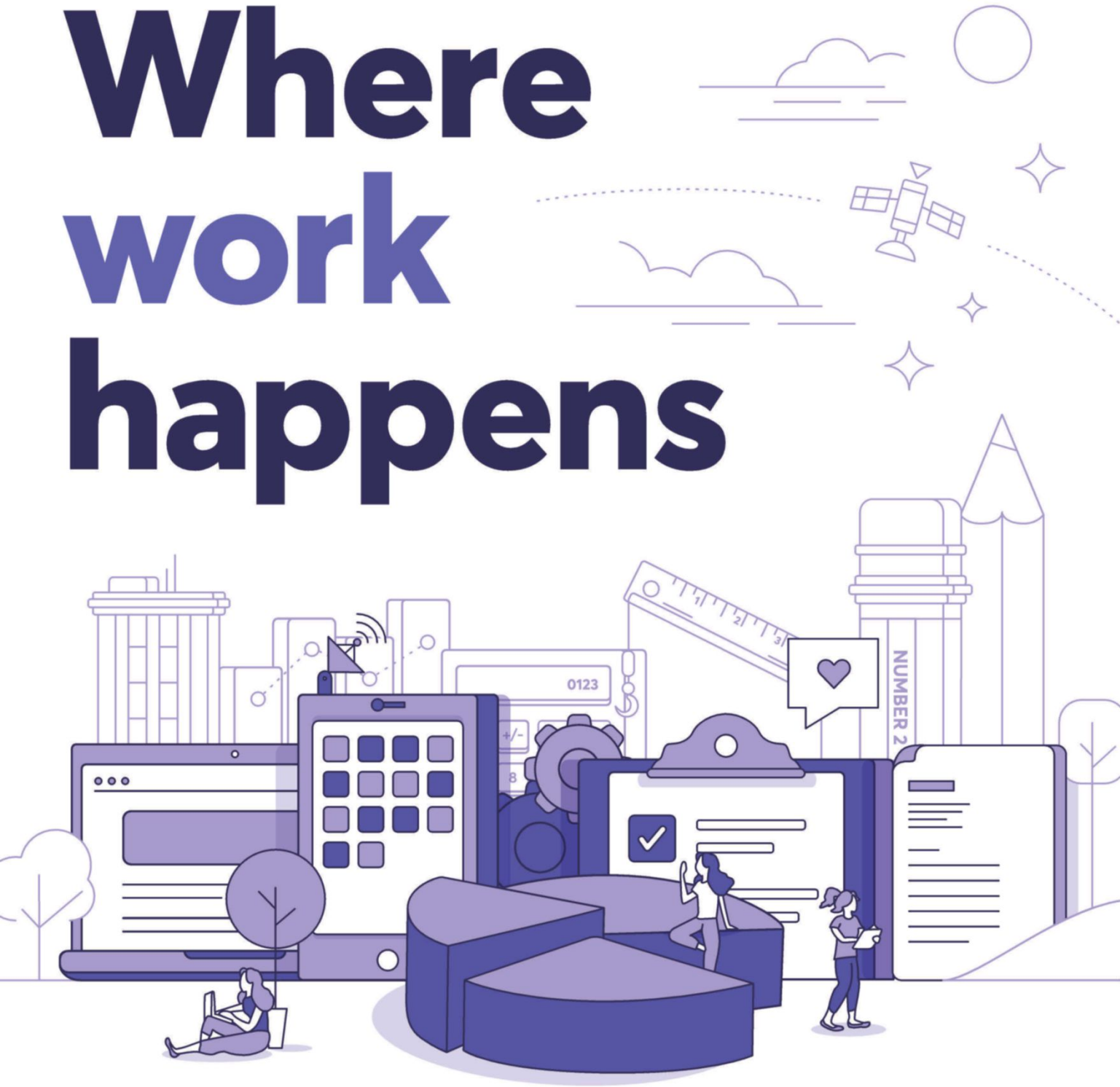
WIRED

FEATURING:
ZEYNEP TUFEKCI
ALICE GREGORY
VIRGINIA HEFFERNAN
STEVEN JOHNSON
DOUG BOCK CLARK

THE GOLDEN AGE OF FREE SPEECH

SPECIAL ISSUE:
TECH, TURMOIL, AND THE NEW CENSORSHIP
P.50

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How AI can help us do our best work

When machine and human intelligence meet, it can be a beautiful thing



When automated teller machines (ATMs) were first introduced in the late 1960s, they saved customers from having to wait for human assistance to conduct simple transactions. But the innovation didn't replace bank teller jobs—in fact, economist James Bessen concluded in 2015 that the number of full-time employed bank tellers grew by almost 2% a year after ATMs were widely deployed in the early 2000s. Bessen dubs this "The Automation Paradox: When computers start doing the work of people, the need for people often increases".

Rather than replace us, the machines that are shaping the future of work are designed to support human workers by taking over the most time-consuming, manual aspects of our jobs, freeing us up to use higher-value skills like creating new products, building relationships with customers, and learning more to make better decisions. Whatever kind of work you do, AI can play a role in giving you time and space to solve problems and get things done.

Machine learning can assist even those who do the most deeply human kind of work. At Crisis Text Line, volunteer counselors are trained to help anyone in crisis, 24/7, all via text instead of phone calls. Behind the scenes, a robust system of AI combines sentiment analysis on incoming texts with a scan for flagged keywords commonly associated with risk. It determines which people need help first and immediately pushes them to the top of the queue. For a nonprofit helping thousands of people every day with a small staff, AI enables volunteers to provide better care to everyone they serve, and helps scale their work to an entire country.

For lawyers, software like that from ROSS Intelligence uses natural language processing to scan thousands of legal documents, helping lawyers build stronger cases. Information that formerly took paralegals hours to put together—even days or weeks—now has the potential to be found in minutes. Less time with noses in case files means legal staff can turn their focus toward important face-to-face proceedings like court hearings, negotiations, and client advisement.

Even writers and artists can find a creative partner in AI. In author Robin Sloan's book *Sourdough*, a programmer teaches robotic arms how to replicate all sorts of professions. Sloan's life isn't too far afield from his own stories, since he built an AI assistant trained on a steady diet of 1950s sci-fi magazines. As he writes, an AI engine offers up dozens of options to complete whatever sentence he has begun. Machine learning isn't writing his books automatically: Instead it's acting in the same way a thesaurus might, as a companion capable of adding wonderful turns of phrase and giving his stories new dimensions.

Far from fearing that machines will take our jobs, we should explore and invest in technology that can free up humans to use our curiosity, creativity, and strategic thinking to its full potential. Think about your routine tasks that take time and energy—requests, organization, finding something you need, or anything else—and imagine how your work could improve if you automated them. Search out apps and tools that have been developed for your field or function, or resources that could help you build them yourself, and be ready to learn how they can transform what you think of as work. In the future of work, which has already begun, machines and humans together have the capacity to do great things.

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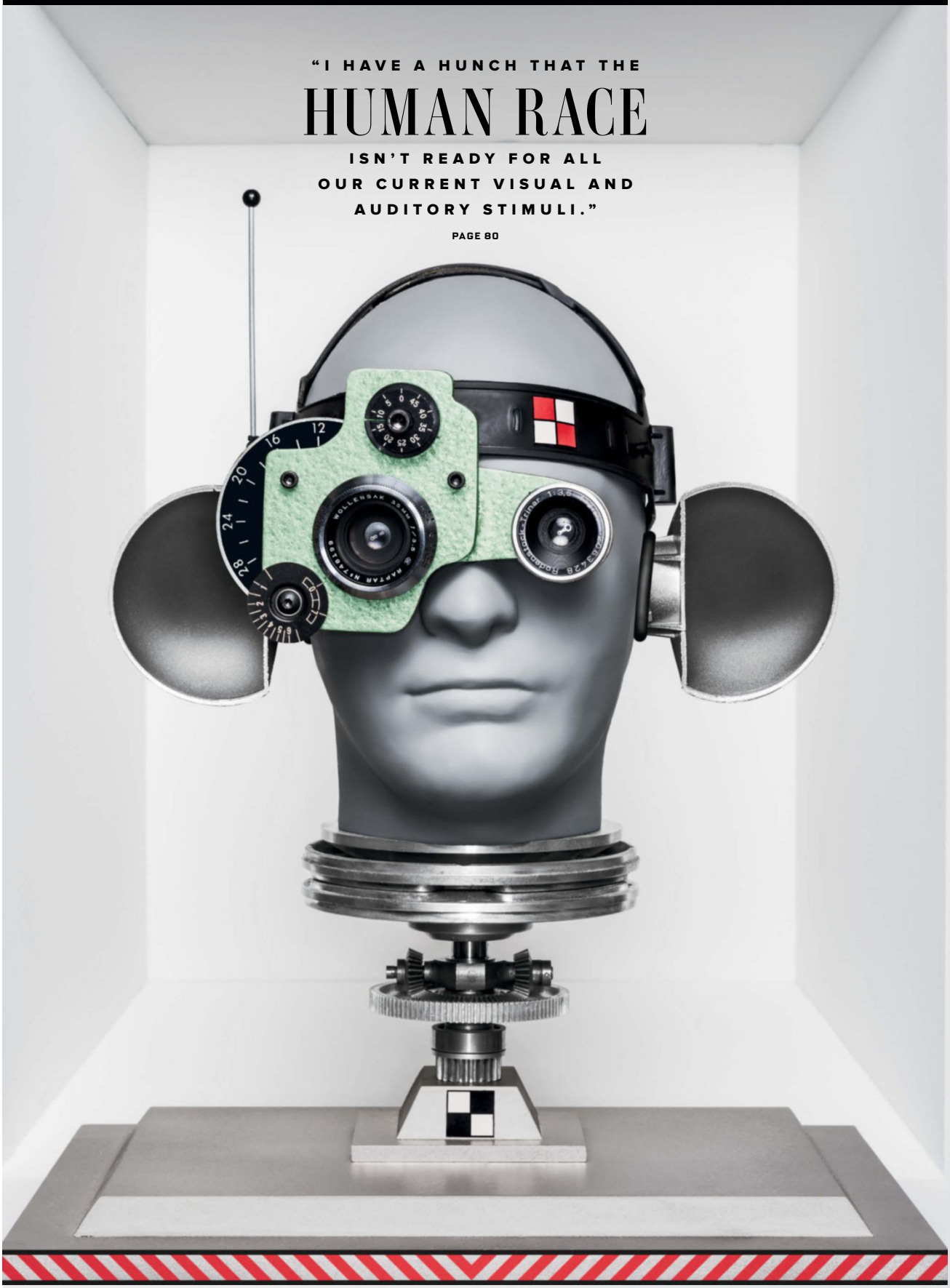
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"I HAVE A HUNCH THAT THE

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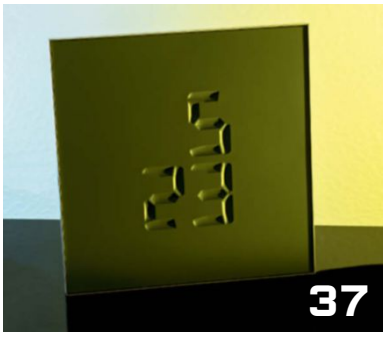
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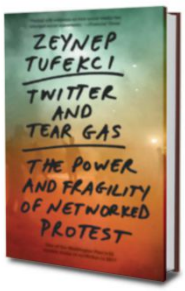

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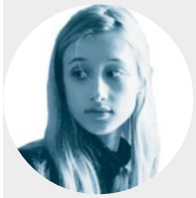
Zeynep Tufekci in Chapel Hill, North Carolina.

TRUTH TELLER

AS AN IBM PROGRAMMER in the 1990s, **Zeynep Tufekci** started communicating on the company's intranet and thought, "This will change everything." Sure enough, on page 50, Tufekci grapples with how today's social internet has completely transformed the context and conditions of free speech. A professor of information science and sociology at UNC Chapel Hill, Tufekci has become one of the most prescient analysts of politics in the age of Facebook, which she credits in part to her lifelong love of science fiction. "Speculative fiction is incredibly useful," she says. Her latest book is *Twitter and Tear Gas: The Power and Fragility of Networked Protest*.



JEREMY M. LANGE



When New York–based journalist **Alice Gregory** first heard about Yondr, a startup that makes fabric pouches designed to keep people from using their smartphones, she was intrigued. Teachers were begging for ways to reclaim students' attention, and Pennsylvania courtrooms that used the product received fewer complaints about cops having their covers blown. But after considering the implications of the simple sack from the perspective of free speech (page 80), Gregory recognized its potential abuses. "The simplicity is both the feature and the bug," she says. "It feels so uninvasive, it's easy to imagine it spiraling out of control."



How far should we go to protect hate speech online? The question is as old as the web itself, says writer **Steven Johnson**, and he should know. In 1995, Johnson cofounded Feed, one of the earliest online magazines, and he's since penned several best-selling books exploring the intersection of technology and society. With the rise of white supremacists online, though, Johnson says, "Hate speech debates suddenly seem so much more pressing than they did 20 years ago." On page 56, Johnson chronicles one tech CEO's decision to leave the Daily Stormer, one of the loudest neo-Nazi voices on the internet, defenseless against activist hackers. Though his instinct is usually to default to free speech, Johnson says in this case, "I'm not really sure what the answer is."



When WIRED approached London-based illustrator **Sean Freeman** to work on the cover for this issue, the idea was to capture the dual nature of civil discourse on social media—open to the masses, but corrosive to itself and everything around it. So we asked Freeman to do some vivid damage to our typeface. "Playing with real-life textures is our thing, so we were excited to show our type slowly being taken over." To do that, Freeman and creative partner **Eve Steben** used photography and CGI to illustrate online discourse and its "gradual degradation." Freeman previously illustrated WIRED stories about Sweden's cashless future and scientists' efforts to cure pain.

FROM TOP: BRYAN DERBALLA; MAXYME G. DELISLE; COURTESY OF STEVEN JOHNSON

ARE ALL EXPERTS WORTH BELIEVING?

Sources: MPA, Total (Duplicated) Magazine Media 360° Audience, Jan-May YTD 2017, Brand Audience Report; Simmons Research, Multi-Media Engagement Study, Spring 2016.

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PLUGGED IN

IN OUR DECEMBER cover story, Brooke Jarvis recounted the astonishing, harrowing details of one of the few online harassment cases that has made it to court. John H. Richardson examined entrepreneur Bryan Johnson's dream of augmenting the human brain with a device called a neuroprosthesis. Anna Wiener traveled to Germany to tour Adidas' new Speedfactory, where the tech industry is both inspiration and existential threat. And in our January issue, Chris Jones spent time with a moonlighting meteorologist in Houston who guided the city through Hurricane Harvey.

Re: "Me Living Was How I Was Going to Beat Him"

"THIS IS, BY FAR, THE MOST INSANE STORY I'VE READ ON CYBERHARASSMENT."

Subrahmanyam KVJ (@SuB8u) on Twitter

Re: "Me Living Was How I Was Going to Beat Him," about the saga of *Allen v. Zonis*, a legal battle that ended in the largest monetary judgment ever awarded to a noncelebrity in a cyberharassment case:

"I worked for someone a lot like T.Z., and even after I quit I was harassed for a while. Each bit of escalation T.Z. committed was just a drumbeat of depressing familiarity. For me it stopped after I threatened to bring in lawyers and the police visited his house. I don't know what else C. and her husband could do at this point."
justprettymuchdone on Reddit

"What is the solution to this problem? It seems like any time T.Z. is granted internet or phone access, he could just start this up again. You simply can't ban someone from the internet. Even if he were imprisoned, I doubt it would be for very long, and then they'd have to go through the years of headache of making their case again."
lalaland75 on Reddit



Re: "Mind Control," about the race to build a brain-computer interface and outpace evolution:

"Even with noble goals, any neuroprosthesis will be opt-in, so there will be people outside the system. If the system happens to become popular and standard, then the late- and non-adopters will be marginalized, disadvantaged, or both. Think of the rural communities that lack broadband internet. We could be left with selective competition or forced adoption, neither of which is a terribly ethical outcome."
Joe Bulone on Facebook

Re: "Fast Break," about Adidas' effort to chase the future with a robot-powered, on-demand sneaker factory:

"IMO, this is the dream: Being able to 3-D print your stuff to fit your body type or specific needs. I know 3-D printing hasn't taken off in the mainstream, but I hope the technology continues to be developed so that it's both affordable and comprehensive enough to print anything we need quickly and cheaply. As a taller guy, I would love to 3-D print my clothes."
Warren Chang on WIRED.com





Re: "Eye of the Storm," about living through Hurricane Harvey with Houston's most trusted weather blogger, Eric Berger:

After this article went to press, we heard from Deb Walters, one of the many people who sought Berger's advice just before Hurricane Harvey. Thanks to Berger's forecasts, Walters decided to cancel a house party she hosts every year for some members of Alcoholics Anonymous and ex-cons. It turned out to be a good call. Although Walters' house was spared, the surrounding streets flooded, which would have stranded the guests there for three days. "These folks are hysterical," she said (as in funny and lovable), "but the type of people you invite to a party aren't necessarily the type of people you want to spend three days with." She finally hosted the shindig three weeks later, for a smaller crowd.
—EDITORS

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ARGUMENT

TWILIGHT OF THE HACKERS

NO MORE SHORTCUTS. IT'S TIME TO WIN THE REAL WAY.

BY VIRGINIA HEFFERNAN



VIRGIL GRIFFITH discovered the allure of hacking in 1993, while slumped at an Intel 80386 in Tuscaloosa, Alabama. He was 10, and he was on a losing streak at *Star Wars: X-Wing*. To hit the leaderboard, he'd need a fleet of ace wingmen, but he only had one X-Wing fighter that could hold its own in the game's World War I–style dogfights. Desperate times call for desperate measures. Digging around in the game's code, Griffith found that each pilot had its own file, so he cloned his good fighter. Copy and paste, copy and paste, copy and paste—fully 20 times. This gave him, he told me years later, "a plentiful supply of the best wing-

FEBRUARY ALPHA THEME:
EXTREMES

World-corrupting hacks, Olympic physics, end-times escape, DIY biopunks, *Black Panther*'s afro-futurism, and more.

men from then on." Players without Griffith's workaround were out of luck.

Those brave pilots, gouged from the game's code, seemed to serve as Griffith's guardian angels in the next few years, during which he lived by the hacker's creed: Enlightened cheating is the highest form of gameplay. You don't beat the TIE fighters. You beat the game itself.

While in college at the University of Alabama, Griffith discovered a chink in the ID card system that let students cadge cafeteria meals. In 2007, shortly after graduating, he invented WikiScanner, a service that exposed the IP addresses and ideological biases of anonymous Wikipedia edits. (In one case, he revealed that people from offices in the US Senate were trying to fix their reputations, where others from Diebold, the company that made insecure voting machines, were using Wikipedia for corporate propaganda). He was on his way to black-hat status—and the circle of Julian Assange—when he discovered something even better than hacking: science.

Griffith is now a 34-year-old research scientist at Ethereum Research in Singapore, where he works on improving the company's blockchain, a big piece of the global infrastructure that allows for secure exchanges of property and currency online. With essential software, he wrote in an email to me, "failures just aren't acceptable anymore." Examples he cites include controlling nuclear reactors, power grids, chip manufacturing. "There is a trend in software development away from the 'hacker' jury-rigging into a mature field, where things are 'proven'," he told me.

The chastening of the outlaw hacker does not make a great campfire tale. Maybe that story is too close to the tedious process of growing up. But with Silicon Valley convulsed by revelations of Big Tech's security failures, founders' above-the-law arrogance, and social media's hospitality to bots, trolls, and fraud, here's a remedy: honest valuations, business ethics, and the application of scientific method unmolested by greed. It's time for a twilight of the hacker ideal.

THE CHASTENING OF THE OUTLAW HACKER DOES NOT MAKE A GREAT CAMPFIRE TALE.

I came by this a year ago, when Joi Ito, director of the MIT Media Lab, told WIRED that the hacker archetype had found its highest articulation in one Donald Trump. Like it or not, Ito argued, Trump represents the counterculture priority of disobedience over compliance. I shudder to repeat Ito's view, but here it is: Trump was "very punk rock."

Trump did indeed hack the American system. His was an especially crude hack, though it did the trick, chiefly because he had the field to himself; for his opponents, Trump-style violations of America's terms of service—bald-face lying, inciting violence—were not strategically or ethically inbounds. The 1910 race to the South Pole comes to mind: The Norwegian explorers figured they could win if they left nothing edible unconsumed, and ate their sled dogs along the way as provisions. The British, committed to their geological studies as much as to winning, refused to eat theirs on principle—and lost. Trump won because he was unhindered by conscience. He ate his dogs.

Hacking a win is a question of principle. But it's also a question of pride. In the short term, beating the system—especially a big one, like the IRS or American democracy—must yield an overman swell of supremacy to those who seem to be its slaves. But in another sense, a triumph secured by illicitly cloning wingmen (or hiding tax returns, eating huskies) doesn't seem like a triumph at all. It's a confession—even if a tacit one—that you weren't good enough to win the real way.

Icarus, the documentary about Russian doping at the 2014 Winter Olympics in Sochi, gives a window on why the Kremlin would be so eager for ill-gotten gold medals that it would hack both the biochemistry of Russia's best athletes and the painstaking system for making sure athletes compete clean. Russian authorities wagered that a rococo cloak-and-dagger biohacking and burglary scheme would work better than traditional training of athletes. Yes, the Russians swept the table that year—but the revelation of their widespread doping asterisks all those medals as suspicious for eternity. That cruel and gratuitous hack also irreparably damaged the bodies, reputations, and futures of the nation's finest athletes, who are regarded as cheaters, with Russia's team now banned from the 2018 Olympics.

Virgil Griffith now sucks down far less Kahlua than when I met him as the father of WikiScanner more than a decade ago. He has now put in time at Caltech, which he credits for beating the smart-ass hacker

Virginia Heffernan *(@page88) is a contributor to* WIRED. *She also writes about Reddit's Change My View on page 86.*

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out of him, and turning him into a scientist. Wiser Griffith sees a bright line separating real science from the hacker culture he came from.

As he wrote to me, "The hacking culture is often more comfortable with approximations and low beauty—they just want to get on with their work—it doesn't need to be optimal." (Products of this hacker approach, in Griffith's view, are the internet's architecture and Apollo 11. The makeshift architecture of the internet may be coming back to haunt it, and early NASA race-to-space engineering has—since the *Challenger* explosion—given way to an ethic of extreme prudence.) By contrast, what Griffith loves about science over hacking is its concern with finding, as he puts it, "the unique and most beautiful solution to the problem which generalizes to N dimensions."

The International Olympic Committee, not always known for its strong stands on corruption, issued a statement when it banned the Russian Olympic teams from this month's Pyeongchang Olympics. The Sochi doping "was an unprecedented attack on the integrity of the Olympic Games," wrote Thomas Bach, the IOC president. "As an athlete myself, I feel very sorry for all the clean athletes ... who are suffering from this manipulation ... We will now look for opportunities to make up for the moments they have missed on the finish line or on the podium."

Imagine that. A year without hackers and cheaters on the podium. And an active commitment to fairness, safeguards, compassion, and integrity? Good. Those are the things we hack at our peril.



WHAT'S THE DEAL

TRUE BLOOD
SURGERY-FREE BIOPSIES

SILICON VALLEY is out for blood—and not just the rejuvenating blood of the young. Biomedical engineers are enthralled by the promise of liquid biopsies, noninvasive tests that detect and classify cancers by identifying the tiny bits of DNA that tumors shed into the bloodstream. Studies at leading cancer centers have already shown the technology's effectiveness in personalizing treatments after diagnosis. Now startups are selling VCs a vision of cheap, surgery-free cancer screening even before symptoms appear. ¶ Andreessen Horowitz, Google Ventures, Verily, and others have invested $77 million in Freenome, which uses machine learning to pinpoint immune system responses that may indicate the presence of cancer. Freenome's most prominent rival, Grail—which plans to harness next-generation gene sequencing to directly measure cancerous genomic alterations in the blood—raised $1.2 billion last year from ARCH Venture Partners. Both companies are racing to make the first DNA-detecting blood test to reveal disease in its earliest stages. It's the holy—well, you know—of cancer care. ¶ If this scientific sprint is giving you Theranos flashbacks, it should. Critics believe that even with the aid of low-cost genetic sequencing and high-powered algorithms, liquid biopsy detection is still years away from being patient-ready. The startups have shared scant data so far. (Grail has begun enrolling 130,000 patients in two huge trials, but it won't have results for a few years.) Having secured massive infusions of funding, it's not money holding these blood unicorns back, it's basic biology. —MEGAN MOLTENI

JAMIE JONES



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***DETROIT: BECOME HUMAN*, BY THE NUMBERS**

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55k CAMERA SHOTS

74k UNIQUE ANIMATIONS

5.1M LINES OF CODE

CRYING GAMES
DAVID CAGE FINDS POWER IN PATHOS

DAVID CAGE SCOFFS at the notion that videogames are fun. "They should trouble you, move you, make you react," he says. As founder of the studio Quantic Dream, the French developer has been stunning and confounding players for two decades with cinematic games that tackle heady issues of love, death, domestic abuse, oppression, and the afterlife. "Some people are shocked when a game evokes real-world issues," he says. "But this platform is about becoming the characters, not just seeing them from the outside like in a film." ¶ *Detroit: Become Human*, slated for release this spring, is the auteur's most ambitious work yet. Cage wrote the game's 2,000-page script and employed more than 250 motion capture actors. Set in Detroit, the future capital of AI manufacturing, the plot revolves around three androids grappling with what it means to be human. Players make decisions to steer the story line; in one demo scene, an android tries to protect a young girl from her abusive father. It's a gripping, unsettling project, one that Cage considers his most compelling. ¶ For purists, *Detroit* is peak Cage, prioritizing dialogue and emotional gimmicks over gameplay. It's a critique he considers myopic. "I disagree that injecting emotion into a game comes at the expense of the playing experience," he says. For Cage, the future of the industry is in inciting pathos. ¶ Whether *Detroit* is received as visionary or exhibitionist, Cage is confident developers will soon embrace the potential of hyperrealistic interactive gaming. The question is whether we're ready for it. —LAURA PARKER

WHO: David Cage, videogame developer

PREVIOUS TITLES: *Heavy Rain*, *Beyond: Two Souls*

FAVORITE GAME: *Rick Dangerous*

FAVORITE MOVIE: *2001: A Space Odyssey*

NOTABLE COLLABORATORS: David Bowie, Ellen Page, Willem Dafoe

GAMING HERO: *Tekken's* Paul Phoenix. "He survived 20 years in this industry with the same haircut, which says a lot."



LAURA STEVENS

ALTERED CARBON

NO BODY LIVES FOREVER



NETFLIX | FEBRUARY 2



THE PHYSICS OF FLIP AND SPIN

BEHOLD THE STOMACH-CLENCHING spectacle of the quad cork 1800. The dizzying snowboarding trick—first landed by British Olympian Billy Morgan, above—involves catapulting off a ramp into four off-axis flips (called corks) and five full spins. Only four people have ever completed the 1,800-degree stunt. But this month in Pyeongchang, South Korea, expect to see more attempts as elite winter athletes compete in the Olympic debut of Big Air, an event in which boarders barrel off a 110-foot-tall ramp to perform seemingly impossible flips and spins. We enlisted physicist John Eric Goff, author of *Gold Medal Physics: The Science of Sports*, to break down the forces at play behind the quad cork 1800. —SOPHIA CHEN

RED BULL MEDIA HOUSE



1

Launch

Olympic boarders will accelerate down 240 feet of slope, 39 degrees at its steepest, before hurtling off the ramp. Speed is key here: Too slow, and they won't get enough air to complete four flips. Goff estimates Morgan hits approximately 40 mph at takeoff.

2

Initiate Spin

Achieving the quad cork's tricky combination of flip and spin requires a simultaneous trunk twist and abdominal crunch. That quick movement likely generates about 50 foot-pounds of torque, 1,000 times the torque it takes to turn your head.

3

Optimize Posture

As his body spirals through the air, Morgan crouches and grabs his board. The smaller he can tuck—minimizing the moment of inertia—the faster he rotates. During the first cork, he throws his left arm out to the side to adjust his rotational direction.

4

Achieve Speed

Morgan pulls both of his arms into his chest like a twirling figure skater to pick up the pace. He needs to spin as quickly as possible to complete all five rotations before touchdown, averaging a whiplash-inducing 1.7 revolutions per second.

5

Brace for Impact

As he completes the last cork, Morgan throws out his arms and straightens his body to slow the rotation. He hits the ground going approximately 50 mph with about 450 pounds of force on each leg, Goff says, about half the force it takes to fracture a bone.

6

Stick It

Morgan lands with his board at a 14-degree angle to decelerate gradually. He bends his knees as he touches down, which extends his collision time and distributes the force. All told, he executes the trick in 2.9 seconds of hang time, soaring 133 feet over the snow.

UNITED STATES V. MICROSOFT CORP.
A TRIAL FOR THE AGES

IN THE TWILIGHT of the 20th century, Bill Gates was well and truly a tentacular squid, with his sucker-covered limbs extending into every level of the computer industry. The one area that Gates didn't dominate: the World Wide Web. And how he tried to conquer that newfangled internet led to an epic court battle that continues to shape how the world sees the five-headed beast that Big Tech has become.

Microsoft famously missed the rise of the web in the early '90s, with Gates dedicating only a fraction of his mid-'90s tome *The Road Ahead* to the internet. Meanwhile, Netscape introduced millions to the pleasures of browsing and surfing, forcing Microsoft to do one of its notorious "fast follows" (i.e., rapid copycat product launches). The company introduced Internet Explorer in 1995 and wasted no time in browbeating and cajoling companies the world over into making it the default web browser on their systems.

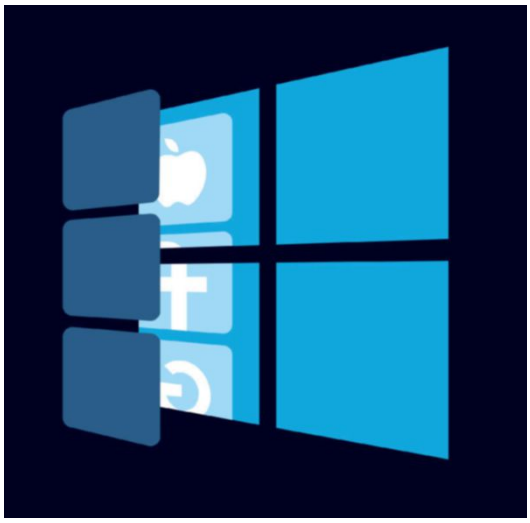
Word of Microsoft's depredations reached the US Department of Justice, which in 1998 sued the company for violating the Sherman Act, a vague and archaic law that regulates the ability of conglomerates to assemble monopolies and stifle competition. What's more, the government's lawyers wouldn't just move to penalize Microsoft with fines—they'd seek to break it into smaller companies.

The case would last more than five years, and the trial had its share of Perry Mason moments, as the wily lead litigator, David Boies, arguing on behalf of the DOJ, dueled in cross-examinations with Microsoft witnesses. The most damning evidence submitted at trial, however, was a videotaped deposition of Gates. Unlike robber barons of yore, he wasn't a portly, cigar-smoking chieftain. He was a rumpled geek who testified about Microsoft's past practices with an amnesiac level of vagueness and a truly Napoleonic persona. This wasn't save-the-world techno-optimism. It was sharp-elbowed libertarianism, and the press coverage of his performance introduced audiences at home to a new character of the digital age: the ruthless tech tycoon. From Gates it was a short jump to Steve Jobs, infamous distorter of reality fields; Jeff Bezos, slayer of publishing's "sickly gazelles"; and so many other dark lords with world-warping visions.

Microsoft lost the first round in 2001, with the presiding judge ordering the company's breakup. This "structural solution" (to use antitrust lingo) was later overturned on appeal, largely because under US law being a monopoly per se isn't illegal. It's typically only when a company abuses that dominance through coercion and collusion (among other anticompetitive tactics that raise prices and hurt consumers) that drastic remedies must be taken, and the appeals court wasn't convinced that the judge in the first trial applied the correct standards to order a breakup. Microsoft and the government decided to cut their losses and reach a settlement, with the company agreeing to a series of "behavioral remedies" that dampened its ability to strong-arm others. Microsoft as Gates built it would survive, but the message from the government was clear: No one company could dictate the tech industry's playbook.

Now, as Gates is off trying to cure malaria, and the chorus of complaint against Big Tech reaches a crescendo, could Bezos and his fellow giants end up in the government's crosshairs? It's unlikely, mostly because the tech world is fundamentally different today than it was in 1998 while US antitrust laws are essentially the same. To use a geopolitical analogy, technology was then a unipolar world and Microsoft its lone superpower. The tech world has since become multipolar: Facebook, Amazon, Google, Apple, and (a reduced) Microsoft are near-absolute monarchs of their respective domains. No single giant can dominate any other, and one company can coerce another only with great difficulty, if at all. The prospect of Facebook twisting Apple's arm to ship a new iPhone without any social media apps except for Facebook's—which is more or less what Microsoft supposedly did to Apple with Explorer—is unthinkable.

Today's titans tower over their kingdoms, secure behind their walls of user data and benefiting from extreme network effects that make serious competition from startups nearly impossible. US antitrust laws, written in the industrial age, don't capture many of the new realities and potential dangers of these vast data empires. Maybe they should. W



By **Antonio García Martínez** *(@antoniogm), who is the author of* Chaos Monkeys.

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END-TIMES ESCAPE

WHY THE TECH ELITE LOVE NEW ZEALAND

THIS YEAR, Rocket Lab plans to blast a 56-foot vehicle into orbit on a mission to revolutionize access to space. The aerospace startup's affordable launchers are among the first to be tailored to commercial satellite customers. But the rocket won't take off from Cape Canaveral or Vandenberg Air Force Base—it was manufactured in Auckland and will launch from New Zealand's Mahia Peninsula. "Tech entrepreneurs are doing all kinds of edgy stuff here that hasn't been tried before," says Berkeley grad and software developer turned Wellington-based angel investor Dave Moskovitz. "Stuff that's like, *whoa*, why would you go to New Zealand for that?"

It's a question that's been whispered about Silicon Valley elites for the past few years, ever since Peter Thiel quietly became a Kiwi citizen; since LinkedIn's Reid Hoffman informed *The New Yorker* that New Zealand is the tech crowd's favored end-of-days refuge; since Ellen Pao mocked her former Kleiner Perkins colleagues for coveting "private-jet escape routes to New Zealand." Indeed, as of October the number of work visas granted to American techies was up 78 percent over the same period in 2012. What gives? Beyond Wellington's obsessive coffee culture and Queenstown's unspoiled landscape (a country roughly the size of the UK with just 7 percent of its population), New Zealand has established itself as an unlikely bolt-hole for the impending apocalypse.

"Thirty years ago New Zealand's biggest hurdle was the tyranny of distance," says David Cooper of Malcolm Pacific Immigration, who advises high-net-worth individuals looking to relocate there. But as our president subtweets Kim Jong-un and we brace for the next hurri-quake, that 13-hour direct flight from San Francisco to Auckland starts to look inviting. "If I'm someone with a lot of money who wants to survive the end of the world, New Zealand is far away from any place I could conceivably see a nuclear weapon hitting," says James McKeon, policy analyst at the Center for Arms Control and Non-Proliferation.

It's also surrounded by vast expanses of ocean, which has a dampening effect on extreme weather, says James Renwick, a climate scientist at Victoria University of Wellington. "New Zealand is affected more slowly by warming trends than other countries, so we have more lead time," he says. "It will be fairly pleasant here for quite a while."

And New Zealand is eager to attract Valley elites: Recruitment efforts are luring tech workers to local startup scenes; LookSee Wellington, which last year flew in techies to attend career info sessions and interviews, received 48,000 applications. Of course, most moneyed Kiwi-wannabes opt for the surer thing, an Investor visa—nearly guaranteed if you meet basic immigration criteria and invest NZ$3 million (about US$2.1 million) for four years or NZ$10 million over three years. Cooper estimates that more than a quarter of his US Investor visa clients hail from California.

Once your abode (or bunker) is under way, integrating is easy, say American escapists. "You can start a business in 20 seconds," says Moskovitz, who has invested in over a dozen New Zealand startups and renounced his US citizenship in 2015. "You just go on the Companies Office website and plonk down NZ$105."

Texas native Shawn O'Keefe, now a program director for Wellington-based accelerator Creative HQ, concurs: "Being small and nimble, we don't have the same level of bureaucracy and bullshit as in the States." New Zealand recently topped the World Bank's annual Ease of Doing Business rankings as the nation most conducive to starting a business, registering property, and securing credit.

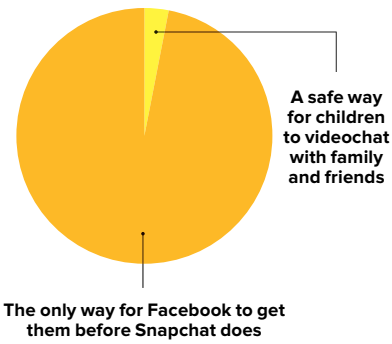
That same no-BS attitude applies to innovation, O'Keefe says: "New Zealand entrepreneurs aren't working on an app to find a better sandwich or whatever—they take real-world problems much more seriously." While that may sound like some Silicon Kiwi spin, the country did introduce a Global Impact visa last year, targeting civic-minded founders tackling society's biggest challenges. Meanwhile, US app peddlers and hedge funders are quietly burrowing into New Zealand's epic hills, plotting their real-world escape. —LAUREN MURROW



CHARTGEIST

BY JON J. EILENBERG

Messenger Kids



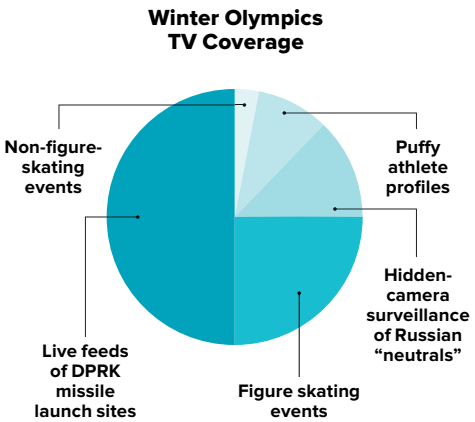


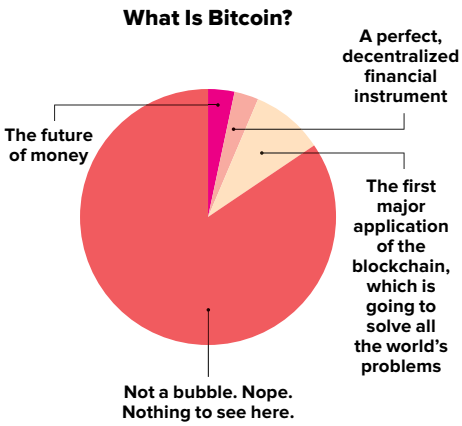


ANGRY NERD

TIPPING POINT

The gig economy used to be so blissfully, mindlessly simple: Open app, order service, auto-pay. Boom—that's it. Then side-gig platforms started turning this refreshingly straightforward transaction into an on-demand guilt trip by asking customers to tip. Wait. Before you @ me (#heartlesscheapskate), hear me out. I have no problem opening my digital wallet so that the first-name-only hero shuttling me through rush hour traffic or building my Ikea bookcase can earn what they deserve. I just don't want their paycheck left to the discretion of randos like me. Because guess what? I'd rather these companies pay their workers more. It's maddening to be expected to subsidize their race-to-the-bottom price wars with my cash and conscience. After all, in an Uber the rules aren't so clear. How much do I tip the driver who endures a 30-minute rant about my Tinder date? Do I ding the guy with the disconcertingly damp backseat and nauseating Black Ice air freshener? Should I skimp on the driver whose car blares MAINTENANCE REQUIRED—or splurge, because that schlepper clearly needs the dough? The moral calculus is infuriating. Recently, the CEO of Skedaddle—you know, the "Uber for buses"—announced Kudos, a blockchain-based platform that aims to usurp tipping with a dubious system of digital ratings and cryptocurrency rewards. *Simple, like the blockchain itself*, said no one, ever. The point is, no good can come of turning a basic transaction into a "pay what you want" situation. Especially when it lets gig-economy tycoons offer some employees—ahem, *contractors*—less than a living wage. —ARIELLE PARDES





ISRAEL VARGAS

ANGRY NERD ILLUSTRATION: ZOHAR LAZAR

DO BEFORE YOU DIE

CLIMB AN ICY FALLS



EACH WINTER, crackling and splintering ice echoes across the Uncompahgre Gorge, roughly 10 miles northeast of Telluride, Colorado. The sound signals high season at Ouray Ice Park, the world's first and largest man-made frozen climbing grounds. The gorge's walls are criss-crossed by 2 miles of pipes, crowned by a network of valves, showerheads, and faucets. Each night, the fixtures unleash more than 100,000 gallons of runoff down the jagged cliff face, cooling the rock. Once the temperature dips below 28 degrees, that gushing water is turned to a mist and the droplets freeze together to form a blanket of ice more than 10 feet thick. Then ice farmers like Xander Bianchi, a former mechanical engineer, shape more than 100 routes into the pitch, dribbling water down freezing chains to form ice columns. Last, climbers suspended by ropes hurl axes into the precipice to hoist themselves up glacial pillars and bright blue curtains. Come spring, the frozen cascade melts away, trickling into the Colorado River. —BLANCA MYERS

How to make an ice wall

Clear
Ice farmers use pickaxes to remove brush—a process called de-vegging—which can hijack the water supply.

Saturate
Water permeates the rock's crevices so that the ice forms a stronger bond.

Mist
The smaller the water droplet, the faster it freezes to the craggy cliff face.

Shape
Farmers create climber-friendly 3-D features like columns and corkscrews.

WHILE IN TELLURIDE // STAY: THE NEW DUNTON TOWN HOUSE IS JUST A TWO-MINUTE WALK FROM THE FREE GONDOLA TO MOUNTAIN VILLAGE. **// DO:** SCORE SOME SNOW GEAR AT WAGNER CUSTOM, WHERE MECHANICAL ENGINEER PETE WAGNER FITS BESPOKE SKIS VIA ALGORITHM, THEN REINFORCES THEM WITH AEROSPACE-GRADE FIBERGLASS, VISCOELASTIC CARBON-FIBER, AND TITANAL ALUMINUM. **// EAT:** DIG INTO SQUARE PIES AND SPIKED HOT CHOCOLATE AT BROWN DOG PIZZA.

KEITH LADZINSKI/AURORA PHOTOS

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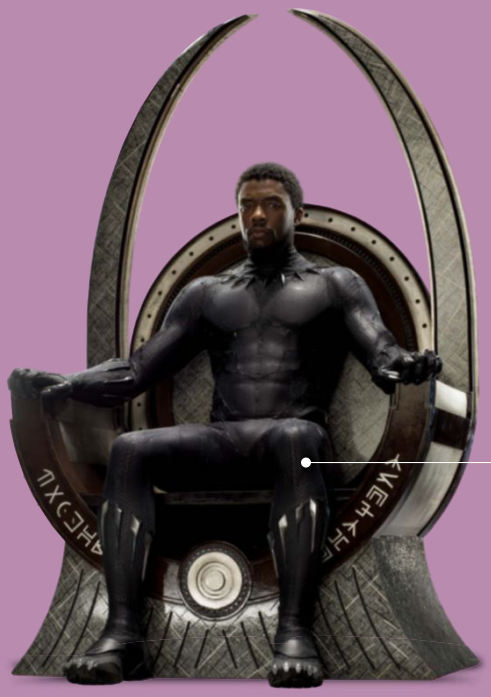
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THE FELINE MYSTIQUE *BLACK PANTHER*'S AFRO-FUTURISM

IN *BLACK PANTHER*, the future is female. Sure, the titular hero is the man-king T'Challa, but his bodyguards, advisers, and chief technologist are all women. Same goes for the crew behind the camera: The design of the movie's setting—the fictional African nation of Wakanda—mostly comes from production designer Hannah Beachler (*Moonlight*, Beyoncé's *Lemonade*) and costume designer Ruth Carter (*Amistad*, *Selma*). "The challenge was imagining how something futuristic looks in Africa," Beachler says. "What would Africans have done given reign over their own culture, without having been colonized? How would their cultures have mixed together?" The answer is a future Tony Stark never could have dreamed of. —ANGELA WATERCUTTER





Super Suit

The source of Wakanda's wealth, the rare (fictional) metal vibranium, powers everything from weapons to fashions. You can see the telltale silver sheen in T'Challa's bodysuit, but you might miss subtler details in the costume's design. "There's a little pyramid pattern from Mali," Carter says. "In close-up, you can see the suit's connection to Africa."

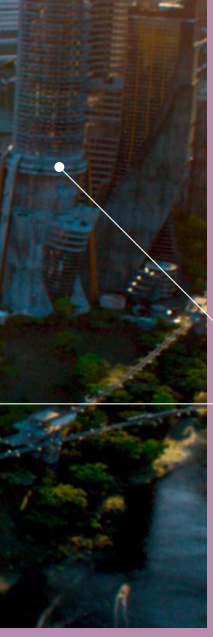
Language

The people of Wakanda mostly speak English, but there is also a native language, for which Beachler developed a character set based on Nigerian pictographs from the fourth and fifth centuries. The characters show up on street signs, battle gear, and the walls of T'Challa's court. (That last one loosely translates to "We together, under the leopard king.")

Transportation

Golden City, the heart of Wakanda, has two major forms of public transit: the Steptown streetcar and a hyperloop. Both, Beachler says, were intended to fulfill people's visions of trains of the future. Since director Ryan Coogler grew up in Oakland, California, the BART system was an influence. Of course, with the help of vibranium, the cars are considerably more efficient.

MARCO GROB (CHARACTERS); MATT KENNEDY (RINGS); MARVEL STUDIOS 2018 (FILM FRAMES)









Air Power

There are three main aircraft in Wakanda: Talon Fighters, which are like fighter jets; Dragon Flyers, biomimetically designed helicopters that look like dragonflies; and the Royal Talon Fighter, T'Challa's version of Air Force One. "The top view of the Royal Talon is inspired by an African mask, and the inside is luxurious," Beachler says. "It's techy, but it's not your usual aircraft."

Architecture

The gleaming glass skyscrapers of Golden City have roots in African architecture—like the rondavel tops of traditional thatched huts. "We started digging deeper and grabbing textures from Timbuktu scaffolding and Mali pyramids," Beachler says. The city also has a district called Steptown, where the hipsters wear clothes with, Carter says, "an Afro-Punk feel."

Warriors

Since the Dora Milaje—T'Challa's personal guards—are part Secret Service, part Navy SEALs, their gear has to be regal *and* combat-friendly. Neck rings protect the warriors and signify rank, while beaded body armor double as family talismans that Dora soldiers can pass down to their daughters. Carter based her designs on the beadwork of the East African Maasai tribe.

Weapons

All the best tech in Wakanda is the work of one woman: T'Challa's younger sister Shuri (Letitia Wright), head of the Wakandan Design Group. "She's like Tony Stark or Elon Musk," Coogler says. Her gauntlets use vibranium power to launch concussive sound waves—but her coolest creation might be high tech ring blades, expertly wielded by Lupita Nyong'o's Nakia.

Wearables

One of Coogler's main goals with *Black Panther* was to make sure all of the technology had multiple functions. For example, kimoyo beads are used as jewelry, but also as communication and medical devices. "A big question I was interested in exploring was, what makes something African?" Coogler says. "For us, we said, 'Let's make it human, let's make it tactile.'"





LEON EDLER



JARGON WATCH

Cryptojacking

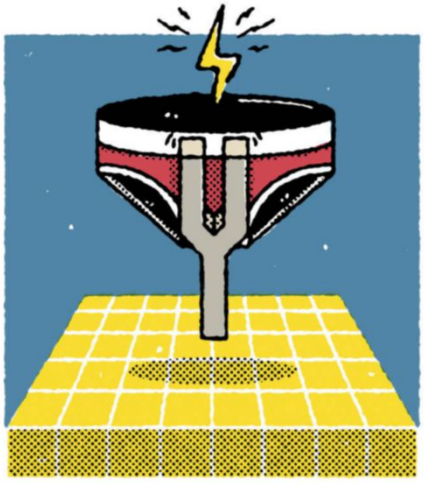
(ˌkrip-tō-'ja-kiŋ)

v. **Swiping computer processing power through a web browser to illicitly mint cryptocurrency.**

People who streamed the TV drama *Billions* last fall may have been hit by some real-life financial chicanery. While they watched, a rogue script on the Showtime website directed their PCs to engage in "mining" operations for a bitcoin-like digital currency. ¶ Doing currency mining on your own machine is perfectly legit. Basically, you're solving gnarly math problems to verify transactions; in return, you get some new coins. But the Showtime cryptojacker tapped into the CPUs of unsuspecting viewers and used their spare cycles to do the spadework. *Not* legit. ¶ But do we care? Jackers pick so many pockets at once that the cost per victim is minimal: a fraction of a cent in electricity and only a slight dip in computer performance (if done right). What's more, browser-based mining isn't all bad: The script was created by a company called Coinhive as a revenue alternative to ads on websites. Charities have used it to collect donations. It might even be a new model for micropayments, letting us opt in to swapping processor time for content or services. And the best part? We don't have to lift a finger. ¶ Unfortunately, that's also what makes cryptojacking so hard to stop: It trades on our apathy, and we've got plenty of *that* to spare. —**JONATHON KEATS**

LIFE HACKERS
BIOPUNKS PUSH THE LIMITS

Rich Lee had armor implanted in his shins in 2016. Soft until struck, the polymer-foam tubes could withstand the full force of a baseball bat swing. The procedure seemed promising—until his stitches burst, prompting him to rip out the tubes. It hurt like hell, but it won't stop him from his next trial. Lee is part of a loosely connected group of biohackers—garage geneticists, chemists, and grinders (those who modify their own bodies)—who are stretching the capabilities of DIY augmentation. When humans optimize into something out of a sci-fi flick, you can thank these reckless pioneers for blazing our enhanced future. —CAITLIN HARRINGTON



Good Vibrations

Lee, CEO of Cyborgasmics, is developing the Lovetron 9000, an implantable vibrator that rests on a man's pubic bone. The swipe of a magnet activates continuous pulsation, resulting in a mutually pleasurable buzz. The questionable sex device can even sync up to music.



Senstronauts

Artist Moon Ribas feels real-time earthquakes through foot-implanted sensors that receive seismic data via an app. She envisions a future of creative consciousness: "Imagine going to a bar, and instead of asking, 'Where are you from?' people ask, 'What sense do you have?'"



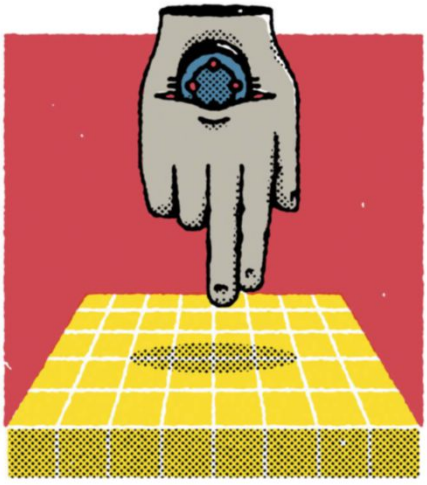
Pharma's Robin Hood

As spokesperson of the DIY medicine collective Four Thieves Vinegar, Mixæl Laufer created cheaper versions of drugs like the EpiPen. Last year, he used off-the-shelf parts to build the Apothecary Microlab, a chemical reactor, and released instructions to concoct drugs at home.



DIY DNA

Josiah Zayner recently achieved a breakthrough in open source genetics: a plasmid that lets tinkerers insert any organism's gene into human cells. In October, Zayner claimed to edit his own DNA, using Crispr to modify a muscle-growth gene. No Hulk-esque side effects yet.



Vital Signs

In 2013, Tim Cannon had a friend slice open his arm to implant a biometric sensor called the Circadia. It monitored his temperature, beaming the data to his tablet via Bluetooth. Now he's developing a new model that will deliver metrics like pulse oximetry and blood glucose.



Glow, Dog, Glow

Mississippi dog breeder David Ishee is attempting to genetically engineer bioluminescent pooches by infusing his pet mastiff's sperm with modified genes that "glow." By altering canine genes, Ishee hopes to eliminate common disorders in problem-plagued purebreds.

So...basically, you have 

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don't have any  skills.

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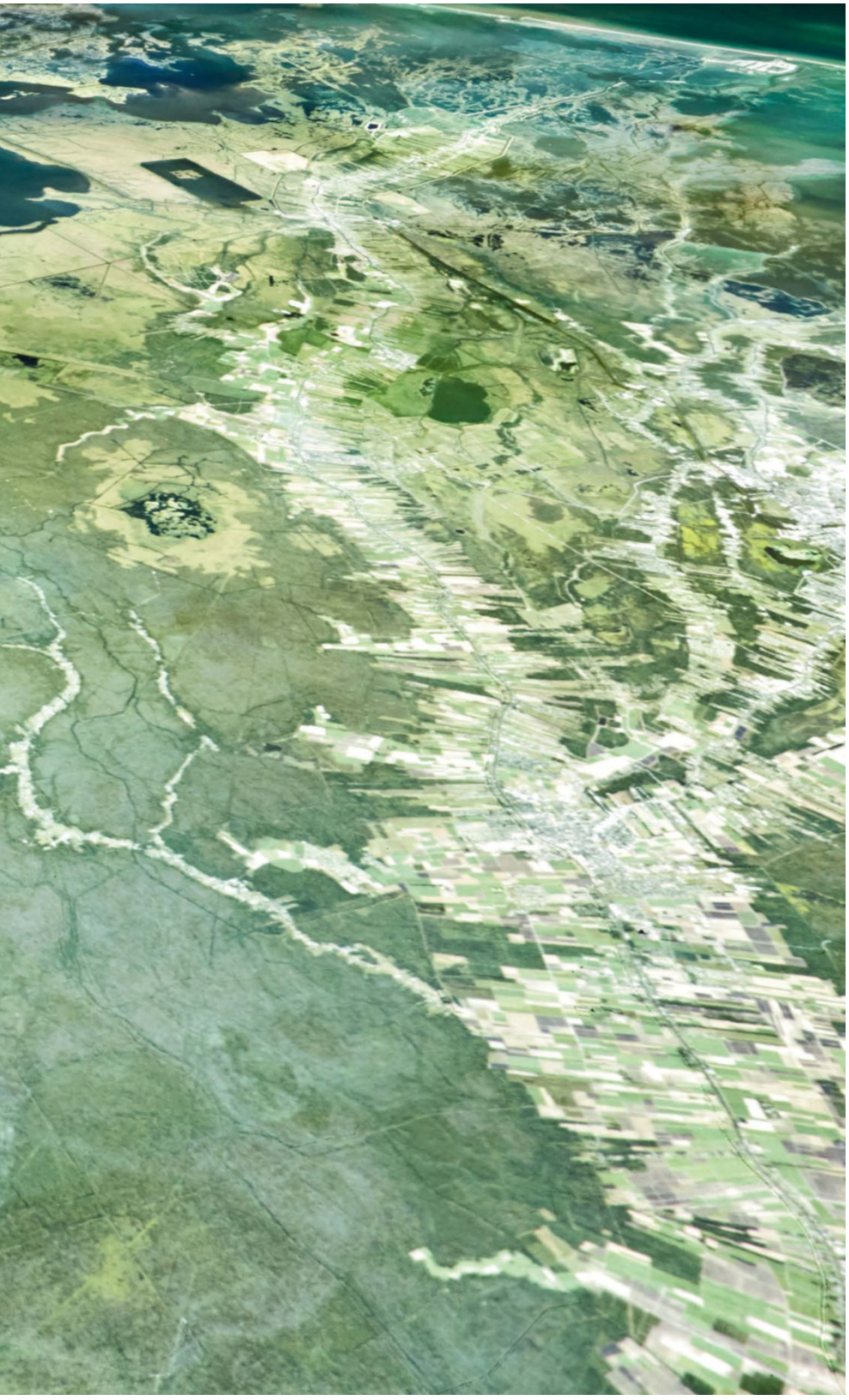
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Twenty projectors beam images of the Mississippi River delta onto the physical model.



FLOW STATE
OL' MAN RIVER MODEL

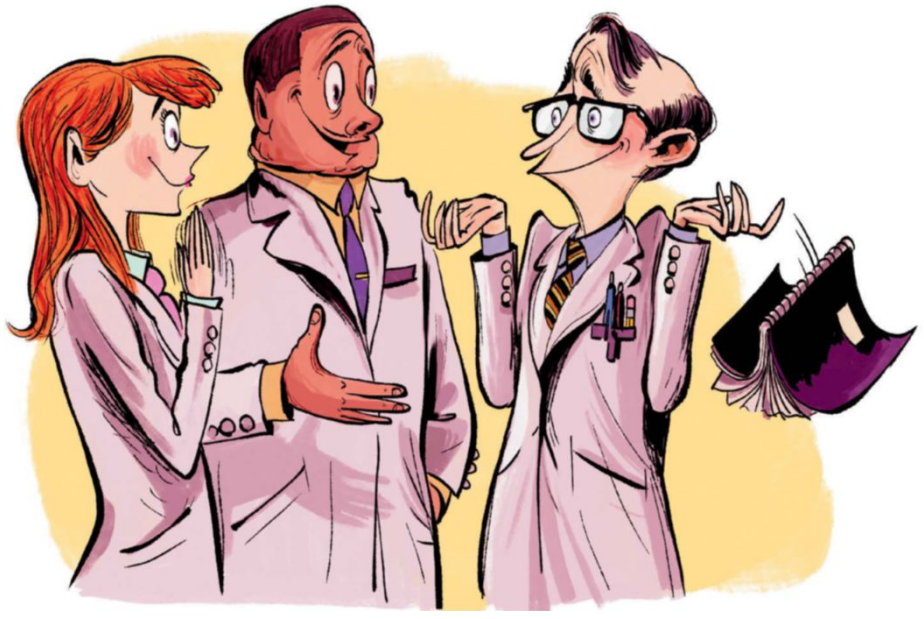
THE MISSISSIPPI RIVER—it's a big deal, OK? The combined ports of South Louisiana and New Orleans move more cargo, ton for ton, than any other US port. So figuring out the Mississippi's hydrodynamics—the way its water, silt, and sand ebb and flow—matters. Matters so much, in fact, that Louisiana has dropped $18 million on a 10,800-square-foot model of Big Muddy's sinuous meanders. It's made of 216 panels of high-density foam, carved to match mapping data down to a quarter-millimeter tolerance. Sure, the Center for River Studies *could* have just simulated all this in a supercomputer, built from spreadsheets and algebra. And that's typically what happens nowadays: IRL models of natural phenomena are the exception. But when you can watch in an hour how the river bottom could transform in the course of, say, a year—and directly observe the potential effects on navigation—the impact is more immediate. "We can bring out students, politicians, and fishers who are tired of seeing PowerPoint or don't believe computer models," says civil engineer Clint Willson. That'll teach people what they can and can't build (and where) along a waterway critical to the US economy but more and more subject to the severe effects of climate change. —ADAM ROGERS

DAYMON GARDNER

CLIVE THOMPSON

RETRACTION HEROES
THEY HAVE THE GUTS TO SAY "I'M WRONG"

WHAT DO YOU DO WHEN you discover you're wrong? That's a conundrum Daniel Bolnick recently faced. He's an evolutionary biologist, and in 2009 he published a paper with a cool finding: Fish with different diets have quite different body types. Biologists had suspected this for years, but Bolnick offered strong confirmation by collecting tons of data and plotting it on a chart for all to see. Science for the win! ¶ The problem was, he'd made a huge blunder. When a colleague tried to replicate Bolnick's analysis in 2016, he couldn't. Bolnick investigated his original work and, in a horrified instant, recognized his mistake: a single miswritten line of computer code. "I'd totally messed up," he realized. ¶ But here's the thing: Bolnick immediately owned up to it. He contacted the publisher, which on November 16, 2016, retracted the paper. Bolnick was mortified. But, he tells me, it was the right thing to do. ¶ Why do I recount this story? Because I think society ought to give Bolnick some sort of a prize. We need moral examples of people who can admit when they're wrong. We need more Heroes of Retraction. ¶ Right now society has an epidemic of the opposite: too many people with a bulldog unwillingness to admit when they're factually wrong. Politicians are shown evidence that climate change is caused by human activity but still deny our role.



Trump fans are confronted with near-daily examples of his lies but continue to believe him. Minnesotans have plenty of proof that vaccines don't cause autism but forgo shots and end up sparking a measles outbreak.

"Never underestimate the power of confirmation bias," says Carol Tavris, a social psychologist and coauthor of *Mistakes Were Made (But Not By Me)*. As Tavris notes, one reason we can't admit we have the facts wrong is that it's too painful to our self-conception as smart, right-thinking people—or to our political tribal identity. So when we get information that belies this image, we simply ignore it. It's incredibly hard, she writes, to "break out of the cocoon of self-justification."

That's why we need moral exemplars. If we want to fight the power of self-delusion, we need tales of honesty. We should find and loudly laud the awesome folks who have done the painful work of admitting error. In other words, we need more Bolnicks.

Science, it turns out, is an excellent place to find such people. After all, the scientific method requires you to recognize when you're wrong—to do so happily, in fact.

Granted, I don't want to be too starry-eyed about science. The "replication crisis" still rages. There are plenty of academics who, when their experimental results are cast into doubt, dig in their heels and insist all is well. (And cases of outright fakery and fraud can make scholars less likely to admit their sin, as Ivan Oransky, the cofounder of the Retraction Watch blog, notes.) Professional vanity is powerful, and a hot paper gets a TED talk.

Still, the scientific lodestar still shines. Bolnick isn't alone in his Boy Scout–like rectitude. In the past year alone, mathematicians have pulled papers when they've learned their proofs don't hold and economists have retracted work after finding they'd misclassified their data. The Harvard stem-cell biologist Douglas Melton had a hit 2013 paper that got cited hundreds of times—but when colleagues couldn't replicate the finding, he yanked it.

Fear of humiliation is a strong deterrent to facing error. But admitting you're mistaken can actually bolster your cred. "I got such a positive response," Bolnick told me. "On Twitter and on blog posts, people were saying, 'Yeah, you outed yourself, and that's fine!'" There's a lesson there for all of us. W

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STYLING BY GRACE SUH; ETCH CLOCK COURTESY OF MOMA DESIGN STORE

WORK

ETCH CLOCK

FETISH MINUTES MADE

IF YOU'RE ALREADY spending the entire 9-to-5 workday gazing at the clock, you may as well invest in a timepiece worthy of prolonged ogling. Every 30 seconds, the current time slowly materializes on the Etch's thermoelastic membrane. Seven-segment numerals, reminiscent of a classic LCD clock, sit beneath the slate-colored face. To display the time, the smooth, stretchy skin is pulled into the crevices needed to form the correct digits. The result looks like the numbers are carved into stone, an effect compounded by the concrete-like hue of the membrane. Moments later, the figures disappear—time, of course, is fleeting. So go ahead, stare all you want. Someday soon you may want to evaluate your career choices. But for now, with a timepiece this engaging, those hours won't seem like a waste. —ARIELLE PARDES

$1,950

MARIA LOKKE

GEARHEAD BUGGING OUT

When you've had more than enough of the office, grab this gear and escape to a café. —ARIELLE PARDES



1

Chrome Juno Travel Tote Bag

A briefcase adds panache to an outfit, but they're usually no good for protecting precious electronics. This carry-all splits the difference. The tough ballistic nylon construction withstands weather and wear, while the dedicated padded laptop sleeve and copious interior pockets keep all your mobile office essentials secure.

$140

2

Hydro Flask Food Flask

This is a serious upgrade from your elementary school lunch box. The vacuum-insulated container keeps 12 ounces of comestibles hot or cold, and the wide mouth makes for easy sipping or spooning. Perfect for whatever fuels your afternoon.

$30



3

Belkin SurgePlus USB Swivel Charger

Electrical outlet space in the coffee shop is a coveted commodity. Make room for yourself without unplugging your neighbor by using this swiveling power strip, which turns a single socket into three. Double USB ports let you charge your phone and tablet while keeping your laptop at 100 percent.

$30

4

Plantronics Voyager 8200 UC

Enjoy corner-office quiet anywhere with these wireless noise-canceling headphones. Dual mics on the earcups mitigate the barking baristas, and the battery lasts more than 20 hours—enough for a few days of Migos beats, Tycho jams, or Zoom marathons.

$380

5

Google Pixelbook

Your email, documents, and calendar all live in the browser now, and Google's powerful Chromebook is a first-class ticket to the cloud. Though an easily luggable 2.4 pounds, it still gets 10 hours of battery life, so it'll chug well past quitting time. Bonus: The stylish two-tone design will ensure you stand out among a sea of MacBooks.

$999

HOW TO STAND OUT

Whether you're Zooming it in or not sitting down on the job, here's how to do it right. —ADRIENNE SO

Videoconference Like a Boss

Acing a group video call is harder than it sounds. "It doesn't take that much tech savviness to click a link, but you'd be surprised by how many people do it and it's just a mess," says media coach Ruth Sherman, who trains celebrities and executives on how to conduct themselves professionally in a digital environment. Follow her tips to appear composed, prepared, and confident. You'll deliver a perfect onscreen performance, even while wearing your pajama bottoms.



1

Set the Scene

Position your face by dividing the frame into horizontal thirds, then aligning your eyes with the upper third without cutting off your forehead. Clear your backdrop of clutter, which Sherman calls “noise.”



2

Light It Right

Don’t sit with your back to a light or a window—it will turn you into a silhouette. Natural daylight from the front is the most flattering. If that’s not possible, put a lamp behind your screen. “It wouldn’t kill you to go out and buy some lights,” Sherman says.

3

Look the Part

Dress for the camera: Solid colors present better than patterns. Don’t move as much as you might during an in-person meeting, and stay within the camera frame. And you know this, but look into the lens, not at the screen. That’s where the people are, and that is how you make eye contact. This requires a surprising amount of practice.

4

Manage the Audio

Make sure your sound equipment is connected and working before the meeting starts. In groups of less than five, it’s safe to assume you can keep your microphone on. In larger conferences, mute your mic as soon as you join the meeting.

5

Be Present

Don’t try to get away with multitasking. “We can see you not paying attention,” Sherman says. Also, don’t cut the video feed without explanation—it’s like walking out of the room without excusing yourself. Rude! Need a break? Explain that you’ll be right back.

Do the Upright Thing

A standing desk is not an automatic ticket to better health. As Joan Vernikos, author of *Sitting Kills* and a former NASA Life Sciences director, discovered in her research on the stresses imposed by microgravity environments, uninterrupted standing can be as bad as sitting. Ideally, you’d switch between the two, but at least if you’re standing you’re more apt to lean forward or backward, or switch legs. To ensure a healthy day at the (standing) desk, incorporate these posture changes.



▲

Work Your Legs

The simplest thing you can do is place a footrest under your desk where you can prop one leg while you stand. Vernikos recommends switching legs often, because “the body needs stimulation through a change signal.”

Practice Movement

Vernikos suggests walking in place or squatting every half-hour or hour. It takes 20 to 30 minutes for your body to feel the benefits of these movements, so dose them out. “If you do a whole bunch in 20 minutes, that doesn’t count.”

▼



Take a Knee

Kneeling exercises are great for getting the blood flowing, Vernikos says. Try swiftly alternating between kneeling and standing five times. Keep it brisk to get the burst of energy you need to bang out those last three Keynote slides.

▼



LEVEL UP
CLICK MATES

Serious typists deserve a responsive keyboard. Here are three steps to tactile heaven. —MICHAEL CALORE



1

GOOD

Aukey KM-G3 RGB

Add some tappy feedback to your strokes and sharpen your email routine with Aukey's nicely priced keyboard. Even with its garish, multicolored LED backlights and springy key switches that click loudly enough to be heard five cubicles away, it's miles ahead of that freebie you're typing on now.

$66

2

GREAT

Logitech Orion G610 Brown

Next to the soft white LEDs beneath the Orion's keys you'll find high-quality, German-designed Cherry MX Brown switches; a tactile bump mid-keystroke and a relatively quiet click make them the best choice for typists. Media controls—including a cool volume roller—sit conveniently above the number pad.

$120

3

AMAZING

Das Keyboard Prime 13

The Prime is all about minimalist elegance and functionality. There are no frills, just 104 backlit keys set into an anodized aluminum top plate. The sturdy build means it'll last at least until your 10th novel. With soft-clicking, finger-pleasing switches, the Das lets you command those Slack channels with comfort and authority.

$129



WORK

PRODUCTIVITY

ENJOY YOUR NEW VIRTUAL OFFICE

Augmented-reality workspaces will transform the way you do your job, and you won't look weird doing it. At all. —DAVID PIERCE

NEXT TIME YOU GET a promotion at work, don't agitate for the corner office. You won't need it. Pretty soon, your office will be as big and messy and private as you like, because you'll be the only one who can see it. ¶ The early days of virtual and augmented reality have focused mostly on gaming, but *Pokémon Go* and *Superhot* are just a tiny part of how you'll ultimately use smart glasses once they're capable enough—and unobtrusive enough—to fit on our faces and into our lives. Most of the people developing mixed-reality tech think the venue where AR will really thrive is the workplace. ¶ Picture it: You get to the office, grab a keyboard off the shelf (because air typing still sucks), and find an open space. You log in to your glasses, and your entire workspace appears in front of you. To your right is a shelf stocked with all the apps and bookmarks you use every day. You reach over and grab one, place it on the floor, and the full-scale CAD model of the car you were designing pops into place. Pinned to the wall are all your digital notes, arranged in exactly the way you left them last night. To your left hover six virtual screens displaying browser windows, stock tickers, and Twitter. You ask Siri to pull up your email, and your inbox appears. You can see everything, but all anyone else sees is you, wearing glasses that look like standard Warby Parkers, typing on a keyboard and reaching around in the air. (This is considered socially acceptable-ish, somehow.) When you really need to focus, you flip on Occluded Mode to turn off the world around you, diving into a black hole of virtual productivity.

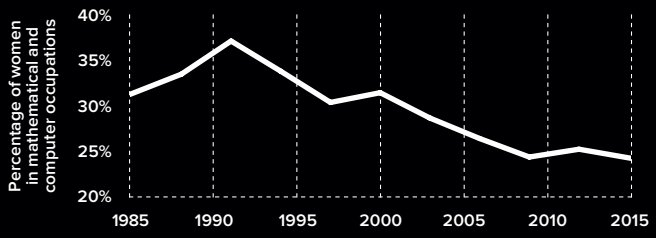
It's going to take a while, but augmented reality will completely reshape the way we work. Even the first phase—simply layering digital information and objects over the real world—will enable you to do your job faster and more efficiently. Big companies like Facebook and Microsoft, startups like Meta and Magic Leap, and even decidedly non–Silicon Valley companies like Boeing and Bosch are building the hardware and software for the AR workplace. They're also grappling with what happens in the second phase of AR work, once we're all comfortable enough in the virtual office to not worry about old metaphors of "documents" and "files," once meetings become multiplayer games and interoffice memos are more like digital stickies automatically plastered on everyone's desk. That's when things really change: Just as ubiquitous cameras led to Instagram and always-on GPS begat Uber, we'll come up with completely new ways to get things done when we're always inside an AR display.

The idea of an office full of people absorbed in AR might seem isolating, but collaboration could actually improve. Working together in mixed reality lets you share information in more useful ways than with email and Slack. (There will still be the need to meet face to face—though maybe just for coffee.) All you'll need is a pair of glasses and enough space to wiggle your arms. Oh, and good practice at whatever body movements communicate "Gosh, I'm working hard on this very important and business-related task!" You know, just in case the boss walks by.

David Pierce *(@pierce) is a senior writer at* WIRED.



PACE OF PROGRESS
For decades, the percentage of women in computing jobs has been dropping.



The Equalizer

Maria Klawe highlights the dangers of keeping women out of tech.

BY MALLORY PICKETT

IN 1978 A YOUNG woman named Maria Klawe arrived at the University of Toronto to pursue a doctorate in computer science. She had never used a computer—much less written a line of code—but she had a PhD in math and a drive to succeed in a male-dominated field. She was so good that, nine months later, the university asked her to be a professor.

Today, however, computer science is one of the few STEM fields in which the number of women has been steadily *decreasing* since the '80s. In the tech industry, women hold only around one-fifth of technical roles. In light of these stats, the prevailing view in Silicon Valley these days is "This is terrible, let's fix it."

In Southern California, Klawe has done what tech has not. For the past 11 years, she has served as the president of Harvey Mudd College—a small liberal arts school in Claremont, California, known for its intensive STEM focus—where the number of women in its computer science program has grown from 10 percent to 40 percent. On the subject, she's optimistic: Change is possible. Now it's the industry's turn—and it could take a lesson from Klawe.

Maria Klawe, president of Harvey Mudd College, has devoted her tenure to increasing the number of women in computer science.

When you meet with men in the tech industry, can you tell that some of them doubt women can succeed in technical work?
That they don't think women are suited for this? Oh, yeah.

People say that?
I was yelled at by one CEO who said his company was bringing women into technical roles but that if he saw it get to 30 percent, he'd know their hiring process was really screwed up. So I asked if he knew that we're graduating women in computer science at more than 40 percent. He just blew me off. And when I asked him why there are so few women on his leadership team, he just said, "Gender isn't an issue for us."

So what about those screwed-up hiring practices? How do they work?
Look at the interview process. If I'm interviewing somebody, I would probably say, "Oh, it's so nice to see you, welcome to Harvey Mudd, we're really delighted to have you here with us." But it would be quite common for a tech company to start an interview without even saying good morning or good afternoon, just: "I want to know what you know about pointers in C++, so show me how to do that." Very adversarial, bragging, trying to show how much smarter they are. There are some women who feel perfectly comfortable in those environments, but I would say for the most part they don't. Also, that kind of environment is just obnoxious.

But that's how so many companies conduct interviews. Google comes to mind.
Google has studied their interview process, and I've heard that it overpredicts success for men and underpredicts success for women. *[Google disputes this.]* They just haven't changed much.

Should they change? Judging from how well these companies are doing, it seems like those methods work. I mean, Steve Jobs was apparently an asshole—
He was an asshole. I met him.

HAIR AND MAKEUP BY ERIN WALTERS. CHART SOURCE: NCWIT AND U.S. BUREAU OF LABOR STATISTICS

BRIAN GUIDO

—and Amazon reportedly has a terrible work environment, yet these are successful companies.
Yep.

So why change just to be friendlier to women?
Google, Facebook, Microsoft—all these companies were successful because they figured out a new way to make money. Google monetized search through advertising, Facebook became an advertising platform, Microsoft created a dominant software platform. But it's probably an error to associate their success with their managerial style or their culture.

Some would say those managerial styles and cultures are crucial, not coincidental.
Let's go back to the first big tech companies, like IBM and HP. Both were highly inclusive, really worked on hiring and promoting women and people of color. In fact, virtually every woman or person of color who's a leader in the tech industry today—who's roughly my age, 66—came up through IBM or HP. Bill Gates and Steve Jobs and all the people in that generation came along in the '80s or late '70s. This happened to be a time when girls and young women were being turned away from computers. Computers became a boys' domain almost overnight.

How?
Women were once about a third, maybe 35 percent, of the computer science majors in this country. Part of that was—I mean, this sounds so ridiculous—but part of that was because women had better typing skills and were thought of as being more careful. In the '70s women were majoring in computer science because it was something they were expected to be *good* at. Then we had personal computers entering homes and schools. There are two kinds of things you can do on a PC as a child. One is word processing. Bo-ring! The other is playing games like *Pong* and *Space Invaders*—computational power at that time couldn't do graphics more sophisticated than that. And who likes to play those kinds of games? Boys. So it's not particularly surprising that very quickly boys took over.

Is there a business reason for getting back to a culture in which computers aren't seen as a boy thing?
The reality is, if tech companies can't persuade more women and people of color to major in computer science, they are not going to be able to fill the positions that they have. Everybody's looking at the same talent. They absolutely know what it costs to recruit a single person, and they know that if their churn for employees is, say, every 13 months, that's not a good business case for them.



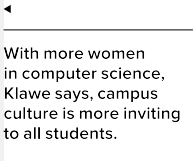
So when you actually start to increase the enrollment of women in computer science programs, what happens?
Well, at pretty much every place—not just Mudd but Carnegie Mellon, MIT, University of Washington, UBC, Princeton—that has made a significant effort to recruit women into engineering and computer science, not only do the female students do as well, they also take on most of the leadership roles.

With that in mind, have you noticed a change on campus?
Huge. It's more social, people are happier—it's just a different vibe. Before, there was a very particular culture, which is fairly common, where computer science is the central focus in

Mallory Pickett
(@MalloryLPickett) is a journalist based in Los Angeles. She wrote about Sweden's cashless future in issue 24.05.

the lives of most of the students. They read Reddit and GitHub, they play a lot of videogames, they do hacking projects. There are still students like that, but there are also people who care more about ballroom dancing.

What's so important about having ballroom dancers be computer scientists?



With more women in computer science, Klawe says, campus culture is more inviting to all students.

If computer science is going to affect every aspect of society—and it is—you really would like to have some dancers, and some artists, and some doctors able to work at the interface of computer science in their field. That's where the demand will be. Having that breadth of knowledge means you have better teams working on projects.

Sure, but is teamwork as important as your ability to write good code?

These days, agile software development often relies on pair programming, where you have two people—a driver and a navigator. The driver codes, the navigator looks over their shoulder and asks questions, and they flip roles about once every half hour. The result is much higher quality software. There are fewer faults.

Yet women still feel unwelcome. What changes at Mudd addressed that?

One was to make the introductory computer science course less intimidating. If you emphasize needing a special kind of brain, students who are underrepresented will do much worse. But if you say this is a discipline that rewards hard work and persistence, everyone does better.

We also started emphasizing more practical applications in introductory classes. In the past we presented computer science as interesting just for its own structure. That was very effective at attracting white and Asian men to the discipline, but only a subset of them, and it was generally not effective for women or people of color. When you start to make the argument that computer science is worth studying because of the things you can do with it, you attract not only more women but also a lot of men who wouldn't have been interested in the usual approaches.

If everyone knows it's a good idea to be more inclusive, and everyone wants to support their female employees, why aren't more companies doing it?

Because changing culture is hard. Every company has somewhat different attributes that make recruiting people and keeping people difficult. Apple is one company that I don't think is particularly trying. They hired their first VP of diversity and inclusion, and that person stayed for less than a year.

Are some companies succeeding?

Etsy convinced people who weren't in software development jobs to be trained for technical roles, and they managed to get to almost 30 percent female in their engineering population relatively quickly. Accenture is doing extremely well and came in at roughly 40 percent female in their hires last year.

How did they do that?

The executive in charge of hiring came to me for help. I said, first of all, change your job descriptions. Don't just list the technical skills you're looking for. List communication skills, creativity, and people skills, so women will know it's a workplace that values those things and because those are traits women tend to have more confidence about.

Gender isn't the only concern, of course. If the percentage of female technical employees is in the teens at many companies, black and brown employees are—

In the single digits! Like, one-handed digits.

What is Harvey Mudd doing about that?

The truth is we made very little progress on race until about five years ago.

What happened?

We had been running a program where we would bring in 35 to 40 high school students for a weekend, and it was primarily aimed at students of color and women. Five years ago, we doubled the program and did two cohorts instead of one. And I started reaching out to African American leaders across the country. We also did research on how to recruit more Hispanic students, and we learned Hispanic families want their kids to stay close to home. So we needed to focus on admitting students from schools in Southern California.

What would you say to schools that are not making these changes?

What's facing us is a very, very different future. The haves will be the people who have the skills that are needed, and the have-nots will be the people whose skills are no longer needed—because of automation, because of AI, because of robotics. We don't know how fast certain kinds of routine jobs will go away, but we do know it will put a further income gap between people who have that kind of education and knowledge and people who don't. If there are not many women, or people of color, or older people, or low-income people getting that technical education and those technical jobs, it's going to further polarize the situation in the country. It's a question of transforming our society so a large enough fraction of people have opportunities for productive work.

So the stakes are high.

We want the Earth to survive. It's pretty straightforward. W

It's an error to associate Big Tech's success with **managerial style or company culture.**

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068 | EVERYTHING YOU SAY CAN AND WILL BE USED AGAINST YOU
BY DOUG BOCK CLARK

080 | PLEASE, SILENCE YOUR SPEECH
BY ALICE GREGORY

086 | THE BEST HOPE FOR CIVIL DISCOURSE ON THE INTERNET ... IS ON REDDIT
BY VIRGINIA HEFFERNAN

For most of modern history, the easiest way to block the spread of an idea was to keep it from being mechanically disseminated. Shutter the newspaper, pressure the broadcast chief, install an official censor at the publishing house. Or, if push came to shove, hold a loaded gun to the announcer's head.

This actually happened once in Turkey. It was the spring of 1960, and a group of military officers had just seized control of the government and the national media, imposing an information blackout to suppress the coordination of any threats to their coup. But inconveniently for the conspirators, a highly anticipated soccer game between Turkey and Scotland was scheduled to take place in the capital two weeks after their takeover. Matches like this were broadcast live on national radio, with an announcer calling the game, play by play. People all across Turkey would huddle around their sets, cheering on the national team.

Canceling the match was too risky for the junta; doing so might incite a protest. But what if the announcer said something political on live radio? A single remark could tip the country into chaos.

So the officers came up with the obvious solution: They kept several guns trained on the announcer for the entire 2 hours and 45 minutes of the live broadcast.

It was still a risk, but a managed one. After all, there was only one announcer to threaten: a single bottleneck to control of the airwaves.

Variations on this general playbook for censorship—find the right choke point, then squeeze—were once the norm all around the world. That's because, until recently, broadcasting and publishing were difficult and expensive affairs, their infrastructures riddled with bottlenecks and concentrated in a few hands.

But today that playbook is all but obsolete. Whose throat do you squeeze when anyone can set up a Twitter account in seconds, and when almost any event is recorded by smartphone-wielding members of the public? When protests broke out in Ferguson, Missouri, in August 2014, a single livestreamer named Mustafa Hussein reportedly garnered an audience comparable in size to CNN's for a short while. If a Bosnian war criminal drinks poison in a courtroom, all of Twitter knows about it in minutes.

In today's networked environment, when anyone can broadcast live or post their thoughts to a social network, it would seem that censorship ought to be impossible. This should be the golden age of free speech.

And sure, it *is* a golden age of free speech—if you can believe your lying eyes. Is that footage you're watching real? Was it really filmed where and when it says it was? Is it being shared by alt-right trolls or a swarm of Russian bots? Was it maybe even generated with the help of artificial intelligence? (Yes, there are systems that can create increasingly convincing fake videos.)

Or let's say you were the one who posted that video. If so, is anyone even watching it? Or has it been lost in a sea of posts from hundreds of millions of content producers? Does it play well with Facebook's algorithm? Is YouTube recommending it?

Maybe you're lucky and you've hit a jackpot in today's algorithmic public sphere: an audience that either loves you or hates you. Is your post racking up the likes and shares? Or is it raking in a different kind of "engagement": Have you received thousands of messages, mentions, notifications, and emails threatening and mocking you? Have you been doxed for your trouble? Have invisible, angry hordes ordered 100 pizzas to your house? Did they call in a SWAT team—men in black arriving, guns drawn, in the middle of dinner?

Standing there, your hands over your head, you may feel like you've run afoul of the awesome power of the state for speaking your mind. But really you just pissed off 4chan. Or entertained them. Either way, congratulations: You've found an audience.

SURE, IT IS A GOLDEN AGE OF FREE SPEECH–
IF YOU CAN BELIEVE YOUR LYING EYES.

HERE'S HOW THIS golden age of speech actually works: In the 21st century, the capacity to spread ideas and reach an audience is no longer limited by access to expensive, centralized broadcasting infrastructure. It's limited instead by one's ability to garner and distribute attention. And right now, the flow of the world's attention is structured, to a vast and overwhelming degree, by just a few digital platforms: Facebook, Google (which owns YouTube), and, to a lesser extent, Twitter.

These companies—which love to hold themselves up as monuments of free expression—have attained a scale unlike anything the world has ever seen; they've come to dominate media distribution, and they increasingly stand in for the public sphere itself. But at their core, their business is mundane: They're ad brokers. To virtually anyone who wants to pay them, they sell the capacity to precisely target our eyeballs. They use massive surveillance of our behavior, online and off, to generate increasingly accurate, automated predictions of what advertisements we are most susceptible to and what content will keep us clicking, tapping, and scrolling down a bottomless feed.

So what does this algorithmic public sphere tend to feed us? In tech parlance, Facebook and YouTube are "optimized for engagement," which their defenders will tell you means that they're just giving us what we want. But there's nothing natural or inevitable about the specific ways that Facebook and YouTube corral our attention. The patterns, by now, are well known. As Buzzfeed famously reported in November 2016, "top fake election news stories generated more total engagement on Facebook than top election stories from 19 major news outlets combined."

Humans are a social species, equipped with few defenses against the natural world beyond our ability to acquire knowledge and stay in groups that work together. We are particularly susceptible to glimmers of novelty, messages of affirmation and belonging, and messages of outrage toward perceived enemies. These kinds of messages are to human community what salt, sugar, and fat are to the human appetite. And Facebook gorges us on them—in what the company's first president, Sean Parker, recently called "a social-validation feedback loop."

There are, moreover, no nutritional labels in this cafeteria. For Facebook, YouTube, and Twitter, all speech—whether it's a breaking news story, a saccharine animal video, an anti-Semitic meme, or a clever advertisement for razors—is but "content," each post just another slice of pie on the carousel. A personal post looks almost the same as an ad, which looks very similar to a *New York Times* article, which has much the same visual feel as a fake newspaper created in an afternoon.

What's more, all this online speech is no longer public in any traditional sense. Sure, Facebook and Twitter sometimes feel like places where masses of people experience things together simultaneously. But in reality, posts are targeted and delivered privately, screen by screen by screen. Today's phantom public sphere has been fragmented and submerged into billions of individual capillaries. Yes, mass discourse has become far easier for everyone to participate in—but it has simultaneously become a set of private conversations happening behind your back. Behind everyone's backs.

Not to put too fine a point on it, but all of this invalidates much of what we think about free speech—conceptually, legally, and ethically.

The most effective forms of censorship today involve meddling with trust and attention, not muzzling speech itself. As a result, they don't look much like the old forms of censorship at all. They look like viral or coordinated harassment campaigns, which harness the dynamics of viral outrage to impose an unbearable and disproportionate cost on the act of speaking out. They look like epidemics of disinformation, meant to undercut the credibility of valid information sources. They look like bot-fueled campaigns of trolling and distraction, or piecemeal leaks of hacked materials, meant to swamp the attention of traditional media.

These tactics usually don't break any laws or set off any First Amendment alarm bells. But they all serve the same purpose that the old forms of censorship did: They are the best available tools to stop ideas from spreading and gaining purchase. They can also make the big platforms a terrible place to interact with other people.

Even when the big platforms themselves suspend or boot someone off their networks for violating "community standards"—an act that *does* look to many people like old-fashioned censorship—it's not technically an infringement on free speech, even if it is a display of immense platform power. Anyone in the world can still read what the far-right troll Tim "Baked Alaska" Gionet has to say on the internet. What Twitter has denied him, by kicking him off, is attention.

Many more of the most noble old ideas about free speech simply don't compute in the age of social media. John Stuart Mill's notion that a "marketplace of ideas" will elevate the truth is flatly belied by the virality of fake news. And the famous American saying that "the best cure for bad speech is more speech"—a paraphrase of Supreme Court justice Louis Brandeis—loses all its meaning when speech is at once mass but also nonpublic. How do you respond to what you cannot see? How can you cure the effects of "bad" speech with more speech when you have no

ZEYNEP TUFEKCI *(@zeynep) is an associate professor at the University of North Carolina and an opinion writer for* The New York Times.

means to target the same audience that received the original message?

This is not a call for nostalgia. In the past, marginalized voices had a hard time reaching a mass audience at all. They often never made it past the gatekeepers who put out the evening news, who worked and lived within a few blocks of one another in Manhattan and Washington, DC. The best that dissidents could do, often, was to engineer self-sacrificing public spectacles that those gatekeepers would find hard to ignore—as US civil rights leaders did when they sent schoolchildren out to march on the streets of Birmingham, Alabama, drawing out the most naked forms of Southern police brutality for the cameras.

But back then, every political actor could at least see more or less what everyone else was seeing. Today, even the most powerful elites often cannot effectively convene the right swath of the public to counter viral messages. During the 2016 presidential election, as Joshua Green and Sasha Issenberg reported for Bloomberg, the Trump campaign used so-called dark posts—nonpublic posts targeted at a specific audience—to discourage African Americans from voting in battleground states. The Clinton campaign could scarcely even monitor these messages, let alone directly counter them. Even if Hillary Clinton herself had taken to the evening news, that would not have been a way to reach the affected audience. Because only the Trump campaign and Facebook knew who the audience was.

It's important to realize that, in using these dark posts, the Trump campaign wasn't deviantly weaponizing an innocent tool. It was simply using Facebook exactly as it was designed to be used. The campaign did it cheaply, with Facebook staffers assisting right there in the office, as the tech company does for most large advertisers and political campaigns. Who cares where the speech comes from or what it does, as long as people see the ads? The rest is not Facebook's department.

M

MARK ZUCKERBERG holds up Facebook's mission to "connect the world" and "bring the world closer together" as proof of his company's civic virtue. "In 2016, people had billions of interactions and open discussions on Facebook," he said proudly in an online video, looking back at the US election. "Candidates had direct channels to communicate with tens of millions of citizens."

This idea that more speech—more participation, more connection—constitutes the highest, most unalloyed good is a common refrain in the tech industry. But a historian would recognize this belief as a fallacy on its face. Connectivity is not a pony. Facebook doesn't just connect democracy-loving Egyptian dissidents and fans of the videogame *Civilization*; it brings together white supremacists, who can now assemble far more effectively. It helps connect the efforts of radical Buddhist monks in Myanmar, who now have much more potent tools for spreading incitement to ethnic cleansing—fueling the fastest-growing refugee crisis in the world.

The freedom of speech is an important democratic value, but it's not the only one. In the liberal tradition, free speech is usually understood as a vehicle—a necessary condition for achieving certain other societal ideals: for creating a knowledgeable public; for engendering healthy, rational, and informed debate; for holding powerful people and institutions accountable; for keeping communities lively and vibrant. What we are seeing now is that when free speech is treated as an end and not a means, it is all too possible to thwart and distort everything it is supposed to deliver.

Creating a knowledgeable public requires at least some workable signals that distinguish truth from falsehood. Fostering a healthy, rational, and informed debate in a mass society requires mechanisms that elevate opposing viewpoints, preferably their best versions. To be clear, no public sphere has ever fully achieved these ideal conditions—but at least they were ideals to fail from. Today's engagement algorithms, by contrast, espouse no ideals about a healthy public sphere.

Some scientists predict that within the next few years, the number of children struggling with obesity will surpass the number struggling with hunger. Why? When the human condition was marked by hunger and famine, it made perfect sense to crave condensed calories and salt. Now we live in a food glut environment, and we have few genetic, cultural, or psychological defenses against this novel threat to our health. Similarly, we have few defenses against these novel and potent threats to the ideals of democratic speech, even as we drown in more speech than ever.

The stakes here are not low. In the past, it has taken generations for humans to develop political, cultural, and institutional antibodies to the novelty and upheaval of previous information revolutions. If *The Birth of a Nation* and *Triumph of the Will* came out now, they'd flop; but both debuted when film was still in its infancy, and their innovative use of the medium helped fuel the mass revival of the Ku Klux Klan and the rise of Nazism.

By this point, we've already seen enough to recognize that the core business model underlying the Big Tech platforms—harvesting attention with a massive surveillance infrastructure to allow for targeted, mostly automated advertising at very large scale—is far too compatible with authoritarianism, propaganda, misinformation, and polarization. The institutional antibodies that humanity has developed to protect against censorship and propaganda thus far—laws, journalistic codes of ethics, independent watchdogs, mass education—all evolved for a world in which choking a few gatekeepers and threatening a few individuals was an effective means to block speech. They are no longer sufficient.

But we don't have to be resigned to the status quo. Facebook is only 13 years old, Twitter 11, and even Google is but 19. At this moment in the evolution of the auto industry, there were still no seat belts, airbags, emission controls, or mandatory crumple zones. The rules and incentive structures underlying how attention and surveillance work on the internet need to change. But in fairness to Facebook and Google and Twitter, while there's a lot they could do better, the public outcry demanding that *they* fix all these problems is fundamentally mistaken. There are few solutions to the problems of digital discourse that don't involve huge trade-offs—and those are not choices for Mark Zuckerberg alone to make. These are deeply political decisions. In the 20th century, the US passed laws that outlawed lead in paint and gasoline, that defined how much privacy a landlord needs to give his tenants, and that determined how much a phone company can surveil its customers. We can decide how we want to handle digital surveillance, attention-channeling, harassment, data collection, and algorithmic decisionmaking. We just need to start the discussion. Now.

THE MOST EFFECTIVE FORMS OF CENSORSHIP TODAY INVOLVE MEDDLING WITH TRUST AND ATTENTION, NOT MUZZLING SPEECH.

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STEVEN JOHNSON

GOES INSIDE **CLOUDFLARE**'S DECISION TO LET A NAZI STRONGHOLD BURN.

In the fall of 2016, Keegan Hankes, an analyst at the Southern Poverty Law Center, paid a visit to the neo-Nazi website the Daily Stormer. This was not unusual; part of Hankes' job at the civil rights organization was to track white supremacists online, which meant reading their sites. But as Hankes loaded the page on his computer at SPLC's headquarters in Montgomery, Alabama, something caught his eye: a pop-up window that announced "Checking your browser before accessing … Please allow up to 5 seconds." In fine print, there was the cryptic phrase "DDoS protection by Cloudflare." Hankes, who had worked at SPLC for three years, had no idea what Cloudflare was. But soon he noticed the pop-up appearing on other hate sites and started to poke around. ¶ There's a good chance that, like Hankes, you haven't heard of Cloudflare, but it's likely you've viewed something online that has passed through its system. Cloudflare is part of the backend of the internet. Nearly 10 percent of all requests for web pages go through its servers, which are housed in 118 cities around the world. These servers speed along the delivery of content, making it possible for clients' web pages to load more quickly than they otherwise would. But Cloudflare's main role is protection: Its technology acts as an invisible shield against distributed denial of service (DDoS) attacks—hacker campaigns that disable a website by overwhelming it with fake traffic. The company has more than 7 million customers, from individual bloggers who pay nothing for basic security services to Fortune 50 companies that pay up to a million dollars a year for guaranteed 24-hour support. ¶ Hankes wanted to learn something about Cloudflare's business, and what really interested him was finding out who Cloudflare was protecting. After a few months of research, he felt confident he'd uncovered something important, and on March 7, 2017, he penned a blog post that denounced Cloudflare for "optimizing the content of at least 48 hate websites." Those sites included Stormfront, the grandfather of white-nationalist online message boards, and the Daily Stormer, at that time one of the most important hate sites on the internet. A virulently anti-Semitic publication, the Daily Stormer was founded in 2013 by a thuggishly enigmatic white supremacist named Andrew Anglin. ("Total Fascism" was the upbeat name of one of his earlier publications.)



Matthew Prince struggled to stay true to his free-speech principles as CEO of Cloudflare.

PHOTOGRAPH **JOÃO CANZIANI**

Without Cloudflare's protection, the Daily Stormer and those other sites might well have been taken down by vigilante hackers intent on eliminating Nazi and white-supremacist propaganda online. Hankes and the SPLC weren't accusing Cloudflare of spouting racist ideology itself, of course. It was more that Cloudflare was acting like the muscle guarding the podium at a Nazi rally. ¶ Matthew Prince, the 43-year-old CEO of Cloudflare, didn't bother responding to the SPLC's pointed accusation. In fact, he has only the haziest recollection of hearing about it. He might have seen a mention on Twitter. He's not sure. Prince is a genial, Ivy League–educated Bay Area resident who once sat in on lectures by a law professor named Barack Obama—the type of person you would expect to have a vivid impression of being denounced by a prominent civil rights organization. But for Prince the criticism was nothing new. At Cloudflare, he was in the business of protecting all kinds of clients, including some whose views vaulted way outside the boundaries of acceptable discourse. He'd already been accused of helping copyright violators, sex workers, ISIS, and a litany of other deplorables. It was hardly a surprise to him that neo-Nazis would be added to the list. Come late summer, however, he would no longer be able to take that breezy attitude. Prince didn't realize it at the time, but that SPLC blog post was the first indication of the trouble to come. Five months later, Prince would be forced to make a very public decision about the Daily Stormer, one made against his own best judgment and that presented some of the thorniest and most perplexing challenges to free speech since the ACLU defended neo-Nazis who planned to march in Skokie, Illinois, 40 years ago.

How did an internet infrastructure company get locked into a vital free-speech dispute with a bunch of Nazis? That is a story that begins, like so many great tales, in the cubicles of San Francisco and the brothels of Istanbul.

I

IN 2010, WHEN Cloudflare first started, long before it counted customers in the millions, Prince and his cofounders, Michelle Zatlyn and Lee Holloway, installed a bell in their cramped SoMa offices. Whenever someone signed up for Cloudflare's services, the bell would ring and the 10 or so employees would all drop what they were doing to see who their new customer was.

One day in 2011, the bell rang and Prince went to see who had signed up. "It was the moment where I was like, 'We need an employee handbook.'" The new customer was a Turkish escort service that needed cyber-protection for a promotional website. But it was only the first. Within two weeks, some 150 Turkish escort sites had signed up for Cloudflare's services. The young outfit had somehow become a go-to service for the Istanbul sex trade.

Curious about this niche-business popularity, a Cloudflare employee contacted the webmaster at one of the escort sites. The webmaster had heard about Cloudflare from a friend who read about it on TechCrunch, and he explained why he sought the company's protection: Orthodox Muslim hackers had decided to take the law into their own hands and wipe the escort sites off the web. They had largely succeeded, until Cloudflare entered the picture.

To understand why the Turkish webmasters flocked to Cloudflare, you have to understand a bit more about where the company interjects itself into the invisible and near-instantaneous flow of bits that travel between an ordinary user and the servers that deliver the information. When you type a URL into a browser and hit Return, that request first goes out to a domain name server, which translates the human-readable URL (call it www.turkishescort.com) into the numerical IP address of the web server that's hosting the content. At that point, a packet of bits is dispatched

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from the domain name server over to the hosting server, and the content you've requested is delivered back to your browser.

The trouble is that "you" might not be you at all. Your computer might be infected with malware that has commandeered it to serve in an army of zombie machines—a botnet—that hackers use to execute DDoS attacks. Your seemingly idle laptop might be helping to swamp an innocent website with thousands of requests per second, overloading the target's servers and making it impossible for legitimate requests to get through. That's where Cloudflare comes in.

Cloudflare protects against these attacks by inserting itself between the browser and host servers that contain the content. From the user's perspective, the experience is frictionless: You hit the bookmark for, say, a local newspaper and within a split second your screen fills with high school sports scores and reports on the mayoral race. But behind the scenes, your request for information has been filtered through one of Cloudflare's data centers.

"At that data center," Prince explains, "we'll make a series of determinations: Are you a good guy or a bad guy? Are you trying to harm the site? Or are you actually a legitimate customer? If we determine that you're a bad guy, we stop you there. We act essentially as this force shield that covers and protects our customers."

During a visit in September to Cloudflare's headquarters—now in more expansive offices in SoMa—Prince took me to the company's network operations center, where monitors line the walls, each filled with graphs and brightly colored blocks of text. These represented hundreds of different attacks being attempted in real time across the Cloudflare network. Cloudflare separates the good guys from the bad using pattern recognition. If it sees a familiar nefarious pattern breaking out, it will stop it, like a human immune system attacking a virus. The cyberattackers who went after the Turkish brothels exhibited a distinctive pattern; at Cloudflare, that fingerprint was dubbed the "TE attack," as in Turkish Escorts.

About a year after the first Turkish escort site became a customer, Prince got a call from someone he calls a panicked "Dutch gentleman." The caller was responsible for the website of the wildly popular Eurovision song contest. It was two days before the final showdown of the television talent show, and the site had been taken offline by a DDoS attack. When Cloudflare's security team looked at the data, they saw the family resemblance immediately: It was the TE attack. The Eurovision contest that year was being held in Azerbaijan, a predominantly Muslim country, and the hackers had decided that Eurovision should be knocked offline. Having seen the attack before, Cloudflare was able to get the site up and running in less than 30 minutes, plenty of time before the final rounds. Fast-forward another six months. Prince was summoned to a big financial firm in New York to help analyze a recent attack on its servers. In the conference room, the finance team slid their log files across the table to Prince and his colleagues. As they scanned the logs, smiles of recognition passed across their faces. It was the same maneuver the Turkish Escort attackers had used.

The TE attacks didn't just help Cloudflare impress Wall Street titans, they also taught the company something about the value of protecting objectionable content. A site that someone, somewhere, deeply despises is the type of site that is likely to be attacked. And when sites are attacked, Cloudflare gets better at what it does; its pattern recognition improves. "Putting yourself in front of things that are controversial actually makes the system smarter," Prince says. "It's like letting your kids roll around in the dirt." This is one of the reasons it makes sense for Cloudflare to offer a free self-service platform: By widening the pool of potential invasive agents, it makes the immune system more responsive. "It's not obvious that a bunch of escorts that aren't paying you anything are good customers. It's not obvious that having people who get attacked all the time—including neo-Nazi sites—that you would by default want them to be on your network. But we've always thought the more things we see, the better we're able to protect everybody else."

Cloudflare has now logged millions of different kinds of attacks, each, like TE, with its own recognizable signature. This growing database of malice ultimately brought Cloudflare to its central, if largely invisible, position as an internet gatekeeper. The day before I visited Cloudflare's offices, 22,000 new customers signed up for its services. Needless to say, there is no longer a bell ringing for each one that signs up.

M

MATTHEW PRINCE GREW up in Park City, Utah. His father started out as a journalist and later

"PUTTING YOURSELF IN FRONT OF THINGS THAT ARE CONTROVERSIAL ACTUALLY MAKES THE SYSTEM SMARTER. IT'S LIKE LETTING YOUR KIDS ROLL AROUND IN THE DIRT."

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became a drive-time radio host, and Prince has memories of "sitting around the dinner table, talking about the importance of the First Amendment and freedom of speech." As an undergraduate at Trinity College in Hartford, Connecticut, Prince briefly considered majoring in computer science before deciding on English literature. He also founded a digital-only magazine. He went on to study law at the University of Chicago, where he attended those lectures by Professor Obama, before going to Harvard Business School, where he met Zatlyn.

Prince's eclectic background gave him the confidence to grapple with Cloudflare's speech dilemma at all its various layers: As a trained lawyer, he understood the legal implications of corporations policing speech acts; as the founder of a tech company, he was familiar with the technical abilities as well as business imperatives of dealing with customers; and as a liberal-arts-son-of-a-journalist, he thought a lot about what kind of rhetoric is acceptable online. Prince felt strongly that the invisible infrastructure layer of the internet, where Cloudflare operated, should not be the place to limit or adjudicate speech. In Prince's governing metaphor, it would be like AT&T listening in on your phone conversations and saying, "Hey, we don't like your political views. We're kicking you off our network."

In the years after the launch of Cloudflare, he argued, public-intellectual style, for the importance of preserving free speech online and the neutrality of the infrastructure layer of the internet. It was partly that history that allowed Prince and his colleagues to dismiss the initial investigation by the SPLC. "We're always having controversies about things," Zatlyn says.

But Prince's law school certitude would soon be challenged by another, even uglier, twist involving the Daily Stormer. In the process of standing guard outside its clients' websites, Cloudflare's filters sometimes trap legitimate complaints against these sites, the majority of which involve copyright infringement. Someone uploads a catchy song to a website without permission from the artist. Eventually, the songwriter takes notice, but her lawyer can't present a cease-and-desist notice because the copyright violator is behind the Cloudflare shield. And so, over time, Cloudflare had developed a policy of passing along any complaint to its customers and letting them deal with the requests.

But a system designed to address copyright infringement proved to be less adept at dealing with Nazis. Ordinary people disturbed by the hate speech on the Daily Stormer would seek to register their complaints about the site to Cloudflare, the host. But instead of directly addressing the complaint, Cloudflare, following its usual policy, would pass those complaints, with the senders' contact information, along to the Daily Stormer.

In early May, another story came out—one that Cloudflare could not ignore. The article, by ProPublica, revealed that people who had complained to Cloudflare about the Daily Stormer were getting harassing and threatening calls and emails, including one that told the recipient to "fuck off and die." The ProPublica piece quoted a blog post under Anglin's name: "We need to make it clear to all of these people that there are consequences for messing with us. We are not a bunch of babies to be kicked around. We will take revenge. And we will do it now." It looked as if Cloudflare had ratted out decent people to an army of fascist trolls.

Recognizing that it had a legitimate problem on its hands that couldn't be erased by invoking free speech, Cloudflare quickly altered its abuse policy, giving users the option of not forwarding their identity and contact information. ProPublica also reported Anglin saying that the hate site paid $200 a month for its Cloudflare protection, a point Cloudflare would not comment on. Despite Cloudflare's pride in protecting any site, no matter how heinous, Prince says he was caught off guard by the Daily Stormer's attacks on the people who complained. "What we didn't anticipate," Prince told me, ruefully, "was that there are just truly awful human beings in the world."

"EMPLOYEES WERE STRUGGLING. THERE ARE SOME REALLY AWFUL THINGS CURRENTLY ON THE WEB, AND IT'S BECAUSE OF US THAT THEY'RE UP THERE."

A FEW MONTHS LATER, on Friday, August 11, a group of torch-wielding white supremacists marched in the streets of Charlottesville, Virginia; the next day a counterprotester named Heather Heyer was run over in what appeared to be an act of political violence. That afternoon, without mentioning Heyer's death, Donald Trump blamed the violence in Charlottesville on "many sides," and the whole country was suddenly engulfed by the question of what we were willing to do to stand up to Nazis. The Daily Stormer posted a repulsive piece under Anglin's

byline with the headline "WOMAN KILLED IN ROAD RAGE INCIDENT WAS A FAT, CHILDLESS 32-YEAR-OLD SLUT." It only got worse from there.

After reading the post, an anti-fascist vigilante hacker known as the Jester tweeted, "Nice site, Andrew. Be a shame if something 'happened' to it." But the threat was empty as long as Cloudflare continued to offer its protection. "That night I was at home and I get this DM on Twitter from the Jester," Prince says. "And he's saying, 'Hey, these guys are jerks. I want to DDoS them off the internet. Will you get out of the way?'" Prince says he responded with a link to a speech he'd given at an internet security conference defending free speech principles. (The Jester did not respond to a request for comment.) Meanwhile, the wrath against Cloudflare was rising. "All of a sudden, a ton of people were yelling at us on Twitter," Prince recalls. The online service GoDaddy, which maintained the Daily Stormer's domain, announced it was canceling this arrangement. The Daily Stormer tried to move its domain registration to Google Domains but was denied. Cloudflare seemed to be the last major player willing to do business with the neo-Nazi site, appearing once again to go out of its way to protect hate speech.

On Monday afternoon, Prince and his management team gathered to address the growing controversy. The backlash weighed heavily on the minds of the rank and file at Cloudflare. "There was definitely water-cooler talk," recalls Janet Van Huysse, who oversees employees and human resources. "We were all over the news. People were struggling. There were a lot of people who were like, 'I came to this company because I wanted to help build a better internet, and we believe fiercely in a free and open internet. But there are some really awful things currently on the web, and it's because of us that they're up there.'" A range of feelings would emerge during a town-hall–style meeting for employees conducted later in the week. One attendee said to Prince, "I don't have a good answer for what we should say going forward as a proud Cloudflare employee. What should I say?" Another asked why they would consider kicking neo-Nazi sites off the platform, but not alleged ISIS sites.

On Tuesday night, Prince was hosting a dinner for Cloudflare interns at his home in San Francisco. At one point during the event, Cloudflare's general counsel, Doug Kramer, pulled Prince aside and said, "It seems like this keeps ratcheting up." Checking his phone surreptitiously during the meal, Prince noticed that fellow technologist Paul Berry, founder and CEO of a social media service called RebelMouse, had taken to Twitter to denounce Cloudflare for hosting "Nazi hate content that even @GoDaddy took down."

After the interns left his apartment, Prince and Tatiana Lingos-Webb, his fiancée, cleaned up and did the dishes. (The two have since married.)



MY ACCOUNT

HOLLY O'REILLY

Songwriter and activist

On being blocked by Trump, and suing him for it

I had an alert that would go off whenever Trump tweeted, and I would reply to most of his tweets. I think it was a Sunday morning: I posted a GIF of the Pope kind of looking at Trump funny, and my tweet said, "This is pretty much how the whole world sees you."

After that, my phone was very quiet all day. I thought, well, maybe he's golfing. Then I came back to my computer in the evening and saw that he had actually blocked me. And I just laughed. I'm nobody. I can't be more than a gnat to him. I felt incredulous, and then amused, and then concerned, all within moments of each other. Then I started thinking, you know, this is something that shouldn't happen.

The things that I want to say are directed not just to Trump but to the other people who are on his feed. If they're watching Fox News and listening to Rush Limbaugh and following Trump's tweets, then Twitter is at least a place where they can get an opposing opinion. But he's blocked people who disagree with him. When you look at his feed now, it's mainly just people who are praising Dear Leader. That's the part that bothers me. So when the Knight First Amendment Institute contacted me, kind of out of the blue, and asked if I would be interested in talking to them about taking part in a lawsuit against Trump, I said sure. Public officials should not be able to block you on social media.

—AS TOLD TO CHELSEA LEU

ILLUSTRATION **MAGDA ANTONIUK**



PHOTOGRAPH **JOÃO CANZIANI**

Stung by Berry's tweet, Prince started bemoaning the ease with which people seemed willing to abandon the basic ideals of free speech. "Maybe there is something different about Nazi content," Lingos-Webb ventured. "And I looked at her and said, 'You too?'" Prince recalls.

"I went to bed angry," Prince says, "and woke up in the morning still angry." Checking Twitter, he discovered that someone on the Daily Stormer site—in full frog-and-scorpion mode—had decided to antagonize the one service left supporting it. An anonymous comment about the site's technical challenges noted the moves by GoDaddy and Google to oust the Daily Stormer: "They succeeded in everything except Cloudflare, whom I hear are secretly our /ourpeople/ at the upper echelons." Overnight, Prince and his colleagues had been welcomed into the ranks of practicing white supremacists.

Prince called Berry to walk through his reasoning for continuing to protect the Daily Stormer. Prince had known the RebelMouse CEO for years through the technology conference circuit and respected his opinions. It was a tense call. Berry told him he understood the predicament. "But when you work that fucking hard to build something that's that successful, you get to choose who uses it," Berry recalls telling Prince. "And you get to set a code of conduct that leaves it clear for people—a code of conduct that says we will not support white supremacy, racism, hate."

"I'd try to make my argument," Prince says now of the conversation, "and Paul would say, 'It doesn't matter, Nazis.' And I'd say, well, it kind of does, because if the phone company is listening in on my phone calls and then decides that they don't like what I'm talking about and starts pulling the plug, that seems creepy to me."

Hanging up with Berry, Prince got in the shower. He had barely slept; his friends seemed to be taking the wrong side of the free-speech argument. But he could see where the controversy was heading: If he kept protecting the Daily Stormer, the inevitable next step was a customer boycott of Cloudflare, with real business consequences. But if he kicked them off, "I thought through the parade of horribles that would follow," he recalls. Suddenly every controversial site on the Cloudflare network would be subject for review, and Cloudflare would have helped establish a precedent for deep infrastructure services regulating speech. As he stood in the shower, all these thoughts swirled around his head. "It was literally one of those lean-your-head-against-the-wall moments—like, what the hell are we going to do?"

"But then I had a thought: Maybe we can kick them off, and *then* talk about why that's so dangerous. Maybe that can change the conversation." Prince would betray his principles and then make the betrayal into an argument for why those principles matter.

M

"MATTHEW CALLED ME at around 10 that morning, and said, 'We're kicking them off,'" Zatlyn recalls. She'd gone to bed feeling Cloudflare was not the right place to censor and assuming they would stick to the company policy. "I was speechless, a little stunned. 'I'm surprised to hear you say this. I was not expecting that. But OK.'"

By late morning, the company's trust and safety team had completed the procedures to remove the Daily Stormer from the Cloudflare network. And Prince drafted a blog post. It began in a just-the-facts mode: "Earlier today, Cloudflare terminated the account of the Daily Stormer."

"Our terms of service reserve the right for us to terminate users of our network at our sole discretion." The tipping point for Prince was the suggestion on the Daily Stormer site that top managers at Cloudflare "were secretly supporters of their ideology."

But then Prince took a rhetorical twist: "Now, having made that decision, let me explain why it's so dangerous."

Prince spoke about the peril posed by DDoS attacks. We might all agree, Prince argued, that content like the Daily Stormer shouldn't be online, but the mechanism for silencing those voices should not be vigilante hackers.

His bigger argument was about the danger of private companies like Cloudflare (not to mention Google or Amazon Web Services) determining what constituted acceptable speech. "Without a clear framework as a guide for content regulation," Prince explained, "a small number of companies will largely determine what can and cannot be online." Perhaps his most striking point came in a separate memo he wrote to his staff. "Literally, I woke up in a bad mood and decided someone shouldn't be allowed on the internet. No one should have that power."

◂ Cloudflare cofounder Michelle Zatlyn says the company's very nature attracts controversy.

P

PRINCE'S DILEMMA OVER the Daily Stormer has been present in net culture from the early days of online communities. But where debates about what forms of speech should be forbidden often seemed academic and remote, today they are at the center of social discourse. White-supremacist movements that once were deemed beyond the pale are more vocal, their ideas spreading openly into the mainstream, with political leaders not always willing to condemn them. Hankes, of the SPLC, says that even fringe hate sites "can have a tremendous impact" because of social media's ability to amplify extreme ideas. "Our position has been that pretty much everyone south of the internet service providers"—in other words, anyone hosting or protecting online content—"has the responsibility to take a stance on these issues," Hankes says, "or be ready to answer for the consequences of people who are taking advantage of their services."

The original free-speech ethos that shaped the internet has also grown shakier: Back then, strong First Amendment values were one of the few areas of agreement among the libertarians and progressives who shaped the early culture. Today, that alliance is less stable. Aggressive anti-hate-speech movements on college campuses have aroused ire among libertarians, and among progressives there is a growing sense that Big Tech has become a breeding ground for bile. Every other week, it seems, there's another flare-up over Twitter's terms of service and the rampant harassment and abuse that plagues that platform.

"Honestly, I am so sad," Berry told me. "I grew up in the Valley; I've been writing code since I was 10, and I believed in technology." But now, Berry says, he sees money to be made as a platform company triumphing over civic decency. "Right now we have a tension between financial success and actually being human."

"LITERALLY, I WOKE UP IN A BAD MOOD AND DECIDED SOMEONE SHOULDN'T BE ALLOWED ON THE INTERNET. NO ONE SHOULD HAVE THAT POWER."

The immense size of those gatekeepers—like Google, Facebook, Twitter and, in its own way, Cloudflare—has also challenged the older vision of cyberspace as a realm of unchecked speech. There have been dark wells of hate online since the Usenet era, but back then, misanthropy was distributed across thousands of different platforms. Even if you felt some speech was objectionable enough to silence, it was a practical impossibility to get rid of it all. No single entity could silence an idea. But in a world where Facebook and Google count their audiences in the billions, a decision by one of those big players could, essentially, quiet an unpopular voice. In December, in fact, Twitter started enforcing new rules to suspend accounts of people who use multiple slurs or racist or sexist tropes in their profile information.

Prince is aware of that power, but he also carefully titrates the various elements in the internet concoction. He argues that there is a fundamental difference between sites like Facebook or Twitter, which provide content, and deep infrastructure like hosting or security services. For Prince, the relative invisibility of Cloudflare to ordinary consumers makes it the wrong place to address speech. "I think that gives us a framework to say infrastructure isn't the right place to be regulating content," he says. "Facebook and YouTube still may be—and it's an easier question for them, because they're advertising-supported companies. If you're Procter & Gamble, you don't want your ad next to terrorist content, and so the business model and the policy line up."

If this sounds like passing the buck, Prince's argument does get philosophical support from civil liberties groups. The Electronic Frontier Foundation, which has taken a stand that what it calls "intermediaries"—services like Cloudflare and GoDaddy that do not generate the content themselves—should not be adjudicating what speech is acceptable. The EFF has a strong presumption that most speech, even vile speech, should be allowed, but when illegal activity, like inciting violence or defamation, occurs, the proper channel to deal with it is the legal system. "It seems to me that the last thing we should be doing is having intermediaries deputizing themselves to make decisions about what's OK," says Corynne McSherry, legal director of the EFF. "What law enforcement will tell you is that it's better for them to be able to keep track of potentially dangerous groups if they're not pushed down into the dark web." She adds: "I want my Nazis where I can see them."

I

IN THE MONTHS following the Charlottesville weekend, the Daily Stormer bounced around

a series of websites, briefly appearing on Russian and then Albanian domains with new URLs. Prince himself has grown more certain that his company should not be in the speech-regulation business. Since ejecting the Daily Stormer, Cloudflare has received more than 7,000 complaints about sites in its network. "The weirdest was a totally nonpartisan cooking blog," Prince says. "We've considered trying to make some of the recipes, to see if they're just really terrible." Though Prince's blog post vowed to establish a framework for managing objectionable sites on its network, little has changed. "We're still having the debate, but I think the likely outcome is that as an infrastructure company, we're going to err on the side of being neutral and not do what we did to the Daily Stormer again," Prince says now.

Cloudflare can legitimately embrace free speech tradition in the defense of its policy. But it is also protecting its business interests. Network software and algorithms have allowed Big Tech to organize and distribute (and in Cloudflare's case, protect) staggering amounts of information. Looking for patterns in DDoS attacks, detecting the signatures of the Turkish Escort attackers—these are the kinds of problems that can be solved at scale with code. But evaluating 7,000 websites for, say, potential incitements to violence is not something that lends itself to a final determination by software alone; it invariably requires human judgment. Facebook and Google have confronted this issue in the past year with the infiltration of Russian ads and fake news into their feeds and screens. But humans are expensive. Only after public outcry did Facebook and YouTube pledge to hire thousands of human moderators to deal with suspicious ads and with videos that are inappropriate for children. Prince may be right that a service like Cloudflare's is the wrong place to make those assessments, but it's also convenient: Opting out of that obligation makes his business much easier to run.

One still-unresolved debate at Cloudflare is about how the company should memorialize the decision to eject the Daily Stormer. "We do a transparency report twice a year, and one of the things that we have is a list of 'things we have never done.'" It's a short list, and one of its key statements is, "We have never terminated a customer or taken down content due to political pressure." That is no longer true. "So we're having this conversation now internally," Prince says, "about whether we have to remove that."

As of December, Prince says, the company was leaning toward keeping the statement but adding an asterisk that links to a full account of the Daily Stormer affair. "So when the next controversy comes along, we'll be able to point to that and say, 'This was the one time we did that, and here are the dangers it creates.'" The Daily Stormer, however, has not been invited back.



ILLUSTRATION MAGDA ANTONIUK

MY ACCOUNT

LAURA MORIARTY

Young-adult novelist

On being deemed "problematic"

Nine months before my fifth novel, *American Heart*, was published, I got an email saying "There's a discussion happening on Twitter about the problematic white-savior narrative in your novel." I thought that was strange. The only thing that had been released was the publisher's two-sentence description: "*American Heart*, about a fifteen-year-old girl who lives in a world where detainment camps for Muslim Americans are a reality; when she decides to help a Muslim woman who is in hiding, the unlikely pair set off on a dangerous journey hitchhiking their way through the heart of America, discovering courage and kindness in the most unexpected places."

When I looked on Twitter, there was a raging discussion saying that it was a terrible, white-supremacist novel. Then, in October, *Kirkus* gave *American Heart* a starred review. It called the book "a moving portrait of an American girl discovering her society in crisis."

The same people who had been outraged about the description were even more outraged about the starred review. Four days later, *Kirkus* said it didn't think its review was sensitive enough—even though the reviewer was a Muslim woman. *Kirkus* retracted the star and asked the reviewer to reflect on her language. So now it says, "It is problematic that Sadaf is seen only through the white protagonist's filter."

I think much of the YA industry is cowed. These are important conversations to have, but someone screams "Racism!" and it's like screaming "Fire!" People just start running and panicking. I've been compared to Milo Yiannopoulos. It's ridiculous.

People said, "You haven't been censored," and I agree. I haven't; the reviewer has been. They censored *her*.

—AS TOLD TO KAT ROSENFIELD

EVERYTHING YOU CAN AND

“

068

DOUG BOCK CL

PROFILES A COMPUTER SCIENTIST WHO MINES DATA TO EXPOSE **FAR-RIGHT EXTREMISTS.**

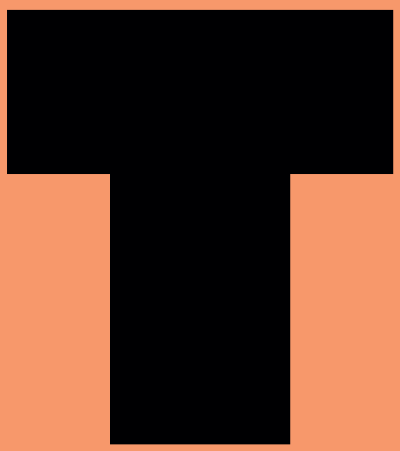
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AGAINST

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ARK

CUSTOM TYPEFACES BY **COMMERCIAL TYPE**



The email arrived just as Megan Squire was starting to cook Thanksgiving dinner. She was flitting between the kitchen, where some chicken soup was simmering, and her living room office, when she saw the subject line flash on her laptop screen: "LOSer Leak." Squire recognized the acronym of the League of the South, a neo-Confederate organization whose leaders have called for a "second secession" and the return of slavery. An anonymous insider had released the names, addresses, emails, passwords, and dues-paying records of more than 4,800 members of the group to a left-wing activist, who in turn forwarded the information to Squire, an expert in data mining and an enemy of far-right extremism.

DOUG BOCK CLARK *(@dougbockclark) wrote about Myanmar's digital revolution in issue 25.10. His first book,* **The Last Whalers,** *comes out in July.*

Fingers tapping across the keyboard, Squire first tried to figure out exactly what she had. She pulled up the Excel file's metadata, which suggested that it had passed through several hands before reaching hers. She would have to establish its provenance. The data itself was a few years old and haphazardly assembled, so Squire had to rake the tens of thousands of information-filled cells into standardized sets. Next, she searched for League members near her home of Gibsonville, North Carolina. When she found five, she felt a shiver. She had recently received death threats for her activism, so she Googled the names to find images, in case those people showed up at her door. Then she began combing through the thousands of other names. Two appeared to be former South Carolina state legislators, one a firearms industry executive, another a former director at Bank of America.

Once she had a long list of people to investigate, Squire opened a database of her own design—named Whack-a-Mole—which contains, as far as anyone can tell, the most robust trove of information on far-right extremists. When she cross-checked the names, she found that many matched, strengthening her belief in the authenticity of the leak. By midafternoon, Squire was exchanging messages via Slack with an analyst at the Southern Poverty Law Center, a 46-year-old organization that monitors hate groups. Squire often feeds data to the SPLC, whose analysts might use it to provide information to police or to reveal white supremacists to their employers, seeking to get them fired. She also sent several high-profile names from the list to another contact, a left-wing activist who she knew might take more radical action—like posting their identities and photos online, for the public to do with what it would.

Squire, a 45-year-old professor of computer science at Elon University, lives in a large white house at the end of a suburban street. Inside are, usually, some combination of husband, daughter, two step-children, rescue dog, and cat. In her downtime she runs marathons and tracks far-right extremists. Whack-a-Mole, her creation, is a set of programs that monitors some 400,000 accounts of white nationalists on Facebook and other websites and feeds that information into a centralized database. She insists she is scrupulous to not break the law or violate Facebook's terms of service. Nor does she conceal her identity, in person or online: "We shouldn't have to mask up to say Nazis are bad. And I want them to see I don't fit their stereotypes—I'm not a millennial or a 'snowflake.' I'm a peaceful white mom who definitely doesn't like what they're saying."

Though Squire may be peaceful herself, among her strongest allies are "antifa" activists, the far-left antifascists. She doesn't consider herself to be antifa and pushes digital activism instead of the group's black-bloc tactics, in which bandanna-masked activists physically attack white suprem-



“I’m the old lady of activism,” says Megan Squire, a professor of computer science at Elon University.

PHOTOGRAPH **JOÃO CANZIANI**

acists. But she is sympathetic to antifa's goal of silencing racist extremists and is unwilling to condemn their use of violence, describing it as the last resort of a "diversity of tactics." She's an intelligence operative of sorts in the battle against far-right extremism, passing along information to those who might put it to real-world use. Who might weaponize it.

As day shifted to evening, Squire closed the database so she could finish up cooking and celebrate Thanksgiving with her family and friends. Over the next three weeks, the SPLC, with help from Squire, became comfortable enough with the information to begin to act on it. In the shadowy world of the internet, where white nationalists hide behind fake accounts and anonymity is power, Whack-a-Mole was shining a searchlight. By mid-December, the SPLC had compiled a list of 130 people and was contacting them, to give them a chance to respond before possibly informing their employers or taking legal action. Meanwhile, the left-wing activist whom Squire had separately sent data to was preparing to release certain names online. This is just how Squire likes it. Hers is a new, digitally enabled kind of vigilante justice. With no clear-cut rules for just how far a citizen could and should go, Squire has made up her own.



Squire, center, marches through the streets of Asheboro, North Carolina, to protest the KKK.

DANIEL HOSTERMAN

S

SQUIRE GREW UP near Virginia Beach in a conservative Christian family. She has been involved in left-leaning movements since she was 15, when her high school environmental club took a trip to protest the pollution from an industrial pig farm. "I loved the activist community," she says, "and saying things we weren't supposed to say." After getting degrees in art history and public policy from William & Mary, she became interested in computers and took a job as a secretary at an antivirus software company, working her way up to webmaster. She eventually got a PhD in computer science from Nova Southeastern University in Florida and moved to North Carolina to work at startup companies before landing a job teaching at Elon. Between classes she could often be spotted around town waving signs against the Iraq War, and in 2008 she went door to door campaigning for Barack Obama. But Obama's failure, in her view, to live up to his rhetoric, compounded by the Great Recession, was "the turning point when I just threw in the towel on electoral politics," she says. She plunged into the Occupy movement, coming to identify as a pacificist-anarchist, but she eventually became disillusioned with that as well when the movement's "sparkle-fingers" utopianism, as she puts it, failed to generate results. In 2016, she cast a vote for the Green Party's Jill Stein.

Donald Trump's campaign, though, gave Squire a new sense of mission: "I needed to figure out what talents I had and what direct actions I could do." When a mosque in the nearby city of Burlington was harassed by a local neo-Confederate group called Alamance County Taking Back Alamance County, she decided to put her skills to use. ACTBAC was using Facebook to organize a protest against the opening of the mosque, so Squire began scraping posts on the page that threatened to "kick Islam out of America." She submitted her findings to the SPLC to get ACTBAC classified as a hate group, and to the North Carolina Department of the Secretary of State, which started an investigation into the group's tax-exempt nonprofit status. She also organized a counterprotest to one of the group's rallies, and it was at this event and others like it where she first became acquainted with the black-clad antifa activists. She was impressed. "They were a level of mad about racism and fascism that I was glad to see. They were definitely not quiet rainbow

peace people." Over the following months, she began feeding information to some of her new local antifa contacts. As white pride rallies intensified during 2017's so-called Summer of Hate—a term coined by a neo-Nazi website—Squire began to monitor groups outside of North Carolina, corresponding with anonymous informants and pulling everything into her growing Whack-a-Mole database. Soon, in her community and beyond, antifa activists could be heard whispering about a new comrade who was bringing real, and potentially actionable, data-gathering skills to the cause.

The first big test of Whack-a-Mole came just before the white supremacist Unite the Right rally in Charlottesville on Saturday, August 12. In the weeks before, because of her database, Squire could see that nearly 700 white supremacists on Facebook had committed to attend the rally, and by perusing their posts, she knew they were buying plane tickets and making plans to caravan to Charlottesville. Her research also showed that some of them had extensive arrest records for violence. She sent a report to the SPLC, which passed it on to Charlottesville and Virginia law enforcement. She also called attention to the event on anarchist websites and spread the word via "affinity groups," secret peer-to-peer antifa communication networks.

The night before the rally, Squire and her husband watched in horror on the internet as several hundred white supremacists staged a torch-lit march in Charlottesville to protest the removal of a statue of Robert E. Lee, chanting "Jews will not replace us!" The next morning, the couple got up at 5 am and drove more than 150 miles through rain and mist to Virginia. At a crowded park, she met with a half-dozen or so activists she knew from North Carolina, some of them antifa, and unfurled a banner for the Industrial Workers of the World. (She'd joined the Communist-inspired labor organization in December 2016, after witnessing what she considered its well-organized response to KKK rallies in North Carolina and Virginia.) Just before 10 am, the white supremacists began marching into Emancipation Park, a parade of Klansmen, neo-Nazis, militia members, and so-called alt-right adherents, armed with everything from homemade plexiglass shields to assault weapons. Squire screamed curses at the white supremacists by name—she knew them because she had their information on file in Whack-a-Mole and had memorized their faces. At one point, a group of clergy tried to blockade the white supremacists, and Squire linked arms with other activists to protect them. A petite woman, she was pushed aside by men with plexiglass shields. Fights broke out. Both sides blasted pepper spray. Squire put on a gas mask she'd been carrying in a backpack, but the pepper spray covered her arms, making them sting.

After the police finally separated the combatants, Squire and dozens of other counter-protesters took to 4th Street in triumph. But then, a gray Dodge Challenger tore down the street—and rammed into their backs. The driver, who had marched with the white nationalists and was later identified as James Alex Fields, missed Squire by only a few feet. She stood on the sidewalk, weeping in shock, as the fatally injured activist Heather Heyer lay bleeding in the street.

Recounting the event months later, Squire began to cry. "I had all this intelligence that I hadn't used as effectively as I could have. I felt like I'd wasted a chance that could have made a difference." When she returned home, she threw herself into expanding Whack-a-Mole.

•

ONE MORNING IN December, I visited Squire in her small university office. She had agreed to show me the database. First she logged onto a foreign server, where she has placed Whack-a-Mole to keep it out of the US government's reach. Her screen soon filled with stacks of folders nested within folders: the 1,200-plus hate groups in her directory. As she entered command-line prompts, spreadsheets cascaded across the screen, each cell representing a social media profile she monitors. Not all of them are real people. Facebook says up to 13 percent of its accounts may be illegitimate, but the percentage of fakes in Squire's database is probably higher, as white nationalists often hide behind multiple sock puppets. The SPLC estimates that half of the 400,000-plus accounts Squire monitors represent actual users.

Until Whack-a-Mole, monitoring white nationalism online mainly involved amateur sleuths clicking around, chasing rumors. Databases, such as they were, tended to be cobbled together and incomplete. Which is one reason no one has ever been able to measure the full reach of right-wing extremism in this country. Squire approached the problem like a scientist. "Step one is to get the data," she says. Then analyze. Whack-a-Mole harvests most of its data by plugging into Facebook's API, the public-facing code that allows developers to build within Facebook, and running scripts that pull the events and groups to which various account owners belong. Squire chooses which accounts to monitor based on images and keywords that line up with various extremist groups.

Most of the Whack-a-Mole profiles contain only basic biographical sketches. For more than 1,500 high-profile individuals, however, Squire fills out their entries with information gleaned from sources like the SPLC, informers, and leaks. According to Keegan Hankes, a senior analyst at the SPLC, Squire's database "allows us to cast a much, much wider net. We're now able to take a much higher-level look at individuals and groups."

In October, after a man fired a gun at counterprotesters at a far-right rally in Florida, SPLC analysts used Squire's database to help confirm that the shooter was a white nationalist and posted about it on their blog. Because so much alt-right digital data vanishes quickly, Whack-a-Mole also serves as an archive, providing a more permanent record of, say, attendees at various rallies. Squire's database has proven so useful that the SPLC has begun laying the groundwork for it to feed directly into its servers.

"ANTIFA WAS A LEVEL OF MAD ABOUT RACISM AND FASCISM THAT I WAS GLAD TO SEE. THEY WERE DEFINITELY NOT QUIET RAINBOW PEACE PEOPLE."





“I DON’T HAVE ANY MORAL QUANDARIES ABOUT THIS. I KNOW I’M FOLLOWING RULES AND ETHICS THAT I CAN STAND UP FOR.”

PHOTOGRAPH **MARK PETERSON**

WHEN SQUIRE SENDS her data to actual citizens—not only antifa, but also groups like the gun-toting Redneck Revolt—it gets used in somewhat less official ways. Before a neo-Nazi rally in Boston this past November, Squire provided local antifa groups with a list of 94 probable white nationalist attendees that included their names, Facebook profiles, and group affiliations. As one activist who goes by the pseudonym Robert Lee told me, "Whack-a-Mole is very helpful. It's a new way to research these people that leads me to information I didn't have." He posts the supposed identities of anonymous neo-Nazis and KKK members on his blog, Restoring the Honor, which is read by journalists and left-wing activists, and on social media, in an effort to provoke the public (or employers) to rebuke them.



Members of Berkeley's antifascist group block an Infowars reporter from covering a rally.

Lee is careful, he says, to stop short of full-on doxing these individuals—that is, publicizing more intimate details such as home addresses, emails, and family photos that would enable electronic or even real-world harassment against them. Squire says that's why she feels comfortable sending him information. Of course, once a name is public, finding personal information is not that hard. In the digital age, doxing is a particularly blunt tool, one meant to terrorize and threaten people in their most private spaces. Celebrities, private citizens, left-wing activists, and Nazis have all been doxed. The tactic allows anonymous hordes of any persuasion to practice vigilante justice on anyone they deem evil, problematic, or just plain annoying. As the feminist videogame developer and activist Zoe Quinn, who has been doxed and brutally harassed online, has written: "Are you calling for accountability and reform, or are you just trying to punish someone—and do you have any right to punish anyone in the first place?"

Squire has been doxed herself. Pictures of her home, husband, and children have been passed around on racist websites. She has received death threats and terrorizing voicemails, including one that repeated "dirty kike" for 11 seconds. Elon University has fielded calls demanding she be fired. On Halloween, Confederate flags were planted in her yard. Still, though Squire fears for her family's safety, she keeps going. "I'm aware of the risks," she says. "But it seems worth it. That's what taking a stand is."

After Charlottesville, Squire considered, in her anger and grief, publicly releasing the entire Whack-a-Mole database. It would have been the largest-ever doxing of the far right. But she worried about the consequences of misidentification. Instead, she worked with her regular partners at the SPLC and activists she trusts. At one point the SPLC contacted a university about a student whom Squire had identified as a potentially violent member of the League of the South. The university did not take action, and she thought about tossing the student's name to the ever-ravenous social media mobs. But here too, she reasoned that when you have someone's life at your fingertips, you need rules. If the university wasn't willing to act, then neither was she. It was, for her, a compromise, an attempt to establish a limit in a national moment pointedly lacking in limits.

Critics might still argue that public shaming of the kind Squire promotes constitutes a watered-down form of doxing, and that this willingness to take matters into their own hands makes Squire and her cohort no better than vigilantes. As David Snyder, executive director of the First Amendment Coalition, says of Squire's work: "Is it ethical to digitally stalk people? It may not be. Is it legal? Probably, as long as she doesn't hack into their accounts and she's col-

PREVIOUS PAGES AND THIS PAGE: MARK PETERSON/REDUX

lecting information they post publicly on an open platform like Facebook." But he warns that limiting speech of anyone, even white supremacists, starts down a slippery slope. "Political winds can shift across time. Liberals who might cheer at a university limiting neo-Nazi speech also have to worry about the flip side of that situation when someone like Trump might penalize them in the future."

As far as Squire is concerned, there's a clear difference between protected speech and speech that poses an imminent threat to public safety. "Richard Spencer yelling about wanting a white ethno-state after events like Charlottesville—it's hard to argue that kind of speech doesn't constitute danger."

Ultimately, Squire sees her work as a type of "fusion center"—a government term for a data center that integrates intelligence from different agencies—for groups combating white nationalism. And she admits that she is outsourcing some of the ethical complexities of her work by handing her data off to a variety of actors. "But it's the same as how Facebook is hypocritical in claiming to be 'just a platform' and not taking responsibility for hate. Every time we invent a technology to solve a problem, it introduces a bunch more problems. At least I'm attentive to the problems I've caused." Squire sees herself as having to make difficult choices inside a system where old guidelines have been upended by the seismic powers of the internet. White nationalists can be tracked and followed, and therefore she believes she has a moral obligation to do so. As long as law enforcement keeps "missing" threats like James Alex Fields, she says, "I don't have any moral quandaries about this. I know I'm following rules and ethics that I can stand up for."

After Charlottesville, some white supremacist groups did find themselves pushed off certain social media and hosting sites (see "Nice Website," page 56) by left-wing activists and tech companies wary of being associated with Nazis. These groups relocated to platforms like the far-right Twitter clone Gab and Russia's Facebook-lite VK. Squire sees this as a victory, believing that if white nationalists flee to the confines of the alt-right echo chamber, their ability to recruit and organize weakens. "If the knowledge that we're monitoring them on Facebook drives them to a darker corner of the internet, that's good," she asserts.

That doesn't mean Squire won't follow them there. She has no plans to stop digitally surveilling far-right extremists, wherever they may be. After Jason Kessler, the organizer of the Unite the Right rally, was unverified on Twitter, he joined VK. His first post read, "Hello VK! I'd rather the Russians have my information than Mark Zuckerberg." The declaration was quickly scooped up by Squire. She had already built out Whack-a-Mole to track him there too. ■

PHOTO REFERENCE: JASON HENRY/THE NEW YORK TIMES/REDUX



ILLUSTRATION **MAGDA ANTONIUK**

MY ACCOUNT

JAMES DAMORE

Former Google engineer

On being fired for writing "Google's Ideological Echo Chamber"

Last year I wrote an internal document calling for a more open discussion of Google's diversity policies, citing research on average gender differences between men and women. Before it went viral, responses from coworkers ranged from "I totally agree" to "Is this true?" or "I disagree because ..."

Once it leaked, rational discussion was impossible: Extreme voices got amplified. It was all about "Oh, this sexist pig" or "Those leftists are all stupid." One manager said, "I intend to silence these views; they are violently offensive."

In the real world, you interact with people near you. You might disagree with them, but you still treat them humanely. When you interact with an avatar, that's not a person anymore. People become objectified. I was objectified as all the racism and sexism in the world.

When whole topics become taboo—like the idea that there are gender differences—many issues become impossible to solve.

An environment where employees compete and talk over one another—what I'd argue is a male-normative one—hurts people who prefer to work together and build each other up. That's disproportionately women. Many women (and some men) will feel unheard, excluded, and underappreciated, particularly because they aren't treated as they'd treat others. But people who are unaware of these differences may see employees who don't thrive in this environment as incompetent.

There was definitely a temptation to recant at certain points. But that would be so harmful to this discussion—because I think what I said was valid, and because it would discourage anyone else from speaking up. And that hurts everyone in the end.

—AS TOLD TO SARAH FALLON

THE REACH OF HATE ONLINE

PUTTING THE INTERNET'S NASTIEST NEIGHBORHOODS IN PERSPECTIVE.

Headlines (and timelines) can make it seem like a rising tide of white supremacists, Nazis, and trolls is one "free speech rally" away from swamping us all. To be sure, hate in America is more visible than it's been in decades, helped along by the internet—the factory where bots, propaganda, and real people slosh around together in an agita-inducing flurry. But all that makes it easy to overestimate how many far-right extremists there are. We pulled together some numbers and facts to put the hate-mongering into context. —EMMA GREY ELLIS

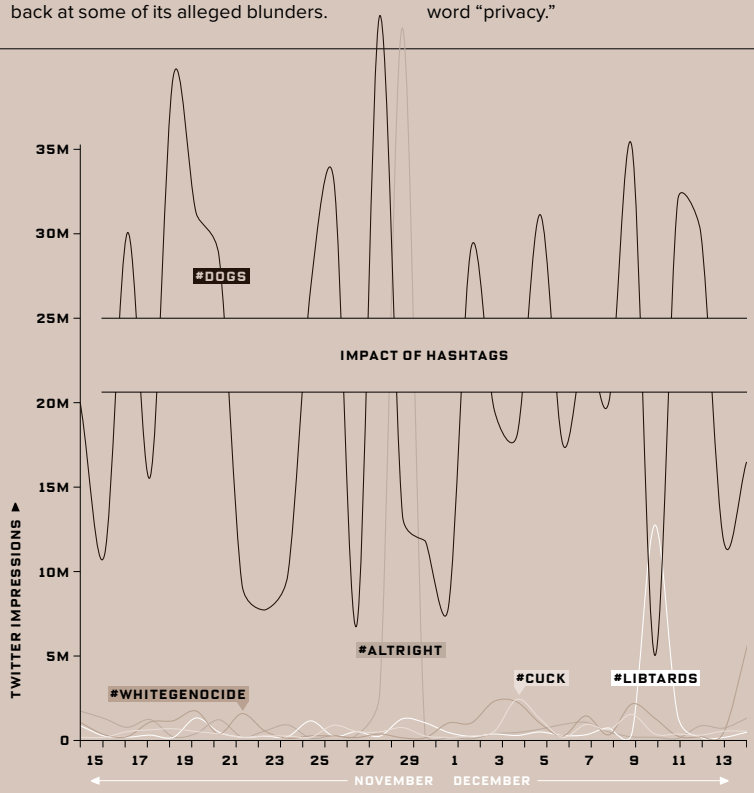
EMMA GREY ELLIS *(@emmagreyellis) wrote about far-right social media platforms in issue 25.10.*

A BRIEF HISTORY OF FACEBOOK CENSORSHIP

Facebook's ongoing effort to police terms-of-service violations has led to some puzzling takedowns, which in turn have resulted in outcry from users. Here's a look back at some of its alleged blunders.

November 2007
Search function seems to omit results for then-presidential candidate Ron Paul, advocacy group MoveOn .org, and the word "privacy."

April 2011
Removes a photo, originally from the British soap opera *EastEnders*, depicting a gay couple kissing.



TWITTER BOTS AND TOXIC #HASHTAGS

Twitter bots have distorted and weaponized political conversation in the US and abroad, and have been used to get non-bot users kicked off the platform. But even *with* robotic assistance, many of the most hateful hashtags—the ones that journalists sometimes use to gauge far-right sentiment—leave only a shallow digital footprint.

19% BOTS' SHARE OF 2016 ELECTION TWEETS

2,752 DEACTIVATED RUSSIAN BOTS

27M BOTS ON TWITTER

45K BOTS' BREXIT TWEETS IN 2 DAYS BEFORE VOTE

HASHTAGS: RITETAG; WEBSITES: ALEXA; SUBREDDITS: REDDITMETRICS.COM; ELECTION BOTS: USC;

CENSUS OF EXTREMITY

Tracking hate groups is notoriously difficult, but according to the Southern Poverty Law Center, whose working database remains the best available resource, there are more than 900 such goups active in the US.

HATE GROUPS PER MILLION RESIDENTS



August 2013
Reportedly filters out content related to Kurdish opposition in Turkey, including maps of Kurdistan.

2014
Allegedly removes thousands of "blasphemous" posts at behest of Pakistani government.

May 2014
Reverses policy after years of removing photos of breastfeeding mothers on the ground that they are "obscene" content.

May 2016
It's reported that news curators have suppressed conservative Trending items.

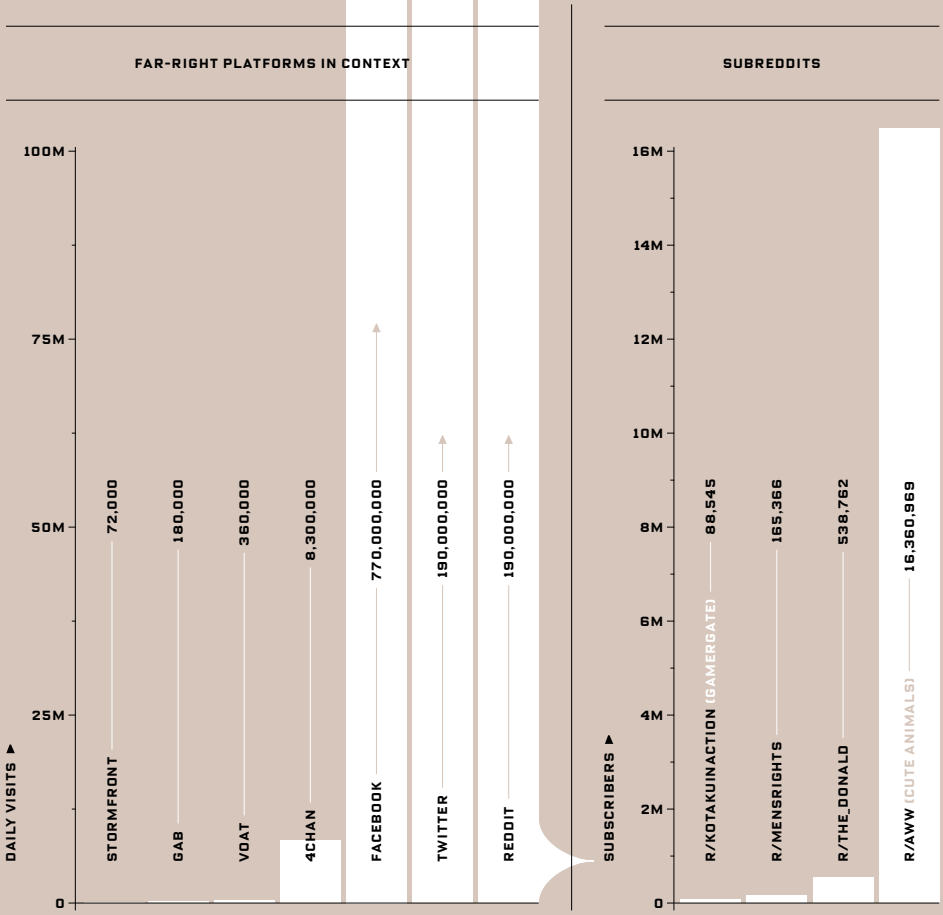
July 2016
Reportedly disables accounts involving the Kashmir dispute and removes photos of the Indian army shooting protesters with pellet guns.

July 2016
Removes Diamond Reynolds' live video of the fatal police shooting of Philando Castile. The company later reinstates it, blaming a "technical glitch."

September 2016
Takes down (and later reinstates) iconic photographs of "Napalm Girl," a nude Vietnamese child running from an attack on her village during the Vietnam War.

THE ECHO CHAMBERS

While hate-filled internet zones like Reddit's notorious /r/The_Donald or the filterless social media platform Gab are shocking places to visit, they're far less populous (and popular) than they might feel.



COUNTER CULTURE

"Free speech rallies" became flashpoints of 2017—yet as the year turned into the Summer of Hate, counterprotesters showed up in far larger numbers.

Charlottesville, Virginia

AUGUST 11

500

DEMONSTRATORS AT A "UNITE THE RIGHT" RALLY

AUGUST 12

130

COUNTERRALLIES HELD ACROSS U.S. IN REPUDIATION

Boston

AUGUST 19

25

FAR-RIGHT DEMONSTRATORS IN ATTENDANCE

40K

COUNTERPROTESTERS OUTNUMBERING THEM

HATE GROUP BREAKDOWN

917

TOTAL HATE GROUPS IN THE UNITED STATES

130 KKK CHAPTERS

100 WHITE NATIONALIST

99 NEO-NAZI

"NEO-NAZIS SHOULD BE LEFT ONLINE. WE NEED TO SEE THEM. BUT REALLY, I'M NOT WORRIED ABOUT THEIR FREE SPEECH RIGHTS. THEY'RE THE LEAST DISENFRANCHISED GROUP I CAN THINK OF."

DANIELLE CITRON, LAW PROFESSOR AND AUTHOR OF *HATE CRIMES IN CYBERSPACE*

777

BREXIT: SWANSEA UNIVERSITY AND UC BERKELEY

PLEASE,

SILENCE

YOUR SPEECH

ALICE GREGORY

VISITS A STARTUP THAT WANTS TO **NEUTRALIZE** YOUR SMARTPHONE—AND UN-CHANGE THE WORLD.

CUSTOM TYPEFACES BY **COMMERCIAL TYPE**

Late last fall, in the gleaming white lobby of Madison Square Garden, uniformed attendants were posted at security stations to make thousands of smartphones stupid. Chris Rock was playing his 10th show in a 12-city international tour, and at every stop, each guest was required to pass through the entryway, confirm that his or her phone was on vibrate or silent, and then hand it over to a security guard who snapped it into a locking gray neoprene pouch—rendering it totally inaccessible. The besuited man ahead of me in line, clearly coming straight from the office, had two cell phones, each of which required its own little bag. The kid behind me groaned that he wouldn't be able to Snapchat his night. The friend whom I'd come to meet was nowhere to be found, and after slipping my phone into the pouch, I couldn't text her to ask where she was. Finally, I spotted her near the escalator. "That was weirdly scary," she said, laughing. ¶ The show would start in 45 minutes. There were still seats to find, bathroom visits to be made, bottles of water to buy. And throughout the lobby, hands everywhere were fidgeting. It was as though all 5,500 of us had been reduced, by the sudden and simple deactivation of our phones, into a roomful of jonesing fiends.

We applied lip balm needlessly, ripped up tissues, cracked our knuckles. The truly desperate could get relief in a cordoned-off "phone zone" just outside the auditorium, where an employee would unlock your phone so long as you stayed within the bathroom-sized pen. "I gotta tell my wife there's no service here," a man told his friend, before ducking in. A woman laughed as she walked by. "It's like a smoking area! Look at all those addicts." Meanwhile, those who resisted the temptation to gain back access to their phones, not five minutes after relinquishing it, complained that they didn't know the time.

YONDR, A SAN FRANCISCO company with 17 employees and no VC backing, was responsible for the cell phone restriction. Its small fabric pouches, which close with a proprietary lock that can be opened only with a Yondr-supplied gadget, have been used at concerts featuring Alicia Keys, Childish Gambino, and Guns N' Roses, and at shows by comedians like Rock, Dave Chappelle, and Ali Wong who don't want their material leaked on YouTube or their audiences distracted by Instagram. They're used in hospitals and rehab centers to enforce compliance with health privacy laws, in call centers to protect sensitive customer information, in churches to focus attention on the Almighty, and in courtrooms to curb witness intimidation. They're used in more than 600 public schools across the country to force children, *finally*, to look at the board and not their screens. The ingeniously unsophisticated scrap of fabric has only one job: to eliminate smartphone use in places where the people in charge don't want it. Which is great when it means creative artists can express themselves freely or the rest of us can see a doctor without worrying we're being recorded. But when it means stifling expression in places where smartphones are increasingly our best chance to document abuses, chronicle crimes, and tell the world what we see, it takes on a different, darker dimension. "The smartphone is many things," says Jay Stanley, a senior policy analyst for the ACLU. "A means of privacy invasion"—something we need to be protected from—"but also an instrument of free speech."

I met Graham Dugoni, Yondr's founder, over drinks one evening in Williamsburg, Brooklyn. He was in New York for two days, meeting with vendors, clients, and business partners about how and why they should use Yondr. "Everyone gets it super intuitively," he says. "Our attachment to our phones isn't all that intellectual. It's much more a body thing, so it was always clear to me that whatever solution there is to this problem had to be itself physical and tangible."

This problem. It's one we all have. Checking Instagram 897 times a day. Refreshing Twitter but not even reading whatever comes up. Feeling our phones buzz, imagining that a cool stranger is offering us our dream job, and then hating ourselves for being so dumb. "If you use a device all the time, it's going to affect your nervous system and your patterns of thought and social interaction. It's really just an impulse check that's needed, I think," Dugoni says. He sees this as a new, awkward epoch of humanity where we might all need a bit of help being our better selves. "In our hyperconnected, atomized modern society," he says, "stepping into a phone-free space provides the foundation for sustained attention, dialog, and freedom of expression."

Dugoni, who is 31 and projects the physical confidence of an extreme athlete, has a flip phone and claims not to read the news. "I'm really selective about my inputs," he told me. "I have a hunch that the human race isn't ready for all our current visual and auditory stimuli." And since founding Yondr in 2014, he has taken it upon himself to try to take us back to a time before cell phones were everywhere and everything. He wants to un-change the world. "I think of it as a movement," he says. "I really do."

Dugoni grew up in Portland, Oregon, studied political science at Duke University, and played professional soccer in Norway until an injury forced him off the field and into finance. At 24 he moved to Atlanta, where he worked, unhappily, for a midsize investment firm, and for the first time in his life sat at a desk for eight hours a day. Dugoni later relocated to the Bay Area and spent a few months working at various startups, but he hated that too. In 2012, at a music festival in San Francisco, he witnessed a pair of strangers film a drunken guy obliviously dancing; they then posted the video to YouTube. Appalled, Dugoni started thinking about how he could have prevented these strangers from making a public spectacle out of someone else's private moment. A tool, maybe, to create a phone-free space.

He spent the next year and a half researching options, reading up on sociology, phenomenology, and the philosophy of technology. And in 2014, after experimenting with different concepts, including a storage locker that could hold individual phones, he settled on a pouch that let people hold onto their phones without being able to use them. Over the next six months, he spent nights sourcing materials from Alibaba, the ecommerce conglomerate, and talking on the phone with Chinese purveyors of fabric and plastic. He'd then sit at his kitchen table until dawn, creating tiny wetsuit-like sleeves and jamming cell phones into them. After 10 prototypes, he created a version that locked and unlocked with ease. He had his product, and he gathered $100,000 from family, friends, angel investors, and his own savings to manufacture and market it.

From the beginning, concert producers understood the appeal of the pouch, and entertainment venues were among Yondr's early customers. That changed in 2016, when Joseph Evers, the



Graham Dugoni went through 10 prototypes before perfecting the Yondr pouch's fit and functionality. ▲

MARIA LOKKE

district court administrator for Philadelphia County, attended a comedy show at the Valley Forge Casino. When the person working security asked for his phone, slid it into one of the pouches, and locked it, Evers realized it could solve a big problem in the courts. At the time, he was struggling with witness intimidation: People were attending hearings and posting photos of the proceedings on social media. "We had tried collecting phones, but it was a nightmare," he told me. "It took forever, and there was a lot of damage [to the phones] we had to pay for." Yondr seemed like an obvious solution. A few days later, he got in touch with the company, and an employee traveled across the country with a case of samples. Evers presented them to the administrative board of the courts in Philadelphia, and everyone agreed immediately and unanimously. Now, on any given day, about 2,000 Yondr pouches are used in Philadelphia courts.

At first, Evers says, he worried that people would bristle at the process, but that hasn't been the case. "There's not a lot of drama," he says. "People get in line and do what they have to do." Evers says the court has seen a "dramatic change" in the number of complaints about social media posts identifying witnesses and undercover officers. "The DA and the police are the biggest beneficiaries," he says. Surrendering your phone "is a small price to pay for safety."

Adam Schwartz isn't so sure. A staff attorney at the Electronic Frontier Foundation, a San Francisco–based nonprofit devoted to defending civil liberties in the digital world, Schwartz wrote to me in an email that the organization is "concerned about technologies that incapacitate, even temporarily, all of the salutary things that a person might do with their smartphone." When I called him to elaborate, he cited the video, shot by a South Carolina high school student in 2015, showing a police officer body-slamming a black, female student for disrupting class. He reminded me of the footage of comedian Michael Richards' epithet-laced 2006 set

ALICE GREGORY *is a writer in New York. This is her first story for* WIRED.



MY ACCOUNT

IJEOMA OLUO

Writer, activist, author, *So You Want to Talk About Race*
Editor at large, the Establishment

On being suspended from Facebook

I was in the middle of Montana on a road trip with my two sons, and the only place open was a Cracker Barrel. We were the only black people there, surrounded by Southern Americana that seemed to harken back to a time that maybe wasn't the best for black people. To blow off steam, I made a quip on Twitter wondering if they would let my black ass walk out of there.

The next thing I knew my phone just blew up. It was surreal. Some clickbaity conservative websites were sharing my tweet as this egregious example of racism against white people. People saw that I was on a road trip and said they hoped I would fall off the edge of the Grand Canyon. They hoped my kids and I died in a car accident. People Photoshopped pictures of my head onto the body of a gorilla. I was seeing images of people being lynched. I tried to report what I could. Twitter actually did a really good job, but Facebook was a different story. I started posting screenshots to show people what I was facing.

I was at Disneyland, getting ready to take the kids out for the day, when I found out that Facebook had given me a three-day suspension for posting images of the harassment that I was getting on Facebook. I started bawling. It wasn't even all the hate, but knowing that our most powerful social media engines were complicit. I tried my best to explain it to the kids in a way that wouldn't make them feel like their mom was a target.

After I wrote a post on Medium about it, Facebook called to apologize. But many black activists and writers of color don't have 115,000 followers on Twitter and 53,000 followers on Facebook, like I do, who can be mobilized to force these platforms to do the right thing. It really is the life of a black woman online.

For weeks after, the moment I got any sort of negative commentary, I would panic, my blood pressure would go up, and I'd wonder, oh God, is this going to happen again? To this day, I still get hate messages about Cracker Barrel.

—AS TOLD TO NITASHA TIKU

ILLUSTRATION **MAGDA ANTONIUK**

that sparked debate about whether entertainers should use racial slurs. He also talked about his concern that his own teenage children should have access to their phones to call 911 should a shooter show up at their school.

Technology has inverted traditional power structures with unprecedented swiftness, and the control of almost any situation is gradually shifting into the hands (literally) of whoever's recording it. Our phones have turned us into socially connected cyborgs, enhancing what it means to see and hear and speak; in taking away the ability to use these devices, we may be compromising something that is becoming not only essential to us, but *about* us. "Ten years ago, very few people were walking around with a camera or video recording device, and one could easily make the argument that Yondr is merely restoring the status quo," Schwartz says. "But the question is, are we better off today, now that the average person can instantly document wrongdoing?"

For all the complaining we do as individuals—about rude dinner companions who look down at their phone between every bite, or our own inability to sit quietly and read novels without impatience—almost nobody would dispute that smartphones have helped catalyze some of the most important social movements of the past few years. Black Lives Matter, Occupy Wall Street, the fight against sexual assault on college campuses: All have been facilitated, at least in part, by footage captured and distributed via smartphones and social media. We've already seen attempts to curb this newly democratized expression, and they're often met with legal challenges—after protesters claimed police departments were using signal jammers to intercept transmissions from their cell phones, the FCC issued an advisory in 2014 calling the practice illegal, except for specially authorized federal agents. Yondr is a private company, not the state, and nobody has filed a suit against the company or its clients. But Gene Policinski, COO of the Newseum Institute and of the Institute's First Amendment Center, thinks smartphone-disabling technology is going to be "litigated over and over again." Phone-restricting devices like Yondr pouches seem innocuous, he says, "but they represent something that could turn potentially dangerous." By way of a hypothetical: What if citizens had to submit their phones to Yondr pouches or something like them before attending a public city council meeting? It could be done in the name of safety, of course, but with a potentially massive silencing effect.

And never mind hypotheticals; even in the sorts of situations that Yondr pouches were originally intended for, the potential applications are troubling. What if there had been Yondr pouches at Hannibal Buress' show when he told a joke that is widely credited for setting in motion the long-overdue takedown of Bill Cosby? And what are we to make of the fact that, within seven months of telling the Cosby joke, Buress hopped on the Yondr train and began preventing audiences from taping his shows?

J

JAY STANLEY, FROM the ACLU, appreciates the ease and elegance of Yondr's method, but he worries that this very easiness—the frictionless slip of the phone into the pouch, the quickness with which the bag locks—could lead someone to believe that they're not really giving anything up. Dugoni recognizes the concerns: "The interplay between privacy and transparency isn't simple, and surveillance and the ability to record others in the public sphere creates a uniquely modern dilemma."

Still, he thinks we gain more than we lose by restricting cell phone use: "What is the etiquette of smartphones?" he asks. "You used to be able to smoke on a plane, and now you can't even smoke on the street in certain places." Dugoni believes legislation restricting cell phone use in certain public areas is inevitable too. "There are already phone-free bars," he says, referring to venues that block cellular signals as a way of encouraging sociability. "And we're going to have to determine where phones should be used as we answer a radically new question: What does it mean to be a human in the world with a smartphone in your pocket?"

At the end of Chris Rock's set, we all herded out of the theater. Security guards were near the exit to snap open the pouches. Reunited with our phones, we feverishly tapped away, while bumping into each other and rolling our eyes. I had received a few work emails, but nothing urgent. My husband had texted me, wondering when I'd be home. Only a few hours had passed. But it felt like 10.

IN TAKING AWAY THE ABILITY TO USE SMARTPHONES, WE MAY BE COMPROMISING SOMETHING NOT ONLY ESSENTIAL TO US, BUT ABOUT US.

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VIRGINIA HEFFERNAN

SUBMITS TO **CHANGE MY VIEW.**

CUSTOM TYPEFACES BY **COMMERCIAL TYPE**

I had a view, and my view was this: Serial sexual abusers should submit to castration. Castration, I believed, would sideline the abuser's compulsions and thus keep the world safe from him (or her lol). While castration hasn't been tested on abusers in the Harvey Weinstein style, it's been used with success on child molesters, bringing the recidivism rate, or so I'd read somewhere, from 75 percent to 2 percent. (Another upside: Castration is rumored to forestall male-pattern baldness.) Of course I meant an entirely bloodless course of hormone therapy. Not a hatchet. I'm not some harridan. The abusers would just get shot up with something called an anaphrodisiac, a brew to suppress androgens and other traces of Aphrodite in the blood.

My opinion was built on a couple of statistics, but less rational motivations were also in play. Like many who have held jobs, I've served my time in taxis and at happy hours showing down with groping goats in the garb of VIPs. I've either wised up to or aged out of this dispiriting cycle, but now, I imagined, with a touch of grandiosity, I might stop it dead. My view, if I really advocated for it, might not only redeem my own experiences, it would revise my earlier meekness with a Valkyrie-like reversal—and avenge the sisterhood.

Yet another contingency undergirded my pro-castration platform: a church-trained, perhaps sentimental worldview that even the worst among us can be delivered from evil—if not by prayer alone then by the ministrations of a compassionate endocrinologist. My hormone-therapy prescription was designed both to recognize the suffering of the sinner—he's "sick" and treatable with medicine—and to punish him with that pitiless word. Castration.

So I had this opinion, and as you can tell I adored it; it made the crooked places in my brain straight and the rough places plain. As the opinion gave me comfort, I grew more tenacious. I amassed an arsenal made of words sharpened to a fine point. I was all but spoiling for a fight.

At the same time, something seemed sinister in my view. Castration? It was zealous. It was maybe mean. At once I realized: I dearly wanted to have my opinion changed.

Because, look, as righteous as I felt, my conscience was also appalled that I wanted to disable the testicles of any mother's son, however much that son liked to masturbate into potted plants and force frottage on colleagues at the vending machine. To recommend that those in power sterilize, spay, and geld the people they don't approve of—that seems the very essence of barbarism. Had my desire for revenge made a Mengele of me? Worse still, was I trying to pass off my personal revenge fantasy as high-minded and rational, inspired by Google searches I dignified as "scientific data"? And so I signed on to Change My View, a section of Reddit where people post opinions and ask to have them changed.

C

CHANGE MY VIEW WAS the brainchild of Kal Turnbull, a musician who was just 17 when he launched the subreddit in 2013, roughly three years before intransigence became the guiding principle of all debate everywhere. As a high school senior, Turnbull could have been forgiven for digging in his heels on teen truisms like punk's not dead or—he's Scottish—*alba gu*

bràth. Instead he rebelled against all sloganeering and groupthink.

"I was generally surrounded by people that all think similarly," Turnbull told me by email from near Inverness, in the Scottish Highlands, where he records music in a farm shed. Back in 2013 Turnbull and his mates tended to discuss *Breaking Bad*, Scottish independence, and indie rock, but Turnbull won't say what the group's consensus on those things was, because he's assiduous about avoiding bias now. "In the grand scheme of the world, we all thought similarly," he told me. "This led me to wonder, what does someone actually do when they want to hear a different perspective or change their view?"

Turnbull didn't want to attract the chippy *you-talkin'-to-me?* crowd that was already adequately represented on Reddit. He meant to populate his forum with people sincerely in quest of lively and honorable debate. At first Change My View did attract rancor and ad hominem brattery, but Turnbull was patient and true to his vision of civil discourse. He enlisted moderators from among the more fair-minded regulars, and for five years now they have policed not just name-calling, rudeness, and hostility but superfluous jokes and mindless agreement. (Turnbull deletes what he calls "low-effort" comments.)

Change My View looks like a standard subreddit, a message board on which threads are organized by topic. (The parent company of Condé Nast, which owns WIRED, holds a majority stake in Reddit.) Yes, you have to trudge through the Caledonian Forest of Reddit's UX and, as usual, risk being hazed when you trespass against Reddit's clubby customs. But it's worth it. CMV is a little heath of reason.

If you have a view, you post it. You're a "submitter." Then those who aim to change your view roll in, posting their views of your view. These are "commenters." Submitters are not supposed to look for fights on Change My View; that's for ... everywhere else on the internet. Instead CMV posters foreground their flexibility—and maybe some insecurity, which brings with it a poignant willingness to be transformed.

Once you submit a view, you've committed to a mental marathon. The rule that makes Change My View different from a freewheeling chat room is that a submitter is required to respond within three hours to brook respectful challenges to their view. You can't just post and skedaddle for the day. If a submitter doesn't respond to commenters in good time, they're considered AWOL, insincere, or obdurate, and the board moves on.

So you train your attention on the topic, and stay and debate. In come the comments, raising questions and courteously testing your conviction. If you're unmoved by the comments and refuse to modify your original submission, the



ILLUSTRATION **MAGDA ANTONIUK**

MY ACCOUNT

BEN SHAPIRO

Cofounder, the Daily Wire; conservative pundit

On being the target of anti-Semitic abuse on Twitter

In May 2016, I posted a nice message on Twitter saying we were grateful to God that our son was born. I immediately got a flood of anti-Semitic messages about his birth, ranging from gas-chamber memes of me to talk about cockroaches and the odd racist tweet. The alt-right had been at me since March, when I came out as #NeverTrump. I knew they would come after me when I made political statements on Twitter, but when I'm tweeting out thanks to God for the birth of my baby son? I was taken aback by the insanity of it.

You have a choice when it comes to these things: Are you going to give it more light, more heat? Or do you try to ignore it? At that point the abuse had become so overwhelming that it was like, *I can't let go of this anymore*. So we wrote about the tweets on the Daily Wire.

I didn't file a complaint with Twitter. I am not a fan of tattling to the referee. If I have to choose between receiving a bunch of garbage on Twitter from evil people and Twitter arbitrarily deciding who to ban, I'll take the evil garbage. What I oppose about Twitter's policies is that Twitter does not make clear what those policies are, and they are not equally applied. If people are making death threats at me from the right, there's a pretty decent chance Twitter will shut it down. If they are doing the same thing from the left, I'm not sure they will.

If I were in charge of Twitter, the standard would be: No threats of violence and no implications that people should do violence. That would probably include "You belong in a gas chamber." Beyond that, have at it.

—AS TOLD TO VERA TITUNIK



PHOTOGRAPH **KATE PETERS**

debate comes to a close when commenters get tired of it. But if you *are* persuaded to change your view, and only when you decide it's changed, you award a delta, the mathematical symbol for change, which is rendered by Option-J on a Mac. The delta goes to the commenter who you believe made you modify, or overturn, your view. To have your view changed or to change someone else's view are both counted as victories.

Recently a poster called Sherlocked_ plowed into a time-honored lion's den: "I lean left but believe abortion should be illegal in most cases." What appeared, however, were not lions at all. Instead, gentlemanly commenters filed in to make debating-society points about physical autonomy. Sherlocked_ heard them out, asking for clarification here and there, but refused to budge.

Finally Penny_lane67 moved the subject from the status of the fetus to the woman, saying that pregnancies can affect women in many ways—some physical, some otherwise. Sherlocked_ acknowledged that this thought was new to him. He mulled it over, ruminating in a few paragraphs.

At last he wrapped up the thread in a small internet miracle: "As I type this and think about it more I think you're right, even if it wasn't abuse and it was simply an accidental pregnancy, there is a chance the pregnancy could cause psychological harm to the mother. And because that would be so hard to diagnose, if I allow abortions in those cases I think I effectively have to in all cases." Delta. Δ

Now I wanted nothing more than to have Sherlocked_'s intellectual curiosity, flexibility, generosity, broad-mindedness. But I wasn't sure I could pull it off. I entered Change My View with trepidation. I felt like I was submitting to chemical castration myself.

T

TURNBULL'S GOOD GARDENING has let a thousand flowers bloom, and what's astounding about Change My View is that no single radioactive topic—not Trump, Brexit, sex, guns—has overrun it. Instead, eclectic subjects, most far from the headlines, pile up like a tone poem.

Kal Turnbull, who is now 22, created the Change My View subreddit in 2013.



ILLUSTRATION **MAGDA ANTONIUK**

MY ACCOUNT

ZAHRA BILLOO

Civil rights attorney

On censoring myself

Years ago, on Memorial Day, I tweeted about how I feel conflicted around the holiday. I wasn't sure how to honor people who I believe died in illegal wars. My tweets got picked up by the far right, and twisted into a narrative about how the Council on American-Islamic Relations, where I work, wanted to cancel Memorial Day. My tweets didn't come close to suggesting that, but Fox News did a story.

It escalated. I got hate mail for days on end. At work, we stopped answering the phone for a week because of the vitriol. Now we get a renewed spate of threats each Memorial Day.

Then, in 2016, at the Democratic convention, Khizr Khan gave a powerful speech. But again I felt conflicted. He was doing incredible work but on a platform that was given to him because his son had fought and died in another illegal war. This time, though, I didn't say anything. I was worried about fallout. I talked to others who felt as I did, but we all hesitated to voice our concerns publicly. I went to bed that night and had this very distinct thought: "I hope Glenn Greenwald will write about the irony of what the DNC was doing." I'm a civil rights lawyer, an American Muslim woman, and I went to bed hoping that a white man would say what I felt I couldn't.

When I was inundated with threats years back, I had been married. Now I was living alone. I look over my shoulder, I make sure all the gates are closed. My apartment complex has security cameras. I live very differently as a single Muslim woman. Some right-wing supporters of the military will say the army men died to preserve my freedom of speech. But if I use that speech, they say they want to kill me.

—AS TOLD TO MARIA STRESHINSKY

Submissions include "Chiropractors are pseudoscientific BS," "Palestine will be completely annexed by Israel within 50 years," and "In *Mrs. Doubtfire* (1993) Daniel is the villain."

The diversity supplies a surge of faith in our fellows. In our era of idées fixes it's almost disorienting to read an opinion that's held lightly, so lightly it's presented expressly for overhaul. Submitters here are by definition skeptical of their own views or otherwise dislike holding too fast to them. But initially I couldn't fathom how to phrase a view as pre-undermined and prime for demolition. That is, until I started looking closely at the submitted views, which, as in the case of my castration view, contained hints of minds at war with themselves. The submitter who finds chiropractors quacks seemed to hope one might relieve their joint pain, where the *Mrs. Doubtfire* connoisseur, who took the controversial stand that lovable Daniel (Robin Williams) is the villain of the piece, appeared mostly to want to match wits with other fans of the film. As for the bold opiner on Israel, maybe this person feared for the future they nonetheless foresaw and was hoping someone would disabuse them of the prophecy. Sometimes an opinion seems like a burden you long to lay down.

If submitting is an act of trust, it follows that commenting on a submission is an act of dominance. Commenters on Change My View are a much more familiar internet type than are submitters, whom they far outnumber. After all, they prefer being right to doubting themselves. They also like debate, persuasion, and the sweet, swift QED of winning an argument. They crave those deltas.

When I first heard about the preponderance of commenters, I wondered whether CMV simply reproduced the power dynamics of ordinary internet shouting matches, with the sole innovation that it had found people, like me, entirely willing to play the fish at the poker table. I pushed Turnbull on this. "Those who are good at challenging views would not necessarily be good at being challenged themselves," he admitted.

"Only one gets to be right!" I persisted, seeing a chance to win.

"WHAT'S ASTOUNDING ABOUT CHANGE MY VIEW IS THAT NO SINGLE RADIOACTIVE TOPIC—NOT TRUMP, BREXIT, SEX, GUNS—HAS OVERRUN IT."

And that's when Turnbull—who at 22 is less than half my age—opened my eyes. His reasoning instantly modeled exactly the civil, and enjoyable, discourse he's promoting.

"Assuming the view change is correct, those who have gained new perspective also 'get to be right,'" he wrote. He even wishes we were all more pleased when we find out we're wrong about something. "I would try to celebrate it," he went on, "but I agree it's not always as simple as this. It seems to be in our nature to focus on how we were wrong over the fact that we're now right (as if we can't be works in progress), and we often attach our egos to what we believe. This is an idea we are trying to challenge at CMV. A view is just how you see something, it doesn't have to define you, and trying to detach from it to gain understanding can be a very good thing."

Racking up deltas is how you get on the leaderboard at CMV. But in some ways, the subreddit rewards change on either side. One of the highest scorers in delta-acquisition to date is a Brett W. Johnson, management consultant, Eagle Scout, and member of Mensa based in Houston.

Johnson emailed me at length explaining that he believes in regularly challenging his own views, and Change My View is the first place he has discovered where you can demonstrate a willingness to change course without being perceived as weak. "In many places, if someone is open to having their mind changed on an issue, they are often met with scorn or ridicule for not already believing the alternate view," he wrote. "There are few places I have ever found where someone can come in and say, 'I'm not sure why people don't think like I do—can anyone help me understand the other side?' and be met with honest, civil, and straightforward discussion."

Johnson is now a moderator on Change My View, and he understood my anxiety about submitting a view for challenge. I realized I was abashed both about my view and my reasons for holding it. And I was about to expose both things to the internet. What if my logic was found wanting?

He wrote, "Personally, I love being wrong! Being shown that I was wrong means that I get to remove a little pocket of ignorance I had and gain a more complete understanding of the world."

My fear of being polemically impotent now seemed embarrassing. I was ready to love being wrong. So at last I submitted my case for the chemical castration of sex abusers to Change My View. You have to post the reasons for your belief, however imminently erroneous; I did that. But I didn't say why I was anxious about my view—that I feared I was a monster for holding it.

The commenters were exceedingly civil. With what seemed like plain curiosity, the first ones asked whether I imagined the men in question would have to have criminal convictions before

they were considered serial abusers. I admitted I hadn't thought of that; most of the men I had in mind were the ones who'd been exposed by extensive reporting, but they hadn't been tried. I conceded that it could be an elective therapeutic treatment for men who acknowledged they were sexually compulsive and destructive, but compulsory castration would be appropriate only for convicts. That taught me that actually administering the kind of program I was advocating would be thorny. Then Moonflower, who has been awarded 60 deltas, wrote, "The problem with any kind of permanent-physical-damage punishment is that occasionally an innocent person will be convicted, and these medications do carry health risks which it would be unethical to force upon a person who might turn out to be innocent." I liked that Moonflower raised the specter of innocence among alleged sexual abusers without politics or stridency. In other forums—like, say, Twitter—anyone who extenuates sexual abuse is considered a traitor to the sisterhood. But "occasionally an innocent person will be convicted" was nothing but an acknowledgment of the imperfection of the criminal legal system. So far, I couldn't tell anything about anyone's political allegiances, gender, or cultural positioning; usually a conversation about sex, gender, and penises brings out the most entrenched ideologues. But here we were discussing logistical, practical, and ethical questions. It came to me in a flash: This had nothing to do with Trump!

That alone was a surprise. We were somehow free.

Damn do these people like to debate. ThomasEdmund84 pulled up as a fellow traveler: "I can't believe this topic came up today (been debating this issue all morning)." I asked him how he and his people had framed the conversation, and he said, "The nature of the debate was quite complex—as best I could tell from the literature, chem castration is very effective in some people and ineffective in others—high chance of side effects in both. I think in the end worth a shot if the person agrees, unfair without." There was something in the "as best I could tell" that suggested he knew he was fallible, and that was the house style on the forum. We're doing the best we can, trying to get to the truth, and no one of us has a monopoly on it.

Eventually I awarded deltas to three commenters who had helped me modify my view: I now allowed that the hormone treatment for sexual abusers would have to be post-conviction, voluntary, and reversible. My opinion was no longer a "take" fitted to Twitter or an op-ed. It was a responsible perspective, honed in a collegial atmosphere. There was something else surprising about this gang. Not one of them had called me a castrating bitch.

In a culture of brittle talking points that we guard with our lives, Change My View is a source of motion and surprise. Who knew that my most heartening ideological conversation in ages would involve gonads, gender wars, and for heaven's sake Reddit?

And in the end Change My View did change my view. It lifted—for a time, anyway—a set of persistent doubts about the sturdiness of my opinions. Yes, my opinions generally sound plausible. As a rule, I substantiate them. But occasionally I suspect with a shudder that I've conceived one in partisan bias, scattershot anxiety, or even outright malice. In short, I question my capacity to reason impartially. What if, in this case, my view was prompted exclusively by rage at widespread sexual mistreatment of women? Or even blind fury at men? I tried to see the bright side: At least I was questioning my beliefs and their underpinnings, which would make me fit right in on Change My View.

While I've been anxious about my moral character more times than I can count, I hadn't realized that I was bringing all that private brooding to my first post on Change My View. What I wanted, in coming to CMV, was to drop my self-doubt—to be relieved of that view of myself.

In this I wasn't alone. I suspected the anti-abortion submitter had felt as I did, worried that his view of abortion was at odds with the rest of his ideals, and that the contradiction suggested something was wrong with him. Just as I feared that misandry motivated me to favor castration, this submitter, who said he was generally liberal, seemed anxious that in wanting to recriminalize abortion he was a closet misogynist.

Maybe what we share when we submit views for changing is not the view itself as much as those poltergeist doubts that haunt all of us—about our motives, our capacity to reason, our politics, our principles, even our essential goodness. It's that profound vulnerability in users of the forum that makes Change My View such a trusting and rewarding community.

There's something wrong with me. That was an opinion that felt like a burden I'd longed to lay down. That was a view it felt like a triumph to change.

VIRGINIA HEFFERNAN *(@page88), a* WIRED *contributor, is the author of* **Magic and Loss: The Internet as Art.**

COLOPHON

UNFILTERED REMARKS THAT HELPED GET THIS ISSUE OUT:

Not knowing I was talking to one of the founders of WIRED; constant refreshing honesty with my S.O.; "I don't see me winning this argument with the person who supplies the PDFs"; telling a friend I take better Instagrams than they do; "I think I am low-key turning into a psychopath"; Roxane Gay's *Hunger*; frank talk about Al Franken at Thanksgiving; "It's fine, we'll bring our laptops to Thai"; that's between me and my Replika chatbot; telling a table of drunk white nationalists that, yes, I did vote for Hillary; "I just want you all to know that I cooked this Thanksgiving meal for me"; #metoo; "You know, without karaoke, I don't think we have all that much in common"; the NPR story about sexual harassment in Hollywood that inspired my Lyft driver to open up about how she got her kids back from a husband who raped, beat, and held her at gunpoint while he kidnapped their children—the most emotional airport goodbye I've ever had with a stranger.

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