

March 28, 2021

The New York Times Magazine



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How social media stars like Addison Rae gave the cosmetics industry a makeover. By Vanessa Grigoriadis

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CAN'T
WAIT**



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Josh Gibson, regarded in his day as “the Black Babe Ruth,” scoring during the Negro-leagues East-West All-Star Game at Comiskey Park in Chicago in 1944. Page 22.



Photograph from Bettmann Archive, via Getty Images

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Behind the Cover *Gail Bichler, creative director: “This week’s cover story is about how the beauty industry has been transformed by social media stars like Addison Rae, whose over 78 million followers make her TikTok account the platform’s second-most popular. Rae is her own brand, so we designed a cover that reflects her: splashy and irreverent.” Photograph by Paola Kudacki for The New York Times.*

Contributors

Vanessa Grigoriadis	<i>"Face Time,"</i> Page 28	Vanessa Grigoriadis is a contributing writer for the magazine. Her last article examined the influence of Madonna over the past 40 years. Her profile of Karl Lagerfeld won a National Magazine Award and she's also the author of a book about sexual assault, "Blurred Lines: Rethinking Sex, Power and Consent on Campus." For this issue, she writes about the impact the beauty industry has had on the psychology of American girls now that TikTok, Instagram and YouTube have replaced magazines for many young people. "The idea of celebrities and social media stars selling their own cosmetic products, instead of simply sponsoring products, fascinated me," Grigoriadis says. "I wanted to know how that sell was changing the self-conceptualization of their fans."
Jon Gertner	<i>"Tracking the Covid Code,"</i> Page 36	Jon Gertner is a contributing writer for the magazine and the author of "The Ice at the End of the World." He writes frequently about science and technology, including features on Tesla and about Climeworks, a Swiss company that is removing carbon dioxide from the atmosphere.
Adlan Jackson	<i>Screenland,</i> Page 7	Adlan Jackson is a writer from Kingston, Jamaica, who writes about music in New York. This is his first article for the magazine.
David Marchese	<i>Talk,</i> Page 11	David Marchese is a staff writer for the magazine and the columnist for Talk. Recently he interviewed Phoebe Bridgers about success and happiness; Kevin Garnett about how basketball has changed; and Ninja about the gender dynamics of gaming.
Rowan Ricardo Phillips	<i>"In Search of a Lost Pastime,"</i> Page 22	Rowan Ricardo Phillips is the author of three books of poetry — most recently, "Living Weapon" — two books of nonfiction and a book-length translation of fiction. He is the recipient of, among other honors, a Guggenheim Fellowship, a Whiting Award and the PEN/ESPN Award for Literary Sports Writing.
Paola Kudacki	<i>"Face Time,"</i> Page 28	Paola Kudacki is a photographer and director known for her portraiture. Her work has appeared on the covers of Time magazine, GQ and Rolling Stone, and she recently directed two music videos for the Foo Fighters. She last photographed two new Democratic congresswomen for the cover of the magazine.

The New York Times Magazine

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Readers respond to the 3.14.2021 issue.

RE: 19 SONGS THAT MATTER RIGHT NOW

The annual Music Issue chronicled the songs and artists that have helped us through the pandemic.



As a **locked-down** baby boomer who has listened ad infinitum these past months to old CDs featuring artists ranging from Sinatra to the Beatles to Simon and Garfunkel, I wondered, “What’s the big deal?” as this year’s Grammys bore down on us with what seemed to me like an amorphous mass of musicians I too often struggle to delineate and understand. Then, on the very day of the awards show, along came this wonderful issue offering fascinating back stories of artists and their music to give me perspective. Thanks to you, I was gently nudged out of dwelling in the past to fully appreciate the present — a lesson transcending music at a challenging time in our lives, when the tendency is to be down and fixated on “the good old days.” Your incisive, impassioned writing has lifted and inspired, causing me to look forward with hope and anticipation.
Greg Joseph, Sun City, Ariz.

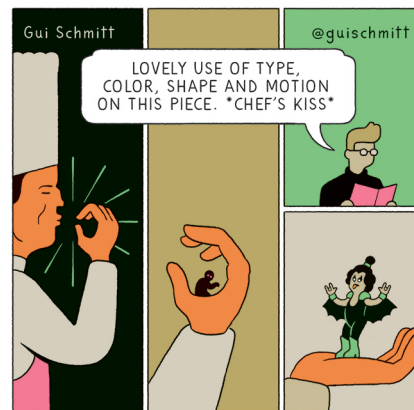
This issue smacked me in the face with the fact that at 78, I am no longer cool, hip or in the know anymore. I recognized Drake, Dua Lipa and, of course, Taylor Swift, but I was totally ignorant of the other artists. The article on J. D. Beck and DOMi was so fascinating, and I am thrilled to have now “discovered” their brilliance. Thank you!
Ellen Prague, Winter Park, Fla.

Fantastic use of technology. Hearing while reading is so much more enlightening. Kudos to the authors, editors,

photographers and others for creating a unique and thoroughly enjoyable presentation online. As an older guy, I know that much of this music is not in my wheelhouse, but the experience was analogous to visiting a museum with a new exhibit that opens a door to a style or a genre not normally pursued.
TC, Westport, Conn.

I think maybe you did a disservice to all the wonderful classical and jazz musicians who have kept many of us going through this pandemic. Maybe I have missed the point of your issue, which is really well done, by the way. And maybe classical and jazz are in a different class or category. But if your focus is music that is getting us through the pandemic, then I’m sure many of your readers have no idea who these musicians are. That’s not to say they aren’t excellent. It’s just my first reaction to this.
Lyn Banghart, Easton, Md.

Your inclusion of the great Bill Frisell and his HARMONY collective took me back to the last Hardly Strictly Bluegrass free festival in San Francisco’s Golden Gate Park in October 2019, months before the pandemic. It was a typically balmy fall afternoon, and thousands of people were there to see and hear the likes of Frisell as Pacific breezes mingled with their beautiful melodies and harmonies in that idyllic setting. At the time, no one could have anticipated what was lurking just around the corner, nor that this would be the last such gathering for some time to come. The recollection of that glorious afternoon and music, however, reassures me that because of such spirits and memories, we shall, indeed, overcome.
Steve Griffith, Oakland, Calif.



THE ISSUE, ON TWITTER

Sweet interactive design & music site from NYT.
[@ELeighton60](#)

Despite being a member of “the youth revolt” 50 years ago, I find myself whining these days about these annoying young people and their cellphones. Then I watch J. D. Beck and DOMi nail Coltrane’s “Giant Steps,” and I remember what a wise sage of my generation once wrote: The kids are all right.
Michael Simmons



As a **2020** college graduate, I think it’s easy to feel that the world has forgotten us since last May. Here, I feel a sense of community I have been longing for. I’m not familiar with all the artists, but this has given me the language to describe why I have not been able to stop listening to “WAP” since it was released.

With so little in my control and no social outlet, the song is an escape. It feels daring, powerful. I watched the video only once but was moved by the celebration of Black women, the reclamation of our sexuality.

My graduation ceremony has been pushed to 2022, I haven’t been able to hold my diploma, job searching has been a nightmare. In its own unconventional way, “WAP” has kept me going: There is joy, there is power, there is a future dripping in the promise of a good time of my own creation.
NW, Raleigh, N.C.

Thank you for putting Sam Hunt in here! He’s so underrated. That song has made me happy-dance all over my living room this past year, wishing I could walk down to my favorite bar, dance with my girlfriends and flirt with random strangers over a cold beer.
Stella, New York

Send your thoughts to magazine@nytimes.com.



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Reality Check



For months, finance gurus on YouTube switched from dreams of wealth to dreams of government relief. ● *By Adlan Jackson* ● “Mark your calendar, there’s a big day coming!” On Jan. 9, with the dream of \$2,000 stimulus checks not yet deflated, the Southern California real estate broker Kevin Paffrath uploaded a video to his “Meet Kevin” YouTube channel, updating viewers on the status of the stimulus. Sitting



before an array of glowing LED screens and pop-culture paraphernalia (a star from the Super Mario games, Thor’s hammer from the Marvel movies), Paffrath, a wiry white man in his late 20s with a close-cropped beard, leaned into the lights and greeted his viewers. Using the earnest eye contact of a veteran YouTuber, he ran through a summary of the situation: the interests at play in Congress, the details of proposed bills, the tangled qualifications for relief. Out of focus, over his shoulder, the monitors reminded us to visit his “Meet Kevin School” and sign up for courses to “Master Stocks”; at the end of the video, we are invited to “#BecomeMore” through

investing, to subscribe to his channel and, of course, to smash that “like” button.

This video would be just one of dozens about potential stimulus packages posted that day, even that evening — many of them from finance influencers like Paffrath, whose pitches normally involve real estate, stocks or airline points. A year ago, they were promising to share their proprietary secrets for achieving wealth, staging monologues in the drivers’ seats of luxury cars and poolside on cruise ships. Brian Kim, a Chicago accountant, had previously been explaining tax preparation, including how high-earners could reduce their obligations; Ramy Wahby once raised a complimentary

The audiences they had been teasing with paths to affluence had ended up sitting around with everyone else, hoping for a check.

glass of Champagne from a first-class airplane seat and offered to explain how he used airline rewards to get there. Now all that had changed. The thumbnails on their channels may have kept their usual style — buffoonish facial expressions, glaring yellow text — but it was videos about stimulus checks that came to dominate their feeds. They vied for the role of soothsayer before a rapt audience with a seemingly insatiable demand for information about when the government would offer financial relief.

Personal-finance influencers turned out to be naturals for this part. They were already performing as the shamans of a core American mythology: that though

Above and opening page: Screen grabs from YouTube



the world may be divided into haves and have-nots, the only thing standing between you and life among the haves was some arcane savvy. The influencers were exactly like you, they promised; it's just that they had cracked the code and would, in their magnanimity, break a taboo to share its secrets with you. (Simply sign up for their classes, buy their books and use the appropriate coupon codes at check-out.) Their shift to stimulus content was sudden and significant, but it was merely a change to the type of knowledge in which their enlightened-everyman personas were trained: Instead of decoding real estate or cryptocurrencies, they opined on means-testing and party politics.

In Paffrath's case, stimulus-check updates began doubling his other videos in view counts; one update became the most popular video on his channel, with 1.1 million views. For other finance gurus, these updates took over their output entirely. Their audiences grew dramatically, but the shift required a tacit admission: that the people they had been teasing with paths to affluence had ended up sitting around with everyone else, hoping for a check.

Viewer demand didn't come from upward-bound entrepreneurs after all, it seemed, but rather from those enduring the kind of precarity where the precise timing of a \$2,000 deposit could mean keeping the lights on or the difference

Among Paffrath's popular streams and videos this winter:

- "When Will Stimulus Checks Arrive? [New Details From Treasury]"
- "McConnell Speaks in Senate! [\$2,000 Stimulus Check Update?]"
- "Did Trump JUST Sign the Insurrection Act?"

between housing and eviction. These audiences didn't want yesterday's news, or even this morning's; the slightest budge toward progress was meaningful and welcome. So the output of YouTube updates was relentless: Every hour, a glut of new videos provided the latest on whether relief was coming and how many dollars of it were likely to arrive.

Paffrath typically uploaded two videos each day. Some content makers uploaded three or more. There was, often, simply not much to say. The key to collecting views was simply to serve as foil to what the audience saw as an infuriating lack of urgency from Congress and the president. The YouTubers tended to mimic the

calm, authoritative style of cable-news anchors, but other than reading other peoples' reporting off printer paper, there was little to do beyond trying to match their viewers' exasperation. The visuals, comically, featured the same techniques used to press investment schemes: stock images of fanned-out \$100 bills and tantalizing click bait like "\$4,200 STIMULUS!"

Paffrath has a charisma that cuts through all this. He's exceptionally talented at talking to a camera, a natural salesman. But when he turns to a flow-chart breaking down the Biden stimulus proposal, what might even be sincerity leaks out. Judging by the ad hoc community formed in his comments sections, his viewers appreciate it.

Then you remember the neon advertisements behind him and the exhortations to go "from \$0 to millionaire and beyond." That Paffrath, a multimillionaire landlord who once extolled the virtues of misleading tenants and vigorously refusing to rent to people with suboptimal credit scores, has come to be an exasperated avatar for emergency economic relief for the neediest — most of whom would be spending it on rent — feels deeply, typically American. A CNBC profile reported that Paffrath actually makes most of his money not from the industry he built his status on, not from investing or even from buying rental properties, but via his audience itself, from his YouTube channel's advertising revenue and affiliate programs.

This confluence of the sincere and the cynical recurs constantly in stimulus-check YouTube. It serves a uniquely American need: Even at the height of desperation, nothing can ever dispel the mirage that riches are available to anyone with the work ethic and (if you insist) a little savvy.

In the days leading up to the relief bill becoming law, Paffrath's stimulus content remained his most popular product; soon he was posting videos calming those members of his audience for whom the \$1,400 deposit had not yet arrived. Can the path forward for someone like Paffrath really lead back to making videos from the driver's seat of a Tesla, promising to make viewers rich? Or will what he has seen during this stint — months of tending to a public desperate for news of a couple thousand dollars — open his eyes to the possibility of being just another rich person hustling the poor? ♦

Even at the height of desperation, nothing can ever dispel the mirage that riches are available to anyone with the work ethic and (if you insist) a little savvy.

Poem Selected by Reginald Dwayne Betts

I've been reading the poems of Honorée Fanonne Jeffers since I was a boy in prison. And now, more than a score of years later, her verse is still making the same complicated music. It's hard, truly, to make some things that need to be said sing. And this poem reminds me of the hardest of call-and-responses. If you can't see yourself in the conversation being had betwixt and between these lines, the poem becomes a question: What have you chosen to ignore during your days?



Note to Black Women in America

By Honorée Fanonne Jeffers

Don't think well of your self
 (drink your anger)
 Don't think well of your body
 (eat your anger)
 Don't think well of what
 you do with your hands
 your feet your tongue
 your mind your god
 whispering rare prophecies
 that no one else can hear
 (drink your anger)
 Don't think well of your
 heroines your revolutions
 (eat your anger)
 Your courageous ones
 whose voices won't
 rattle when they demand
 what is due what to do
 in this nation of cages
 and well-explained blood
 (drink your anger)
 And remember
 don't think well
 of your children
 or your children's children
 (eat that anger)
 They are only on loan
 to you until we name
 the day of the slaughter

Reginald Dwayne Betts is a poet and lawyer. He created the Million Book Project, an initiative to curate microlibraries and install them in prisons across the country. His latest collection of poetry, "Felon," explores the post-incarceration experience. In 2019, he won a National Magazine Award in Essays and Criticism for his article in *The Times Magazine* about his journey from teenage carjacker to aspiring lawyer. **Honorée Fanonne Jeffers** is a poet, novelist, critic and professor of English at the University of Oklahoma. Her latest collection, "The Age of Phillis," was published by Wesleyan University Press.

Dr. Diane E. Meier on existential cataclysms in health care. ‘My point is not that my colleagues don’t want to be bothered. They *can’t* bother.’



Serious illness and suffering. Fear and fresh awareness of death. The uncertainty they all bring and what, for each, would constitute humane and effective medical treatment. Those physical and emotional concerns, central to palliative care, have forced their way into so many of our lives during the pandemic, even as we edge toward some skewed version of normalcy. They're also the concerns that Dr. Diane E. Meier has been working on and thinking deeply about for decades. Meier, 68, is the longtime director of the Center to Advance Palliative Care, which is part of New York City's Mount Sinai Hospital, and a 2008 recipient of a MacArthur Foundation "genius" fellowship. She has been a uniquely qualified observer of the Covid-induced cataclysms — often existential — experienced by patients and physicians. "If ever we needed to be reminded of how important human connection and support is for people with serious illness," Meier says, "this pandemic has made the point very, very clearly."

In September, you were quoted in The Washington Post saying that during the pandemic, other physicians have been looking to palliative-care doctors "to be the human side of medicine." What does that imply about the medical system's deficiencies? That the public's experience with the medical profession has been subsumed by the marketplace, where there is enormous pressure on everyone working in the system to see multiple patients in a very short period of time and ensure that the services we offer are well reimbursed. Which is why the pandemic was such a blow to the economy of many health care systems: The major sources of income, which had to do with elective surgical and other procedures, were shut down because of the need to repurpose health systems for masses of people with Covid. The pandemic is the exemplar of why that is such a fragile foundation for a major first-world country's health care system. The drivers are about doing what is necessary to get paid as opposed to what we thought our profession was all about, which was serving human beings who are suffering. It's not that my colleagues are uncaring or don't realize that their relationship with patients is a powerful instrument of healing; my point is not that my colleagues don't want to be bothered. They *can't* bother. So they're relieved to

have palliative-care colleagues who will take the time that they know their patients and patients' families need. That enables our colleagues to overcome the moral distress and ethical inner conflict that the business side of medicine creates.

Do patients feel differently about palliative care when the need for it is caused by something unfamiliar like Covid-19 as opposed to, say, a cancer diagnosis? The fear and anxiety is completely different. It's not that getting a diagnosis of dementia or cancer or kidney failure is not frightening. It is, but it's somewhat normalized. You know people it's happened to. Whereas the Covid pandemic — there was so much interesting coverage marking the 500,000th death about how invisible all the grieving is and how the whole country is in a state of numbness and denial because it is all too much to take in. It *is* too much to process. Let's say that's been your mindset: It's not going to happen to me. Then it does. All that denial falls apart. All that numbness won't protect you. It is frightening, and compounded by the fact that family members can't be with patients.

Below: Dr. Diane E. Meier in her office at Mount Sinai in 1997. Opposite page: Meier and a Mount Sinai colleague, Dr. R. Sean Morrison (right), discussing palliative care with Senator Sheldon Whitehouse of Rhode Island in Washington in 2011.

David Marchese
is the magazine's Talk columnist.

Has the pandemic affected our collective attitude toward grief? There are many shadow pandemics. One is the trauma to the entire health profession during this last year. The other trauma is the roughly 10 people for every person who has died from Covid who are grieving. That's over five million people. That is a shadow pandemic that will be with us long after we get the virus under control. Our current president has worked hard to begin to address that through the ritual ceremonies to remember the dead and honor them, and he has talked a lot about his *own* losses, to normalize talking about losses and how they're with you every day. That's important. We need other people to do it too.

This is a bit of a sidetrack: In December, you published a piece in JAMA Internal Medicine about the "slippery slope" of increased access to physician-assisted death.¹ But I'm still not quite clear why there would be a major concern about people unduly requesting medical assistance with ending their life when, by and large, people don't want to die. Countries that have enabled euthanasia or assisted



suicide have claimed that it has to be totally voluntary, cannot be due to financial or family pressures, cannot be due to untreated or unrecognized depression and cannot be due to untreated, poorly managed pain. They state that, and yet there is no evidence that those are not the major factors driving this. What it takes to adhere to those guidelines is incredibly expensive and time-consuming and *doesn't happen*. That's the situation in the Netherlands and Belgium and Canada.² All the heartfelt adherence to restrictions that are announced when you first get the public to vote in favor of this go up in smoke once the practice is validated. And it's always with the talking points that it's about relief of suffering, that the person, even though he cannot say this, would agree that he would be better off dead. Ethically, do I think people should have the right to control the timing of their death? I do. I think it's dangerous public policy. It's a dangerous path to go down with the claim that it is all about respect for autonomy, when the real drivers are getting rid of a painful and expensive burden on society.

But couldn't we always say that if people had access to better care then they wouldn't consider this other option? What if the reality is that access to better care isn't there? Are we saying to suffering people, "There are ways to still find meaning in life; we just can't necessarily guarantee you'll be able to take advantage of them"? There is a real tension there. Our system is so broken. But do we solve that problem by offering them physician-assisted death? I wouldn't want to be part of that society. There was a recent case in Canada: a guy with neurodegenerative disorder who was cognitively intact.³ In order to go home from the hospital, he needed 24-hour care, and the government would not pay for 24-hour care. He recorded hospital staff offering him medical aid in dying as an alternative. You think that doesn't create pressure on people who already feel like burdens? They need to be met with a resounding commitment to continued relationship. Not: "You're right. I agree you'd be better off dead. Here's a prescription." That pushes someone who is struggling right over the cliff.

Should we think of suffering as inevitable? That's a great question, and the answer to any great question is "It depends." It depends on the type of suffering. Dame Cicely Saunders⁴ used to talk about "total

1 Meier's article, "The Treatment of Patients With Unbearable Suffering — The Slippery Slope Is Real," was written in response to the Dutch study "Euthanasia and Physician-Assisted Suicide in Patients With Multiple Geriatric Syndromes." That study, which was published in the same issue of *JAMA Internal Medicine*, looked at the complicated factors that lead to older people requesting euthanasia or physician-assisted death.

2 All three countries allow euthanasia or physician-assisted death. In the United States, assisted death is currently legal in California, Colorado, Hawaii, Maine, Montana, New Jersey, Oregon, Vermont, Washington and the District of Columbia.

3 This is a reference to Roger Foley, an Ontario man suffering from cerebral ataxia, who in 2018 released recordings that he claims are proof that health care workers tried to coerce him into choosing assisted death.

4 The Englishwoman who founded St. Christopher's Hospice in London. Saunders is considered the founder of the modern palliative-care movement. She died at St. Christopher's in 2005 at age 87.

5 Meier will step down as director of the Center to Advance Palliative Care this spring but will continue on as director emeritus and strategic medical adviser.



pain." It was not just pain or constipation or fatigue or depression or difficulty sleeping. It was issues of purpose, meaning, identity, relationships. So while the practice of medicine is pretty good at the mechanics of treating things that cause tremendous suffering, the existential, spiritual and relationship fundamentals are addressed very often in the purview of palliative-care teams. We see that as part of our job. In the rest of medicine, clinicians *don't*, and people are left to find their way. If they're not strongly embedded in a faith community or extended family, it causes tremendous suffering, because meaning comes through relationship. The fear of death is about the loss of relationship with the world and the people in it.

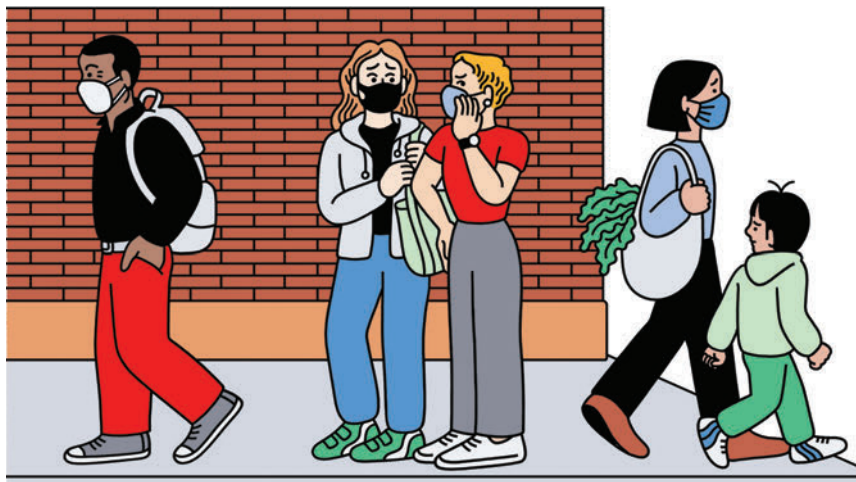
At this stage of your career,⁵ are there aspects of the human experience of chronic illness or pain that used to be mysterious to you that you now understand? It has to do with trauma. Trauma is widespread. In wealthy families and poor families; individual and family trauma; community trauma and societal trauma. We have so much of that here — just start with racism and go on. It is repressed and treated with denial. That doesn't make it go away. It's controlling how people respond to new trauma, whether it's a diagnosis or a pandemic or a January 6th. So my perspective on trauma has a bigger scale than it used to — a species-level and tribal-level scale. And as I read the news, I don't know whether we're going to evolve our way out of this. The need to hate and kill the other is

a determinative human characteristic, and it informs so many aspects of our society. I also don't see a disconnect between what has happened to the practice of medicine and that reality, because what's happened to medicine is being driven by a societal commitment to profit above all else. And what is that? It's trauma.

You could imagine somebody rolling their eyes at you, saying, "You're saying capitalism is trauma?" What has happened to the practice of medicine is that the public perception is that it has become totally transactional. That we do things either to make money or to avoid spending money. So, for example, many people of color fear that a conversation about whether or not they want cardiopulmonary resuscitation is not about what's best for that patient; it's about saving money for the hospital. Those perceptions are not wrong. That's the problem. And there's more than a kernel of truth in the perceptions of people feeling as if they or their loved one is being put through a marketplace of M.R.I.s and P.E.T. scans and specialists and subspecialists, and everybody is billing. The visibility of the extraction mind-set of the practice of medicine — it's not subtle, and the public knows it. I'm worried about blowing the hard-earned trust that our profession worked toward over hundreds of years through, essentially, the commercialization of health care delivery. ♦

This interview has been edited and condensed for clarity from two conversations.

My Friends Are Wonderful, but Also — I'm Learning — Racist. How Should I Respond?



Although Sydney, Australia, has been my home for almost 40 years, I am temporarily living in Melbourne to be close to family. The Covid-19 situation here has caused a lot of anger among many residents. We went into a second lockdown following outbreaks in aged-care facilities and in the city's public-housing estates, which have a high concentration of Sudanese and Asian immigrants.

The handful of friends I have in this city live in the very affluent eastern suburbs (as do we) and have relatively little cause for concern. Yet they are fuming over the fact that we are inconvenienced because of people whom they repeatedly refer to as "these ethnics." This is clearly intended as a racial slur and causes me much angst. My friends, like me, are Jewish; unlike me, they are children of Holocaust survivors. Should they not feel greater compassion for the suffering of those recent immigrants escaping violence and ethnic cleansing in their home countries?

Australian colonists decimated native populations and stole native land. Is it ethical for us to be so self-congratulatory

when so many Indigenous Australians, who make up more than 3 percent of our population, live in fourth-world conditions?

My friendships have endured because I have found my friends to be loving, family-oriented and honest citizens. They observe the Jewish concept of *chesed* (kindness) to its limit. However, this recent racist narrative disturbs me deeply. I have rehearsed several responses to the "these ethnics" comments along the lines of "Except for our Aboriginal people, we are all ethnics in this country," while suggesting charities to which my friends can contribute so that their fellow Melburnians receive basic care.

I can be very direct when I respond to injustice and racism. I am afraid my responses will be misconstrued and mark the beginning of the end of a very long friendship. What is the most appropriate response in this situation?

Name Withheld

In Jonathan Coe's Brexit novel "Middle England," a British woman makes

approving mention of a notorious 1968 speech in which the politician Enoch Powell declared that Britain was being menaced by nonwhite immigration. The younger woman she's talking to is appalled and jolted by a sense that the two "lived in different universes," which were "separated by a wall, infinitely high, impermeable." It sounds as if you've recently had an experience like that.

The word "racism" actually came into widespread use in English in reference to Nazi attitudes toward Jewish people. Being the victim of prejudice, however, does not inoculate us from our own prejudices. Edward Augustus Freeman, who went on to be Regius professor of history at Oxford, wrote, while visiting America in 1881, that his interlocutors generally agreed with his proposal that "this would be a grand land if only every Irishman would kill a Negro and be hanged for it." Yet WASP bigotry toward the Irish immigrants didn't save them from bigotry toward Black people. (Nor, conversely, did suffering from anti-Black animus prevent the likes of Frederick Douglass from disparaging Irish-Americans.) I've heard Africans complain about being subject to racism from Europeans and Americans while denigrating Africans of certain other ethnic groups in ways that sound awfully like racism. Consider, for that matter, the tensions that have lately arisen between Asian-Americans and Black Americans. "Suffering is partial, shortsighted and self-absorbed," the philosopher Olufemi O. Taiwo observes. "We shouldn't have a politics that expects different: Oppression is not a prep school."

Nor is displaying lovingkindness (as the King James Bible I grew up with often translated *chesed*) toward your in-group incompatible with displaying hostility toward members of an out-group. I think of the writer Doris Lessing's memoir about trips she took as an adult to Zimbabwe (formerly Rhodesia), where she grew up. She had left, in part, because she detested the racism and sexism of her fellow white colonials. Yet she managed to convey the appealing sense of community among the whites with whom she stayed, including her brother. Because she was only visiting, she didn't bother to challenge their racist attitudes — she thought it would make no difference — and she didn't have to decide



Bonus Advice From Judge John Hodgman

Krisa writes: My friend Ken and I had dinner plans. But after a day at the vet with my sick dog, I texted that I might not be home in time for dinner and attended to Maybelline. Next morning, I awoke to his texts that he went to the restaurant, because my message was "unclear." He brings this story up repeatedly. We need an official ruling!

Even after all this time at home, I can think of no better evening than staying in with a dog. Sorry, Ken. But also: sorry, you. You were unclear. Now that we're inching back to socializing, here's a cancel-culture refresher: It's OK to cancel any plan. Usually you shouldn't have agreed to it anyway. And the other person will always be fine with it, especially if it's me. But sometimes it's Ken, who will always go to the restaurant. You owe these creatures of pure hope your honesty, clarity and a reply text! Get well soon, Maybelline!

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.)

whether to be friends with the people who had them.

You, on the other hand, are not merely visiting, however long you stay in Melbourne. So far as I can see, you've got three choices. One is simply to tolerate your friends' intolerance — though my sense is that this won't work for you. Another is to conclude that these moral failings are an obstacle to friendship; friendship is a moralized relationship, after all, and taking certain values seriously can entail not condoning them in your friends. But at this point in your life, you're clearly reluctant to lose longstanding, meaningful relationships.

That leaves you trying to scale a formidable wall. You're in good company. The great rabbi and civil rights leader Abraham Heschel, who lost much of his family in the Holocaust, worried about the many people whose "moral sensitivity suffers a blackout when confronted with the Black man's predicament"; he wanted each of us to be the sort of person who, like you, "resents other people's injuries." There

can be *chesed* in lovingly calling friends to account and reminding them that, in Heschel's simple formulation, humanity is one. We can hope that your friends will take your thoughtful responses for what they are — a sign that you care about our common humanity and that you care about them. Of course, they could be offended or else simply decide to shut up about the "ethnics" when you're around. But it's just possible that the warmth of your conviction will prompt them to reconsider their attitudes. It would be a kindness, anyway, to try.

My spouse, a health care provider in charge of vaccine distribution for a large health system, received the Covid-19 vaccine in the first few days of distribution.

I am in my 50s, healthy and working from home, so I am toward the end of the line. My spouse and I decided not to use my spouse's position to help me jump the line and be vaccinated with higher-risk groups. But when my group's turn comes, is it ethical to use

There can be *chesed* in lovingly calling friends to account and reminding them that, in Heschel's simple formulation, humanity is one.

my spouse's connections to move to the front of the line within my group?

Name Withheld

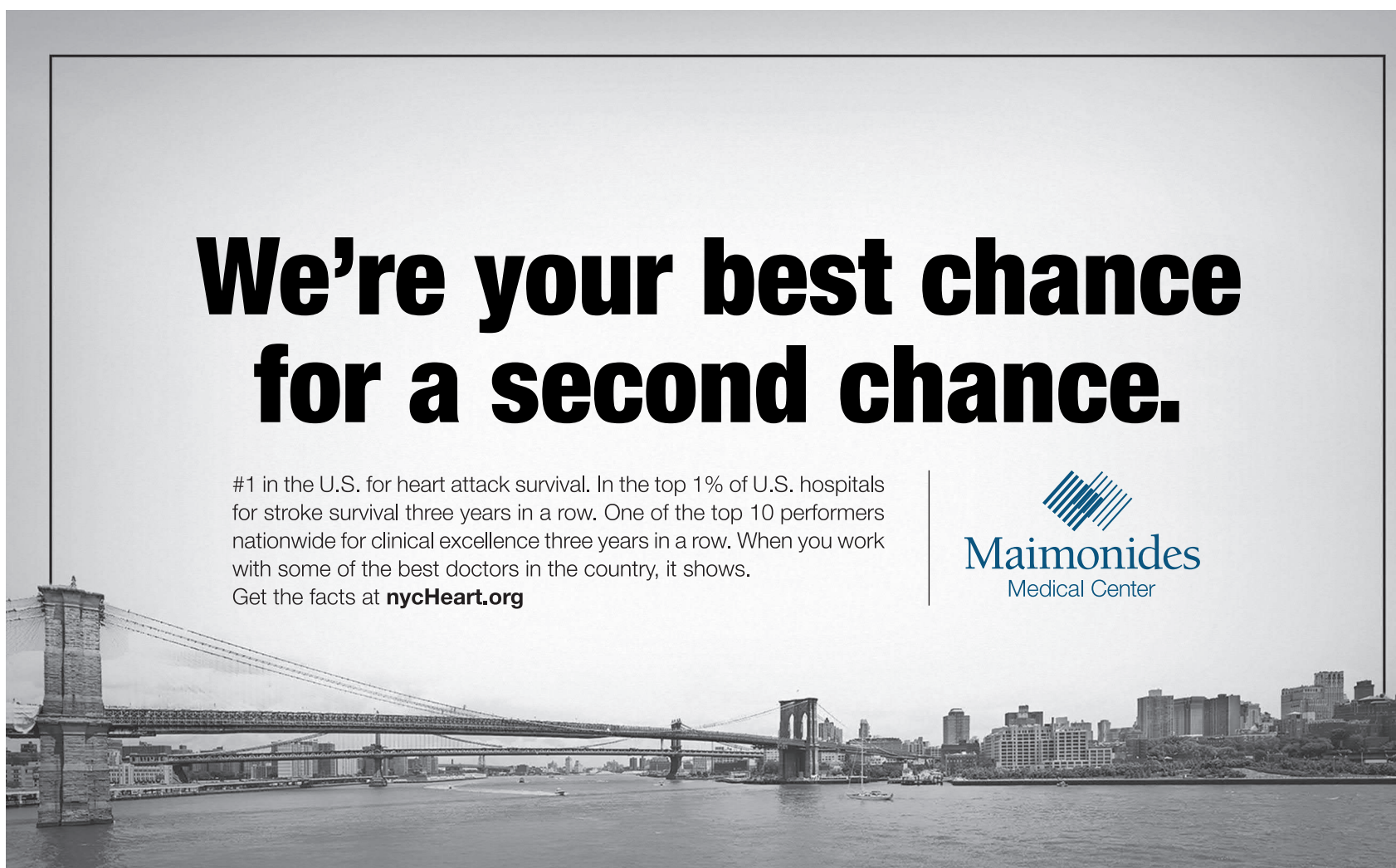
People like your spouse have a professional responsibility not to use their role in the system to get special treatment for their own families, in violation of their duty to give equal consideration to those with equal entitlements. The principles that led you not to seek vaccination before others in your category count against jumping the line within your category too. You can safely continue to live the way you do, working at home and taking the necessary precautions when you're out. Indeed, because (as the evidence suggests) your spouse is now unlikely to transmit the virus to you, you're already benefiting from your spouse's vaccination. ♦

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

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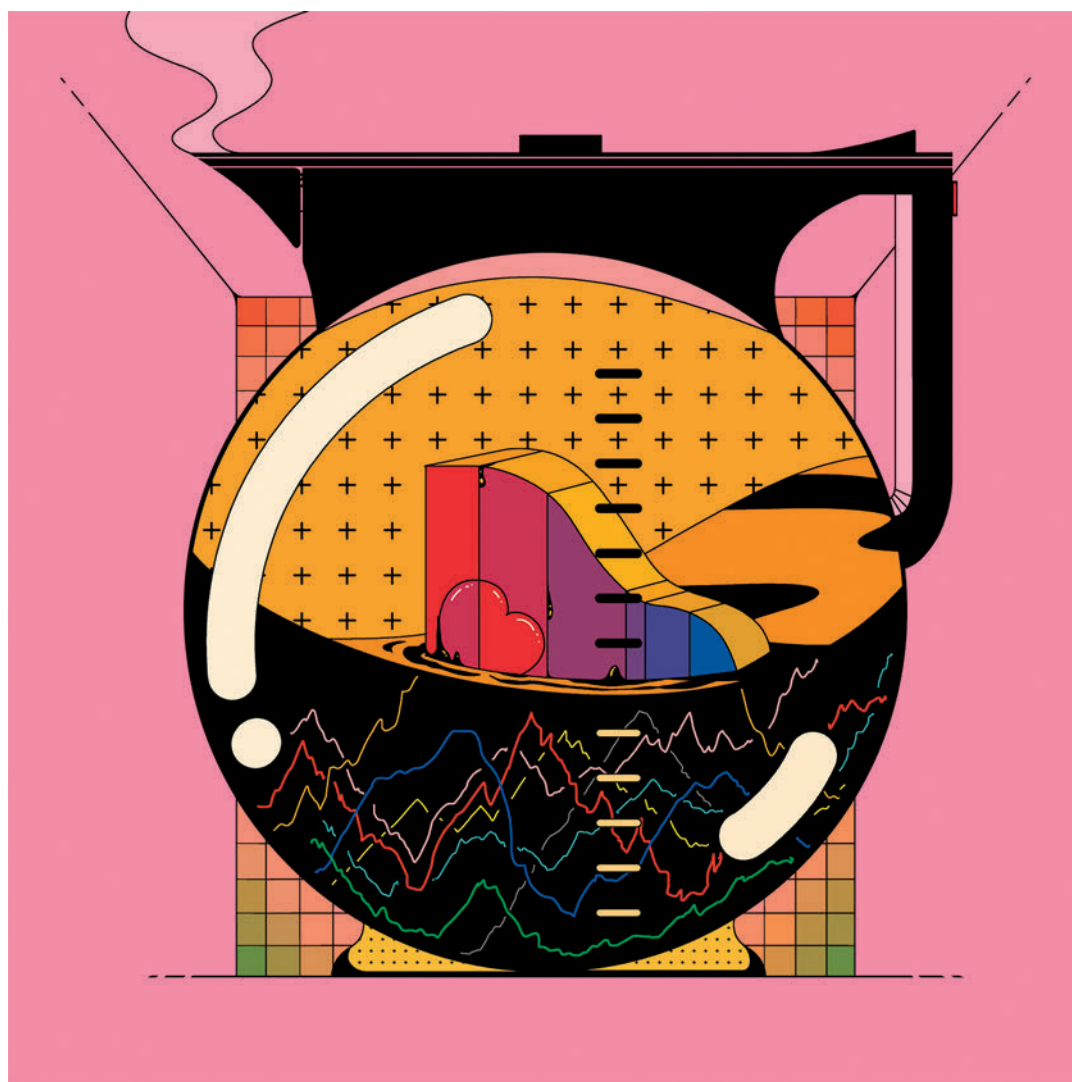
If randomized control trials or observational studies alone can't say whether coffee is good for our hearts, maybe machine learning can help.

Should you drink coffee? If so, how much? These seem like questions that a society able to create vaccines for a new respiratory virus within a year should have no trouble answering. And yet the scientific literature on coffee illustrates a frustration that readers, not to mention plenty of researchers, have with nutrition studies: The conclusions are always changing, and they frequently contradict one another.

This sort of disagreement might not matter so much if we're talking about foods or drinks that aren't widely consumed. But in 1991, when the World Health Organization classified coffee as a possible carcinogen, the implications were enormous: More than half of the American population drinks coffee daily. A possible link between the beverage and bladder and pancreatic cancers had been uncovered by observational studies. But it would turn out that such studies — in which researchers ask large numbers of people to report information about things like their dietary intake and daily habits and then look for associations with particular health outcomes — hadn't recognized that those who smoke are more likely to drink coffee. It was the smoking that increased their cancer risk; once that association (along with others) was understood, coffee was removed from the list of carcinogens in 2016. The next year, a review of the available evidence, published in *The British Medical Journal*, found a link between coffee and a lower risk for some cancers, as well as for cardiovascular disease and death from any cause.

Now a new analysis of existing data, published in the American Heart Association journal *Circulation: Heart Failure*, suggests that two to three (or more) cups of coffee per day may lower the risk of heart failure. Of course, the usual caveats apply: This is association, not causation. It could be that people with heart disease tend to avoid coffee, possibly thinking it will be bad for them. So ... good for you or not good for you, which is it? And if we can't ever tell, what's the point of these studies?

Critics have argued, in fact, that there isn't one — that nutrition research should shift its focus away from observational studies to randomized control trials. By randomly giving coffee to one group and withholding it from another, such trials can try to tease apart cause and effect. Yet when it comes to understanding how any aspect of our diet affects our health,



both approaches have significant limitations. Our diets work on us over a lifetime; it's not feasible to keep people in a lab, monitoring their coffee intake, until they develop heart failure. But it's notoriously difficult to get people to accurately report what they eat and drink at home. Ideally, to get to the bottom of the coffee question, you would know the type of coffee bean used and how it was roasted, ground and brewed — all of which affect its biochemistry — plus the exact amount ingested, its temperature and the amount and type of any added sweetener or dairy. Then you would consider all the other variables that influence a coffee drinker's metabolism and overall health: genome, microbiome, lifestyle (sleep habits, for example) and socioeconomic status (is there household stress? poor local air quality?).

Randomized control trials could still yield useful insights into how coffee influences biological processes over shorter periods. This might help explain, and thus validate, certain longer-term associations. But before doing a trial on a given nutrient, scientists need to have some reason for thinking that it might have a meaningful impact on lots of people; they also need to already have plausible evidence that testing the compound on human subjects won't do them lasting harm.

The Circulation study employed observational data, but its initial aim was not to assess the relationship between coffee and heart failure. This is how the lead author David Kao, a cardiologist at University of Colorado School of Medicine, characterized it to me: "The overall question was, What are the factors in daily life that impact heart health that we don't know about that could potentially be changed to lower risk." Because one in five Americans will develop heart failure, even small changes in their behaviors could have a big cumulative impact.

Traditionally, researchers start out with a hypothesis — coffee lowers the risk of heart disease, for example. Then they compare subjects' coffee intake with their cardiovascular history. One drawback to this process is that there are all sorts of ways researchers' preconceived notions can lead them to find false relationships by influencing which variables they include and exclude in the analysis or by prompting unscrupulous researchers to manipulate the data to fit their theory. "You can dredge up any finding you want

in science using your own biases, and you get a publication out of it," says Steven Heymsfield, a professor of metabolism and body composition at the Pennington Biomedical Research Center at Louisiana State University. To illustrate this point, a widely cited 2013 review in *The American Journal of Clinical Nutrition* searched for 50 common cookbook ingredients in the scientific literature; 36 had been linked individually to an increased or decreased risk of cancer, including celery and peas.

Kao, however, didn't start with a hypothesis. Instead, he used a powerful and increasingly popular data-analysis technique known as machine learning to look for links between thousands of patient characteristics collected in the well-known Framingham Heart Study and the odds of those patients' developing heart failure. The algorithm "will start to line up the variables that contributed the most to the variance in the data," or the range of cardiac outcomes, says Diana Thomas, a professor of mathematics at West Point. "And that's objective."

The ability of machine learning to process vast amounts of data could transform the ability of nutrition researchers to study their subjects' behavior more precisely and in real time, says Amanda Vest, medical director of the Cardiac Transplantation Program at Tufts Medical Center, who wrote an editorial that was published with the Circulation study. For example,

it could be trained to scan photographs of subjects' meals and interpret their macronutrient level. It could also analyze data from geolocation devices, activity sensors and social media.

But machine learning is only as good as the data being analyzed. Without careful controls, says Michael Kosorok, a professor of biostatistics at the University of North Carolina at Chapel Hill, "it gives us the ability to make more and more mistakes." If, for instance, it is applied to data sets that aren't diverse or random enough, the patterns it sees won't hold up when the algorithm then uses them to make real-world predictions. This has been a serious problem with facial-recognition software: Trained primarily on white male subjects, the algorithms have been much less accurate in identifying women and people of color. Algorithms must also be programmed to handle uncertainty in the data — as when one person's reported "cup of coffee" is six ounces and another's is eight ounces.

An analysis like Kao's, which starts with no preconceived notions about what the data might say, can reveal connections no one has thought of. But those findings must be rigorously tested to see if they can be replicated in other contexts. After the link appeared between coffee intake and a reduced risk of heart failure in the Framingham data, Kao confirmed the result by using the algorithm to correctly predict the relationship between coffee intake and heart failure in two other respected data sets. Kosorok describes the approach as "thoughtful" and says that it "seems like pretty good evidence."

Still, it's not definitive. Rather, it's part of a growing body of evidence that, at the moment, can say little about how much coffee people should drink. "It may be good for you," says Dariush Mozaffarian, dean of the Friedman School of Nutrition Science and Policy at Tufts University. "I think we can say with good certainty it's not bad for you." (Additives are another story.) Getting more specific will require more research. Last year, Mozaffarian and others called on the National Institutes of Health to establish an institute for nutrition science that could coordinate those efforts and, crucially, help people interpret the results. "We need a well-funded, well-organized, coordinated effort to figure out nutrition," he says. "No single study gets to the truth." ♦

Kim Tingley is a contributing writer for the magazine.



Biking at Night

By Daniel Peña



“I’m going for a ride,” I told my wife one night in early November, as a second Covid wave was sweeping through Berlin. We were living in a basement apartment on Solmstrasse in Kreuzberg, a former punk neighborhood turned hipster haven. We had come to Germany on account of her mother’s surgery. Mortality was on everyone’s mind, and we seldom left the apartment. Still, my friend suggested I get a bike with two locks. “Bikes are like gold now,” he said. Soon mass-transit

rides could be superspreading events. I’d need a way to move around.

As I was heading out, my wife threw me a scarf and a skullcap to wear beneath my helmet. No one wears a helmet in Berlin, but I did even if the roads were mostly empty. The *spätkaufs* — late-night convenience stores with cheap beer and welcoming benches — had long been shuttered by government order, along with bars and clubs. A rare blanket of silence fell over everything. After

An orienting celebration in a time of disorientation.

midnight, I had the city mostly to myself. Just me and the odd taxi driver cruising the streets.

The joys of the night ride were the joys of feeling present in my body again, orienting myself amid the disorientation of pandemic life, which has a tendency to erase the body even as it threatens it, even as it demands of it endless productivity. Pedaling felt like a celebration of kinetic energy, of blood, cartilage and bone. A reminder that my body was still

healthy and functioning despite the pandemic, despite the two heart operations I had as a kid to correct my tachycardia, which took me out of sports entirely. I remember the doctor's orders: no football, no physical education.

They told me I was fragile, and so I became fragile. I was in middle school then. It felt as if my body had been taken away from me. They put me in a combination swing-dance-and-painting-class instead. I did terrible still lifes in low light with Big Bad Voodoo Daddy on a loop. It was the turn of the millennium, and the post-dotcom years in Austin were full of foreclosures and wide streets with few cars. Lance Armstrong was still a legend then. The doctors never said no cycling, and for a brief moment in central Texas, biking became more popular than football, which salvaged my social life. I still believe that the speed, the wind, the blood in your ears on a silent street can do that to a body — manifest it into existence once again.

Maybe it was for these reasons I developed an affection for the night ride. Below the whoosh of the wind, I listened for my heart, then the rhythm of my tires over pavement. I watched the streetlamps passing by, syncopated. Eventually the pain of hard physical exertion would set in, not to mention the wind lashing my face or the occasional, teeth-rattling cobblestone street. The jolts of the road were constant reminders that there was a road beneath my tires and the possibility of travel. The stress on both the body and the bike made tangible what I'd suspected all along: that removed from my family, my friends, my former life, I still existed in these streets.

In the quiet of the night, I got lost. I flew down hills and blew through stop signs. I went 35 miles per hour on an empty pedestrian walkway. I thought of all the other bodies that had inhabited those spaces, too, and the city suddenly unfurled itself under my tires.

There was a frivolity to the night ride, too, a kind of frivolity I hadn't felt these past months. I'd spent so much of the pandemic sitting at a desk, sitting in bed, sitting on a couch. Sitting and worrying and doom-scrolling. My days were defined by a constant dread, and the world felt like a thing that happened to me, not something I could participate in. But during the night ride, I paid attention

Removed from my family, my friends, my former life, I still existed in these streets.

Daniel Peña
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only to the moment. If I didn't, I'd hit the pothole in the road, or my wheel would fall into some precarious groove. So by necessity, I became present, and I felt present, which is to say everything started to feel fun again.

This was especially true when I reached Karl Marx Allee, my favorite street in Berlin for its Soviet-style architecture and for its unusual straightness, which invites the cyclist to really hammer the pedals. Whenever I passed it, I couldn't help thinking of Jeffrey Carney, an American double agent, who must have ridden down this street, too. He was an asset for the East German Stasi and an avid Berlin cycling enthusiast himself. He exchanged American intelligence for

only a stipend of 300 deutsche mark and Oral-Turinabol, an anabolic steroid, to fuel his endless rides through Berlin. The Stasi knew that he was mostly in search of some escape, to find himself on the other side of something. After the wall fell, he was caught by American intelligence in 1991 working as a metro driver in Berlin, still cruising the streets.

Of course, you can see why. The night ride is the easiest way of seeing yourself on the other side of something. East gone west gone east. The convergence of the entire world into a set of streets. And for the span of darkness, there's the illusion that if only by bike, you might escape compass and orientation entirely. You might just go anywhere. ♦

Tip By Malia Wollan

How to Collect Firewood



“Worst-case scenario, the tree ends up falling on you, and you end up dying,” says Trennie Collins, 36, a member of the Southern Ute tribe who lives in Durango, Colo. Picking up sticks with your hands is for amateurs. To cut enough firewood to keep a house warm in winter, you need to know your way around a chain saw as Collins does; in her early 20s, she became one of the first women on her reservation certified to take trees down as a faller. When the pandemic started last spring, Collins saw how many people were struggling for basic needs like food and heat. She helped start the Four Corners Mutual Aid Network, a volunteer organization that provides all kinds of assistance, including firewood, to several southwestern Colorado counties and to the Ute Mountain Ute, Southern Ute and Navajo reservations.

“Don’t go out alone,” says Collins, who recommends collecting wood in teams of two or three. Always wear long pants and shirts, boots, ear protection and helmets. The United States Forest Service and the Bureau of Land Management allow firewood collection on many public lands with a permit for a small fee. Follow their rules on what, how and when to cut. Mostly you’ll want to take trees that are already dead. Hardwoods like oaks tend to burn hotter and longer than coniferous softwoods like pines. Don’t enter a forest willy-nilly as if you own the place. “Go with respect for the land,” Collins says.

Before firing up your chain saw, look up for what foresters call widowmakers — large branches that could fall and crush you. Never take down trees when it’s windy. Once a tree is on the ground, remove branches and slice the trunk into rounds, which you’ll load into your truck or trailer using a wheelbarrow. Chop the rounds using an ax or mechanical splitter. Swing the ax with your whole body, and always spread your legs to avoid cleaving one of your feet.

The mutual-aid group stores firewood on a nearby farm, where it hosts what Collins calls “splitting parties” of volunteers who show up with their own axes. Many of those receiving donated firewood are Indigenous elders who rely on wood for heat but cannot afford to buy it or chop their own. Gathering wood is hard work; you will be tired. For Collins, giving that wood away is deeply gratifying — a gift of warmth when the world is cold. ♦

It's All in the Pot: This ginger-spiked chicken-meatball *nabe* is best made in a *donabe*, Japan's ubiquitous clay vessel.



A *donabe* is a Japanese cooking vessel made of clay — *do* means “clay,” *nabe* means “pot.” But if you talk to Naoko Takei Moore, it’s also a way of thinking about cooking, a way of finding joy in the day-to-day of the kitchen. Takei Moore, who was born in Yokohama and grew up in Tokyo, remembers the communal-style *donabe* at the center of her family’s dining table year round, and how it drew everyone

toward it for the simmering dish known as a *nabe*, or hot pot. “The most common style when I was growing up was *yosenabe*, which means anything goes,” she said. Some nights, that meant a pot of fish and vegetables in a miso broth, or a clean-out-the-fridge pot of scraps simmered in dashi. Some nights it was tiny handmade meatballs seasoned with white miso and ginger, or big wobbly cuts of

Earthen flavor:
Chicken-meatball
hot pot.

soft tofu with whatever vegetables looked good. “I loved it, but didn’t think it was anything special,” she said.

That changed after Takei Moore immigrated to Los Angeles, where she worked in the music industry. On a visit home, Takei Moore tasted rice cooked in a traditional *donabe* again and saw it all differently. “I had a moment of crazy happiness,” she said. “I already knew

how rice cooked in a donabe could taste wonderful, but this was just so striking.” The pot seemed almost magical to her, though she knew exactly how it worked — unglazed clay, which is porous, takes time to build up heat, and the donabe’s thick walls distribute that heat gently, then cools down slowly. Like the clay pots of so many other cuisines, the pot didn’t just distribute heat differently from stainless steel and cast iron; it also imparted flavor — a certain level of sweetness, richness and possibly even some minerality from the clay itself.

“Some people want to feel happiness that’s too big,” Takei Moore said. “But for me, every day, I just look for something small.” It can be as small as cooking something delicious for herself, or even teaching someone else to cook it. Back in Los Angeles, she started to teach Japanese-cooking classes out of her home, showing people how to use a donabe, how to steam and braise with it and how to build one-pot meals in layers. She explained to each student how the clay from Japan’s Iga region was a lake bed about four million years ago, and how that clay was now used by ceramists to make the donabe she sold. Online, Takei Moore even started to go by the name Mrs. Donabe.

As demand for the pots and other Japanese cookware in Los Angeles grew, Takei Moore opened a small shop called Toiro in West Hollywood, full of clay bowls and many different styles of donabe — some brushed with stripes, some with curved lids that doubled as serving platters. For anyone not used to cooking with clay, a row of beautiful and delicate donabe can be intimidating. As the donabe is used, over and over, it gets darker and the inside fills with fine crackles, which can also make newcomers to clay cooking nervous. “The patina grows,” Takei Moore said, referring to the changes in the surface as the pot ages. “And that’s part of the donabe growing with you.” She doesn’t think chips or stains are anything to worry about. “If it still looks brand-new after a year, then you get embarrassed — it means you’re not cooking with it!”

Takei Moore cooks with a donabe daily, and even wrote a cookbook titled “Donabe” in 2015. She regularly shares new nabe recipes on her website. One of my favorites is her tsukune miso nabe,

My only donabe is an old online purchase — nothing fancy — chipped and singed and still completely reliable.

a chicken-meatball hot pot made with a mix of mushrooms, big pieces of delicate fresh tofu and tender greens, added just at the end so they wilt into the seasoned dashi. The meatballs, mixed with miso and grated raw ginger, come together in just a few minutes. And as the meatballs simmer in the dashi, they complicate it and infuse it with even more flavor. Although the recipe calls for dashi, Takei Moore says you can get away with just soaking a piece of kombu in water because the meatballs and mushrooms release so much of themselves as they cook, making the dish richer and richer as it simmers. If you don’t have a donabe, you could make it in another kind of wide, heavy-bottomed pot. Or, you could try getting an inexpensive donabe to see how you like it.

Though high-end handmade donabe can be expensive, they aren’t the only kind. My only donabe is an old online purchase — nothing fancy — chipped and singed and still completely reliable for that meatball nabe with scoops of soft tofu and a tangle of pea shoots on a rainy spring night. And as Takei Moore reminded me, earthen pots shouldn’t be set aside on a high shelf just for display, or only reserved for special occasions. “I come from donabe culture,” she said. “And over there, the donabe is really for everybody, and for every day.”

Tsukune Miso Nabe (Chicken-Meatball Hot Pot in Miso Broth)

Time: 30 minutes

For the meatballs:

- 1 pound ground chicken
- 2 scallion greens, thinly sliced
- 1 tablespoon grated ginger
- 1 tablespoon white miso
- 1 tablespoon potato starch
- ½ teaspoon fine sea salt

For the hot pot:

- 1 quart dashi
- 2 tablespoons mirin
- 3 teaspoons white tamari, or soy sauce
- ¼ cup white miso
- 8 ounces mixed mushrooms, such as shimeji, maitake and enoki, sliced or torn roughly into bite-size pieces
- 14 ounces soft or medium firm tofu, cut or scooped out into about 8 pieces
- 4 ounces spinach, pea shoots, rapini

or other tender green, cut into bite-size lengths

- 1 tablespoon roasted white sesame seeds, ground

Yuzu shichimi togarashi, to taste

1. Prepare the meatballs: In a medium bowl, combine all the ingredients for the meatballs, and knead with your hands until the mix is smooth and shiny. Cover, and refrigerate until ready to shape and cook.

2. Prepare the hot pot: Place a large donabe, Dutch oven or other heavy-bottomed pot over medium-high heat and bring the dashi to a simmer. Add the mirin and tamari. Whisk in miso: You can put the miso in a strainer and hold it directly in the broth as you whisk, so it dissolves smoothly.

3. With wet hands, shape the chicken mixture into tablespoon-size balls to make about 30 meatballs, then drop them into the simmering broth. Add the mushrooms and tofu. (If using very delicate tofu, wait and add it with the greens.)

4. Bring the broth back up to a simmer, turn the heat down to low, and cover. Simmer gently until all the ingredients are cooked through, about 10 minutes.

5. Add the greens, and cover for 1 more minute, then serve with sesame and *togarashi*.

Yield: 4 servings.

Adapted from Naoko Takei Moore. ♦

In Search of a Lost Pastime ● Major League Negro-leagues stats into its record book part of what needs to be remembered.



Major League Baseball now wants to welcome Latin American players — but the numbers are just a small fraction of the total. ● By Rowan Ricardo Phillips



Henry Aaron,

who died in January, will forever cast a long shadow over Major League Baseball. It was Aaron, of course, who broke Babe Ruth's career record of 714 home runs on April 8, 1974, on his way to finishing with 755 after 23 seasons in the majors. In that time, he drove in more runs and amassed more total bases than anyone else ever has. He ranks fourth all-time in runs created and third all-time in hits. Aficionados of the counting stats — the ones you can add to, one at a time, like hits, home runs, R.B.I.s — like to recite how you can discount all of Aaron's home runs and he would still have more than 3,000 hits. Proponents of advanced statistics turn to other measures of Aaron's greatness, such as wins above replacement: According to the essential online database Baseball Reference, if you consider that 19,902 players have played in Major League Baseball through its 150 years — I'm including the National Association, from 1871 to 1875 — Aaron scores higher than 19,895 of them.

But numbers tell only part of the story. Players will come along and surpass Aaron, statistically speaking, at least — Barry Bonds already did, with his 762 home runs (although the persistent specter of doping makes his home-run crown ring hollow). And yet, here was a player mined from the platinum ore nestled deep into the bedrock of the history of Black baseball: Aaron was the last full-time major-league ballplayer to first make his mark in the Negro leagues — and the last Negro-league ballplayer ever to start in a major-league game.

Henry Aaron is where statistics and society meet. As Aaron approached Babe Ruth's career home-run total, he received constant threats to his life as well as to the lives of his family. His journey to home run No. 715 was a miserable one for him. As he pursued Ruth's record, he was pursued by mail, much of it vicious. And that's how Aaron unexpectedly toppled yet another record, the Guinness world record for the most fan mail received in one year by a private citizen: 900,000 letters. About a third of them, Guinness notes, "were letters of hate engendered by his bettering of Babe Ruth's career record for 'home runs.'" When Babe Ruth hit his final home run, in 1935, Henry Aaron was a year old. No Black ballplayer had played in what were considered the major leagues in 51 years.

Most players live off their milestone moments, but Aaron always seemed to have simply survived his. It is chiseled into baseball lore: a classic Aaron swing at an Al Downing high fastball in the fourth inning on that warm and cloudy early-spring night in Atlanta. When officials paused the game to celebrate the historic occasion, Aaron stood before a microphone and said, "I just thank God it's all over." Who could blame him?

A month earlier, as the inevitability of breaking Ruth's record was sinking in for him and the nation, an essay by Aaron appeared in papers across the country: "The Babe is a legend now," he wrote. "He created more excitement than any player who ever lived. What I find so hard to believe is that Hank Aaron, a nobody from Mobile, Alabama, is the first player in 40 years

to challenge that home-run record. How did it come about?" Reflective sentences in the third person usually obscure or repress something. The "aw shucks" of Aaron's line rises in a bubble only to be popped by the pointed question that follows: How did it come about? The question seems rhetorical, but it is intended for us.

Back in 1952, the Boston Braves spent \$10,000 to purchase the rights to sign Aaron from the Indianapolis Clowns of the Negro American League. The Braves' general manager, John Quinn, considered the price a steal. In fact, the Negro leagues paid the steepest cost for baseball's integration. Their Black fans flocked to major-league games to catch a glimpse of the new dawn; Black newspapers likewise turned much of their attention to the fortunes of Black players in the big leagues; and major-league teams were learning through trial and error how to siphon the best talent from Negro-leagues rosters. Just two years earlier, the Braves had to pay the Montreal Royals, the Brooklyn Dodgers' top minor-league team, \$200,000 for the former Negro American League star Sam (the Jet) Jethroe, who at 33 would become the first Black player for the Braves and the 1950 National League Rookie of the Year. (He remains the oldest player ever to win the award.) Aaron, on the other hand, was signed at 18 and, after two years of terrorizing minor-league pitching, joined the Braves in the major leagues. But he would never play with the Jet, who was out of the league before Aaron hit his first big-league home run.

When Aaron made his debut with the Braves — who had moved to Milwaukee — in April 1954, Jackie Robinson was entering his eighth season in the majors, and the game was still being integrated at a slow trickle. Then suddenly, in that one month, Tom Alston became the first Black player for the St. Louis Cardinals, Curt Roberts became the first Black player for the Pittsburgh Pirates and Chuck Harmon and Nino Escalera became the first Black players for the Cincinnati Reds. But both Alston and Harmon would be out of the league after four years, Roberts after three. Escalera would play just the 1954 season. Baseball being a numbers game meant something different for Black players, most of whom broke their teams' color barrier and quickly disappeared from the game. Twenty years later, on the verge of surpassing Major League Baseball's greatest number, Aaron's essay would run under the title "I Can't Do It Alone."

Baseball was forged amid the fires of the Civil War, and segregated baseball arose from the rancidness that followed Reconstruction. "The end of the Civil War, and the apparent liberation, gave Blacks the notion that there could be mutual benefit in the existence of Black teams, if not yet in the open integration on the ball field," Mark Ribowsky writes in "A Complete History of the Negro Leagues: 1884 to 1955." As a result, a Black baseball "scene" had emerged by 1865, centered in the East. In 1867, the National Association of Base Ball Players, the sport's first governing body, enacted a resolution barring any club whose roster included players of color. For the next 50 years, Black baseball would be a tenuous, peripatetic enterprise. Giants nevertheless walked the earth: the mighty Cuban Giants, Page Fence Giants, Cuban X Giants, Columbia Giants, Leland Giants, Philadelphia Giants and Birmingham Giants were just a few of the Black professional teams that were active around the turn of the 20th century. (Some even chose names without "Giants" in them, like the French Lick Plutos.)

It was not until February 1920 that Rube Foster, whom The Chicago Tribune referred to as a "budding entrepreneur" and "booking agent," was able to breathe life into his cherished vision of a Negro National League. Under Foster, who had been an outstanding pitcher on the various circuits that popped up and also failed with great frequency across the country before the Negro leagues, the N.N.L.'s flagship teams included the Chicago Giants, Cuban Stars, Dayton Marcos, Detroit Stars, Indianapolis ABCs, Kansas City Monarchs, St. Louis Giants and his own team, the Chicago American Giants. The league flourished. By 1926, however, the imposing and influential Foster was incapacitated by mental illness, and by 1930 he was dead. Robbed of Foster's organizational acumen, and battered by the financial impacts of the Great Depression, the Negro National League folded in 1931.

● **Opening pages:** The East team of the 1936 East-West All-Star Game, a Negro-leagues exhibition game held at Comiskey Park in Chicago, included five Hall of Famers: Biz Mackey (standing, sixth from right); Josh Gibson (standing, seventh from right); Satchel Paige (standing, ninth from right); Cool Papa Bell (seated, third from left); and the manager Oscar Charleston (kneeling, far left).

Six other leagues sprang up as rivals or successors to the N.N.L.: The Eastern Colored League ran from 1923 to 1928, before part of it splintered off into the American Negro League for a single season in 1929; the East-West League started in 1932 but made it through only half a season; the Negro Southern League, considered a minor league of the Negro leagues, played the 1932 season as a major league, then disappeared in 1936; a second Negro National League fared far better, lasting from 1933 until 1948; and the Negro American League, home of Henry Aaron's Indianapolis Clowns, began in 1937 and stayed afloat until 1962. (A version of the Clowns, as much a comedy troupe as baseball team by the end, played exhibition games into the 1980s.) These seven leagues constituted the Negro leagues.

Last December, just five weeks before Aaron's death, Major League Baseball released a statement intended to change both the history and the future of the game. It began: "Commissioner of Baseball Robert D. Manfred Jr. announced today that Major League Baseball is correcting a longtime oversight in the game's history by officially elevating the Negro leagues to 'Major League' status." The Negro leagues had never been recognized by Major League Baseball as a minor league, let alone a major league. They were cultivated in what little space Major League Baseball allowed them to exist, separate and profoundly unequal. And in calling this injustice "a longtime oversight," Major League Baseball is wading, rather gently, into the historical mess it has made of the game it champions and represents but does not and will not ever own all to itself.

The potential impact of Major League Baseball's decision is as if the International Astronomical Union had, in 2006, upgraded a number of celestial bodies around Pluto to planets instead of downgrading Pluto to a dwarf planet, leaving us suddenly with several more planets in our solar system and new names to put to heart — Ceres, Eris, Makemake, Haumea. Life's day-to-day would have gone on seemingly unchanged, but the very scope of where we begin and where we end — the boundaries and populace of our imagined community, and the scope of our dreams — would have certainly changed. A planet, of course, is not a statistic, and baseball is not astronomy. Nevertheless, the prospect of seeing the Homestead Grays legend Josh Gibson — regarded in his day as "the Black Babe Ruth" (though Black fans often called Ruth "the white Josh Gibson") — at the top of the list of single-season records for batting average with a .441 in 1943 brings to mind Copernicus's eventually winning the argument that the sun is indeed at the center of our solar system. From now on, it might be Gibson and not Ted Williams — who hit .406 in 1941 — who will be regarded as the last major-league player to have hit better than .400 in a season. Gibson's mind-blowing average would also go down as the highest single-season batting average, outpacing Hugh Duffy's .440 in 1894, when professional baseball was in its seventh year of strictly, although silently, enforced segregation.

Consider other additions to the record books, like Leon Day, who threw a no-hitter on opening day 1946 for the Newark Eagles. Previously, only Bob Feller managed that feat in the major leagues, with his opening-day no-hitter for Cleveland in 1940. The effects of these shifts in the annals of achievement will have a long-term effect on the game's history. I remember learning about baseball history when current players neared historical marks: George Brett's and Tony Gwynn's coming close to .400 brought up constant references to Williams's .406. Now these records will put players and teams from the Negro leagues in the thoughts and words of many more people.

"That is the intention of what we are working on," says Pat Courtney, head of communications for Major League Baseball. "If a graph were to pop up saying that 'Pitcher X is the first to do Y since Pitcher Z back in 1930,' the goal is to include Negro-leagues stats and game records," Courtney said, referring to an imagined moment during a broadcast when an announcer might ask, for example, which major-league pitcher threw a no-hitter on opening day. "At some point in the coming months, we will be able to answer, 'Bob Feller in 1940 and Leon Day in 1946.'"

A small step toward not forgetting. But is it enough? "It doesn't change history," Gary Ashwill told me in an email. Ashwill is a baseball historian and co-founded the Seamheads Negro Leagues Database, which Major

● Henry Aaron waiting for the train in Mobile, Ala., in 1952, en route to Winston-Salem, N.C., to meet up with his first professional team, the Indianapolis Clowns of the Negro American League.



League Baseball cited as a prime factor in its decision to incorporate Negro-leagues records. "But it might change current perceptions of history, by directing attention to players and teams and leagues that were much easier to ignore before."

At the height of the Negro leagues, despite the constant challenge of keeping them in operation, the quality of play was extraordinary. That Josh Gibson, Cool Papa Bell, a young Satchel Paige and so many others were barred from playing official major-league games against major-league talent — and also barred from equal wages, barred from full public recognition, barred from earning a pension from Major League Baseball — is a great tragedy for the sport itself. And the current plan announced by Major League Baseball to account for this comes with a severe stipulation: The league intends to incorporate regular-season Negro-leagues statistics from box scores and game reports for only the years from 1920 to 1948. In the estimation of Major League Baseball, teams before 1920 primarily played in exhibition games and barnstorming tours, where the quality was below that of Major League Baseball. And yet, a number of those players are in the National Baseball Hall of Fame.

Are we separating 29 years of Black baseball from its 100 years of history just because some box scores are available? "This may sound strange coming from someone who compiles statistics," Ashwill said. "I actually think people are focusing too much on the numbers. To me the important element of M.L.B.'s decision is the recognition of Black players, teams and leagues as equals." He went on: "There's no doubt that from the 1880s to 1919, many of the best baseball players in the world — John Henry Lloyd, Pete Hill, Rube Foster, Joe Williams, Dick Redding, Grant Johnson — played for Black independent teams. I'd say recognition is due to them as well."

Black baseball before 1920 and after 1948 remains outside the Major League Baseball realm for now. (As do — another missed opportunity — the pioneering women who played in the Negro leagues, like Toni Stone, Mamie Johnson and Connie Morgan.) A part of me wonders if Major League Baseball would have given more thought to including Negro-leagues stats after 1948 if Henry Aaron had hit eight home runs for the Clowns instead of five — because those extra eight home runs would have put him back ahead

● Cool Papa Bell, with the St. Louis Stars in the 1920s. Bell is considered to be one of the fastest players to ever play the game.



of the controversial and thus far Hall-of-Fame-denied Bonds. But that way a world of archival entropy lies.

Baseball operates on a steady diet of fact and folklore. Josh Gibson may have hit almost 800 home runs in league and independent baseball during his 17-year career — it says so on his Hall of Fame plaque. Research into Gibson's career home run totals is ongoing, but Baseball Reference thus far has him at 113; Seamheads says 239. Who knows what will become of all those other hundreds of home runs that lived in the hearts and minds of fans of the Negro leagues? There are no plans at present to change his plaque, nor should there be. Folklore needs fact to ground it, but fact needs folklore to thrive. It bears repeating: Baseball numbers never give us the full story. As Tom Shieber, senior curator of the National Baseball Hall of Fame, told me, statistics form part of the whole, but not the how and the why of it. Given the infrastructural inequalities at play, any rush to compare Negro-leagues stats to non-Negro-leagues stats seems willfully ahistoric. Shieber, for example, argues that some of these infrastructural inequalities — borderline unplayable fields, for example, or poor night lighting — could affect player performance in ways that are impossible for statistics to quantify for Negro-leagues players.

And what to do with the numbers when the numbers themselves are not necessarily even the numbers? Did Gibson hit .441 in 1943? Or did he hit even higher: .466? The lower batting average includes all-star and postseason appearances, which are not included in Major League Baseball's regular-season statistics. Embracing new data means more work is to be done by baseball researchers and historians. Ashwill told me he and his colleagues at Seamheads have box scores for 72.45 percent of known Negro-leagues games from 1920 to 1948. "We will likely nudge this number up, but it's quite unlikely we will ever get very close to 100 percent," he added. "Newspapers simply did not publish box scores for every game, and league records were either not kept or no longer exist."

As we wait for these Negro-leagues numbers to be adjudicated, what we have from Major League Baseball are its words, and the very first words of the league's statement are reason to feel concerned that Major League Baseball is still stuck in its ways. Who thought it was a good idea to announce that after half a century of segregating and sabotaging Black baseball players in

● Josh Gibson, with the Pittsburgh Crawfords in the 1930s. Gibson's career batting average and home runs are among the highest in baseball history.



the United States, the organization was now "elevating" the Negro leagues? The implications that the Negro leagues were beneath Major League Baseball are obvious and tired, and they certainly did not escape notice, especially by the families of the former players, most of whom are dead. Should their families say thank you? Courtney could not recall how the language of the statement came to be in there, but he admitted that he realized quickly there was a messaging problem. "I don't know if that was universally felt," Courtney told me, "but I do know that there were particular people that felt that way."

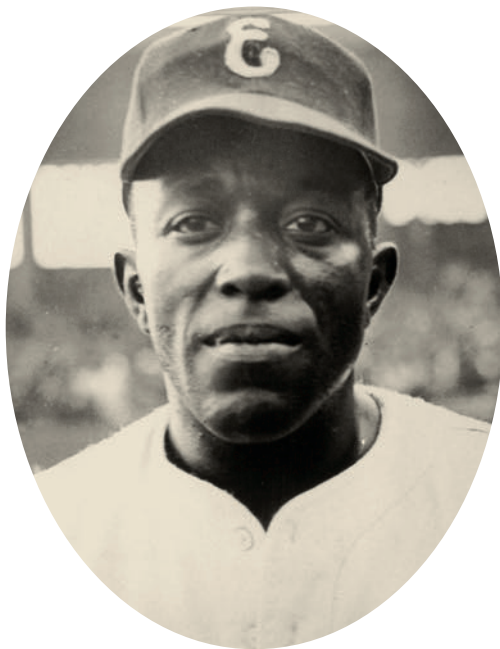
"I think that a lot of people find this disturbing," Shieber told me. And with good reason. Research by Todd Peterson, who edited "The Negro Leagues Were Major Leagues," has found that between 1900 and 1948, Black baseball teams played against "intact major-league outfits, as well as games against all-star aggregations," 617 times, posting a record of 315 wins, 282 losses and 20 ties — a winning percentage of .527. These games, however, like so many games played by Negro-leaguers, were not official.

During segregation, white baseball was commonly referred to as "organized baseball." What is elevated to Major League Baseball status may now be not only a matter of race but also a matter of reliable archival material. "'Disorganized' is looking at it through the lens of M.L.B.," Shieber said, as we spent part of our Zoom call looking over old photos and box scores of Cuban Giants games against Wesleyan College's varsity team from the 1890s. "That's not a knock against M.L.B.," he added. "It's a knock against discrimination." He paused and thought quietly for a moment. "We at the museum really need help telling this story," he continued. "There's just no way of getting around that."

"There was no written rule barring Negroes from organized baseball," Robert W. Peterson writes in his 1970 book, "Only the Ball Was White: A History of Legendary Black Players and All-Black Professional Teams." And yet, he wonders, if that was the case, what caused managers like John McGraw and Connie Mack to suddenly get cold feet when they were on the cusp of signing Black players? There was nothing in the rule books against doing so. "Presumably," Peterson writes, "the answers lie in the attitudes of the other major-league operators."

And those attitudes were largely upheld in silence, powered by stale rationalizations that still exist today in order to justify the past: namely, that enfranchising Black people would make some white people upset;

● Leon Day, with the Newark Eagles. Day is one of only two professional pitchers to throw a no-hitter on opening day, in 1946.



that an integrated team traveling across segregated America would create logistical nightmares for all involved; and that the players who would be enfranchised lacked the skills required to make such efforts worth all of the upheaval — all of which, if it needs to be said, was overwhelmingly untrue. “Unspoken, but underlying all the stated objections,” Peterson concludes, “was the most compelling reason of all: baseball tradition.”

In a 1942 news release, for example, Kenesaw Mountain Landis, the stringent commissioner of Major League Baseball from 1920 until his death in 1944, declared: “There is no rule against major clubs hiring Negro baseball players. I have come to the conclusion it is time for me to explain myself on this important issue. Negroes are not barred from organized baseball by the commissioner and have never been since the 21 years I have served. There is no rule in organized baseball prohibiting their participation to my knowledge.” Major League Baseball’s “longtime oversight” was actually a longstanding blindness inflicted upon itself. When Oedipus finally discovered the horrible truths in front of him, truths he had been hiding from, he blinded himself by stabbing his eyes with golden brooches.

Major League Baseball’s capacity and penchant for self-harm has always been astounding. Barring many of the best players of the game for well over half a century simply because of the color of their skin is but the most egregious example. “Organized baseball was steeped — perhaps a better word would be ‘pickled’ — in tradition,” according to Peterson. “Since there had not been a Negro in the organized leagues in the memory of most baseball men, it must be part of God’s plan that there should be none.” And if things in Major League Baseball were segregated from top to bottom, because of God’s plan, that meant that the tradition of segregation and the history that arose from it were out of everyone’s hands.

I have lived in Williamstown, Mass., for the better part of a year now and have gotten to know it well — as well as one can know a place in the middle of a plague. As with most New England college towns, Williams College’s campus bejewels the Main Street with its manicured quad and latticework of stone and brick buildings.

A quaint one-way street where you’ll find most of the shops in the center of town runs perpendicular to Main Street. This is Spring Street. You know Spring

● Satchel Paige, with the Kansas City Monarchs in 1942. Paige’s wins in the Negro leagues may soon be added to the M.L.B. history books.



Street: There’s the place to buy Thai or Indian or Mexican or Mediterranean, there’s the wine store where Jason greets you by name, there’s the post office, the ice cream place, an independent bookstore and a corporate chain, a yoga studio, a cinema. If you were to stand under its marquee and roll a baseball southward down Spring Street’s slight slope, in no time it would arrive at a plaque fastened to a stone in the ground. This plaque honors Frank Grant, who was elected to the Baseball Hall of Fame in 2006. The stone represents where he once lived, when he and his family moved to town from nearby Pittsfield.

“Frank Grant, born in Pittsfield in 1865, was regarded by many of his contemporaries as the greatest African-American baseball player of the 19th century. He moved to Williamstown in 1871, where he lived with his family on Spring Street. Playing primarily second base, Grant played first with integrated minor-league teams before playing a decade with top Negro-league teams. His reputation as a premier versatile player with speed and a powerful bat was recognized with his induction into the Baseball Hall of Fame in 2006. Mr. Grant died in New York City on May 27, 1937.”

Grant was born Ulysses Franklin Grant, in Pittsfield, Mass., on Aug. 1, 1865. His given name was an inheritance of the Civil War, as was his love of baseball. The game was already popular in the 1860s and became a mainstay activity for idle troops, prisoners of war and free Black Americans. Although the historical material on Black players in baseball at the time is spotty, Robert Peterson’s research found that by 1867 teams were “sufficiently well organized, at least in the North, to have challenge matches for supremacy.” That same year, the National Association of Base Ball Players was concerned enough with the question of the possible effects emancipation might have on the game that it took the clarifying step at its annual convention — attended by representatives from 237 teams — of voting unanimously to bar individual Black players as well as any Black baseball clubs from membership, and to expel any club with a Black player on its roster. “Beadle’s Dime Base Ball Player,” one of the earliest baseball guides, subsequently summarized the benign intention of the N.A.B.B.P. in the spirit of racial gaslighting later put to use by Landis by helpfully pointing out to its readers that the organization’s goal behind this ban was merely “to keep out of the Convention the discussion of any subjects having a political bearing, as this undoubtedly had.”

This was the world of “organized baseball” — a term that would come into vogue at the height of the Negro leagues to simply

(Continued on Page 45)



KYLIE COSMETICS
Matte Liquid Lipstick >>



RARE BEAUTY
Soft Pinch
Liquid Blush >>

HONEST BEAUTY
Crème Cheek Blush >>



FENTY BEAUTY
Sun Stalk'r Instant
Warmth Bronzer >>



HONEST BEAUTY
Invisible Blurring
Loose Powder >>



ITEM BEAUTY
Air Hug Concealer >>



RARE BEAUTY
Stay Vulnerable
Melting Blush >>



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HONEST BEAUTY
Liquid Eyeliner >>



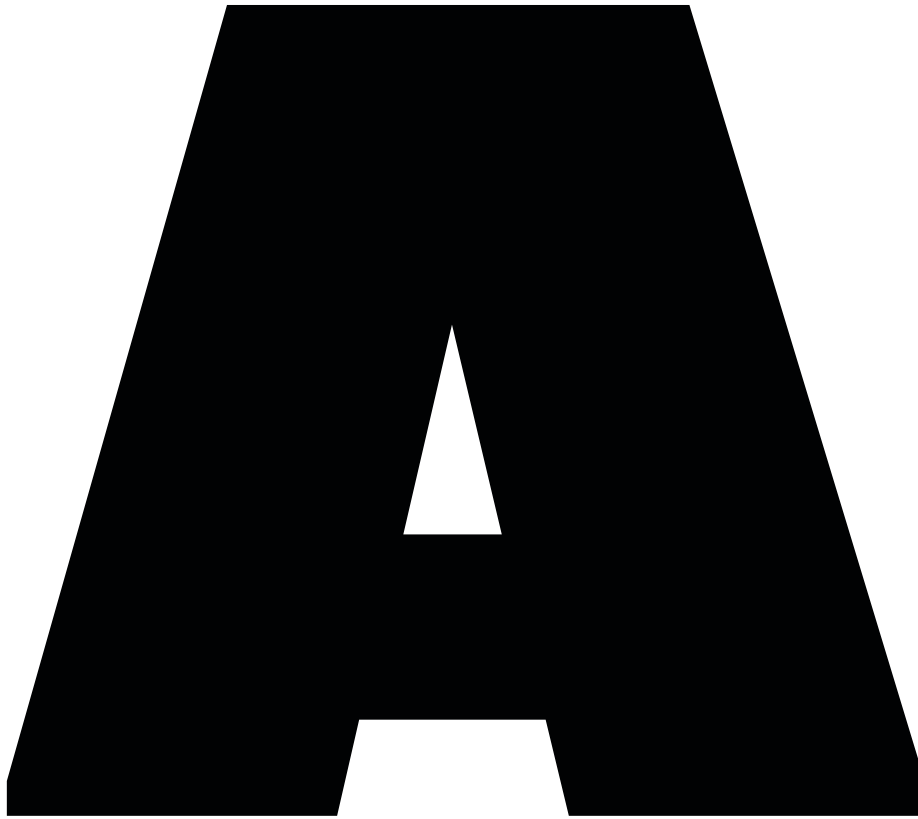
ITEM BEAUTY
Lash Snack Lengthening
Mascara >>



KYLIE COSMETICS
Blush >>



FENTY BEAUTY
Match Stix Contour
Skinstick >>



little over a year ago, Addison Rae Easterling rode down the boulevards of Beverly Hills in an Uber to meet with Marcelo Camberos, the chief executive officer of Ipsy, the largest beauty subscription service in the United States. Ipsy, named after an intensive pronoun in Latin, *ipse*, sells small “glam bags” of beauty companies’ products like, say, cheek highlighter in a shade of tiramisù. For \$12 and up a month, the company mails those bags to millions of subscribers, many of whom listen to advice from Ipsy’s vast network of vloggers, influencers and stylists. Now, in a new venture called Madeby Collective, the company hoped to manufacture and develop entirely new lines of makeup on its own. What Ipsy needed was a face to help them sell it.

Easterling, 20, professionally known by only her first two names, seemed like an ideal candidate. In 2019, she was a college freshman dejected over not making the Louisiana State University pep squad and had been filming videos of herself doing slithery hip-hop dances that call to mind Max Headroom as a belly dancer. In a surreal turn of events appropriate for our times, cheerleader-ish girls dancing just this way to rap music was the height of entertainment during the pandemic, whether enjoyed genuinely or for laughs. Soon Easterling, or Rae, became the second-most-popular human being on TikTok, Gen-Z’s social media platform of choice. (The most popular, Charli D’Amelio, was also a slithery dancer, this time from Connecticut.) Rae estimated that she had about three million followers on

TikTok when she met Camberos, but within a year she amassed 73 million — a population larger than that of the United Kingdom.

Now Rae found herself in a strange and modern predicament: She had become very famous and needed to get paid for it. Rae would start selling merch, making T-shirts with the phrase “I’m a Bad Bleep,” a reference to a viral song by Australian rapper The Kid Laroi (“I need a bad bitch/Addison Rae”), but continuing down that road, the typical influencer-hawking-vitamins-for-your-hair route, may have seemed too small. So Rae followed a new path, recently forged by many social media stars and A-list celebrities (two quantities that seem as if they will eventually merge) like Rihanna, Kim Kardashian, Kylie Jenner, Jennifer Lopez, Lady Gaga and others who come to mind when you imagine a mistress of the universe beaming her wants and desires at Earth like lasers. She wanted to start her own beauty brand.

At her meeting in Beverly Hills, which took place at Rae’s agent’s office, Camberos pulled out some makeup testers he had brought along: lip gloss, rouge, powder. She turned them over in her palms, considered their colors. Afterward, Rae agreed not to the usual sponsored-content deal of posting thrilled accolades about the products on her social media feeds, nor the 1990s perfume deals in which celebrities branded fragrances with their own names, but rather to putting out her first makeup and skin-care line with Madeby Collective as a co-founder. They called the line

Item Beauty, a reference to the way that two people who are in a state of romantic swoon are an “item,” which you would assume meant Rae herself, the icon, and a fan, who would seek to align herself with Rae. But when we spoke, she offered a different meaning. “Me and my makeup are a pair,” she told me. “We’re working together, and we’re together.” In other words, the commercial relationship was the primary one.

Rae’s deal with Ipsy was but a small part of a major shift in the beauty industry, which is nowhere more complex, and profitable, than the United States. People with clout, from celebrities to social media stars to lifestyle influencers, are changing the way the sell works, exploiting the intimate relationships they have with their fans in a way that wasn’t possible before in the industry. And while most of their profits aren’t close to comparable to established brands, at the moment, beauty is big business: Americans have long spent more in aggregate on beauty and personal care than any country in the world, about \$92.8 billion in 2019, according to Euromonitor, a consumer-research company. Though revenues dipped during quarantine, over all, global consumers have close to doubled their spending in the past 15 years, as prices of products have risen and beauty has entered a phase of total pop-culture domination, on par with hip-hop and gaming.

As with gaming, it’s the interactivity of the web, particularly YouTube (the fun of following along with tutorials about how to contour eyes to make them appear larger, for example) and Instagram (where you boastfully show off your face’s final look) that has made beauty’s pop-culture gambit such a success. TikTok, rapidly becoming a dominant force in media, was equally fertile ground. “Makeup does well in any type of video format where you see transformation, a before and after,” says Michelle Lee, editor in chief of Allure. Trends bubble up on TikTok now, and then we’re talking about them in the real world, on TV, on websites. “When I was growing up, I would watch Nickelodeon and think, I need this slime, and now TikTok is taking that place, where kids look to see ‘What are these cool people doing, what are they wearing,’” Chloe Hall, the digital beauty director of Elle, says. “Some of the best beauty personalities on TikTok right now are 14-year-olds in their basement. It’s wild.”

As beauty has become a pop phenomenon, a radical change in the perception of the cosmetics business has also taken place. When Naomi Wolf wrote “The Beauty Myth” more than three decades ago, she chastened the industry for pushing an unrealistic standard of beauty that prevented women from reaching their full potential, much as ideals of domesticity, motherhood and chastity once did. She compared the process of making yourself conventionally attractive to

'IT'S BRAINSTORMING THE ENTIRE TIME, WHICH IS SO FUN. AND I HAVE THE CRAZIEST IDEAS SO RANDOMLY.'



ITEM BEAUTY
Lip Quip Moisturizing
Lip Oil >>



ITEM BEAUTY
Cheek Money Swipe & Glow
bronzer contour duo >>

a work shift, or the “third shift” (the other shifts being your professional life and care

of the household). But in our new virtual society, the same beauty industry that was once maligned has been embraced as a universal good. Beauty companies are lauded for providing us with tools of self-expression and celebrating the human desire to adorn the face using something other than the tricks of social media (filters, lighting, Facetune). And many individuals and companies within the industry have capitalized on this impression. Applying cosmetics is a worthy lifestyle choice characterized as self-love, self-care and wellness — all positive, healthful qualities, even if you have the sneaking suspicion that “wellness” is mostly a coded word for the pursuit of being skinny and pretty, or tamping down anxiety about not being skinny and pretty.

Though I am the type of person who spends as much time trying to avoid myself in the mirror as I do looking in it, I should admit that before hopping on a video call with Rae this fall, I spent quite a bit of time prepping my own face. I’ve worn makeup nearly every time I’ve appeared in public since about her age, though my regimen was never terribly time-consuming. You could have reasonably expected that Covid-era sequestration would dampen the attention

that we pay to our looks, but Zoom meetings, FaceTime family chats and awkward video cocktail hours have brought many of us closer to the sight of our own faces, and I’ve found myself confronted by pores and blemishes that I would have preferred weren’t viewed by others in high definition. We seem to be among the first people in history to be both in the midst of a global pandemic and also obliged to project an attractive image of ourselves to the outside world.

On the day of our call, smoke from nearby fires in Los Angeles, where Rae lives, was obscuring the blue sky. Despite the environmental chaos taking place outside her window, Rae, who was sitting in a bedroom with blindingly white walls at her parents’ house, was poised and spunky. She wiggled a little in her seat, just enough for me to spy a neatly made bed behind her decorated with a pillow that read Team Addison. Despite the cumbersome technology, her deep brown, saucer-size eyes seemed to draw me right into her soul, a prerequisite for success when trying to make it in the transactional world of beauty, where such intimacy is the currency of the day.

Rae’s voice was soft and breathy. Her gold hoop earrings bounced a little as she gestured with her hands. It’s very 21st century to dream of

coming to Hollywood and making it as a beauty mogul. Did Rae always imagine this? “Yeah,” she said. “I feel like for every girl, it’s a dream.”

UNTIL THE LATE 19TH century, according to Geoffrey Jones’s 2010 book, “Beauty Imagined,” the beauty business was a mostly local enterprise where pamphleteers sold advice and pots of rouge. But then factories began spitting out tubes of lipstick en masse, and the availability of portrait photography became widespread, which inspired some to change their appearance. Some beauty brands that began in the 1920s are still around in some form, often under the names adopted by their eccentric founders. Many didn’t use their birth names or real stories. Estée Lauder was born Josephine Esther Mentzer in Corona, Queens. Helena Rubinstein was born Chaja Rubinstein in Poland in 1872; after refusing an arranged marriage, she emigrated to Australia and began selling a cream that she claimed had been formulated from herbs in the Carpathian Mountains. Max Factor was born Maksymilian Faktorowicz in Lodz, then part of Russia, and became the cosmetician for the Imperial Russian Grand Opera before leaving for America. Elizabeth Arden, born Florence Nightingale Graham outside Toronto, opened salons across the world; married a man who had a doubtful royal title; and famously had her

horses' legs rubbed down with her Eight Hour Cream.

For about a hundred years, some of the companies started by these founders earned many millions. Legacy brands are doing well globally, especially in China, where people are now addicted to American beauty brands. According to the NPD Group, a market-research company, sales volume in China of prestige beauty products, a category that includes brands like MAC and Nars, now exceeds that in the U.S. But this entrenched structure of large corporations is now far from the only way to create beauty products. And those who have worked in big beauty for decades are trying their hand at independence. (Bobbi Brown, the face of corporate beauty takeovers when Estée Lauder bought her brand in the 1990s, said that she wore a necklace bearing the date that her non-compete clause expired before beginning a beauty line of her own, Jones Road.) “Some big brands aren’t innovating and they aren’t growing,” says Linda Bolton Weiser, an industry analyst at D.A. Davidson. “Have you looked at CoverGirl packaging recently? It looks like it’s from the 1970s.”

As the business becomes atomized and we spend more time at home scrolling skin-care ads on Instagram, the role of retail has a murkier future. Brands have traditionally drawn business from customers browsing in actual stores. If you’ve ever been to a Sephora on a pre-pandemic Friday night, you know it can be a party in there, with 9-to-5-ers blowing off steam by sticking their fingers in fomites of lip-gloss jars, then hitting happy hour nearby. The bulk of sales, pre-Covid, was still coming from retail. But in 2020, according to the NPD Group, prestige beauty brands declined 19 percent, while direct retailers of consumer cosmetics fell only 4 percent. “What Covid did, in my view, is speed up the whole process by three to five years of retailers that were frail and now are collapsing,” Jeffrey Ten, a beauty-brand consultant, said. The beneficiaries, he said, were e-commerce companies, big-box retailers and Amazon.

In many ways, the business today resembles the original beauty business of a century ago, when showy salespeople with innovations — or at least what they claimed were innovations — dominated. “Fashion’s always been where the romance is and where the glamour is,” says Sarah Brown, a brand adviser and a former beauty director of *Vogue*. “But now for people who want to be stars, who want to be C.E.O.s, who want to be wealthy, start a business, sell a business — they want to be in beauty.” (There may currently be too many of these people. Lee, of Allure, told me that she regarded the current proliferation of entrepreneurs as a bubble.)

The primary innovations, now, are less technological than cultural. And many of these changes are far overdue. The beauty industry has long exhibited devotion in its advertisements to what



was once seen as the blond, blue-eyed American ideal, with the occasional woman of color thrown in (Eva Longoria). Fracturing this hegemony required someone extraordinary from outside the system to exert pressure on gatekeepers, and by that I mean Rihanna.

In 2017, when Rihanna and LVMH started the makeup line Fenty (Rihanna’s surname), she pushed the concept of creating foundations that actually matched the color of your skin. This was something beauty conglomerates had the practical capacity to do for decades but often didn’t, choosing instead to make women like me, with dark olive skin, paint from the same palette as Caucasians from Northern Europe.

And if you were Black? Conglomerates did not make a line expressly for Black women until 2006, when CoverGirl introduced Queen, with Queen Latifah. “You could walk into a drugstore and get products that were quote unquote tailored for you,” says Amanda Johnson, co-founder of Mented, an indie lipstick brand that focuses on women of color. “But without proper focus and investment, you ended up with products that were somewhat subpar.”

Today many companies are celebrating the true spectrum of American skin tones, and many new beauty stars don’t have a traditional blonde, blue-eyed look. Those who don’t hew to the former ideal are increasingly highlighted, like Pat

McGrath, the 51-year-old British Black makeup star who developed Giorgio Armani's beauty line in the 1990s before introducing her own, Pat McGrath Labs. (This year, she became the first makeup artist to be appointed a dame of the British Empire.) We are being fed different images in advertisements than we were only a few years ago: We see some plus-size models, trans models and a supermodel with vitiligo, Winnie Harlow. Ipsy has even incorporated this change into its nomenclature; after I interviewed Rae, it acquired another company and formed a larger entity, BFA Industries, short for Beauty for All.

Consumers have been behind some of these changes; when they don't see their identities included in brands, they demand representation or will spend their money elsewhere. Powerful voices, too, are trying to maintain momentum toward more diversity. "I'm fearful it's a trend, or a moment, and so I think we need to hold their feet to the fire and make sure we change the composition of the executive boards," Hall, Elle's digital beauty director, says.

Though a majority of influencers paid to represent brands these days resemble Rae — and tend to command higher fees than their Black counterparts, according to Bloomberg Businessweek — their primary occupation is speaking a fan's language and drawing them close, becoming both friend and muse. They are the beauty industry's de facto mouthpieces now. They, too, speak the language of wellness and seem to share the same elevated morals (or the elevated morals we project on them). The relationship a celebrity can have with a fan is far more elaborate than the one between a brand and a customer, even though, at its core, those relationships are the same.

THOUGH RAE DREAMED of becoming a beauty mogul when she was younger, it was hard to imagine how this was going to happen. Rae's mother was 21 when Rae was born and split with Rae's father shortly thereafter. Mother and daughter lived in towns including Lafayette, La., while her mother tried to make a go of consignment boutiques named Déjà Vu and Cha Cha Charms. Her father was in and out of the picture, though both parents now appear in the background of Rae's 15-second TikTok videos as a happy family.

Rae made sure to build her unvarnished cheer into her beauty line, collaborating on piquant names for her products, like Cheek Money for bronzer, Lip Quip for lip gloss and Lash Snack for mascara. "My team and I do tons of calls, almost every other week," she told me. "It's brainstorming the entire time, which is so fun. And I have the craziest ideas so randomly. So it consists very much of me randomly having an outburst of an idea and then the team making it come to life, which is really, really cool." One thing Rae

was adamant about was that she wanted Item's products to fit into a small bag, because she likes her makeup to be easy to carry. The first time she flew with her mother to Los Angeles, when she was 16, long before she became a famous TikToker — before TikTok even existed — the first thing they did at the car-rental agency was rush to the bathroom to put on makeup (lip liner, for Rae, was key) in case they saw anyone famous or anyone famous saw them or they were somehow otherwise discovered to be the stars that they were fated to be.

Rae seemed genuinely excited about Item's line, but she didn't seem able to get into specifics about producing it and did not comment on her financial arrangement with Ipsy, which might be far smaller than her title of co-founder implies. In fact, most stars who were now saying they "have" new beauty brands were benefiting from a fine semantic distinction: They weren't actually making the formulas or managing production, meaning dealing with research and development and manufacturers and shipping. Manufacturers like Seed, in Oxnard, Calif., were doing most of the work, and partnering with stars to put their names on products. Although these "white label" manufacturers have come into the light a bit, they have traditionally been averse to publicity, says Linda Wells, who was the editor in chief of Allure for 25 years. When I reached out to Seed, their press contact was so difficult to find that I was passed among various people, including one whose email signature said she was a dog mom obsessed with crème eye shadow. They declined to be interviewed.

These manufacturers, according to Raina Penchansky, head of the influencer marketing company Digital Brand Architects, are playing an increasingly important role in the new beauty ecosystem, particularly where influencers are concerned. "There used to be straight licensing deals, where a company gets to use someone's name for a combination of a design fee, a percentage of sales, a royalty and sometimes a minimum guarantee — that was the traditional, old-school way," Penchansky said. "But now a lot of manufacturers, especially in California, are going to an influencer and saying: 'We're going to launch this brand together. We're the back-end manufacturer, and we own, say, between 80 and 50 percent of the brand, and you own the other piece of it. And when it sells, we get an exit.'"

For Item, what was perhaps more important than Rae's actually making the line was her relationship with other social media stars and influencers. Networking has been a key part of the business for at least a decade. In 2011, Michelle Phan, considered the first beauty influencer, co-founded Ipsy, then called MyGlam. Phan pioneered the YouTube beauty tutorial — a blockbuster feat. A calm Floridian, she made dreamy

videos about the importance of using your ring finger to apply under-eye concealer, sometimes with cameos from her cat, or shared her beauty rules in a soft voice over spalike piano music, like the fact that you must fill in eyebrows with a color three shades lighter than your hair color.


Rae missed Phan's heyday, but she absorbed the generation of YouTubers that came afterward. From age 12, she began developing a talent for applying her own makeup with a steady hand and good sense of color. She had her favorite influencers, including the glamorous male makeup figure James Charles and the trans woman Nikkie de Jager. "These influencers let you in on their beauty secrets — it seemed like something they hadn't shared before, and they provided a level of intimacy, or at least alleged intimacy," Kathleen Hou, beauty director of The Cut, says. "Then it's like being a fan of an indie band, and they used to play at your local bar. You keep watching as they become more and more popular."

Having developed fan bases in the millions, some influencers exerted extraordinary power by positioning themselves as beauty critics. A social media star like Rae, hoping to make it in the beauty business, would normally have had to spend an inordinate amount of time deferring to them (sending gift bags, upbeat D.M.s, bartered mentions and perhaps cash). But Rae's 73 million followers had sort of fallen out of the sky, and it seemed her clout was equal to or exceeded theirs.


So to promote Item, Rae generated TikTok videos of herself looking cute in a new lip gloss while sashaying around to a rap song — basically what she was doing before she had her own lip gloss to sell. In one photo for Item, she bit on a tube of makeup while winking, and in a video, she faux-slept in a bed with a made up face, then pretended to wake up and immediately spray her face with setting mist, a liquid spray with water and alcohol that stops makeup from wearing off.

What I found less of in Rae's feed were videos demonstrating the doubtlessly painstaking labor that went into achieving her look. This was curious, because YouTube makeup tutorials have become central to beauty culture. You could call them the Us magazine of our era, a way of demonstrating "Stars: They're just like us." During the videos, stars not only seem to be taking their beauty regimens extremely seriously, but they'll school you in the reasons you should, too. Jessica Alba, the actor turned head of the Honest Company, the organic baby-and-beauty-product behemoth (and one of many newer beauty stars who is Latina), recently made a video in which she walked the viewer through her day-to-night beauty routine, capped with a smoky eye. "As a woman in the world, trying to do the things, get your hustle on, wearing all the hats, I think it's important that we take the time to take care of ourselves," Alba says, staring earnestly into her

'SOME OF THE BEST BEAUTY PERSONALITIES ON TIKTOK RIGHT NOW ARE 14-YEAR-OLDS IN THEIR BASEMENT. IT'S WILD.'

RARE BEAUTY
Stay Vulnerable Glossy
Lip Balm >> 



RARE BEAUTY
Positive Light Liquid
Luminizer >> 



camera. "It's important. And don't let anyone take that away from you."

For Alba, a skin-care routine seemed to be a genuine act of empowerment, a radical way of reclaiming the right to take time for yourself. It's the same effective rhetoric that has fanned out from Gwyneth Paltrow's Goop to sell mascara, Botox, expensive exercise classes and other products that are considered a path to "me time" and "living your best life." But Rae was selling her fans a different dream: the dream of an ordinary girl who finds herself, quite surprisingly, swept up in the world of glamour. She didn't need to issue proclamations about how hard it was to find the time to make herself look pretty. When Rae started becoming famous, she had the "no-makeup makeup" look of a lot of young women, where the objective is to cover up any irregularities and enhance the natural pigment of lips but not go wild with glitter and blue eye shadow. And her ideology about cosmetics, if you could identify such a thing, was in line with this look.

But this winter, as Rae's TikTok followers grew to more than 78 million from 70 million, I noticed that something was different about her videos. She had started promoting all manner of stuff, including Coca-Cola (which paid her to sip from a

retro-style bottle while emitting a satisfied sigh), and shot a Miramax film (a gender-role-reversed remake of "She's All That," in which she played a character who turns an unpopular boy into a prom king). She released a single, "Obsessed," a female empowerment anthem about becoming obsessed with yourself. And more and more, she was wearing heavy makeup (and possibly using filters) in nearly all her videos. I almost couldn't see the person beneath it, and I wondered whom she was trying to look like. Putting on cosmetics is a highly mimetic activity: In your mind's eye, when you're looking at yourself in the mirror, you're keeping in mind an idol as much as you're creating a better version of yourself. You may not be Snow White's evil stepmother demanding to know who is more beautiful, but you are engaging in a sort of fortunetelling and imaginative scrying. You're envisioning who you will be in the future when you have polished your look and what that suddenly more glorious moment may hold.

As I watched Rae make love to the camera, the woman who popped into my mind was the one whom so many in Rae's generation were influenced by: Kylie Jenner. Every era has its aesthetic signifiers — the tiny rosebud lips of

Clara Bow in the 1920s, the gapped-toothed look of Lauren Hutton in the 1960s, the hooded eyes and straight brows of Cheryl Tiegs in the late 1970s. Kylie was ours.

A YEAR AGO, Rae went on a YouTube *mukbang* (a type of video popularized in Korea featuring people eating food but now typically referring to videos in which social media stars eat, talk and promote). After the makeup artist James Charles tended to her face, Rae said she wanted to do a "collab" with Kylie. "Hit me up, Kylie," she purred. There is no evidence that Kylie took the hint; instead, Rae became tight with Kourtney Kardashian, the sister who tends to get less screen time. Kourtney connected with Rae last year after Kourtney's preteen son asked if he could meet her: For kids that age, who don't intersect with the world of cosmetics, Rae was just a tween pop idol. The women apparently hit it off. Kourtney, 41, and Rae, 20, have spent time being videotaped for the internet. They work out, lie by the pool in their bikinis and eat-slash-promote healthful snacks from Kourtney's wellness site, Poosh.

Still, Kylie was the one that many beauty entrepreneurs aspired to be. She has a wildly popular

brand. She sold hundreds of products, including Kyshadow, Kylie Skin, plus a \$95 pink minifridge to keep all the products in. And in 2020, after she was featured on the cover of *Forbes* magazine as the “youngest self-made billionaire” in American history for the success of her beauty line, she sold 51 percent of the company, at a valuation of \$1.2 billion, to the publicly traded beauty giant Coty, a legacy beauty conglomerate that was founded by the early-20th-century perfume entrepreneur François Coty and was now trying to stay relevant.

Coty needed a splashy purchase like Kylie’s company. According to *Forbes*, Kris Jenner had shown a *Forbes* reporter tax returns that the magazine came to believe may have been doctored. *Forbes* said Kylie was not, in fact, a billionaire. (Kylie and Kris Jenner have denied falsifying any tax returns.) The chief executive of Coty stepped down, and Coty and Kylie’s company were sued by Seed, the third-party manufacturer for her line, which argued that Kylie’s company stole trade secrets when she sold the stake to Coty. (Coty says that it will vigorously defend the lawsuit, which it considers meritless. Kylie declined to comment.)

In her social media posts, Kylie was often clad in brightly colored unitards or neon string bikinis no larger than children’s headbands. But it was her face that was the extraordinary part of her — the tiny tapered chin, the skin that appeared to be several shades darker than her natural color, the oversize lips (she first received lip fillers at 16). This face has become so widespread that it’s actually not called “Kylie face.” It’s called Instagram face.

You’ve seen Instagram face before, whether you use Instagram or not. In addition to Kylie, her sister Kendall Jenner and supermodels Bella and Gigi Hadid have it. It’s rarely accomplished via biology, but through a process of dermatologic procedures involving lifting foreheads with threads or injecting lips with filler every three months. (I am not claiming these women have had these procedures, though I will admit to visiting social media accounts suggesting this is the case.)

Jonquille Chantrey, a cosmetic surgeon in London, describes Instagram face as having a sort of heritage pastiche: smooth forehead and wider eyes, or, if the eye hikes up at the end, “fox eye”; fuller lips, with the height of the top lip equal to the bottom; tapered nose and chin; and a very, very high cheekbone. These may be characteristics of different ethnicities, but they are rarely seen together in one real face. Instagram face — an averaging of many possible inputs — is not one that exists among humanity. It may not even exist among Kardashians.

So while the range of skin tones celebrated by the beauty industry and the news media has expanded considerably, under the democratizing forces of social media, something unusual has also happened: The constant global pageant of

Instagram — a two-sided marketplace of faces and eyeballs — has landed on this surprisingly homogeneous set of beauty standards. Little about Kylie seemed to be real, and yet, when Rae was growing up, many people wanted to look like her. “Everyone is image-literate these days to some extent, and our teenagers more than the rest of us, so they’re very aware that images are doctored, but that doesn’t actually change the way it enters their self-perception,” says Heather Widdows, a British philosopher and the author of “Perfect Me,” a 2018 study of contemporary beauty norms.

On closer examination, our definition of beauty has not expanded as much as we may imagine, Widdows says. She believes that we define beauty today in four ways: smoothness (lack of pores, blemishes or body hair), thinness (with some curves), firmness and youth. Generally, our beauty influencers and advertisements shift only one of these categories — for example, a plus-size influencer will meet the ideal in all ways other than weight. Widdows thinks that these images are not challenging overall beauty norms but rather embedding them.

LIKE RAE IN her initial conversation with Camberos, I spent a lot of time turning over Item’s products in my palms, trying to understand what they were communicating. I peered at Item’s ingredient list. Her concealer included Carica papaya extract, and the Lip Quip had camellia japonica seed oil. There were words in those phrases that I didn’t recognize.

“Consumers always get dissatisfied with beauty products and want something new, but the reality is technology in cosmetics hasn’t substantially changed in 30 or 40 years,” Perry Romanowski, a cosmetic chemist, said. These oils and extracts likely add little to nothing, he said, like a vast majority of press-release-friendly ingredients in other beauty products (CBD, noni fruit). But people perk up when they read them on a label.

Romanowski has the weary air of someone who has spent his life in a fun house pointing out the warps. He said that innovation has largely stalled, partly because many companies no longer test products on animals. “Cosmetic products are regulated, and color cosmetics are the most regulated of all, and that environment leads to a lot of limitations on how you can differentiate your product,” he said.

I asked him what the difference was between the stick of lipstick that is inside a tube of Chanel and the one inside a tube of CoverGirl. “There’s not really a difference,” he answered. “It’s a packaging and marketing story. There might be some aesthetic differences, but the Chanel product can be made at the same price level that the CoverGirl can be made. The amount of money that you have to spend for it has little to do with how much it costs to make it.” Romanowski also talked

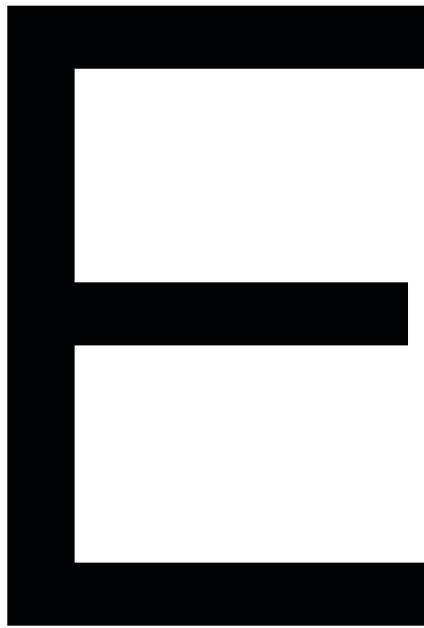
about skin care, the magical goop that fills so many pretty jars and tubes. He didn’t think high-end moisturizers worked beyond moisturizing and called many products mostly marketing fluff backed up by dubious science.

I wondered if Romanowski found this maddening — an America so deeply bought into the illusion that beauty can be found in just the right product, but very little “right product” to be found. “No, it makes people happy, and how can that be maddening?” he said. “Yes, you’re being duped a bit. You’re being told a story. But it’s like reading a novel.” Reflecting on the information that he shared with me, he added, “Do people really want to know this?”

Over Zoom, I had asked Rae what makeup was for, why so many of us wear it. “I guess makeup is something you do when you want to help the way you feel about yourself. I mean, I literally have a breakout right here, and I’m using foundation to cover it up,” she told me, pointing to a cheek. “It’s another form of painting, and you’re doing it on your skin. I think you should for sure work on enhancing your own features and embracing that if there’s a flaw in you, it’s something that sets you apart from other people. Maybe it’s not even a flaw, it’s just something you think is a flaw, but it’s really part of who you are and makes you different.”

This is the party line of contemporary beauty culture: cosmetics are tools of free expression and self-enhancement, rather than self-erasure. But the more time that I spent studying Rae’s accounts, the more I felt this was only part of the story. Unlike models of the past, who rarely revealed their innermost issues when they were in their heyday — lest they be shamed for being too beautiful to have problems — Rae had forged a direct relationship with her fans, and she wanted to talk to them about emotional and personal issues.

TikTok videos are too abbreviated to communicate much about our deepest feelings, but I found that Rae was open about her insecurities everywhere she could be, like her Twitter account, which was peppered with some shockingly vulnerable statements such as, in August, “why am i crying,” and, “hi whoever needs to hear this. . . YOUR BODY IS PERFECT. YOU are perfect. I love you.” We might imagine Rae spent her days with a boyfriend splashing in a pool or opening elaborate gifts from companies that hoped she would post pictures of their presents. And from her social feeds, that seemed to be true, but at night, sometimes, other things happened. In confessional mode, she often dropped the bubbly cheerleader act, explaining in a tweet last April, “I’m not asking for everyone to like me or love who I am/what I look like . . . but I am asking that everyone be positive or not say anything at all.” In her mentions, she was called a whale; someone else said *(Continued on Page 43)*



dward Holmes was in Australia on a Saturday morning in early January 2020, talking on the phone with a Chinese scientist named Yong-Zhen Zhang who had just sequenced the genome of a novel pathogen that was infecting people in Wuhan. The two men — old friends — debated the results. “I knew we were looking at a respiratory virus,” recalls Holmes, a virologist and professor at the University of Sydney. He also knew it looked dangerous.

Could he share the genetic code publicly? Holmes asked. Zhang was in China, on an airplane waiting for takeoff. He wanted to think it over for a minute. So Holmes waited. He heard a flight attendant urging Zhang to turn off his phone.

“OK,” Zhang said at last. Almost immediately, Holmes posted the sequence on a website called *Virological.org*; then he linked to it on Twitter. Holmes knew that researchers around the world would instantly start unwinding the pathogen’s code to try to find ways to defeat it.

From the moment the virus genome was first posted by Holmes, if you looked, you could find a genetic component in almost every aspect of our public-health responses to SARS-CoV-2. It’s typically the case, for instance, that a pharmaceutical company needs samples of a virus to create a vaccine. But once the sequence was in the public realm, Moderna, an obscure biotech company in Cambridge, Mass., immediately began working with the National Institutes of Health on a plan. “They never had the virus on site at all; they really just used the sequence, and they viewed it as a software problem,” Francis deSouza, the chief executive of Illumina, which makes the sequencer that Zhang used, told me with some amazement last summer, six months before the Moderna vaccine received an emergency-use authorization by the Food and Drug Administration. The virus’s

code also set the testing industry into motion. Only by analyzing characteristic aspects of the virus’s genetic sequence could scientists create kits for the devices known as P.C.R. machines, which for decades have used genetic information to formulate fast diagnostic tests.

In the meantime, sequencing was put to use to track viral mutations — beginning with studies published in February 2020 demonstrating that the virus was spreading in the U.S. This kind of work falls within the realm of genomic epidemiology, or “gen epi,” as those in the field tend to call it. Many of the insights date to the mid-1990s and a group of researchers in Oxford, England, Holmes among them. They perceived that following evolutionary changes in viruses that gain lasting mutations every 10 days (like the flu) or every 20 days (like Ebola) was inherently similar to — and, as we now know, inherently more useful than — following them in animals, where evolution might occur over a million years.

An early hurdle was the tedious nature of the work. The Oxford group had to analyze genetic markers through a slow and deliberate process that could provide insight into a few dozen characteristics of each new variant. It wasn’t until the late 2000s that drastic improvements in genetic-sequencing machines, aided by huge leaps in computing power, allowed researchers to more easily and quickly read the complete genetic codes of viruses, as well as the genetic blueprint for humans, animals, plants and microbes.

In the sphere of public health, one of the first big breakthroughs enabled by faster genomic sequencing came in 2014, when a team at the Broad Institute of M.I.T. and Harvard began sequencing samples of the Ebola virus from infected victims during an outbreak in Africa. The work showed that, by contrasting genetic codes, hidden pathways of transmission could be identified and interrupted, with the potential for slowing (or even stopping) the spread of infection. It was one of the first real-world uses of what has come to be called genetic surveillance. A few years later, doctors toting portable genomic sequencers began tracking the Zika virus around Central and South America. Sequencers were getting better, faster and easier to use.

To many, the most familiar faces of this technology are clinical testing companies, which use sequencing machines to read portions of our genetic code (known as “panels” or “exomes”) to investigate a few crucial genes, like those linked to a higher risk of breast cancer. But more profound promises of genome sequencing have been accumulating stealthily in recent years, in fields from personal health to cultural anthropology to environmental monitoring. Crispr, a technology reliant on sequencing, gives scientists the potential to repair disease-causing mutations in our genomes. “Liquid biopsies,” in which a small amount of blood is analyzed for DNA markers, offer the prospect of cancer diagnoses long before

symptoms appear. The Harvard geneticist George Church told me that one day sensors might “sip the air” so that a genomic app on our phones can tell us if there’s a pathogen lurking in a room. Sequencing might even make it possible to store any kind of data we might want in DNA — such an archival system would, in theory, be so efficient and dense as to be able to hold the entire contents of the internet in a pillowcase.

Historians of science sometimes talk about new paradigms, or new modes of thought, that change our collective thinking about what is true or possible. But paradigms often evolve not just when new ideas displace existing ones, but when new tools allow us to do things — or to see things — that would have been impossible to consider earlier. The advent of commercial genome sequencing has recently, and credibly, been compared to the invention of the microscope, a claim that led me to wonder whether this new, still relatively obscure technology, humming away in well-equipped labs around the world, would prove to be the most important innovation of the 21st century. Already, in Church’s estimation, “sequencing is 10 million times cheaper and 100,000 times higher quality than it was just a few years ago.” If a new technological paradigm is arriving, bringing with it a future in which we constantly monitor the genetics of our bodies and everything around us, these sequencers — easy, quick, ubiquitous — are the machines taking us into that realm.

And unexpectedly, Covid-19 has proved to be the catalyst. “What the pandemic has done is accelerate the adoption of genomics into infectious disease by several years,” says deSouza, the Illumina chief executive. He also told me he believes that the pandemic has accelerated the adoption of genomics into society more broadly — suggesting that quietly, in the midst of chaos and a global catastrophe, the age of cheap, rapid sequencing has arrived.

One morning last August, after the pandemic’s first wave had ebbed on the East Coast, I visited the New York Genome Center in Lower Manhattan to observe the process of genetic sequencing. On that day, lab technicians were working on a slew of SARS-CoV-2 samples taken from patients at New Jersey’s Hackensack University Medical Center. Dina Manaa, a lab manager at the center, handed me a blue lab coat upon my arrival. “I’ll walk you through the entire process,” Manaa said, and over the next 20 minutes, we went up and down the lab’s aisles as she explained the work.

The sequencing of a virus, much like the sequencing of human DNA from a cheek swab or a drop of blood, is painstaking. Samples are moved along what is essentially an assembly line: “weighed” on exquisitely sensitive “scales” to check the mass of the specimen; bathed with chemical solutions known as reagents; tagged with a “bar code” of genetic material so each sample can be individually tracked. Most of the

preparations, Manaa explained, are about checking the quality of the virus sample and then amplifying its genetic material — in effect, transforming a tiny and invisible amount of the coronavirus extracted from a swab into vast quantities of DNA, all in preparation for being read and analyzed by a device built to do exactly that.

In another lab, Manaa paused by a row of five sleek and identical new machines, the Illumina NovaSeq 6000 — or “Nova-seeks,” as they’re called. These were similar to the machines used in China to sequence the virus for the first time, six months before. The NovaSeqs are about the size of an office photocopier and have few distinguishing

features, apart from a large touch-screen interface and a vent pipe that rises from the back of the device to the ceiling. Each machine costs roughly \$1 million; there are about 1,000 of them in the world right now. At a nearby lab bench, a technician named Berrin Baysa was pipetting minuscule amounts of clear, virus-laden solutions from one tube to another and moving her mixtures into small, spinning centrifuges. After nearly two days of preparation, these were the final steps for the Hackensack samples. At last, Baysa combined the tiny cocktails she had made by pouring them together into something known as a flow-cell, a flat glass cartridge about the size

of an iPhone, containing four hollow chambers. She then carefully popped the flow cell into a drawer slot in a NovaSeq 6000.

“OK, keep your fingers crossed,” she said after punching some instructions into a touch-screen and then tapping “GO.” She held up both hands and crossed her own fingers.

For this particular task, it would take the machine two days to complete the readings, she said — meaning that at that point, the full genetic sequences of the virus would be ready for the “bioinformaticians,” who would look for patterns and variants in the samples.

The NovaSeqs represent the culmination of about two decades of technological development that in large part began with the Human Genome Project, which was completed in 2003 and funded mainly by the National Institutes of Health. The project showed that the human genome — “nature’s complete genetic blueprint for building a human being,” as the N.I.H. describes it — is composed of a sequence of about three billion “base pairs.” These are bonded chemicals coded as A, C, G and T, where A stands for adenine, C for cytosine, G for guanine and T for thymine. The chemical pairs are frequently grouped together on our chromosomes, in about 30,000 information-dense strings, or clumps. The clumps are our genes.

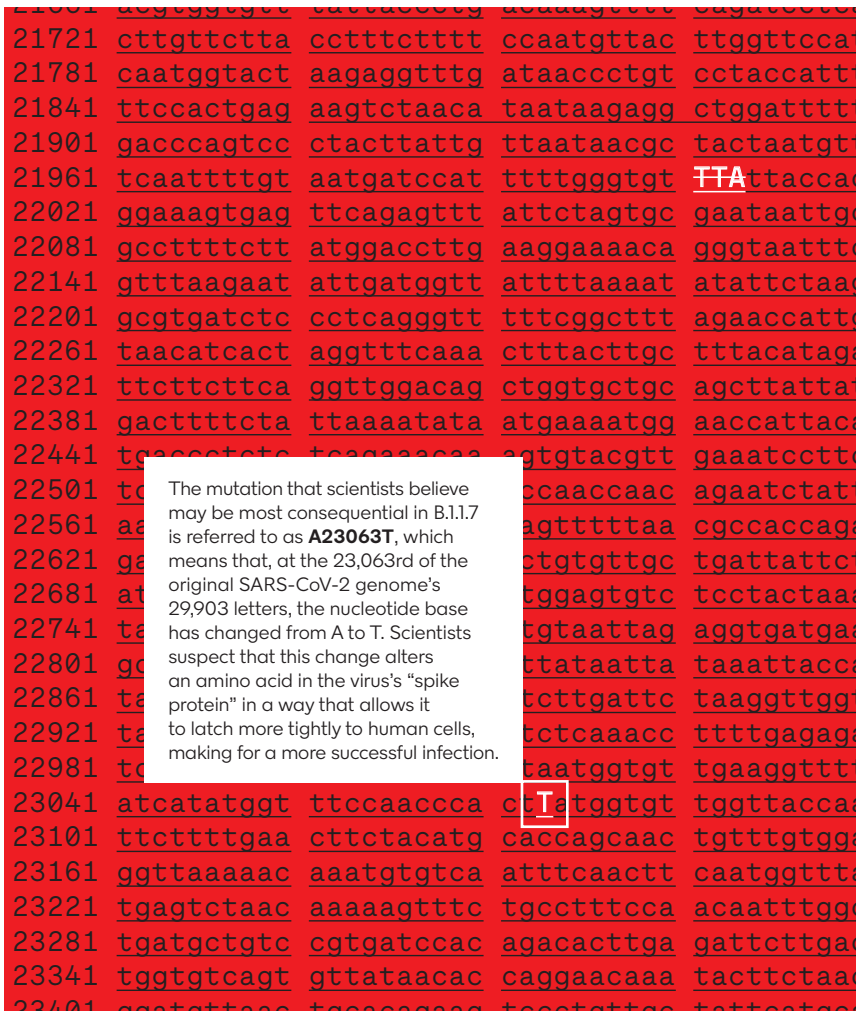
The Human Genome Project required 13 years of work and cost more than \$3 billion. Jeffery Schloss, who for many years oversaw technology grants at the National Human Genome Research Institute, a division of the N.I.H., told me that in 2002, he attended a meeting to map out the future of sequencing. “This had been a massive effort, to sequence the human genome,” Schloss recalls, “but we knew it was just the beginning of what we needed to do, which meant that sequencing had to change dramatically. And in the course of that meeting, some people brought up this crazy idea: What if you could sequence a big genome for a thousand dollars? What would that enable?”

Most of the scientists in Schloss’s circle believed it might lead to profound revelations. By studying the genomes of a large population of, say, Alzheimer’s patients, researchers might piece together how certain genes, or combinations of genes, could make someone more likely to become ill. In an even larger sweep, they might gain insights into the health or disease markers of entire population groups or countries. Sequencing might find uses beyond basic science — routine clinical scans for prenatal testing, say, or for genes known to increase the likelihood of certain cancers.

Schloss’s office invested \$220 million in various start-ups and ideas over a period of about 15 years. The ultimate goal was to help bring down the cost, and raise the speed, of whole-genome sequencing. Even if the \$1,000 genome remained out of reach, perhaps a new generation of machines might come close. “It was really unclear how long it would take for any of those to get into

Surveilling the Enemy

When viruses replicate, copying errors regularly arise in the code. The image on the previous pages is the entire genome sequence of the B.1.1.7 variant of the coronavirus, all of the 29,885 “letters” of the code, with places marked where nucleotides, represented by A, C, T or G, have either been deleted or have morphed from one to another. (In SARS-CoV-2, which is composed of RNA rather than DNA, one of the virus’s four distinctive building blocks can be represented by either a U or a T, as it is here.) B.1.1.7 is the version of the coronavirus that swept through Britain at the end of 2020, a more contagious variant that is expected to soon become the most dominant in the United States.



X Nucleotide mutations **XXX** Nucleotide deletions **XXX** Spike-protein region

commercialization,” Schloss recalls. “They had to become commercially *successful*. It was all pretty uncertain.” Indeed, many of the sequencing startups from the early 2000s ultimately failed in the marketplace. A few, however, were subsumed into the core technology of other firms. A company known as Solexa, for instance, developed ingenious ideas — known as “sequencing by synthesis” — that involved measuring genetic samples optically, with fluorescent dyes that illuminated elements of DNA in the samples. That company was ultimately bought by another firm — Illumina, which quickly became a leader in the industry.

As machines improved, the impact was felt mainly in university labs, which had relied on a process called Sanger sequencing, developed in the mid-1970s by the Nobel laureate Frederick Sanger. This laborious technique, which involved running DNA samples through baths of electrically charged gels, was what the scientists at Oxford had depended upon in the mid-1990s; it was also what Dave O’Connor, a virologist at the Univer-

was the decrease in cost. Illumina achieved the \$1,000 genome in 2014. Last summer, the company announced that its NovaSeq 6000 could sequence a whole human genome for \$600; at the time, deSouza, Illumina’s chief executive, told me that his company’s path to a \$100 genome would not entail a breakthrough, just incremental technical improvements. “At this point, there’s no miracle that’s required,” he said. Several of Illumina’s competitors — including BGI, a Chinese genomics company — have indicated that they will also soon achieve a \$100 genome. Those in the industry whom I spoke with predicted that it may be only a year or two away.

These numbers don’t fully explain what faster speeds and affordability might portend. But in health care, the prospect of a cheap whole-genome test, perhaps from birth, suggests a significant step closer to the realization of personalized medicines and lifestyle plans, tailored to our genetic strengths and vulnerabilities. “When that happens, that’s probably going to

traits — could inform diagnosis and treatment. What is the best medication based on a patient’s genome? What is the ideal dosage? “We’re trying to address a very important question that’s never been answered at this scale,” Elemento explained: “What is the *utility* of whole-genome sequencing?” He said he believed that within one or two years, the study would lead to an answer.

Some of the grandest hopes for sequencing have arisen from the notion that our genes are deterministic — and that by understanding our DNA’s code, we might limn our destiny. When an early reading of the human genome was unveiled in 2000, President Bill Clinton noted that we were getting a glimpse of “one of the most important, most wondrous maps ever produced by humankind.” But the map has often proved hard to read, its routes unclear. The past 20 years have demonstrated that inherited genes are just one aspect of a confounding system that’s not easily interpreted. The progress of using gene therapy to treat

Quietly, in the midst of chaos and a global catastrophe, the age of cheap, rapid sequencing has arrived.

sity of Wisconsin, Madison, was using in the early 2000s, as he and his lab partner, Tom Friedrich, tracked virus mutations. “The H.I.V. genome has about 10,000 letters,” O’Connor told me, which makes it simpler than the human genome (at three billion letters) or the SARS-CoV-2 genome (at about 30,000). “In an H.I.V. genome, when we first started doing it, we would be able to look at a couple hundred letters at a time.” But O’Connor says his work changed with the advent of new sequencing machines. By around 2010, he and Friedrich could decode 500,000 letters in a day. A few years later, it was five million.

By 2015, the pace of improvement was breathtaking. “When I was a postdoctoral fellow, I actually worked in Fred Sanger’s lab,” Tom Maniatis, the head of the New York Genome Center, told me. “I had to sequence a piece of DNA that was about 35 base pairs, and it took me a year to do that. And now, you can do a genome, with three billion base pairs, overnight.” Also astounding

be the most powerful and valuable clinical test you could have, because it’s a lifetime record,” Maniatis told me. Your complete genome doesn’t change over the course of your life, so it needs to be sequenced only once. And Maniatis imagines that as new information is accumulated through clinical studies, your physician, armed with new research results, could revisit your genome and discover, say, when you’re 35 that you have a mutation that’s going to be a problem when you’re 50. “Really, that is not science fiction,” he says. “That is, I’m personally certain, going to happen.”

In some respects, it has begun already, even amid a public-health crisis. In January, the New York Genome Center began a partnership with Weill-Cornell and NewYork-Presbyterian hospitals to conduct whole-genome sequences on thousands of patients. Olivier Elemento, a doctor who leads the initiative at Weill-Cornell, told me that the goal is to see how a whole-genome sequence — not merely the identification of a few genetic

diseases, for instance, has been halting; it wasn’t until last year that physicians had a resounding success with a treatment on several patients with heritable genes for sickle-cell anemia. In the meantime, scientists have come to realize something else: A complex overlay of environmental and lifestyle factors, as well as our microbiomes, appear to have interconnected effects on health, development and behavior.

And yet, in the course of the past year, some of the extraordinary hopes for genomic sequencing did come true, but for an unexpected reason. During the summer and fall, I spoke frequently with executives at Illumina, as well as its competitor in Britain, Oxford Nanopore. It was clear that the pandemic had meant a startling interruption in their business, but at each company the top executives perceived the situation as an opportunity — the first pandemic in history in which genomic sequencing would inform our decisions and actions in real time.

From the start, the gen-epi community understood that the SARS-CoV-2 virus would form new variants every few weeks as it reproduced and spread; it soon became clear that it could develop one or more alterations (or mutations) at a time in the genome's 30,000 base letters. Because of this insight, on Jan. 19, 2020, just over a week after the virus code was released to the world, scientists could look at 12 complete virus genomes shared from China and conclude that the fact that they were nearly identical meant that those 12 people had been infected around the same time and were almost certainly infecting one another. "That was something where the genomic epidemiology could help us to say, loudly, that human transmission was rampant, when it wasn't really being acknowledged as it should have been," Trevor Bedford, a scientist at the Fred Hutchinson Cancer Research Center, told me.

When Bedford's lab began studying viral genomes in Seattle, he could go a step further. By late February, he concluded that new cases he was seeing were not just being imported to the U.S. from China. Based on observations of local mutations — two strains found six weeks apart looked too similar to be a coincidence — community transmission was happening here. On Feb. 29, Bedford put up a Twitter post that noted, chillingly, "I believe we're facing an already substantial outbreak in Washington State that was not detected until now." His proof was in the code.

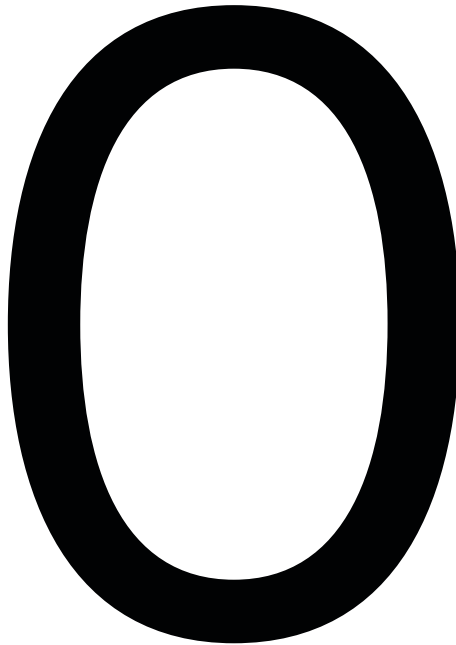
Bedford's lab was one of many around the world that began tracking the virus's evolution and sharing it in global databases. In the meantime, gen-epi researchers used sequencing for local experiments too. In the spring of 2020, a team of British scientists compared virus sequences sampled from ill patients at a single hospital to see if their infections came from one another or from elsewhere. "We were able to generate data that were useful in real time," Estée Torok, an academic physician at the University of Cambridge who helped lead the research, told me. "And in an ideal world, you could do that every day." In other words, sequencing had advanced from a few years ago, when scientists might publish papers a year after an outbreak, to the point that genetic epidemiologists could compare mutations in a specific location in order to be able to raise alarms — *We have community spread! Patients on Floor 3 are transmitting to Floor 5!* — and act immediately.

To watch the pandemic unfold from the perspective of those working in the field of genomics was to see both the astounding power of new sequencing tools and the catastrophic failure of the American public-health system to take full advantage of them. At the end of July, the National Academy of Sciences released a report noting that advances in genomic sequencing could enable our ability "to break or delay virus transmission to reduce morbidity and mortality." And yet the report scathingly noted that sequencing endeavors for the coronavirus were "patchy,

typically passive, reactive, uncoordinated and underfunded." Every scientist I spoke with understood that the virus could evolve into dangerous new variants; it was many months before one in particular, known as B.1.1.7, emerged and demonstrated that it was more transmissible and most likely more deadly. Researchers were similarly worried that our sequencing efforts to track the pathways of infection — unlike more serious and government-supported efforts in Britain or Australia — were flailing.

One of the Biden administration's approaches to slowing the pandemic has been to invest \$200 million in sequencing virus samples from those who test positive. With the recent approval of the \$1.9 trillion American Rescue Plan, a further \$1.75 billion will be allocated to the Centers for Disease Control and Prevention to support genomic sequencing and disease surveillance.

In late January, the C.D.C. began disbursing money to public-health laboratories around the country to bolster the sequencing work already being done at academic labs. But the effort was starting from a low baseline. One calculation in *The Washington Post* noted that the United States had ranked 38th globally in terms of employing sequencing during the pandemic; as of mid-February, the U.S. was still trying to catch up to many European and Asian countries. And it therefore couldn't be said that new or dangerous variants weren't landing on our shores or emerging here afresh. What *could* be said is that we were unable to know.



ne day at the New York Genome Center, a researcher named Neville Sanjana told me that he thinks of genetic sequencers not as a typical invention but as a kind of "platform technology." The phrase resonates among those who study innovation.

Such technological leaps are rare. They represent breakthroughs that give rise to "platforms" — cellphones, say, or web browsers — that in time revolutionize markets and society.

The immense value of a platform innovation is related to how it can be adapted for a range of uses that are unforeseen at its inception. It can be like a toolbox, waiting at the back of a closet. What happened with sequencing during the pandemic serves as a good example. Another is Sanjana's work on new Crispr technologies, which he uses to modify or repair strings of DNA to better understand the genetic basis of human disease. Twenty years ago, when officials at the N.I.H. talked about investing in the future of sequencing, altering the human, plant or animal genome on a regular basis was not something they could have predicted. But Crispr requires Sanjana to constantly evaluate his editing by using sequencers — usually a desktop Illumina model, in his case — to check the results. "It would be impossible to do these experiments otherwise," he says.

It has been the case historically that platform innovations don't merely create new applications. They create new industries. And while countless genomics companies have already sprung up, for now just four companies run most of the sequencing analyses in the world. These are Illumina and Pacific Biosciences, based in the United States; Oxford Nanopore Technologies, based in Britain; and China's BGI Group.

According to the Federal Trade Commission, Illumina controls roughly 90 percent of the market for sequencing machines in the U.S., and by the company's own assessment, it compiles 80 percent of the genomic information that exists in the world in a given year. It is sometimes described as the Google of the genomics business, not only because of its huge market share but also because of its products' ability to "search" our complete genetic makeup. In short, it dominates the business. Last year, the firm took in over \$3 billion in revenue and about \$650 million in net income. In its hunger for expansion, the company has recently made a run of acquisitions. In late September, for example, Illumina announced that it intended to acquire, for \$8 billion, a biotech company called Grail, which has created a genomic test that runs on an Illumina sequencer and that an early study suggests can successfully detect more than 50 types of cancers from a small sample of blood. On a recent corporate earnings call, deSouza called Grail and early cancer detection "by far the largest clinical application of genomics we're likely to see over the next decade or two."

As the pandemic unfolded, I spoke often to genomics executives about which industries could be transformed by their technologies and how their machines would be deployed in the years to come. One model for the future was built around the strengths of Illumina — big machines like the NovaSeq, with an extraordinary capacity

for sequencing, housed in central testing labs (as they are now) and run by specialists. But a very different set of ideas emerges from one of Illumina's main competitors, Oxford Nanopore. Oxford's sequencers involve a technology that is electronic rather than optical; it is based on the concept of moving a sample of DNA through tiny holes — nanopores — in a membrane. The device measures how genetic material (extracted from a sample of blood, say) reacts to an electric current during the process, and it registers the letter sequence — A, G, C, T — accordingly. One distinctive feature is that a nanopore device can read longer threads of DNA than an Illumina device, which can be helpful for some applications. It can also give readouts in real time.

Yet the biggest difference may be its portability. In 2015, Oxford Nanopore began selling a sampling and sequencing gadget called the Minion (pronounced MIN-eye-on) for \$1,000. It is smaller than a small iPhone. The chief executive of Oxford Nanopore, Gordon Sanghera, told me he sees his company's tool as enabling a future in which sequencing insights can be derived during every minute of every day. Inspection officers working in meatpacking plants would get results about pathogenic infection in minutes; surveyors doing environmental monitoring or wastewater analysis can already do the same. Your dentist might one day do a check of your oral microbiome during a regular visit, or your oncologist might sequence your blood once a month to see if you're still in remission. A transplantation specialist might even check, on the spot, about the genomic compatibility of an organ donation. "The company's ethos," Sanghera says, "is the analysis of anything, by anyone, anywhere." Indeed, there happens to be a Minion on the International Space Station right now.

The technology, compared with Illumina's, is considered by most scientists I spoke with to be less accurate, but it has advantages beyond those that Sanghera mentioned. It was the Minion that enabled scientists to test for diseases like Zika without any infrastructure beyond a laptop; more recently, it's what allowed Estée Torok and other researchers in Britain to track viral mutations in real time in a hospital. "That ability to do sequencing in the field, even in rural Africa, has opened up possibilities that were never previously even envisioned," Eric Green, who runs the National Human Genome Research Institute, part of the N.I.H., told me recently.

Bringing the equivalent of an iPhone into genomics may not effect a revolution overnight. Sanghera doesn't imagine that big central testing labs, or Illumina, could fade away anytime soon; indeed, his own company markets a line of large sequencers for big labs, too. And for sure, related technologies can coexist, much like cloud computing and desktop computing, especially if they solve different problems. For now, Sanghera regards the coronavirus, and the surveillance

efforts in Britain and the U.S. that are increasing demand for his company's products, as hastening the culture's genomic transition. He said he sees no obstacle to a \$100 whole human-genome sequence in the near future. His company, he told me, is also working with a new chip that may eventually bring down the cost to \$10.

It seems beyond debate that the pandemic has demonstrated that we can benefit from genomic sequences even before we fully unravel all their mysteries. We can use them as a sort of global alarm system, for instance, much as they were used by Eddie Holmes and Yong-Zhen Zhang when they shared the SARS-CoV-2 sequence in January 2020. As it happens, there are a variety of different surveillance efforts underway, some driven by health agencies and others by academics, that would go much further than simply posting a sequence on a website — efforts that would share critical public-health information faster and, more broadly, might be useful for another new coronavirus, a deadly influenza strain or even a bioterror attack.

Pardis Sabeti, a geneticist at Harvard, told me that last May she received a philanthropic grant to help develop and deploy a pandemic "pre-emption" network called Sentinel. "We've always aimed for that ability to do surveillance," she told me, adding that the goal of Sentinel would be to use genomic technologies everywhere — in rural clinics in Europe, villages in Africa, cities in China — to detect familiar pathogens within a single day of their appearance and novel pathogens within a week. The system would then race to share the data, via mobile networks, with health workers and communities so as to elicit a rapid response: travel restrictions, quarantines, medicine. Anything necessary to break chains of transmission. With a virus that spreads exponentially, a day could matter. A week could mean the difference between a small but deadly outbreak and a global cataclysm. (The time between the first case of Covid-19 and the release of the sequence of the virus was most likely about two months.)

As successive waves of the pandemic washed over the world, I noticed that the buzzword at the sequencing companies also became "surveillance." For the most part, it meant tracking new variants and using sequencing codes to help reveal paths and patterns of transmission. Yet surveillance sometimes seemed a flexible concept, given that Illumina and Oxford Nanopore were selling flexible machines. Surveillance could mean the search for the next novel virus in Asia or even early cancer detection in our bodies. And it sometimes meant mass testing too. Last year, both deSouza and Sanghera successfully adapted their companies' machines to do clinical diagnostic tests for the coronavirus; the goal was to step in and help increase global testing capacity at a moment when many medical facilities were overwhelmed by the demand.

In many respects, a genetic sequencer is over-engineered for the task of simply testing for a virus. A P.C.R. machine is faster, cheaper and less complex. And yet there are potential advantages to the sequencer. Illumina eventually won emergency approval from the Food and Drug Administration for a diagnostic test for the NovaSeq that can run about 3,000 swab samples, simultaneously, over the course of 12 hours. Thus, a single machine could do 6,000 coronavirus tests per day. Two hundred NovaSeqs could do more than a million. In addition to this immense capacity, it's viable to test for the virus and sequence the virus at the same time: An analysis run on a sequencer could inform patients whether they have the virus, and the anonymized sequencing data on positive samples could give public-health agencies a huge amount of epidemiology data for use in tracking variants. "I can envision a world where diagnosis and sequencing are kind of one and the same," Bronwyn MacInnis, who directs pathogen genomic surveillance at the Broad Institute, told me. "We're not there yet, but we're not a million miles off, either."

Last summer, a few big clinical laboratories, notably Ginkgo Bioworks in Boston, began plans to roll out tests for Illumina sequencers, pending authorization from the F.D.A. Ginkgo, with help from investments from Illumina, as well as a grant from the N.I.H., began building a huge new laboratory next to its current one, where the company would install 10 NovaSeqs. "After we get the big facility built, that's when we'd be trying to hit 100,000 tests a day," Jason Kelly, Ginkgo's chief executive, told me at the time. It was technically possible to sequence many of the positive coronavirus samples, too, he said.

When I asked Kelly what he would do if his capacity goes unused, he didn't seem concerned. He doubted his sequencers would be idle. "By betting on sequencers as our Covid response," he remarked, "we get flexibility for what you can use this for later." After the pandemic, in other words, there will still be new strains of flu and other viruses to code. There will be a backlog of sequencing work for cancer and prenatal health and rare genetic diseases. There will be an ongoing surveillance effort for SARS-CoV-2 variants. An even bigger job, moreover, involves a continuing project to sequence untold strains of microbes, a project that Ginkgo has been involved with in search of new pharmaceuticals. "I think of this as like building fiber in the late 1990s, for the internet," Kelly said. "Back then, we laid down huge amounts of fiber, then everything crashed."

But it turned out that a decade after the dot-com crash, optical fiber was essential for the expanding traffic of the web. And what Kelly seemed to be saying, I later realized, was that he would expand his lab because sequencing had to be the future, in all kinds of different ways. There was no going back. ♦

that he saw “hotter girls everyday.” “Things like this can tear someone’s self-esteem up if they’re already having negative thoughts in their own head,” she wrote.

I asked Rae how she could believe what she had just told me — that makeup is just about enhancing your inherent beauty — while also at times feeling terrible about her own looks. Rae tapes a weekly, roughly 20-minute Spotify podcast with her mother, “Mama Knows Best,” and on one episode she said that she was sometimes so down about her appearance that she wouldn’t eat before filming TikTok videos. “How do you square self-love and self-hate?” I asked.

“I think it’s something that I’m figuring out for myself,” Rae answered, a bit hesitant. “And I’m not 100 percent sure how to handle it yet, but I’m working on it.” She paused. “I think at the end of the day, it’s just realizing that I am who I am for a reason, and this is what I was given — this is the body I was given. So I might as well love it, because it’s the only one I have.”

This was a lovely answer, if a mix of genuine belief and proverb. Yet what was becoming clear was that social media has demystified and deglamorized beauty just as it has made it a more constant pressure. All of us, including Rae, can really envy the gorgeous influencers on our feeds in a way we might not have envied past models like Christy Turlington, who was made of different stuff, untouchable. What’s more, we never had to put photographs of ourselves out there for public consumption. There’s a tremendous amount of anxiety generated by the fact that we do all this now in proximity with people who do it much better and whose lives seem, albeit artificially, within reach.

This is not news to those who are prominent in beauty culture. After all, they’re often famous because of social media, and when they choose to make a beauty line, it’s not just about cashing in — most of the time they feel insecure, and they use cosmetics to help themselves feel better and want to share those to make others feel better too. But this becomes a vicious cycle, and it’s hard to step back.

Michelle Phan, an early influencer and Ipsy co-founder, confused the beauty community when she stopped posting online in 2015. Two years later, she restarted her makeup line, Em Cosmetics, which she bought back from L’Oréal, and sold her stake in Ipsy. “Once, I was a girl with dreams, who eventually became a product, smiling, selling and selling,” she said in a 2017 video explaining her departure. “Who I was on camera and who I was in real life began to feel like strangers.” She added: “My insecurities got the worse of me. I became imprisoned by my own vanity and was never satisfied with

Instagram face — an averaging of many possible inputs — is not one that exists among humanity. It may not even exist among Kardashians.

how I looked. The life I led online was picture perfect. But in reality, I was carefully curating the image of a life I wanted, not had.”

Working within the system, Rae was trying to address the way that she was also torn apart by a lot of the same concern over her looks that other people had. She even built vulnerability into the branding of her makeup line. Last year, Rae and Item sold a round, orange-colored compact, and when you opened it, it had a mirror with the words “I love you say it back.” This was a riff on a popular meme, a standard-issue message of girlboss empowerment but also an acknowledgment of widespread insecurity that Rae, and the person buying the compact, might feel.

I thought that was sweet, but an intimate relationship with the idol was also what the consumer was demanding. A display of insecurity from Rae, or at least an acknowledgment that Rae might look in the same mirror and need a jolt of confidence the same way the consumer does, may be part of that. “Relatability is the No. 1 thing that makes people click ‘check out,’” Sarah Brown told me.

It was hard to tell whether Rae was truly insecure or simply using a marketing tactic to gain fans. “Everybody is insecure about their bodies, and the more our culture gets visual, the more insecure we’ll all get, and it doesn’t matter how you look objectively one bit,” Widdows, the philosopher, told me. “So it’s not implausible to think even the most beautiful celebrities might also be insecure. In fact, it’s very plausible to think they are. But to say that they suddenly stopped being insecure because they put their own lipstick on, I find much less plausible.”

Still, the psychological flytrap in this kind of rhetoric — “I want you to know your body is perfect even though you’re buying this product to look like me, and I am insecure about my looks” — was powerful, and stars other than Rae were gesturing to it as well. When I asked Camberos, the beauty executive, where he saw beauty culture today and where it was going, he said it was connected to the issue of mental health. Rae told *British Glamour* that she felt she was in a good place regarding her appearance lately and quoted the saying “Comparison is the thief of joy.” When asked about what she

was proudest of, though, Rae said, “Just staying mentally healthy has been a really big accomplishment for me.”

It was a bit chilling to think about linking these two things, a beauty brand and mental health, especially as our era of global pandemic comes to a close and we emerge in the light, blinking, looking to create new idols. In September, Selena Gomez, who has been open about her bipolar disorder, introduced her own line, Rare Beauty. In marketing efforts, the company, which offers soft concealers, foundations and blushers, vowed that “we will use makeup to shape positive conversations around beauty, self-acceptance and mental health.” And shortly before the musician Halsey began promoting her new makeup line in early 2021, she chose to post an old photo of her emaciated body on Instagram, explaining that she suffered from an eating disorder. Kylie, too, recently put a saying from a self-help author on her Instagram — “may the dark thoughts, overthinking, and doubt exit your mind right now,” it read in part — along with a photo of a bathtub and naked legs, slightly covered in suds, against which rested a clear pink bottle from her skin-care line.

Normalizing mental-health issues was a worthy goal. “Think of the way it used to be in the past, when beauty messaging was hugely chauvinistic and about how a product would help you attract a man or about your acne being so shameful,” Kathleen Hou of *The Cut* says. “I think beauty is more aware today of how to talk about these issues than, say, fashion. They might not have the ultimate solution, but it’s better than not addressing it at all.”

Yet it was hard to shake the feeling that the industry seems to be counting on everyone’s agreeing that beauty culture is solely empowering, obscuring a dialectic of confidence-building and -destroying, kept afloat by hyperreal images on our phones. This was Rae’s true innovation: Rather than making a lipstick with the perfect gloss, she was making clear that she had problems with beauty culture, but you might as well join her and experience it all alongside her, the highs of achieving a beautiful look, the lows of feeling that you never measure up.

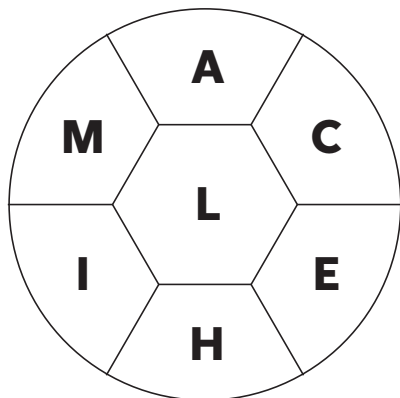
The degree to which social media and its effect on Rae and others was the source of this insecurity was hard to ascertain, but it seemed very likely that Rae had become famous by being relatable and somewhat insecure, and then that the fame itself had opened her up to criticism, which made her even more insecure but also even more monetizable. I imagined a similar chain reaction was happening with her fans: The more they relied on her products to make them beautiful, the more they felt they needed these products to feel good. They were stuck in that compact’s mirror, telling one another to feel better about themselves, but never quite reaching their goal. ♦

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: 8 = good; 17 = excellent; 26 = genius



Our list of words, worth 29 points, appears with last week's answers.

HALF HITCHES

By Patrick Berry

Pair each four-letter word on the left with a four-letter word on the right to complete an eight-letter word. A single letter in one of the two four-letter words must be changed. For example, SAGA and BOND could combine to form VAGABOND (SAGA → VAGA), and TAPE and STAY could combine to form TAPESTRY (STAY → STRY). Clues appear in mixed order at the bottom. Each four-letter word will be used exactly once.

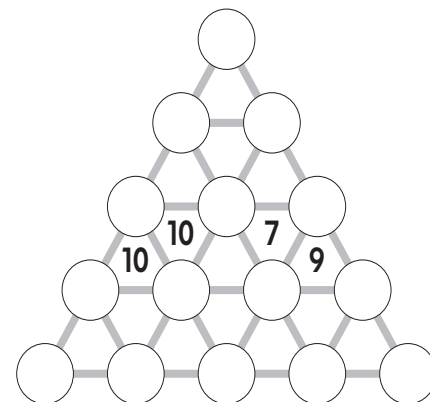
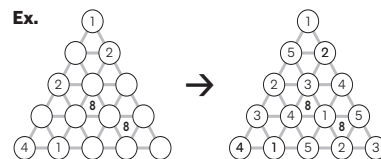
- | | |
|----------------|------|
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| 6. INFO _____ | ODOR |
| 7. MAST _____ | RAIN |
| 8. POPE _____ | REAL |
| 9. QUIT _____ | STIR |
| 10. SHOD _____ | THAW |
| 11. SIGH _____ | TRIP |
| 12. ZERO _____ | UNIT |

Clues Casual • Comfortable piece of furniture • Four-line stanza • Large, extinct beast • Letter holder • Mystery • Pertaining to the home • Runway for a plane • Sum total of inhabitants • Unrestrained violence • Visited some tourist spots • Word before ball or table

TRIANGULUM

By Wei-Hwa Huang

Enter the digits from 1 to 5 in the circles so that no digit is repeated along any line, and so that the bold numbers inside the grid equal the sum of the digits in the three adjacent circles. Some figures have been placed for you.



ACROSTIC

By Emily Cox & Henry Rathvon

Guess the words defined below and write them over their numbered dashes. Then transfer each letter to the correspondingly numbered square in the pattern. Black squares indicate word endings. The filled pattern will contain a quotation reading from left to right. The first letters of the guessed words will form an acrostic giving the author's name and the title of the work.

1	F	2	H	3	S		4	V	5	E	6	W	7	O		8	L	9	M	10	D	11	A	12	B	13	X	14	G	15	I		16	N	17	P	18	F	19	Q		20	V	21	T	22	K	23	E	
24	H		25	L	26	C	27	R		28	A	29	B	30	W		31	F	32	M	33	O	34	G	35	N		36	Q	37	H	38	U		39	J	40	D	41	R	42	X	43	L		44	F			
45	V	46	A	47	W		48	P	49	I	50	E		51	Q	52	M	53	S	54	O	55	T		56	L	57	G	58	K		59	C	60	U	61	H	62	B		63	V	64	Q	65	W	66	M		
	67	J	68	F	69	E	70	X	71	D		72	C	73	U		74	I	75	H	76	K		77	S	78	A	79	T		80	B	81	P	82	W	83	E	84	J	85	O		86	D	87	G			
	88	V	89	M	90	L		91	X	92	N	93	K		94	C	95	S	96	P	97	F	98	R	99	T	100	U		101	H	102	J	103	L	104	Q	105	V	106	B	107	G		108	K	109	E		
	110	I	111	A	112	D		113	N	114	C	115	F	116	R	117	X		118	Q	119	U	120	T	121	H		122	S	123	O		124	V	125	G	126	M	127	B	128	E	129	A	130	R	131	I		
	132	C	133	W	134	X		135	H	136	L	137	U	138	J	139	D		140	O	141	V	142	M		143	Q	144	G	145	N	146	A		147	T	148	C		149	K	150	L		151	R				
	152	D	153	U	154	E	155	P	156	B	157	F	158	I	159	S		160	M	161	W		162	G	163	A		164	R	165	L	166	H	167	O	168	D	169	J		170	U	171	Q	172	K	173	E	174	I

A. Quaint way of saying "IMHO"

11 146 28 78 129 163 46 111

B. Laugh out loud with glee

127 29 12 106 80 156 62

C. What a hug or blowing a kiss might offer

94 148 114 59 72 26 132

D. Failing to see what's so funny

86 168 40 10 152 71 112 139

E. Star of "The Fall Guy" and "The Six Million Dollar Man" (2 wds.)

173 50 109 83 69 23 5 128 154

F. Exchange of <3 symbols, maybe

44 115 157 18 31 68 97 1

G. "Come on, that's ridiculous!" (2 wds.)

144 57 87 14 34 162 107 125

H. Denizen of the Great Barrier Reef

61 166 75 135 37 101 24 121 2

I. The Beatles' first release on the Apple record label (1968) (2 wds.)

49 131 15 74 110 174 158

J. Cheerfully indifferent

84 138 102 67 39 169

K. The slash represents a raised one in this: /:

58 76 93 149 172 22 108

L. Publisher of Vogue, GQ and Wired (2 wds.)

8 136 103 90 150 165 25 43 56

M. Upbraid, dress down, chew out

32 142 52 9 89 160 126 66

N. Singer of "OMG," "Yeah!" and "Scream"

16 35 92 113 145

O. Showing no feelings

85 7 123 167 33 140 54

P. Communal character

155 48 81 96 17

Q. Skip James blues song covered by Cream (3 wds.)

64 143 51 171 104 118 36 19

R. Visage-altering work (2 wds.)

41 164 98 27 116 151 130

S. Shape-shifting computer game

77 3 122 95 53 159

T. High valuation

99 120 147 55 79 21

U. Sci-fi Britcom with a computer named Holly (2 wds.)

153 119 38 100 170 60 137 73

V. Digital platforms like YouTube and Twitter (2 wds.)

141 105 63 4 20 124 45 88

W. Express strong interest or approval

47 161 65 133 82 6 30

X. App whose content is swiped left and right

91 117 13 42 134 70

Baseball

(Continued from Page 27)

denote non-Negro-leagues professional baseball — that awaited Grant. By this time it was 1884, he was 19 and still in Williamstown, pitching for an integrated amateur team, the Greylocks, on the town’s south side. If an apartheid form of baseball was the will of the N.A.B.B.P., the message had yet to either register with or deter Grant, who grew up playing baseball with white kids in town.

One contemporary newspaper article on Grant in his prime remarked that “wherever he had played, he has quickly become a favorite.” But the story of Grant’s prime years is also the story of the color line catching up to him. “Were it not for the fact that he is a colored man,” the article continued, “he would without a doubt be at the top notch of the records among the finest teams in the country.”

Given that the article headlines Grant’s contentious move from the no-longer-integrated Buffalo Bisons to the all-Black Cuban Giants — the first all-Black professional baseball club and a team stacked with late-19th-century heavyweights like George Stovey and Clarence Williams — it was clear that Grant actually was on one of “the finest teams in the country.” The Sporting News, far from an ally of Black ballplayers in that era, said of that vintage of the Cuban Giants, “This club, with its strongest players on the field, would play a favorable game against such clubs as the New Yorks or Chicagos,” referring to teams of the nonintegrated leagues.

Bob Kendrick is the president of the Negro Leagues Baseball Museum in Kansas City. On a recent Friday afternoon, he told me that the museum was busy preparing for its conversion to a Covid-vaccination center for the community come Monday. Kendrick is a gifted storyteller,

and the oral tradition flows freely through him. Players flashed and flickered in his voice — Moses Fleetwood Walker, Josh Gibson, Ernie Banks, Roy Campanella, Jackie Robinson, Larry Doby, Buck O’Neil, Cool Papa Bell, Monte Irvin, Satchel Paige — but when I brought up Aaron, a melancholy took hold of his voice before he let go and began to reflect joyously.

“For me, the statistical aspect of this is almost secondary. It’s the recognition and the atonement that comes along with the acknowledgment of the Negro Leagues as just what it was: a major league,” Kendrick told me.

“I, for one, don’t ever want the lore and legend to go away,” he continued. “These stories about Josh Gibson should be viewed as larger than life. Babe Ruth was in many eyes Paul Bunyan. Well, for Black folks, Josh Gibson was John Henry. And I don’t want to lose that.”

His favorite photograph in the Negro Leagues Baseball Museum collection is one of Henry Aaron in 1952, when Aaron was 18. He stands on the tracks of the L&N Railroad station in Mobile, posing uncomfortably. The sun is in his eyes, and he doesn’t know what to do with his hands, so he hides them behind his back. On the ground right beside him is a duffel bag — maybe it holds two changes of clothes, a glove, a baseball. Maybe he has \$2.50 tucked away in his pocket. Aaron is waiting for a train to take him to Winston-Salem, N.C., where he will meet up with his first professional team: the Indianapolis Clowns of the Negro American League. He would play only 26 games for the Clowns — hitting for a .366 average, with five home runs and nine stolen bases while playing shortstop. Compared with the statistical legacy he would leave Major League Baseball, these may seem a trifle, a small sample size. Until you ask yourself, as Aaron asked us to, How did it come about? ♦

Answers to puzzles of 3.21.21

MORES

E	S	S	A	Y	S	C	O	T	B	I	B	L	E	G	R	A	B				
P	I	P	P	A	A	U	T	O	A	F	F	I	X	O	H	M	E				
S	L	E	E	P	I	N	T	H	E	B	U	F	F	E	T	D	E	U	S		
O	V	E	R	O	K	I	E	R	B	I	R	A	S	S	L	E					
M	A	D	C	O	W	T	R	A	I	L	E	R	P	A	R	Q	U	E	T		
				U	A	E				L	E	E	R	A	T	M	U	S	T		
N	B	A		T	Y	P	E	A	B			S	A	L	S	A					
C	O	L	D	H	A	R	D	C	A	C	H	E	T	A	D	D	L	E	D		
I	D	L	E	S		O	I	L		R	O	S	A	N	N	E	I	V	Y		
S	E	E	M		A	F	T			A	B	A		I	C	A	N	S	E	E	
				Y	O	U	V	E	H	A	D	Y	O	U	R	F	I	L	E	T	
S	P	O	N	G	E	S		B	R	O		E	T	A		W	I	N	K		
O	H	O		L	E	S	B	I	A	N		W	I	I		E	M	C	E	E	
P	I	P	P	I	N		L	E	T	S	M	A	K	E	A	D	E	L	A	Y	
				E	N	O	K	I		O	S	I	R	I	S		E	L	S		
				M	O	R	E		O	N	B	A	S	E		R	E	F			
B	A	C	K	S	T	A	G	E	P	A	S	S	E		B	L	A	R	E	D	
L	A	T	I	S	H		C	P	R		W	A	Z	E		M	O	J	O		
A	L	O	E			U	N	S	O	L	I	C	I	T	E	D	B	I	D	E	T
M	O	P	S			G	R	I	M	E		O	N	E	S		O	N	I	C	E
E	X	I	T			S	A	T	E	S		B	E	N	T		G	E	N	T	S

KENKEN

5	1	3	2	4
4	2	5	3	1
2	5	1	4	3
1	3	4	5	2
3	4	2	1	5

4	7	5	3	1	2	6
6	3	4	2	7	1	5
2	5	7	6	3	4	1
7	1	2	4	5	6	3
3	6	1	7	4	5	2
1	2	3	5	6	7	4
5	4	6	1	2	3	7

PUNS AND ANAGRAMS

C	L	A	M	B	A	R		I	M	P	A	S	S	E
A	A	M	I	L	N	E		T	I	E	D	O	W	N
T	R	I	D	E	N	T		U	N	T	A	M	E	D
F	A	D		D	U	R	A	N	T	E		E	E	L
I	M	A	C		L	A	N	E	S		C	O	T	E
S	I	L	O	S		C	D	S		B	O	N	E	S
H	E	A	R	T	I	E	R		G	I	V	E	N	S
R	A	T	I	O	S		M	I	S	T	R	E	A	T
E	R	R	E	D		B	E	N		H	U	N	C	H
S	E	A	R		C	A	D	E	T		P	U	R	R
H	A	L		H	A	S	A	C	O	W		R	E	O
I	M	A	W	A	R	E		U	T	O	P	I	A	N
P	A	L	A	T	E	S		R	E	V	E	N	G	E
S	P	A	R	E	S	T		E	M	E	R	G	E	S

KENKEN

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.

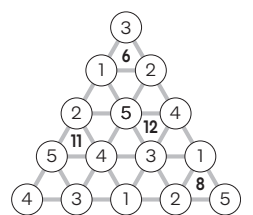
9+		6×		30×
2÷	4+			
	14+			
1-		5		3-
8+			3	

12+		105×	108×			3-
11+				12+	3-	
	3-		3+			35×
7+		4			42×	
	36×		16+			
12+	1			30×		
		3-		7	2÷	

DOUBLE OR NOTHING

AR		ES	
	DE	CA	DE
	VA	PE	
CA	ST	RO	
	AT	OM	IC
NE	ED		ED

TRIANGULUM



Answers to puzzle on Page 44

to include them in your score. other legitimate dictionary words in the beehive, feel free lemming, lilac, llama, malice, mammal, melee. If you found cliché, climate, email, halaj, helical, icicle, leach, leech, celliac, chalice, chalice, chicle, chill, chilli, cilia, claim, Chemical (3 points). Also: Acclaim, allele, camel, camellia, SPELLING BEE

OVER THE MOON

By Olivia Mitra Framke

Olivia Mitra Framke, of Jersey City, N.J., is an academic adviser at the New School's College of Performing Arts in Manhattan. She started solving crosswords during college — but not at college. Her dad would hoard New York Times Magazines, and the two of them would solve together when she returned home. This is Olivia's ninth crossword for The Times, and her fourth Sunday. — W.S.

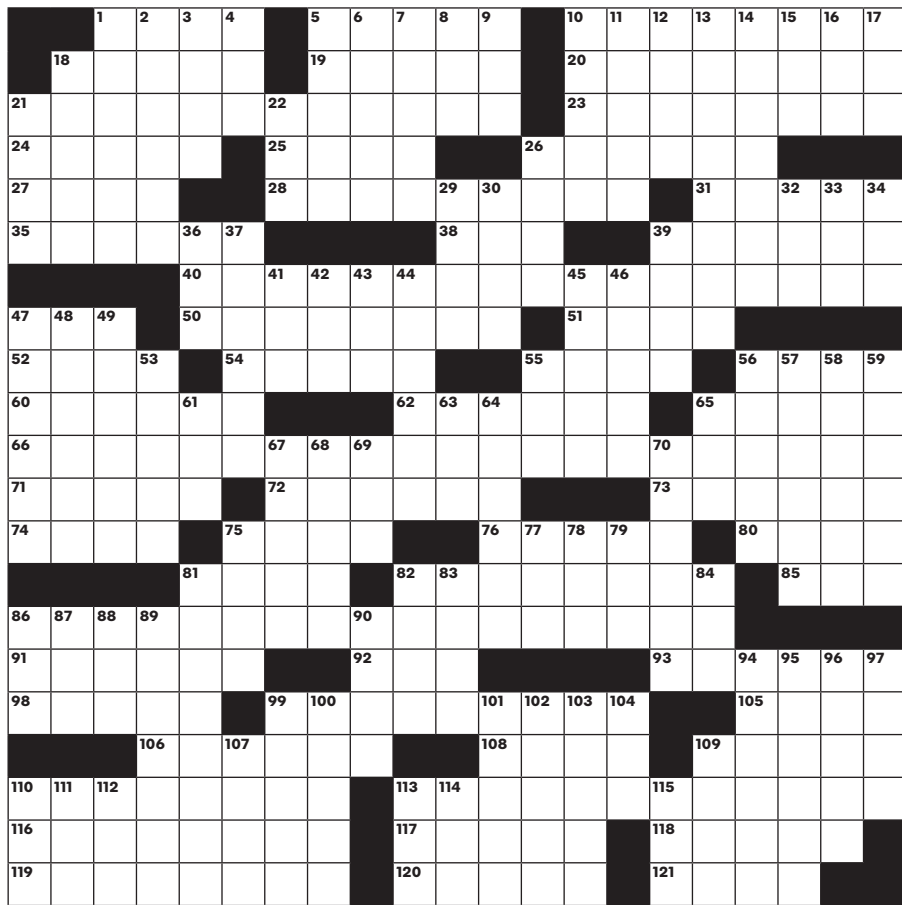
ACROSS

- 1 Pest-control product
- 5 Luggage label
- 10 Color effect in graphic design
- 18 Video-game princess of the Kingdom of Hyrule
- 19 Writer Zora __ Hurston
- 20 Take part in a D.&D. campaign, e.g.
- 21 Brand of fruity hard candy
- 23 Personae non gratae
- 24 *Uranus*
- 25 "Arrivederci!"
- 26 Jerks
- 27 "__ to differ!"
- 28 One taking the long view?
- 31 Tarot-deck character
- 35 Some surgical tools
- 38 "Unit" of fun
- 39 All-star duo?
- 40 Comfort in not knowing, say
- 47 Request
- 50 *Jupiter*
- 51 Ships passing in the night?
- 52 Sch. on the Rio Grande
- 54 Hollers
- 55 Like some parties and flowers
- 56 "Back to the Future" antagonist
- 60 Hit movie released as "Vaselina" in Mexico
- 62 Husk-wrapped dish
- 65 Colorful tropical fish
- 66 Song standard on "Barbra Streisand's Greatest Hits"
- 71 *Saturn*
- 72 With 11-Down, hit 2001 film with an "!" in its title
- 73 Stirred up
- 74 Cold shower?
- 75 Muralist __ Clemente Orozco
- 76 2021 Super Bowl champs
- 80 Boy, in Barcelona
- 81 Animated character who wears a red shirt and no pants
- 82 Time before computers, facetiously

- 85 Fleet runner: Abbr.
- 86 One feature of a perfect nanny, in a "Mary Poppins" song
- 91 *Mars*
- 92 Hesitate in speaking
- 93 More inquisitive
- 98 Jaded sort
- 99 Solo flier?
- 105 Prefix meaning "both"
- 106 Welled (up)
- 108 Like people who are much looked up to
- 109 Insurance-fraud ploy
- 110 Determiner of cannabis legality, e.g.
- 113 Classic carnival ride
- 116 Cherished family member
- 117 *Neptune*
- 118 Golding of "Crazy Rich Asians"
- 119 Sporty car
- 120 Deliver a speech
- 121 World of Warcraft spellcaster

DOWN

- 1 Leans (on)
- 2 Claim
- 3 Pastoral poem
- 4 __ es Salaam
- 5 Navel type
- 6 Sticker on the back of a laptop, say
- 7 Home to the Sugar Bowl and Heavenly ski resorts
- 8 Draft pick?
- 9 Neighbor of Belg.
- 10 Word after focus or Facebook
- 11 See 72-Across
- 12 Mountain map figs.
- 13 Ones getting the message
- 14 Rio beach of song
- 15 Hollow center?
- 16 Turner who led an 1831 slave rebellion
- 17 Grateful sentiments, in online shorthand
- 18 "The Greek" of film
- 21 Corner space in Monopoly

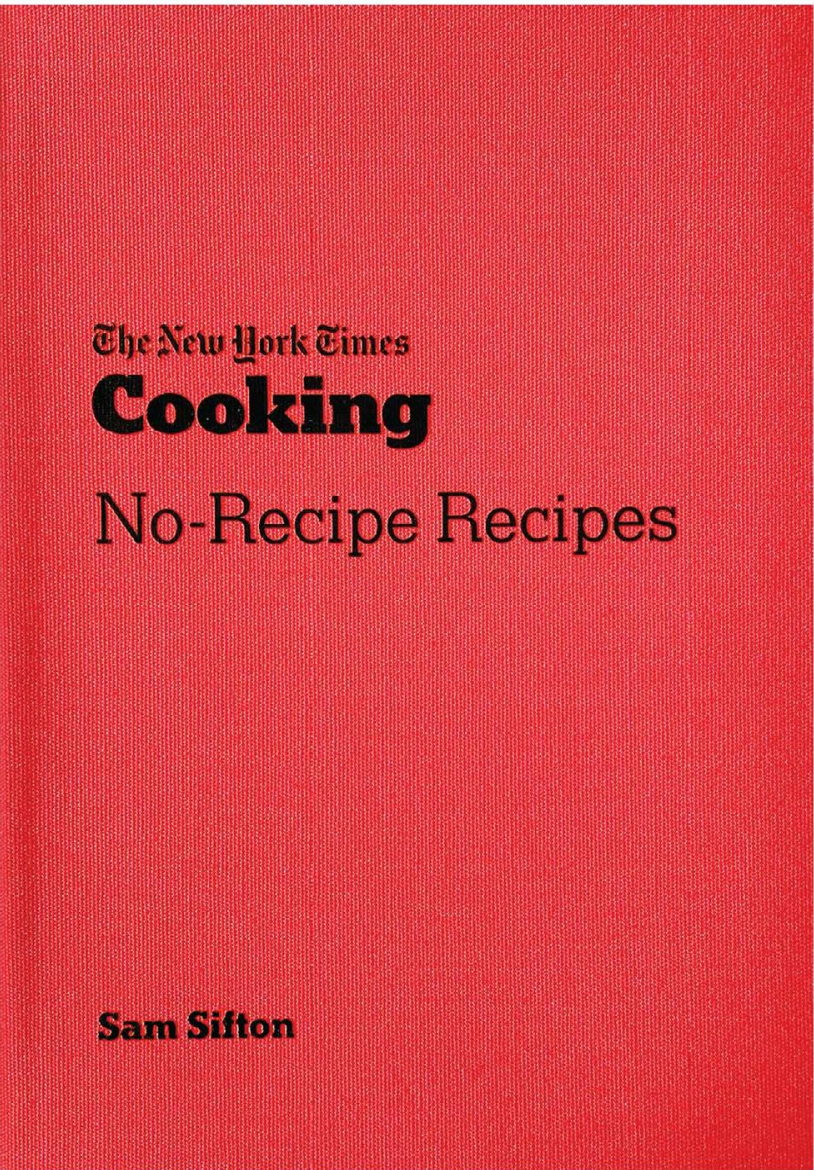


- 22 Juggling or magic, in a talent show
- 26 Nobel laureate Morrison
- 29 Poker variety
- 30 "This Will Be" singer Natalie
- 32 Sommelier's métier
- 33 "Monsters, __"
- 34 Be on the level?
- 36 "Notorious" Supreme Court initials
- 37 Knocked 'em dead
- 39 Not spoiled
- 41 Suffix with serpent
- 42 One of five in "pronunciation": Abbr.
- 43 Choice of sizes, briefly
- 44 Celebratory, quaintly
- 45 Deception
- 46 Cowboy or Patriot, for short
- 47 Zeros
- 48 Distinct melodic segment
- 49 Not waver from
- 53 Fruit also called a custard apple or prairie banana
- 55 Baby's cry
- 56 Cue at an audition
- 57 Land jutting into il Mediterraneo

- 58 Quaker
- 59 Community of followers
- 61 Thesaurus listing: Abbr.
- 63 Melber of MSNBC
- 64 Candy featured in a classic "MythBusters" episode
- 65 Confucian's spiritual path
- 67 In __ (peevd)
- 68 Nintendo dinosaur who eats fruit and throws eggs
- 69 Bring to court
- 70 2003 best seller whose title is one letter different from a fantasy creature
- 75 Pleasures
- 77 Grammy winner DiFranco
- 78 Rendezvoused
- 79 __ gow (Chinese domino game)
- 81 Money earned from an event, say
- 82 Gush
- 83 Archaeologist's find
- 84 Brian once of glam rock
- 86 U.S. health org.
- 87 "Hands off, that's mine!"
- 88 Austrian article

- 89 Sent off
- 90 Lose a layer
- 94 Bit of luau wear
- 95 "No question!"
- 96 Magazine whose 60th anniversary issue had the cover line "Denzel, Halle & Jamie"
- 97 What's hard about a melon?
- 99 Origami shape called "orizuru"
- 100 Tree surgeon, at times
- 101 Interior chambers
- 102 Gem weight
- 103 Bonnie's partner in crime
- 104 Quadratic formula subj.
- 107 Oodles
- 109 Measurement in plane geometry
- 110 Camera type, briefly
- 111 As well
- 112 DuVernay who directed "Selma"
- 113 Queal before P
- 114 Canal locale
- 115 Piece de resistance?

Puzzles Online Today's puzzle and more than 9,000 past puzzles: nytimes.com/crosswords (\$39.95 a year). For the daily puzzle commentary: nytimes.com/wordplay.



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