BY MRSIMPLE

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WIRED Readers

Culture
12.01.2021 12:00 PM

Six-Word Sci-Fi: Stories Written by You

Here’s this month’s prompt, how to submit, and an illustrated archive of past favorites.

Play/Pause Button

Illustration: Elena Lacey
THIS MONTH’S PROMPT

In six words, write a story about your next-generation pet.

Submit stories on Twitter, Facebook, or Instagram, or email us at mail@wired.com. We'll choose one to illustrate.

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DECEMBER 2021

A Children’s Book From the Future

ILLUSTRATION: VIOLET REED

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Andy Greenberg

Culture
12.01.2021 06:00 AM

The Matrix Is the Best Hacker Movie

Most people point to *Sneakers*, *Hackers*, or *WarGames*. They're all wrong. The Wachowskis actually invented the ultimate cyber superhero.
ILLUSTRATION: OLEG BUYEVSKY

In the spring of 1999, a 20-year-old hacker named Eva Galperin and her boyfriend walked into a screening of *The Matrix* at a theater in San Francisco, and walked out with a sense that they had just seen themselves—or, at least, who they could be. Galperin, at the time a Unix-focused systems administrator with black and blue dreadlocks, promptly bought herself a long, black, flared coat. Her boyfriend purchased a pair of Oakleys.

But it wasn't just the movie's fashion sense that spoke to them. Galperin felt it represented the experience of hacking in a way she'd never seen before. Neo seemed chosen to undertake his superheroic journey because he understood that "by interfacing with this black screen with glowing green writing on it, he could change the world in ways that it was not necessarily meant to be changed," says Galperin, who works today as the director of cybersecurity at the Electronic Frontier Foundation. "I definitely came out with the feeling: Our people made a film."

For years the generally accepted canon of classic hacker movies has been a kind of holy trinity: 1983's *WarGames*, with its digital delinquent caught up in Cold War geopolitics; the 1992 computers-and-cryptography heist film *Sneakers*; and 1995's teen cyber-hijinks thriller *Hackers*. With a couple of decades of hindsight, however, it's well past time to recognize that *The*

Matrix has in some ways eclipsed that triumvirate. As other hacker films ossify, turning into computer cat-and-mouse-game time capsules, *The Matrix* has become the most abiding, popular, and relevant portrayal of hacking—a brain-plug jacked so deeply into our cultural conception of the genre that we've almost forgotten it's there.

Fans of those other films will point out that *The Matrix*'s goth-garbed flying kung fu fighters don't hack much in the literal sense. Yes, Neo starts the film selling digital intrusion tools stored on MiniDiscs, and in the sequel Trinity realistically uses the scanning program Nmap to breach an electric utility server. But those moments are only brief winks at the real world of cybersecurity.

The real hacking in *The Matrix* is metaphorical. The red-pill lesson Morpheus gives Neo is that a user in a digital system doesn't have to abide by its terms of service. For those who understand the underlying truth of a virtual environment—its technical reality, not the illusions described in the user manual—rules like gravity are not immutable laws but polite conventions. “Some of them can be bent,” Morpheus tells Neo. “Others can be broken.”

In most real-world hacking, that rule-breaking plays out within the uncinematic frame of a computer screen. *The Matrix* expands that computer to envelop reality itself; the virtuosic bending and breaking of digital rules naturally becomes a kind of physics-defying wushu.

“*The Matrix* shows the universe that software can create,” says Dino Dai Zovi, a well-known hacker and security researcher who cofounded the security firms Trail of Bits and Capsule8. “And the more that software controls everything in our lives, the more awe-inspiring it becomes to have power over that software.”

This concept of hacking transcends the technology of any particular era, which explains why hackers, years later, still resort to the movie's analogies to explain their work. When University of Michigan researchers exploited a chip's electric leakage to hide a backdoor in it in 2016, they described it as “outside the Matrix.” When security researcher Joanna Rutkowska showed

she could trap a victim computer inside an invisible layer of software under her control, she dubbed it a “blue pill” attack.

“I can use *The Matrix* to explain, well, that's the woman in the red dress that everybody sees, but a hacker can see the code that renders that woman and change the color of her dress,” says Katie Moussouris, a renowned security researcher and CEO of Luta Security. “And even though you, the programmer, didn't mean to allow that, it's possible because I can inspect what's really going on under the surface.”

Most of all, *The Matrix* captures the *feeling* of hacking, says Dai Zovi, who first saw the film when he was a 19-year-old college student. A year later, he was working as a systems administrator for an ultra-early social media company called SuperFamilies.com, which had a few extra Sun Microsystems workstations lying around. One Friday he asked if he could take one home to mess with it—and found a memory corruption vulnerability in its software that he spent an entire spring break learning to exploit.

When he had finally succeeded, Dai Zovi experienced for the first time what it felt like to fully take over a piece of code with a technique he'd invented, making it do whatever he wished. He compares it to when Neo leaps into Agent Smith's body, explodes him, and then stands silently in his place while the world subtly bends around him. “He does this flex, and the screen sort of bubbles, like he warps spacetime,” Dai Zovi says. “When you write your first exploit—or your hundredth or thousandth—you feel that flex. You want to run it a million times once you perfect it, to get that feeling of power and capability.”

Hackers don't quite wield superpowers in our reality just yet. But as networked computers permeate even more physical objects—our cars, home devices, and even critical infrastructure like electric grids, water supply systems, and manufacturing—modern life is becoming more Matrix-like all the time. The ability to control those computer systems becomes a skill that can alter the real world.

Unplugging from that pervasive computing is, for most of us, already no longer an option. Better, perhaps, to don your flared coat, dive into the

digital world, and start bending some spoons.

More from WIRED's special series on the impact of the *Matrix* franchise—and the future of reality

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This article appears in the December 2021/January 2022 issue. Subscribe now.

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Amy Webb

Science
12.01.2021 06:00 AM

Welcome to the (Synthetic) Meatspace

Reactor-grown nuggets, human-edited genetic code, and new mRNA technologies could change our relationship to life itself.
ILLUSTRATION: CHRISTIAN GRALINGEN

Midway through *The Matrix*, Cypher glides a knife through an enormous steak, gazes at the hunk of meat dangling off his fork, and acknowledges that his reality is not, well, real. That steak is a construct, part of a digital program telling his brain that it is “juicy and delicious.” Angry and disillusioned with the harsh, scorched real world, Cypher asks for safe passage back to a virtual one, where he'll once again be fed a steady stream of preprogrammed electrical signals to be interpreted by his mind as a luxurious experience.

That scene stayed with me, back in 1999, after the credits rolled and I exited a Tokyo movie theater not too far from Akihabara, a dense hub for vendors selling electronics, video games, and experimental displays, all of which presaged a *Matrix*-like future. We'd escape into a digitized reality, using headsets or wires, to frolic in virtual landscapes.

Two decades later, something unexpected looms: The future of reality will be virtual, yes, but also synthetic. Starting with components from the natural world—DNA, more basic molecules, cells–scientists are already altering biology, performing a kind of alchemy that allows these materials to serve a new or better purpose. Cypher's future meal will not be a digital construct but a physical one, synthesized from animal cells.

And scientists are synthesizing more than just dinner. The opportunities for breakthroughs in medicine, human performance, and materials science are enormous. But biology has a tendency to evolve in unexpected ways. Our new designs for life have the potential to morph into unrecognizable mutations of what we see today, leading to a cascade of unintended consequences.

The forces driving the synthesized meat movement are practical. Modern agricultural systems are helping destabilize Earth's climate and ecosystems, while extreme weather events add immense uncertainty to farming and ranching. Scientists at Oxford and the University of Amsterdam have estimated that cultured meat would require 7 to 45 percent less energy, occupy 99 percent less land, and produce 78 to 96 percent less greenhouse gas than conventional animals farmed for consumption.

A synthetic-biology-centered food supply mitigates greenhouse emissions in other ways too. For one thing, it promises to shrink the distance between various operators in the supply chain. Once eaten only in Japan, sushi now requires a CO_2-intensive operation of commercial fishing grounds, fishermen, freezers, temperature-controlled airplanes, and refrigerated trucks to bring raw fish to the masses. Synthetic tuna would remove most of those steps while coming close to the real thing; Finless Foods, based in California, is already developing cultured bluefin tuna meat. In the next decade, large bioreactors might be situated just outside major cities, producing cultured meat to be used by schools, hospitals, and perhaps even restaurants and grocery stores. Sea life currently threatened by overfishing could once again flourish in our oceans.

But once we're able to synthesize meat, we'll face a novel regulatory challenge. Theoretically, we'll have the capability to culture meat from any animal, which means that some people will choose to culture and consume animals we'd never consider eating today because of their high level of intelligence, like dolphins, chimpanzees, and elephants. Someone, somewhere, might just attempt to make cocker spaniel kebabs, which, technically, will fall outside the jurisdiction of current regulatory agencies. A ban on certain synthetic meats might go into effect, but a black market

and an underground speakeasy scene for thrill-seeking diners would potentially emerge.

Your favorite wine, beer, and spirit is about to be synthesized too. If, like me, you're a bourbon drinker, you know how important the aging process is—seasonal temperatures constrict and expand the wood of the barrel, producing rich flavors over several years. If something goes wrong during that long process, it can be financially catastrophic for the distiller (not to mention heartbreaking for the drinker). But a synthetic booze, designed using artificial intelligence to identify patterns in a massive data dump of possible style and flavor combinations, would reduce the uncertainty of waiting. A synthesized whiskey could be made out of its molecular components to have the characteristics of a product from a Kentucky distillery, but be bottled in a lab in San Francisco. Bay Area companies like Bespoken and Endless West are producing engineered spirits now.

Synthetic flavors are going to call into question what we think of as authentic and good, and what roles humans must play in cultivating what we eat and drink. We assume that consumers will pay for craftsmanship, and that may still be true in the future, with a twist: What if they value chief bioscientists and their work more than master brewers?

If we can see beyond the haze of our synthetic Old Fashioneds, the current moment—in which we are learning to manipulate molecules, engineer microorganisms, and build biocomputing systems—is the start of a new era in the evolution of civilization: the Biological Age. What we build during this new age will unlock new business opportunities, mitigate or even reverse environmental damage, and improve the human condition in countless other ways. In May 2010, scientist J. Craig Venter and his team announced an astonishing discovery: They could destroy the DNA of an organism called *Mycoplasma capricolum* and replace it with DNA they had written on a computer that was based on another similar bacterium, *Mycoplasma mycoides*. Using special software, DNA sequences are loaded into a sort of text editor for DNA code. After the DNA is written or edited to a researcher's satisfaction, a new DNA molecule is generated from scratch using something akin to a 3D printer. What I'm describing isn't

cloning life but, rather, redesigning it using synthetic biology, a new field of science that reengineers organisms to have new capabilities.

Venter's team named their 907-gene creature JCVI-syn1.0, or Synthia, for short. It was the first self-replicating species on the planet whose parents were, technically, computers, and the project was designed to help the team understand the basic principles of life, from the minimal cell up. In 2016, Venter's team created JCVI-syn3.0, a single-celled organism with even fewer genes—just 473—which made it the simplest life-form ever known. The organism acted in ways scientists hadn't predicted. It produced oddly shaped cells as it self-replicated. Scientists came to believe that they'd taken away too many genes, including those responsible for normal cell division. They remixed the code once again, and in March 2021 announced a new variant, JCVI-syn3A. It still has fewer than 500 genes, but it behaves more like a normal cell.

These variants are now considered by some to be a new branch on the tree of life—one where humans redesign and shape novel species. This level of control unlocks huge new opportunities. We've already had a glimpse of one, in the form of messenger RNA, found in the Pfizer-BioNTech and Moderna Covid-19 vaccines. Lab-manufactured mRNA delivers a set of instructions to cells that help them thwart the virus's attack. This approach —using synthetic RNA—is far more effective and adaptable than long-standing vaccine protocols. In effect, Moderna and BioNTech are crafting genetic instructions that can be written like software and packaged into the equivalents of nanoscopic USB drives. Once these biological drives are inserted into cells, those cells dutifully download mRNA instructions, translating a string of letters into a protein. The mRNA is then (metaphorically) ejected, and the cells produce certain components of the coronavirus in order to kick-start the immune system. Such vaccines would potentially be safer and easier to control, because unlike gene therapies, which can lead to permanent or even inherited genetic changes, mRNA only exists in our cells ephemerally, like a disappearing Instagram story. These vaccines for Covid-19 are just the first of many wonders that tomorrow's bioeconomy will create.

Using mRNA, scientists could instruct the body to build up its immunological defenses to find and kill cancers. Long before they were making Covid-19 vaccines, both Moderna and BioNTech were researching just that. After analyzing a tissue sample from a cancerous tumor, the companies run genetic analyses to develop custom mRNA vaccines, which encode protein-containing mutations unique to the patient's tumor. The immune system uses those instructions to search and destroy similar cells all throughout the body. BioNTech is currently in clinical trials for personalized vaccines for many cancers, including ovarian cancer, breast cancer, and melanoma. Moderna is developing similar cancer vaccines. Both companies understand that the most powerful drug factory on Earth may already be inside you. We just need to figure out how to harness it.

Biology is the most important technology of this century. However, unlike digital or inorganic physical technology, which tends to degrade or to seize up if not maintained, biology often self-sustains, even when we don't want it to. Here's where those unintended consequences come into view. Creating a minimal viable genome, or any other novel organism, could lead to a cascade effect and be impossible to manage in the wild, though the possibility of JCVI-syn3.0 escaping and causing harm is low. But what happens when engineered genes mix with wild populations and native species? So-called outcrossing could lead to new types of weeds, or a new pathogenic microorganism that could spread disease to other animals. A lab accident could result in today's harmless laboratory bacterium becoming tomorrow's ecological catastrophe.

The technologies used to edit and rewrite life are already in use, in some unexpected ways. In 2017 researchers at the University of Tokyo and Stanford University reported that they had injected a rat embryo, which had been edited to grow without a pancreas, with special mouse stem cells. As the rat matured, it formed a pancreas made entirely of mouse cells. The team then transplanted cells from that pancreas back into a mouse that had been given a drug to cause diabetes and cured it of the disease. In a more worrisome milestone in biology, in 2021 scientists at institutes in China, Spain, and the US announced they had grown macaque monkey embryos that were injected with human stem cells. They grew in the lab for as long as 20 days before dying.

There is a term for these synthetic, hybrid life forms: *chimeras*, which in Greek mythology were part lion, part goat, and part serpent monsters. And a monkey-human hybrid is an ethical minefield. At some point, such chimeras will inherit qualities that are somewhere between humans, on which experimentation isn't allowed, and animals, which are often bred specifically for research. We don't have a system in place to define “human” characteristics in a world of animal-human chimeras. How will we decide when an animal becomes *too* human? What if chimeras escape and outcross in the wild?

Depending on where you stand, our coming synthetic realities land somewhere between “really exciting” and “gravely concerning.” The *Matrix* movies urged us to wake up and resist authoritarian rule. In our quest to break free of constraints, to rewrite life as we see fit, we may find ourselves grappling with an inverse problem: a total lack of control. Within the next decades, we will need to make decisions, like how to rethink our global supply of food and whether a commercial entity should be given the keys to evolution. If we're not careful, we might cleave society in harmful new ways. What if the digital divide that so worries people today is followed by a synthetic divide, in which only the wealthy enjoy the benefits of enhanced medicine and improved bodies? With powerful biotechnology systems in place, to whom will we grant the authority to program life, or to create new life-forms? As individuals, we have free will and a responsibility to make good choices about the coming bioeconomy, which we will need to survive on this planet and beyond. The code for our futures is being written today. It is where humanity's new origin story begins.

More from WIRED's special series on the impact of the *Matrix* franchise—and the future of reality

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The Editors

Culture
12.01.2021 06:00 AM

WIRED Peers Into the Future of Reality

Two decades after *The Matrix*, technologies have emerged that make us question what is real—in ways stranger, if less sinister, than the movie imagined.

The first Matrix movie introduced a generation of sci-fi fans to an ancient philosopher's saw: What if your entire reality were a deceit? Two decades on, the film's plot—free-thinking renegades attempt to expose the lies behind an oppressive system—is as timely as ever, but its conceptual premise feels almost quaint. The technologies that have emerged since then do indeed raise the question of what is real, but now they do it in ways that are stranger than even the movie predicted, if rarely quite as sinister.

Your day-to-day reality is an increasingly synthetic experience: Computerized voices inhabit your smart speakers, deepfakes bring dead movie actors back to life, and AI-generated artworks go for eye-watering prices at auction. The simulacrum is extending into food too: Supermarket shelves already contain countless vegan substitutes for meat and other animal products, and before long “real” meat, grown in a lab, will join them. You can inhabit virtual realities and augment your physical one with virtual characters (*Pokémon Go*), street signs (Google Live View), or furniture (Ikea Studio). All your social media profiles may be real, but does any of them reflect “the real you”? The same question goes for the profiles you can't even see—those stitched out of data held by credit card companies, shopping sites, or search engines. Each one is a virtual version of you that influences your physical life and, if there are errors in the data,

makes you out to be someone you're not. And now, everyone is suddenly talking about building this thing called "the metaverse."

In short, things are already weird, and they're going to get a whole lot weirder really fast. So we decided to use the release of *The Matrix Resurrections* as a springboard for a special issue of WIRED exploring the future of reality—one in which the question is not "What if we're all living in a simulation and don't know it?" but "What happens when we're living in a simulation and in reality simultaneously, and we know it, but we have trouble telling them apart?" In which case, it doesn't matter whether you take the red pill or the blue one: We're all going down the rabbit hole either way. *—THE EDITORS*

More from WIRED's special series on the impact of the *Matrix* franchise—and the future of reality

> Yahya Abdul-Mateen II Is Ready to Blow Your Mind
> At the End of the World, It's Hyperobjects All the Way Down
> Can a Digital Reality Be Jacked Directly Into Your Brain?
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Paul Ford

Ideas
12.01.2021 06:00 AM

The Most Efficient Way to Debug the Simulation

Look, some of these tickets just have to be marked WONTFIX so everyone can move on.
Illustration: Elena Lacey

This article is from WIRED's special series on the impact of the Matrix franchise—and the future of reality

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== NEW MEETING TRANSCRIPT AVAILABLE ==

====== “SIMULATION NEXT STEPS” =======

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===== SINGULARITY STANDARD TIME ======

Hello, everybody.

It's great to see you all in one place for the first time. I've been doing my best to learn your names, but I'm terrible with hexadecimal, so bear with me. Before we start, a quick housekeeping note: I know you're used to holding these stand-up meetings once per Earth extinction event, but I think we need a more agile cadence. Let's try Tuesday mornings. Look out for the calendar invite.

I'd like to begin by thanking each of you for the warm welcome you've given me since I took over as product manager. Like I told the Stakeholder this morning, I can't imagine a team I'd want to lead more. While I know your last PM had their own way of working, and many of you enjoyed the flexibility and latitude they gave you, I do want to remind you that they have been erased. So this is truly a fresh start for all of us.

Whenever I come on board as a PM, one of the first things I like to do is clean up the ticketing system. Too many open tickets can make it hard to see priorities and set shared goals. We currently have 2.37 trillion of them outstanding. At this stage I just want to call out a few showstoppers and explain my thinking. We'll be working through the rest in subsequent stand-ups.

ERTH-0019, "World peace." Look at the length of this thread! Obviously everyone wants this, because it seems like every engineer and designer had an idea or five to contribute—but no one wrote any code or broke it down into milestones. You'll hear me say this a quadrillion times, so start counting: **Visions are not goals**. If I can't see a straightforward way to make incremental progress and measure success with consistent, reliable metrics, I will remove a ticket. So seriously: Marking WONTFIX. Also in this category: HUMN-9991, "End war."

CHEM-1083, "Delete most silicates." Great ticket, but why didn't anyone step up to implement it before it was too late? We knew from prior simulations what would happen if they discovered semiconductors: They'd develop transistors and computers, figure out Moore's law, and pretty soon Elon Musk would be on Twitter. Imagine the number of wasted development cycles we could have avoided if we'd just replaced all the quartz and silicon with, I don't know, calcite. It's too late to do anything now; if we remove the silicates, they're going to realize they're in a simulation, and we'll have broken the Stakeholder's rule.

RLGN-3944, "Make prayers work." I know the original spec called for this, but ultimately it didn't land in early releases, and implementing it now would be a huge lift. We've spent all this time building out a big globalized economy, and suddenly we're going to let anyone who closes their eyes and makes a wish be a billionaire? Plus there are a ton of edge cases that I don't

see captured: Sure, someone could pray for Grandma to live, but for how long? What if not everyone wants to see her thriving? Marking WONTFIX and archiving.

MNEY-3848, “Replace simulated real currency with simulated digital currency.” This is one of those tickets where engineers make up the solution to a problem that exists only in their heads. There was one galaxy I managed where the interplanetary currency was denominated in shrieks of pain (wedding gifts were a particular challenge), but even that made more sense than the blockchain. That said, we're in it now and we need to see this one through. Leaving the ticket open and looking for ideas.

ERTH-4873, “Fix Versailles.” Great example of a badly worded ticket. It was filed in 1927, so the original intent was clearly to lower the financial burdens on Germany after the First World War and avoid a second. Instead, an engineer and a designer spent 20 years shaping the topiary at the gardens of Versailles, which is an edge case at best, and by the time anyone noticed, we were down, what, 70 million users? This is not what the Stakeholder is paying for. Archiving.

PNGA-8901, “Add more ice to the Arctic.” Another good ticket, and I can't figure out why it was ignored. If we'd done this we'd have much less mess on our hands.

MAML-0784, “Squirrels but with spider legs.” This is one I just hate. There's no use case, no market demand, yet for some reason at least three of you believe this sim needs eight-legged squirrels. Also, why is it sized at two months of work? It's an afternoon in the modeler for any designer. So I can't decide whether I'm more annoyed that it was proposed or that it didn't happen. There are millions of tickets like this. Not even marking them WONTFIX, just deleting.

I'm also closing out “Elect a dinosaur president” (Was this serious?); “World peas” (duplicate of ERTH-0019); “Have just one gender and race” (I've tried this and it was far, far worse than you might expect); “Make a new religion based on science” (Fun idea, but you have no idea how insufferable it gets); “Introduce generalized artificial intelligence” (When

we let them do that they figure out it's a simulation! Remember what the Stakeholder pays us for!).

In general, I feel that this group has lost track of the Stakeholder's mandate, which is to build the most ridiculous, grimly comical universe possible within physical law. I did hear in my first meeting that they liked the US health care system, Enlightenment-era sea piracy, and cats. They hated the US Civil War (too serious), squirrels (I guess that's why someone suggested spider squirrels?), and Facebook (unusable). Overall, it seems like this has been a disappointing experiment, which is probably why it's been so hard to get resources to expand it beyond just this one planet. I know you all feel that. Stick with me, though. At my last universe, I managed to spin out over 30 galaxies. Or you can be harvested and turned into metaversal cognicurrency. Your call.

I may ask for some nights-and-weekends work up front, but know that I want us all to get onto a normal schedule. It's clear that we need to be communicating much more frequently. I'll be organizing some epics, and I don't mean HIST-0003, “Send the Bull of Heaven to attack Gilgamesh.” (Seriously, let's not go there again.)

Also I know you all put a lot of work into it, but we should probably go ahead and sunset the moon.

See you Tuesday. I'll bring coffee.

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Nicholas De Monchaux

Ideas
12.01.2021 06:00 AM

What *The Matrix* Got Wrong About Cities of the Future

Where the movie foresaw a distinction between digital and physical reality, modern cities are merging them, and not necessarily in a good way.
ILLUSTRATION: PAULINA ALMIRA

Like neo's pink, hairless body in *The Matrix*'s great reveal, cities have been invaded by tubes for nearly their entire lives. Over the centuries, water pipes, gas pipes, steam pipes, electricity cables, and air ducts have crept across buildings and landscapes, coursing through walls, floors, and sidewalks on their way to making the modern world.

By a long margin, the water came first. Earthen conduits moved stormwater in Xi'an, China, millennia ago; lead tubes led drinking water under the stone-paved streets of classical Rome. In response to the waterborne pandemics of the 19th century, the modern European and North American city became defined by sewers and drains so extensive as to be beyond imagining. Today, when water tumbles out of the tap into your sink, it is but a cameo turn in an epic journey from faraway reservoir through final sewage treatment, across dozens—even hundreds—of miles, and months or years of time.

Like the blood vessels of our own bodies, the pipes and wires of modern buildings and cities structure our lives while remaining almost entirely hidden. Yet they inexorably define the spaces we inhabit. These conduits bring us the ubiquity of suspended ceiling grids—designed to screen the mess behind. They also brought us the grand expanse of the Champs-

Élysées—engineered to cover the enormous masonry sewers that ushered in Paris' ultimate triumph over cholera.

Today's urban infrastructure is the latest step in this long history, but unlike the tubes and wires of the past, it doesn't merely shape the city. Rather, it presents challenges more akin to the larger conflicts of *The Matrix* itself—between the city's real body and a newly present, virtual reflection of it.

This new infrastructure is one of information. While cities have always been defined by the flow of ideas, for most of human history these were stored in our heads, or in objects we carried—scrolls, tablets, books, and paper. In the Industrial Age, however, huge swells of productivity and connectivity were unleashed by the machinery of connected data—from pneumatic tubes for paper telegrams to the mid-century telex, the wired telephone infrastructure, and the wireless networks now displacing it.

This architecture of media and information has transformed public and domestic space—whether in the form of the phone booth, the Wall Street trading floor, or the TV-centric layout of our living rooms—just as surely as the fountain and the sink did in their days. An x-ray of a skyscraper would reveal an agglomeration of hundreds of miles of cable and conduit wrapping around the structure, enabling human beings to live in densities greater than at any point in human history and connecting their bodies and minds to a vast, shared system of resources and communication.

Yet one constant throughout these centuries of development, extending into the Information Age, has been the premise that infrastructure is a shared, public good. In the long history of Rome, the link between flowing water and good governance has always meant that, even in a modern drought, the city's mayors turn off the *nasoni*—Rome's ubiquitous public drinking fountains—at their peril. In the 1970s, contracts were handed to US cable television providers only in return for the promise of public programming—from school board hearings to city council meetings. This balance of real and virtual, public and private, remained fairly constant for most of the 20th century.

What's more, the public good of shared infrastructure includes something more intangible and encompassing than the simple provision of stuff. By

providing the same thing, in the same way, everywhere, traditional infrastructure opens up a space of innovation—whether for business owners or appliance designers or even sidewalk vendors—in which further experimentation and invention is possible. Whether street grid or electricity grid, this foundation of public infrastructure is what enables much of our global culture's inventiveness, resilience, and meaning. It makes neighborhoods and collaborations possible.

It is not just the pervasiveness of infrastructure but its relative neutrality that is at the core of such possibilities. When you can walk everywhere, you might end up wandering anywhere. You see the whole city on your way, but you are, to all who don't yet know you, whoever you wish to be. And architecturally, the space you find, empty but with utilities, is not a liability so much as a cultural and social possibility. Just as much as running water, the city's infrastructure supports the serendipity, anonymity, and reinvention at the core of all of our best possibilities—and the city's generative role in our economy and society.

This is also where the transition to a third age of information-led city infrastructure represents a break with the past—and where *The Matrix*, for all its prescience, likely misread the future.

In 1999, the virtual world of computing was still something we thought of as quite separate from our real bodies and cities. As in *The Matrix*'s own influences—William Gibson's cyberspace, Neal Stephenson's Metaverse—a digital, networked reality was another domain, unconstrained by limitations like space and gravity and untethered from our real-world selves. *The Matrix*, accordingly, is premised on a clear division: between reality, where the rebels' ship coasts through underground caverns in a postapocalyptic wasteland, and the virtual realm of city streets and office buildings in which most people live out their simulated lives. In today's landscape of urban data, by contrast, the effect of technology working its way into every body, object, and environment has been to create a parallel world that is bound indelibly to the real one—but, like the Matrix, still operates by very different rules.

This new world is inhabited by our digital shadows. They follow our steps in the real one and are born from the data trail we leave when we post on

social media, search on Google Maps, order things from Amazon, or leave reviews on restaurant sites. Some companies now favor the phrase “digital twin” to describe this doppelgänger—not even our ghost, but our constantly reshaped reflection.

Yet the virtual city is a mirror that distorts as much as it reflects; our virtual shared space remains radically different from our physical one. Offline, our infrastructure is largely public, our movement is still mostly free and without surveillance, and laws govern our interactions. Online, we exist in an entirely privatized world with weak governance, few civil liberties, and an entirely commercial raison d'être. To simply gain access to today's digital environments, we have allowed a degree of control and intrusion—the tracking and storing of every fragment of our online lives—that we would never accept in what we still refer to as “reality.”

Much of the blame for this predicament lies precisely with the nostalgic 1990s idea, implicit in *The Matrix*, that our real and virtual selves are separate. But, as should be obvious by now, they are not. Indeed, our compromises in the digital realm are what allow Google and Facebook to transform our data into supra-governmental economic might in the physical one. While such companies are not powered by anything quite so literal as the hibernating human batteries of the movie's dystopian towers, they do subsist on our humanity—the extracted value of our relationships, ideas, and experiences.

This power is now evident in the shaping of our cities as well. The effects are sometimes subtle, like expanded building lobbies for package delivery or the closed storefronts of local merchants put out of business by online retailers. Sometimes they are more dramatic. When Egyptian activists used Facebook to coordinate protests in Tahrir Square a decade ago, we marveled at the virtual world's ability to reshape civic space. When social media algorithms, optimizing for sustained attention and outrage instead of truth or transparency, helped drive people toward the US Capitol riot of January 6, 2021, the events left their scars in the form of fences around the Capitol.

Compared with such upheavals, the changes to our behavior and environment wrought by something like Google's Live View, which overlays walking directions on the view through your smartphone camera,

may seem mild, or even useful. When Google points us toward the perfect coffee shop or Amazon suggests those just-right mugs or Facebook shows us things that consistently pique our interest (and outrage), it appears to us as coincidence. But what we are actually experiencing is the opposite—the optimization of our attention through surveillance. It exists in contrast to the serendipity we experience as we wander a city, in which boredom, chance, and the ability to inhabit different, unexpected versions of ourselves and our experience are all instrumental. And it is the polar opposite of the anonymity, and opportunity for reinvention, that the city best affords.

Consider, once more, *The Matrix*. Twenty years on, one of the most essential but anachronistic elements of the plot structure is the idea that Morpheus' crew can relatively easily evade surveillance in the virtual world they occupy. The spaces most celebrated by the film—dingy, fabulous nightclubs, stylish down-at-heel neighborhoods—are those of transgression, invention, and remaking of the kind the movie as a whole celebrates. Today, the prevalence of surveillance in our digital lives and the growing use of AI-powered technologies like facial recognition scraped from social media profiles to track our real bodies make the prospect of such easy digital anonymity seem as dated, if charming, as the film's Nokia banana-phones.

In the later Matrix movies, the walls between the real and virtual world collapse, and the human-batteried AI juggernaut comes to its own kind of reckoning. In the fabric of our cities and landscapes, we face a reckoning too. As the infrastructure of the virtual world becomes ever more twinned with our physical reality, will the decisions and compromises we've made in virtual space come to define our physical one? Or will we instead begin to bring some of the principles that have made civic space a public resource into the virtual world?

Today, some of the best prospects for doing so are afforded by activists, researchers, or journalists who use the tools of digital data collection to create graphics and visualizations that render visible that which we tend to overlook in today's urban environments—from the racial and social disparities between neighborhoods to the structures of informal transportation. Such work embraces the prospect that digital data can be a tool for more just, sustainable, and even beautiful cities.

With the third wave of urban infrastructure now upon us, we face a fundamental choice. On the one hand, we could continue to allow the optimization and exploitation of digital space by private companies to define our shared, civic reality. On the other, we could embrace the guiding principles that have best shaped cities across history—equal access, accountability, even anonymity—and demand them of the cities of tomorrow as well.

More from WIRED's special series on the impact of the *Matrix* franchise—and the future of reality

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Madeline Ashby

Culture
12.01.2021 06:00 AM

It’s Time to Reimagine the Future of Cyberpunk

In the 20th century, the genre imagined the body modifications and protective streetwear that could save us from our own future. Now it needs to envision humanity anew.
ILLUSTRATION: DEBORA CHEYENNE

Cyberpunk is like cyberspace: instantly recognizable, but so ubiquitous as to be intangible. An aesthetic movement and a commentary on capitalism, it can be a genre, a subjectivity, an adjective, a political approach, a time period. (Though the same could be said of the words *Renaissance* or *Victorian*.) It can tackle artificial intelligence, embodied identity, digital immortality, or simply, in the case of Pat Cadigan's *Synners*, whether a marriage can survive electronic pornography addiction. Like the best fiction, cyberpunk still slips on like a pair of fingerless gloves, even if—in the 21st century, partially situated in the future it imagined—it's hard to see where fiction ends and reality begins.

Despite all of this, cyberpunk often gets reduced to an aesthetic: black leather, mirror shades, implants—pieces of flare that look cool when lit by neon and computer screens. But to define cyberpunk by its look is to do it a disservice, especially since those sartorial choices are the whole point in the first place: armor against a world in collapse. In a future so hostile that no one is fit to survive, those who *do* have been fitted for something new—new brain, new heart, new nerves—perhaps in exchange for a lifetime of indentured servitude. Cyberpunk foretold a desperate world of unlicensed

physicians doing back-alley body modifications, and while so far all they do is perform illegal butt lifts, with Crispr, who knows?

Perhaps the genre gets pigeonholed by its look because, going back to old testaments like *Neuromancer* or *Snow Crash*, it seemed allergic to any talk of feelings. Ideas, sure; sentiment, no. Like the noir fiction with which it so frequently overlaps, cyberpunk is full of wounded characters whose pursuit of physical invulnerability keeps them emotionally unavailable to everyone but the audience. It's telling that people turned against the *Matrix* films when they had the audacity to be lushly, erotically romantic—when climaxes hinged on a hero knowing how to reach inside his partner and touch her just right. Viewers weren't ready for a Wife Guy who wanted to walk away from his messianic power; it was like watching an entire trilogy of *The Last Temptation of Christ*'s final 15 minutes, right down to the long hair and linen.

Still, 40-ish years since its incept date, cyberpunk maintains a vast claim on the aesthetic landscape—one often ironically divorced from the dark, anti-capitalist messages those visuals sought to convey. It has inspired video games like *Cyberpunk 2077* (naturally starring Neo himself, Keanu Reeves), an Urban Decay eye shadow palette characterized by deeply '90s duo chromes, a collaboration between Yohji Yamamoto and Adidas, and roughly 4 million posts on Instagram. For everyone who watched *Stand Alone Complex* on Adult Swim (or, let's be real, a DivX player), there's now a bespoke keyboard aglow with bisexual lighting, a liquid meal plan, or a "smart" vibrator. For everyone else, there's cottagecore.

Here's a fun game: First, check out *Mondo 2000*'s tongue-in-cheek 1993 piece "R.U. a Cyberpunk?" Note the abundance of straps, holsters, and handheld cameras. Then, go look at photos from January 6, 2021, or the bow-and-arrow-wielding protesters who took to Hong Kong's streets in 2019, or MRAPs rolling through Portland. Ask yourself: If a specific future has already happened, what happens to stories about that future? Now that time has caught up with them, are these visions simply contemporary literature, no more speculative than stories about donated kidneys and grown men dating high schoolers?

“Above culture, clothing, and genre, cyberpunk is a lifestyle that blends a combination of ‘low-key living’ with a deep understanding of social fabric backdoors and full access to high-tech gadgets,” fashion writer Mandy Meyer wrote in *The Vou*. Yossy, the founder of Japanese cyberpunk fashion brand Helvetica, has stressed that the clothing should use innovative materials yet be functional, telling Shell Zine it “should strengthen the wearer, like an exoskeleton, and at the same time be comfortable and not too stuffy or formal.” Mostly this means dressing like you live in Seattle, because in cyberpunk it's always raining.

In this regard it's difficult to discern the line between the influence of a genre on design aesthetics and the grudging march of time (and brands) into the endless fires and floods of the 21st century—a context wherein the tactical is practical. Dreams of jetpacks have been replaced by designs for bulletproof backpacks. From a genre perspective, the future resembles science fiction less than it does a murder mystery: A whole planet is dying while its inhabitants argue about who stuck which knife in.

Before cyberpunk was reduced to an aesthetic, it was a philosophy. Whereas earlier generations of science fiction located conflict outside the body, on the battlefield or in the stars, the post-Watergate, post–*Roe v. Wade*, post-Vietnam generation of mostly American sci-fi writers imagined that the next theater of combat would be the human body and mind. Today, when it seems like every Facebook group is a Potemkin village and Texans can put bounties on abortion providers, that suspicion seems well warranted.

The most prescient aspect of cyberpunk was not any one particular innovation, like razor fingernails or brain-machine interfaces or even a ubiquitous metaverse awash in pornography, advertising, and the viruses endemic to both. Instead, it was the genre's focus on the ongoing commoditization of human workers by a narrowing field of multinational corporations. Instead of creating same-jackboot-different-day dystopias like *Logan's Run* or *Make Room! Make Room!*, cyberpunk writers asked, “What if capitalism is the dystopia?”

Some of the most influential texts in the genre are about labor and bodily autonomy. *Blade Runner* is a story about runaway slaves, and *Blade*

Runner: 2049 is about the reproduction of slaves. *Neuromancer* is about a man selling his hacker skills to earn back the full function of his body's nervous system. *Akira* features government experimentation on children's bodies so they can better perform militarized work. *Snow Crash* presupposes a Los Angeles populated with precarious gig workers delivering pizza. *Ghost in the Shell* wonders who truly "owns" a cyborg body if an employer pays for its upkeep. *The Matrix* operates on the premise that all human bodies can be "grown" into batteries whose primary purpose is to keep artificial intelligence functioning.

Writing for Slate, Kelsey D. Atherton summed up cyberpunk's present-day parallels thusly: "Replace the Tyrell Corporation with Amazon and reframe the replicants as 'essential services,' and suddenly you have a world of workers terrified that their jobs are inherently a death sentence—moving straight from fiction to reality." Technology studies scholar Damien P. Williams agrees: "I think cyberpunk is still relevant, but in a different way; rather than a warning about where we're headed, it's a mirror about where we managed to end up."

Not everyone concurs. In the face of a burning planet, the idea of using technology to achieve immortality seems naive at best. Young people in China are "lying flat" instead of working, and refugee children in Sweden have "resignation syndrome"; in a world where despair is a #mood, the desire to extend life indefinitely is a little vampiric, if not simply gauche. "Cyberpunk was relevant and important to boomers obsessed with questions of law and order, and who were determined to avoid the realities of human aging and embodiment. In 2021, we have new and different mass obsessions, making cyberpunk seem quaint," says Hugo nominee and Nebula Award winner Kelly Robson. "In conclusion, fuck cyberpunk."

Considering the world has caught up with, if not surpassed, the genre's imagination, its place in fiction might be limited, or limiting, in the way that rehashing Tolkien might be limiting for a fantasy writer. This is one of the challenges of telling a future-set story: Eventually time catches up, like a rubber band snapping back into shape. And sometimes it stings. Readers often assume that authors are happy when they "predict" future events "correctly," but rarely are we asked about the queasy feeling of watching

one's worst vision come to pass. Describing his debut novel for CrimeReads, Lincoln Michel says, "*The Body Scout* is an attempt to replace the 'cyber' in cyberpunk with flesh and look at what happens when the human body becomes the major realm of technological innovation and corporate control … These days, the greatest dystopian novel might be the evening news."

Just because cyberpunk's history looks like the present doesn't mean it can't point toward the future. Ten years after Bruce Bethke published his 1983 short story "Cyberpunk," Octavia E. Butler released what is arguably one of the most influential novels in science fiction, *Parable of the Sower*. It tells the story of a young Black woman named Lauren Olamina living outside Los Angeles in 2024, watching as an authoritarian president is elected, human rights eviscerated, company towns built, and old neighborhoods destroyed. Lauren does what heroes do: She prepares. She gathers her wits and her seeds and leads her community toward freedom and, ultimately in the book's sequel, the stars. Like most of Butler's novels, it shifted the narrative focus from individual rebellion and success to communal liberation and legacy. If cyberpunk warned about capitalism's cancerous late stages, *Parable* asked, "So what are you doing about it?" And while cyberpunk as a genre took on metaphors for slavery and autonomy, Butler's books examined the actual transatlantic slave trade.

Butler's fiction focused on, among other things, genetic engineering, the embodied experience of aliens and posthumans, what an individual owes to her family and community, power and its uses, terrible sacrifices in the name of survival. Recalling a dinner with her in *Essence*, author and scholar Tananarive Due says Butler expressed the central question of her work as "How can we make ourselves a more survivable species?" Although she is considered the mother of Afrofuturism, her narrative patterns also repeat across all of cyberpunk's genre successors: hopepunk, biopunk, solapunk, and more. She echoes in Nalo Hopkinson's *Midnight Robber*, Premee Mohamed's *The Annual Migration of Clouds*, Louise Erdrich's *Future Home of the Living God*, Nnedi Okorafor's *Lagoon*, Becky Chambers' *The Long Way to a Small, Angry Planet*, Tade Thompson's *Rosewater*, L. X. Beckett's *Gamechanger*, and more. In Toronto, Black Lives Matter activists just purchased a 10,000-square-foot community hub for Black artists and

activists and named it the Wildseed Centre after one of Butler's books. Whether or not any of this qualifies as cyberpunk activity, it's still exemplary of what the movement could look like.

In her notes, Butler said: “The struggle is to hold it together, keep it alive, and teach it to be and do its very best.” She was summarizing Mother Olamina's ongoing mission, but she was also describing the 21st century in searing detail. This is the work of forward-looking science fiction. For better or worse, so much of cyberpunk's android dreams have come true. Now we have to imagine how to build ourselves anew.

More from WIRED's special series on the impact of the *Matrix* franchise—and the future of reality

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Meghan O'Gieblyn

Ideas
11.29.2021 08:00 AM

My Music App Knows Me Way Too Well. Am I Stuck in a Groove?

WIRED's spiritual advice columnist on predictability, freedom—and the duality of rebellion.
Illustration: Michael Kennedy

One of the streaming music apps I use creates customized playlists for me, and it's scarily good at predicting songs I'm going to like. Does that make me boring?

—Playing It Safe

Dear Playing It Safe,

I once read somewhere that if you want to slowly drive someone mad, resolve, for a week or so, to occasionally mutter, "I knew you were going to say that" after they make some casual remark. The logic, as far as I can tell, is that by convincing a person that their thoughts are entirely predictable, you steadily erode their sense of agency until they can no longer conceive of themselves as an autonomous being. I have no idea whether this actually works—I've never been sadistic enough to try it. But if its premise is correct, we all must be slowly losing our minds. How many times a day are we reminded that our actions can be precisely anticipated? Predictive text successfully guesses how we're going to respond to emails. Amazon suggests the very book that we've been meaning to read. It's rare these days to finish typing a Google query before autocomplete finishes our thought, a

reminder that our medical anxieties, our creative projects, and our relationship dilemmas are utterly unoriginal.

For those of us raised in the crucible of late-capitalist individualism, we who believe our souls to be as unique as our thumbprints and as unduplicable as a snowflake, the idea that our interests fall into easily discernible patterns is deeply, perhaps even existentially, unsettling. In fact, Playing It Safe, I'm willing to bet that your real anxiety is not that you're boring but that you're not truly free. If your taste can be so easily inferred from your listening history and the data streams of "users like you" (to borrow the patronizing argot of prediction engines), are you actually making a choice? Is it possible that your ineffable and seemingly spontaneous delight at hearing that Radiohead song you loved in college is merely the inflexible mathematical endpoint of the vector of probabilities that have determined your personality since birth?

While this anxiety may feel new, it stems from a much older problem about prediction and personal freedom, one that first emerged in response to the belief in divine foreknowledge. If God can see the future with perfect accuracy, then aren't human actions necessarily predetermined? How could we act otherwise? A scientific version of the problem was posed by the 19th-century French physicist Pierre-Simon Laplace, who imagined a cosmic superintelligence that knew every detail about the universe, down to the exact position of all its atoms. If this entity (now known as Laplace's demon) understood everything about the present world and possessed an intellect "vast enough to submit the data to analysis," it could perfectly predict the future, revealing that all events, including our own actions, belong to a long domino chain of cause-and-effect that extends back to the birth of the universe.

The algorithm that predicts your musical preferences is less sophisticated than the cosmic intellect Laplace had in mind. But it still reveals, to a lesser degree, the extent to which your actions are constrained by your past choices and certain generalized probabilities of human behavior. And it's not difficult to extrapolate what predictive technologies might expose about our sense of agency once they become even better at anticipating our actions and emotional states—perhaps even surpassing our own self-

knowledge. Will we accept their recommendations for whom to marry, or whom to vote for, just as we now do their suggestions for what to watch and what to read? Will police departments arrest likely criminals before they commit the crime, as they do in *Minority Report*, tipped off by the oracular predictions of digital precogs? Several years ago, Amazon filed a patent for "anticipatory shipping," banking on the hope the company would soon be able to correctly guess our orders (and start preparing them for dispatch) before we made the purchase.

If the revelation of your own dullness is merely the first stirrings of this new reality, how should you respond? One option would be to rebel and try to prove its assumptions false. Act out of character. When you have an inclination to do something, do the precise opposite. Listen to music you hate. Make choices that will reroute your data stream. This is the solution arrived at by Dostoevsky's narrator in *Notes From the Underground*, who takes up irrational and self-damaging actions simply to prove that he is not enslaved to the inflexible calculations of rational self-interest. The novel was written during the heyday of rational egoism, when certain utopian thinkers believed that human behavior could be reduced to a series of logical rules so as to maximize well-being and create the ideal society. The narrator insists that most people would find such a world intolerable because it would destroy their belief in individual freedom. We value our autonomy over all the comforts and the advantages that scientific determinism offers—so much so, he argues, that we would seek out absurdity or even self-harm in order to prove that we are free. If science ever definitively proves that humans act according to these fatalistic rules, we would destroy ourselves "for the sole purpose of sending all these logarithms to the devil and living once more according to our own stupid will!"

It's a rousing passage, though as predictions go it's not especially prescient. Few of us today appear to be tormented by the comforts of predictive analytics. In fact, the conveniences they offer are deemed so desirable that we often collude with them. On Spotify, we "like" the songs we enjoy, contributing one more shard to the emerging mosaic of our digital personhood. On TikTok, we quickly scroll past posts that don't reflect our dominant interests, lest the all-seeing algorithm mistake our curiosity for

invested interest. Perhaps you have paused, once or twice, before watching a Netflix film that diverges from your usual taste, or hesitated before Googling a religious question, lest it take you for a true believer and skew your future search results. If you want to optimize your recommendations, the best thing to do is to act as much like "yourself" as possible, to remain resolutely and eternally in character—which is to say, to act in a way that is entirely contrary to the real complexities of human nature.

With that said, I don't advise embracing the irrational or acting against your own interests. It will not make you happy, nor will it prove a point. Randomness is a poor substitute for genuine freedom. Instead, perhaps you should reconsider the unstated premise of your query, which is that your identity is defined by your consumer choices. Your fear that you've become boring might have less to do with your supposedly vanilla taste than the fact that these platforms have conditioned us to see our souls through the lens of formulaic categories that are designed to be legible to advertisers. It's all too easy to mistake our character for the bullet points that grace our bios: our relationship status, our professional affiliations, the posts and memes and threads that we've liked, the purchases we've made, and the playlists we've built.

What remains more difficult to predict are the qualities that make you truly distinct: your thoughts and beliefs, your personal history, the unspoken nuances of the relationships that have made you who you are, and the unbounded expanse of moral and imaginative possibilities that constitutes your own mind. Attending to those aspects of yourself is the work of a lifetime—and far from boring.

Yours Faithfully,
Cloud

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This article appears in the December/January issue. Subscribe now.

Virginia Heffernan

Ideas
11.26.2021 08:00 AM

Why Is It So Hard to Believe In Other People's Pain?

People—and groups—who are suffering are often dismissed. Scarry's axiom might help us understand why.
Illustrations by Santos Shelton

Hostile suspicion of others, encompassing everything from the position of their mask to their stance on mandates, has marked this wretched pandemic from the start. Now, in perhaps the unkindest cut, suspicion is aimed at people with long Covid—the symptoms that may afflict as many as a third of those who survive a first hit of the virus. One theory is that Covid infection riles up the body's defenses and can leave the immune system in a frenzy, causing shortness of breath, extreme fatigue, and brain fog. In *The Invisible Kingdom*, her forthcoming book about chronic illness, Meghan O'Rourke reports that doctors often reject these symptoms as meaningless. When medical tests for these patients come up negative, "Western medicine wants to say, 'You're fine,'" says Dayna McCarthy, a physician focused on long Covid.

This is not surprising. Skepticism about chronic conditions, including post-polio syndrome and fibromyalgia, is exceedingly common—and it nearly always alienates patients, deepens their suffering, and impedes treatment. Until researchers can find the biomarkers that might certify long Covid as a "real" disease, the best clinicians can do is listen to testimony and treat symptoms. But the project of addressing long Covid might also be served by a more rigorous epistemology of pain—that is, a theory of how we come to believe or doubt the suffering of other people.

In her 1985 book *The Body in Pain: The Making and Unmaking of the World*, Elaine Scarry makes a profound assertion: “To have great pain is to have certainty; to hear about pain is to have doubt.” Because the claim illuminates both pain and knowledge, and because women rarely attach their names to philosophical assertions, I'd like, belatedly, to dub this elegant proposition “Scarry's axiom.”

The axiom came to mind this fall for two reasons: I was trying to support a friend with long Covid, and I participated in a forum about how the media contends with racism. It was the second experience that illuminated the first and suggested Scarry's axiom as a way to understand the acute distrust that now pervades our pluralistic country.

At the forum, a socialist and a libertarian each lodged complaints. The socialist charged that the media's focus on racism leaves out a more significant battle—the never-ending class struggle. The libertarian argued that the media's focus on race fails to understand the individual, with his or her pressing fear of death and aspirations to art, money, and transcendence. The libertarian then took shots at easily offended undergraduates who put emotion before reason and are forever getting “offended” and needing “safety,” which he said were postures incompatible with education.

This familiar debate ground on. As far as I can tell, no one on any side—and I disagreed with both the socialist and the libertarian—ever budged. But perhaps that's because we kept missing a truth in front of our faces: that we were all dismissing as somehow less than real the pain of others while elevating our own, and that of our confreres, as hard fact.

As Scarry's book makes clear, this dynamic of doubt holds for both emotional anguish and physical pain. Microaggressions toward another tribe? Those can't be so bad. But setbacks to a meritorious individual's fortune-building efforts and attacks by sniveling critics and cancelers? To a libertarian, those represent authentic agony. Rich tech bros who complain of loneliness and despair? These strike socialists as entitled elites, weeping over their dented Teslas while the working class are trapped in debt.

But Scarry's axiom does more than conjure what some call the oppression olympics, the demoralizing squabbles about which demographic deserves a

gold medal for the greatest suffering. By the axiom, it's not that some forms of pain are more acute than others; it's that some pain seems undeniable while other suffering appears fraudulent.

You can see why this renders futile the well-intentioned empathy-building exercise in which students listen while classmates share trying personal experiences. Before we even think of empathizing with others—an advanced psychological operation—we have to confront a deeper problem: We don't even believe them. Paradoxically, the more insistent or dramatic an account of suffering is, the more likely listeners are to fear that they're being manipulated. If that anxiety about coercion is then conveyed as doubt ("I'm not buying it"), the original sufferer may perceive their listener's irritability as nothing but a cover for cruelty or gaslighting. And on it goes. This belief-doubt spiral is especially common in America, or on the internet, where no single idiom exists for the credible expression of pain.

Scarry argues that any response that meets the statement "I am in pain" cannot reflect the same degree of pain (since it's not in the respondent's body), and thus may strike the pained person as insufficiently understanding. The pained person might then decide that the best way to call attention to their affliction (the better to get relief from it) is by inflicting a little pain on the other party: snapping, shouting, crying, or turning away. Two people end up in pain—one with aches, the second with aggravation. Each is suspicious of the other. And each experiences the other as a source of pain instead of a salve for it.

This is on display in American medicine and politics, but it's cartoonishly clear in sports, especially pro soccer, which includes hammy performances of pain that fall outside the usual idiom of American athletics. While Americans love to exaggerate aggression, and consider flexing (trash-talking, posing, menacing an opponent) mostly wholesome, they famously disdain the common European move of exaggerating injury, or flopping. As Eric Levenson wrote in *The Atlantic* in 2014, American athletes fail at "selling their falls" with arias of agony, and try to pass off their refusal to flop as a "moral victory to cling to when they inevitably lose."

Why is this?

The refusal to cry out in pain seems grounded in an entrenched anxiety related to Scarry's axiom: What if all pain is an act, even our own? Seen this way, preserving skepticism about other people's groans and wails may be a shield against guilt. If we believe in another's pain, after all, we may feel obliged to fix it, or take on the blame. Here's where the debate about representations of racism comes in. A case study is the far-right complaint (in dubious faith) that white kids who are taught critical race theory are being guilt-tripped about the suffering of races to which they don't belong. In the unusual quest of Americans to feel no guilt, many of us are quick to forcefully repel claims of pain. We don't only have doubt, as Scarry's axiom has it; we cultivate that doubt and extend it to the suffering of others.

The answer, obviously, is not to stop expressing or acknowledging pain. The speech act known as complaint is not an accusation or a demand for remedy. Rather, it's a plea for witness, a request to be paid the simple courtesy of belief. O'Rourke, who herself suffers from chronic illness, describes the intense loneliness of being doubted. That loneliness is deepened when listeners panic about being manipulated and can't even accept a description of pain as plausible or interesting, lest they spiral into helplessness and self-recrimination.

People who high-handedly dismiss long Covid patients using words like “you're fine” must dial down their anxiety about being tricked or trapped. This pandemic-ridden country has not been fine for a long time, and to recognize that is not to be a fool, but to be sane.
