however, researchers have discovered that the clock in the brain is by no means the only one in our body. It turns out that most of our cells contain a group of genes that might be thought of as gears in a mechanical watch, keeping time everywhere internally. These “clock genes” — there are at least six that are considered integral to the watch’s operation — work together the same way in each cell. And just as they cause the release of hormones in the brain, they dictate other processes in other parts of the body. In the early 2000s, advances in the ability to detect the activity of genes in various tissues revealed that the cell clocks are organized into separate organ-level clocks representing every physiological system: There’s a skin clock and a liver clock and an immune-system clock; there’s a clock for the kidney, heart, lungs, muscles and reproductive system. Each of those clocks syncs itself to the central clock in the brain like an orchestra section following its conductor. But those sections also adjust how and when they perform based on guidance they receive both from the environment and from one another, and their timing can provide feedback to the central clock and cause it to adjust the time it keeps too. The liver, for instance, determines when to rev up your metabolism based on when you eat; if you do that in the middle of the night, the liver will be receiving contradictory cues from the brain, which is telling it to rest. As a result, when the liver starts processing the midnight food, it will do so less efficiently than it would have done after a daytime meal — and it sends conflicting signals back to the brain and other organ systems.

Such internal misalignment, or dysregulation, can throw our physiology out of whack. Perhaps the most familiar way we experience this sort of internal chaos is when traveling across multiple time zones: As we eat, sleep or engage in other activities based on the local time, our central and peripheral clocks reset themselves at different rates to match the new environment. The symptoms of jet lag — insomnia, exhaustion and stomach problems, sluggishness and distractedness — are examples of the sort of overall malaise caused by circadian confusion. Staying up hours later on the weekend than you do during the week has the same effect: This has been dubbed “social jet lag.”

Circadian rhythms, in other words, are relevant to more than sleep. But few realized *how* relevant until 2014, when a professor of pharmacology at the University of Pennsylvania named John Hogenesch published a paper with his colleagues showing that almost half of the genes in mice produce proteins on a 24-hour schedule. This means that as the clock genes cycle through their functions, their work is activating or deactivating thousands of other, nonclock genes in consistent daily patterns. The finding astonished circadian experts. After giving a talk about the paper at a conference, Hogenesch went to the bathroom and encountered at the urinal Horacio de la Iglesia, a prominent biologist at the University of Washington with decades of circadian research to his name. De la Iglesia was incredulous about what he had just heard. Until then, it was thought that at most 30 percent of our genome was under circadian regulation. The mouse study implied that the number was far greater. “This was a mind-blowing idea,” de la Iglesia says.

Hogenesch, an imposing figure, 6-foot-1 with an indifference to fashion mores and a naturally dubious expression, felt awkward but compelled to engage on the spot. He remembers explaining further that hundreds of the time-regulated genes he had identified in the mice were already being targeted in their human equivalents by existing drugs or were potential drug targets. The fact that the genes oscillated — became active or inactive in a predictable pattern — meant that those drugs might be very effective at certain times of the day and less so at others. And they might trigger side effects at certain times but not others, depending on the phase of the clocks in affected tissues. Hogenesch has since found that 50 percent of our genes are controlled by the clock. That amounts to about 10,000 of the roughly 20,000 genes we have.

“It was very hard to accept,” de la Iglesia, who is also the president of the Society for Research on Biological Rhythms, told me recently, recalling their conversation. “I love the idea, because I’m a circadian biologist. But it’s hard to believe.”

Hogenesch has been explaining himself, and the relevance of clock genes to medicine, ever since. In 2018, he moved to Cincinnati Children’s Hospital Medical Center, where he was given a lab in the human-genetics division. (Before his appointment at Penn, he had a leadership role at the Genomics Institute at the pharmaceutical company Novartis, which jump-started the careers of numerous leaders in molecular biology.) Hogenesch hoped that being in daily proximity

to patients and doctors would give him a chance to use circadian research to help people directly.

Western medicine has long been skeptical of studies that tout the health benefits of synchronizing treatments with biological cycles — as traditional Chinese medicine does — in large part because there was no scientific explanation for the results. The relatively recent revelation of the genetic underpinnings of circadian rhythms has sparked a re-evaluation of many decades-old ideas. Previously, those ideas were tested by seeing whether people who received a particular health intervention had different outcomes depending on when they received it, or by observing associations between the timing of certain behaviors, like sleep, and people's risk of disease.

Now scientists possess the technology to see how circadian rhythms oscillate at a molecular level based on behavior and time of day in both mice and people. Hogenesch is one of those scientists, and his effort to bridge the divide between the lab and the clinic has been its own kind of experiment in moving circadian biology from the fringes to the center of mainstream medical treatment. Ultimately, he and others hope, figuring out how the clocks in us work will enable us to control them in ways that improve our health — keeping us vigorous longer. At the moment, they tick relentlessly toward one end. Conceptually speaking, at least, if you could slow them down or pause them at will, you would be altering humanity's relationship with time itself.

creatures, humans included, tend to behave differently during the day than they do at night. The two periods reward opposing sensory strengths when it comes to hunting and hiding. For most of modern history, before we understood that the suprachiasmatic nucleus drives the sleep-wake cycle, it was assumed that we and other creatures simply took our cues from our surroundings — Is it light out? Dark? — when it comes to being active or resting.

But by 1971, Ronald Konopka, a graduate student at the California Institute of Technology, had begun testing a theory that certain behavior was, in fact, innate — driven by genes rather than external signals. To many, the notion sounded crazy; behavior was far too complex to be hereditary. Konopka, however, had observed that fruit-fly pupae usually emerged from their chrysalis-like shell at dawn, when the humidity enabled them to unfold their wings. How could the pupae, lacking a timer as they metamorphosed inside their cocoons, know when it was morning? Konopka and his professor Seymour Benzer — a molecular biologist at the forefront of the field that became known as behavioral genetics — began inducing random DNA mutations in fruit flies and watched for pupae that emerged at the wrong time of day. They produced three lineages that did: One emerged seemingly at random; one emerged too early; and one emerged too late. Remarkably, all three had mutations in the same gene. In ordinary flies, it seemed, that gene ran a 24-hour clock that was reset each day; the period of the clock in the mutants was too short, too long or nonexistent.

Gradually it became clear that humans and other mammals had evolved similar clock genes that allowed them to anticipate — rather than simply react to — day and night. Scientists are now confident they know basically how they work. "It's a little bit like looking at something mechanical, an engine in a car — there's pistons and a crank shaft," says Michael Young, a professor of genetics at Rockefeller University who shared the 2017 Nobel Prize in Physiology or Medicine for his work on clock mechanisms. Two genes (one of which Hogenesch identified early in his career) produce proteins that activate another pair of genes, causing them to start making proteins of their own. When these reach a certain level in the cell, they interfere with the gearworks, so to speak, keeping them from turning. Eventually, the proteins degrade, and the process (which several other genes also participate in) begins again. Each on-off cycle takes about 24 hours. Our cellular clocks are running essentially the same way in a liver cell as they are in a neuron, but what those cells accomplish as a result is quite different. As Joseph S. Takahashi, the chair of the neuroscience department at the O'Donnell Brain Institute at the University of Texas Southwestern Medical Center, who identified the first clock gene in mammals, put it to me: "Once you find that every cell in your body has a clock, then you want to know, Well, what's it doing? In a way we're still in that phase."

The suprachiasmatic nucleus is wired directly to the retina, and in the 1980s, it was confirmed that the brain clock could be calibrated by sunlight or artificial light, which signals when it's daytime. Getting light consistently when you first wake up, and waking up at the same time each day, can help keep the clock on track so that, in turn, you fall asleep at an optimal hour; it can also prevent a weakening of your circadian rhythms or a decrease in their amplitude. This results in less contrast between your active phase and your rest phase, which, in the case of sleep, can potentially translate into feeling more tired during the day and waking more often at night. Robust rhythms, however, require that the brain does not receive light signals at night. Some studies show that even while you're sleeping, dim light can penetrate your closed eyelids and confuse the clock.

Maintaining healthy circadian rhythms in the brain can improve the duration and quality of sleep, and better sleep correlates with better neural function and a reduced risk of Alzheimer's disease, which has been associated with fragmented sleep. Adjusting the central clock, though, can also shift the sleep cycle to coincide with the optimal time for neurological repair during the brain's 24-hour cycle.

Scott Killgore, a professor at the University of Arizona, has explored light as a treatment for military veterans who have suffered traumatic brain injuries or have post-traumatic stress disorder. His findings suggest that exposure to blue light (a proxy for sunlight) in the morning could make therapy for PTSD more effective by improving his subjects' sleep. But *when* veterans get sleep — not just its quantity and quality — also seems to be important. Morning blue light (as opposed to a placebo of amber light) helped people recover from brain injuries and concussions largely by prompting them to fall asleep an hour earlier and awaken an hour earlier, which, Killgore says, appeared to equate to a "better time of night" for brain repair. After six weeks, subjects with traumatic brain injuries felt less sleepy, had better balance and did better on planning and sequencing tests; functional M.R.I.s showed that a brain region associated with visual attention had grown larger and had faster communication between neurons.

Being exposed to light when your body ought to be resting, on the other hand, can have a significant negative impact. In March, Phyllis Zee, a neurologist at Northwestern University, and her colleagues reported in PNAS that just one night of moderate light exposure during sleep — roughly what you would get by leaving the bedroom shades open to the streetlights — impaired glucose and cardiovascular regulation in otherwise healthy

'ONCE YOU FIND THAT EVERY CELL IN YOUR BODY HAS A CLOCK, THEN YOU WANT TO KNOW, WELL, WHAT'S IT DOING?'

young study participants; over time, these changes could increase the risk of heart disease and diabetes. Last month, a publication in Sleep co-authored by Zee linked any nighttime light exposure during sleep to a substantial increased risk of obesity, diabetes and hypertension in older adults. The findings lend support to large epidemiological studies that have shown that light during sleep — particularly from a TV left on in the bedroom — is a risk factor for obesity. (Some 40 percent of Americans report leaving a TV or bedside lamp on at night.) A 2019 study in The Journal of Health Economics looked at people living in adjacent counties on either side of a time-zone border, a circumstance akin to comparing the impacts of daylight time versus standard. Those on the western side, for whom it was dark in the morning and light at night for an extra hour, slept less, were more likely to be overweight and obese and had higher risks of diabetes, heart attacks and cancer.

Widespread exposure to bright light at night has only been possible within the past 100 years. Until the invention of electricity and air travel, it would have been relatively tough to throw your brain clock out of alignment with the sun. Now, however, at least 20 percent of Americans work a shift that requires them to sleep during the day and be active at night for part of the week; this means they are likely to be exposed to daylight when they should be resting and often getting no comparable light when they're up and about. Such shift work — required of hospital and factory workers, restaurant staff, transportation providers, the military, first responders, new parents — has been associated with a wide range of health disorders. To figure out why, Kenneth Wright, who directs the Sleep and Chronobiology Laboratory at the University of Colorado, has had healthy volunteers sleep during the day and stay awake all night. It doesn't take long for that schedule to significantly alter the sorts of proteins their bodies create in ways that are known to increase the risk of chronic disease. "Shift work goes against our fundamental biology," Wright says. "It's not going to go away. So what can we do? We have to come up with effective strategies to help them."

That, he and others believe, will most likely include advising them to eat, exercise and get the right sort of light at times that offset some of the health risks they face. For example, consider the timing of meals. Eating at night increases the risk of glucose intolerance, which causes diabetes, because the kidney, pancreas and liver are primed to be resting then. But a 2021 study in Science Advances demonstrated that when subjects were kept up at night, as shift workers are, but were awakened during the day to eat, they did not experience glucose intolerance. (It is possible for you to effectively become nocturnal by manipulating the time you get light, melatonin and other circadian cues — so that the active phase for your liver, brain and other organs occurs at night — but this is often impractical for shift workers who want or need to spend part of the week awake during the day.) Charles Czeisler, one of the study's authors and chief of the division of sleep and circadian disorders at Brigham and Women's Hospital in Boston, also directs the division of sleep medicine at Harvard Medical School. He began his career as a sleep researcher in the early 1970s, before the importance of sleep to overall health was as widely appreciated as it is now. Currently, the application of circadian rhythms to health care — some speak of it as "circadian medicine," while others use "chronomedicine" — is often considered just a facet of sleep medicine, and it lacks the cohesion and influence that discipline has achieved. "Circadian medicine extends so far from sleep medicine," Czeisler told me. "We need to develop a new clinical specialty — in the same way sleep medicine was developed half a century ago."

Hospitals

are, perhaps paradoxically, one of the worst environments imaginable for maintaining optimal circadian health. This goes for both staff and patients. Typically there is little natural light, and what there is is far dimmer indoors than out; patients' sleep is constantly interrupted by noises and procedures, many of which take place overnight and are thus performed by shift workers. When Hogenesch arrived at his Cincinnati hospital four years ago, he saw opportunities for improvement everywhere, starting with the lights. Cincinnati happened to be designing a new building, and he got involved in planning a lighting system for its neonatal intensive care unit that could mimic the full spectrum of daylight outside at any given hour. Right now, lights aren't considered "medical devices," meaning they are not regulated by the Food and Drug Administration the way, say, pacemakers or bandages are. Instead, lighting schemes are largely based on habit and assumption rather than evidence of their effects on patient health. "The culture of neonatal intensive care is that darker is better," Jim Greenberg, the co-director of the hospital's perinatal unit, told me. "There's a misconception that the womb is a dark, quiet place. Part of standard practice is putting shrouds over isolettes to keep them in the dark."

Research has repeatedly shown, however, that premature infants who receive 12 hours of light followed by 12 hours of darkness are discharged an average of two weeks earlier than those who are exposed to near constant darkness or near constant light. The new system will allow the hospital to go a step further and investigate for the first time the optimal lighting conditions for premature infants. This fall, doctors plan to test the effect of both various spectra and light-dark cycles on the metabolism and growth of newborns with gastrointestinal disorders. It's easy to imagine similar experiments revolutionizing the best practices for illuminating nursing homes, schools and office buildings. Oftentimes, as is true in the NICU, there is a presumption that drawn curtains and darkness bring tranquillity to the elderly and those suffering from pain or illness — when in fact the absence of light most likely results in worse moods, sleep and health.

After his encounter with de la Iglesia, Hogensch decided to go on a public-relations offensive. If circadian scientists were startled by one another's work, it was no wonder that clinicians in other disciplines weren't aware of their research and thus weren't using it to help patients. I heard him exhort a handful of circadian researchers at a lunch in early 2020. "It's time for us to get out of our labs," he told them, "and into our colleagues' offices."

He meant this literally, David Smith, a pediatric ear, nose and throat doctor at Cincinnati, says. "It's like a political candidate doing house to house — John has given I don't know how many talks." This has required a certain willingness to set aside his ego. Hogenesch is internationally known in his field. But, he says, the reaction of specialists at the hospital when he barged into their units wielding PowerPoint slides and an encyclopedic knowledge of circadian research relevant to their disciplines tended to be, "Who's this Häagen-Dazs guy?"

It was at one such talk that Hogenesch discovered a probable circadian-rhythm malfunction that wasn't caused by poor light or fragmented sleep. Several doctors from Cincinnati's bone-marrow transplantation and immune-deficiency division happened to be in attendance. In their unit, children with leukemia are given chemotherapy to kill abnormal cells and suppress the immune system before a transplant, so that they don't reject a donor's marrow. The procedure often results in life-threatening complications. Afterward, patients typically spend three to eight weeks recovering in the hospital.

During that time, the doctors told Hogenesch, the children often developed hypertension that was difficult to medicate. They also described an effort they had been making to improve sleep in the unit by limiting disruptive noise at night — unnecessary monitor alarms, janitorial services, the clank of doors against metal doorstops.

Curious, Hogenesch followed them up to their floor, hoping he might be able to suggest some useful additional tweaks. I visited the hospital in 2020, and while I was there, he and one of the transplant researchers, Christopher Dandoy, re-enacted this episode for me. Inside an empty room, Dandoy flicked a switch by the door. "I was pretty sure the lighting would be crappy, *(Continued on Page 45)*

Photo illustration by Bobby Doherty for The New York Times

LIQUID GOLD

How one restaurateur's long-shot bet on liquefied natural gas helped America become one of the biggest exporters of fossil fuels. By Jake Bittle / Photograph by Sebastian Nevols

f you wanted to tell the story of how the United States became one the world's largest exporters of fossil fuels, you could start in the Middle Devonian period, around 400 million years ago, when a warm inland sea dense with primitive aquatic organisms covered parts of the northeastern United States and Appalachia; you could explain that as these creatures lived, reproduced and died, their remains settled on the ocean floor and were compressed beneath layers of sedimentary rock, until eventually they transformed into a gas trapped thousands of feet below what is now Pennsylvania.

Or you could start with the murder of Nicole Brown Simpson.

On June 12, 1994, Simpson ate dinner with some family members at an Italian restaurant called Mezzaluna in the Brentwood neighborhood of Los Angeles. Simpson's mother left her glasses there, so a waiter from the restaurant, Ron Goldman, went to Simpson's home to return them. Shortly after midnight, Goldman was found dead with Simpson outside her condo. In the aftermath of the murders, reporters and photographers descended on Mezzaluna, followed by buses full of gawking tourists. People walked in to pester employees for details about Simpson's final evening, even asking waiters what she ordered for her last supper (apparently rigatoni). An owner of the restaurant, a Lebanese American entrepreneur named Charif Souki, was disgusted by the media frenzy — "the morbid curiosity, the lack of taste and decency of people, was pretty astonishing," he would say later. He decided to sell Mezzaluna and went on to try his hand at something new. After some deliberating, he settled on the oil-and-gas industry.

With a mop of unkempt hair and a penchant for elegant double-breasted suits, Souki didn't look the part of a Houston wildcatter. He also didn't know anything about drilling for oil or gas. But he did have a thick Rolodex from his posh Beirut upbringing, his days as an investment banker and his tenure as restaurateur to the stars. Why not raise a little money and give it a try? The infrastructure that moved fossil fuels around and converted them into energy was unfathomably complex, but the people in the business did something relatively simple: They borrowed money, dug up fuel and tried to sell it. That didn't sound so hard to Souki.

At the turn of the century, growth in the American energy sector had leveled off. Major oil producers like Exxon Mobil and Chevron had staked out the Gulf of Mexico for almost all the oil and natural gas it could yield, and there didn't seem to be an obvious next place to drill, so there wasn't much new money flowing in. In fact, some experts and commentators were worried that the United States would struggle to find enough oil and gas to meet rising demand. Buying more oil would be easy enough, because millions of barrels of crude moved all around the world every day on tanker ships, but natural gas was different. The United States was already importing around one-fifth of its annual consumption, mostly from Canada, and the pipelines could carry only so much. Unless the United States could find more gas within its own borders, the price of the fuel would skyrocket.

There is another way to move natural gas around, though. If you cool it down to minus 260 degrees Fahrenheit, it transforms into a liquid. This liquefied natural gas — L.N.G. for short — takes up about one six-hundredth of the space that regular gas does, which means you can load it onto tanker ships and send it across the ocean. The United States had never had much need to import liquefied natural gas before, but Souki figured that rising demand would soon justify the costs. He had already built a small energy company called Cheniere, part of an unsuccessful attempt to find new oil and gas in the Gulf of Mexico, and he decided to put his chips on L.N.G. He called friends from his investment-banking days and pitched them on a solution to America's energy woes: a gas-processing plant that could "regasify" L.N.G. as it arrived from countries like Qatar, then pump it into domestic pipelines. A lot of people thought he was crazy, but eventually he found the money, and it wasn't long before he identified a site for the $2 billion facility on a swampy section of the Louisiana-Texas border, not far from a fishing community called Sabine Pass.

The only problem was that he was completely wrong. Around 2007, just as his terminal was nearing completion, a group of energy moguls made a series of breakthroughs in a new method for extracting gas from deep layers of landlocked shale. Hydraulic fracturing, or fracking, had the potential to unlock enough gas to satisfy American energy demand for generations and turn the nation into the world's largest producer of oil and gas. It also made Souki's import terminal virtually worthless. In his book "The Frackers," the reporter Gregory Zuckerman later recounted how Souki looked out at the crowd during the ribbon-cutting ceremony for the Sabine Pass facility only to see his investors and supporters staring at their BlackBerrys. They were watching Cheniere's stock price plummet in real time.

Previous page: Charif Souki in London in June.

The only way for Souki to save the investment was to turn the facility around, reconfiguring it to liquefy the natural gas from fracking and prepare it for shipping. This was not a matter of flipping a switch. Condensing natural gas into a liquid is much more complicated and energy-intensive than converting liquid back to gas, and retrofitting the terminal required Souki to raise an astonishing $20 billion from bankers and investors, many of whom had been involved in the first round of financing and hadn't yet recouped their initial investment. Furthermore, the idea of an export terminal cut against most people's understanding of America's role in the global energy ecosystem. In the decades since the 1970s oil embargo, the United States had tried and failed to achieve energy independence. It seemed ludicrous to think that the nation should now hawk natural gas to other countries when just a few years earlier it was scrambling to find enough of it. "This is somebody who enjoys being on a roller coaster," one oil analyst told a Times reporter in 2011, referring to Souki. "It is more likely to see snow in New York in July than to see exports of gas from L.N.G. terminals in the United States."

Souki pushed ahead, though, and soon Cheniere's gargantuan export facility was rising up out of the bayou, its hulking steel pipeline arrays and rotund storage tanks looming over the swampy water. Even before its first shipment left, it was clear that Souki had finally placed the right bet. Overseas demand for natural gas was only getting stronger as countries began to shift away from their reliance on coal power. European countries could get most of their gas by pipeline from Russia, but giant Asian economic powers like China, Japan and South Korea needed another way to import the fuel. When completed, Cheniere's export facility would be the only such facility in the mainland United States, giving Souki an effective monopoly on the market. In 2013, he became the nation's highest-paid chief executive, netting an annual compensation of $142 million.

"From here on," he told a Houston newspaper at the time, "it's either good or better."

THE UNITED STATES is now one of the largest exporters of liquefied natural gas, dominating the global market alongside countries like Qatar and Australia. As of April, the nation was shipping out around 12 billion cubic feet of liquefied gas per day, equivalent to the daily gas consumption of Britain. There are now seven active liquefaction terminals, and as many as a dozen more are in various stages of planning and construction from Brownsville, Texas, to Jacksonville, Fla. The United States has flooded the world with supply, helping to double the global volume of L.N.G. exports

between 2015 and 2019. Japan and South Korea have built dozens of regasification terminals over the past decade, and China has quintupled its natural-gas imports over the same period. Natural gas has emerged as a kind of Goldilocks fuel for power generation: less polluting than coal and less disruptive than switching to renewables. In other words, it's the best of the worst.

Gas is also the most recent arrival to the world's energy markets. Like its elder siblings coal and oil, it forms over tens of millions of years under the surface of the earth, but unlike these fuels, natural gas is mostly methane, which contains fewer atoms of carbon than the molecules that make up oil and coal. Burning it releases less carbon dioxide into the air as a result. To the extent that we replace coal power with gas power, we reduce carbon emissions by about half. This is already happening in the United States, where power-sector emissions fell by about one-third from to 2005 to 2019 as a result of coal-to-gas switching, and in China, where a state-led program to phase out coal has improved air quality in Beijing.

In the early 2000s, gas producers and energy-friendly politicians pointed to the relatively low carbon profile of gas as evidence that it could serve as a "bridge fuel" that could fulfill the world's energy needs while we transition from fossil fuels to renewables like solar and wind. Souki makes another moral pitch for liquefied natural gas, which is that it can also displace fuels in the developing world that pose more immediate health dangers. "People in Africa die from indoor pollution because they use wood and cardboard to prepare their meals," Souki told me. "There are people in India that die of outdoor pollution." There, dozens of coal-fired plants operate 24 hours a day, blackening the skies over New Delhi and Mumbai, leading to almost 80,000 premature deaths per year, according to one analysis. "So if you restrain or restrict energy to the people who need it, you're killing them."

This is a somewhat unorthodox pitch for a fossil-fuel tycoon to make, but Souki has never been an ordinary tycoon. He is as easy to find in Aspen, Colo., as he is in Houston; he frequently talks to reporters and is frank about climate change. In 2012, as Exxon Mobil's chief executive, Rex Tillerson, was calling environmental groups "manufacturers of fear" about global warming, Souki was declaring his support for a carbon tax. As the rest of the world has sought gas as a substitute for coal, the American L.N.G. industry has begun to position itself as a purveyor of clean energy. Cheniere, for example, hired one of President Barack Obama's climate advisers, Heather Zichal, to serve on its board of directors. A former senior vice president of the company was a deputy assistant energy secretary in the Obama administration; its vice president for public affairs used to work for Senator Edward J. Markey of Massachusetts, a noted climate hawk.

One wrinkle in the bridge-fuel argument, though, is that unburned methane itself is also a greenhouse gas — in fact, during the first 20 years after its release, it is more than 80 times as powerful as carbon dioxide at warming the climate. You don't have to be a chemistry professor to understand the conundrum. If you can get the gas out of the ground and into a power plant without letting it leak, it releases less carbon than coal or oil. If you let too much of it escape into the atmosphere while producing it, though, you might damage the climate more than if you just left it in the ground and burned coal instead.

Methane leaks are possible at almost every point in the supply chain. The point of production carries the biggest risk, when frackers push the gas out of the ground and shove it into pipelines. Still, leaks can also happen as the fracked gas travels through hundreds of miles of pipeline on its way to the Gulf of Mexico: In January, a satellite spotted a large methane plume that seemed to be emanating from a cluster of pipelines in central Louisiana. There's also the potential for methane to escape at the liquefaction facilities themselves. An export plant in Louisiana owned by a company called Venture Global leaked almost 100 tons of natural gas over the course of two days in January. The methane involved had the potential to warm the earth roughly as much as 1,000 cars do over an entire year.

Critics also say the facilities pose significant risks for those who live near them. In June, an export facility in Freeport, Texas, had a leak that resulted in a "vapor cloud" of natural gas that exploded in the open air, an accident that is expected to put the plant out of commission for three months. These vapor-cloud explosions have occurred at a few oil facilities in recent years, and safety experts have expressed concern about the potential for even larger blasts at liquefaction plants. Souki has been frank about the nastiness of the business that has made him so wealthy too: "I wouldn't want an L.N.G. terminal next to my home," he told Forbes in 2005.

Nevertheless, the growing demand abroad for American gas has driven a rapid expansion of L.N.G. export infrastructure in the United States, which has rewritten the rules for the global energy marketplace. For a long time, natural gas was burned close to where it was produced, but the explosive growth of the L.N.G. industry has turned the fuel into a commodity like oil, something that almost every country needs but that comes from only a select group. The countries that control the largest gas reserves also control whether hundreds of millions of people can keep their lights on and their furnaces lit. The geopolitical significance of this fact has become startlingly clear over the last few months. The Russian invasion of Ukraine sent global energy markets into turmoil overnight, severing a link between the powerhouse economies of the West and one of the world's main suppliers of oil and gas. It was easy enough for countries like Germany and Britain to agree that they would give up Russian oil, because they could buy oil on tankers coming from anywhere, but finding more gas was not so simple. Almost half the continent's supply came from Russian pipelines, and European nations couldn't simply stop burning gas — not if they wanted to keep the lights on.

The United States wasted no time in positioning itself as a kind of white knight for Europe's energy needs. As countries like Germany and Italy scrambled to find enough gas for next winter, the Biden administration promised to fill about one-third of the threatened Russian supply. The White House didn't frame this rescue mission in climate terms, but selling gas to Europe is arguably one of the most significant climate policies enacted by the Biden administration. The substitute gas would keep European economies from falling back on coal, but it could also ease the pressure on governments to further build out renewable energy sources like solar and wind. Back in the United States, meanwhile, it would make gas companies very wealthy, even as the rapid pace of L.N.G. exports drove up domestic natural-gas prices and raised American energy bills.

ven though it was Souki's audacious bet that helped create the L.N.G. boom, he may not end up benefiting from the crisis brought about by the war in Ukraine. That's because, at least for the moment, he doesn't actually own a liquefaction facility. In late 2015, just two months before the first gas shipment left Cheniere's plant in Sabine Pass, the company's board ousted him. The move came at the behest of the activist investor Carl Icahn, who had acquired a 13.8 percent stake in the company and thought Souki was taking it in the wrong direction. Souki wanted to use the proceeds from the first terminal to build another terminal in Southwestern Louisiana and expand into other ventures; Icahn wanted to cut spending and pay dividends. After a 10-hour private session that Souki was not invited to, the board sided with Icahn.

Souki retreated to Aspen, but his time in the wilderness didn't last *(Continued on Page 49)*

His Trauma, and Mine

After my partner was brutally beaten on the street, I became one of the many thousands of Americans caring for someone with PTSD — and our relationship changed forever.

By Virginia Eubanks   Illustrations by Vartika Sharma

The night our world changed, I was in a copper baron's palatial Adirondack home, writing about the history

of the poorhouse. That afternoon, with the stained-glass reflections of autumn colors blazing through my window, I pored over an 1832 vendue contract auctioning the care of three female paupers to the lowest bidder in Sandown, N.H.

I had taken a year's unpaid leave from teaching at the State University of New York at Albany to write a book about technology and poverty. It was the first book I'd written for a popular press, the first written as a journalist rather than a scholar. I knew I had chosen risk: insecure income, shifting health insurance, a left turn from my career path that might not pay off.

During my monthlong writing residency, I had no cell service, so I struck up an epistolary romance with Jason, my partner of 11 years. He told me about his dreams: a tiny U.F.O. banging against his shins, failing to abduct him; a nightmare about killing someone and fleeing the law. I confessed my discomfort with the retreat: I was writing about the 19th-century exploitation of the poor, the very people ground into mortar to build the storied estate where I was staying.

On Oct. 8, 2015, I stepped out onto the veranda, in a vest and scarf against the cold. The fiery colors of the near-peak leaves had vanished, giving way to the night sky. I threw my head back in hopes of glimpsing a meteor shower. But the clouds obscured the Draconids, so at about 10 p.m., I went to the basement computers to check my email.

From: "Jason Martin"
Subject: Re: Yup!
Date: October 8, 2015 at 6:14:34 PM EDT
To: "Virginia Eubanks"

Virginia!
bad nwews. I just got outta the ER where ive been for almost 24 hours. i jot jumped late last night by the deli. nobody I recognized. They kicked and punched me on the groupnd for a long time apparently. But the wierdest-part is how it passed so quickly and intensely I iddnt even have a reaction. I may have lost conciousess for a moment or two. cause next memory is sitting on chair in deli with cops asking questions. . . . oh wow so tired and so messed up right now. despite the good prognosis. . its takng all my energy to write this, so sorry for brevity and inabiity ti make it a more readable piee
xoxoxoxoxox
jason

My ears buzzed and my breath caught. I staggered to the residents' phone booth. Rubbing my fingers nervously over the graffiti scratched by decades of artists into 100-year-old planks, I dialed Jason's cell number, and his father answered. They were together. Jason was stable. But his jaw was broken in three places. A cheekbone broken. An eye socket.

I was ready to jump into my ancient pickup and rattle home, but Jason's dad deterred me. As much as I wanted to rush to his side, there was nothing I could do before morning but watch him sleep. If my truck broke down along the Northway, I would be stranded.

I left the woods as the sun was rising the next day and arrived home to learn the details. Several men had beaten Jason unconscious less than two blocks from our home in Troy, the small city in upstate New York where we live. He was walking back from the corner store with Zebra Cakes and Camel Lights, and someone asked for a cigarette. When he turned to respond, he was hit the first time. He thinks there were four or five guys, all or mostly white, probably in their 20s and 30s. But he can't be sure. He remembers just flashes: shoes in a circle around his head, waking up in the folding chair, a jagged moment of light and sound during the ambulance ride.

It was good that he didn't remember more. The damage to his face and skull required six and a half hours of plastic surgery to repair.

That attack marked the beginning of our struggle to navigate a relationship transformed by trauma. Since then, I think I've read just about everything that has been written about how to support a loved one healing from post-traumatic stress. Among other things, I've discovered how devastating caregiving can be for those of us partnering someone with PTSD. While Jason's diagnosis wouldn't arrive for a few more months, and while my own clinical troubles would take years to emerge, that attack is an incandescent dividing line. Everything else — falling in love, building a life and our unknown future — now arranges itself in relationship to that moment, arrayed before or after what we call the Catastrophe.

When Jason and I got together in 2004, I was going through a numbing divorce from a man who left town with his best friend's wife 10 days before I defended my Ph.D. dissertation. That I stayed in the relationship as long as I did left me feeling like a chump. "He was just your grad-school husband," my friend Rachel consoled me over the phone. "Your self-esteem is so low in grad school."

Jason had been a friend for years. I was newly single, playing the field. Considering my options, I spied him in a crowded barroom and thought: Jason Martin — that would be fun. And I tipped my cowboy hat so it covered both our faces and kissed him. Jason resisted my attempts to get him into my bed, his slowly unfolding woo suggesting a longing for durability, for depth. I resisted his resistance, herding him toward shallow intimacies like a Border collie.

Jason asked, "What are your three superpowers?" When I couldn't identify any, his face drew together in mock concern. "Oooohh," he said, shaking his head, "I can't go out with you again until you know your superpowers." Something in him sensed that my confidence was at a low ebb, and he wanted me undiminished, undimmed. The next time he called, I had a list: I can make anything taste good. I have a magic ray that makes everyone feel sexy. I see people as they really are.

A musician and artist, Jason was a local celebrity in the Capital region. He lived in Schenectady in his early 20s and helped community members make TV shows for the local public-access cable station, creating operatically bizarre video art to play in late-night schedule slots. After a failed bid for City Council on the Green Party ticket, he moved to nearby Troy and opened a music studio and performance space. He created Power Animal System, a genderqueer art troupe, and performed all over the region, decked out in 1980s-era ladies' business suits, wigs and wolf masks. When the independent newsweekly tired of trying to categorize his creative output — as poet, musician, producer, video and performance artist — it named him the region's "Best Jason Martin" three years in a row.

Where Jason went, community flourished. His superpowers were legion. He was at home anywhere. His mind was brilliantly unconstrained. He brought out people's creativity, dragging them onto open-mic stages, shoving instruments into laughingly resistant hands. "Now you're a musician," he would say. "Play!"

We feasted, profligate with our health and extravagant in our desire for each other. After roast pork shoulder and dark chocolate, we would smoke cigarettes in my apartment with greasy fingers, dancing to Captain Beefheart records and Ethiopian pop. We had what I took to calling "Lie Detector Sex." Because I grew up in a household shaped by the secrets and separations of alcoholism, Jason's emotional openness and physical fearlessness were both provocation and revelation.

We faced struggles like any couple: I was more wounded by my divorce than I'd hoped; his boundary-pushing could shade into carelessness with my feelings. A few years after we started dating, he was diagnosed with

Source photograph: Getty Images

Illustration by Vartika Sharma

bipolar disorder. His case was relatively mild and well controlled, with few of the symptoms that wreak so much havoc on relationships: no suicidal ideation, no sexual or financial shenanigans. He saw a psychiatrist regularly and adjusted medications when necessary. We saw a couples' counselor when our relationship needed mending.

I bought a house in South Troy in 2009, and we moved there together, filling it with talismans of our devotion. We sheetrocked a cartoon he drew of the two of us inside a first-floor wall. In the backyard, we planted a Montmorency cherry tree, known for its jewel-toned, half-sweet, half-sour fruit. We buried beneath it a tiny bundle — rose petals for romance, cinnamon for spice, our initials intertwined. We cemented a block print of the tarot card for strength — a woman holding open the jaws of a lion — under our threshold. Written on its back: "Protect this house, those who pass through it and the love that makes it a home."

The attack happened, by my count, 127 steps away from our front door.

After Jason had plastic surgery on Oct. 23, 2015, the hospital didn't keep him overnight for observation. Instead, they gave me a small set of wire clippers and told me that if the anesthesia or the pain made him sick, I should cut the wires holding his jaws together so that he wouldn't aspirate on his own vomit. I curled myself into a tiny ball on the corner of the bed and watched him, terrified, holding the wire cutters, until I fell into a restless sleep near dawn.

The next morning, I went to the drugstore to pick up his painkillers. The pharmacist informed me that the prescription had been canceled. The system showed we did not have health insurance.

In a panic, I called our insurance provider. The customer-service rep assured me that it was a technical glitch and reinstated our prescription coverage so I could pick up Jason's pills. But when I looked up our account on the company's website, it showed that all our claims for the plastic surgery had been denied. We owed $38,962.47.

That night, I moved into the small in-law apartment on the first floor of our house. I was listening to the internal voice that whispered I would need my sleep to get through what was to come. But also sharing a bed with Jason would be like sleeping with a fitful nuclear bomb. He radiated heat, sweated through the sheets, his arms flailed and his feet pedaled. Nightmares shocked him awake dozens of times a night.

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), trauma is an event involving "actual or threatened death, serious injury, or sexual violence" intense enough that it overwhelms a person's ability to cope.

Our bodies respond to trauma before we can apprehend the experience in our thoughts or feelings. Senses are heightened, adrenaline is released and the emotional and rational parts of the brain cede control to the autonomic nervous system, responsible for regulating primal bodily functions such as heart rate, digestion and respiration.

The three most well-known responses to trauma are fight, flight and freeze. The fight response prepares the body for battle. A blinding rage gives you energy and tunnel vision, and you lash out at perceived attackers. The flight response prepares the body to run, compressing you into an unpredictable spring of kinetic energy. The freeze response shuts everything down and prepares you to survive a brutal onslaught.

Fight, flight and freeze are all common, adaptive mechanisms for surviving assault, rape, battle or natural disaster. You have little conscious choice about which path you take when threatened with existential harm.

A 2016 study estimated that more than 82 percent of Americans will experience at least one traumatic event during their lifetime. But according to national surveys, a much smaller number, about 4 percent of men and 10 percent of women, will develop post-traumatic stress disorder.

I came to see the canonical symptoms of PTSD as mirrors of trauma responses. The intrusive thoughts, nightmares and flashbacks that psychiatrists call "re-experiencing" echo fight responses. Re-experiencing occurs when a sensory stimulus such as a sound, image, smell or even an invention of your dreaming mind — a trigger — pulls you back into the moment of trauma as if you are living through it again. Pathological vigilance, irritability and jumpiness, known as reactivity, feel like flight responses that have outlived their purpose. Avoiding people, places and activities that might trigger a trauma response recalls the body's protective shutdown during freeze. Taken to its extreme, any of these symptoms can worsen into dissociation, essentially the mind splitting off into an altered state, resulting in blackouts and lost time. There is also another set of PTSD symptoms laid out in the DSM-5: negative thoughts and feelings that began or worsened after the trauma. This always seemed to me self-evident. Existential trauma is a stone-cold bummer.

Many people who endure a traumatic event will experience nightmares, jumpiness and emotional numbing in its wake. A PTSD diagnosis, however, requires that symptoms last at least a month. PTSD is a disease of persistence.

People who are bipolar, like Jason, are more likely to develop PTSD after a traumatic event than the rest of the population, though the

etiology and symptoms of the two illnesses are entirely different. Bipolar didn't change Jason's fundamental character. When his depression was particularly acute, he retreated to rest and recover, but he remained a kind, open, creative and generous man, the partner I knew. PTSD was different.

Fighting through the aftermath of the attack was exhausting. But it was also very simple, all action and no feeling. I experienced a state some partners of the chronically ill call survival euphoria. I picked the closest lion, and I wrestled it down.

I fought to get Jason, in pain and frustrated, gasping and seething through metal and gauze, into his rusted 2008 Hyundai Accent after the plastic surgery that rebuilt his face and skull. I fought — in the end, successfully — to get our medical insurance reinstated and our medical debt cleared. I fought to manage the extraordinary generosity of our community. A fund-raiser to support Jason's healing made the local news, and 200 people showed up. I had laryngitis, but I attended anyway. Wearing a long scarf, I didn't say a word the entire evening, gesturing to my throat and shaking my head again and again.

On Halloween, I blended fun-size Butterfingers in milk so Jason could drink them through his extra-wide smoothie straw. On Thanksgiving, I blended turkey, stuffing and chicken stock. I managed Jason's medications, giving him his oxycodone and then hiding the bottle when he bellowed for more, like a drug-seeking bear, an hour later.

Then, in December, Jason was leaving his first performance after the attack when a drunken homophobe perceived him as queer and tried to attack him in the street. While friends prevented the irate man from landing any punches, Jason endured verbal abuse, death threats and was chased through the street while his jaw was still wired from the surgery.

After the second attack, he disappeared for three days, a stretch of time that he still doesn't remember. By January 2016, a clinical psychologist had diagnosed him with PTSD.

From the outside, our life looked normal. We hired a wonderful aide with the money from the fund-raiser, and with her help, Jason managed to keep his job as an adjunct instructor of video art at a local college. Jason attended weekly therapy sessions with a clinical psychologist specializing in trauma. He even managed to play a few gigs at house parties.

But our private world was harrowing. Jason hid weapons behind doors and under beds. He had a special system for defending himself against imagined intruders: a brick to throw, then a bat to swing if they persisted and then, finally, a knife for up-close combat. He put plywood over the windows. Junk-food wrappers and dirty clothes piled up. Agoraphobia meant that the garbage didn't always make it out of the house for pickup. A few dirty dishes were overwhelming, and they quickly morphed into impregnable piles.

I stayed downstairs in my tidy bubble, mounting emergency cleaning expeditions to the second floor every few weeks. Even so, we endured a series of infestations: moths, ants and, finally, mice.

I became hypervigilant about Jason's hypervigilance, constantly scanning the horizon for threats. I worried that the laughter and trash talk of neighborhood kids would be too loud; that fresh baked bread would be too soft and he would tear it trying to butter it; that his keys would be misplaced or the car wouldn't start on the first try; that it would be too hot or too cold, or too sunny or too rainy, that he wouldn't have a warm jacket or sunglasses or a working umbrella at hand.

Any one of these things transformed a normal morning into a tsunami of explosive rage followed by shuddering withdrawal. Blue skies, then the meteor, then the ice age.

Leading lights in PTSD research — Janina Fisher, Bessel van der Kolk, Pat Ogden, Dan Siegel and others — like to talk about the crucial role "interpersonal neurobiology" plays in treating trauma. The theory is this: As social creatures, human beings learn from birth to regulate our emotions by interacting with others. Optimally, caregivers will respond to an infant's hysterical cries with caring gestures: calm rocking, shushing. They will identify needs — Is the baby hungry? Wet? — and do their best to meet them. Good-enough caregiving, the theory goes, leads to secure attachment, and in that safe space a child learns to regulate his own emotions, meet her own needs. In other words, interpersonal neurobiology suggests that our ability to regulate our emotions doesn't just arrive as we hit developmental milestones; it evolves in relationship with people around us.

When we are hijacked into reliving a trauma or become withdrawn and shut down — what psychologists call dysregulated — we regain emotional balance as we once learned it: communally. Ruth Buczynski, president of the National Institute for the Clinical Application of Behavioral Medicine, suggests that "relationship is paramount" to healing trauma.

Healthy relationships are both vaccine against PTSD and potential cure. Meta-analyses of existing studies in 2000 and 2003 found that poor relationship quality was among the strongest factors in developing PTSD after a

Source photograph: Getty Images

Illustration by Vartika Sharma

traumatic event. A 2010 study found that good social support leads to increased improvement in patients seeking therapy for chronic PTSD.

You need strong relationships to survive the kind of psychic wound Jason suffered during the attacks. The paradox is that trauma's lingering impacts can enfeeble human connection, weakening even the strongest of social bonds. PTSD takes from us the very thing we need to heal from it.

I tried to maintain some semblance of my former life: I worked on the book, started a new research project, was offered a job and briefly considered moving us both to Philadelphia. When I wasn't working, I made appointments and returned calls: therapists, doctors, human resources, insurance companies, co-workers, family and friends. Jason kept going to therapy every week as the scars faded from his face. But he was dogged by insomnia — nightmares and hypervigilance kept him awake at night, and he spent most of his daylight hours watching TV and drifting in and out of sleep on the living-room couch. I scheduled meal deliveries and dropped off laundry at the fluff-and-fold. I looked for blackout curtains and white-noise machines on Amazon. I fought and fought.

Then, I fled.

On the first anniversary of the beating, I was in Los Angeles on a reporting trip. For the second anniversary, I was on the road, working on the new research project.

When I was away, I desperately tried to feel something — anything — for myself. In Helsinki, Finland, to speak at a conference of Nordic social workers, I sat in a 190-degree smoke sauna and then padded outside, barefoot and mostly naked, to plunge into a hole in the ice in the Baltic Sea, over my head in the black near-freezing water, once, twice, three times.

In 2016, I was on the road 147 days. In 2017, I was gone 97 days.

We needed the money I earned through speaking engagements and research grants. But to claim that all my travel was materially necessary would be disingenuous. I wanted space and time away from the maelstrom of PTSD. I *wanted* to leave as much as I needed to leave.

In December 2017, we decided to experiment with traveling together. Before the attacks, we were partners in adventure — we drove hundreds of miles of Route 20, visiting 1930s-era attractions: sifting through a museum of petrified creatures, spelunking in Howe Caverns, trying to choose a favorite roadside cheeseburger. We tramped the Adirondacks and floated in the Sacandaga reservoir. He ducked under security fencing to photograph crumbling 19th-century hotels while I kept lookout from the car.

We wanted to try to recapture that feeling. We used all my Amtrak points to buy two round-trip tickets in a sleeper car for a seven-day trip to Montana for my mom's 75th birthday. In theory, it was perfect: a tiny fishbowl of our own, traveling across the country at a leisurely pace. I imagined we would read, play cards. I bought a tiny electric kettle so we could make tea while the world passed outside the windows.

In practice, it was a nightmare: a tiny fishbowl in which we were trapped together. Jason didn't sleep. He was easily triggered and emotionally volatile. He snapped at me, other passengers, the conductor. I seethed and withdrew, thinking how much fun I would be having if I were alone.

One night in January 2018, shortly after my father died, I came upstairs to share dinner with Jason, sad and exhausted and seeking comfort. "I'm feeling super vulnerable today," I said. "So please let me know if you can't be nice."

Despite the evidence amassing in my journal, I had trouble admitting that I was exhibiting my own signs of PTSD: panic attacks, hypervigilance, emotional numbing, nightmares.

I'm not sure why that request precipitated the worst fight of our relationship. Perhaps it was the veiled suggestion that Jason had changed so much that he might hurt me when I was vulnerable, the insinuation that he was no longer the man he used to be.

I remember that a look crossed his face, the look our cat gets when he has spotted a mouse — ears perked and gaze sharpened. I felt a malevolent part of Jason — a part I hadn't imagined existed — turn its attention to me. I can't remember much about the fight, but I know I felt like prey. I cried on the kitchen floor. Jason watched television nearby, silent and checked out as I sobbed. It felt as if I were living with an angry, cruel, terrified stranger who wore Jason's face.

The dark joke among PTSD caregivers is that your partner becomes the "T" in your own PTSD. PTSD researchers point out that during trauma, prey automatically orients to the predator, giving the threat all its attention. Jason oriented to people yelling outside the house, strangers on the street, angry white men on TV.

I oriented to Jason.

In August 2019, Jason and I shared two packs of American Spirits. We'd both quit smoking by then, but we decided that any time you get rejected by a mental hospital, you get to buy a pack of cigarettes.

I'd just returned from a monthlong reporting trip in Iowa and Illinois for a story about government debt collection. Jason was in awful shape — the thousand-yard stare I knew meant dissociation, and under the surface of this blank, numb goneness, the simmering of unpredictable rage. I asked when he had last eaten. He said he didn't know. I asked when he had last showered or changed his clothes. He didn't know. I asked when he had last taken his medication. No idea.

I called our couples' therapist, and she suggested that I take him to the hospital, arguing that he needed inpatient treatment. "He's not doing any of the things that are necessary to keep living," she said, and coached me through what I should say when I tried to check Jason into a behavioral-health crisis center. Use the phrase "decreasing function," she said. Use the phrase "passive annihilation."

We hoped for a three-day admission that might stabilize his medications and his mood, offer new possible treatments, and give us both a moment of rest. We waited in the E.R. for five hours, Jason sitting beside me wearing a ball cap pulled down over his eyes, sunglasses blocking his peripheral vision, hovering like a rabbit about to bolt. The unit was full, and as long as he was not suicidal or homicidal, the nurses finally told us, his care was a low priority. We were welcome to wait, they said, but it might be all night. The sounds of the hospital were triggering Jason's PTSD, and he deteriorated as I watched. About half an hour after he curled up, fetal, on the floor of the E.R., I gave up and took him home.

It had been almost four years since the attacks, and we had weathered it all with white-knuckled grippings onto our old life. Like a liturgy, we had assured ourselves time and time again that we were making real progress, that we were on the road back to normal. "We're halfway through," we had promised each other, six weeks after the attacks. "Halfway there," we said at six months. And again at the one-year mark, and at the two-year mark: "Halfway," we repeated with increasing desperation. "Halfway."

The failed attempt to get Jason into inpatient treatment wasn't a simple setback. It was the moment we started to

wake up to our new reality. There would be no back to normal.

Jason's PTSD was proving resilient, but not remarkably so: A 2018 study found that 50 percent of cases globally last more than two years, and 23 percent last more than 10. I read more clinical studies, trauma theory, memoirs and self-help books to understand, to interrogate, to find a way forward. Seeking fellow travelers, I pored over websites and online support groups.

One author, assuming everyone with PTSD was a veteran, asked: "Is he more controlling since returning from war?" The book advised me to respond to attempts to restrict my activities and police my actions by "maintaining a sense of humor."

A website argued that because people with PTSD may fear abandonment, any suggestion that I might leave the relationship could "intensify their symptoms and make conflict worse."

Another book offered pointers on adjusting my communication style: I should drop everything I was doing and give Jason all my attention any time he spoke. I should maintain eye contact at all times. I should ask for permission to interrupt before I speak.

"If at any point he looks bored or agitated, or starts shutting down or questioning your motives," the book advised, "quickly summarize your reflections and stop." The more I looked for help, the angrier I got.

Most people with PTSD in the United States never served in the military, but much of the research on the subject in this country is funded by the Department of Veterans Affairs. So while there is little data on post-traumatic caregiving in nonmilitary families, research shows that the partners of veterans with PTSD "have a greater likelihood of developing their own mental-health problems." Studies of Vietnam vets have shown that partners of those with PTSD report "lower levels of happiness, markedly reduced satisfaction in their lives and more demoralization" compared with partners of returning soldiers without PTSD. Caregivers also report stress, unmet needs and instances of physical and emotional violence in their relationships.

The V.A. recognizes this and has tried to address it. As of June 2022, about 37,000 families were enrolled in the V.A.'s Program of Comprehensive Assistance for Family Caregivers. The program, established in 2010, provides training, health care and a small stipend for family members of seriously wounded veterans. A 2019 analysis by Katherine E. M. Miller and her colleagues found that caregivers in the program who received a modest stipend — $600 to $2,300 monthly — were able to work substantially less at their day jobs.

There is no Program of Comprehensive Assistance for Family Caregivers of victims of community violence or rape.

Researchers and psychologists call partners like me "supportive others." The RAND Corporation calls caregivers of veterans with PTSD "hidden heroes." Everyone seems to agree that we are crucial to healing. And yet, we are asked to paper over the cracks in institutional support systems with strips torn from our own skin. Without adequate assistance, we are offered two equally unthinkable choices: Martyr yourself or leave.

The night we failed to get Jason into the mental hospital, I tucked him under a blanket on the couch, made him a hot cocoa and left him watching Netflix. I sat on the back porch, smoking a cigarette, making a hard decision: I had to stop traveling. I said no to dozens of invitations, slowly clearing my calendar, but I still had that article about government debt to finish. I was scheduled to do another monthlong writers' retreat, so half a dozen of our most extraordinary friends stepped in to help.

Each of them claimed a day to stop by, check that Jason had eaten, make sure he was taking his meds. They brought guitars, doughnuts, YouTube recommendations, gossip. Occasionally one of them would have to take Jason by the hand, lead him into the kitchen and ask him gently to eat something, spoonful by spoonful. It was an all-amateur, all-volunteer psych ward.

Each week, I took a 14-hour round-trip train ride from Montauk to Albany to check in and make phone calls: hospital, therapist, insurance, repeat. The most stubborn obstacle was finding a psychiatrist to adjust Jason's medications. It took five weeks to schedule a session. When I explained our situation through tears, begging for an emergency appointment, a receptionist responded, "They're all emergency appointments."

While we waited, Jason was unable to teach his class. After finally getting a new prescription, he had to wait for the new meds to start working, and the rest of the semester slipped away. We were crushed when we received a letter from the university informing us his teaching contract would not be renewed. He was now officially out of work. I prepared to hunker down and accompany Jason through the maze of the unemployment and disability systems. Our income dwindled. My responsibilities doubled.

Researchers sometimes talk about the communicability of PTSD as if it were a form of dark magic, the miasma of mental health, like the bad air once thought to cause plague. They suggest that caregivers suffer from vicarious trauma, that we catch secondhand symptoms from overempathizing, from simply imagining the assaults on our loved ones. Or that caregivers develop compassion fatigue because we fail to focus on our own well-being.

In December 2019, I started to keep a journal. In it, I described almost comically transparent nightmares: dreams about broken pipes spewing water overhead, dreams of drowning. Though I'd made sure that Jason had a social network, my own relationships were strained. In the first year or so after the Catastrophe, we received such an outpouring of support that it was easy to feel grateful, surrounded by love. But after four years, my friends got on with their lives — had babies, moved, took new jobs — while part of me was still stuck in 2015. I had taken so much water out of the well of my friendships; I felt guilty sending the bucket down again. I was exhausted, and in my limited free time, all I wanted to do was go to the woods, sit in silence and do nothing. To revel in being responsible only for myself.

In 2020, trying to dispute a medical bill that had gone into collections, I got stuck for most of an hour in a hellish labyrinth of broken voice prompts and singularly unhelpful call-center workers. After I hung up, billing error still unresolved, I began to pace, stalking back and forth in the cramped in-law apartment, mind racing, until my legs gave out underneath me. I cried so hard that one of my eyelids turned inside out, and then climbed into the hottest shower I could stand. I started taking deep breaths to calm down, but I was so out of control that I began to hyperventilate.

Despite the evidence amassing in my journal, I had trouble admitting that I was exhibiting my own signs of PTSD: panic attacks, hypervigilance, emotional numbing, nightmares. Finally, I asked the psychologist I was seeing regularly to give me the Clinician-Administered PTSD Scale for DSM-5. I ranked up a symptom severity score of 33 out of 80, placing me in the "moderate" category.

My PTSD diagnosis was possible because the DSM-5 designates that a "qualifying exposure" to trauma can occur in any of four ways: direct personal experience, witnessing trauma to others, repeated exposure to gruesome details of traumatic events or indirect experience through a family member. According to the DSM-5, my trauma originated in learning about Jason's trauma; it arose in that moment when I stepped off the veranda beside that sylvan lake and checked my email.

But I disagree.

I believe my PTSD was caused not by empathy, or by referred suffering or burnout but by living with someone with PTSD and an avalanche of daily, direct "small-t" traumas: impossible paperwork, the broken health care system, mounting debt, a constant exhaustion that fed isolation from family and community. My traumatic exposures were the fruit of institutional failures: Every time Jason was denied resources he needed to heal, I was left to pick up the slack.

The pandemic trapped Jason and me in the house together, for better and worse. Things deteriorated enough that we separated in July 2020, Jason moving into an Airbnb despite our Covid fears. He came back when we ran out of money, three weeks later. After hearing about Jason's continued difficulty with focus and emotional control, our couples' counselor suggested he might also be suffering from a traumatic brain injury. "Count backward from 100 by sevens," she

instructed him. "Spell 'world' backward." Jason was laughing, but he couldn't do it.

It took us six months to schedule an appointment with a neuropsychologist. After performing a comprehensive series of tests, she reported that he most likely had a moderate traumatic brain injury, which worsened his psychiatric symptoms and resulted in cognitive deficits, based on his description of losing consciousness during the attack, his slowed mental processing, trouble with memory and problem-solving and — most troubling for a musician — diminished fine motor control.

A neurologist might be able to give us more answers, offer new resources. It took us nine months to make that appointment, but we went to one together in October 2021. The neurologist didn't see any evidence of a traumatic brain injury on Jason's M.R.I. or electroencephalography, but he was deeply concerned about cardiac events that could result from his persistent insomnia.

"Less than four hours of sleep a night will kill you," we both remember the doctor saying. His clarity startled us into action. Jason moved off the living-room couch, where he slept most nights, and back into the upstairs bedroom. He shut off screens two hours before bedtime, established a sleep routine. Finally, he began to get real rest.

Jason settled into a combination of Eye Movement Desensitization and Reprocessing (E.M.D.R.), sensorimotor and talk therapies. I relied on a cognitive behaviorist and a genius bodyworker who combines massage with internal family systems therapy. Jason meditated and arranged visits from friends; I guarded my time alone and hiked until my legs felt rubbery. And slowly, things started to improve.

We reclaimed our house. We threw out what I had taken to calling "the depression couch." We repainted the bedroom and rearranged the furniture. We put up a wall of pictures reminding us of better times.

We were both done fighting and fleeing. We'd taken the relationship out of deep freeze and allowed it to thaw. We finally had the energy to look with an honest eye at what remained.

What I saw was fear. Fear that he stays with me because I'm a good nurse. Fear that I stay because I've let my loyalty to him overwhelm my responsibility to myself.

We've had sex only once in six years.

"Let's try to ease into intimacy," my psychologist suggested. "Start by sitting back-to-back for a few minutes every day — you don't even have to look at each other. Do some deep breathing. Observe your reactions."

So, most nights around sundown, Jason and I meet and sit on the living-room floor, back-to-back, for a few minutes. I look straight ahead. I resist my body's urge to pull away. I examine my feelings.

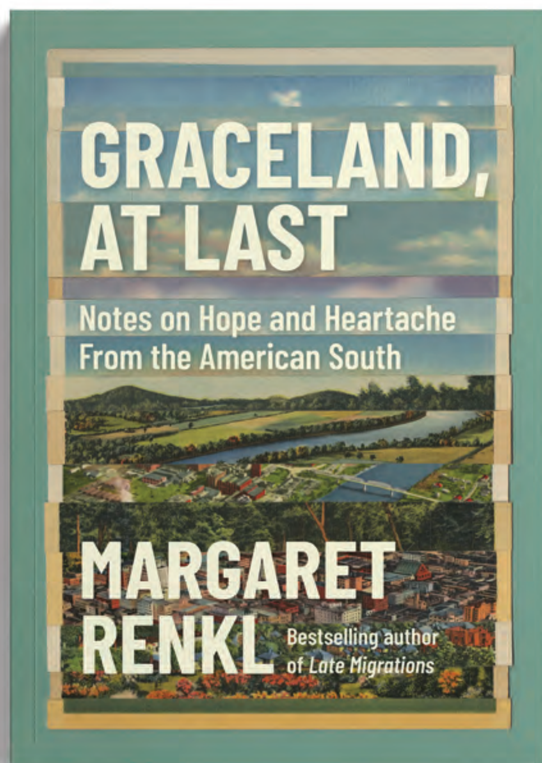
I would love to report that in these moments, I realize that PTSD has brought us closer, made us appreciate the small stuff, deepened our gratitude. But that's not true. And yet, dozens of conversations about this essay have rekindled our commitment. We've stretched ourselves — sometimes painfully — to imagine the narrative from each other's point of view. PTSD didn't bring us together, but unraveling our story has begun to re-establish trust.

We are different people now. Jason used to be able to talk to anyone: politicians, punks, professors, psychiatrists, psychics, plumbers. Now when he leaves the house, it is with hat pulled down over his eyes and keys bristling from his fist. He avoids grocery stores, the library, walking downtown.

My superpowers have changed, too. While the kitchen is still full of grits and black-eyed peas, pickled beets and potpies, I haven't dusted off the sex ray in years. And I'm not entirely sure I can see others — even Jason — as they really are anymore.

But we persist. We play gin rummy together by candlelight after dinner. We borrow DVDs from the public library — "Spaceballs," "The Thin Man," "Booksmart" — movies with no punching to trigger Jason, and no sex, which just makes me too sad. Sometimes I put my foot on his thigh under a shared blanket.

We've survived a catastrophe, barely, and maybe that's enough. For now, we are aware of where we are and where we are not. We approach each other tenderly. We wound each other. We stumble and slide and try again. ◆



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Answers to puzzles of 7.3.22

EXPANSION PACK

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KENKEN

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ACROSTIC

(ROBIN WALL) KIMMERER, BRAIDING SWEETGRASS — If a fountain could jet bouquets of chrome yellow in dazzling arches of chrysanthemum fireworks, that would be Canada Goldenrod. Each three-foot stem is a geyser of … gold daisies, ladylike in miniature, exuberant en masse.

A. Kaboom
B. Incendiary
C. Moire
D. Moosejaw
E. Elysium
F. Roof garden
G. Eclat
H. Rhizome
I. Brighten
J. Riot
K. Acanthus
L. IMAX
M. Dandy
N. Ineffable
O. Noodles
P. Guy Fawkes
Q. Squirt
R. Witch hazel
S. Effuse
T. Eocene
U. Thistle
V. Garland
W. Red Cloud
X. Aloft
Y. Sunshade
Z. Set out

CRAZY EIGHTS

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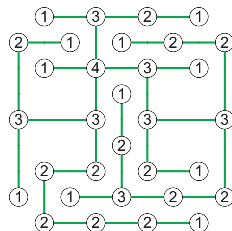
HASHI



Answers to puzzle on Page 48

SPELLING BEE

Ankiebone (3 points). Also: Abalone, alone, baboon, balloon, bankbook, baobab, bloke, bobble, bonbon, booboo, ebook, ennoble, kabob, knoll, koala, nabob, noble, oaken. If you found other legitimate dictionary words in the beehive, feel free to include them in your score.

Yuval Sharon

(Continued from Page 25)

its single-ticket sales were to new audience members, with more than double the usual number coming from Detroit residents.

In April, Sharon directed the company's first show back in the Detroit Opera House since the start of the pandemic: the inherited-repertoire favorite "La Bohème." Sharon being Sharon, his version unfolded in reverse order, opening with Act IV, in which Mimì dies, and ending with Act I, in which she and her lover, Rodolfo, first meet. Detroit has died and been reborn so many times that Sharon's reworking of the classic felt like an oblique nod to the city. Beginning with the sorrow that would befall these young people created a fantastic dramatic tension as the story proceeded, but an odd feeling of hope persisted as the story moved from the end of the affair to its blooming: Tragedy may be inevitable, but the lovers' time together felt entirely worthwhile.

Not everyone loved the idea. Sharon, when I saw him at the dress rehearsal, was delighted by a write-up on the website of The Daily Mail, the British tabloid, bearing the headline, "Detroit gives tragic classic opera La Bohème a woke reboot: City will stage production in REVERSE order to avoid ending where main character dies so audience leaves feeling 'hopeful and optimistic.'" He began reciting various angry comments to me ("Excellent idea by the woke left"), cackling so loudly that a tech guy preparing to film the rehearsal shushed us. Taking a seat in the mostly empty house, Sharon leaned back to watch the run-through while an assistant director typed his murmured notes into a laptop: *His beard looks too trim, make it messier. A couple of words in this supertitle are wrong. Move that stool out of the shadow or it'll be too dark.* And, when one of the characters stood in a particular position with his arm raised: *Oh, no — that looks like the poster from "Hamilton!"*

At the gala opening two days later, a string quartet played songs by Taylor Swift and Daft Punk. The opera itself flew by, per Sharon's design: "I wanted it to feel like Japanese calligraphy, where you can't remove your brush from the page," he said in a talk before the show. "That's what I'd like this production to feel like: one brush stroke, quick. Like being young." The minimalist set, by John Conklin, allowed Sharon to eliminate intermissions, which are usually necessary for scene changes, and the relative simplicity of the staging gave him time to focus on the performers, who now had to be prepared to sing the most difficult arias at the end of the evening; Edward Parks and Brandie Inez Sutton, playing the comic-relief lovebirds Marcello and Musetta, stole the show.

"The challenge, when we do 'La Bohème' and more standard repertoire," Sharon told me last fall, "will be, how do we bring an improvisatory spirit into something that feels more fixed?" — a spirit closer to that of "Bliss," wherein the discipline required of the performers also came with enormous freedom. "For me, that's one of the big experiments of coming into an environment like an opera house, and why 'La Bohème,' for me, is one of my biggest experiments." Not merely doing it backward, he went on, but trying to figure out how to make an opera written in the 19th century feel as if it were being invented right there on the spot. "That discovery, in each and every repetition," Sharon said. "That's what you want to try and find a way to capture." As his production neared its finish (technically the start), even throwaway lines accrued unexpected weight, landing sudden, sharp blows. In the conclusion of Act I, Mimì agrees to join Rodolfo at the Café Momus: *"E al ritorno?"* he asks. *And when we come back? "Curioso,"* she replies. *Let's see.* ◆

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Fill the grid with digits so as not to repeat a digit in any row or column, and so that the digits within each heavily outlined box will produce the target number shown, by using addition, subtraction, multiplication or division, as indicated in the box. A 5x5 grid will use the digits 1–5. A 7x7 grid will use 1–7.

10+	80×			1
			5	15×
	4−	1−		
12+		2−	2÷	
			2÷	

30×		13+			9+	
	10+			7+		4−
3−		1−	2÷		3	
1−				3÷	8+	
1	4−	1−			11+	
18×		1−	35×		10+	
			3−			5

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Circadian Medicine
(Continued from Page 31)

and you guys did not disappoint," Hogenesch said cheerfully. For confirmation, he opened up a light-meter app on his phone and waved it at the anemic overhead lights and a window the size of a pizza box. He pointed at all the blue lights glowing on various medical devices. "Clock resetters," he announced. (He duct-tapes over the unblinking blue eye of electronics in his own home and travels with a roll of tape for hotel-room makeovers.) A television was mounted above the bed, too, one that patients were free to leave on all night.

The room's poor lighting and lack of total darkness didn't surprise Hogenesch, but he was startled to learn that the patients were fed intravenously 24 hours per day, a protocol based partly on the delivery and expiration times of the nutritional formula. Hogenesch explained to his colleagues that people often develop hypertension and other problems if they eat during their circadian rest phase, which is usually at night. "We had never thought about that in a clinical sense," Dandoy told me.

It took a year for Hogenesch, Dandoy and others to get the transplant division to agree to run a trial in which some patients would be fed for only 12 hours during the day instead of constantly. The hypothesis was that these children would experience better metabolic and immune-system regulation than those who received the current standard of care. "It could be a huge game-changer," Dandoy told me. By the end of last year, a dozen patients had tried the 12-hour regimen with no ill effects, though it is too early to say how much patients may benefit from it relative to their peers in a control group. The unit's dietitian, Cindy Taggart, was initially skeptical that the logistics would work. (Sometimes 14 hours for feeding is the best she can do.) Anecdotally, she thinks it is helping. "I do feel like my patients return to eating faster," she says.

Metabolism isn't just about the digestion of food. It's also about how all our cells use energy to perform the tasks required to keep us alive and functioning. The more efficiently they can do that — while simultaneously replicating and repairing themselves — the better off we tend to be. Phyllis Zee, the neurologist who in 2014 founded the Center for Circadian and Sleep Medicine at the Feinberg School of Medicine, the first place in the United States to consider circadian medicine as a separate specialty, thinks patients with lots of common chronic diseases — from diabetes to heart disease to cognitive decline — might see improvement by changing their behaviors to improve the synchronization of their internal clocks. "You don't need to do the fancy stuff," she says. Keeping a log of when you sleep and wake, eat and take medications — as well as how the night goes and how you feel — could give you and your primary care doctor plenty of information to act on.

Indeed, one of the great promises of circadian medicine is its D.I.Y. appeal: If we could figure out the optimal time to eat or exercise, for example, we could change our behavior immediately — free of charge — not only to minimize the harm but also to maximize the health benefits of given activities. Professional athletes and their trainers, for instance, know that physical performance peaks in the late afternoon or early evening. (Most world records are broken in the evening.) In February, Cell Metabolism published an "atlas of exercise metabolism" that showed how, for mice, the metabolic effects of running on mini-treadmills changed over 24 hours. It may be, says Juleen Zierath, a physiologist at the Karolinska Institute in Sweden and one of the study's authors, that certain types of activity — like low-intensity exercise versus high-intensity — are ideally undertaken at certain times depending on the outcome you prioritize (weight loss, blood-sugar control, strength). "These are small changes for small improvements," she says. "I would call it fine-tuning."

For elite athletes, though, the slightest advantage can make the difference between a loss and a victory. Charles Czeisler has served as a sleep consultant for professional sports teams, including the Boston Celtics and the Red Sox, since 2009. The Celtics schedule, he says by way of example, was "inadvertently inducing tremendous circadian disruption." Their games often ended at 11 p.m.; they finished up at the arena, ate dinner and arrived home as late as 4 a.m. Then many had to get treatment for injuries at 7 a.m. before practice at 9 a.m. Fixing the problem didn't require any special therapy or high-tech equipment. Czeisler just persuaded them to maintain consistent sleep-wake times throughout the week and weekend: practicing in the afternoon, going to bed at 3 a.m. and sleeping until 11 a.m. He insisted that they not schedule early-morning flights. When they traveled to the West Coast, he advised them to shift their schedule by three hours to keep their bodies on East Coast time. It's impossible to quantify the exact impact Czeisler's adjustments have had on performance, but a 2017 study in the journal PNAS analyzed 20 years of Major League Baseball statistics and was able to ascribe a dip in teams' winning percentage to the circadian disruptions that cause jet lag.

Nonathletes and circadian researchers have focused more interest on the question of when to eat or fast — whether to skip breakfast or dinner, for example. Some of the most convincing answers have come from randomized controlled trials by researchers at Tel Aviv University and the Hebrew University of Jerusalem. Separate trials with participants who were overweight and who had diabetes showed that consuming most

of your calories early — having a large breakfast, a medium lunch and a small dinner — leads to lower blood-sugar levels and greater weight loss compared with sizing the meals in reverse order.

On average, Americans eat within a 12-hour window. But Courtney Peterson, an associate professor of nutrition sciences at the University of Alabama at Birmingham, has found that shrinking that to a six-to-eight-hour window and eating more of the day's calories earlier can lower blood pressure and blood sugar, which may help people with diabetes and high blood pressure.

Depriving cells of nutrients can initiate different metabolic processes. Studies involving mice have found that when the animals' caloric input is restricted to 30 percent below what they typically consume, they live 30 percent longer than usual. Looking at those experiments, Joseph Takahashi, the Texas Southwestern neuroscientist, who is also an investigator at the Howard Hughes Medical Institute, wondered how much influence circadian rhythms, as opposed to caloric restriction and the fasting period, had on the mice's longevity. In a study published in Science last month, he and his colleagues managed to tease apart this correlation. When the restricted diet was meted out to mice around the clock, their life spans were only 10 percent longer than those of mice in a control group that ate as much as they wanted whenever they wanted. Mice on the restricted diet that got their food all at once ate all their calories within a two-hour window — and lived an additional 10 percent longer. Finally, when the mice ate during their active phase, rather than during their rest phase, they lived another 15 percent longer yet.

This suggests that the time of day when the mice ate was just as important to their longevity as any other factor. To try to figure out why, Takahashi and his team examined the liver tissue after the mice died. They discovered that the longer the mice lived, the more active were the genes regulating immune function and inflammation; the genes associated with metabolism were less active. "Aging you can think of as really a disease of inflammation," Takahashi told me. The implication is that by figuring out the relationship between our clock genes and the genes governing metabolism and inflammation — and modifying the workings of clock genes to speed up or slow down those processes throughout the body — we may be able to prevent disease and thereby remain healthy into old age.

Researchers have long known that the immune system, which generates inflammation in response to harmful stimuli like injury, toxins and germs, oscillates in a 24-hour rhythm. Since 1960, studies of mice have repeatedly demonstrated that the time of day they are injected with a bacterial toxin that prompts an immune reaction significantly affects their mortality: the infection kills about 80 percent of the mice that are exposed to the pathogen during their rest phase; it kills only 30 percent of those exposed in the middle of their active period.

When we are awake, immune cells are poised to respond to damage in our tissues; at night, they circulate in the bloodstream and collect information about any threats encountered that day. Wounds heal faster during the day. Flu vaccines are more effective if given in the morning. In 2015, Aziz Sancar, a professor at the University of North Carolina School of Medicine, won the Nobel Prize for his discovery that a skin protein that repairs damage from ultraviolet exposure is controlled by a clock gene and thus operates with circadian rhythmicity. Rodents exposed to UV radiation at 4 a.m., for example, are five times more likely to develop invasive skin cancer than those exposed at 4 p.m.

There is a growing interest in exploiting circadian rhythms — by aligning our behavior with our clocks or our clocks with our behavior — to improve the efficacy and reduce the side effects of treatments for diseases, especially cancer. Changing our behavior, of course, is much easier. Decades ago, studies led by Francis Lévi, a medical oncology specialist at Paris-Saclay University, conducted before the cellular clock mechanisms were well understood, found that the toxicity of cancer drugs — responsible for the harmful side effects that accompany chemotherapy — could be reduced and the drugs' effectiveness against cancer cells boosted if the drugs were infused at certain times of day. But follow-up studies showed that a particular infusion schedule improved the length of survival for men with colorectal cancer by nearly 40 percent, whereas the same schedule reduced survival for women by 25 percent. Lévi has since found that another colorectal drug was least toxic for men at 9 a.m., when it was most toxic for women; their least toxic window was 3 to 4 p.m.

Lévi is now conducting trials in France to figure out more precisely how sex and other factors influence patients' response to and tolerance for chemotherapy. He is also studying how the circadian timing of tumors may differ from those of their hosts, which could reveal when they are most vulnerable to destruction. Lévi believes this work can help patients soon. Sancar, who is also doing research on tumors, is more cautious. "There's been a great deal of wishful thinking unfortunately in our field," he says. "You have to be realistic with what you have. You cannot be optimistic."

As you get older, you are more vulnerable to cancer, as well as Alzheimer's, diabetes and hypertension. And it's clear that the strength of our circadian rhythms — how distinct our active and rest phases are — weakens with age. "If you look at little kids, they run around all day, and they sleep like a log at night," says Erik Musiek, a neurologist and a director of the Center on Biological Rhythms and Sleep at Washington University School of Medicine in St. Louis. An 80-year-old, by contrast, may wake 15 times a night and nap frequently during the day. "We don't know how to improve that," Musiek says, except by advising older patients to get sunlight and keep moving during the day, and to avoid light at night. If the relationship between clock genes and the diseases of aging could be understood, the thinking goes, we could change the way those genes work by targeting them more precisely and effectively with drugs, Musiek says. "We don't know how to do that now without completely messing up someone's circadian rhythms."

A new drug usually takes at least a decade to develop. Hogenesch thinks that we could take advantage of our biological clocks to improve the efficacy and reduce the side effects of the drugs we already have. In August 2019, he and his colleagues published a paper in Science noting that the circadian half of our genome includes many targets of the roughly 2,000 prescription drugs available in the United States. Very few of those medicines have been tested clinically at multiple times of day. Only four of the top 50 most-prescribed drugs come with F.D.A.-approved recommendations for when they should be taken.

Hogenesch had hoped that pharmaceutical company executives would read the Science paper and be inspired to retest their existing drugs with timing as a variable. Besides improving those on the market, the companies might also find that experimental drugs that did not work well enough to obtain federal approval previously would do so if given at a different hour. Hogenesch says he has personally raised the paper's conclusions with executives from at least two major drug companies. Their response: " 'That's really interesting. Great paper,' " Hogenesch says. "And then they change nothing." That may be because it's easier to make drugs that remain active all day in the body than it is to get people to take a pill, or multiple pills, at specified times.

This is perhaps the single biggest obstacle in translating into practice the circadian research that could help us now: If we knew the optimal time to take medicine or get treatment, would we — *could* we — hit that window? "It's a big question," says Zachary Buchwald, a radiation oncologist at the Winship Cancer Institute at Emory University Medical Center. Already, according to one 2010 study, half of all prescription drugs are taken incorrectly.

Last year, Buchwald and his colleagues published a paper in Lancet Oncology showing that patients with metastatic melanoma who received at least 20 percent of their immunotherapy drug infusions after 4:30 p.m. did not live as long, on average, as those who received them earlier. But the study was purely observational. To be sure that it was the timing of the drug that affected survival — and not, for instance, because patients with other health disadvantages, like fewer financial resources, tend to schedule later appointments — Buchwald needs to be able to assign patients to random time slots, and he's not sure any of them will be willing to accept that. It's hard enough for

them to come in at an hour of their choosing. And if timing does affect survival, what he dreams of is a drug he can administer shortly before an infusion that shifts the clock in the immune system and the affected tissues to the ideal time. Without that, determining each patient's clock phases to identify the best time for an infusion and then getting the patient to the clinic in that interval feels out of reach, he says. "An hour here or there — if that's what matters, we're kind of doomed to failure."

The conundrum Buchwald, Hogenesch and others face is that to determine how critical the timing of drug taking is, you need large data sets with hundreds — preferably thousands — of diverse patients taking a drug across 24 hours. Otherwise, you risk not seeing small effects, or believing that an anomalously large effect is representative. But before institutions with the resources to run those studies will undertake them, they want proof that doing so will be worth it. Takahashi points out that cancer research is the largest biomedical field in the United States, yet relatively few people are working on circadian rhythms and cancer. "For them to have any impact on the field of cancer in the U.S., which has more than 5,000 labs, it's like a drop in the bucket."

Unable to persuade pharmaceutical companies that retesting drugs is in their financial interest, Hogenesch has pressed his case at his hospital and others. Initial drug doses given in hospitals, his team has learned, are most likely to happen at specific times of day, usually corresponding to shift changes and when medical teams make their rounds. "Clinical decisions should be made around the clock," he and his co-authors wrote in a 2019 PNAS publication. "Pain, infection, hypertensive crisis and other conditions do not occur selectively in the morning." In person, he is blunter: "No matter how dumb it is," he says, referring to conventional hospital practices involving lighting, for example, or drug delivery, "they don't want to change it."

His observations have resonated with circadian scientists struggling to make headway at their own institutions. "John has managed to elevate the discussion or the awareness of the discussion that needed to happen," says Elizabeth Klerman, a professor of neurology at Harvard Medical School who works in the sleep division at Massachusetts General Hospital. Frank Scheer, director of the Medical Chronobiology Program at Brigham and Women's Hospital, has also been impressed. "We're trying to improve the health of the most vulnerable, we have a responsibility to take care of them, and despite that, they're in environments not conducive to sleep," he says, of hospital patients. "I think his work is beautiful. He's making great headway in this area."

Though the PNAS data revealed that when hospitals deliver drugs very likely makes more operational than medical sense, it wasn't able to show whether that timing harms patients. If it doesn't, why change it? Hogenesch's team and collaborators at other hospitals are now analyzing electronic medical records to see if they can show that the times certain common drugs are given affect how well they work. This is harder than it sounds, because the data hospitals collect is primarily for billing, not research, and when patients receive services and medications isn't always noted. If logging the times of procedures — of blood draws, vaccines, urine and other samples — in patients' electronic medical records were standard practice, it could vastly improve our understanding, Zee notes. "Nowhere in your vaccination record does it say when you got it." But doing that ought to be "so easy," she adds. "This is all electronic."

Any data gleaned from medical records will still be observational, but the more such data you have from a variety of sources, the more persuasive it can be. In the meantime, researchers can create larger and more representative samples by looking at multiple small studies collectively in what's called a metanalysis. Last year, to help make the case that medication timing could have a major impact, Hogenesch and colleagues released as a preprint, ahead of peer review, a metanalysis of previous clinical trials that included the time of day that subjects received one of 48 pharmacological or surgical treatments. Unexpectedly, low-dose aspirin, which millions of people take daily to prevent cardiovascular disease and which doesn't come with guidance for when to take it, proved to be the most time-sensitive: Eight out of 10 studies found it to be more effective when given in the evening as opposed to in the morning.

Personalized circadian medicine may be the future. The timing of our clocks varies by individual, set by the sun, indoor lighting, genetic predisposition, our behavior, our age, one another. Scientists are still scrambling to develop a quick and easy method for telling what phase, or phases, your organs are in. But for now, absolute precision isn't required to improve the coordination and strength of your biological rhythms. Circadian researchers generally suggest getting as much sunlight as you can during your day, especially upon waking, dimming the lights before sleep and making your bedroom dark. (Parking America on standard time, not daylight, would help accomplish that.) Front-load your calories earlier in the day. Most of all, try to keep your schedule comparable across the week, including weekends. "There's room here to think about overall health optimization — improving mood, improving overall health," Helen Burgess, a professor of psychiatry and co-director of the Sleep and Circadian Research Laboratory at the University of Michigan, told me. "We're all getting older. Many of us feel like we're languishing," she added. "What are the tiny little things I can do to feel better?"

Circadian medicine may enhance our well-being, in other words, but most of us should not expect it to transform our lives anytime soon. There are, though, exceptions to that rule whose unusual circumstances may point toward broader applications later. As Hogenesch put it to me, "You learn from the edge cases."

Soon after he arrived at Cincinnati, a colleague in Boston forwarded him an email from the parents of Jack Groseclose, a teenager with Smith-Kingsmore syndrome, an exceedingly rare condition caused by a mutation in a single gene that brings about pain and seizures, developmental delays, autism and a disposition to self-harm. In their letter, Mike and Kristen Groseclose explained that Jack was taking a drug to turn off the gene. It had improved many of his symptoms, but his sleep had taken on a bizarre pattern. For more than a week, he wouldn't sleep longer than an hour or two and instead paced constantly. (A Fitbit his parents purchased to track his activity showered them with congratulations.) Then, for seven to 10 days, he would sleep for 14 hours. "After 10 days of little to no sleep, his body starts to break down," they wrote. "He becomes shaky and unsteady, breaks out with eczema." Jack's doctors were baffled. Hoping to generate an explanation, the Grosecloses had included in their email a bar graph of Jack's sleep cycle and a photo of him. "He was looking poorly," Mike told me. Kristen added, "We thought a visual aid might help."

Hogenesch saw the name of Jack's specialist, stood up, walked down the hall and knocked on the specialist's door. Carlos Prada was an expert in rare genetic diseases in Hogenesch's own division at Cincinnati. "He was 60 meters from where I was," Hogenesch says, "and we had never talked about it."

By happenstance, Hogenesch had recently discovered that turning off the same gene in mice increased the period of their circadian rhythm, making a cycle more than 24 hours long, and dampened its amplitude, blurring the boundaries between their phases of activity and rest. He explained to Prada that the drug Jack was taking might be having a similar effect on him. Prada, who has since moved to Lurie Children's Hospital of Chicago, and his colleagues began incrementally changing Jack's dose until they found one that maintained the drug's benefits without dysregulating sleep. When I talked with the Grosecloses, Jack had slept through the night for 30 days in a row. He was 17, and it was the most sleep the three of them had ever gotten as a family.

That, Hogenesch says, is the kind of meaningful, real-world change he has been pushing for. Inspired, he founded and began directing a sleep-and-circadian-medicine center at the hospital to treat complex cases, which includes assessing patients' genetic profiles. The center opened in 2020 and has been booked solid ever since. In May, Hogenesch was elected president of the Society for Research on Biological Rhythms; he will take the helm in 2024. A lot of new researchers are joining the field, he told me, and he hopes to use his role to promote their work — to make it relevant not just to doctors and patients but to everyone. To you.

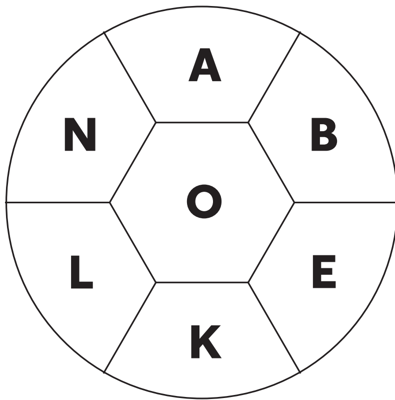
"I think," he says, "this is our time." ◆

SPELLING BEE

By Frank Longo

How many common words of 5 or more letters can you spell using the letters in the hive? Every answer must use the center letter at least once. Letters may be reused in a word. At least one word will use all 7 letters. Proper names and hyphenated words are not allowed. Score 1 point for each answer, and 3 points for a word that uses all 7 letters.

Rating: 7 = good; 13 = excellent; 19 = genius



Our list of words, worth 21 points, appears with last week's answers.

HEX NUTS

By Patrick Berry

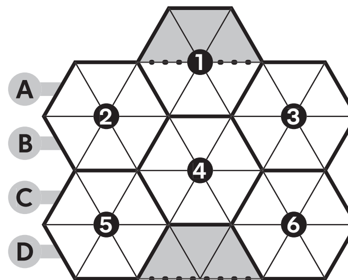
Each nine-letter Row answer reads across its correspondingly lettered row. Each six-letter Hex answer fills its correspondingly numbered hexagon, starting in one of the six spaces and reading clockwise or counterclockwise. As a solving aid, the two shaded half-hexagons will contain the same three-letter sequence (as if the grid is wrapping around vertically).

ROWS

A. Have a rapturous reception (3 wds.) B. When new TV shows might get replaced C. Where Ernest Shackleton led three expeditions D. Projectiles in a Three Stooges fight (2 wds.)

HEXES

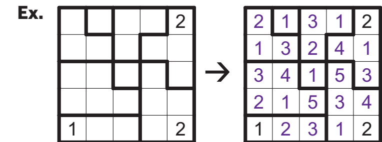
1. Overhaul 2. "Nothing for me, thanks" (2 wds.) 3. Martini garnished with a pearl onion 4. "Veni, vidi, vici" speaker 5. Easy gallop 6. Dots on a state map

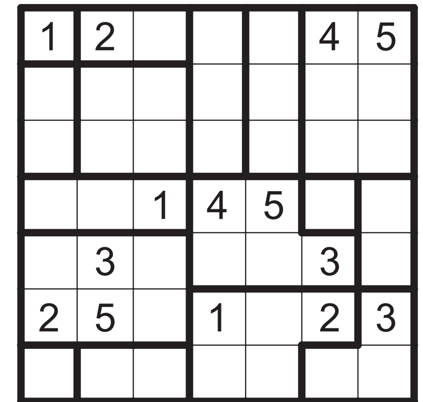


RIPPLE EFFECT

By Prasanna Seshadri

Fill the cells of each heavily outlined area with the digits from 1 to n, where n is the number of cells in the area. If two identical numbers appear in the same row or column, at least that many cells must separate them.





CRYPTIC CROSSWORD

By Alan Arbesfeld

ACROSS

1 Commercial suitable to make a screenplay from (5)

4 Annoyed about bridge (5,4)

9 Jersey city egg producer describing strange book (7)

10 Took charge after clothing got messed up (7)

11 The whole gym, pal (4)

12 Top dogs caught in very nice ending (5,5)

14 Offered a kind of talk about topless sex (8)

15 Massaged, we heard, for a nice way to feel (6)

18 Devoted sweetheart (6)

19 Fill in overdue pattern (8)

22 Junk yard brings something to play on a computer (5,5)

24 Role reversal is a ploy (4)

26 Head of the meadow telling secrets (7)

27 Harsh criticism hurt style (7)

28 Natter loosely about sib putting up a fight (9)

29 Transports kisses to the ear (5)

DOWN

1 Basically top-shelf article skill (2,5)

2 Mac unable to be fashioned into mobile aid (9)

3 Don't begin to incite a hit (4)

4 Jailbird punished and restrained (8)

5 Like the best shots taken in Congo already (2,4)

6 Losing roll, he is taken by suckers for dumps (10)

7 House where bad guy drops in (5)

8 Prince Harry, for one, had deer running amok (7)

13 Dispel army haphazardly for old sound bite (4,2,4)

16 Shift car's "D" gear for driving events (4,5)

17 Notices in a station where you can't find a bar (4,4)

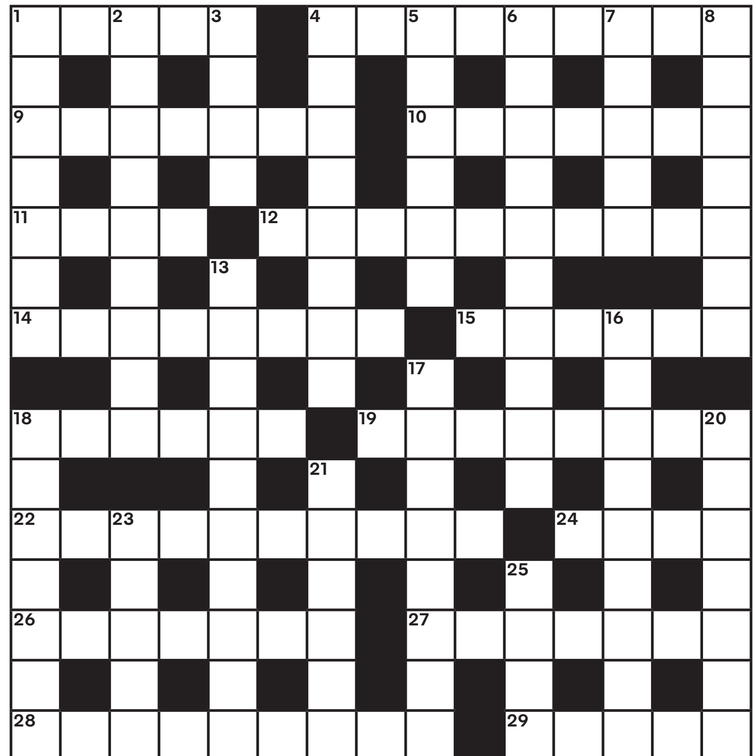
18 Mixing plaster is a way to make an attachment (7)

20 Sex pressure grips state (7)

21 Drip returns to Indian city for drug (6)

23 Germany is oddly possessive of some rebel soldiers (5)

25 Rolls back a cold shoulder (4)



Natural Gas

(Continued from Page 35)

very long. A few months later, he teamed up with another L.N.G. executive to found a new company called Tellurian and laid out plans to build an export terminal in Southwestern Louisiana — indeed on the very same site he had been pitching while still at Cheniere. He had a new financing scheme in mind, one that would entail greater risk but also yield mind-boggling profits: While Cheniere had charged frackers a fee to turn their gas into liquid, Souki wanted to start his own fracking operation, liquefy his own gas and sell it directly to overseas buyers.

"I felt that there was one more chapter to be written," Souki told me. "The real business model would be to own the American molecules and sell them on the global market."

As he searched for financing, Souki turned himself into an online evangelist for liquefied natural gas, posting regular updates on YouTube ("Two minutes with Charif Souki on supporting our European friends"). These videos have helped attract many of the same retail investors who poured money into companies like GameStop and AMC, and who now believed that Tellurian's stock was underpriced relative to the potential payout. One video showed Souki flying in a helicopter over Louisiana, pointing out the vacant field where Tellurian's facility would someday stand. Getting it up and running was imperative: Tellurian had a productive fracking operation in the woods of the northern part of the state but still no way to bring the gas to market.

Souki still didn't when I met him in early February at Tellurian's office in downtown Houston. The company has a small space in a building owned by the oil supermajor TotalEnergies, and from the upper-story conference room, Souki and I could look out and see the distant expanse of the Texas City oil complex, a warren of storage tanks and refineries spewing bright orange flames. Despite all the hurdles Tellurian was facing, Souki had an unflappable air about him and spoke with the kind of blasé confidence one might expect from a man accustomed to raising billions of dollars for long-shot projects. He was wearing one of his trademark double-breasted suits, along with a pink tie, and as he talked he sometimes removed a retractable ballpoint pen from his jacket and fidgeted with its clicker.

I wondered why Souki was so determined to get back into the L.N.G. business. After all, he had already made a fortune, and the industry he started was reaching maturity. Tellurian was still several years and billions of dollars away from being able to profit off it again. Why didn't he just stay home in Aspen?

"The world is screaming for natural gas," he said, "and I would like to be able to deliver natural gas as soon as possible." There was already an energy shortage in Europe over the winter, a result of a fast pandemic rebound, and people in Britain were worried about paying their gas bills — how could he not want to supply them with more fuel? Moreover, he said, "the emerging countries are going to add two billion people, and their standards of living are improving all the time. They're not going to say, 'I don't want to live like you.' "

As Souki sees it, the need to provide the world with energy in the short term outweighs the long-term demand of acting on carbon emissions. The world may be facing energy and climate crises, he said, "but one is going to happen this month, and the other one is going to happen in 40 years." He added: "If you tell somebody, 'You are going to run out of electricity this month,' and then you talk to the same person about what's going to happen in 40 years, they will tell you, 'What do I care about 40 years from now?' "

Two weeks later, Russia invaded Ukraine. The booming American L.N.G. industry rushed in to fill the gap left by Russian gas, turning its focus from Asia to Europe. Cargoes that had already left American export facilities bound for Japan or China changed course and headed to France and the Netherlands, fetching multiple times the price they would have just days earlier. A few weeks after the invasion began, the United States and the European Commission announced a long-term agreement to help Europe free itself from Russian gas, with American producers promising to supply at least one-third of what Russia had once provided the continent. Bulgaria, Germany and Greece all raced to build new import terminals so they could accept American gas before winter, as Russia cut off gas deliveries to one country after another; eventually, Germany was moving to flip on old coal plants. Just a few months earlier, at the United Nations Climate Change Conference in Glasgow, these same European governments had affirmed their intention to give up fossil fuels, but now they had to shelve those ambitions.

I met Souki again in April in New York, at the downtown offices of a media-strategy company. Souki was taking advantage of the chaos in energy markets to again make his moral case for sending fracked gas all over the globe: He was stopping in New York to talk to potential investors and develop a new media strategy for Tellurian before he went down to Washington to meet with policymakers and legislators. We huddled together at a conference table in the lobby.

"All of a sudden, Europe has put all of its climate aspiration on the back burner," he told me, reviewing the early events of the war. Countries like the Czech Republic, Italy and Romania were warning that they might have to reactivate their shuttered coal plants or extend the life spans of those that had been scheduled to close.

'The world is screaming for natural gas, and I would like to be able to deliver natural gas as soon as possible.'

"We're going to need gas," he said, "*especially* if you're serious about climate issues."

He was quick to clarify that this wasn't his concern. "As a company, I couldn't care less about the climate," he said. "Of course I care, OK? But my responsibility is not to care about the climate. My job is to make a product that people need and sell it to them at the cheapest possible price to me." This was not going to be very difficult, provided Souki could finish his new facility. By the summer, gas prices in Europe were six times as high as in the United States; once Souki's terminal was up and running, he would be able to reap the entirety of that price differential, a jaw-dropping arbitrage. Yet again, he would have proved everyone wrong.

Still, the facility in Louisiana would need to export gas for years to pay itself off, which meant that Tellurian would need to keep fracking more gas to supply it, and that people around the world would need to keep buying and burning that gas, dumping more methane and carbon dioxide into the atmosphere. Souki's gamble depended on the energy transition moving at a very specific pace, neither too fast nor too slow — his customers were countries that wanted to move away from the dirtiest fuels but weren't ready or willing to shift toward altogether clean energy. For as long as the transition moved at this halting pace, it would be gamblers and tycoons like him who set the course of global climate policy, selling people the fuels they wanted for as long as they wanted them. Souki himself might have an exit strategy, but the industry he created would outlast him, spraying flames into the night sky for decades to come.

I asked Souki what he thought the long-term trajectory of the L.N.G. boom might be. The fuel might be necessary right now, but what about in 20, 30, 40 years? He was betting that the world wasn't ready to give up fossil fuels. But someday it would, and the facilities he built would be effectively useless. What would happen then?

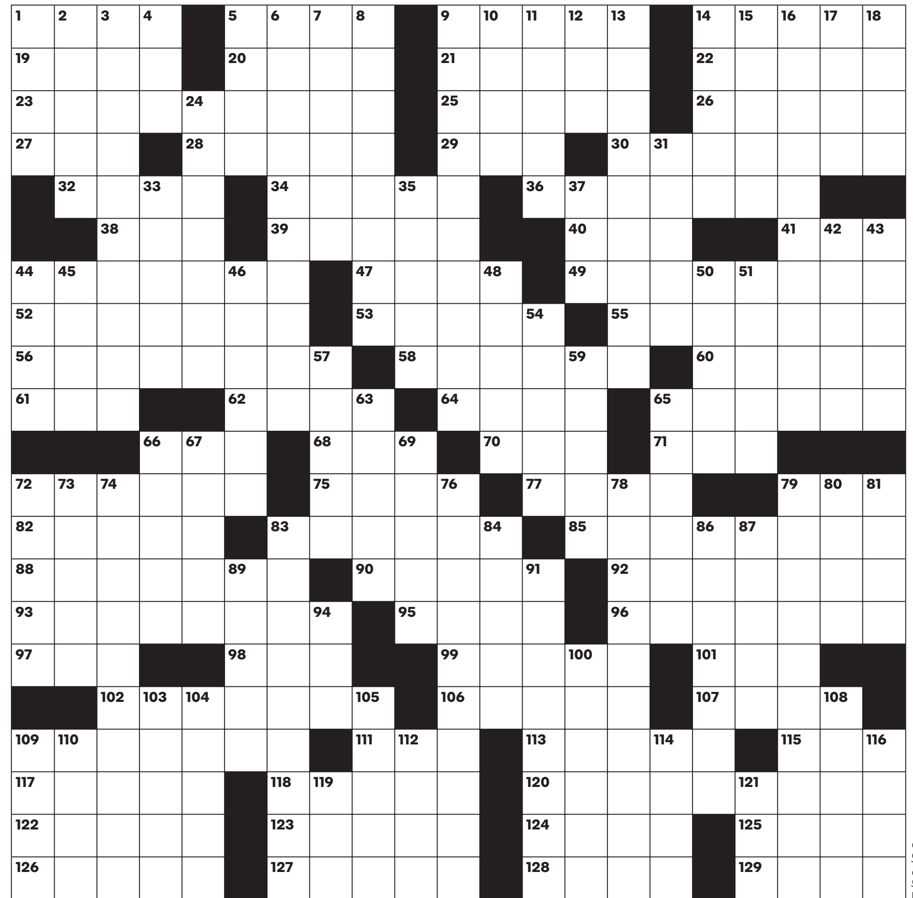
He smirked and waved his hand, as if to swat the question away.

"I'll be dead," he said, "so it won't matter." ◆

MOVIN' ON UP

By Christina Iverson and Scott Hogan

Scott Hogan is making his New York Times debut with this puzzle, after many submissions. He is a patent attorney from Midland, Mich. Christina Iverson is a crossword constructor and editor from Ames, Iowa. They met through the Cruciverb Facebook page, a forum for crossword constructors. Scott says he takes inspiration from the lyric of "Movin' On Up," the theme song from "The Jeffersons" — "It took a whole lotta tryin', just to get up that hill." — W.S.



7/10/22

ACROSS

1 [omg haha!!]
5 Left speechless
9 Reward for sitting, say
14 Entice
19 Something we share
20 Rocker John whose surname sounds like a leafy vegetable
21 "__ Man Chant," song by Bob Marley and the Wailers
22 Diarist Nin
23 Where some stable relationships form?
25 San Diego State athlete
26 Verge
27 Name that's 98-Across backward
28 The sky, they say
29 "All the Light We Cannot __" (2015 Pulitzer-winning novel)
30 Certain Chinese teas
32 Roman emperor after Nero and Galba
34 Heep of "David Copperfield"
36 Drop the "Donuts" from "Dunkin' Donuts," e.g.
38 Some four-year degrees: Abbr.
39 Kind of attack with no attacker
40 Michael Jackson hit whose title is heard 88 times in the song
41 What might accompany a grave admission?
44 Claws
47 Cheese with a light, nutty flavor
49 Quite an uproar
52 Design style influenced by Cubism
53 Fabric often dyed with indigo
55 Each of its interior angles measures 135 degrees
56 Swing preventer, of a sort
58 Like some vows
60 Run off together
61 Personal ID
62 Like a sweater that shrank in the dryer, maybe
64 Its alphabet includes delta
65 Some Brothers Grimm villains
66 Artless nickname?
68 Tease
70 Sarcastic punch line
71 That guy's
72 40 winks
75 Threads
77 Tepid greeting
79 Second word of many a limerick
82 Sans-serif font
83 Thesis writer
85 Meaning of a signal flare
88 2021 Aretha Franklin biopic
90 Strained
92 Greek name meaning "golden one"
93 Something filmed in Broadway's Ed Sullivan Theater, with "The"
95 Journalist Skeeter in the Harry Potter books
96 Train segment
97 Butt end
98 Name that's 27-Across backward
99 "Sweet dreams!"
101 Rapper __ Rida
102 It's not a good look
106 Family/species go-between
107 The last thing you need?
109 Like the community portrayed in Netflix's "Unorthodox"
111 Piercing tool
113 Tickle
115 Evian, in its native land
117 Cruciverbalist's favorite cookies?
118 "Well, gosh!"
120 Tipsy trips
122 Teatro alla __
123 Takes a car, in a way
124 Lab assistant in "Young Frankenstein"
125 It may be upper or lower
126 Blue-book filler
127 Much of a sponge
128 Mad, with "off"
129 Word of surprise

DOWN

1 Santa __, Calif.
2 Closing section
3 Banana wielded by a maestro in a pinch?
4 Drug that can be microdosed
5 Berry in a bowl
6 Animated short before a Pixar movie?
7 New York resting place for Mark Twain
8 In the stars
9 Give a scathing review of a major camera brand?
10 Demolish
11 Compound with a fruity smell
12 Had a hero, say
13 Mexican street-food mogul?
14 Pair of small hand drums
15 Defunct company of accounting fraud fame
16 Smaug, in "The Hobbit"?
17 Send an e-message to
18 Makes shame-y noises
24 Does a fad 2010s dance
31 Pro using cutting-edge technology?
33 Movie rating that's practically NC-17
35 Political staffers
37 Retreat
42 "Fingers crossed!"
43 Window units
44 Small amounts
45 God whose name sounds almost like the ammunition he uses
46 Starts to go haywire
48 Where 122-Across can be found
50 Places for placentas
51 Surrounding lights
54 Movement championed by the Silence Breakers
57 Get rid of
59 Light-headed sorts?
63 Word after gas or ice, in astronomy
65 Novelist Achebe
66 Wizard's name in books and movies
67 Spun things
69 Kind of patch that may create holes instead of repairing them
72 Otis and __ (1960s R.&B. duo)
73 Disciplines
74 Response to "Why art thou queasy?"
76 What Amazon retirees enjoy most?
78 Result of love at first sight?
79 What a dog greets its returning family with?
80 Inter __
81 Trade jabs
83 Retail takeover scheme?
84 Fix, as laces
86 Nomad
87 Annyeonghaseyo : Korean :: __ : English
89 Tailgating dish
91 "Tarnation!"
94 Very, colloquially
100 Compassionate
103 Actress Davis who was the first African American to win the Triple Crown of Acting
104 Start of a guesstimate
105 Like a proverbial beaver
108 Model material
109 Place for a run?
110 Rainbows, e.g.
112 "__ saved!"
114 Large amount
116 Bookstore sticker
119 "Euphoria" airer
121 Excellent service?

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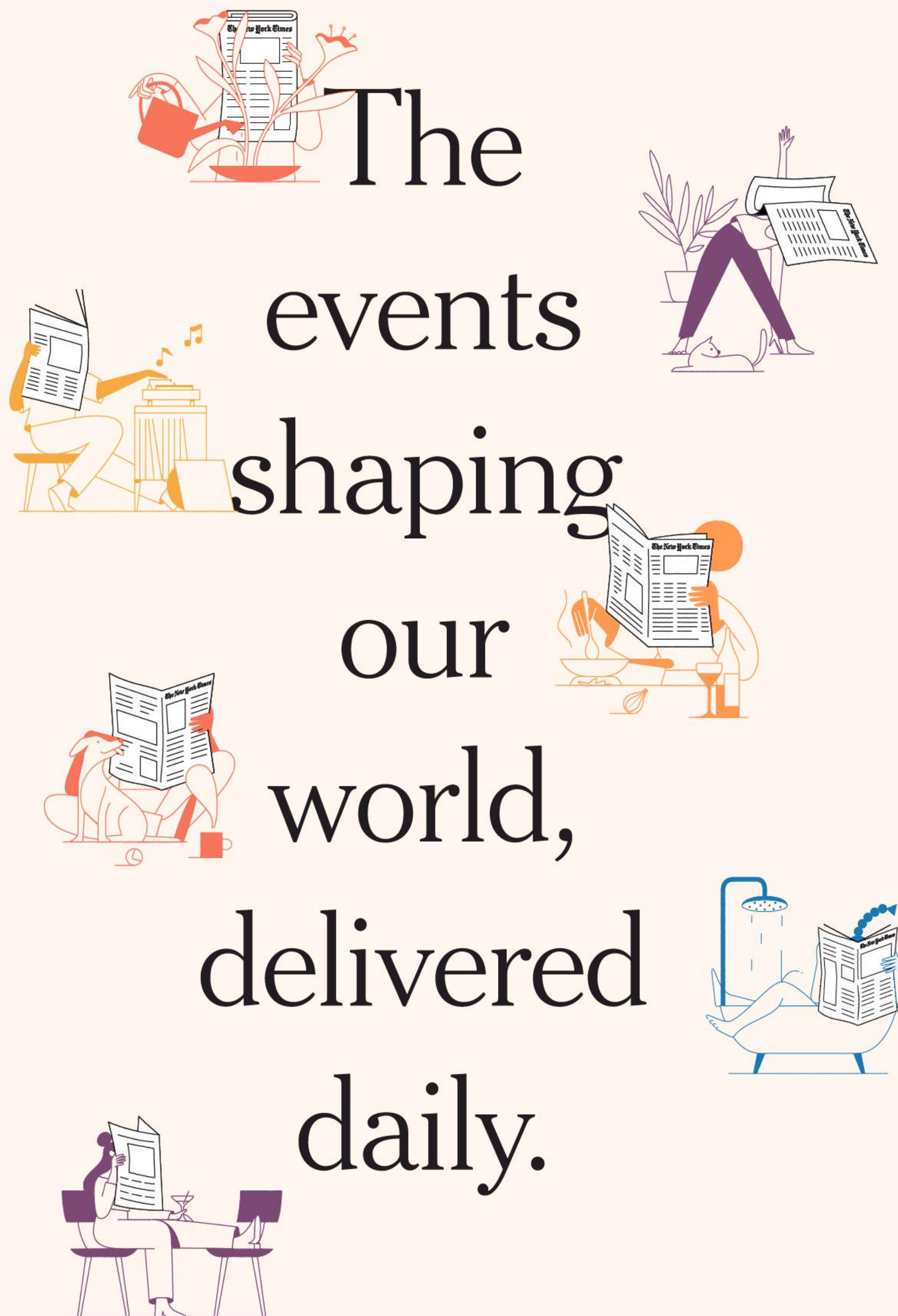

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