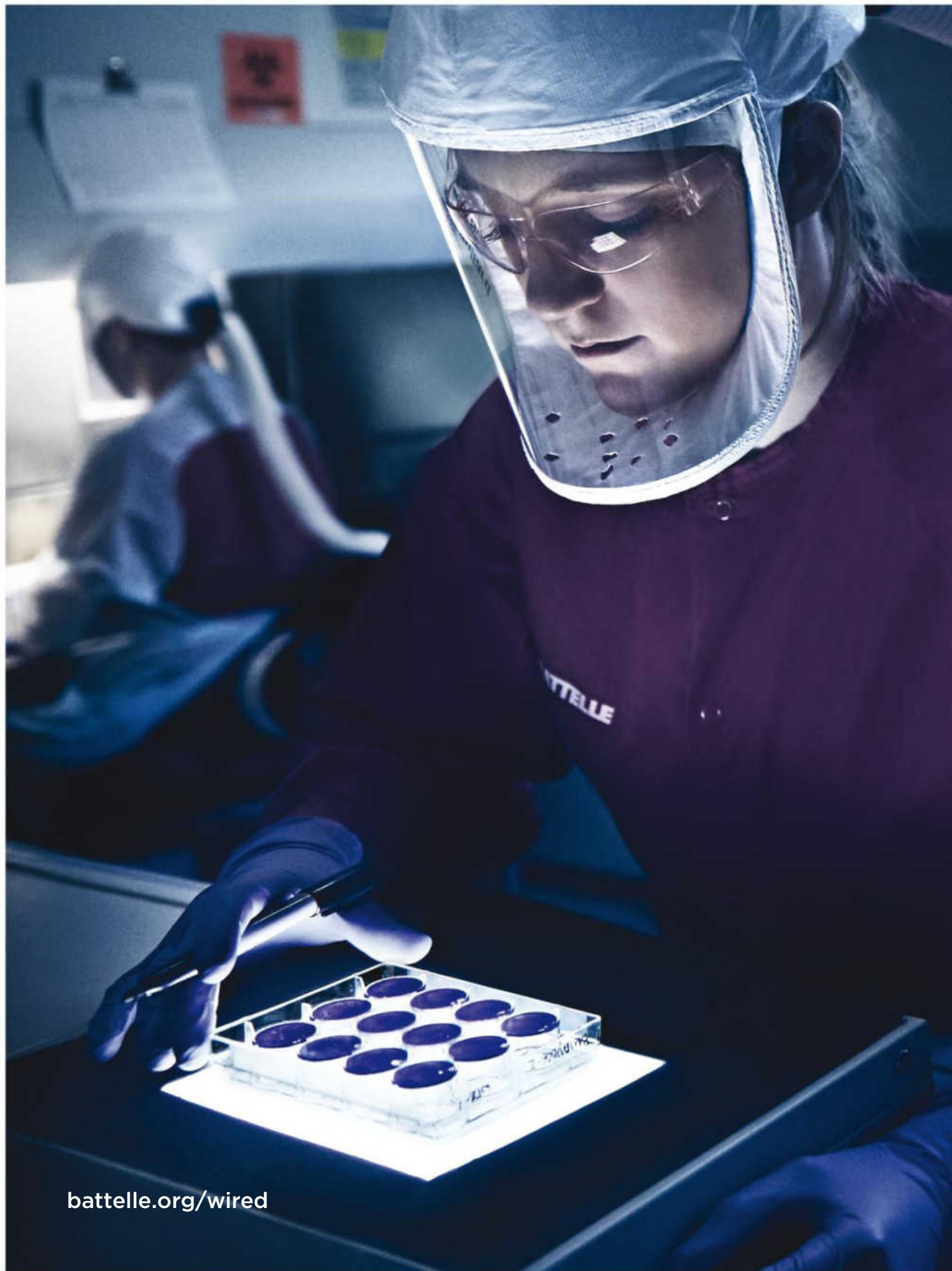


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The
Hunt for
RUSSIA's
Most
Notorious
Hacker

P. 52





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THIRD
BOX? ”



—Tillmann Werner, CrowdStrike researcher, “CHASING THE PHANTOM”

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WIRED 25TH ANNIVERSARY FEATURE

**"WE REALLY WEREN'T CONVINCED THAT
THE INTERNET COULD BE A DESTINATION
FOR SHORT-FORM COMEDY."**

—WILL FERRELL, from "Comedy Boom," an oral history of Funny or Die



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Are You Laughin' at Me?

Comedy in the age of Trump

WITH

- *Full Frontal's* **Samantha Bee**
- *Pod Save America's* **Jon Lovett**
- Conservative comedian **Chonda Pierce**
- A *Daily Show* script, deconstructed
- Muslim stand-up **Negin Farsad**
- Fake tweets by **Owen Ellickson**

Comedy Boom

An oral history of Funny or Die, the site that transformed humor on the internet.

BY BRIAN RAFTERY

VERY GLAD I DID NOT BOTHER READING THIS FAILING MAGAZINE. NO TALENT, THESE PEOPLE. SAD!

HUMOR: SO IMPORTANT. ESPECIALLY AT A TIME LIKE NOW, WHEN WE'RE ALL WORRIED ABOUT WHAT I'M GOING TO DO TO THE COUNTRY, OR THE WORLD, EVEN.



52

Chasing the Phantom

A mysterious Russian hacker known as Slavik stole at least \$250 million from US banks. Then the FBI learned what he was really after.

BY GARRETT M. GRAFF

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Where Is My Brother?

As refugees flee conflict zones, thousands disappear—into new lives or into the sea. Now social media is helping uncover their fate.

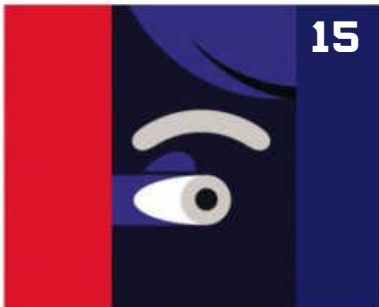
BY ERIC REIDY



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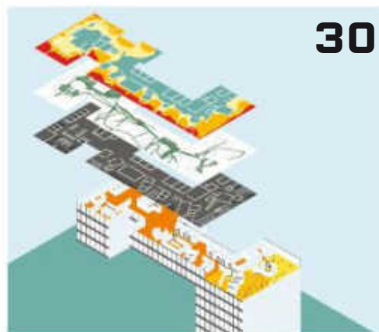


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In 2018, WIRED will turn 25 (that's 100 in internet years!). And the celebration starts now: In the issues leading up to the big anniversary, we'll publish oral histories that tell the stories behind the most influential ideas, inventions, and events since 1993. We kick off the party this month with a look back at *Funny or Die*, the revolutionary comedy site that changed how laughs spread online.



MEET THE NEW(ISH) GUY

WIRED HAS A NEW EDITOR IN CHIEF, but he isn't new to WIRED. Nick Thompson first joined the magazine as an editor in 2005. (The job offer arrived the day before he was set to start law school.) During his first term here, he edited stories about faking your own death, fake tech lobbyists, and even fake identities; the last piece turned into the Oscar-winning film *Argo*. Thompson then moved to *The New Yorker*, ultimately becoming editor of its website. When asked by the staff here about his plans, Thompson responded, "You can't really do better than what Louis Rossetto and Jane Metcalfe said when they started this thing: 'Tell us something we've never heard before in a way we've never seen before.'"



Depicting a decade's worth of gags from the top names in comedy is no joke. To illustrate our oral history of *Funny or Die* (page 76), collage artist **Eddie Guy** curated a "kitchen sink image" from more than 50,000 hires pics he has collected over the years. Each person's body is made up of 10 to 25 photos, which he cut into pieces and digitally manipulated. For inspiration, Guy watched Zach Galifianakis' talk show *Between Two Ferns*. "I was like, what is going on?" Guy says. "Fifteen minutes later I was laughing my head off."



The rapid-fire banter between *Full Frontal* host Samantha Bee and her writing partner Jo Miller might be hard for some to follow, but not for **Virginia Heffernan**, who interviewed the pair for "Full-Frontal Assault" (page 68). "It reads as a normal

conversation to me," she says. "It's how I talk to my friends." Heffernan, who has written comedy for print and stage, is the author of *Magic and Loss: The Internet as Art*. She also cohosts Slate's *Trumpcast* podcast.



As reporter **Eric Reidy** was investigating the disappearance of a group of refugees, he learned about body management—the process by which officials identify the remains of those who die at sea. Along the Mediterranean, "most bodies are never recovered," Reidy says. And those that are typically remain unidentified. "The conversation about refugees usually takes place at a level of abstraction," he says. "When you engage with people who experience it directly, it becomes a lot more complicated." Then Reidy heard about an Italian police inspector who was using Facebook to identify the dead and communicate with their relatives. "I hoped to bring a bit of dignity to the characters by telling their stories," he says. Read "Where Is My Brother" on page 84.

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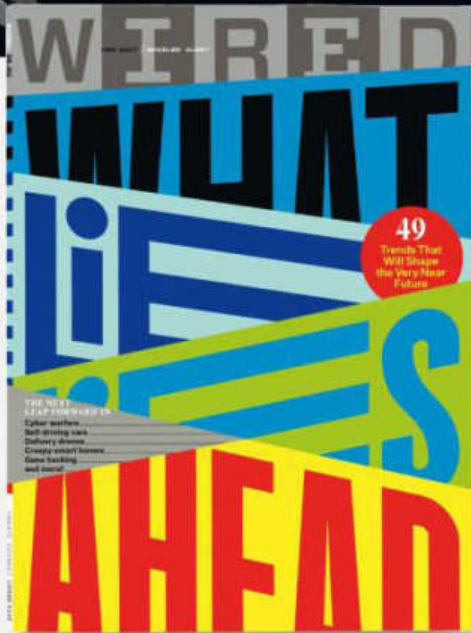


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TRENDING NOW

In February we identified 49 trends—from cybersecurity reform to the Snapchat sensation—that will shape 2017 (“What Lies Ahead”). But frankly, our stories are always about what’s just around the corner. Take a profile of Enron trader turned philanthropist John Arnold. His bid to call out iffy research and make data more transparent could change how we do science (“Waging War on Bad Science”). And Minnesota’s risky attempt to reverse terrorism could alter how we do law enforcement. And the right approach to global warming could affect how we continue to exist on this planet. Looks like rapid change is one trend that won’t go away anytime soon.

Re: “Waging War on Bad Science”

“GREAT ARTICLE. THE ARNOLDS ARE MY NEW HEROES.”

HenryT2 on WIRED.com

Re: “Waging War on Bad Science”

“Science. The system’s not perfect, but we can make it better. It’s still more trustworthy than anything else we’ve got.”
Moaning Mertyl
(@rhythmandmelody) on Twitter

“Most people who choose science as a career have nothing but good intentions. And

thanks to people like John Arnold, reproducibility issues are becoming higher-profile, and as a result, problems are identified more quickly. But increased competition for funding causes some scientists to behave recklessly and try to be first to publish without considering whether the data could be fooling them.”
wraithnot on WIRED.com



Re: “Complex”:
Inside the world of
Donald Glover

“Donald Glover’s talent, creativity, and versatility have always impressed me. This was fun to read.”

Kali Hawlk
(@KaliHawlk) on
Twitter

“Coats were invented so that we could have this photo of Donald Glover. These photos are something to behold.”
Hunter Harris on
Vulture.com

“God sent Donald Glover because he loves you and wants you to be happy.”
Max Im a Koopa
(@meakooa) on
Twitter



Re: “Can You Turn a Terrorist Back Into a Citizen?”: The path to deradicalization

“Really good article. Interesting how the discovery of dogma and doctrines is similar to the discov-

ery of a new drug that will eventually destroy the user.”
Erik Van Lennep on
WIRED.com

“Incredible human story at the intersection of compassion, justice, politics, and science.”

Boyd Hobbs
(@boydhobbs) on
Twitter



Re: “This Is a Test: Stand Up for the Climate—and for Civilization”

“The only way we’ll get governments and corporations to pay attention to conservation initiatives is if they are monetized. Take the plastic crisis: The only way plastic manufacturers will switch to alternatives will be if they save money in the process. Conservation bodies need to wake up to the fact that government and corporations simply do not and never will care about the environment, period.”

Bc Beats on
Facebook

“Let the shit hit the fan. It’s the only way. We don’t ever wake up until it’s too late.”
Isaac White on
Facebook

UNDO

You can watch Donald Glover’s VR experience for *Awaken, My Love!* on a mobile device, not an Oculus VR headset (“Complex,” issue 25.02).

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ARGUMENT

GIMME SHELTER DISASTERS DON'T HAVE TO END IN DYSTOPIAS

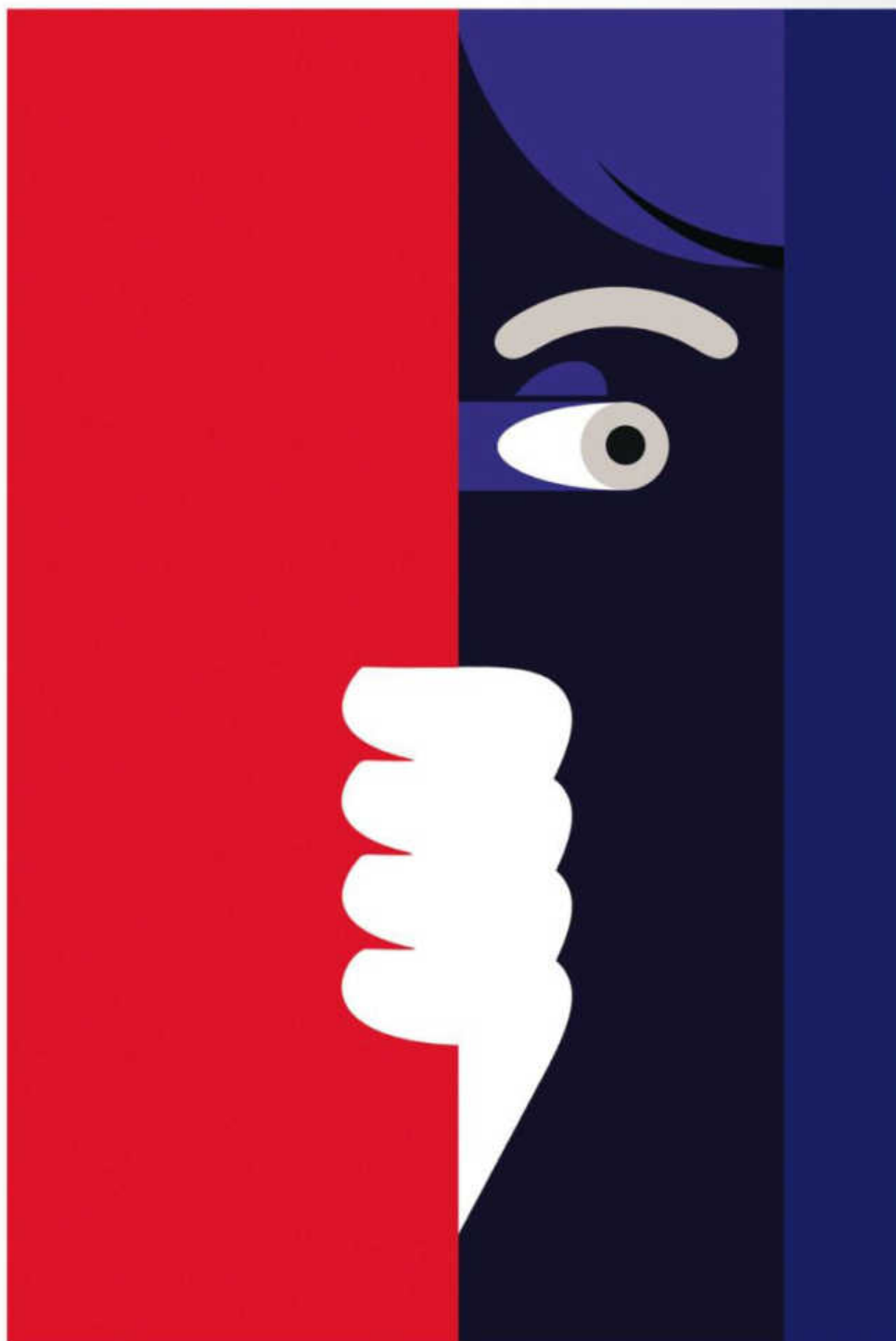
BY CORY DOCTOROW

M

MY NEW NOVEL, *Walkaway*, is about a world where the super-rich create immortal life-forms (corporations) so effective at automating away labor that the rest of us become surplus resources. The ensuing battle—over whether humanity will finally, permanently speciate into elite transhumans and teeming, climate-wracked refugees—triggers slaughter and persecution. It's a utopian novel. ¶ The difference between utopia and dystopia isn't how well everything runs. It's about what happens when everything *fails*. Here in the nonfictional, disastrous world, we're about to find out which one we live in. ¶ Since Thomas More, utopian projects have focused on describing the perfect state and mapping the route to it. But that's not an ideology, that's a daydream. The most perfect society will exist in an imperfect universe, one where the second law



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of thermodynamics means that everything needs constant winding up and fixing and adjusting. Even if your utopia has tight-as-hell service routines, it's at risk of being smashed by less-well-maintained hazards: passing asteroids, feckless neighboring states, mutating pathogens. If your utopia works well in theory but degenerates into an orgy of cannibalistic violence the first time the lights go out, it is not actually a utopia.

I took inspiration from some of science fiction's most daring utopias. In Kim Stanley Robinson's *Pacific Edge*—easily the most uplifting book in my collection—a seemingly petty squabble over zoning for an office park is a microcosm for all the challenges that go into creating and maintaining a peaceful, cooperative society. Ada Palmer's 2016 fiction debut, *Too Like the Lightning*, is a utopia only a historian could have written: a multipolar, authoritarian society where the quality of life is assured by a mix of rigid social convention, high tech federalism, and something almost like feudalism.

The great problem in *Walkaway* (as in those novels) isn't the exogenous shocks but rather humanity itself. It's the challenge of getting walkaways—the 99 percent who've taken their leave of society and thrive by cleverly harvesting its exhaust stream—to help one another despite the prepper instincts that whisper, “The disaster will only spare so many of its victims, so you'd better save space on any handy lifeboats, just in case you get a chance to rescue one of your own.” That whispering voice is the background hum of a society where my gain is your loss and everything I have is something you don't—a world where

material abundance is perverted by ungainly and unstable wealth distribution, so everyone has to worry about coming up short.

(Recall that half the seats on many of the *Titanic*'s lifeboats were empty. Some toxic combination of panic and uncooperativeness drove those who made it to safety to leave those benches half-filled, even as more than 1,500 passengers drowned around them.)

THE BELIEF IN OTHER PEOPLE'S PREDATORY NATURE IS THE CAUSE OF DYSTOPIA.

Here's how you can recognize a dystopia: It's a science fiction story in which disaster is followed by brutal, mindless violence. Here's how you *make* a dystopia: Convince people that when disaster strikes, their neighbors are their enemies, not their mutual saviors and responsibilities. The belief that when the lights go out, your neighbors will come over with a shotgun—rather than the contents of their freezer so you can have a barbecue before it all spoils—isn't just a self-fulfilling prophecy, it's a *weaponized narrative*. The belief in the barely restrained predatory nature of the people around you is the cause of dystopia, the belief that turns mere crises into catastrophes.

Stories of futures in which disaster strikes and we rise to the occasion are a vaccine against the virus of mistrust. Our disaster recovery is always fastest and smoothest when we work together, when every seat on

every lifeboat is taken. Stories in which the breakdown of technology means the breakdown of civilization are a vile libel on humanity itself. It's not that some people aren't greedy all the time (or that all of us aren't greedy some of the time). It's about whether it's normal to act on our better natures or whether our worst instincts are so intrinsic to our humanity that you can't be held responsible for surrendering to them.

Our technology has revealed much of human nobility and cruelty. It's given us global troll armies, to be sure—but also communities of mutual aid, support across vast distances, mobs of good people effecting one internet-based barnraising after another. Science fiction stories about the net “predicted” both, but the best science fiction does something much more interesting than prediction: It *inspires*. That science fiction tells us better nations are ours to build and lets us dream vividly of what it might be like to live in those nations.

Last year was full of disasters, and 2017 is shaping up to be more disastrous still—nothing we do will change that. Disasters are part of the universe's great unwinding, the fundamental perversity of inanimate matter's remorseless disordering. But whether those disasters are dystopias? That's for us to decide, and the deciding factor might just be the stories we tell ourselves. **W**

Cory Doctorow
(@doctorow) is co-editor of *Boing Boing*. His novel *Walkaway* comes out in April.



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3.1 BILLION VIEWS



Roman Atwood, 33
Gen Z's Johnny Knoxville, he'll do anything to shock—even pretend to kill his kid—for clicks.


2016 EARNINGS: \$8 million

16.5 MILLION SUBSCRIBERS
6.6 BILLION VIEWS



Markiplier, 27
The action gamer—aka Mark Fischbach—punctuates videos with irreverent commentary.

2016 EARNINGS: \$5.5 million



Germán Garmendia, 26
Latin America's biggest YouTube star pushes zany sketches and vlogs across two channels.


2016 EARNINGS: \$5.5 million

30.9 MILLION SUBSCRIBERS
3 BILLION VIEWS



7.6 MILLION SUBSCRIBERS
1.2 BILLION VIEWS


7.8 MILLION SUBSCRIBERS
1.8 BILLION VIEWS



Rosanna Pansino, 31
This nerdy baker makes treats like Flash Drive Crispy Treats and Red Blood Cell Cupcakes.

2016 EARNINGS: \$6 million

11.8 MILLION SUBSCRIBERS
3.1 BILLION VIEWS



Rhett and Link, 39 and 38
This quippy, well-coiffed duo hosts a talk show that draws celeb guests like Amy Schumer.

2016 EARNINGS: \$5 million

THE VIEW MASTERS

AN ANNOTATED MAP TO THE YOUTUBE STARS

OH, YOU'VE NEVER heard of smoshing? *Shemurr*. The originators of the term, Ian Hecox and Anthony Padilla, are YouTube idols. Between merch, ads, and sponsorships, intertainers (that's internet entertainers) have gone from bedroom vloggers to multi-millionaires with digital empires. (Though as outcast PewDiePie shows, you're just one offensive clip—or in his case nine—away from disgrace.) As a fresh stack of YouTuber-penned books hits shelves this year—II SuperwomanII's *How to Be a Bawse*, Rachel Ballinger's *101 Things That Piss Me Off*, Ryan Higa's untitled opus—the platform's stars are converting cultlike fan followings into cash.

—EMMA GREY ELLIS

► Invaluable advice from Tubers' books

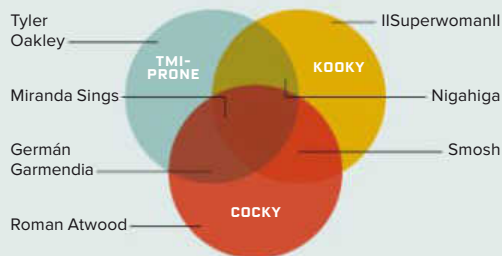
***The Nerdy Nummies Cookbook*, by Rosanna Pansino**
TIP: "Remember: Never trust an atom ... They make up everything!"

***Binge*, by Tyler Oakley**
TIP: "When life throws a wrench in your plans, catch it and build an Ikea bookshelf."

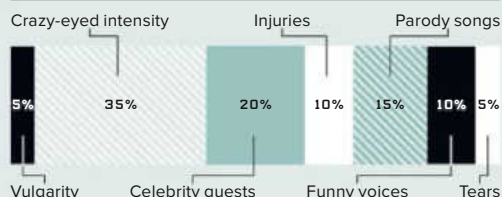
***#Chupaelperro*, by Germán Garmendia**
TIP: Adapt to change, like *Pokémon*'s Charmander. "He turns into a powerful, super-mega-hyper dragon."

***Selp Helf*, by Miranda Sings**
TIP: "In This chapter i will Tech you how to How 2 conker Love."

► #DGAF personas rule the YouTube universe



► Essential elements of a viral video



APPROPRIATE FOR ALL AGES TECH, MEET OLD PEOPLE

MY 88-YEAR-OLD grandfather lives alone, can't drive or do basic chores, and never learned to cook. Half his beachfront home in California sits empty while he runs out of retirement money. This isn't a tragic tale. It's a market opportunity—and big-name startups don't get that. Let's start with TaskRabbit. Why are its services not available by phone? Seniors would love to pay someone to, oh, pick up their dry cleaning and drop off their snail mail. Then there's Blue Apron, which for some reason is not peppering my grandpa's inbox with ads for senior-specific meal plans featuring large-type recipe cards. And you, Airbnb, you are really missing out: People over 60 are, according to your own data, the fastest-growing host population. So start actively courting these folks! They answer their phones. They email. And, of course, they're a huge demo with cash to burn. Seniors contribute \$7.6 trillion to the GDP. To be fair, some companies have made progress. Lyft and Uber now allow riders to request a car via phone call (even from a landline). But that's basically it. And I don't really count aged-up imitations of existing products—like Silvernest, the Airbnb for olds—because they don't have frillions in venture capital. You unicorns do. So let Peter Thiel suck the blood of innocents to preserve his youth; it's time for the rest of you to face up to the reality (and upside) of old age. —MALLORY PICKETT



ILLUSTRATION BY NISHANT CHOKSI

► Subscribers + Views = 💰

When you have more subscribers than Apple Music and *The New York Times* combined—like Germán Garmendia does—you know you're a big deal.

SUBSCRIBERS

VIEWS

► Crossover appeal

Cameo appearances, by type

STUNTS

FOOD

SONGS

FUN



Nigahiga, 26

Ryan Higa is known for game-show-style dares. *Nigai* is the Japanese word for *bitter*.

NET WORTH: \$2 million

19.2 MILLION SUBSCRIBERS
3.2 BILLION VIEWS



Tyler Oakley, 28

The gushing activist (and Ellen DeGeneres protégé) is beloved for his confessionals.

2016 EARNINGS: \$6 million

8 MILLION SUBSCRIBERS
615 MILLION VIEWS

WRESTLED WITH ...

Miranda Sings, 30

Colleen Ballinger adopts a narcissistic alter ego, Miranda, to spoof YouTube navel-gazers.

2016 EARNINGS: \$5 million

MOCKED STEREOTYPES WITH ...

ATTEMPTED A BLINDFOLDED MAKEUP CHALLENGE WITH ...

WATCHED PORN WITH ...

PLAYED FLIP CUP WITH ...

DANCED THE HARLEM MILK SHAKE WITH ...

EXECUTED A SERIES OF DARES WITH ...

VOICED A "SMOSH BABIES" CARTOON FOR ...

11 MILLION SUBSCRIBERS
1.7 BILLION VIEWS



Smosh, both 29

Buddies Anthony Padilla and Ian Hecox flood seven channels with skits, pranks, and songs.

2016 EARNINGS: \$7 million

22.5 MILLION SUBSCRIBERS
6.2 BILLION VIEWS



IISuperwomanII, 28

Canadian-Indian rapper Lilly Singh parodies everything from Punjabi culture to parents.

2016 EARNINGS: \$7.5 million

► Fans take their adoration offline

YouTube stars have legions of followers. If you know what to look for, you can identify them IRL.

Lamps / Higaholics

LEADER: Nigahiga
COHORT: Sunny, straitlaced millennials listening to K-pop and making GIFs on Higa's TeeHee mobile app.

Mirandas

LEADER: Miranda Sings
COHORT: Theater kids wearing bright red lipstick, screaming "Haters back off!"

Mythical Beasts

LEADERS: Rhett and Link
COHORT: Suburban hipsters sporting "randler" swag—the Rhett and Link mascot that looks like a mouse with antlers and wings—and slurping

pour-over coffee from *Good Mythical Morning* mugs.

Team Super / Unicorns

LEADER: IISuperwomanII
COHORT: Snapchatting tweens in backward hats and IISuperwomanII's official Smashbox lipstick: Bawse. They say "shemurr" when they're feeling awkward.

Germaniters

LEADER: Germán Garmendia
COHORT: Chihuahua-owning gamers blasting Garmendia's music, including the catchy pop number "We Believe in Love, but Love Doesn't Believe in Us."

► US teens 🇺🇸 spending time on YouTube

Percentage of 15- to 18-year-olds who visited these sites in the past 24 hours.

YouTube	81%
Facebook	72%
Instagram	51%
Twitter	39%
Pinterest	19%

► Big brands woo stars to reach millennials

Match the YouTuber to their sponsor.

- | | |
|-------------------|-----------------------|
| 1. Nigahiga | A. Coca-Cola |
| 2. Roman Atwood | B. Lenovo |
| 3. Smosh | C. Toyota |
| 4. Rhett and Link | D. Scott toilet paper |
| 5. IISuperwomanII | E. Schick razors |
| 6. Miranda Sings | F. Jack in the Box |

ANSWERS: 1. B; 2. D; 3. A; 4. C; 5. A; 6. F



WHAT'S INSIDE

LITHIUM-ION BATTERIES

FIRED UP, READY TO BLOW

Lithium Cobalt Oxide

To store or release energy in a slim, efficient Li-ion power pack, lithium ions ping-pong between two electrodes: a sheet of lithium cobalt oxide and a sheet of graphite. When you charge your new drone (or smartphone or laptop or hoverboard), electrons flowing in from the outlet help lure lithium ions out of the LiCoO_2 , which then migrate to the graphite electrode and wait to be released—along with electrons (energy!)—later. Within the Li electrode, cobalt and oxygen form sturdy layers of octahedrons, which keep the molecule from collapsing as ions enter and exit. But at high temperatures that edifice can crumble, contributing to a very combustible situation.

Graphite

A mineral form of pure carbon, best known as the writey part in pencils. Graphite forms the second electrode, and the lithium ions lodge within it as the battery charges. Then, when you turn on your MacBook, those ions get pulled out of the graphite to journey back to the lithium cobalt oxide, a process that produces the electricity to let you browse Facebook—we mean respond to all those work emails.

Polypropylene

A thin slab of this plastic keeps the electrodes apart. The separator, as it's called, is perforated with micron-scale holes to let Li ions pass through. It's often to blame if your phone becomes a smoking inferno—faulty separators can let the electrodes touch, triggering a process known as thermal runaway. That can quickly generate huge amounts of heat (up to 1,700 degrees Fahrenheit) and pressure, causing the flammable substances present to burst into flames.

Ethylene Carbonate

This clear, flammable, organic solvent helps shuttle ions back and forth. If a malfunctioning battery heats up enough (say, from a bad separator), the hot liquid can escape the case, react with oxygen in air, and kaboom!

Lithium Hexafluorophosphate

A white powdery substance that's dissolved into the ethylene carbonate, LiPF_6 just sort of floats around in the battery, supplying additional lithium ions to speed up charging and discharging. This compound is not flammable. Yay! But it does burn skin on contact. Boo!
—CHELSEA LEU





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ALPHA

RELATIONSHIPS



SILICON VALLEY'S SEXUAL REVOLUTION

IN SILICON VALLEY, love's many splendors often take the form of, well, many lovers. For certain millennials in tech—as well as, rumor has it, a few middle-aged CEOs—polyamory holds especial appeal. Perhaps that's because making it work is as much an engineering challenge as an emotional one, requiring partners to navigate a complex web of negotiated arrangements. (There's an app to keep track of that, obvs: The Poly Life.) Some enthusiasts even claim it's the way of the future. "If life extension is possible, we might have to think about relationships differently," says one Valley-based polyamorist. "It's pretty hard to have an exclusive relationship with someone for 300 years." True that—but balancing multiple LTRs takes just as much dedication and discipline (if not more). —JULIAN SANCTON

Rules of Polyamory

1. Tap OkCupid

Good old OkCupid is where you'll find a critical mass of poly-amorous users. The app features questionnaires to help determine if the lifestyle is right for you, plus tools that make it easier to find other poly enthusiasts.

2. Study up

The gospel is Dossie Easton's 1997 book, *The Ethical Slut*. But more compelling to STEM-y polyamorists might be *Sex at Dawn*, which draws on primate physiology to prove that monogamy is, like, totally a construct.

3. Join the club

Some workplaces (cough Googlecough) have quasi-official poly clubs; you can also find meetups online. Just know there are plenty of subsets within the community, especially in California, so be prepared to discuss neopagan liturgies with Nebula Moon-Ostrich.

4. Don't be a leech

You shouldn't go to a get-together hoping to hook up. These are not orgies. (Though tech-nerd orgies do get *pret-ty* wild, what with the color-coded bracelets signaling what you're cool with doing/having done unto you.) And stick to your age bracket—restrictions are enforced to keep things comfortable.

5. Be honest (and avoid Manhattan)

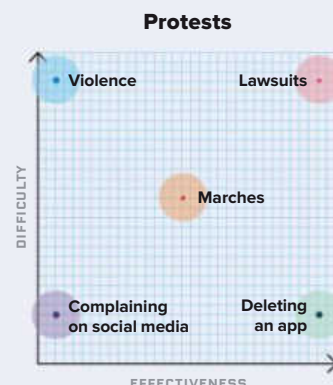
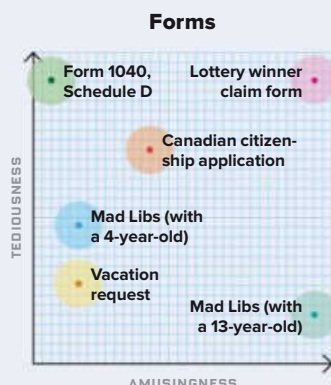
Transparency is what separates polyamory from infidelity. It's also what makes it difficult. Thankfully, this is one area where the Valley's left-brained legions have an advantage. "Lying is unacceptable," says Emily Witt, author of *Future Sex*. "In New York, playing people is much more normal."

6. Don't get jelly

No matter how rational you think you are, you're hardwired for jealousy. But you can stifle that instinct through frank discussion. Some polyamorists even show their primary partner the romantic texts and emails they send to other people. Sound awkward? Hey, relationships are work—and more relationships are more work.

CHARTGEIST

BY JON J. EILENBERG



HP recommends Windows 10 Pro.

The Desktop, Reinvented.

HP Elite Slice
A Modular Masterpiece



Learn more at hp.com/go/slice/wired

 Windows 10 Pro



keep reinventing

Cortana is your truly personal digital assistant.

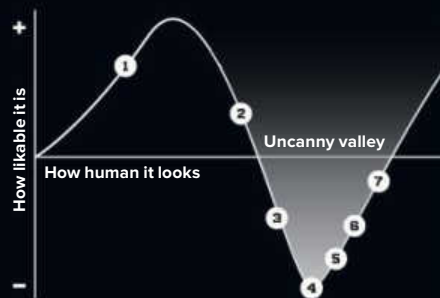
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BOTS LIKE US A VIEW OF THE UNCANNY VALLEY

IF A ROBOT were to look at you with a twinkle in its eye, you wouldn't be blamed for running away in terror. But that plunge into the uncanny valley doesn't bother Max Aguilera-Hellweg, who's been photographing anthropomorphic bots since 2010. "I've never found myself afraid of any of them," he says. In fact, he'd love for his subjects to appear *more* lifelike. A student of anatomy—Aguilera-Hellweg graduated from med school at 48—he looks for "the right angle to find that bit of humanness." But the point of his new book, *Humanoid*, isn't to terrify you. It's to remind you that robots aren't human—we only make them so. —CHARLEY LOCKE

Mapping the Creepy Machines



NASA's Valkyrie bot will likely get to Mars before people do—an idea that enthralled Aguilera-Hellweg. He shot her from below to portray how she might look floating in zero gravity.



"For Yume, I was imagining a '40s Hollywood glamour portrait. I wanted to find that right light so her plastic eyes, her silicone skin, her polyester hair would cross that line from machine to possibly human."



Researchers at Osaka University had to miniaturize the robotics to fit into the tiny body of Affetto. "He was too cute and adorable" with clothes on, Aguilera-Hellweg says, so he asked the team to undress the tot-bot.



The real-life model for Geminoid F is quiet and reserved. "She had very sincere, deep emotion for her geminoid. You could tell she had some kind of relationship with her."



Robot skin—nooo! Texas-based Hanson Robotics calls it Frubber, and it gives Joey Chaos (an android rock star) a range of facial expressions. "If you see a robot wince, you've conned the user." Or disturbed them.



Can you put human consciousness in a bot? The inventor of Bina48 tried, programming her with 20 hours of her wife's recorded memories. When Aguilera-Hellweg met Bina48, she was philosophizing about Sartre and the human condition.

4

Japanese roboticist Hiroshi Ishiguro didn't stop at creating this geminoid, or twin, of himself. He's also gotten plastic surgery to maintain the likeness as he has aged.





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Q:

I'M MARRIED. IS IT WRONG TO GET A TINDER ACCOUNT AND LOOK AT IT, EVEN IF I HAVE NO INTENTION OF CONTACTING ANYONE?

BY JON MOOALLEM

A:

As a matter of convenience—since your question is low on information—I'm going to make some assumptions about you before we proceed. First, I'm going to assume you are a male and straight. (Maybe I'm succumbing to certain prejudices about straight males; nevertheless, it's what I'm going to assume.) More important, I'm going to assume you're a decent person and a loyal partner and take you at your word that you have no intention of cheating on your wife. ¶ Now, having done all that, I'm going to compare you to a snake. The brown tree snake, specifically: *Boiga irregularis*. Surely you've heard of it. It's fanged, venomous, and can top out at 10 feet long. And there are roughly 1.5 million of them sliding around Guam, a land mass only a fifth the size of Rhode Island. ¶ The snake doesn't belong in Guam; it's invasive, having likely first arrived there after World War II. (It's believed that the species—possibly just one pregnant female—stowed away on military equipment.) As its population exploded, the snake devoured the island's native birds and lizards, literally swallowing many of them into extinction. Brown tree snakes frequently cause power outages on the island. They slip into buildings and garbage cans. They are a menace—ecologically but also just in a nightmarish, snaky way. They have set off chain reactions that no one could have anticipated and that no one wants to put up with.

And so, since 1993, the US government has spent millions of dollars a year trying to contain and eradicate them. It has tried everything, from the commonsensical to the baroque: snake barriers, snake traps, snake-sniffing dogs. In 2013 the US air-dropped 14,000 dead mice affixed with tiny cardboard parachutes and laced with poison. Of this gambit, one federal technician wrote, "It seems simple and straightforward." Well, not really. But that's the point—the solutions are just as unimaginable as the problem.

Now, my first reaction to your question was simple. I wanted to butt out. I wanted to say, essentially, that whether you should be allowed to lurk on Tinder is exclusively up to you and your wife. If she's cool with it and you're cool with it, what does it matter if it strikes me as weird and, well, a little lecherous? Maybe for you it's just an innocent form of people watching, a way for you to commune, like some left- and right-swiping Walt Whitman, with the fantastic breadth of humanity.

But the truth is, as fascinated as many of us married people are by Tinder, it's just not a place for us. We are an invasive species. Granted, we're not going to gobble up the natives, reproduce like mad, and cause power outages. But no matter your intentions, you will, almost inevitably, cause ancillary and unpredictable disruptions. What if someone likes the look of you and wants to meet? Is it fair to incite that kind of hope—even for a split second—if you are, as you say, unavailable? And who would you be *displacing*? What if the algorithm shoves you at someone, at a particular moment, instead of an actual Mr. Right? Or Mr. Right Enough? Or Mr. Why the Hell Not? Any number of misters have more legitimacy and claim to that spot than you do.

And that's just it: You'd be occupying a space you just shouldn't occupy. The moral question here, I realized, hinges not just on your good faith toward your wife but on your good faith toward the many strangers you'd also—just by virtue of setting up a profile—be entering into a relationship with.

I know you're not a fundamentally bad or scummy person. (Or so I've assumed.) But bear in mind that none of those 1.5 million snakes is inherently scummy either. They're all just slithering around, eating and breeding, storing up their poison, searching out new spaces with their creepy wet tongues. ■

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A WHIFF OF CULTURE

FINE ART THAT REALLY GROWS ON YOU

YOU BECOME AWARE of Anicka Yi's work before you even step into the gallery. The pungent odor of decomposing kombucha leather, the acrid tang of burning paper, or the cloying sweetness of deep-fried flowers wafts through the halls. The New York-based artist specializes in olfaction, evoking reactions through sense of smell. "I create scents based on a narrative," Yi says, "whether it's about capturing an elusive memory or trying to profile a human being." ¶ For her latest solo exhibition, which opens April 21 at the Guggenheim Museum in New York, Yi sought art in an unlikely place—the armpit—extracting the essence of human sweat as a meditation on identity. She translates the chemical compounds into scents, which are emitted alongside live bacteria sculptures. "I've always maintained that scientists and artists have a lot in common," Yi says. "There's a lot of experimenting—and failure—involved." ¶ There are also surprises. While interpreting her odorous sample set into a sweat-inspired fragrance, Yi experimented with notes of ginger, cypress, and coriander. Sounds enchanting enough to be a perfume: Armpit, by Givenchy. —ANNIE TITTIGER

From Armpit to Exhibition

Swab

Yi collects sweat and bacteria samples from subjects.

Isolate

A forensic scientist uses chromatography to distill each sweat sample into its chemical compounds.

Identify

A Parisian perfumer helps Yi translate the compounds into scents.

Support

Biologists regulate the temperature and nutrition for the bacteria to thrive.

Exhibit

With plexiglass and resin, Yi creates a petri-dish-like vessel to display her living sculptures. The representative scents waft through the room.



JARGON WATCH

rovables n. pl. /'rō-və-bəlz/ Tiny robots that live on your clothing. A swarm could pose as jewelry or hide in a pocket, then deploy to check your vitals, remove cat hair, or take a microphone up to your collar when you get a phone call. **paperfuge** n. /'pā-pər-fyūj/ A hand-operated centrifuge made of paper and string. Inspired by an ancient toy, the 20-cent device can spin blood samples fast enough to diagnose malaria in villages with no electricity.

g-putty n. /'jē-pu-tē/ Silly Putty spiked with graphene flakes. It's conductive, and the electrical flow is so sensitive to deformation, it can be used to detect a spider's footsteps. Or, more usefully, to make wearable, always-on blood pressure sensors that don't require a constrictive armband. —JONATHON KEATS



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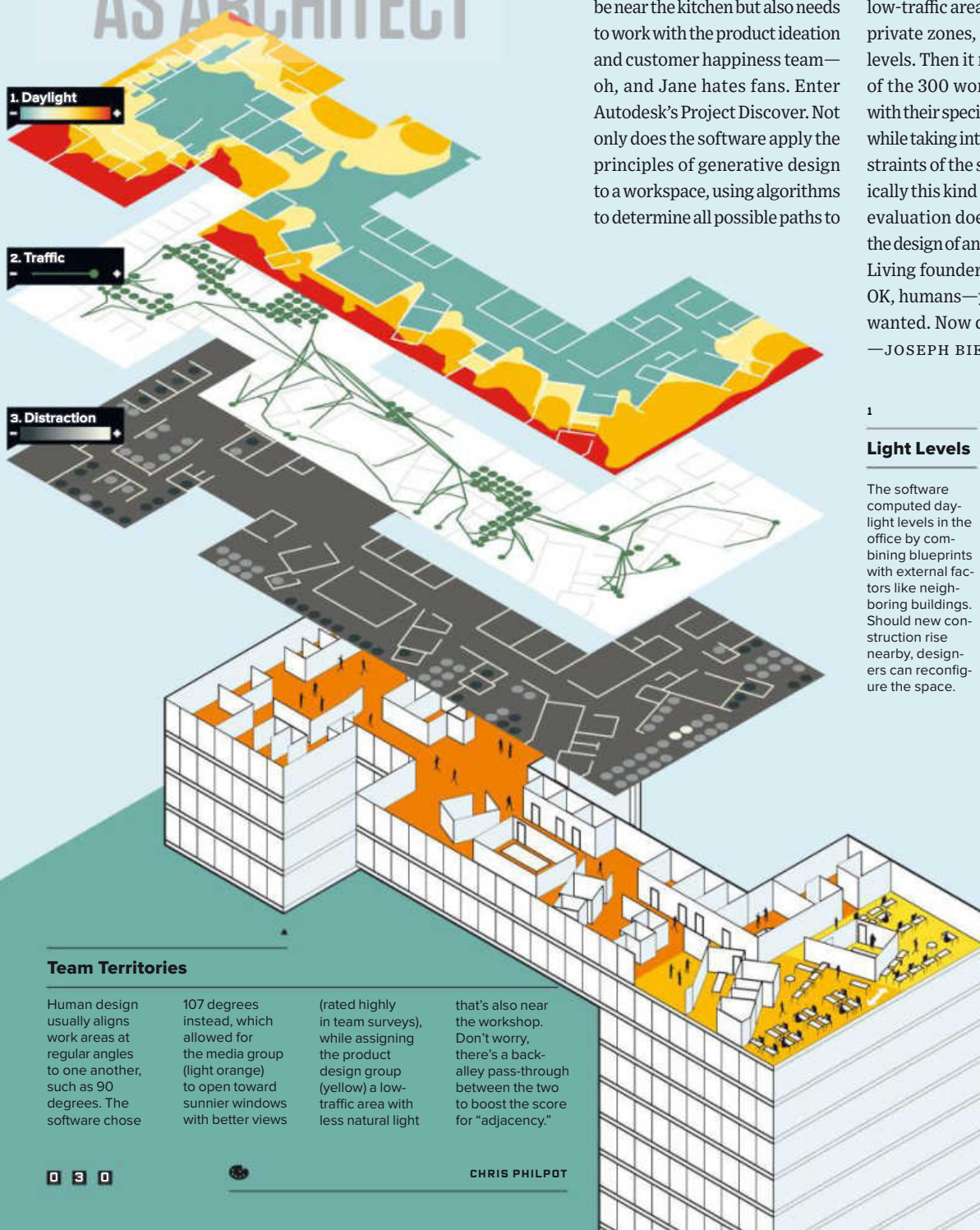
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THE ALGORITHM AS ARCHITECT



Team Territories

Human design usually aligns work areas at regular angles to one another, such as 90 degrees. The software chose

107 degrees instead, which allowed for the media group (light orange) to open toward sunnier windows with better views

(rated highly in team surveys), while assigning the product design group (yellow) a low-traffic area with less natural light

that's also near the workshop. Don't worry, there's a back-alley pass-through between the two to boost the score for "adjacency."

ARRANGING EMPLOYEES in an office is like creating a 13-dimensional matrix that triangulates human wants, corporate needs, and the cold hard laws of physics: Joe needs to be near Jane but Jane needs natural light, and Jim is sensitive to smells and can't be near the kitchen but also needs to work with the product ideation and customer happiness team—oh, and Jane hates fans. Enter Autodesk's Project Discover. Not only does the software apply the principles of generative design to a workspace, using algorithms to determine all possible paths to

your #officegoals, but it was also the architect (so to speak) behind the firm's newly opened space in Toronto. ¶ That project, overseen by design firm The Living, first surveyed the 300 employees who would be moving in. What departments would you like to sit near? Are you a head-down worker or an interactive one? Project Discover generated 10,000 designs, exploring different combinations of high- and low-traffic areas, communal and private zones, and natural-light levels. Then it matched as many of the 300 workers as possible with their specific preferences, all while taking into account the constraints of the space itself. "Typically this kind of fine-resolution evaluation doesn't make it into the design of an office space," says Living founder David Benjamin. OK, humans—you got what you wanted. Now don't screw it up.

—JOSEPH BIEN-KAHN

1

Light Levels

The software computed daylight levels in the office by combining blueprints with external factors like neighboring buildings. Should new construction rise nearby, designers can reconfigure the space.

2

Traffic Flow

The facilities and HR teams wanted to be by high-traffic areas, so the software put them near places that the algorithm gave the highest "interconnectivity" score: reception and off the main corridor.

3

Sight Lines

The fewer coworkers visible from a given desk, the better its visual distraction score. Diagonal walls and unexpected angles help cut down on the largest cause of that distraction: views of corridors.

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FLOOD OF MONEY

THE UPSIDE OF CLIMATE CHANGE

BY CLIVE THOMPSON

IN MIAMI BEACH, they call it “sunny-day flooding.” You’ll be hanging out downtown under clear blue skies—only to see, whoa, the streets slowly filling with water. ¶ Miami Beach, Florida, is a coastal city built on porous limestone, so as climate change melts polar ice into the oceans, water is literally pushed up out of the ground. “It’s an eerie, scary, unnerving feeling, like something out of a sci-fi movie,” says Philip Levine, mayor of the city of 90,000. On days when Miami Beach actually gets a coastal storm, it can see a 2-foot flood. ¶ So the city decided enough is enough. Levine has begun a \$400 million resilience plan that calls for installing high tech drainage systems and painstakingly raising the roads several feet. “It’s not fun to go and raise people’s fees,” Levine says. But what choice do they have? ¶ Global-warming denialists, including, at times, the new US president, claim that climate change isn’t happening. This is abject nonsense—ask anyone who lives near an ocean. They’re all dealing with the unsparing laws of physics, and the 2.6 inches the sea rose between 1993 and 2014. Flooded basements don’t care whether you believe burning carbon-based fuel is raising Earth’s temperature or not. ¶ That’s why coastal cities worldwide are pumping more than \$280 billion a year into an Adaptation Economy, which puts a price tag on preparing for the future. That amount is increasing by more than 4 percent a year in well-off, developed cities.



The money is propelling some ingenious engineering. The Dutch are great at this—Rotterdam already has sophisticated dikes, and the city is building newfangled “water plazas,” buildings with reservoirs that sequester rainfall, letting it seep out into the ground or into wading pools for kids instead of adding to floods. Other innovations even have aesthetic value: In China, Dutch engineers are building a “sponge city” that uses a network of grass gardens and ponds to absorb runoff, an approach they call “living with water.”

Dutch firms, long specialists in the arts of living below sea level, are suddenly in high demand. “Climate change, sea level rise, and the risk of flooding is a great business opportunity for us,” says a somewhat rueful Piet Dircke, head of water management for Amsterdam-based adaptation firm Arcadis, which is working on the sponge city.

This isn’t only about atoms; the Adaptation Economy has to move bits too. If you want to understand how and where water will inundate the coasts, you have to model it. Cloud supercomputing and lidar—the tech that helps self-driving cars “see”—have already produced better estimates of storm surges. Even greater puzzles remain, such as how intertidal marshland is affected by encroaching salt water. That stuff is “really difficult” to model, says Scott Hagen, director of the Center for Coastal Resiliency.

Consider this a cursed area of innovation—it shouldn’t be necessary. But it is, and we need far more of it. That’ll require political action: States and the federal government need to give cities more dough, and Congress should reform flood insurance so that people have greater incentives to protect their homes, with, say, tide-proof ground floors, or to avoid building in endangered coastal areas. Meanwhile, impoverished coastal cities worldwide are in urgent need of foreign aid—before rising seas create humanitarian and refugee crises.

I recently visited an experimental sponge park created by architect Susannah Drake on the edge of an old toxic canal in Brooklyn. Drake filled recessed concrete boxes with soil and plants specially designed to absorb and dissipate flood runoff. It was postapocalyptically peaceful and strange. This is the one silver lining of our predicament: If we get adaptation right, we’ll not only preserve our cities—we’ll upgrade them. ■



WIRED INSIDER

FLIR'S BRING THE HEAT MAKER CHALLENGE

An early innovator in thermal imaging, FLIR has been making people safer through applications of its tech for over 30 years. Their Lepton® micro-thermal sensor lets users take thermal energy snapshots and videos as well as measure temperature—and it's so tiny it can live within a device as small as a smartphone. Consider all the emerging applications like autonomous driving and IoT: it can see in the dark, detect heat profiles, and provide temperature information, adding unique and valuable data on what's happening in the world around us.



**BRIAN
BOATRIGHT**

All it takes is one absentminded moment. A bathtub overflowing in the dead of night could do thousands of dollars in damage by morning. Boatright's ThermoDefender could fix all that. It will send data about fires and floods to a smartphone user and will integrate with other smart devices to shut off valves remotely since "you can't always be there to watch your home."

FLIR's long-standing commitment to makers recently culminated in the Bring the Heat Maker Challenge with WIRED Insider. The winning project among hundreds of potential business opportunities (all using FLIR's Lepton) was Brian Boatright's ThermoDefender, which he demoed at CES 2017.

When FLIR released a consumer-grade thermal camera, Boatright was thrilled. Integration was "super easy" too: he went from zero to a CES-ready prototype in under six weeks. Now he predicts his idea will soon be a key part of home safety, like self-learning thermostats and CO2 detectors. And scaled up, an industrial-level version could prevent "tens of thousands of dollars in damage in a single use."



lepton.flir.com



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Since 1965, Princess Yachts has strived to deliver voyages of endless possibility to each and every customer and continues to do so by building yachts to universal acclaim in the south west of England. The result of a detail-oriented culture of innovation, these yachts are some of the most technically advanced in the world.

The Princess Yachts Design Studio is constantly working to develop ingenious ways to ensure every last inch of each boat is ergonomically sound, highly practical, spatially perfect, and impeccably hand-finished. Once the team of naval architects, designers, and engineers has determined a design, the craftspeople fastidiously bring it to life with their unique skills. Every beautiful detail is crafted and finished within the Plymouth shipyards. This enables Princess to consistently monitor quality throughout each build. And this makes Princess Yachts unique.

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HOME ENTERTAINMENT

MASTER & DYNAMIC MA770

FETISH ART ROCK

ONE SURE WAY to give your favorite music some added weight: Pipe it through Master & Dynamic's hefty new speaker. The maker of luxe headphones enlisted architect David Adjaye—the designer behind DC's new National Museum of African American History & Culture—to give its first wireless speaker an elegant facade. The swooping modernist cabinet is molded from a concrete composite that has five times the dampening power of wood. Translation: When you crank the volume, the twin Kevlar drivers on the front won't rattle or cause sound-smearing resonance. One 100-watt pyramid can fill a room with sound, but you can connect multiple units together using Google Cast. Portable, it is not—each one weighs 35 pounds. But hey, it's not just a speaker, it's a sculpture. —LIZ STINSON

\$1,800

GADGET LAB





GEARHEAD SCREEN PLAY

Upgrade your den of infinite diversion with the right gear and you'll forget what a movie theater even is. —TIM MOYNIHAN

1

LG B6 OLED 4K HDR Smart TV

A couple years ago, OLED televisions cost as much as a Hyundai. Now some of the best, like the B6, come in at two grand for a 55-incher. LG's beguiling 4K panel has the impossibly deep blacks of any OLED screen. But it also supports the latest image-enhancing content formats, like HDR10 and Dolby Vision. Super fancy!

\$2,300

3

Blu Dot Clad Three-Door Credenza

Don't distract from your carefully engineered sound and vision by cheaping out on the furniture. Blu Dot's handsome walnut credenza is bolstered by a brawny steel skeleton, and the 18-inch-deep adjustable shelves will accommodate any A/V arrangement.

\$2,599

2

Sonos Playbase

Put your TV on a pedestal—one that delivers great sound. Sonos' newest speaker is a three-channel riser for your telly that works with your incumbent Sonos setup: Wirelessly stream songs to the Playbase, or pair it with the company's other boxes for multiroom jams.

\$699

4

Sevenhugs Smart Remote

This context-aware wand outshines other universal remotes by controlling whatever it's pointed at—not just TVs, streamers, and speakers but thermostats and smart bulbs too. Put sensors around a room and let the Sevenhugs figure things out. Hell, it'll even summon an Uber.

\$299

5

Softsquare

When movie night plus-ones become plus-fives, these soft modular seats ensure those extra rumps have a comfy perch. For quieter times, pack nine of these Danish-made poufs together to create a divine love nest for two.

\$295

2

3

5

4



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HOME ENTERTAINMENT

HOME PROJECTORS

HEAD-TO-HEAD LIGHT HOUSES

The latest TVs are gorgeously slim. But a richly colored layer of photons is downright ethereal. —TIM MOYNIHAN

Sony VPL-VW675ES

BEST FOR:
Flush 4K adopters

Get the same picture quality you'd find at a great movie theater. Sony's pricey 4K cannon fires 1,800 lumens of lifelike, high-dynamic-range video out of its motorized lens. It's future-proof too—it handles the HLG video format, which will eventually be used for broadcasts with deep-color effects.

\$15,000



Epson PowerLite Home Cinema 5040UB

BEST FOR:
Demanding Blu-ray buffs

Can't afford 15 grand? This 1080p hi-def projector does an elegant job of striving for 4K performance. Epson's show box can accept 4K sources and play them back with HDR effects. It's not the same level of eye dazzle as an 8-megapixel image, but with the PowerLite's pixel-shifting tricks and impressive 2,500-lumen output, your peepers certainly won't protest.

\$2,999



falling for beer



oct.co

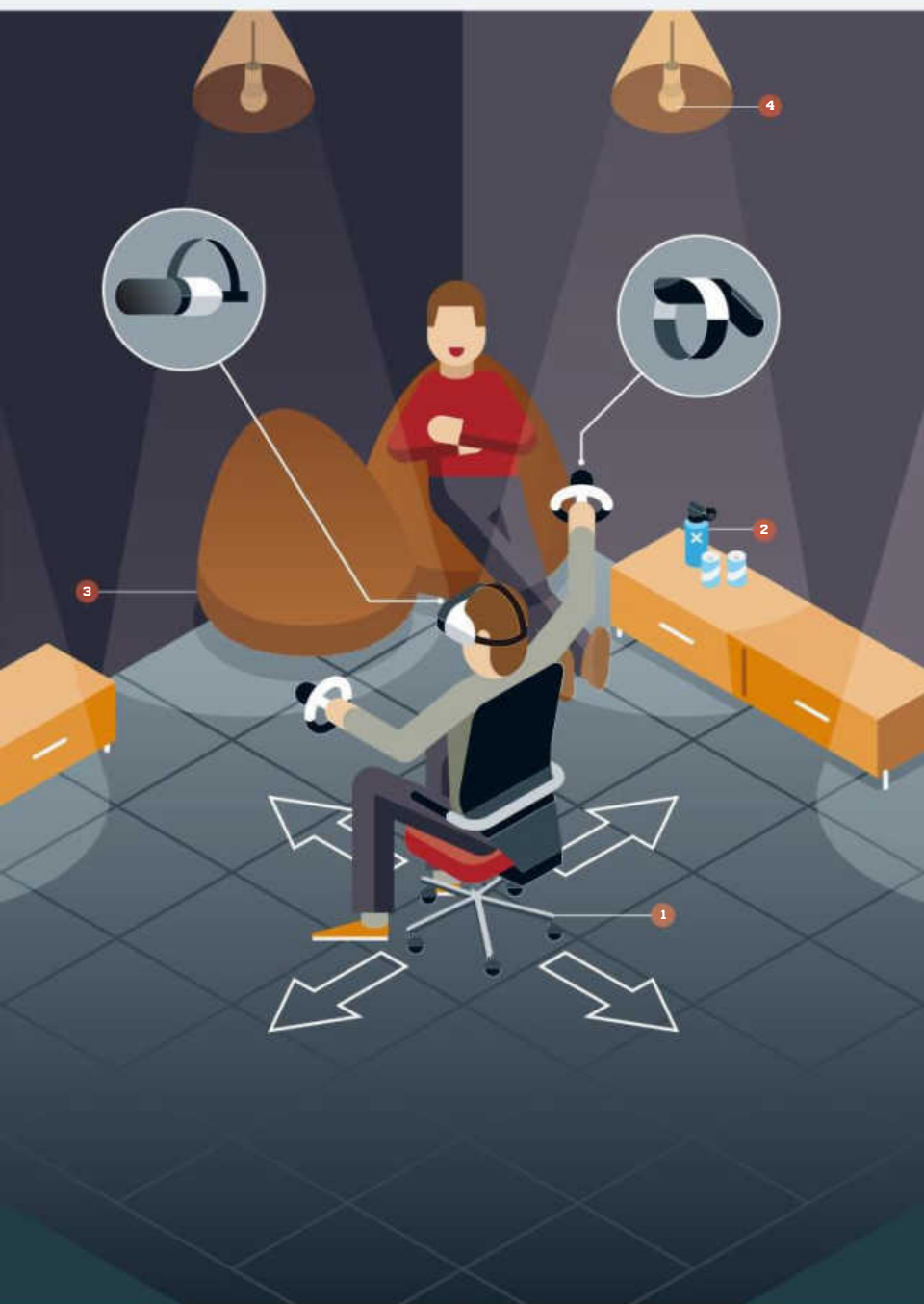
A new site for beer lovers,
brought to you by Pitchfork's
creative studio, Slow Focus.

October



THE SETUP UNREAL ESTATE

You arranged your TV room so you can sit around in comfort. Now, prepare your virtual-reality space so you can thrash around without breaking your damn neck. —PAUL SARCONI



Take a Load Off

After an epic battle against evil robots, you may need to lie down. A soft landing zone like a futon or a beanbag chair will let you readjust to real reality—or combat the spins after a furious firefight. Plus, your friends can nest there as they wait their turn (or, more likely, watch and judge).

Water Yourself

Yes, virtual reality sickness is real—it's just motion sickness induced by a face computer. To combat it, take a break every 15 minutes. Hydration is an excellent nausea repellent: A water bottle with a sippy straw will let you top up your fluids without soaking the front of your shirt or abandoning your mission mid-sortie. In case you can't get out of the virtual abyss in a timely manner, keep some stomach-soothing ginger chews at the ready.

Dim the Lights

As you blast between faraway galaxies in your new reality, the lighting in your VR playroom doesn't matter. But it does matter as you emerge from the headset. Smooth the transition with subdued illumination. The ambience should coo "*bienvenue*" rather than blare "WELCOME BACK, DUDE!!!"

Clear Some Space

Virtual reality goggles make you completely blind to your surroundings. Put plenty of distance (at least 7 feet) between you and items you can break—or that can break you. Push the coffee table to the farthest wall, or better yet, banish it from the room. Remove anything made of glass. Find a new place in your home for anything shin height. Ditch the chandelier, so you can wave your hands in the air as you chop melons in *Fruit Ninja*.

Get a Swivel Chair

Watching VR—or experiencing it—isn't a sit-down, bag-of-popcorn, nestle-in-a-slanket activity. You're going to want to sit down, but it should be on a swivel chair so you can spin about and actively engage in the digital universe. Make sure you get one with wheels—you'll need to roll around easily.

WIRED RECOMMENDS

1. Steelcase Gesture
\$998
2. Hydro Flask with Straw Lid
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3. Sumo Gamer beanbag chair
\$219 AND UP
4. Sylvania Lightify Smart LED bulb
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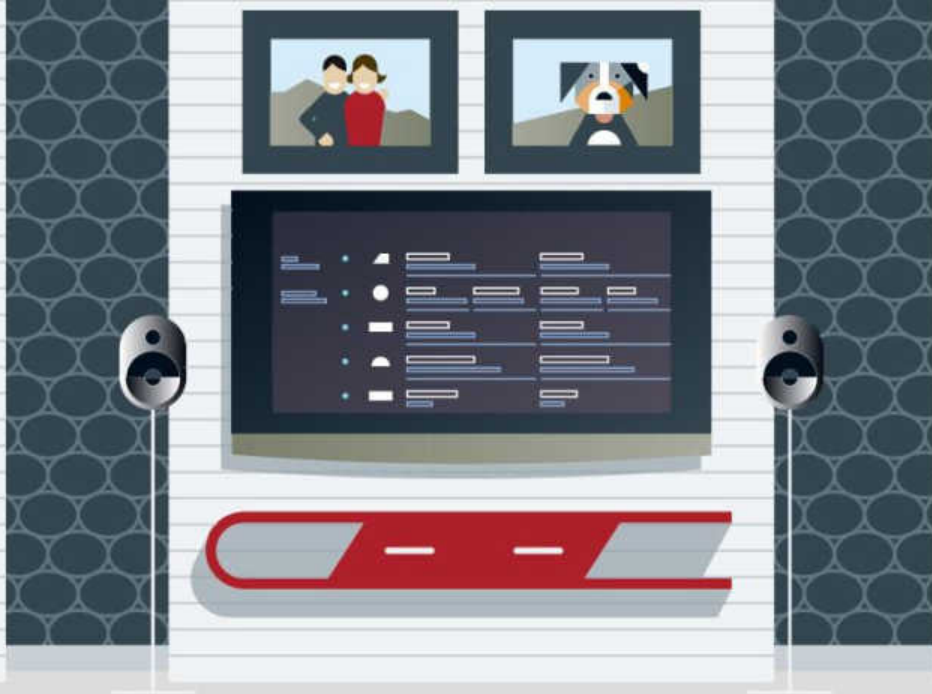


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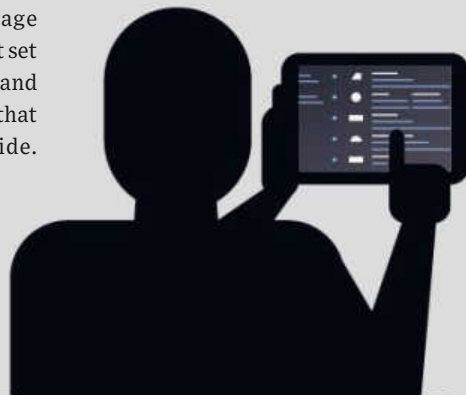
HOME ENTERTAINMENT

STREAM LIVE TV

HOW TO WATCH IT ALL

You've banished cable from your life. But that doesn't mean you have to miss out on Twitter-ific live programming. —DAVID PIERCE

LIVE TELEVISION is not over. What's over is having 14,000 impossible-to-navigate channels and a remote you need a PhD to operate, all tied to a giant overheating box that hasn't been redesigned since the Clinton administration. All that old junk is being replaced by a handful of internet-first services that combine the best of live, on-demand, and streaming television. Anything you want, everywhere, always. Most of them work the same way: A couple of Jacksons (or Tubmans!) a month gets you a few dozen channels delivered to every device with a screen in your home—handheld, wall-mounted, or otherwise. Each package gives you a slightly different set of channels, restrictions, and designs. But they all beat that blurry, blue onscreen guide.



DirectTV Now

BEST FOR:
Smartphone channel surfers

The closest thing to a cable replacement: \$35 a month, 60-some channels, available everywhere, in a super-survable setup. It can be used on only two screens at once, and not every platform offers apps. But if you have AT&T cell service, streaming TV won't count against that stingy data cap.



Hulu

BEST FOR:
Sitcom and sports addicts

Since Hulu is co-owned by four of the biggest media companies, it's not exactly shocking that the newly redesigned app has lots of content. It's a solid all-in-one buffet for about \$40 a month: all the movies and next-day shows you've always gotten, Hulu's original shows, and most of your local channels and sports.



Sling

BEST FOR:
Cost-cutting cord cutters

Sling has been in the streaming game longer than just about anyone. Basic service costs \$20 a month, and you can add sports and kids' stuff for a few extra bucks. Local content is sparse, but you get nearly everything you want without paying for anything else.



PlayStation Vue Now

BEST FOR:
Smartphone channel surfers

Ignore the whiff of gaming in the name: Vue is the most powerful cable substitute out there. For \$40 a month, it serves up lots of local channels, will stream to five devices at a time, and boasts a hefty cloud DVR that lets you rewatch the red carpet as often as you'd like. Best of all, your Vue credentials work, just like a cable login, to access HGTV, AMC, and other channels on Roku.



DISCOVER WHAT'S MOVING YOU

Technology has proven a convenient salve for society's most intractable problems, and now some of the world's brightest engineers, designers, and researchers have focused their technological resources and brainpower on rethinking the future of transportation.

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WIRED



FROM PLUGGING IN TO CUTTING THE CORD, THE GEICO GECKO TAKES A LOOK BACK AT THE EVOLUTION OF GAMING

Throughout history, it seems, people have invented machines only to then try to outsmart them—and nothing draws you in faster to this long-standing “man versus machine” rivalry than videogames.

Many trace videogames' beginnings to the 1939–40 New York World's Fair, which was billed as “the dawn of a new day” and a chance to see “the world of tomorrow.” Among the forward-looking exhibits, the Nimatron was an electromechanical machine programmed to play the ancient game of nim; it even doled out tokens stamped “Nim Champ” to winners.

Inspired by the Nimatron, a decade later the Nimrod was developed by a completely different team for the Festival of Britain in 1951, becoming the first computer designed specifically to play a game. However, it wasn't made entirely for entertainment. The actual intent was to show how quickly computers could do math, which turned out to be pretty fun.

For where gaming goes next, follow the evolution of gaming and visit geico.com to learn more.

GEICO



SWIMMING IN OIL MONEY

Each election cycle, gushers of money flow to legislative lobbyists who fight for fossil fuels. Environmentalists can't keep up.



The Man Who Fell for Earth

Meet the hedge fund billionaire who's dedicating his life to saving the planet.

BY NICK STOCKTON

TOM STEYER ISN'T your average California tree hugger. The former hedge fund manager—number 1,121 on *Forbes'* wealthiest people list, with \$1.61 billion—was once best known for turning \$15 million into \$30 billion in about two decades.

But then he went hiking. Steyer and environmental activist and author Bill McKibben spent a day trudging through the Adirondacks. Not long after, Steyer parted ways with the leadership of his company and his oil and gas investments, began to fight the Keystone XL pipeline, and then reinvented himself as a one-man superfund for climate causes. His organization, NextGen Climate, has spent \$170 million over the past four years advocating for pol-

icies and politicians that help the environment and advance renewable energy.

It's an uphill battle. Steyer was the largest single donor on either side of the 2016 election—\$86 million of his own money. Yet climate change skeptics rule the federal government and many statehouses. Somehow, though, Steyer isn't acting like a loser. Since November he's become an even more vocal representative of the nearly two-thirds of Americans who do think human-caused climate change is a real problem. He talked to WIRED about California's role in science, his own political ambitions ("governor" has a better ring to it than "former hedge fund manager," right?), and whether Donald Trump could ever possibly, conceivably help save the planet.

WIRED: So Keystone XL has been revived, the Clean Power Plan is in peril, and the former CEO of Exxon is our secretary of state. How are you?

STEYER: I know there are five stages of grief, but my parents raised me to pull up my socks when times get tough. So I really never had the luxury of feeling bad, because right after the election I felt like we needed to figure this thing out.

What is NextGen going to do?

We have been cosponsoring marches with immigrants' and women's rights groups. We've been running ads against Trump's nominees and policy positions. And we've been organizing resistance activities on the college campuses where we established ourselves during the campaign. We will continue to go on the offensive each time the administration attempts to derail global actions to stop climate change.

During the confirmation hearings for Rex Tillerson, Scott Pruitt, and others, you guys took out attack ads. What's your goal?

Those guys disagree with us on almost every point. One of the things we strongly believe—and Tillerson was a perfect example—is that the

Tom Steyer was the biggest campaign donor in 2016, spending \$86 million on progressive causes. So what does he do after losing? Fight harder.

people Trump nominated consistently put corporate interests ahead of American interests. We feel it's important to get citizens to be reminded of this common thread: that the new administration doesn't hate working against climate change, they don't hate science—they just love oil and gas profits.

There's a wide swath of rural Americans who are happy and hopeful for Trump. Are you reaching out to them?

After the election, the first thing I wanted to know was how our voter registration work on 370 campuses across the country affected turnout. We monitored 12 precincts where there were a lot of millennials and saw that voter turnout was up overall. And turns out, we did do well at rural schools. What we are still trying to figure out is whether that turnout voted Republican or Democrat. That is, if those new voters brought our messaging about politicians who supported climate action to the voting booth.

Given what you know about how policy moves markets, what will we give up when Trump pulls the US out of the Paris agreement?

I was in business for 30 years, and my experience is that the best way to operate is to work fairly and closely with partners over a long period of time. The most expensive way to do business is to do it deal by deal, each of which is highly contentious. If deal by deal is the model, where instead of partners or allies we

have counterparts and competitors, that is very expensive, difficult, and dangerous. OK, so look at the Paris agreement: It's going to force the developed world to change its energy sources. That means the US could be the leader in developing renewable technology for more than a billion people—a huge incoming market—who don't have electricity at all.

The Paris agreement was a

est respect for climate science. When Kelly Ayotte—who has a dismal 35 percent rating from the League of Conservation Voters—voted for the Clean Power Plan, a lot of people said, “Oh, she's really an environmentalist.” But that's ignoring her record and the reason why it's so hard for her and other Republicans to stand up for the environment in this political climate, because they have to stand up to

a lot of volatility in the oil and gas markets. Fossil fuels are raw materials that have to be extracted and processed. Wind and solar energy are different. The only costs associated with them are technological. WIRED readers should be familiar with the idea that technology gets better and cheaper every year. That's not true about fossil fuels. The techniques we use to withdraw them might get

THE EVOLUTION OF A MAN

From Wall Street to the Adirondacks, billionaire Tom Steyer took an unusual path to becoming the nation's leading climate change activist. —LEXI PANDELL



An alumnus of Morgan Stanley and Goldman Sachs, Steyer moves to San Francisco and starts the investment firm Farallon Capital with \$15 million.

1986

Steyer becomes more involved in California politics and briefly considers running for governor in the wake of the Gray Davis recall.

2003

Students at Yale and Stanford (Steyer's alma maters) criticize the universities for investing in Farallon, which they say funds antilabor and antienvironment companies. Steyer takes note.

2004

great achievement of American leadership. So the idea that we're going to walk away and give up leadership of 194 countries, and walk away from our position as a leader in the world for the past 100 years, will be an incredibly expensive and dumb thing to do.

Are there any Republican climate leaders?

You know, we all act like it is an incredible triumph if a Republican shows the remot-

the fossil fuel industry. I think there are a lot of Republicans who know the truth and would like to do the right thing but don't understand how.

Solar and wind energy costs have been coming down for decades. Why aren't they replacing fossil fuels faster?

There are a lot of subsidies for oil and gas, things like tax breaks and access to markets. That's partly because there's

better every year, but the price has actually risen over time. If you take away subsidies from fossil fuels, wind and solar are actually cheaper.

You believe businesses can provide solutions to climate change but only with the right government policies. Is that era over?

Well, most of the energy regulation in the US comes from the state level, which lets states

Nick Stockton
(@stocktonsays)
is a staff writer on
the science desk
at WIRED.

like California pursue more ambitious emissions regulations. It also lets states with lots of renewable energy coordinate to share it when needed, but federal regulations would help more.

The issue is going to be, to an extent, what the new administration will do to subsidize fossil fuels—how they can make dirtier fuel, which is more expensive, more attractive. Maybe that means leasing public lands

say what's going to happen, because the world does tend to surprise us. If you didn't learn that in 2016, then you weren't paying attention.

Can California's politicians really create a bulwark against Trump?

The administration has said they're going to go after their political opponents. California embodies that opponent. Taking money away from health

the people of California, and by doing so put forward a different image of what the true values of Americans are, just be aware, it ain't cheap. My point is, this is not a theoretical problem for us.

How potent is the state's ability to resist?

Financing that opposition will be tricky. First, the California budget is leveraged really highly to the personal income

"I think there are a lot of Republicans who know the truth and would like to do the right thing."

gets taxed in California like regular income. If there are no tech IPOs, the tech sector isn't doing well, so there aren't a lot of stock profits—equity profits—from those companies, and that hits the revenue line of the California state budget [*claps loudly*] super hard. You may have also noticed that we have had a bull market for the past six years.

In January, in an op-ed for *The Sacramento Bee*, you wrote about creating "the broadest coalition possible, one that embraces our shared values and delivers on the promise of a better future for all Americans." You even echo Obama's "Let's get to work."

Maybe he stole that from me! **Well, it reads like you are a guy getting ready to run for office.**

[*Slaps table.*] Well, our mission statement is: "Act politically to prevent climate disaster and promote prosperity for every American." So are we broadening our message? That's always been our message. Whatever I do, and I honestly don't know what it is, will be consistent with that effort. ☐



Twenty years after its founding, Farallon Capital is worth \$30 billion.

2006

A year after he and his wife, Kat Taylor (pictured, left, in the mid-'90s), sign the Giving Pledge, Steyer joins the board of Next Generation, an organization for children's issues and climate change.

2011

After reading an article by author Bill McKibben, Steyer invites the writer on a hike in the Adirondacks. Steyer comes out of the wilderness ready to advocate for alternative energy.

2012

Steyer founds NextGen Climate, an environmental advocacy nonprofit and political action committee.

2013

NextGen Climate puts up \$95 million for candidates, voter engagement, and more. Steyer spends nearly \$86 million himself.

2016

at low prices. But the only thing they can really do to ensure long-term drilling is put in infrastructure, like pipelines.

Do you think there is any chance for Trump to not be awful for climate?

[*Long pause.*] I don't think there's any chance that Trump is going to step up and do the right thing out of the conviction that it's the right thing to do. But, you know, you can't really

care, in the form of the Medicaid expansion—that would be more than \$15 billion from California's budget. Consider that the state's general fund budget is about \$120 billion. They are also going after cities that resist their deportation efforts. They're talking about withholding money from schools. This is gigantic and very, very threatening. If you talk about trying to stand up as best we can for

and capital gains of the richest Californians. That means it is super volatile, because incomes go up and down much more often than property values, which is how most states finance themselves. What's worse is that the budget is also highly leveraged to the stock market. So when tech companies are going public and things are happening, then that income for the employees who benefit

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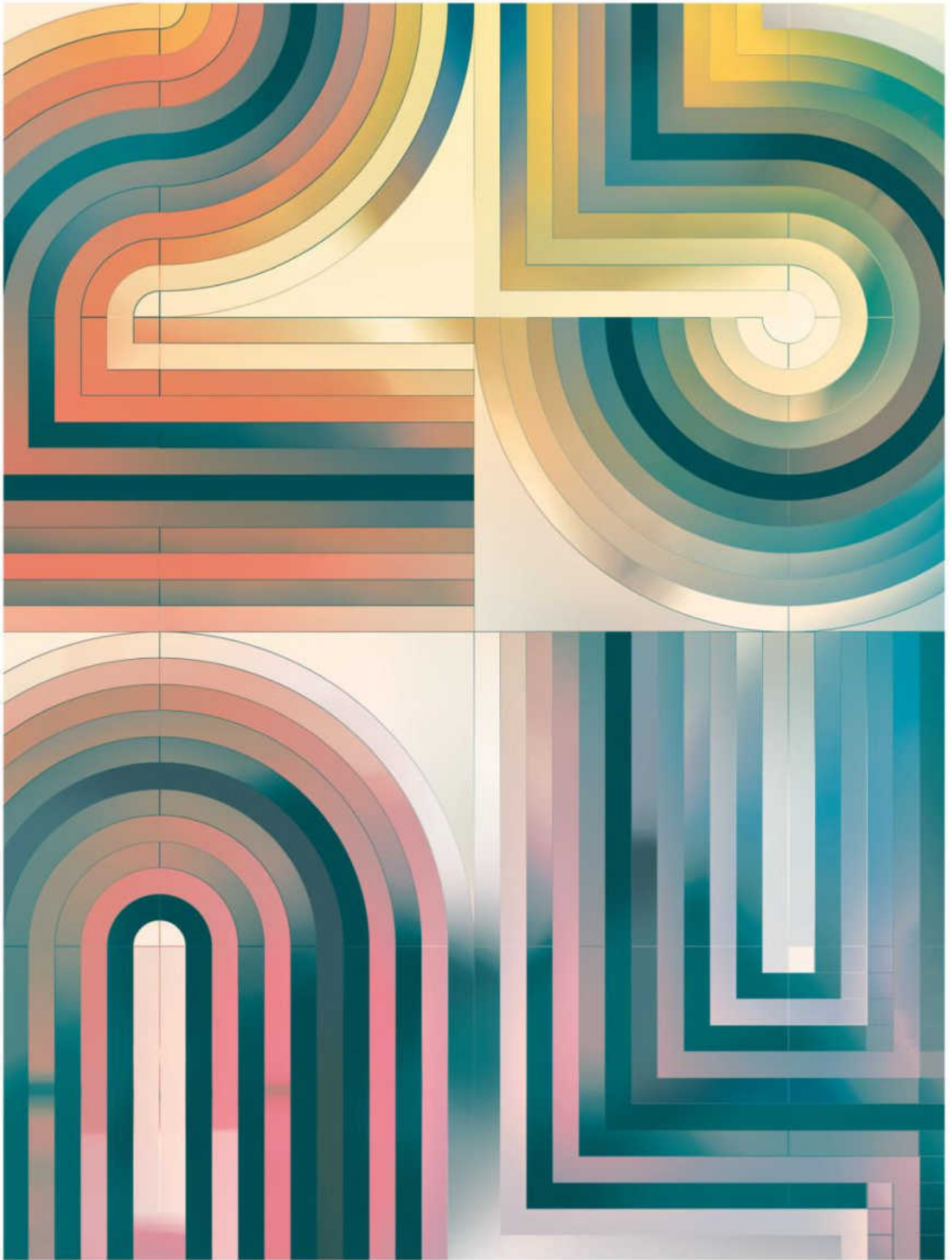
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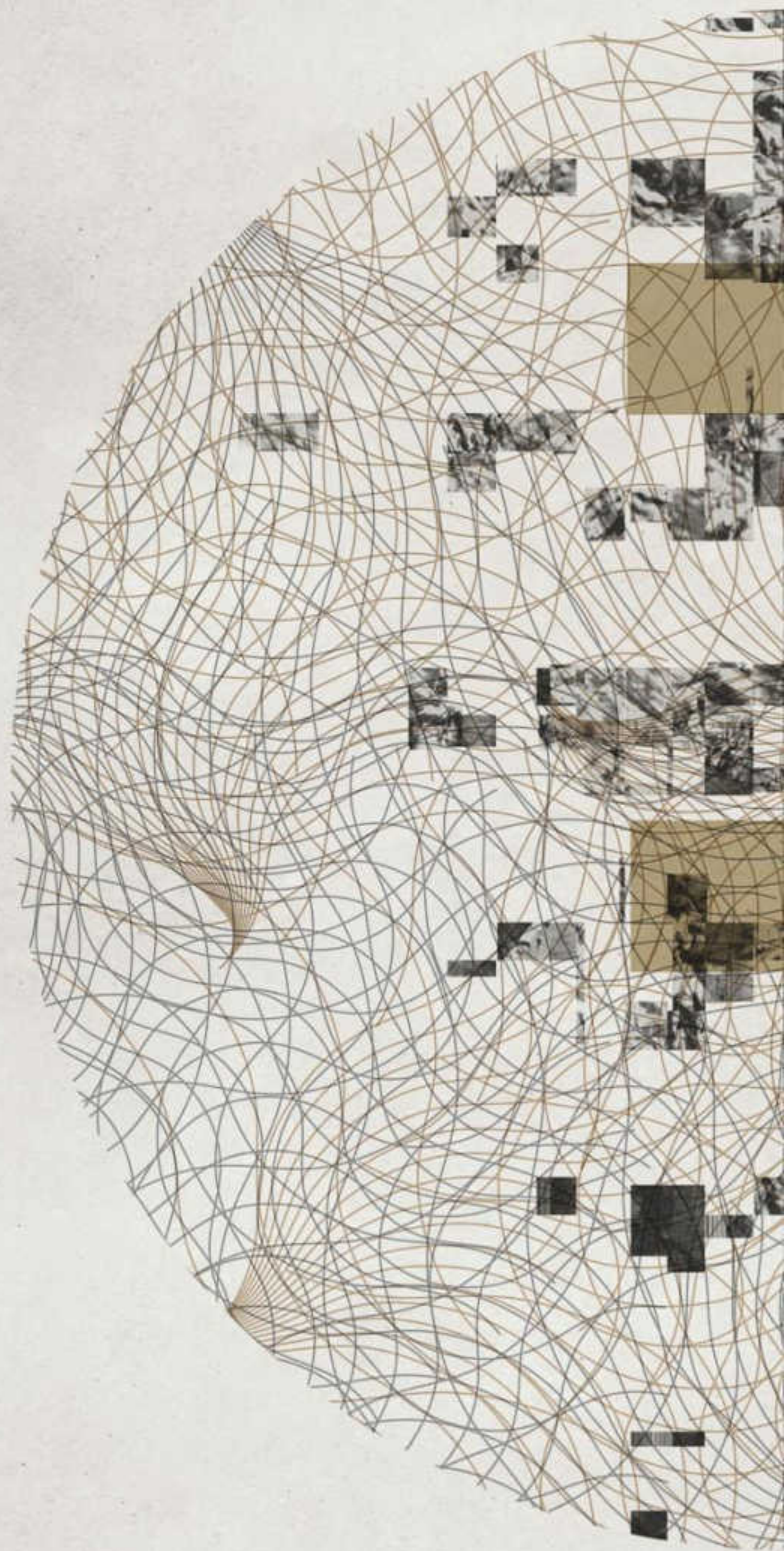
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 ANDY GILMORE

0 5 1

CHASING THE PHANTOM

BY GARRETT M. GRAFF



A MYSTERIOUS RUSSIAN HACKER STOLE A FORTUNE FROM U.S. BANKS. THEN THE FBI DISCOVERED WHAT ELSE HE WAS AFTER.

 CHAD HAGEN

ON THE MORNING of December 30, the day after Barack Obama imposed sanctions on Russia for interfering in the 2016 US election, Tillmann Werner was sitting down to breakfast in Bonn, Germany. He spread some jam on a slice of rye bread, poured himself a cup of coffee, and settled in to check Twitter at his dining room table.

The news about the sanctions had broken overnight, so Werner, a researcher with the cybersecurity firm CrowdStrike, was still catching up on details. Following a link to an official statement, Werner saw that the White House had targeted a short parade's worth of Russian names and institutions—two intelligence agencies, four senior intelligence officials, 35 diplomats, three tech companies, two hackers. Most of the details were a blur. Then Werner stopped scrolling. His eyes locked on one name buried among the targets: Evgeniy Mikhailovich Bogachev.

Werner, as it happened, knew quite a bit about Evgeniy Bogachev. He knew in precise, technical detail how Bogachev had managed to loot and terrorize the world's financial systems with impunity for years. He knew what it was like to do battle with him.

But Werner had no idea what role Bogachev might have played in the US election hack. Bogachev wasn't like the other targets—he was a bank robber. Maybe the most prolific bank robber in the world.

"What on earth is he doing on this list?" Werner wondered.

1

OMAHA

AMERICA'S WAR with Russia's greatest cybercriminal began in the spring of 2009, when special agent James Craig, a rookie in the FBI's Omaha, Nebraska, field office, began looking into a strange pair of electronic thefts. A square-jawed former marine, Craig had been an agent for just six months, but his superiors tapped him for the case anyway, because of his background: For years, he'd been an IT guy for the FBI. One of his nicknames in college was "the silent geek."

The leading victim in the case was a subsidiary of the payments-processing giant First Data, which lost \$450,000 that May. That was quickly followed by a \$100,000 theft from a client of the First National Bank of Omaha. What was odd, Craig noticed, was that the thefts seemed to have been executed from the victims' own IP addresses, using their own logins and passwords. Examining their computers, he saw that they were infected with the same malware: something called the Zeus Trojan horse.

In online security circles, Craig discovered, Zeus was notorious. Having first appeared in 2006, the malware had a reputation among both criminals and security experts as a masterpiece—smooth, effective, versatile. Its author was a phantom. He was only known online, where he went by the handle Slavik, or lucky12345, or a half-dozen other names.

Zeus infected computers through fairly typical means: fake IRS emails, say, or illegitimate UPS shipping notices that tricked recipients into downloading a file. But once it was on your computer, Zeus let hackers play God: They could hijack websites and use a keystroke logger to record usernames, passwords, and PINs. Hackers could even modify login forms to request further valuable security information: a mother's maiden name, a Social Security number. The ruse is known as a "man in the browser" attack. While you sit at your computer logging into seemingly secure websites, the malware modifies pages before they load, siphoning away your credentials and your account balance. Only when you log in from a different computer do you even realize the money is gone.

By the time Craig started his investigation, Zeus had become the digital underground's malware of choice—the Microsoft Office of online fraud. Slavik was something rare in the malware world: a genuine professional. He regularly updated the Zeus code, beta-testing new features. His product was endlessly adaptable, with variants optimized for different kinds of attacks and targets. A computer infected with Zeus could even be folded into a botnet, a network of infected computers that can be harnessed together to run spam servers or distributed denial-of-service

attacks, or send out more deceptive emails to spread the malware further.

But sometime shortly before Craig picked up his case in 2009, Slavik had begun to change tack. He started cultivating an inner circle of online criminals, providing a select group with a variant of his malware, called Jabber Zeus. It came equipped with a Jabber instant-message plug-in, allowing the group to communicate and coordinate attacks—like in the two Omaha thefts. Rather than rely on broad infection campaigns, they began to specifically target corporate accountants and people with access to financial systems.

As Slavik turned increasingly to organized crime, he dramatically narrowed his retail malware business. In 2010 he announced his "retirement" online and then released what security researchers came to call Zeus 2.1, an advanced version of his malware protected by an encryption key—effectively tying each copy to a specific user—with a price tag upwards of \$10,000 per copy. Now, Slavik was only dealing with an elite, ambitious group of criminals.

"We had no idea how big this case was," Craig says. "The amount of activity from these guys was phenomenal." Other institutions began to come forward with losses and accounts of fraud. Lots of them. Craig realized that, from his desk in suburban Omaha, he was chasing a well-organized international criminal network. "The victims started falling out of the sky," Craig says. It dwarfed any other cybercrime the FBI had tackled before.

2

JABBER ZEUS

CRAIG'S FIRST major break in the case came in September 2009. With the help of some industry experts, he identified a New York-based server that seemed to play some sort of role in the Zeus network. He obtained a search warrant, and an FBI forensics team copied the server's data onto a hard drive, then overnighted it to Nebraska. When an engineer in Omaha examined the results, he sat in awe for a moment. The hard drive con-

tained tens of thousands of lines of instant message chat logs in Russian and Ukrainian. Looking over at Craig, the engineer said: "You have their Jabber server."

This was the gang's whole digital operation—a road map to the entire case. The cybersecurity firm Mandiant dispatched an engineer to Omaha for months just to help untangle the Jabber Zeus code, while the FBI began cycling in agents from other regions on 30- or 90-day assignments. Linguists across the country pitched in to decipher the logs. "The slang was a challenge," Craig says.

The messages contained references to hundreds of victims, their stolen credentials scattered in English throughout the files. Craig and other agents started cold-calling institutions, telling them they had been hit by cyberfraud. He found that several businesses had terminated employees they suspected of the thefts—not realizing that the individuals' computers had been infected by malware and their logins stolen.

The case also expanded beyond the virtual world. In New York one day in 2009, three young women from Kazakhstan walked into the FBI field office there with a strange story. The women had come to the States to look for work and found themselves participating in a curious scheme: A man would drive them to a local bank and tell them to go inside and open a new account. They were to explain to the teller that they were students visiting for the summer. A few days later, the man had them return to the bank and withdraw all of the money in the account; they kept a small cut and passed the rest on to him. Agents pieced together that the women were "money mules": Their job was to cash out the funds that Slavik and his comrades had siphoned from legitimate accounts.

By the summer of 2010, New York investigators had put banks across the region on alert for suspicious cash-outs and told them to summon FBI agents as they occurred. The alert turned up dozens of mules withdrawing tens of thousands of dollars. Most were students or newly arrived immigrants in Brighton Beach. One woman explained that she'd become a mule after a job at a grocery store fell through, telling an agent: "I could strip, or I could do this." Another man explained that he'd be picked up at 9 am, do cash-out runs until 3 pm, and then spend the rest of the

GARRETT M. GRAFF (@vermontgmg)
wrote about James Clapper in issue 24.12.

day at the beach. Most cash-outs ran around \$9,000, just enough to stay under federal reporting limits. The mule would receive 5 to 10 percent of the total, with another cut going to the recruiter. The rest of the money would be sent overseas.

The United States, moreover, was just one market in what investigators soon realized was a multinational reign of fraud. Officials traced similar mule routes in Romania, the Czech Republic, the United Kingdom, Ukraine, and Russia. All told, investigators could attribute around \$70 million to \$80 million in thefts to the group—but they suspected the total was far more than that.

Banks howled at the FBI to shut the fraud down and stanch the losses. Over the summer, New York agents began to close in on high-ranking recruiters and the scheme's masterminds in the US. Two Moldovans were arrested at a Milwaukee hotel at 11 pm following a tip; one suspect in Boston tried to flee a raid on his girlfriend's apartment and had to be rescued from the fire escape.

Meanwhile, Craig's case in Omaha advanced against the broader Jabber Zeus gang. The FBI and the Justice Department had zeroed in on an area in eastern Ukraine around the city of Donetsk, where several of the Jabber Zeus leaders seemed to live. Alexey Bron, known online as "thehead," specialized in moving the gang's money around the world. Ivan Viktorovich Klepikov, who went by the moniker "petrOvich," ran the group's IT management, web hosting, and domain names. And Vyacheslav Igorevich Penchukov, a well-known local DJ who went by the nickname "tank," managed the whole scheme, putting him second in command to Slavik. "The amount of organization these kids—they're in their twenties—were able to pull together would've impressed any Fortune 100 company," Craig says. The gang poured their huge profits into expensive cars (Penchukov had a penchant for high-end BMWs and Porsches, while Klepikov preferred Subaru WRX sports sedans), and the chat logs were filled with discussions of fancy vacations across Turkey, Crimea, and the United Arab Emirates.

By the fall of 2010, the FBI was ready to take down the network. As officials in Washington called a high-profile press conference, Craig found himself on a rickety 12-hour

train ride across Ukraine to Donetsk, where he met up with agents from the country's security service to raid tank's and petrOvich's homes. Standing in petrOvich's living room, a Ukrainian agent told Craig to flash his FBI badge. "Show him it's not just us," he urged. Craig was stunned by the scene: The hacker, wearing a purple velvet smoking jacket, seemed unperturbed as agents searched his messy apartment in a Soviet-style concrete building; his wife held their baby in the kitchen, laughing with investigators. "This is the gang I've been chasing?" Craig thought. The raids lasted well into the night, and Craig didn't return to his hotel until 3 am. He took nearly 20 terabytes of seized data back to Omaha.

With 39 arrests around the world—stretching across four nations—investigators managed to disrupt the network. But crucial players slipped away. One top mule recruiter in the US fled west, staying a step ahead of investigators in Las Vegas and Los Angeles before finally escaping the country inside a shipping container. More important, Slavik, the mastermind himself, remained almost a complete cipher. Investigators assumed he was based in Russia. And once, in an online chat, they saw him reference that he was married. Other than that, they had nothing. The formal indictment referred to the creator of the Zeus malware using his online pseudonym. Craig didn't even know what his prime suspect looked like. "We have thousands of photos from tank, petrOvich—not once did we see Slavik's mug," Craig says. Soon even the criminal's online traces vanished. Slavik, whoever he was, went dark. And after seven years of chasing Jabber Zeus, James Craig moved on to other cases.

3

GAME NOT OVER

ABOUT A YEAR AFTER the FBI shut down the Jabber Zeus ring, the small community of online cybersecurity researchers who watch for malware and botnets began to notice

a new variant of Zeus emerge. The malware's source code had been leaked online in 2011—perhaps purposefully, perhaps not—effectively turning Zeus into an open source project and setting off an explosion of new variants. But the version that caught the eyes of researchers was different: more powerful and more sophisticated, particularly in its approach to assembling botnets.

Until then, most botnets used a hub-and-spoke system—a hacker would program a single command server to distribute orders directly to infected machines, known as zombie computers. The undead army could then be directed to send out spam emails, distribute malware, or target websites for denial-of-service attacks. That hub-and-spoke design, though, made botnets relatively easy for law enforcement or security researchers to dismantle. If you could knock the command server offline, seize it, or disrupt a hacker's ability to communicate with it, you could usually break the botnet.

This new Zeus variant, however, relied on both traditional command servers and peer-to-peer communication between zombie machines, making it extremely difficult to knock down. Infected machines kept a constantly updated list of other infected machines. If one device sensed that its connection with the command server had been interrupted, it would rely on the peer-to-peer network to find a new command server.

The network, in effect, was designed from the start to be takedown-proof; as soon as one command server was knocked offline, the botnet owner could just set up a new server somewhere else and redirect the peer-to-peer network to it. The new version became known as GameOver Zeus, after one of its file names, gameover2.php. The name also lent itself naturally to gallows humor: Once this thing infects your computer, went a joke among security experts, it's game over for your bank accounts.

As far as anyone could tell, GameOver Zeus was controlled by a very elite group of hackers—and the group's leader was Slavik. He had reemerged, more powerful than ever. Slavik's new crime ring came to be called the Business Club. A September 2011 internal announcement to the group—introducing members to a new suite of online tools for organizing money transfers and mules—



concluded with a warm welcome to Slavik's select recipients: "We wish you all successful and productive work."

Like the Jabber Zeus network, the Business Club's prime directive was knocking over banks, which it did with even more ruthless inventiveness than its predecessor. The scheme was multipronged: First, the GameOver Zeus malware would steal a user's banking credentials, intercepting them as soon as someone with an infected computer logged into an online account. Then the Business Club would drain the bank account, transferring its funds into other accounts they controlled overseas. With the theft complete, the group would use its powerful botnet to hit the targeted financial institutions with a denial-of-service attack to distract bank employees and prevent customers from realizing their accounts had been emptied until after the money had cleared. On November 6, 2012, the FBI watched as the GameOver network stole \$6.9 million in a single transaction, then hit the bank with a multiday denial-of-service attack.

Unlike the earlier Jabber Zeus gang, the more advanced network behind GameOver focused on larger six- and seven-figure bank thefts—a scale that made bank withdrawals in Brooklyn obsolete. Instead, they used the globe's interconnected banking system

against itself, hiding their massive thefts inside the trillions of dollars of legitimate commerce that slosh around the world each day. Investigators specifically identified two areas in far eastern China, close to the Russian city of Vladivostok, from which mules funneled huge amounts of stolen money into Business Club accounts. The strategy, investigators realized, represented an evolutionary leap in organized crime: Bank robbers no longer had to have a footprint inside the US. Now they could do everything remotely, never touching a US jurisdiction. "That's all it takes to operate with impunity," says Leo Taddeo, a former top FBI official.

4

STOP THE BLEEDING

BANKS WEREN'T the gang's only targets. They also raided the accounts of nonfinancial businesses large and small, nonprofits, and even individuals. In October 2013, Slavik's group began deploying malware known as CryptoLocker, a form of ransom-

ware that would encrypt the files upon an infected machine and force its owner to pay a small fee, say, \$300 to \$500, to unlock the files. It quickly became a favorite tool of the cybercrime ring, in part because it helped transform dead weight into profit. The trouble with building a massive botnet focused on high-level financial fraud, it turns out, is that most zombie computers don't connect to fat corporate accounts; Slavik and his associates found themselves with tens of thousands of mostly idle zombie machines. Though ransomware didn't yield huge amounts, it afforded the criminals a way to monetize these otherwise worthless infected computers.

The concept of ransomware had been around since the 1990s, but CryptoLocker took it mainstream. Typically arriving on a victim's machine under the cover of an unassuming email attachment, the Business Club's ransomware used strong encryption and forced victims to pay using bitcoin. It was embarrassing and inconvenient, but many relented. The Swansea, Massachusetts, police department grumpily ponied up \$750 to get back one of its computers in November 2013; the virus "is so complicated and successful that you have to buy these bitcoins, which we had never heard of," Swansea police lieutenant Gregory Ryan told his local newspaper.

The following month, the security firm Dell SecureWorks estimated that as many as 250,000 machines worldwide had been infected with CryptoLocker that year. One researcher traced 771 ransoms that netted Slavik's crew a total of \$1.1 million. "He was one of the first to realize how desperate people would be to regain access to their files," Brett Stone-Gross, a researcher with Dell SecureWorks at the time, says of Slavik. "He didn't charge an exorbitant amount, but he made a lot of money and created a new type of online crime."

As the GameOver network continued to gain strength, its operators kept adding revenue streams—renting out their network to other criminals to deliver malware and spam or to carry out projects like click fraud, ordering zombie machines to generate revenue by clicking on ads on fake websites.

With each passing week, the cost to banks, businesses, and individuals from GameOver

THE GANG'S STRATEGY REPRESENTED AN EVOLUTIONARY LEAP IN ORGANIZED CRIME.

grew. For businesses, the thefts could easily wipe out a year's profits, or worse. Domestically, victims ranged from a regional bank in north Florida to a Native American tribe in Washington state. As it haunted large swathes of the private sector, GameOver absorbed more and more of the efforts of the private cybersecurity industry. The sums involved were staggering. "I don't think anyone has a grasp of the full extent—one \$5 million theft overshadows hundreds of smaller thefts," explains Michael Sandee, a security expert at the Dutch firm Fox-IT. "When a bank gets attacked en masse—100 transactions a week—you stop caring about the specific malware and the individual attacks; you just need to stop the bleeding."

Many tried. From 2011 through 2013, cybersecurity researchers and various firms mounted three attempts to take down GameOver Zeus. Three European security researchers teamed up to make a first assault in the spring of 2012. Slavik easily repelled their attack. Then, in March 2012, Microsoft's Digital Crimes Unit took civil legal action against the network, relying upon US marshals to raid data centers in Illinois and Pennsylvania that housed Zeus command-and-control servers and aiming legal action against 39 individuals thought to be associated with the Zeus networks. (Slavik was first on the list.) But Microsoft's plan failed to put a dent in GameOver. Instead it merely clued Slavik in to what investigators knew about his network and allowed him to refine his tactics.

5

ASSAULT

BOTNET FIGHTERS are a small, proud group of engineers and security researchers—self-proclaimed "internet janitors" who work to keep online networks running smoothly. Within that group, Tillmann Werner—the tall, lanky German researcher with the security firm CrowdStrike—had become known for his flair and enthusiasm for the

work. In February 2013 he seized control of the Kelihos botnet, an infamous malware network built on Viagra spam, live onstage during a presentation at the cybersecurity industry's biggest conference. But Kelihos, he knew, was no GameOver Zeus. Werner had been watching GameOver since its inception, marveling at its strength and resilience.

In 2012 he had linked up with Stone-Gross—who was just a few months out of graduate school and was based in California—plus a few other researchers to map out an effort to attack GameOver. Working across two continents largely in their spare time, the men plotted their attack via online chat. They carefully studied the previous European effort, identifying where it had failed, and spent a year preparing their offensive.

In January 2013, they were ready: They stocked up on pizza, assuming they were in for a long siege against Slavik's network. (When you go against a botnet, Werner says, "you have one shot. It either goes right or wrong.") Their plan was to reroute GameOver's peer-to-peer network, centralize it, and then redirect the traffic to a new server under their control—a process known as "sinkholing." In doing so, they hoped to sever the botnet's communication link to Slavik. And at first, everything went well. Slavik showed no signs of fighting back, and Werner and Stone-Gross watched as more and more infected computers connected to their sinkhole by the hour.

At the peak of their attack, the researchers controlled 99 percent of Slavik's network—but they'd overlooked a critical source of resilience in GameOver's structure: a small subset of infected computers were still secretly communicating with Slavik's command servers. "We missed that there's a second layer of control," Stone-Gross says. By the second week, Slavik was able to push a software update to his whole network and reassert his authority. The researchers watched with dawning horror as a new version of GameOver Zeus propagated across the internet and Slavik's peer-to-peer network began to reassemble. "We immediately saw what happened—we'd completely neglected this other channel of communication," Werner says.

The researchers' ploy—nine months in the making—had failed. Slavik had won. In

a trollish online chat with a Polish security team, he crowed about how all the efforts to seize his network had come to naught. "I don't think he thought it was possible to take down his botnet," Werner says. Dejected, the two researchers were eager to try again. But they needed help—from Pittsburgh.

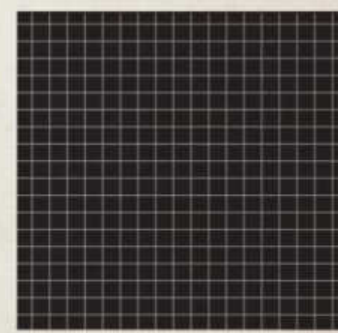
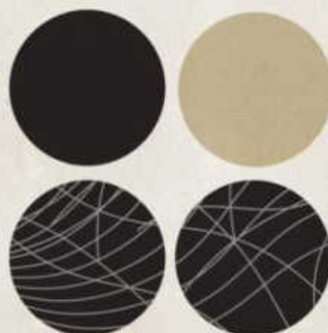
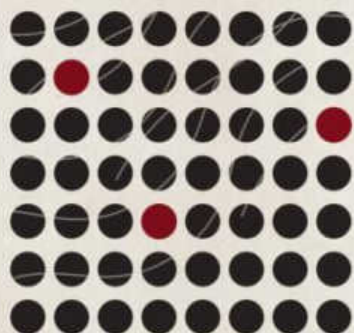
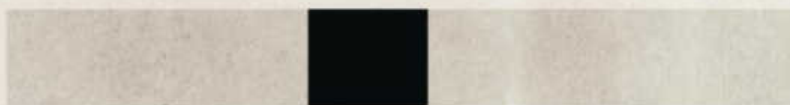
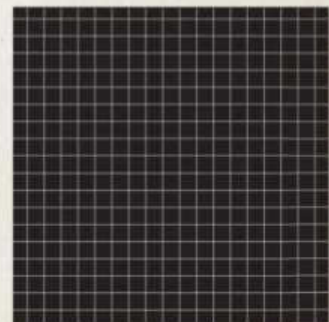
6

PITTSBURGH

OVER THE PAST DECADE, the FBI's Pittsburgh field office has emerged as the source of the government's biggest cybercrime indictments, thanks in no small part to the head of the local cybersquad there, a one-time furniture salesman named J. Keith Mularski.

An excitable and gregarious agent who grew up around Pittsburgh, Mularski has become something of a celebrity in cybersecurity circles. He joined the FBI in the late '90s and spent his first seven years in the bureau working espionage and terrorism cases in Washington, DC. Jumping at the chance to return home to Pittsburgh, he joined a new cyber initiative there in 2005, despite the fact that he knew little about computers. Mularski trained on the job during a two-year undercover investigation chasing identity thieves deep in the online forum DarkMarket. Under the screen name Master Splyntr—a handle inspired by *Teenage Mutant Ninja Turtles*—Mularski managed to become a DarkMarket administrator, putting himself at the center of a burgeoning online criminal community. In his guise, he even chatted online with Slavik and reviewed an early version of the Zeus malware program. His DarkMarket access eventually helped investigators arrest 60 people across three continents.

In the years that followed, the head of the Pittsburgh office decided to invest aggressively in combating cybercrime—a bet on its increasing importance. By 2014, the FBI agents in Mularski's squad, together with another squad assigned to a little-known



Pittsburgh institution called the National Cyber-Forensics and Training Alliance, were prosecuting some of the Justice Department's biggest cases. Two of Mularski's agents, Elliott Peterson and Steven J. Lampo, were chasing the hackers behind GameOver Zeus, even as their desk-mates simultaneously investigated a case that would ultimately indict five Chinese army hackers who had penetrated computer systems at Westinghouse, US Steel, and other companies to benefit Chinese industry.

The FBI's GameOver case had been under way for about a year by the time Werner and Stone-Gross offered to join forces with the Pittsburgh squad to take down Slavik's botnet. If they had approached any other law-enforcement agency, the response might have been different. Government cooperation with industry was still a relatively rare phenomenon; the Feds' style in cyber cases was, by reputation, to Hoover up industry leads without sharing information. But the team in Pittsburgh was unusually practiced at collaboration, and they knew that the two researchers were the best in the field. "We jumped at the chance," Mularski says.

Both sides realized that in order to tackle the botnet, they needed to work on three simultaneous fronts. First, they had to figure out once and for all who was running GameOver—what investigators call "attribution"—and build up a criminal prosecution; even after millions of dollars in thefts, neither the FBI nor the security industry had so much as a single Business Club member's name. Second, they needed to take down the digital infrastructure of GameOver itself; that's where Werner and Stone-Gross came in. And third, they needed to disable the botnet's physical infrastructure by assembling court orders and enlisting the help of other governments to seize its servers across the globe. Once all that was done, they needed partners in the private sector to be ready with software updates and security patches to help recover infected computers the moment the good guys had control of the botnet. Absent any one of those moves, the next effort to take down GameOver Zeus was likely to fail just as the previous ones had.

With that, Mularski's squad began to stitch together an international partner-

ship unlike anything the US government had ever undertaken, enlisting the UK's National Crime Agency, officials in Switzerland, the Netherlands, Ukraine, Luxembourg, and a dozen other countries, as well as industry experts at Microsoft, CrowdStrike, McAfee, Dell SecureWorks, and other companies.

First, to help nail down Slavik's identity and get intelligence on the Business Club, the FBI teamed up with Fox-IT, a Dutch outfit renowned for its expertise in cyber-forensics. The Dutch researchers got to work tracing old usernames and email addresses associated with Slavik's ring to piece together an understanding of how the group operated.

The Business Club, it turned out, was a loose confederation of about 50 criminals, who each paid an initiation fee to access GameOver's advanced control panels. The network was run through two password-protected British websites, Visitcoastweekend.com and Work.business-club.so, which contained careful records, FAQs, and a "ticket" system for resolving technical issues. When investigators got legal permission to penetrate the Business Club server, they found a highly detailed ledger tracking the group's various ongoing frauds. "Everything radiated professionalism," Fox-IT's Michael Sandee explains. When it came to pinpointing the precise timing of transactions between financial institutions, he says, "they probably knew better than the banks."

7

SPYWARE

ONE DAY, after months of following leads, the investigators at Fox-IT got a tip from a source about an email address they might want to look into. It was one of many similar tips they'd chased down. "We had a lot of bread crumbs," Mularski says. But this one led to something vital: The team was able to trace the email address to a British server that Slavik used to run the Busi-

ness Club's websites. More investigative work and more court orders eventually led authorities to Russian social media sites where the email address was connected to a real name: Evgeniy Mikhailovich Bogachev. At first it was meaningless to the group. It took weeks' more effort to realize that the name actually belonged to the phantom who had invented Zeus and created the Business Club.

Slavik, it turned out, was a 30-year-old who lived an upper-middle-class existence in Anapa, a Russian resort city on the Black Sea. Online photos showed that he enjoyed boating with his wife. The couple had a young daughter. One photo showed Bogachev posing in leopard-print pajamas and dark sunglasses, holding a large cat. The investigative team realized that he had written the first draft of Zeus when he was just 22 years old.

But that wasn't the most astounding revelation that the Dutch investigators turned up. As they continued their analysis, they noticed that someone at the helm of GameOver had been regularly searching tens of thousands of the botnet's infected computers in certain countries for things like email addresses belonging to Georgian intelligence officers or leaders of elite Turkish police units, or documents that bore markings designating classified Ukrainian secrets. Whoever it was was also searching for classified material linked to the Syrian conflict and Russian arms dealing. At some point, a light bulb went off. "These are espionage commands," Sandee says.

GameOver wasn't merely a sophisticated piece of criminal malware; it was a sophisticated intelligence-gathering tool. And as best as the investigators could determine, Bogachev was the only member of the Business Club who knew about this particular feature of the botnet. He appeared to be running a covert operation right under the noses of the world's most prolific bank robbers. The FBI and Fox-IT team couldn't find specific evidence of a link between Bogachev and the Russian state, but some entity seemed to be feeding Slavik specific terms to search for in his vast network of zombie computers. Bogachev, it appeared, was a Russian intelligence asset.

In March 2014, investigators could even

watch as an international crisis played out live inside the snow globe of Bogachev's criminal botnet. Weeks after the Sochi Olympics, Russian forces seized the Ukrainian region of Crimea and began efforts to destabilize the country's eastern border. Right in step with the Russian campaign, Bogachev redirected a section of his botnet to search for politically sensitive information on infected Ukrainian computers—trawling for intelligence that might help the Russians anticipate their adversaries' next moves.

The team was able to construct a tentative theory and history of Bogachev's spycraft. The apparent state connection helped explain why Bogachev had been able to operate a major criminal enterprise with such impunity, but it also shed new light on some of the milestones in the life of Zeus. The system that Slavik used to make his intelligence queries dated back approximately to the moment in 2010 when he faked his retirement and made access to his malware far more exclusive. Perhaps Slavik had appeared on the radar of the Russian security services at some point that year, and in exchange for a license to commit fraud without prosecution—outside Russia, of course—the state made certain demands. To carry them out with maximum efficacy and secrecy, Slavik asserted tighter control over his criminal network.

The discovery of Bogachev's likely intelligence ties introduced some trickiness to the operation to take down GameOver—especially when it came to the prospect of enlisting Russian cooperation. Otherwise, the plan was rumbling along. Now that the investigators had zeroed in on Bogachev, a grand jury could finally indict him as the mastermind behind GameOver Zeus. American prosecutors scrambled to bring together civil court orders to seize and disrupt the network. "When we were really running, we had nine people working this—and we only have 55 total," says Michael Comber of the US Attorney's office in Pittsburgh. Over a span of months, the team painstakingly went to internet service providers to ask permission to seize GameOver's existing proxy servers, ensuring that at the right moment, they could flip those servers and disable Slavik's control. Meanwhile, the Department of Homeland Security, Carnegie

Mellon, and a number of antivirus companies readied themselves to help customers regain access to their infected computers. Weekly conference calls spanned continents as officials coordinated action in Britain, the US, and elsewhere.

By late spring 2014, as pro-Russian forces fought in Ukraine proper, the American-led forces got ready to move in on GameOver. They'd been plotting to take down the network for more than a year, carefully reverse-engineering the malware, covertly reading the criminal gang's chat logs to understand the group's psychology, and tracing the physical infrastructure of servers that allowed the network to propagate around the globe. "By this point, these researchers knew the malware better than the author," says Elliott Peterson, one of the lead FBI agents on the case. As Mularski recalls, the team checked off all the crucial boxes: "Criminally, we can do it. Civilly, we can do it. Technically we can do it." Working with a cast of dozens, communicating with more than 70 internet service providers and a dozen other law enforcement agencies from Canada to the United Kingdom to Japan to Italy, the team readied an attack to commence on Friday, May 30.

8

TAKEDOWN

THE WEEK LEADING UP to the attack was a frantic scramble. When Werner and Stone-Gross arrived in Pittsburgh, Peterson had them over to his family's apartment, where his kids gawked at Werner and his German accent. Over dinner and Fathead beer, they took stock of their looming attempt. They were running way behind—Werner's code wasn't close to being ready. Over the rest of the week, as Werner and Stone-Gross raced to finish writing, another team assembled the last court orders, and still others ran herd on the ad hoc group of two dozen governments, companies, and consultants who were helping to take GameOver Zeus down. The White House had been briefed on the plan and was waiting for results. But the effort seemed to be coming apart at the seams.

YET AGAIN, BOGACHEV READIED FOR BATTLE— WRESTLING FOR CONTROL OF HIS NETWORK.

For instance, the team had known for months that the GameOver botnet was controlled by a server in Canada. But then, just days before the attack, they discovered that there was a second command server in Ukraine. The realization made hearts drop. “If you’re not even aware of the second box,” Werner says, “how sure are you that there’s not a third box?”

On Thursday, Stone-Gross carefully talked more than a dozen internet service providers through the procedures they needed to follow as the attack launched. At the last minute, one key service provider backed out, fearful that it would incur Slavik’s wrath. Then, on Friday morning, Werner and Stone-Gross arrived at their office building on the banks of the Monongahela River to find that one of the operation’s partners, McAfee, had prematurely published a blog post announcing the attack on the botnet, titled “IT’S ‘GAME OVER’ FOR ZEUS AND CRYPTOLOCKER.”

After frantic calls to get the post taken down, the attack finally began. Canadian and Ukrainian authorities shut down GameOver’s command servers, knocking each offline in turn. And Werner and Stone-Gross began redirecting the zombie computers into a carefully built “sinkhole” that would absorb the nefarious traffic, blocking the Business Club’s access to its own systems. For hours, the attack went nowhere; the researchers struggled to figure out where the bugs lay in their code.

By 1 pm, their sinkhole had drawn in only about a hundred infected computers, an infinitesimal percentage of the botnet that had grown to as many as half a million machines. A line of officials stood behind Werner and Stone-Gross in a conference room, literally watching over their shoulders as the two engineers debugged their code. “Not to put any pressure on you,” Mularski urged at one point, “but it’d be great if you could get it running.”

Finally, by evening Pittsburgh time, the traffic to their sinkhole began to climb. On the other side of the world, Bogachev came online. The attack had interrupted his weekend. Perhaps he didn’t think much of it at first, given that he had easily weathered other attempts to seize control of his botnet. “Right away, he’s kicking the

tires. He doesn’t know what we’ve done,” Peterson recalls. That night, yet again, Bogachev readied for battle—wrestling for control of his network, testing it, redirecting traffic to new servers, and deciphering the Pittsburgh team’s method of attack. “It was cyber-hand-to-hand combat,” recalls Pittsburgh US attorney David Hickton. “It was amazing to watch.”

The team was able to monitor Bogachev’s communication channels without his knowledge and knock out his Turkish proxy server. Then they watched as he tried to come back online using the anonymizing service Tor, desperate to get some visibility into his losses. Finally, after hours of losing battles, Slavik went silent. The attack, it appeared, was more than he had bargained for. The Pittsburgh team powered on through the night. “He must’ve realized it was law enforcement. It wasn’t just the normal researcher attack,” Stone-Gross says.

By Sunday night, nearly 60 hours in, the Pittsburgh team knew they’d won. On Monday, June 2, the FBI and Justice Department announced the takedown and unsealed a 14-count indictment against Bogachev.

Over the coming weeks, Slavik and the researchers continued to do occasional battle—Slavik timed one counterattack for a moment when Werner and Stone-Gross were presenting at a conference in Montreal—but ultimately the duo prevailed. Amazingly, more than two years later, the success has largely stuck: The botnet has never reassembled, though about 5,000 computers worldwide remain infected with Zeus malware. The industry partners are still maintaining the server sinkhole that’s swallowing up the traffic from those infected computers.

For about a year after the attack, so-called account-takeover fraud all but disappeared in the US. Researchers and investigators had long assumed that dozens of gangs must have been responsible for the criminal onslaught that the industry endured between 2012 and 2014. But nearly all of the thefts came from just a small group of highly skilled criminals—the so-called Business Club. “You come into this and hear they’re everywhere,” Peterson says, “and actually it’s a very tiny network, and they’re much easier to disrupt than you think.”

IN 2015, the State Department put a \$3 million bounty on Bogachev’s head, the highest reward the US has ever posted for a cybercriminal. But he remains at large. According to US intelligence sources, the government does not, in fact, suspect that Bogachev took part in the Russian campaign to influence the US election. Rather, the Obama administration included him in the sanctions to put pressure on the Russian government. The hope is that the Russians might be willing to hand over Bogachev as a sign of good faith, since the botnet that made him so useful to them is defunct. Or maybe, with the added attention, someone will decide they want the \$3 million reward and tip off the FBI.

But the uncomfortable truth is that Bogachev and other Russian cybercriminals lie pretty far beyond America’s reach. The huge questions that linger over the GameOver case—like those surrounding Bogachev’s precise relationship to Russian intelligence and the full tally of his thefts, which officials can only round to the nearest \$100 million or so—foreshadow the challenges that face the analysts looking into the election hacks. Fortunately, the agents on the case have experience to draw from: The DNC breach is reportedly being investigated by the FBI’s Pittsburgh office.

In the meantime, Mularski’s squad and the cybersecurity industry have also moved on to new threats. The criminal tactics that were so novel when Bogachev helped pioneer them have now grown commonplace. The spread of ransomware is accelerating. And today’s botnets—especially Mirai, a network of infected Internet of Things devices—are even more dangerous than Bogachev’s creations.

Nobody knows what Bogachev himself might be cooking up next. Tips continue to arrive regularly in Pittsburgh regarding his whereabouts. But there are no real signs he has reemerged. At least not yet. ■

HOW
COMEDY IS CHANGING
POWER



HOW
POWER IS CHANGING
COMEDY



ARE

YOU

LAUGHIN'

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AT

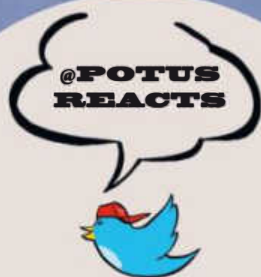
ME?

PHOTOGRAPHS BY
**DAN
WINTERS**



GEORGE CARLIN. Lenny Bruce. That dog puppet. We've always had comedians zinging truth to power. ("Suppose you were an idiot, and suppose you were a member of Congress. But I repeat myself," Mark Twain quipped in 1881.) But today it's getting hard to tell where politics ends and comedy begins. The change started with Jon Stewart and *The Daily Show*, which made even sitting presidents want in on the joke. Now we have politicians yukking it up everywhere from *The Tonight Show* and *Saturday Night Live* to Funny or Die's absurd *Between Two Ferns* (page 76). Along the way we've had comedians become politicians (hi, Al Franken) and politicians throw stand-up into their stump speeches. (Have you heard the one about the salmon? See page 72.) Comedy is now politics. Politics is comedy. And with our new president, not all of it is exactly funny. ¶ It's no coincidence this evolution has coincided with the rise of social media. The only thing that can accelerate a topic online better than outrage is humor—combine the two and you have a potent tool for reaching millions. (Hell, even protest signs—WE SHALL OVERCOMB—spawn top-10 lists.) No wonder, as the divisiveness between Americans goes supernova, the savagely shareable, politically charged burn has become our dominant lingua franca. ¶ But do the jokes, parodies, and 140-character barbs make a difference? Has comedy taken an all-new LOL-shaped role in molding public opinion, or is it just another layer reinforcing our filter bubbles? Is it challenging power or just making us smug? And, as all humor becomes political, is politics warping comedy? One thing's for sure: The

knives are out and they are sharp. Nobody wants to hear "What's the deal with cheese?" jokes anymore. Comedy today is either a weapon or a source of catharsis. ¶ Maybe we need it to be both. When we have a president who talks about Frederick Douglass as though he's still alive and uses Twitter to bully both the judiciary and Nordstrom (sad!); when we have online right-wing mobs that blur the line between irony and hate, destroying civil discourse just for the lulz; when we have a splintered left that's so bent on being offended that it manages to riot against free speech—what's not to laugh at? ¶ Inside the anger-fueled, social-media-driven world of comedy in the Trump age.



COMEDIAN AND *SUPERSTORE* WRITER OWEN ELLICKSON (@ONLXN) IMAGINES THE PRESIDENT'S RESPONSE TO THESE STORIES IN AN EPIC (FAKE!) PREDAWN TWEETSTORM.

● NISHANT CHOKSI

0 6 6

TRUMP HAIR, MAKEUP, AND WARDROBE BY AMER DUFFIN; PATTERNS BY OVERLAP/GETTY IMAGES



THE ART OF THE MUSICAL DIG

The Roots—the house band of *The Tonight Show Starring Jimmy Fallon*—are known for sneaking flyby jabs into 10-second snippets of walk-on music. We compiled the best of band-leader Questlove's cleverly subversive ditties for recent political guests.





OBAMA DID NOT MIX CULTURE & POLITICS, TRUMP DID! I HAVE BEEN CULTURE FOR MANY YEARS. POLITICS CAME LATER BUT WAS ALWAYS INSIDE OF ME.



ple I know. You're not dumb for having a pool among your friends to guess the sex of Beyoncé's twins, and you're not a genius for having a position on Betsy DeVos. You're probably just American.

I trace it back to President Obama. He was the biggest rock star we'd ever seen in modern politics, and whoever was gonna follow his act had to try to match that star power. The image of Kanye West meeting with Trump after the election was the very definition of this; the fact that our new president could find the time to meet with a *rapper* but couldn't bother getting a daily intelligence briefing told us everything we needed to know about his priorities. Trump only cared about putting on a show, and instead of my social feed being equal parts celebrity gossip and political posts, everything was all at once about Kanald.

It only seemed logical to re-create that combination on a late-night show, to bring to life how people actually consume news now. You can't just come out and make a silly topical celebrity joke anymore, and you can't just make fun of somebody's small hands or dumb hair. You need to dissect the tough subjects and find the irony in people's beliefs and misconceptions. You need to focus on creating comedy that explains not only why something is funny but why it's wrong or complicated or hypocritical. That's where the real funny comes from. Late-night hosts used to have to worry about getting political—didn't want to upset anyone, didn't want to jeopardize the ratings—but people like John Oliver have proven you can succeed with niche audiences. It's like they've got their own social feeds: If people didn't agree with them, they wouldn't be following them.

ROBIN THEDE (@robinthede) was head writer of *The Nightly Show With Larry Wilmore*.

When Kanye Met Donald

A LATE-NIGHT STORY

BY TV COMEDY WRITER
ROBIN THEDE

As politics becomes more like pop culture, comedy becomes more like social feeds.

Unlike a lot of people, I wouldn't say I'm *scared* by what's happening in the world right now. I would say that I'm *mortified*. I wake up every day to more insane news and think, "I can't wait to get back on TV." When I shot the pilot for a new late-night show at

the end of last year, I knew I wanted to focus on stories in both politics and pop culture, because there really is no separation anymore. Everything political has become pop culture, and most pop culture has a political bent to it—on Instagram, the Women's March looked like Coachella! I scroll down my timeline and it's equal parts celebrity gossip and political posts. Same with most peo-

FULL-FRONTAL ASSAULT

The team at *Full Frontal With Samantha Bee* aims to overestimate the intelligence of the American public.

Samantha Bee and her producer and writing partner at *Full Frontal*, Jo Miller, know people often watch their show as news. Comedy gives them cover, though—and freedom. They do real reporting, but unlike straight-faced media, they're not trapped by the creaky machinery of equal time, false equivalency, and sham neutrality. Bee and Miller do have two hard, fast rules: Mind your metaphors (don't fear satire, but don't depart from the truth, ever) and #dgaf (look it up).

Before the show's launch early last year, Bee and Miller spent years together at *The Daily Show*, where Bee made her name elegantly cornering interview subjects into hideous self-parody. At *Full Frontal* she and Miller have accepted their new role among the informed commentariat, committing to careful reporting, conscientious fact-checking, op-eds lighted for satire, and a ruthless conviction that their show is not for ratings, Twitter, or dumb people. (Though, for the record, their ratings usually top *The Daily Show's*.) *Full Frontal* is also the most mercilessly feminist show (ever) (in history)—and Bee has emerged as a leading voice for the galvanized left. In April she's even hosting Not the White House Correspondents' Dinner on the same night as the cringey annual date between the White House and the Fourth Estate. Playing nice with a president so contemptuous of the media is going to challenge journalists for at least the next four years. Bee and Miller have resolved to **play not-nice**.

BY
**VIRGINIA
HEFFERNAN**

RYAN PFLUGER

YOU THINK I'M GONNA MESS
EVERYTHING UP? LOOK AT YOU:
YOU'RE SO SCARED YOU'RE READING
ABOUT COMEDY IN A COMPUTERS
MAGAZINE. A MESS, YOU!



0 6 8

by Chief Keef and Soulja Boy



BEE: APOLOGIZE FOR SAYING I LIED! IF I SAID SOMETHING THAT WAS NOT TRUE, IT WAS ONLY BECAUSE I THOUGHT PEOPLE BELIEVING IT WOULD HELP ME.



JM: Beginning at *The Daily Show*, we've been doing this for a long time, staring into the abyss. You can't turn away. It's gonna be a long war. And we have to pull our head out of our American ass. This is a global shift. So it's important that we tell real stories on our show.

SB: Everything's grounded in research and journalism. We have a team of journalists working here, and a fact-checker. We care deeply about facts.

VH: *I know we want to draw a bright line between The Onion and Full Frontal on the one hand, and Infowars on the other, but where is that line?*

JM: We're not fake news. Like, *The Onion* is a fake newspaper—that's its idiom. It's a parody of a newspaper—the format of it. But on the show, we're not pretending to be a "news show."

VH: *You've also avoided the flat-out grieving, letting yourselves wallow.*

JM: I went and read a bunch of memoirs of people who lived in the '30s. Now we're reading history books. We're doing Edmund Burke, Masha Gessen. I've also read Sebastian Haffner's *Defying Hitler*. It's time to read the Federalist Papers. We're not maudlin or sentimental. We're always sincere. We're also funny. The worst moments are when you need satire the most. I think that's why everybody loves *The Onion* forever, because they came through on 9/11 ["U.S. VOWS TO DEFEAT WHOEVER IT IS WE'RE AT WAR WITH"]. You don't abdicate your function right when you're needed.

Virginia Heffernan: *Full Frontal set a hard, tart pace for political comedy in its first season—and then started regrouping, like many of us in the US, in China, and, well, on earth. When did your regrouping start?*

Samantha Bee: On election night, everybody was quietly retreating into their

clothing. Turtle-necks, curling up in beanbags, pulling sweaters up.

Jo Miller: We're gonna be wearing Slankets. *Full Frontal* Slankets. Safety Slankets for all of us.

SB: As everyone was retreating into their turtle-necks, my main response was "This is really going to change the show." This

show felt so much more permanent to me. It just got grounded. We need a bigger office. We need a full-time security guard. We need to change our layout. We need better systems.

JM: We set up trenches, like World War I. It's gonna be a long war.

VH: *This is the opposite of*

the traditional Wolf Blitzer approach: Cover the election, have no stake in it, repeat, or—

JM: Wolf Blitzer is running on Windows 95.

VH: *—SNL's approach: "Just keep laughing at everyone." I know you have fun here, but you also seem to act on principle and with purpose.*



"We don't care if anybody doesn't get our references. We don't care if it goes too fast."

SB: A lot of the sillier things I've done really predate this show. I feel like I've left that behind. The stories we're telling on our show are real. We're just wringing as much comedy out of them as humanly possible.

VH: *What about the metaphorical language you use? Trump talks in something like metaphors, where "more nukes" means "let's go, Mets" or something. When you say stuff about reproductive rights, like "They have their hands on our vaginas," is it possible that could be taken literally?*

JM: But those metaphors of theirs are nonsense. They pretend to be talking in metaphors when they're in fact lying. What Peter Thiel says about not taking Trump literally is bullshit, and it's a way of spinning the fact that Trump lied on the campaign trail repeatedly—and made promises that he could not keep, even if he had every intention of keeping them. Why are we having a serious discussion about applying their spin to cover backtracking on unfulfillable promises, and taking that as a lens through which to view comedy?

VH: *And you don't think someone with opposing politics to yours could watch the show and see—*

JM: The truth is we do the show for us. We don't care if anybody doesn't get our references. We don't care if it goes too fast. We don't care if you haven't done the homework.

SB: Do your homework later. Or not. It doesn't really matter. It sounds

ridiculous and totally disingenuous, but we're literally doing the show just for ourselves. And I think that is the key to the whole experience. That's what allows me to completely disconnect from social media. It doesn't matter to me. It's just like doing comedy in the back room of a bar.

VH: *You two report often in the red states. How are the women doing out there?*

SB: We talked to enough people whose husbands voted on their behalf. We talked to women who do interesting jobs but they're the only women within a 500-mile radius who do the jobs they do. They still never vote for women.

JM: They complain about sexism, but they still think women shouldn't be in charge because they're too emotional.

SB: My husband called the election. He also called Ivanka Trump our first female president. He's a very good predictor of things to come.

JM: See, now my stomach hurts.

VH: *Do you feel called to do this show now?*

SB: Do I feel called? No! Is that a bad answer? I feel like, Jo, we always laugh about how we're in our I-don't-give-a-fuck years, and that is key to the show's success.

JM: I think it was at 45 when I just stopped being nice at *The Daily Show*. It was like, "You're talking over me, I'm not going to stop talking. You can shut up." And, "Yeah, don't say the thing I said a minute ago."

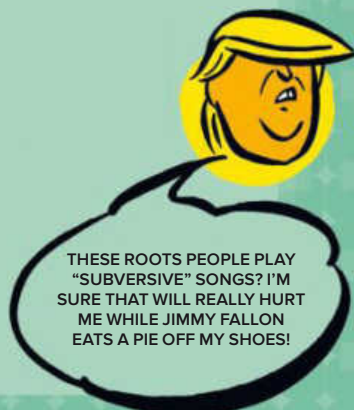
SB: It's also so fun to stop

being a people pleaser all the time. It's the greatest joy. I've been a people pleaser all my life, and there's still a remnant of that person, but it's getting smaller and smaller. It's slipping down the drain.

VH: *Tell me about this Not the White House Correspondents' Dinner. You seem to have started the exodus from that jolly DC bro roast. Now Trump's not even going. Why undermine DC's great annual tradition?*

JM: When we planned it, we figured White House correspondents were liable to spend that evening either (1) eating lima beans at home because they were blacklisted or (2) sitting there in Spanx enduring a furnace of hostility from the most powerful man in the world. So we wanted to provide a third option, while celebrating the free press on which our show—not to mention our democracy—depends. Plus we really want to party with Shep Smith and Katy Tur, because they seem fun.

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



We asked our producer Allison MacDonald to see if anyone had blamed Trump's shriveled crowd on the cold weather. Instead she was able to find Kellyanne Conway blaming it on the rain, which was even better.



VT-SOT is videotape-sound on tape—also known as a videoclip.



OTS means "over the shoulder"—it's the box with the pictures. Nobody knows what MOZ1 means.



We debated correcting these phony claims but decided it would disturb the flow of our penis metaphors. We fact-checked them later in the show.



We asked Allison to dig around for any other defenses of Trump's crowd that could also plausibly refer to penises. She found this one, and it was ... [kisses fingers like Italian chef].



You can write words on a page, but the performance matters a lot. Trevor delivered this line with particular gusto, though I can't imagine why.



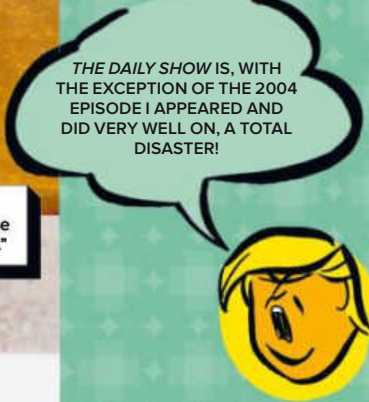
I highly doubt that Trump cares about or even believes in the female orgasm.



During our brainstorming meeting, one of our producers, Adam Lowitt, joked that Trump was defending his crowd size the way men defend their penis size. That was in our minds when I cowrote this pass with fellow writer Zach DiLanzo.

The audience caught on to the meaning here immediately. Our audience is very smart—and perverted.

Our first draft used the less subtle phrase “stand-in for his dick.”



THE DAILY SHOW IS, WITH THE EXCEPTION OF THE 2004 EPISODE I APPEARED AND DID VERY WELL ON, A TOTAL DISASTER!

THE DAILYSHOW WITH TREVOR NOAH

TREVOR NOAH: IT'S INSANE THAT DONALD TRUMP WOULD SPEND THE FIRST 24 HOURS OF HIS PRESIDENCY FIGHTING OVER SOMETHING AS INCONSEQUENTIAL AS HOW BIG HIS CROWD WAS AND HOW LONG IT STRETCHED. AND I WOULD NEVER SUGGEST THAT THE PRESIDENT OF THE UNITED STATES SEES HIS INAUGURATION CROWD AS SOME KIND OF METAPHOR FOR HIS MANHOOD, BUT THE WAY HE AND HIS DEFENDERS TALK ABOUT IT—IT'S ALMOST UNAVOIDABLE.

[TAKE: ROLL 112]

[TAKE: VT-SOT: CONWAY]

[TAKE: “AND GEORGE, I WOULD JUST SAY ABOUT CROWD SIZE. FIRST OF ALL, THERE WAS RAIN THAT -- THE DOWNPOUR THAT WAS REPORTED. AND I THINK IT DETERRED MANY PEOPLE FROM COMING.”]
{SOT}

[TAKE: OTS-MOZ1: FREEZE OF CONWAY]

SO WHAT YOU'RE SAYING IS, WHEN A PRESIDENT'S CROWD IS EXPOSED TO COLD WATER, THERE TENDS TO BE SOME SHRINKAGE.

[TAKE: ROLL 114]

[TAKE: VT-SOT: PRIEBUS]

[TAKE: WALLACE: “TAKE A LOOK AT THOSE PICTURES. ON THE LEFT, YOU'VE GOT THE OBAMA INAUGURAL CROWD. ON THE RIGHT, YOU'VE GOT THE TRUMP INAUGURAL CROWD. WHICH ONE IS BIGGER? PRIEBUS: LISTEN, YOU ARE ALSO NOT SAYING THAT THAT PICTURE WAS TAKEN BEFORE HE WAS EVEN SPEAKING.”]
{SOT}

[TAKE: OTS-MOZ1: FREEZE OF PRIEBUS]

OH, I UNDERSTAND.

TRUMP'S CROWD WAS A GROWER, NOT A SHOWER.

[TAKE: ROLL 116]

[TAKE: VT-SOT: SPICER]

[TAKE: “THIS WAS THE FIRST TIME IN OUR NATION'S HISTORY THAT FLOOR COVERINGS HAVE BEEN USED TO PROTECT THE GRASS ON THE MALL. THAT HAD THE EFFECT OF HIGHLIGHTING ANY AREAS WHERE PEOPLE WERE NOT STANDING. WHILE IN YEARS PAST, THE GRASS ELIMINATED THIS VISUAL.”]
{SOT}

[TAKE: OTS-MOZ1: FREEZE OF SPICER]

AH, THE GRASS COVERINGS. WHAT TRUMP'S PRESS SECRETARY IS SAYING IS THAT WITH SOME DIFFERENT LANDSCAPING CHOICES, THE CROWD WOULD HAVE APPEARED NOTICEABLY LARGER.

[TAKE: ROLL 118]

[TAKE: VT-SOT: AINSLEY EARTHARDT, FOX NEWS]

[TAKE: “BACK WHEN PRESIDENT OBAMA WAS BEING INAUGURATED, THAT WAS THE FIRST AFRICAN AMERICAN PRESIDENT SO OF COURSE YOU ARE GOING TO GET A BIGGER CROWD.”]
{SOT}

[TAKE: OTS-MOZ1: FREEZE OF AINSLEY]

YEAH I MEAN, I KNOW IT'S A STEREOTYPE, BUT BLACK PRESIDENTS “DO” TEND TO HAVE BIGGER CROWDS. TRUMP SHOULDN'T BE EMBARRASSED BY THAT.

[TAKE: OTS-MOZ1: WOMEN'S MARCH CROWD ON WASHINGTON MALL]

WOMEN ALL OVER THE WORLD MARCHED TOGETHER TO TELL TRUMP HOW UNSATISFIED HE'S LEFT THEM.

Classic small-penis excuse. Very difficult for other people in the locker room to disprove.

This is a joke about the president's pubes.

HOW YOUR COMEDY GETS MADE

BY

DAN AMIRA

Daily Show writer

Liberal elite

FAKE NEWS WE CAN GET BEHIND

Satirical news outlet *The Onion* takes swipes at both sides of the aisle in its doll headlines.

“Longtime Reader of Lib-Slaves.info Sick of Mainstream Bias on Sites Like WideAwakePatriot.com”

“Area Liberal No Longer Recognizes Fanciful, Wildly Inaccurate Mental Picture of Country He Lives In”

“Nothing Would Surprise Me at This Point,” Says Man Who Will Be Shocked by Eight Separate News Items Today”

“Trump Gives Intelligence Agencies Their Daily Briefing”

“Paul Ryan Grudgingly Impressed by Angry Protester Who's Matched His Running Pace For 9 Miles”

“Journalist Wondering Where to Mention Getting Yelled at by US President in Article”

“Trump Insists That Now, More Than Ever, Americans Must Stand Strong in Face of Empathy”

“Nation Throws Off Tyrannical Yoke of Moderate Respect for Women”

LIBERAL ← → CONSERVATIVE

AT THE DAILY SHOW, we seek to hold those in power accountable for their hypocrisy, dishonesty, and, of late, their poor grasp of basic grammar. More important than any of that, of course, is the comedy. The sweet spot is when our jokes add context to a larger issue—as on January 23, when we explored the president's pathological self-consciousness through the timeless magic of dick jokes.

MARIA LOKKE





CARRY A BIG SEITZ

CONFESSIONS OF A PRESIDENTIAL JOKE WRITER

Jon Lovett was a speech—and joke—writer for Hillary Clinton and Barack Obama. He's now part of the team behind Crooked Media, a political-content startup that launched its first podcast, *Pod Save America*, after the election. Lovett quickly became *Pod*'s breakout star, injecting rapid-fire critiques of Trumpland with humor. He told WIRED editor Maria Streshinsky about smoked salmon and the wisdom of Kellyanne Conway.

072



WHENEVER YOU'RE TALKING about using humor in politics or in a policy speech or in a serious moment, you're talking about using it as a tool to engage people. That's why putting a joke in a political speech is a luxury, and it is always a risk. A boring speech can be just a boring speech. But a speech with a joke that falls flat is awful. I hate it. That's why I think it's easier to hate a comedy. If a drama doesn't land, it's boring; if a joke doesn't land—you hate that.



WHEN A JOKE WORKS, it works. It can make a point in a really simple way; it can be a great

little sound bite to put on television or share on social media. Humor has this incredible power in how we communicate about politics now, in part because there's something natural in the way it's communicated. The audience shares context, and we share frustration. The same things that are silly to you are silly to me. I think that's why jokes are so effective, and that's why it hurts when they don't land, because it hurts to discover that two people don't find the same thing funny, because it means in some way they don't share the same sense of the world.

One thing lots of people have noticed that is troubling to the core: We've never seen Donald Trump laugh. What's that about?



IN THIS ONE State of the Union speech, we were talking about simplifying the government. Obama was talking about how complicated wildlife management could be. He said there is one department that handles the salmon in the freshwater, and another department handles them when they are in salt water. Then we added this joke—please brace yourself: “And I hear it gets more com-

plicated once they're smoked.”

Congress chuckled. There was a pause. Some light laughter, but the next day NPR looked at how the speech was portrayed in news headlines. They included the words *jobs, economy, future, America, together*—the classic words in a State of the Union. Then they asked people to say what they remembered and did a word cloud. The result was just a giant salmon in the center of the diagram. You would have thought that the president gave a State of the Union about salmon policy with some light references to education and war.



I DON'T WANT TO draw too many sweeping conclusions, but there is nothing wrong with sharing moments with like-minded people about how ridiculous and morally reprehensible the opposition is behaving. Shows like *Full Frontal* are awesome, they do good work. They give people relief in a crazy time—they reinforce for the people watching that things are absurd.

Blaming these shows for anything, which some people do sometimes, is ridiculous.



I'LL GIVE "LOVETT" THIS: HE'S RIGHT, HILLARY SHOULD'VE EXPLAINED HOW I WOULD HURT AMERICANS. I WENT INTO BIG DETAIL ABOUT HOW I WOULD DO IT!

The idea that there are people out there who would have gone and marched on Washington but instead stayed home to watch John Oliver—it's just so stupid. Give me a break.



WHAT WE CAN'T forget, though, is that there are millions of people who aren't watching those same comedians, and our shorthand isn't necessarily the shorthand of people outside of this liberal consensus and culture.



ONE OF THE PITFALLS that happened with the Clinton campaign, and Democrats in general, is that it wasn't enough to acknowledge that what Donald Trump was doing was reprehensible: the way he talked about women, his critiques of Muslims, his conflicts of interest, his total disregard for the truth, his vulgarity, his disrespect for America as a society. Acknowledging it was step one. Step two is: And this is how it's going to actually make your life worse.

Everything now has to be about step two. Kellyanne Conway is one of the most dishonest humans ever to grace the office she holds. But, and it's hard for me to admit it, she has the simplest and smartest explanation for what we are talking about, which is: There is a difference between what offends you and what affects you. She is behaving terribly, but you know what, a broken clock is still right twice a day and all that.



WE CAN LAUGH and we can make fun and we can fight and we can do it through jokes and through comedy, but it has to be about more than why people are reprehensible. It has to be more than the absurdity. It has to go that next step and tell people how this is actually going to damage people's lives.

We don't have a time machine to fix our problems. (At least I'm pretty sure we don't have a time machine. If we did, we'd be using it to fix some problems right now. Send Comey an Edible Arrangement.) It's hard not to be hyperbolic. We have to use every tool available, and comedy is one of them.

JON LOVETT (@jonlovett) hosts *Pod Save America* with a gaggle of former Obama staffers.



WITH **CHONDA PIERCE**

THE QUEEN OF CLEAN CLAPS BACK

Political correctness has been quashed, thanks to Trump. Now politicians and comedians alike are facing the aftermath in the form of vocal, quick-to-call-bullshit voters and fans. Conservative Chonda Pierce—the profanity-free comic who performed at Trump's inaugural ball—learned this firsthand: If you want to mock snowflake liberals, you have to be able to take it when a stranger tells you to (praise Jesus) f-off. —LAUREN MURROW

How did you become the Queen of Clean?

Some comics had to fight their way through open mic nights and smoky comedy clubs; I had to endure a couple of tall-haired, self-righteous Christians who told me I was going to hell. We all paid our dues—I just had to do it without alcohol.

Is it tough to get conservatives laughing?

If it's a crowd that supports Trump, I'll be all right. I don't get as many hecklers as emails telling me I'm going to hell. I live in a tiny town outside Nashville. I was just in Walmart and a stranger said, "Are you that girl from the inauguration?" I said, yes, I am. And he said f-you and walked off. Sometimes I'd rather just get heckled.

Do you draw a lot of material from politics?
Absolutely. When Donald

Trump got into the race, every comedian out there should have sent him flowers. You don't even have to write anything, you just repeat what you heard on the news.

Is it uncomfortable to make fun of the person you voted for?

If someone asks me how I voted, I'll tell 'em, and it's not always popular. But honesty goes a long way. I get frustrated—everyone wants to be so dog-gone politically correct.

Is that a problem in comedy?

Some artists will have something disparaging to say about Trump, and I wanna go: The very thing you're complaining about is the fuel of what we do.

Who are the comedians you admire?

Oh man, I love Ellen DeGeneres. And I like Amy Schumer; I just wish she didn't talk so much about what happens in her bedroom. But maybe I'm just jealous—let's be honest, she seems to get a lot of action that I've never gotten.

Is it harder to tell a clean joke than a dirty joke?

Sometimes you have to be more clever. But believe me, I still shock the Bible Belt. Actually, they're really fun people to shock. All you have to do is talk about sex or dancing and they're all appalled.

Has the political discord been draining on your sense of humor?

You know, when I first hit menopause, I was like—praise Jesus!—I've got great material now. Five years later, I'm pretty sick of talking about menopause and I'd like to get out of it. It's the same with political humor.

How did your set go at the inaugural ball?

When a crowd gets nervous when you're talking about your Spanx, you can tell they're really conservative. Trump's team said they didn't want anybody picked on except for Donald Trump. So I told a joke about how when Donald makes it to heaven, Moses will stand there and part his hair.

Did anything funny come out of the experience?

On Friday night I was like Cinderella at the Jesus ball. Saturday morning, I stepped into a sea of protesters wearing vagina hats. It was surreal.

CHONDA PIERCE
(@chondapierce) is an Emmy-nominated comedian and author.

LIBERALS GIVE CHONDA PIERCE A HARD TIME BECAUSE SHE VOTED FOR ME? IMAGINE HOW THEY ARE WITH ME, WHO IS ME!





GRAB
ME!

Who counts as a real American has emerged as a flash point in the debate over what makes America great. For an Iranian American comic, that means mixing patriotism with punch lines.

JOINTLY WITH NEGIN FARSAD

BY STAND-UP COMIC
NEGIN FARSAD

THERE'S AN unwritten rule in the world of comedy: If you are a person of color, if you have a disability, if your nose is too ethnic, you have to call yourself out when you walk on that stage. You have to be self-aware that *you* know, that *they* know, that your face is weird-looking. Explain your face!

I often walk onstage and say, "I'm an Iranian American Muslim female, like all of you," emphasis on *American*. It's "funny" because there are

never Iranian Americans in the audience. And chances are, the only Iranian Muslims the audience knows anything about are (a) violent terrorists on TV or (b) violent terrorists that many alt-right types, and some regular-right types, like to fantasize about. President Trump, painting with his own gorgeous brush, recently referred to those affected by his travel ban as "bad people," "bad dudes," and, um, "evil."

With my simple introduction, I'm identifying the (brown) elephant in the room. I'm deducting points from the "Muslims Are Evil" column and adding them to the "Muslims Are Funny" column. And I'm establishing a baseline for American patriotism. Then, throughout my set, regardless of what I'm talking about, I'm engaging in a political act. If I do jokes about my mother, who was born in Iran, it's seen as political. It doesn't matter if my mom joke is about the way she keeps me abreast of Brangelina's postdivorce life-building—any Iranian accent on any American stage is political. But beyond making people laugh, I'm trying to prove to the audience that my Iranian mom is just as ridiculous as any American mom.

For comedians of color, disabled comedians, and all the "other" comedians who don't figure neatly into the plan to MAKE AMERICA GREAT AGAIN—we have to first prove our patriotism, and then we can proceed with the jokes. This may sound like a burden, but it isn't. We get to play our very small part in redefining what it means to be American. And with their laughter, the audience affirms it. The audience becomes the public, retabulating their "Muslims Are ..." spreadsheets, one gig at a time. Yes, you're laughing at a Muslim woman. But you're also laughing at a patriot.

NEGIN FARSAD (@neginfarsad) is the author of *How to Make White People Laugh*.

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10 TIMES TRUMP WAS ACTUALLY FUNNY



1. "My biggest opponent was the microphone." —OCT 3, 2016, after debating Hillary Clinton
2. "I want to just pray for Arnold, if we can, for those [New Celebrity Apprentice] ratings." —FEB 2, 2017, at the National Prayer Breakfast
3. "I have this thing called Twitter and Facebook, which is amazing actually. It's like owning *The New York Times* without the losses." —SEP 24, 2015, on *Morning Joe*
4. "Let me start with Little Marco. He just looked like Little Marco to me. And it's not Little. It's L-I-D-D-L-E." —MARCH 2016, to *New York* magazine about Marco Rubio
5. "Most of the people standing behind me will not be able to go to work ... So you have one last chance to get out." —JAN 28, 2017, after extending an executive order limiting officials' lobbying after they leave government
6. "We're going to get rid of [the Johnson Amendment] so fast ... I figure it's the only way I'm getting to heaven." —SEP 9, 2016, on a law that bans tax-exempt churches from donating money to political candidates
7. "He's become more famous than me." —JAN 22, 2017, on FBI director James Comey
8. "It used to be cars were made in Flint and you couldn't drink the water in Mexico. Now cars are made in Mexico and you can't drink the water in Flint." —SEP 15, 2016, at the Economic Club of New York
9. "Maybe she fainted at how good-looking I am." —JAN 27, 2016, after a woman collapsed at a rally in Gilbert, South Carolina
10. "What can look so beautiful at 30? An airplane." —FEB 17, 2017, of Air Force One



UPDATE

HAD A VERY NICE CALL WITH @WIRED ED NICK THOMPSON. TOLD HIM I WOULD GUEST-EDIT AND FIX. SUBSCRIPTIONS WILL GO THROUGH THE ROOF!

BY
**BRIAN
RAFTERY**

PHOTOGRAPH BY
**DAN
WINTERS**



COMEDY

**How three
guys and a
half-baked
idea changed
online humor
forever.
Funny or Die
at 10, an oral
history.**

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“THE LANDLORD” WAS MORE

than Funny or Die’s first video; it was a comedy revolution. When it went live on April 12, 2007, the short sketch—which pitted Will Ferrell against a swearing, rent-seeking toddler—made the site’s premise so simple even a 2-year-old could understand it: A user submitted a homemade comedy video, and the audience could vote to banish it or send it to the homepage. And while a handful of other comedy shorts would wind up on FunnyorDie.com that same day, it was “The Landlord” that best captured the site’s frills-free philosophy. ¶ “The spirit of it was ‘Let’s just screw around,’” recalls Adam McKay, the onetime *SNL* head writer who cofounded the site with Ferrell and writer-producer Chris Henchy (*The Campaign*). “Maybe it would be a little comedy clubhouse, where people like Zach Galifianakis and Paul Rudd will want to do stuff.” ¶ Ten years later, that clubhouse is a mini empire encompassing TV shows (*Billy on the Street*, *@midnight*), movies (*Donald Trump’s The Art of the Deal: The Movie*, starring Johnny Depp), advertising for clients like Under Armour and Kia, and a recently established Washington, DC, office trying to shape public policy. In fact, with the political-satirical complex more crowded than ever, Funny or Die’s spoof-to-power approach has become even more urgent. As the site enters the age of Trump, we asked its founders and fans to reveal the smashes, near crashes, and highfalutin fart jokes that helped it become one of the sharpest, funniest forces in

POP CULTURE.

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PART
ONE
THE LANDLORDS

By 2007, streaming technology was beginning to captivate investors and audiences. While several sites vied for attention, the big player was YouTube. It had launched in 2005 with help from Silicon Valley VC firm Sequoia Capital and—thanks to early viral hits like Saturday Night Live’s digital short “Lazy Sunday”—would soon be getting 100 million streams a day.

Mark Kvamme (partner, Sequoia Capital, 1990–2012)

My son was a fledgling comic at the time, and he said to me, “I can’t find anything funny on YouTube. They should have a thing like Hot or Not, where there’s a voting system.” And it just so happened that about a week later, I had a meeting down at CAA.

Michael Yanover (head of business development, CAA)

I said to Mark, “YouTube is entertaining, but in an amateurish way, like *America’s Funniest Home Videos*. Isn’t there room in the marketplace for more professional video?” As we were thinking on it, Will Ferrell—who was a client of CAA—was putting together a company, Gary Sanchez Productions, with Adam McKay and Chris Henchy. We met with them in a trailer on the *Blades of Glory* set to pitch this idea of a comedy-video site.

Adam McKay (cofounder; director of *Anchorman*)

We were just like, “Whatever.” We remembered the first dot-com crash from the early 2000s, and we were super-dubious.

Will Ferrell (cofounder)

We really weren’t convinced that the internet could be a destination for short-form comedy.

Adam McKay

We did kind of miss doing sketches the way we used to do at *SNL*. Our manager was the guy who pushed us: “If you treat it as pure fun, this could be really cool for you guys.” And we liked the idea that anyone could put sketches up.

Will Ferrell

Eventually the financiers needed an answer, and we felt like we had nothing to lose.

Adam McKay

My daughter Pearl was going through the stage some kids do where they’ll repeat anything you say. I had a buddy, Drew Antzis, who liked to film stuff, so I called him up: “Can you come by to Will’s guesthouse?” He showed up with his camera and we shot it in like 40 minutes, no exaggeration.

Drew Antzis (editor/director/producer)

I think it was after Will’s son’s birthday party, and I think there was a little bit of sugar involved, so it was pretty energetic.

Will Ferrell

I just tried to have an honest conversation with her—as honest as one can have with a belligerent 2-year-old landlord.

Michael Yanover

We said, we should send videos to 10 friends with a link. And that’s it. That’s the marketing plan.

Chris Henchy (cofounder)

I was in New York when we put “The Landlord” up. It had about 100 views when I went to lunch, and when I came back it had 60,000 views.

Lauren Palmigiano (writer/director/producer)

It was the perfect storm of cursing baby and celebrity and the internet. I remember McKay was like, “We’re going to be rich!”

Adam McKay

Within a week, *The Ellen DeGeneres Show* wanted Pearl on the show. Jackie Chan was doing some movie and they wanted Pearl to be in it. My wife was so pissed at me. [*Laughs.*] We said no to all of it.

Mark Kvamme

For the launch, my son put up a video that got something like 300,000 views—him doing stand-up as a teenager, telling a dolphin joke. The following week, when the media picked it up, we were serving about 20,000 video plays a second. It’s a miracle the site didn’t crash, except for a few hours later in the week. We soon went from one server to 100 servers.

Adam McKay

People were uploading stuff, and a lot of it was just junk, but some of it would actually be kind of surprisingly good. There was a hunger for this stuff.

Kristen Bell (*The Good Place*; early *Funny or Die* star)

There was something so inspiring about it: “Fuck all that. Let’s just grab a camera and do it.”

Though hardly a rough-and-tumble operation—not many startups get backers as big as Sequoia and CAA—Funny or Die did spend its earliest years in a series of glamour-free bungalows in Hollywood, with a small staff and an ever-growing team of work-for-hire comedians, many of whom had

gotten their start at the Upright Citizens Brigade theaters in New York and Los Angeles. Thanks to the success of “The Landlord,” which today has 85 million views, Funny or Die was able to lure in stars like Eva Longoria, Don Cheadle, and Justin Bieber to appear in videos.

Owen Burke (writer/director/producer)

Nothing was established about what to make or how.

Jon Hamm (*Mad Men*; early Funny or Die star)

We shot in “the Shed,” this shitty little garage on a side street in deepest, grossest Hollywood.

Lauren Palmigiano

Over time, we had to get a little more organized. When Mike Farah came on, he gave us some Hollywood know-how.

Mike Farah (producer, current CEO)

I’d been working at a production company, and my job ended during the 2007–2008 writer’s strike. I’d met a lot of comedians at UCB, and I started producing short-form comedy videos, because there were no other jobs available. You had the strike, you had digital filmmaking cheaper and easier to access, and you had YouTube.

Dick Glover (CEO of Funny or Die, 2008–2015)

At the time, the mission wasn’t just Funny or Die, it was a model: user-generated content, plus a voting mechanism, plus celebrity shareholders who were vested in its growth. We were going to try to put that chemistry together with other topics.

Within a year, with comedy videos bringing in eight-figure view counts, the company launched noncomedy sites like Tony Hawk’s Shred or Die and Tom Colicchio’s Eat, Drink, or Die, hoping that FoD’s formula of big names + good videos +

crowdsourced content = gold could work in other arenas. But not everything stuck.

Adam McKay

We weren’t wild about all the other sites. They were saying, “No, no, this can work,” and when they put them in place, I was like, “No. There’s no appetite for this.” I think everyone kind of realized that we’d extended the company too far.

Dick Glover

The fall of 2008 hit. Sequoia Capital called a mandatory meeting. They put up a slide of a tombstone that said RIP: GOOD TIMES. Then they gave a presentation about how horrible the economy was. I went, “Holy fuck.” We cut 30 or 40 percent of the cost out of the company and decided to focus on the one thing we were really good at: comedy.

PART
TWO
THE POLITICS OF PARIS

In August 2008, just as the economy was cratering, FoD produced a last-minute sketch that would land headlines around the world—and solidify the company’s rep as the place for celebs willing to make a statement.

Jake Syzmanski (director)

John McCain had used an image of Paris Hilton in one of his campaign ads, implying Obama only cares about celebrity. And McKay had a great idea: “We need Paris Hilton to respond with her own campaign ad.”

Adam McKay

I was in my car—I think I was going to see my shrink—when I heard about the ad. I wrote the script really fast, and the next day Jake flew to meet Paris.

Paris Hilton

I thought the writing was hilarious. We filmed it in my parents’ backyard—I remember trying to pick the perfect swimsuit—and did it in two takes. Everyone was impressed with my memorization skills.

Jake Syzmanski

The whole shoot took less than 45 minutes. I edited it on the plane and put it on the website the next morning. Paris, by the way, was very nice. She made me a turkey sandwich.

**“ONE TIME KATIE COURIC
WAS DOING A STORY ABOUT
US AND SHE ASKED, ‘WHAT
ARE YOU DOING HERE?’
I SAID, ‘I’M PHOTOSHOPPING
TRON HELMETS ONTO THESE
FRAGGLES.’ SHE DIDN’T
SEEM TO UNDERSTAND.”**

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Andrew Steele (creative director)

The Paris Hilton video is a crystallization of a kind of sensibility that I think was very much Funny or Die in the beginning: “Let’s do relevant topical comedy and see if we can find people interested in helping us make that in the Hollywood world.”

Jon Hamm

There was no upside to doing it back then—it’s not like your manager was saying, “Oh, you should get on Funny or Die.”

Mike Farah

No one else was making these kinds of videos. This was before Jimmy Fallon had “Lip Sync Battle” and before James Corden had “Carpool Karaoke.”

Lauren Palmigiano

I was in the meeting where we pitched Marion Cotillard, and there were about 30 ideas, including something called “Forehead Tittas.” And I remember on her way out, she was like, “I really like ze fart and ze ‘Forehead Tittas’ idea. I want to do something fun.” She wanted boobs on her head.

Dashiell Driscoll (writer)

The first time Jeff Goldblum came in for a meeting, we all just hung out for what felt like 90 minutes. He talked extensively about his robe collection.

Jennie Pierson (writer/performer)

At the beginning, there was a lot more weird stuff: “OK, what do we all find funny?” We did a video in 2010 called “Sense of Smell” about a war veteran, played by Bryan Cranston, who goes on this big monologue about how he has no sense of smell, but now his sense of taste is heightened, so he’s been tasting all of our farts. He was doing this monologue with all these euphemisms for farting, and he came up with “Famous Anus cookies.” He improvised that. Also, he bought everybody ice cream from the ice cream truck that was passing by.

Scott Gairdner (writer/producer/director)

One time Katie Couric was doing a story about Funny or Die. She interviewed me and asked, “What are you doing here?” My reply was, “I’m Photo-shopping Tron helmets onto these Fraggles,” which is what I was literally doing at that moment. She didn’t seem to understand what that meant.

Though headline-driven videos kept Funny or Die in the news—and helped usher us into an age of DIY-friendly celebrities—the site had also become a hub for oddball experimental sketches, both from the site’s creative teams and from users worldwide vying for attention from Funny or Die’s now huge audience. Out of that deluge came some surprising successes—and some new comedy stars.

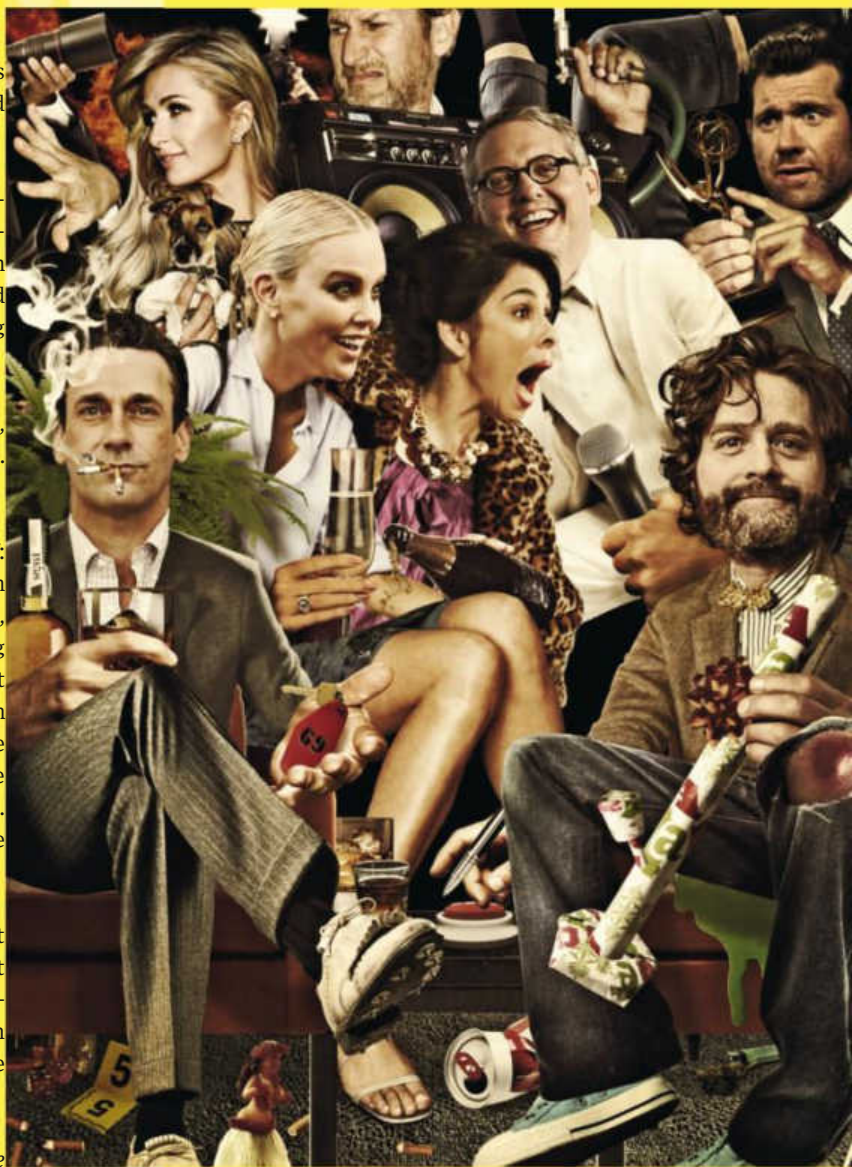
Billy Eichner (creator, *Billy on the Street*)

In the mid-’00s, I was making man-on-the-street

videos as segments for a live variety show that I was doing in New York. Funny or Die got in touch with me and said, “Hey, we like these videos, do you mind if we put them on our homepage?” At that time, if you were someone like me, one of your goals was to get on the Funny or Die homepage—that was big.

Derek Waters (creator, *Drunk History*)

I started *Drunk History* in 2007 on my own YouTube page, just for fun. And then—I don’t know how to politely say what happened—but Funny or Die would just post it as well. When I



started working with them, the cast and budget went up a bit—I definitely don’t think I would have gotten Will Ferrell or John C. Reilly on my own—but I still wanted the show to feel home-made and not all of a sudden so well produced that it took the comedy out of it. So it was great that Funny or Die didn’t have a big budget. [Laughs.]

Billy Eichner

Eventually, Mike Farah set me up with a small production company to make a 10-minute version of how *Billy on the Street* would work. We got five pilot offers.

PART
THREE
 A FERNIN' SENSATION



*On January 4, 2008, Funny or Die premiered the first installment of *Between Two Ferns*, a talk-show-slash-awkward-confrontation hosted by Zach Galifianakis. The comedian, who would become a household name the following year with *The Hangover*, spent much of the next decade prodding and cajoling A-listers like Brad Pitt, Charlize Theron, and even the 44th president of the United States.*

Zach Galifianakis (host, *Between Two Ferns*)

I've always had this fantasy of subverting the very fake celebrity interview, because I had a very eye-rollingly attitude toward Hollywood in the first place. I had a talk show [VH1's *Late World With Zach*], but I never quite got to do with it what I wanted. I was fantasizing about doing it again, and the context of a cable access show made sense.

Scott Aukerman (executive producer, *Between Two Ferns*)

We shot the first episode with Michael Cera for a sketch show I was filming, in the basement of where my office was. We reached out to one of our friends who was a producer at Funny or Die and said, "Hey, do you mind if we put up this video?" We didn't even know how it worked.

Jon Hamm (two-time *Ferns* guest)

If you look at the old comment sections, a lot of people didn't realize the person was in on the joke. They were like, "Look at that dumb actor who's getting punked by Zach."

Zach Galifianakis

There's a part of me that gets giddy inside when I know there's a question that—even though guests know what they're in for—still can be offensive.

Scott Aukerman

We filmed Bruce Willis back-to-back with Sean Penn; that was a very, very long day. Zach really wanted to do it in character as his "brother," Seth Galifianakis, so he had to shave his beard right after Bruce Willis and keep the mustache.

"Seth Galifianakis" (to Sean Penn, in a 2010 episode)

This country boy right here is not really intimidated; I'll follow you home tonight.

Sean Penn (to “Seth Galifianakis”)

I’ll knock you the fuck out right in your chair.

Zach Galifianakis

You don’t always know how much you can get away with. [Laughs.] I thought Sean was really mad. But I think we went and got a snack afterward. And the guests have all been really ecstatically fun. I don’t like to talk about behind-the-scenes stuff, but there are some really odd pieces of history that I have from a couple of shoots. One of them is a piece of underwear. I won’t go into details.

In 2014, Ferns landed its first political guest when President Obama made an appearance to promote the Affordable Care Act. Hillary Clinton would follow two years later.

Brad Jenkins (executive producer, DC office)

I was working at the White House in Valerie Jarrett’s office. When the HealthCare.gov website went down in late 2013, it took two months to fix. While the site was down, our team was trying to figure out, “How are we going to reintroduce this to the public?” And Funny or Die had this very unique history. There was no other company that we could really point to that had those sort of political-impact videos and that also had this massive distribution network.

Zach Galifianakis

I think it’s weird that politicians have to go on *Between Two Ferns*. It’s a sad state.

Scott Aukerman

Before filming Obama, someone broke a glass teleprompter. It shattered all over this room of the White House, and the president was on his way. His people were like, “What have we got ourselves into?”

Brad Jenkins

The Obama video, in many ways, helped save the first year of enrollment for Obamacare. Before that video launched, I wouldn’t call the White House risk-averse, but I think that they played it safe—the most controversial thing the president was willing to do was maybe go on a late-night talk show.

Zach Galifianakis

You have to be open to making fun of yourself—which, in the long run, can be very endearing. With the Hillary one, there was one bit we had to edit out because it was too long: I was like, “Oh, we have a faxed question from one of our viewers.” So Hillary Clinton had to wait for this long fax question to come through. And there was just the noise of the fax machine while I was trying to make small talk with her. That was probably the happiest I’ve been performing in a long time. It gives me joy when those two worlds can kind of dance with each other.

PART FOUR THE FUTURE OF FUNNY

In the past two years, Funny or Die has experienced both expansions and contractions: In 2015 it opened a Washington, DC, office, creating videos for everyone from small think tanks and nonprofits to then-vice president Joe Biden. A year later, however, FoD laid off 30 percent of its employees and in early 2017 relocated its New York staffers to Los Angeles. It’s the latest move for a company that has been forced to adjust to an increasingly scattered media landscape, and which will now have to figure out how to keep viewers entertained—or simply keep viewers—during the attention-dividing Trump years.

Mike Farah

Before the layoffs, we had a lot of talented people, but we were stretched thin. We needed to focus on what we could do that no one else could. We had to get our sense of urgency back.

Adam McKay

When the site was founded, everyone just thought “TV and movies.” And then it became “TV, movies, the internet.” And eventually, it kind of became anything, you know? There are screens at gas stations. Everything really splintered.

Will Ferrell

I think we simply need to get back to creating funny and topical stuff that forces people to say, “Did you see the piece that Funny or Die did?” We need to focus on the blocking and tackling, if you will, of what led to the success of the site in the first place.

Brad Jenkins

When we thought about this DC office, people asked, “Well, are you going to do Republican videos too?” I’m willing to take a meeting with anyone—we’re not opposed to someone just because they wear a red tie or a blue tie. Our job is to be funny.

Adam McKay

I’m going to start writing pieces again—it’ll be more involvement than I’ve had in a little while with the site. The novelty is gone from the celebrity thing, which is actually a healthy development. So now we’re just making us a little leaner and meaner so we can react to news stories as they break.

Owen Burke

Sometimes you need a celebrity for that, sometimes you don’t.

Adam McKay

Trump’s presidency is the biggest event in our lifetime. There’s going to be a massive amount of cartoonish absurdity with this next four years. **W**

by
Eric
Reidy



photo-
graphs
by
Gianni
Cipriano



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Where Is My Brother?

AS MILLIONS OF
REFUGEES FLEE
CONFLICT ZONES,
THOUSANDS
DISAPPEAR—
INTO NEW LIVES
OR INTO THE
MEDITERRANEAN
SEA. FOR THEIR
FAMILIES,
SOCIAL MEDIA
CAN BE THE ONLY
WAY TO LOCATE
THE VANISHED
AND IDENTIFY
THE DEAD.

As the rickety blue

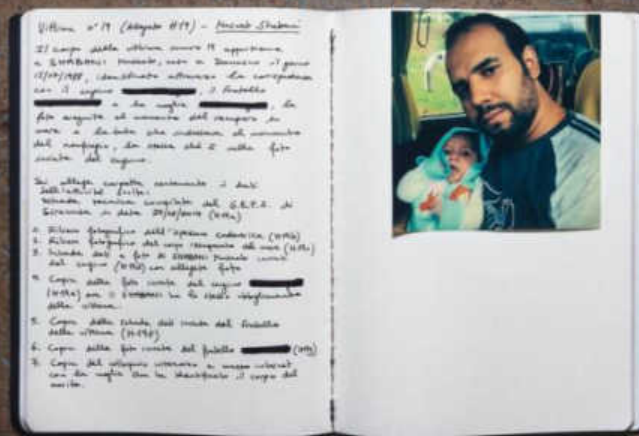
fishing boat started to take on water, the panic set in.

Musaab Shabani was standing on the deck of the 50-foot vessel, squeezed in tight among hundreds of other desperate people. Most were Syrians, like him. Above them, the roof overflowed with passengers. Below them, the people crammed into the storage hold clamored to scoop up buckets of incoming water and pass them above deck to be dumped overboard.

Earlier in the day, the engine of the trawler had given out while in the territorial waters off the coast of Libya. The smugglers responsible for the journey sent another boat with a crew, but instead of pulling the struggling vessel back to shore where the engine could be fixed, they tugged it into international waters. Fortunately, a passing merchant ship alerted the Italian Maritime Rescue Coordination Center in Rome, which dispatched three government ships to help. They also sent a helicopter to monitor the situation until the boats could arrive. But at the first sight of the chopper, the smugglers cut the tow-

line, turned back to Libya, and left the fishing boat and its hundreds of passengers to drift at sea.

In the hours it took for the government to arrive, the wind picked up and water continued seeping in through the trawler's aged wood hull. When the Italian rescuers showed up, the passengers forced their way toward the edge of their boat, their arms outstretched for life jackets or helping hands. This sudden movement caused the boat to angle sharply and almost tip over in the rolling waves. Terrified, some passengers pushed toward the opposite



Above: A photo of Musaab Shabani and his son next to a report from the investigation into Musaab's disappearance.

side, sending the vessel careening in the other direction. For a moment, the boat seemed to freeze on edge in the gathering dusk. And then, at 7:58 pm on August 24, 2014, it flipped. In one violent motion, the smooth hull turned skyward, pointing the stalled propeller uselessly into the air. Musaab was thrown into the sea.

At the time he was 26 years old, with jet-black hair, a receding hairline, and a dark stubbly beard on his round cheeks. In Damascus, where he lived before the civil war, he had worked as a self-taught computer technician, the neighborhood IT guy who could help with a system crash. In the summer, he used to rent a car with his

friends and younger brother, Abd, and make the four-hour drive to the coastal province of Latakia to lounge on the beaches and swim in the blue Mediterranean waters.

But that was a distant memory. The uprising against Syrian president Bashar al-Assad began in 2011, and a little over a year later, Musaab and Abd were arrested under suspicion of supporting the opposition. Abd says they were tortured both physically and psychologically, and after a month and a half in captivity they were cleared and released. They fled to Gaziantep, just across the Turkish border, and sought to build some semblance of a normal life. Musaab worked briefly at a radio station that supported the Syrian opposition. When that fell through, he and Abd moved on to Istanbul, where he found a job at a garment factory. It went bankrupt and closed within a year. His new life wasn't all darkness—he married and had a son—but he couldn't seem to get his bearings.

Meanwhile, tens of thousands of people had been fleeing Syria to Libya, where they would pay a smuggler somewhere between \$500 and \$2,000 for a spot on a boat that would carry them on an illicit journey to southern Italy. From there, most people continued north to other European countries, like Germany and Sweden, with stronger economies and better support systems for asylum seekers. Musaab knew people who had already made the journey, and he decided to follow them.

The plan was for Musaab to go first, and later, once he was given status as a refugee, his wife and son would join him through the United Nations' family reunification program. In early August 2014, he boarded a flight to Algeria (which, at the time, was still granting visas on arrival to Syrians with passports); from there smugglers helped him sneak across the Tunisian desert and into Libya, where he headed to Zuwara, a city known to be the starting point for clandestine crossings to Italy. The smugglers Musaab paid to make arrangements for the trip to Europe promised there would be life jackets. They also promised that there would be no more than 150 people on the boat.

When Musaab reached the beach the night the boat was leaving, he found it packed with more than 500 men, women,

and children—and no life jackets to be seen. A handful of people tried to back out. This was not what they had agreed to. But the smugglers were armed and threatened to kill anyone who didn't get on board.

That was how Musaab's voyage began, and it ended as he tumbled into the sea with hundreds of other passengers frantically clawing the water to stay afloat, their arms and legs and bodies tangling together. Italian rescuers pulled 24 dead bodies from the water that day, along with 352 survivors. The remaining hundred-some passengers were unaccounted for. Within days, Abd heard that a cousin who was also on the boat had gotten in touch with his relatives. The cousin had been on the deck, like Musaab, but they were separated in all of the chaos. After the boat flipped, the cousin lost track of Musaab and couldn't find him among the survivors in Italy. Rumors swirled among refugees that some of the passengers were being detained by Italian authorities. Maybe Musaab was with them, or his cousin had somehow overlooked him in the confusion following the wreck. Nobody knew. Like thousands of others who have fled their homes over the past two years and joined the greatest mass migration in human history, Musaab had gone missing.

At
58
years
old,

Angelo Milazzo is nearly bald, with closely cropped gray hair on the sides of his head, a strong nose, and brown eyes crowned with bushy salt-and-pepper eyebrows. He has been a police inspector in the southeastern Sicilian province of Siracusa for 22 years. When we met in September, he sat behind a bare metal desk, one of four in a cramped office in Siracusa's Palazzo di Giustizia. While talking about his work, he was meticulous, showing an investigator's obsession with detail. It animated him. And, over the course of the evening, his desk began overflowing with files filled with documents he wanted to show me. He would shuffle through them, pulling out pieces of paper and photographs, tapping them with a finger to illustrate a point.

Back in 2014, he was working with the Interagency Task Force for Combating Ille-

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gal Migration (GICIC, by its Italian acronym). Italy is a main European gateway for refugees from the Middle East and Africa. Nearly half a million people have fled to the country since 2014—and more than 10,000 of them died crossing the Mediterranean, the vast majority of whom remain unidentified. The main mission of Milazzo's unit is to investigate the clandestine movement of people across the Mediterranean and to arrest the smugglers who make it possible. When a boat carrying refugees arrives safely, GICIC investigators are often at the scene to interview passengers in the hope of identifying the smugglers. When a ship sinks, they're charged with identifying the bodies.

The government response to the August 24 shipwreck was in many ways typical of the Italian system. It took nearly two days for the navy vessels carrying the survivors and the dead to reach Siracusa. The ships had no refrigeration units, so the corpses were left in mortuary bags on deck. The rescuers photographed the bodies before sealing them up, which is a good thing: Under the sun, they bloated and became disfigured, the skin blackening as if burnt.

Once in Siracusa, the survivors were sent to shelters. The bodies were taken to a mortuary, where coroners created a report of postmortem data consisting of identifying information, including height, sex, and approximate age. Tattoos, scars, birthmarks, and other distinguishing characteristics were noted, and DNA samples were taken. All of this information was then given to the district attorney's office so the process of identifying them could begin.

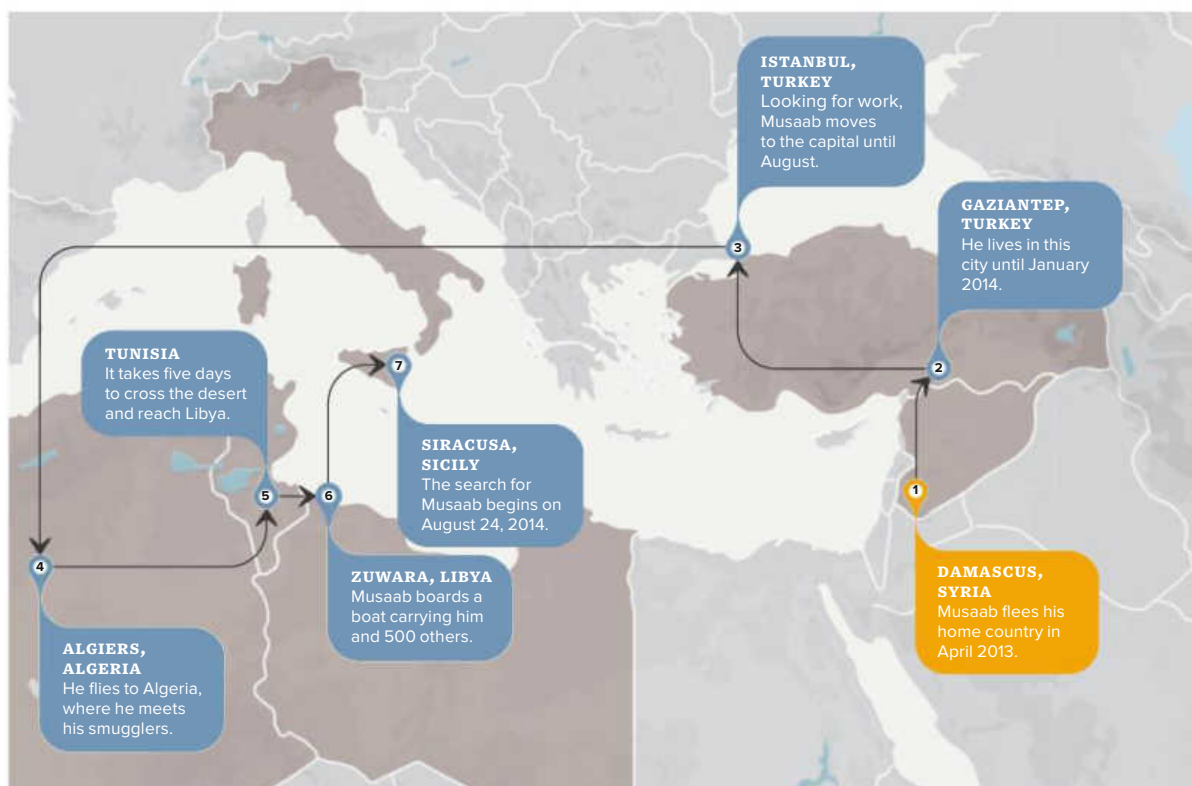
Unless a passport or some other official government document is found on a body, the only legal way to determine the identity of a victim is through confirmation from an immediate family mem-

ber. "You've got to reach out to families, and you've got to collect data from them," says Simon Robins, a researcher with the Mediterranean Missing project, an initiative studying missing migrants in the region. "As long as you don't have the information from families, you're not going to identify anybody."

This is where most shipwreck investigations involving Syrian refugees end. By 2014, nearly all of Europe had cut off diplomatic relations with the Assad government, meaning Italian investigators couldn't go through official channels to reach families back in Syria. They also couldn't rely on nongovernmental and humanitarian orga-

Musaab's Journey

How one man traveled thousands of miles over 16 months in search of a better life.



nizations, most of which buckled under the weight of the refugee crisis.

When the task of investigating the August 24 shipwreck fell to Milazzo, he knew the odds of identifying every missing person and every anonymous body were against him, but he got to work. The day before the investigation began, he had received the résumé of a translator named Rabab Marina Mina. She was 38 years old and from a Greek family, but she had settled in Sicily after marrying an Italian man who owned a pizzeria in Siracusa. She spoke five languages, including Arabic, and Milazzo hired her to start immediately.

Milazzo and Mina headed to a shelter where hundreds of the shipwreck's survivors were living. They arrived around



lunchtime, and everyone was gathered in the large dining hall. “You could tell from their faces that, yes, they had reached their goal—they reached Italy—but that many of them lost something of greater value,” Milazzo says.

Within that first week, Milazzo and Mina interviewed most of the witnesses and were able to find relatives of six of the 24 victims. But that left 18 bodies and scores of passengers unaccounted for, and Milazzo and Mina would spend the next few weeks trying to track down potential leads through NGOs and humanitarian organizations. They got few responses and no matches. Their cases were running cold.

It was, to him, a revelation. In all his years in the illegal immigration task force, he’d never heard of anyone using Facebook to contact families and forge connections across borders. This was in 2014, and though social media has been a mainstay in police investigations in America for over a decade, Milazzo was not aware of any official policy either encouraging or prohibiting its use in Italian investigations. After he requested and received permission from the district attorney to open a Facebook profile that he could use to contact the families of the missing, he set up

a page under the name SIRIA-GICIC. For the cover photo, he used an image of the rickety blue fishing boat overflowing with passengers, their faces turned to the far-off Italian navy helicopter monitoring and documenting the situation until help could arrive. They were waiting to be saved.

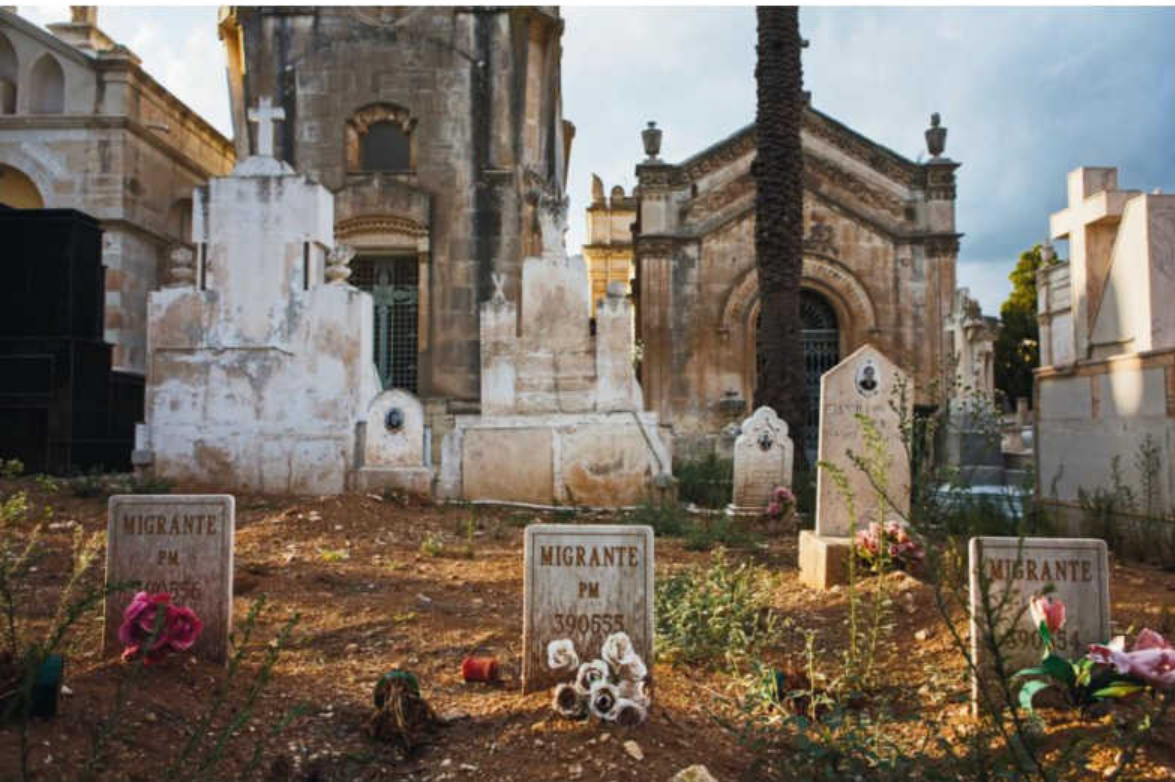
As Milazzo began his

work, Abd Shabani was in Istanbul awaiting news from his brother, Musaab. When Musaab

left Istanbul to make his way to Italy, Abd chose to stay behind. He was making decent money, hawking souvenirs to tourists under the vaulted ceilings of the picturesque Grand Bazaar. “I saw my future here,” Abd told me when I met him at a rooftop café near his workplace.

“We would do almost everything together,” he said of their childhood. Sometimes at night, when it was too late to go out, they’d tell their father they were going to visit relatives nearby but instead would sneak off to kick a soccer ball around. Later on, Abd would tag along with Musaab as the older boys went to picnic and barbecue in the countryside. And, of course, he

0 8 9



Above: A cemetery in Sicily. On this island alone, there are more than 1,500 graves of anonymous migrants and refugees. Left: Angelo Milazzo, the police inspector who led the investigation of the shipwreck.

Some days, Milazzo and Mina would spend hours searching through news reports and websites about the missing. They came across a Facebook page with a list of 64 names of people who had washed ashore in Tunisia, victims of Mediterranean crossings gone wrong. Out of curiosity, Milazzo and Mina started searching for each of those names on Facebook, and they found profiles for all of them. This got them to thinking about the vast web of friends and family that emanated from each account. “If all the missing people who washed ashore in Tunisia are on Facebook,” Milazzo remembered thinking, “why shouldn’t I just look for my missing people there and use their own networks to reach out to their families?”

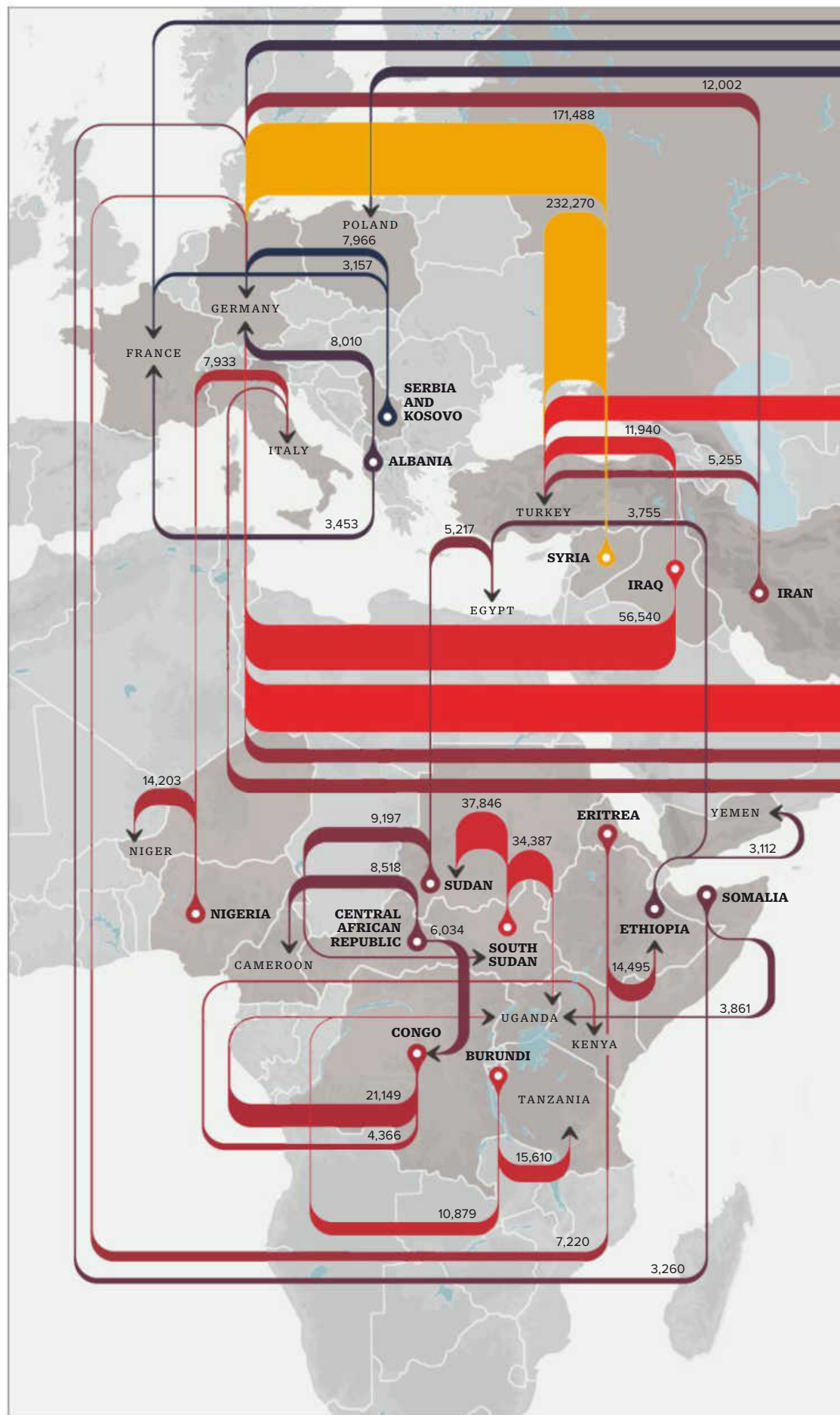
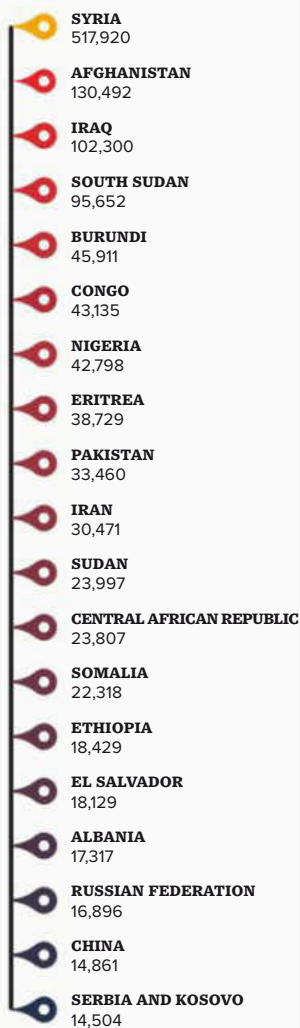
21st-Century Exodus

As of early last year, more people were displaced from their homes than ever before. In just the first half of 2016, more than 1.5 million people became refugees and asylum seekers, searching for security, safety, and a second chance.

—BLANCA MYERS

1. Where They're Coming From ...

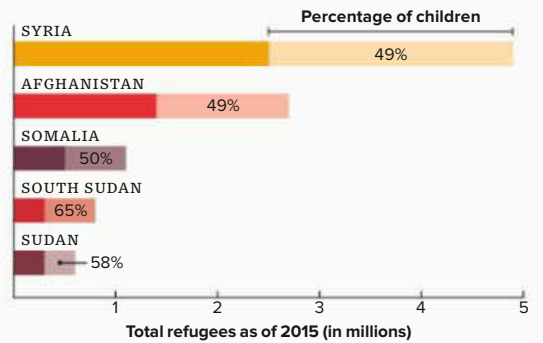
These 19 countries produced the greatest number of refugees and asylum seekers in the first half of 2016.





3. And How Many of Them Are Children

The UN estimates that by the end of 2015, there were 21.3 million refugees worldwide—and just over half of them were kids. These five countries saw the largest exodus, and millions of these refugees were under 18 years old.



was there for the trips to the beach in the summertime.

The last time Abd heard from his brother before he left Libya for Italy, Musaab had sent him one last text. “I have just one favor to ask you,” it read. “If I die, take care of my son.”

In the summer of 2014 the number of Syrians crossing the Mediterranean was beginning to skyrocket as the civil war intensified, and an online community blossomed around their movement. On pages run by activists and amateur news outlets, people shared information about the best routes and tried to warn one another about potential dangers. They also attempted to monitor the movement of boats after they set out to sea.

Musaab had used some of these pages to plan his journey. Now Abd used them to try to figure out why he still hadn’t heard from his brother. Each day at work, he obsessively checked online for updates, scouring sites dedicated to Syrian refugees for bits of information, a picture or a piece of news, something, anything, that could give him a sense of what had happened. Abd would also check Musaab’s Facebook page constantly, only to find no updates since Musaab had left for Libya. “We were living on hope,” Abd said, sustained as much by his cousin’s initial report—perhaps Musaab was detained or distracted in the chaos?—as the lack of any evidence indicating otherwise.

0 9 2

The SIRIAGICIC profile

on Facebook went live on October 10, 2014, nearly two months after the shipwreck, with Milazzo and Mina linking to the Facebook pages where the shipwreck was already being discussed. Within minutes, people from all over the world who were



THE CHAT THREADS

WERE HAUNTING:

MOTHERS, WIVES,

HUSBANDS,

BROTHERS, SISTERS,

ALL REACTING TO

PICTURES OF THEIR

DEAD LOVED ONES.

looking for answers about missing loved ones started contacting Milazzo and Mina.

Since neither of them had ever used social media to solve a case, they didn’t know what tactics worked best. Sometimes they posted close-ups of the victims’ clothing and personal items to see if anyone recognized them. (They made sure to avoid revealing victims’ faces.) When a potential family member contacted them, Milazzo and Mina moved the conversation to a private chat. In other cases, they sifted through the mounds of information sent by the families, looking for details that might match the postmortem data in their files.

Milazzo received a message from a man

Left: In the GICIC offices in Siracusa, inspectors maintain a library of records related to the landing of migrant boats. Below: Abd Shabani, now 24, in his adopted city of Istanbul. "I see my future here," he says.

named Ahmad al-Rashi, who'd heard that his nephew might have been on the ship—midtwenties, black hair, round cheeks. Milazzo replied with a picture of a faded black tracksuit worn by one of the victims who matched the description. Al-Rashi recognized the clothes immediately and sent back a photo of his nephew wearing the same outfit. It was a match. But Milazzo

knew better than anyone that an uncle couldn't confirm the name of the dead. That had to be done by the victim's next of kin, and because al-Rashi couldn't bring himself to give any false hope or bad leads to the rest of his family, he would not put Milazzo in touch with the next of kin. Instead, he would only give Milazzo his nephew's name. To track down the next of kin, and to complete the process, Milazzo was on his own.

On October 13, Milazzo published the name given to him by the uncle. And 800 miles away, Abd Shabani logged on to Facebook, clicked on SIRIA-GICIC, and saw the words "Musaab Shabani" staring back at him from the screen.

"I just didn't believe it," Abd told me. He sent a private message to SIRIA-GICIC and followed up with a scanned copy of his passport to prove he was Musaab's brother. (Abd would only learn later, through me, of his Uncle Ahmad's role in the investigation, which was all the more shocking to him because he says they are not particularly close.)

In the picture Milazzo and Mina sent back to Abd, a body is inside a partially unzipped body bag. The sun is shining and his head is tilted back, but it is clearly Musaab. He looks peaceful, almost as if he

were sleeping, except for two small streaks of blood under his eyes from vessels that had burst. "When I saw the picture I was just like—that's my brother. I know my brother. It was him. It was *him*," Abd said, trailing off. It didn't matter how good of a swimmer Musaab was, or how much he liked to float in the blue water at the beach in Latakia. He had drowned.

In the three months

Milazzo and Mina searched for names from the August 24 shipwreck, they had contact with dozens of family members like Abd. Sometimes the two investigators would be in touch with relatives in different countries and continents, working late into the night at Mina's husband's pizzeria. The chat threads were haunting: mothers, wives, husbands, brothers, sisters, all receiving pictures of their dead loved ones. In one message, after seeing a picture of her sister, a woman sent a simple "thumbs up" emoji before signing off. In another, a wife confirmed her husband's death. "Rest in peace, my love," she wrote. By the end of 2014, Milazzo

and Mina had put names to 21 out of 24 bodies—15 of them through Facebook.

Milazzo has since been transferred out of the migration task force—he now tracks down people who fail to respond to subpoenas. But two and a half years since the shipwreck, and with the permission of the prosecutor's office, he is still working to confirm the identities of the remaining bodies.





مُحَمَّد

الله

MUSAAB SHABANI

15-7-1988 24-8-2014

Damascus - Syria

"I'm convinced that little by little I will be able to discover the identities of all 24 victims," he says of the ongoing DNA testing and family outreach. "It will bring me a lot of satisfaction, because it will mean bringing closure to these families."

Vittorio Piscitelli, Italy's high commissioner for missing people, is aware of Milazzo's success with the August 24 shipwreck and has supported him publicly—he congratulated Milazzo when the two met at an event in Palermo last September. But there is a reason Milazzo wasn't aware of any official policy concerning social media during his investigation in 2014—there is no official policy, even three years later, and Piscitelli is wary of adopting Milazzo's social media methods more broadly. "It is one thing to do it for just a few cases," he says. "It's something else doing it at a national level."


Piscitelli's main concern is safety—in places like Syria, where families are often punished for the acts of a single family member, revealing the names of refugees could pose a risk to the people they left behind. "We don't want the secret service of these countries knowing that their fellow citizens are here and that we're working on their identification," Piscitelli says. There are also potential legal obstacles. The EU has strict regulations over sharing personal data across international borders, and widespread adoption of Milazzo's tactics could pose legal problems. The issue is still unresolved—previous attempts to determine whether it's legal to use social media to identify refugees stalled because of the safety issues raised by Piscitelli. That Milazzo was even granted permission from his superiors to open this Facebook account in the first place suggests the Italians still lack a coherent strategy for identifying the dead.

"I understand where their fears about safety come from," says Simon Robins, of the Mediterranean Missing project. "But I think there are ways to use social media to make progress without putting people in danger," perhaps involving social media in the initial outreach phase before transferring the process to secure government channels. In any case, Robins believes, sticking to the existing patchwork of bureaucracies would be catastrophic. "It

can't work on the scale and with the speed that we know social media can achieve," he says. And for any government to not use every tool available—to ignore technological advances that have been shown to work and instead rely on an aging, inefficient system—is, to Robins, the worst kind of indifference.

Abd is 24 now,

almost as old as his brother was when he died, and he has found some stability in Istanbul. His nephew is close to 3 years old, and Abd has tried to keep true to his brother's last request. After Musaab died, his wife returned to Syria with their son hoping for a fresh start, and Abd talks to them regularly on Skype. He struggles with his brother's absence, but he says he's better off than the thousands of siblings, parents, spouses, and children who'll never know what became of their missing loved ones. "I couldn't imagine living on the hope that Musaab was still alive," Abd told me just before we said goodbye. "It's better that we know he is dead."

Last year was the deadliest on record in the Mediterranean. More than 5,000 people drowned in the sea, most of whom remain unidentified. In Sicily alone, there are more than 1,500 graves of anonymous migrants, and for a few years Musaab's was one of them. Not long after he arrived in Italy, he was buried in a graveyard in the Sicilian village of Sortino before anyone knew his name. His gravestone identified him only as "9," just another nameless refugee. Abd recently arranged for a new gravestone to be put in place, this time with Musaab's name carved in marble for all the world to see. 

0 9 5

Opposite: Musaab's gravestone, which recently replaced the marker that identified him only as "9," shown on the opening pages of this story.

COLOPHON

BAD JOKES THAT HELPED GET THIS ISSUE OUT:

How does a train eat? It chew-chews!; the climate change "hoax" (is the joke on Earth or on us?); A guy walks into a bar with jumper cables around his neck, and the bartender says, "Look, I'll let you hang out, but you better not try to start anything!"; I saw a terrible accident the other day at Whole Foods involving a Prius and a Subaru—there was quinoa everywhere!; GOP = grabs our pussy; Alec Baldwin as Donald Trump; Why was six afraid of seven? Because seven eight nine!; the guest on the *Kill Tony* show at SF Sketchfest who wanted six girlfriends but was unemployed; doing my own taxes; As the song goes, "That's Calore!"; Me: "Hey, can I ask you a question?" Rob Capps: "It's mostly weights, little bit of cardio."

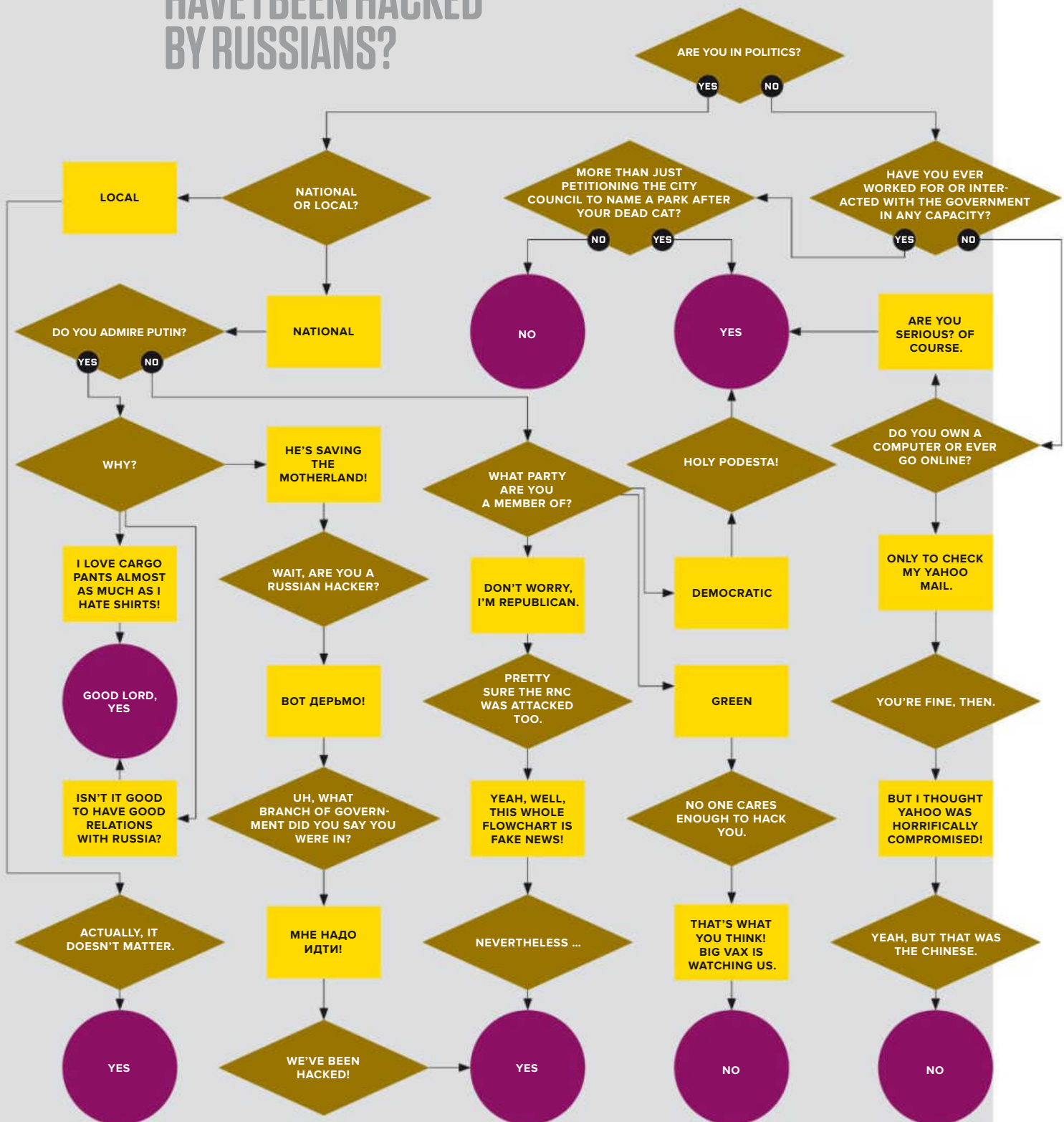
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THE WORLD BETTER.**

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