

Rolling Stone

50th ANNIVERSARY YEAR

Issue 1301 >> November 30, 2017

PIZZAGATE
THE ANATOMY
OF A FAKE
NEWS
SCANDAL

THE PARANOID
CONFESSIONS OF
POST
MALONE

TAYLOR
SWIFT

ELON MUSK

THE ARCHITECT
OF TOMORROW

25 PEOPLE
SHAPING THE
NEXT 50 YEARS



WILL SMITH



FROM THE DIRECTOR OF
SUICIDE SQUAD AND END OF WATCH

BRIGHT

A NETFLIX FILM

JOEL EDGERTON



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NETFLIX | DEC 22

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"All the News That Fits"



Post Malone's finger tattoos honor his favorite bygone stars. Page 54

25 People Shaping the Future

— FEATURING —

Elon Musk

Inside the inventor's world-changing plans to inhabit outer space, revolutionize high-speed transportation, reinvent cars – and hopefully find love along the way.

By NEIL STRAUSS Page 36

FEATURES

28 Anatomy of a Fake-News Scandal

Inside the web of conspiracy theorists, Russian operatives, Trump campaigners and Twitter bots who manufactured Pizzagate, the "news" that Hillary Clinton ran a child-sex ring. By AMANDA ROBB

54 Confessions of a Hip-Hop Rock Star

Post Malone sounds off on race, Bieber, and the pleasures of Olive Garden. By JONAH WEINER

ON THE COVER

Elon Musk photographed in Hawthorne, California, on October 5th by Mark Seliger. Grooming by Gina Monaci

ROCK & ROLL

13 Inside Bowie's Final Act

A new documentary dives into the singer's remarkable last years.

DEPARTMENTS

Letters	8
Playlist	10
Records	59
Movies	62

MUSIC

BEST POP-PUNK ALBUMS

From Descendents to Blink-182 and beyond, we count down the classics of punk rock's most lovelorn subgenre, including the albums that inspired Green Day's Billie Joe Armstrong and the Belfast band that lit a fire under a young Bono.



Armstrong



MOVIES McDormand

BEHIND 'THREE BILLBOARDS'

Filmmaker Martin McDonagh on making the year's best flick, and why Frances McDormand is the greatest actress alive.



CULTURE POT LOVERS'

GIFT GUIDE 2017

A handy shopping list of the best weed products and accessories sure to light up the holiday season.



GLIXEL

HOW GAMES TACKLE NAZIS

The creators behind shoot-'em-up Wolfenstein II discuss the game's timely romp through a Nazi-ruled America.

DYLAN'S GOSPEL YEARS

Biographer Clinton Heylin, gospel singer Regina McCrary and drummer Jim Keltner join host Brian Hiatt and Andy Greene to weigh in on Bob Dylan's most mysterious era, as he releases the box set *Trouble No More*. Rolling Stone Music Now airs Fridays at 1 p.m. ET on the SiriusXM Volume channel. Download and subscribe on iTunes or wherever you get your podcasts.

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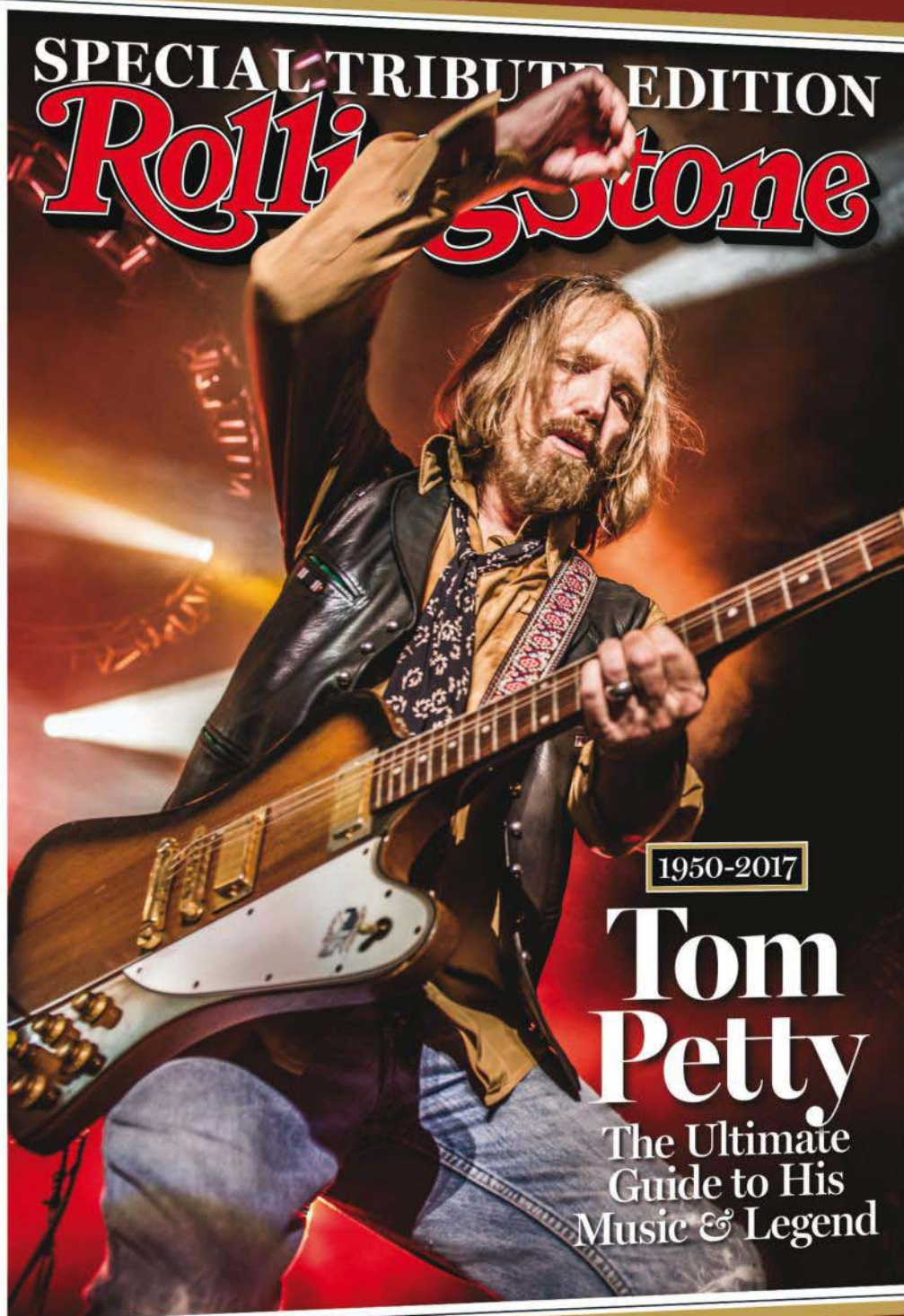
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Rolling Stone

TOM PETTY: THE ULTIMATE GUIDE

SPECIAL TRIBUTE EDITION



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Fifty Years of Rolling Stone Photos

RS 1299 ROCKS! ALL THE PICS from the past 50 years were amazing to view, and I gained some insights as well into their origins.

Jonathan Roberts
Myrtle Beach, SC

ALL THE GREAT PHOTOS brought back so many memories. One photo I really wish you would publish again is the 1974 cover photo of Karen and Richard Carpenter by the phenomenal Annie Leibovitz – it truly captured Karen's joy of life.

Pam Quiggle, Tempe, AZ

IF "A PICTURE IS WORTH A thousand words" (and each word was worth \$100), then the net worth of the Photo Issue is \$6.5 million.

Joe Braun
Carmel, CA

WHILE THERE WERE MANY true icons in your photo selec-

tions, I was disgusted to see Kid Rock among them. He is to music what Cheez Whiz is to cheese.

Phil Kaye
Scarborough, ME

THE ISSUE WOULD HAVE been more special with one photo of Jim Morrison.

Michael Cordray
Fairborn, OH

ONE OF MY ALL-TIME FAVORITE shots of Keith Richards. Especially love the belt and mushroom on the crotch.

Billyobblues, via the Internet

ANNIE LEIBOVITZ CAUGHT the personalities of innumerable legends in her photographs. She was and is an artist packing a camera!

Linda Brown, via the Internet

WHAT A SHOT OF BONO IN A bubble bath, by Anton Cor-

R.I.P., Tom Petty

We had planned to devote all of RS 1299 to a retrospective of the magazine's most iconic photographs. But the passing of Tom Petty on October 2nd compelled us to pay proper tribute to his legend in the issue. Readers responded.

THANK YOU FOR THE touching tribute to Tom Petty. I finally let out a good cry after a month of shock. I believe he had more to offer, which is why his passing has been difficult for me to process. Thanks, Tom, for the wonderful music and awesome memories of the concerts I attended.

Katie Myers, Greenville, SC

PETTY WENT TO A HIGHER place on October 2nd, just a week after finishing his sold-out 40th-anniversary tour. He was a multigenerational rock legend with a catalog of work and a list of hits matched by few.

Mark Iannuzzi
Williamsburg, VA

WOW. WHAT A COVER AND what a man. Interesting and thoughtful. It's been a long time since I've loved a cover as much as the one of Petty. Not much can be said except love him, miss him and damn, what a loss.

Mary Clement
Gilbert, AZ

bijn. I don't even like U2 all that much, but this photo is a masterpiece.

Alberto Gobbato, Via the Internet

THERE IT WAS, ON PAGE 50: the most sexual, androgynous, mind-blowing photo I have ever seen in RS. Knowing some of Axl Rose's behavior, allowing this level of vulnerability was shocking. Once again, you have blown me away.

Rebecca Camacho-Sobczak
Tarzana, CA

PETTY WAS A TROUPEUR AND a troubadour. His unforgettable songs felt like a friend was talking to me in the rowdy language of my



generation. He showed us survival and redemption through music.

Debra Park
Casper, WY

THE WORLD HAS LOST A music legend, and thank you to ROLLING STONE for such an amazing tribute to Petty. His timeless music will always live on.

Jeff Swanson, Everett, WA

THEO WENNER'S SHOT OF Miley Cyrus is iconic. It led to a subscription for me!

Cristian Lopez, via the Internet

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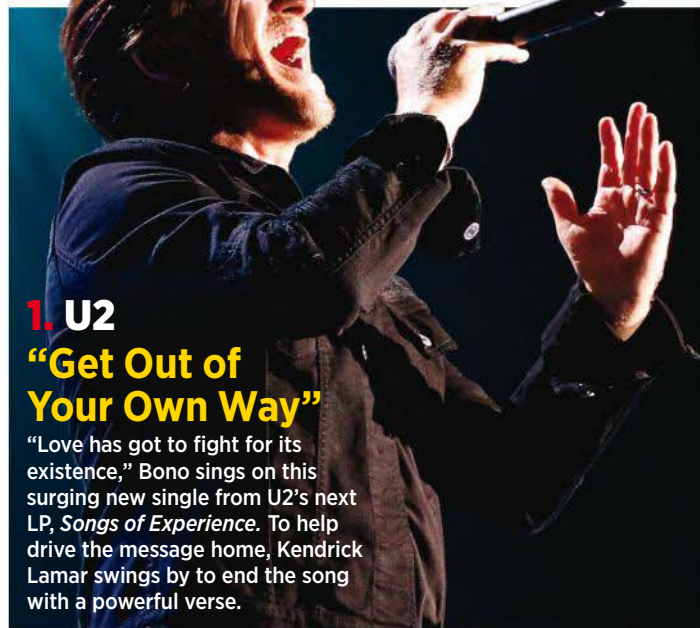
PART OF OUR DNA”

-TITO BEVERIDGE



The Playlist

OUR FAVORITE SONGS, ALBUMS AND VIDEOS RIGHT NOW



1. U2 "Get Out of Your Own Way"

"Love has got to fight for its existence," Bono sings on this surging new single from U2's next LP, *Songs of Experience*. To help drive the message home, Kendrick Lamar swings by to end the song with a powerful verse.

2. Mavis Staples "Little Bit"

A highlight from the gospel-soul icon's politically charged third album with producer-collaborator Jeff Tweedy of Wilco. "This life surrounds you/Guns are loaded," Staples sings, as guitars burst like thrown bottles over a nasty groove.

3. N.E.R.D. feat. Rihanna "Lemon"

Pharrell reactivates his funk-punk band N.E.R.D. for a throbbing track cranked sky-high by Rihanna's on-fire rapping.

4. Porches "Find Me"

Porches' Aaron Maine gives vintage Chicago house music a sad, sweet makeover, crooning about his blissed-out aloneness over a track that'll still have you bouncing around your room.



5. Charlotte Gainsbourg "Ring-a-Ring O' Roses"

The French singer's nursery-rhyme-tinged tune nods to spacey Nineties lounge pop, with sublime results.

6. Franz Ferdinand "Always Ascending"

The Scottish dance rockers at the height of their goth-glam disco game – like LCD Soundsystem fronted by *Station to Station*-era Bowie.



7. 21 Savage, Offset, Metro Boomin "Without Warning"

The Atlanta hip-hop supergroup's new mixtape is a diamond-studded fever dream, and we're totally addicted to it.



MY LIST



Peter Buck

Songs I Played On My Road Trip

The R.E.M. guitarist – who oversaw a new 25th-anniversary edition of *Automatic for the People* – played these songs on a recent Mexican vacation.

Tom Petty "Here Comes My Girl"

This could have been one of the greatest singles of 1966, but it had this modern drive to it. It's a great song.

The Rolling Stones "Child of the Moon"

They recorded this B side after *Satanic Majesties*, but they didn't go overboard with the goofball, fake-psychedelic shit.

King Hannibal "The Truth Shall Make You Free"

A wicked James Brown-Sly Stone funk song about being a heroin addict and finding God. It's one of the most amazingly fucked-up songs ever.

Sam Cooke "A Change Is Gonna Come"

Every time I hear this, the hair stands up on my arms. Imagine if he lived to make a whole album about civil rights.

Todd Rundgren "Couldn't I Just Tell You"

A perfectly constructed song: Great riff, great chord changes, and it pushes and pulls. I love how he was completely changing at all times.

CLOCKWISE FROM TOP LEFT: TAYLOR HILL/FILMMAGIC; RICK DIAMOND/GETTY IMAGES; NOAM GALAI/WIREIMAGE; ROB BALL/GETTY IMAGES; PRINCE WILLIAMS/GETTY IMAGES; COLLIER SCHORR

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TIME TO SHINE

Rock&Roll



Inside Bowie's Final Act

IN OCTOBER 2015, DAVID BOWIE decided to end his cancer treatments after learning the disease had spread too far to recover from. The very same week, he traveled to a Brooklyn soundstage to shoot a video for his new song "Lazarus," the name of a biblical figure that Jesus brought back from the dead. Bowie spent the day in a hospital bed as cameras captured him with a bandage around his head. "Look up here, I'm in heaven," he howled. "I've got scars that can't be seen."

A new documentary dives inside the singer's last days and final masterpiece – and proves he had a killer sense of humor

BY ANDY GREENE

Footage from that day and recollections from those who were there make up one of the pivotal scenes in *David Bowie: The Last Five Years*, a revelatory new documentary directed by Francis Whately – who chronicled Bowie's golden Seventies period in his 2013 documentary *David Bowie: Five Years*. The film, which airs on HBO in January, traces the singer's final chapter as he emerged from a long hiatus to create two brilliant albums and an off-Broadway musical – while battling an

JIMMY KING

illness that would take his life just two days after 2016's *Blackstar* was released. "He wanted to make his final act one to remember," says Whately. "And one way of coping with the pain of the treatment and knowing what was going to happen was to keep himself occupied."

The project presented several challenges. While Whately was able to draw from a wealth of Bowie footage for his first documentary, he had very little to work with while exploring Bowie's final chapter. The singer grew fiercely private during that time, not granting a single interview or performance. "I had sleepless nights thinking, 'How am I going to fill 90 minutes without any footage?'" says Whately. "I was really worried."

He decided to get creative, reuniting the bands that performed on 2013's *The Next Day* and *Blackstar*, asking them to play and share their memories of the highly secretive sessions. He filmed the *Blackstar* musicians at 55 Bar, the same downtown New York jazz club where Bowie first saw them perform before inviting them to play on the album. Guitarist Ben Monder says he was unaware Bowie was sick at all as they recorded. "Even being ignorant of all this," Monder says, "I was struck by how energetic he was and what great spirits he was in."

Whately also spent time with Tony Visconti, Bowie's frequent producer from 1969 all the way up to *Blackstar*, who shares unheard demos from the last sessions. The most chilling moment comes when he plays the isolated vocals from "Lazarus," which allow you to hear each agonized breath Bowie took between lines.



FACE THE STRANGE
Bowie on the set of "Blackstar"

Earl Slick recalls an arcade-game competition with Bowie: "That's not the David I had known in his early years."

"He's in that song...in that moment," says Visconti. "For the four or five minutes he was singing, he would pour his heart out."

Behind-the-scenes footage from Bowie's videos was another treasure-trove. Footage is interspersed with analysis from friends; video director Johan Renck discusses the significance of the skeletal astronaut character Bowie commissioned for "Blackstar." "Is that Major Tom?" wonders Whately. "I have no way of knowing that, but he certainly wanted you to believe that it was. It's the character that made him successful, so the idea of one

of his last videos having Major Tom absolutely made sense."

Whately frequently uses concepts and references in Bowie's final songs to flash back to prior moments in his career when they were explored; he traces the theme of celebrity from "The Stars (Are Out Tonight)" back to Bowie's lifelong struggle with fame. "I wanted to look at his final period through the prism of the past," Whately says. There is also a lengthy prologue centering on Bowie's 2003-04 *Reality* tour, which ended prematurely when he suffered a near-fatal heart attack right after stepping offstage at a festival in Germany. Tour footage from that time shows Bowie goofing off with his band and checking out a Montana truck stop, at one point competing with guitarist Earl Slick to win stuffed animals in a claw-machine game. "His sense of humor was on," Slick recalls. "That's not the David I had known in early years." In one hilarious moment, Bowie looks through cassettes on a discount rack and finds the 1989 release by his side project,

Tin Machine, and 1979's *Lodger*. "These must be albums that nobody ever bought so they got moved here," he says.

Whately considers the film a tribute to an artist he met a handful of times during his long tenure working at the BBC. It wasn't until after the release of *Five Years* that he felt a personal connection to the singer. "Near the end of his life, he wrote to see how I was doing," says Whately. "He said to me, 'I'm very happy with my lot in life and the new album. What more can any man ask for?' It really showed the dignity of the man."



LET'S DANCE
Slick (left) and Bernard Fowler, who will take part in the tour.

Bowie's Bands Reunite for Emotional Tour

This year's epic tribute returns to take new risks

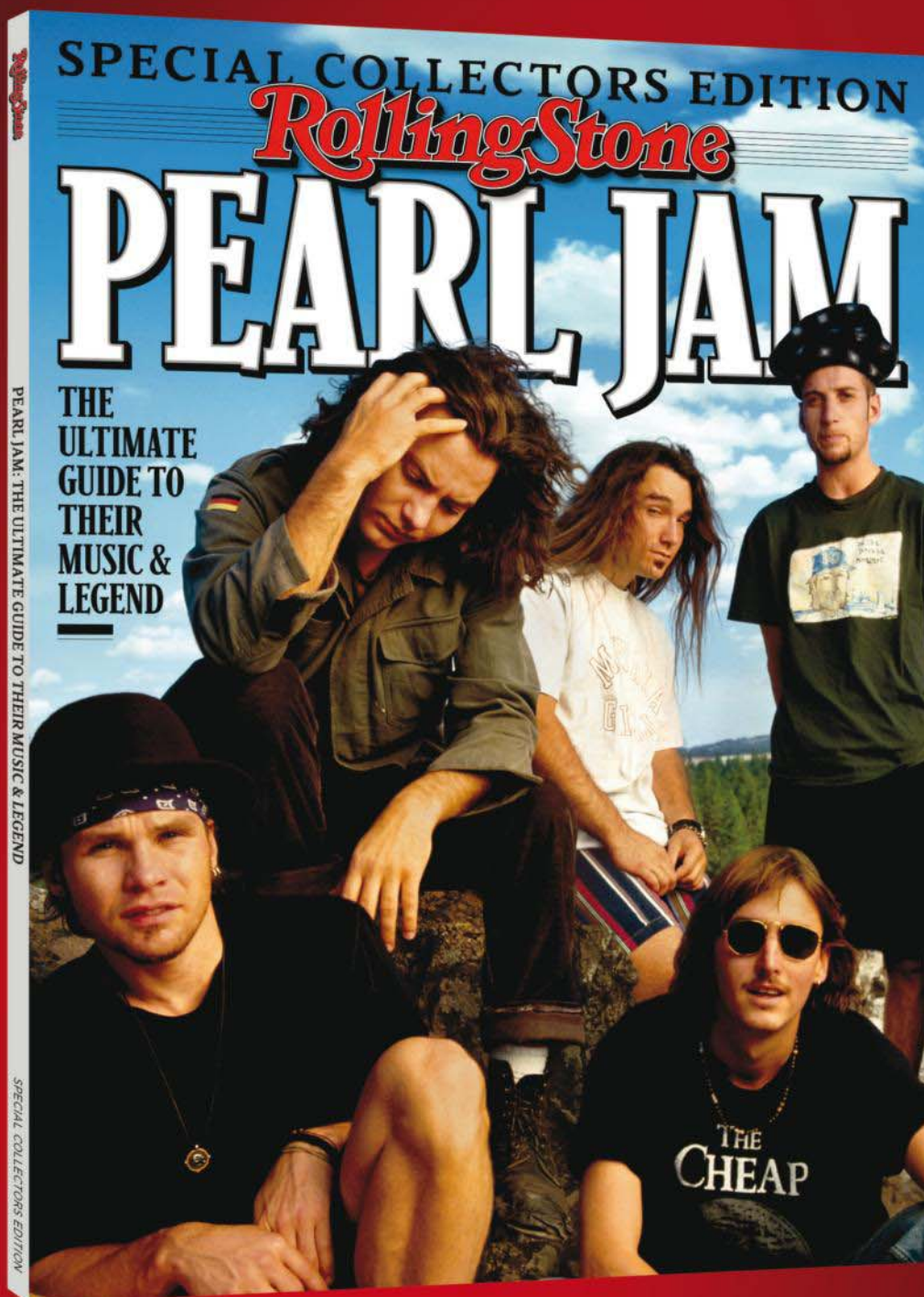
Of all the Bowie tribute concerts that happened after the singer's death, none came close to Celebrating David Bowie. It gathered many of Bowie's greatest touring musicians, including the full band from his final run, A Reality Tour, to play his songs, joined by all-star guests like Sting and Perry

Farrell. Hitting only five cities around the world, it was a brief but moving event, especially for the musicians onstage. "The whole time, I was like, 'Don't lose it,'" said guitarist Earl Slick, who played with Bowie on and off for nearly 40 years. The tour was a financial success, and returns in February for a 28-city run with a band including Slick, King Crimson's Adrian

Belew (who played on *Lodger*) and Spiders From Mars keyboardist Mike Garson. Producer Angelo Bundini says to expect a new set list that takes more chances: "David was famous for not being nostalgic. This time, we're going to follow his lead by being more Bowie-future than Bowie-past. It's the same beloved Bowie catalog, but a whole new approach."

A.G.

FROM TOP: JIMMY KING; PSQUARED PHOTOGRAPHY



ON NEWSSTANDS NOW

Wherever Magazines Are Sold

Playing the Grammy Game

The new ways to snag an award: media campaigns, intimate performances and paying experts who know who the voters are

BY STEVE KNOPPER

WHEN HARRY STYLES SAT down for an October 15th segment on *CBS This Morning*, the normally press-shy singer's solo debut was already five months old and he had no new tour dates to promote. But to experts, his timing was perfect – the Recording Academy had just mailed ballots to 12,000 Grammy voters to decide the nominees for the January ceremony. “Harry Styles is in the conversation for Album of the Year, so that gives him visibility during the voting period,” says a record-label source. Adds another, “Harry doing something for an older demographic like *CBS This Morning* is just what a good PR manager would advise: ‘We want voters to know you’re not one-fifth of a teen-pop band, you’re a serious artist.’”

In recent years, Grammy contenders have been more aggressively campaigning for awards, which can be a major boost for sales and streams. Taking cues from Hollywood, labels push artists to take part in Grammy Foundation events and secure voter-friendly media bookings; before the 2016 Grammys, Kendrick Lamar taped *Austin City Limits* for PBS and did a prominent NPR interview. “I want to win them all,” he told one reporter (he won Best Rap Album). Some even pay for access to mailing lists that claim to reveal Grammy’s secret voters. “It gets more intense every year,” says Daniel Glass, president of Glassnote Records, which is pushing Childish Gambino for a Grammy. “I am getting hit personally, as a voter, with ‘For your consideration, please vote for me!’ e-mails that I have not seen at this level. The lines of decorum and class are being broken down.”

Grammy voter committees change every year; to be a voter, you must have contributed to at least six commercially released tracks. To get in front of voters, some artists take part in the Grammy Museum’s intimate onstage conversations. Styles, Julia Michaels, Zac Brown Band, Steve Martin, and Fleetwood Mac’s Lindsey Buckingham and Christine McVie have all participated in those Q&As this fall – and they are all possible nominees for next year. “It heightens awareness of

your act,” says Bob McLynn, manager of Lorde, Sia, Green Day and others. “You do events throughout the year to garner favor, the same way an actor who’s up for an Oscar will do a bunch of events for the Academy.” Some artists are playing an even longer game; indie band the Head and the Heart visited the Grammy offices and played Tom Petty’s MusiCares Person of the Year event earlier this year. While the band saw it only as a way to honor a hero, the event is con-

send an e-mail blast to her list, highlighting a group or artist. She says successes include indie performers like Fantastic Negrito, the Oakland singer who won 2017’s Best Contemporary Blues Album. “We were trying to figure out how to differentiate ourselves,” says Negrito’s co-manager, Philip Green, adding that the e-mails were just one part of a long campaign. But a prominent label source warns these lists aren’t reliable: “I feel so bad when folks



SIGN OF THE TIMES Lorde, Styles and Lamar are possible 2018 nominees. Campaigns for awards are so aggressive “the lines of decorum are being broken down,” says Glassnote’s Daniel Glass.

considered a great way to get in front of likely voters. Adds someone close to the band, “When artists go on the road, you also try to see if they can do the Grammy school [programs], where kids ask them questions. Artists find it rewarding, and you become part of the fabric of the Grammys, and get in their newsletters.”

There are also back-channel methods. Monique Grimme, co-owner of New Jersey indie label Bongo Boy Records, networked, gained access to a voter-only message board and several secret Facebook groups, and compiled a list of 8,000 probable voters. Clients can pay \$125 for her to

hire those third-party people, because their lists are not reaching our members.”

Portugal. The Man recently joined the Grammy push, taking out full-page ads in some major newspapers. “You have to have a profile during that [voting] period, otherwise people won’t remember your record,” says their manager, Ritch Holtzman. Chance the Rapper did the same in 2016, paying huge for a full-page *Billboard* ad solely to reach that small voting pool. “At first I was like, ‘People take out Grammy ads – why? That seems lame,’” Chance tweeted. “Then I was like...I’m gonna make a bunch of these.”

TECH



BEST
FOR

SPORTS

Bose SoundSport Free

Wireless earbuds are perfect for runners, eliminating the annoyance of a sweaty cord behind your neck. The SoundSport Free's are bulkier than some buds, but they're way more comfortable than they look. We were blown away by their deep bass and wide sound field – no other wireless sport earbuds come close.

\$250 BOSE.COM



BEST
FOR

AUDIOPHILES ON THE GO

Bang & Olufsen E8

Going cord- and cable-free feels great, but until the E8s, we hadn't heard a pair where sound quality matched convenience. These are rich and punchy – better than you might have thought wireless headphones this tiny could be.

\$299 BEOPLAY.COM

BEST
FOR

HOME LISTENING

Klipsch Heritage HP-3

Sure, they're pricey, but they're built to last from durable materials like solid wood and sheepskin. Still, they weigh less than a pound, and the vented design reduces pressure, so you can get lost in long sessions. The sonics are wide and brilliant, spacious like the best loudspeakers.

\$1,199 KLIPSCH.COM

Best New Headphones

The year's top options, from highly crafted throwbacks to earbuds with brains of their own

BY JESSE WILL



BEST
FOR

TRAVEL

Bowers & Wilkins PX

These Bluetooth headphones sound crisp and rich, thanks to digital smarts that smooth out the incoming audio signal. Lift an ear cup (to hear the flight attendant, say) and your song instantly pauses. Put it back and you pick up where you left off.

\$399 BOWERS-WILKINS.COM



BEST
FOR

NOISE-CANCELING

Libratone Q Adapt In-Ear

Smart noise-canceling buds require a charge, so it's a bummer when you forget to plug them in overnight. These, though, can be charged directly by your iPhone. Their four-level noise-canceling tech will let some street noise in for safety – or banish nearly everything other than the music.

\$149 LIBRATONE.COM



BEST
FOR

BUDGET

Beats urBeats3

Nothing matches the classic earbud for low-maintenance pocketability, but few at this price have such deep bass and sparkling highs. The flat cord prevents tangling, and has a button for Siri, too.

\$99 APPLE.COM

CLOCKWISE FROM TOP LEFT: BOSE; KLIPSCH; BANG & OLUFSEN; BEATS BY DRE; LIBRATONE; BOWERS & WILKINS

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King Krule: Rock's Coolest New Crank

At 23, he's made a great LP and been invited to Kanye's studio. But Archy Marshall just wants to be left alone

THE KIDS OUTSIDE CHICAGO'S Metro have been waiting for hours to see Archy Marshall, the 23-year-old London singer known as King Krule. But Marshall, who has a cold, is having a hard time getting excited about the sold-out show. "I love playing music," he says. "But especially on days like today, where my throat feels like shit, I dunno."

Marshall's blasé attitude extends to pretty much everything, including celebrity

Marshall's ability to spin murky tales of disaffected working-class urban youth has made him something of an underground cult hero. His new LP, *The Ooz*, veers from jazz to punk to dub and hip-hop, with Marshall singing about everything from class warfare to depression in his gruff, preternaturally low growl. The schizophrenic arrangements make sense when Marshall starts talking about his childhood: A portrait of Afrobeat icon Fela Kuti hung in his home, and he was

listening to underground jazz and reggae artists like Albert Ayler and Augustus Pablo, respectively. By 11, Marshall was recording on an 8-track. From then on, he says, "I was always in my own world, creating." He missed so much school that social services at one point threatened his parents with jail time; Marshall's luck turned around at 14 when he was accepted into the famed BRIT School, whose alumni include Adele and Amy Winehouse. "That school saved me," he says. He began posting music on Bandcamp as Zoo Kid. Dean Bein, president of Marshall's label, True Panther, stumbled onto the bleak, folkly "Out Getting Ribs," and in 2011 released the then-17-year-old's debut EP as *King Krule*. *Six Feet* followed and was nominated for the BBC's album of the year. Marshall says his teenage success "empowered me. I was like, 'Yeah, I always knew I was a genius. Now people know.'" The success encouraged him to indulge in his wildest artistic



KING OF PAIN "I was always in my own world, creating," says Marshall, who released his debut LP at 17.

endorsements. When Kanye West invited him to make music after hearing his 2013 breakthrough, *Six Feet Beneath the Moon*, Marshall says, he declined because he didn't want the pressure. Beyoncé shared his spare, angsty 2013 single "Easy Easy" on social media. Today, Marshall says he's still skeptical of her praise. "I'm not going to lie to you," Marshall says. "I don't think Beyoncé ever contacted me personally or ever complimented me from her own brain. I think it was something her social media team did. I haven't met her. She hasn't gone out to a gig. So how true is this shit?"

fantasies on *The Ooz*, which features his eccentric observations amid manic fits of guitar and lounge-singer piano.

Backstage after an intense performance, Marshall greets guests like Chance the Rapper's band and SZA's producer Carter Lang, who brings up the possibility of a collaboration between Krule and the R&B singer. Marshall listens before excusing himself to his dressing room to roll up a cigarette. His mood seems to be brightening; asked to offer a take on tonight's show, he flashes a rare smile. "Eh," he says. "It was all right."

DAN HYMAN

MAKER'S 46®

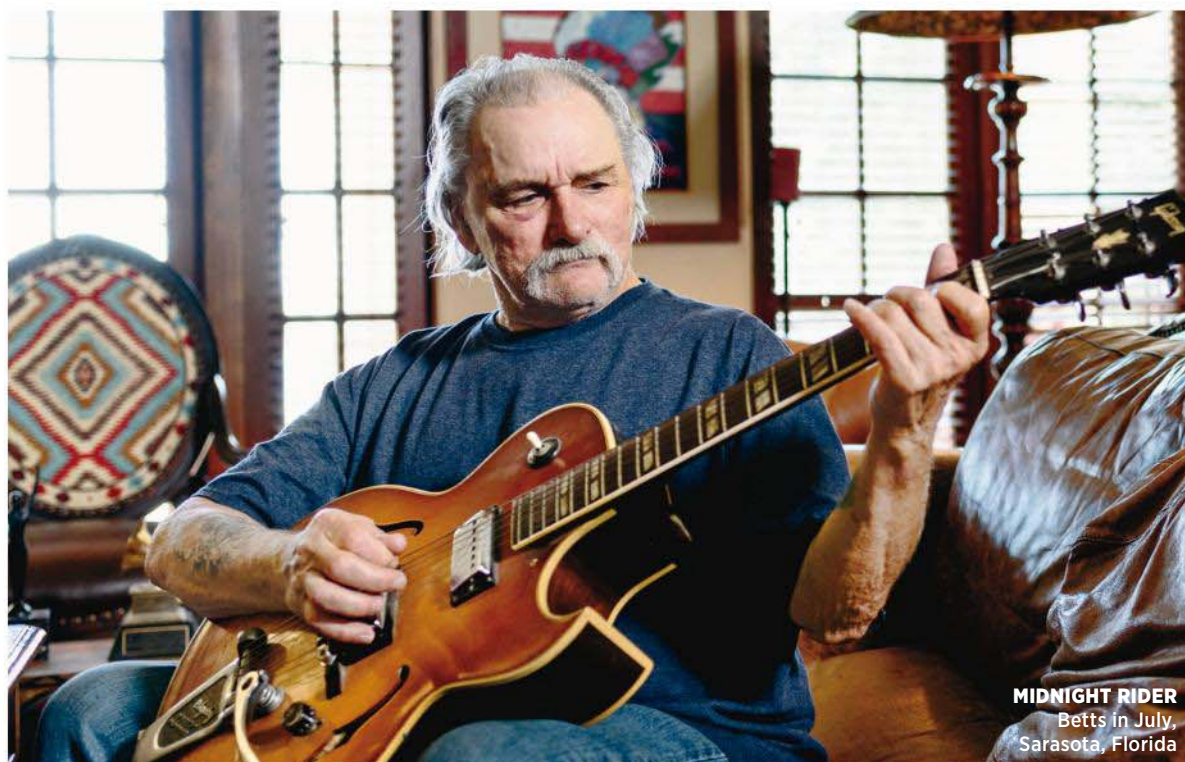


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MIDNIGHT RIDER
Betts in July,
Sarasota, Florida

The Lost Allman Brother

Dickey Betts' bad behavior got him fired from one of rock's wildest bands. Retired in Florida, he's ready to make peace with his past

BY DAVID BROWNE

LEANING FORWARD ON A COUCH in his home on the west coast of Florida, two cans of Budweiser in front of him and Duane Allman's Dobro on a stand nearby, Dickey Betts hesitates. "I don't know if you want to write this or not," he says. "But, shit, my career is over, so I don't give a shit."

He starts talking about an incident in 1993, when Betts, along with Bob Dylan, the Band, Stephen Stills and others, had been invited to play at a Bill Clinton inauguration event. Betts' performance was shaky – the house band was so inept, he says, it could barely get through "Southbound," a song from his years with the Allman Brothers Band. Backstage, Betts recalls, he met "a real smartass in a three-piece suit" who told him, "You got to do some woodshedding to play with the big boys." Betts became enraged, slugging the guy and knocking him onto Dylan, who was napping on a couch. Betts was afraid he had hit a congressman, but it turned out he was another act's drug dealer. "It was

really a relief," Betts says. "I was worried about the police comin' to arrest me."

The Allman Brothers Band were among rock's hardest-living groups, and Betts more than lived up to his side of that deal – from taking swings at two cops in 1976 to instigating an Allmans band brawl 20 years later. Trashed hotel rooms and arrests are as much a part of his legend as signature songs like "Ramblin' Man" and "Jessica." With his horseshoe mustache and moody-cowboy image, Betts was so charismatic that Cameron Crowe based one of the central characters in *Almost Famous* – Stillwater guitarist Russell Hammond, played by Billy Crudup – on Betts. "Crudup's look, and much more, is a tribute to Dickey," Crowe says. "Dickey seemed like a quiet guy with a huge amount of soul, possible danger and playful recklessness behind his eyes. He was a huge presence."

He still is. Betts' white hair and stout frame make him look like a Confederate soldier. Hunting accessories – bows and arrows – sit near his Grammy Awards in his high-ceilinged living room, where he

relaxes with his dog, Mandy. "You really got to control her – she'll play with you and then draw blood with her damn claw," Betts warns.

Betts, 73, unamicably parted ways with the Allmans in 2000; today he considers himself retired. He last played live with his band three years ago, at a 300-capacity club in Mill Valley, California. Soon after, the death of his brother sent him into a depression, and his back was bothering him so much that he worried about relying on Vicodin to get through shows: "It's a little bit of burnout, a little sour grapes, a little bit like a boxer who gives it up. It's pretty tough, to tell you the truth. Everyone wishes they could be young forever. But I feel like I did my work, and I'm not gonna do anything that's gonna top what I'm known for. So why don't you just stay home?"

For all his excesses, Betts has outlived every founding member except drummer Jaimoe. Drummer Butch Trucks committed suicide in January, and Gregg Allman succumbed to various health issues, primarily liver cancer, in May. "You don't know

the fuckin' half of it," Betts says, solemnly, of recent events.

Betts gives a tour of his home, full of Allmans artifacts. Gold-album certifications for landmarks like *At Fillmore East* and *Eat a Peach* are mounted near handwritten letters from then-President Jimmy Carter, thanking Betts for helping to raise money for his 1976 presidential campaign. The mementos are reminders of Betts' vital role in the group. It was Betts who suggested that Duane recruit his younger brother, Gregg, as the band's singer; it was Betts who wrote some of the Allmans' most enduring material (from the jazzy instrumental "In Memory of Elizabeth Reed" to rare later hits like "Crazy Love"). And it was Betts who assumed the leadership role after Duane died in a 1971 motorcycle accident. "Dickey had so much reverence for the Allmans' music," says Warren Haynes, who joined the band in the late Eighties. "He looked at it as a sacred thing."

In 1976, the Allmans broke up, Betts telling *ROLLING STONE*, "There is no way we can work with Gregg again. Ever." Gregg had testified in court against his drug dealer and road manager, which the bandmates saw as a betrayal. After a three-year reunion that ended in 1982, they re-formed in 1989, and Betts soon became the driving force again, especially after Allman relapsed. "I have all the respect for Gregg Allman," says Betts. "He was a leader when it came to talent. Duh! But he was never the leader-type *personality*." But Betts wasn't easy to work with either. Tired of dealing with his bossiness, drinking issues and unpredictability, the three other founders — Allman, Jaimoe and Trucks — wrote him a letter after a series of rocky shows in 2000, saying he was out of the band until he sobered up. "He would say, 'I need to go get myself straight,' and that's what he would do," Jaimoe says. "This time he didn't do it. He didn't get fired. He quit."

Betts disagrees, saying he was kicked out thanks to "a whole clandestine business thing" that stemmed from the moment he asked manager Bert Holman for an audit of their finances. "Big fuckin' mistake on my part," Betts says. (Holman says he has no recollection of that request.) Whatever the case, Betts was awarded an undisclosed financial settlement and his walking papers. Betts neglects to discuss that period in detail ("I don't want to say anything bad about Gregg"), but he speculates that without all the dysfunction, the Allmans might have gotten even more popular — as revered as the Grateful Dead.

"After Jerry [Garcia] passed away, we were right in the position to move into that next-step thing," he says. "But everyone was fucking my band up. Gregg wanted horns. And it was just so crazy."

IT'S TIME TO HEAD TO BETTS' FAVORITE local bar, Mad Moe's. He gets in his pickup and pulls out of his gated driveway, passing a property called the Bay Preserve, a nonprofit center that hosts sports practices, weddings and other events. "They have 300 teenage kids come over there and they're arrogant as hell," Betts says. "They're driving down the road and

"Dickey wrote a lot of key songs and all those great instrumentals," he says, "but because the band was called the Allman Brothers Band, it was confusing for people."

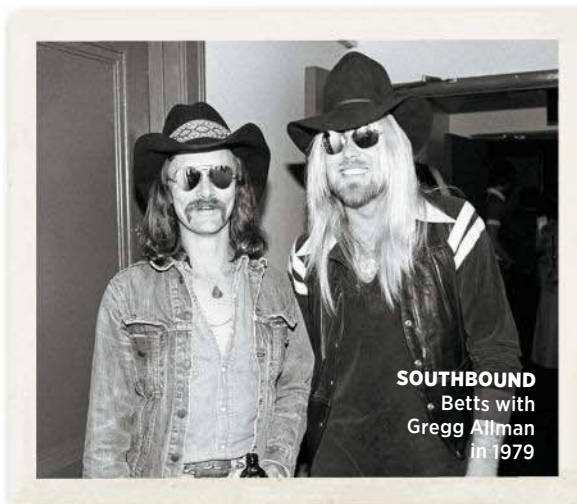
During their 40th-anniversary run in New York in 2009, Betts was presented with an opportunity to rejoin. Newer members Haynes and guitarist Derek Trucks had made the case he should be invited. But he felt the invitation was halfhearted — just three songs, at the last minute. "On one level, we were disappointed," says Holman. "On another, we were relieved. It was going to be a tense moment."

Betts once dubbed the later version of the Allmans "a tribute band," but is now more careful with his words. "Those guys are on the other side now," he says, referring to Butch Trucks and Allman. He dismisses rumors of bad blood with Allman, who made several less-than-flattering comments about Betts in his memoir *My Cross to Bear*. "That whole idea about me and Gregg not liking each other was bullshit. I liked the old fucker!"

Two years ago, Allman said he'd welcome a reunion with Betts, and the comment set off tentative plans for a joint tour. Allman's worsening health prevented it, but he was thinking about Betts to the end. Recording his final album, *Southern Blood*, Allman left a spot for a solo to be played by Betts. "Gregg wanted to tie up loose ends," says Don Was, who produced the LP. "[Dickey] was the last one."

Allman never got around to asking Betts to record that part, but the two did speak a few times in the weeks before Allman's death, their first conversations in 17 years. "Gregg could only whisper, but we got things worked out," Betts says. "We went through the court thing, so he thought I had it out for him. I had to let him know I didn't." Betts attended Allman's funeral; his son Duane says his father was very quiet.

Duane isn't convinced his father has retired. Dickey disagrees. He's financially secure thanks to a combination of real estate investments, licensing and a cut of Allmans merch. After Betts jovially flirts with waitresses at the bar, it's time to go home. The relentless Florida heat is pounding down. "I don't really go fuckin' outside until later on," he says. Arriving home, he steers past the gate and opens his front door. "I've had a great life and I don't have any complaints," he says. "I don't know what I would've done to make it different. There are lawsuits I probably could have dealt with better. But so what? You do the best with your amount of time."



"Dickey had a huge amount of soul, possible danger and recklessness behind his eyes," says Cameron Crowe. "He was a huge presence."

won't get out of your way. You work your whole life to get a place like this, and they're *renting!*"

The Bettises have long been irked by the Bay Preserve. In March, Betts' fifth wife, Donna, whom he married in 1989, grew so outraged that she pointed a rifle at a crew team as it paddled past their house. Charged with 18 counts of aggravated assault with a deadly weapon, Donna was sentenced to 90 days of rehab and 30 days in jail. "It's a crummy situation," Betts says. The incident was the latest bump since Betts parted ways with the Allmans. Betts figured on his own he could draw 5,000 fans and make \$20,000 a night. Instead, he wound up playing bars for a fifth that amount and staying in low-rent hotels. Haynes wonders if some fans might not have known Betts' role in the Allmans.

I WAS DELIGHTED AT THE ENERGY and grittiness of the live tracks,” Eagles singer-drummer Don Henley says of the previously unreleased concert recordings – from October 1976, at the Forum in L.A. – on the new 40th-anniversary reissue of the band’s fifth studio album and biggest seller, *Hotel California*. “We’re a year late, technically speaking,” Henley admits, noting that the LP’s original release was in December ’76. “But we had enough foresight to record those shows. I was surprised that we were doing songs from the album before it even came out. That was pretty ballsy.” Henley is speaking the day after a milestone in the Eagles’ touring life: their debut performance at Nashville’s country-radio landmark, the Grand Ole Opry. It was also the climax of the band’s first tour since the 2016 death of Henley’s co-founder, singer-guitarist Glenn Frey. “We’re taking it one step at a time,” Henley says of the reborn lineup with country star Vince Gill and Frey’s 24-year-old son, Deacon, on guitars and vocals. “But it isn’t so much about us as it is the songs. That’s what people come to hear.”

Last night at the Opry, Vince Gill dedicated “New Kid in Town” to Deacon. In fact, with Gill, there are two new kids in your band.

It was a no-brainer for us to get Vince into the band. Nobody else, other than Deacon, was even discussed. We had known Vince. Glenn played golf with him. And Vince was in a band called Pure Prairie League. They did a style of music similar to ours – country-influenced pop. He fit like a glove. And his personality is great. He’s just glad to be there. He’s probably the happiest guy onstage.

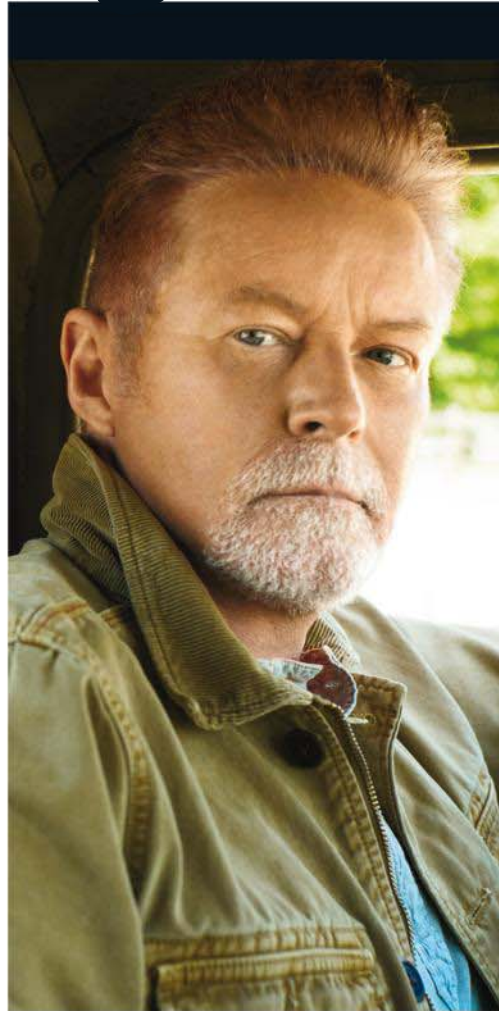
Deacon, in turn, had to grow up fast in his father’s shoes.

It’s extraordinary what that young man has done. I saw him sing “Peaceful Easy Feeling” at his father’s memorial service. As difficult as that must have been, he was so brave and composed. I’m sure, on the inside, he was churning. But he sang with poise and grace. After a few months went by, I thought, “Why not see if he would like to be in the band?”

Did you ever question whether it was right to continue without Glenn?

Yes, I did. The only way it felt justified to me was to have the family blood in the band. Deacon doesn’t sound like his father. He’s a good singer in his own right. And I have to hand it to him. We rehearsed for a couple of months. And his first gig with us was at Dodger Sta-

Q&A



Don Henley

On continuing the Eagles, 40 years of ‘Hotel California,’ and why the past always seems better than it really was

BY DAVID FRICKE

dium [at the Classic West festival in L.A. on July 15th]. He had done some gigs with his dad – private parties or clubs. To go from that to 55,000 people is extraordinary.

Did you have any advice for him before going onstage that day?

[Guitarist] Joe Walsh and I told him not to think about it too much – just concentrate on the job. It’s a double-edged sword for Deacon. He is honored to be carrying on his dad’s legacy. On the other hand, it reminds him poignantly of his dad, when he is sitting in dressing rooms where his dad sat, when he’s onstage where his dad was. There’s the wonderful part of it and the sadness that goes with it. I’ve told him that he doesn’t need to feel obligated to do this indefinitely, that he doesn’t have to stand in his father’s shadow. At some point, he may want to carve out his own future, and that’s just fine.

What is it like to play some of those Seventies hits – with that sardonic eye on consumerism and self-absorption – in the age of Trump? Most of this tour ran through the heart of his base: North Carolina, Georgia, Kentucky, Michigan.

Which is why we don’t speak about politics onstage. People have their own interpretation of these songs. A lot of people connect them to the past. And the past is always bathed in a golden light. It always looks better than it really was. I said something onstage last night: “This song is from 1974. You thought things were crazy then.” But that’s as far as I was gonna go. People can infer from that what they want. **The reissue of *Hotel California* is the first time you have given an Eagles album the bonus-tracks treatment. Is there anything else worthy of future reissues? *The Long Run* was originally supposed to be a double album.**

We’ve been through the vaults three or four times at the urging of the record label. There’s nothing else there. There were a few things that got started for *The Long Run*, but they didn’t have enough steam. They never got finished. If I had my way, they would never be released. Glenn wouldn’t want them out. **What are your plans for 2018: more touring, the studio?**

There is nothing etched in stone. Deacon wants to start writing. I think our management is holding some venues, as managers are wont to do. Everyone is so tired from the past two years, what we’ve been through, that we need a break. After the holidays, we will get together and talk about what we want to do. As Glenn used to say, we run this band on a yearly basis. That’s still the way it is.

50th

ANNIVERSARY

FLASHBACK

Life With Yeezus

Interviewing Kanye West was never easy. But for the staff of 'Rolling Stone,' spending time with the mad genius of modern hip-hop was always deeply fascinating

ON THE MORNING OF JULY 29TH, 2010, ROLLING STONE'S Twitter account sent out a message to Kanye West. "Hey Kanye!" it read. "Since you're in NYC, come visit the ROLLING STONE offices and rap for us!" West had been previewing songs from his upcoming album, *My Beautiful Dark Twisted Fantasy*, and writer Daniel Kreps thought he should play them for ROLLING STONE. "We did it as a joke," says Kreps, "not anticipating he'd respond or actually come to the office."

But the next day, West burst into ROLLING STONE'S midtown headquarters with a laptop full of unreleased music. For the next two hours, the most gifted, most complicated musician of his generation holed up in a small conference room packed beyond capacity with staffers. After a hilarious speech in which he talked about an internship at the Italian fashion label Fendi, explained the album and compared himself to Daniel Day-Lewis, West ripped off the jacket of his designer suit, leapt onto the conference room table and rapped along to much of *Dark Twisted Fantasy*. He sometimes got so close to staffers that they had to wipe his spittle off their faces. "He appeared to be actually weeping during 'Runaway,'" says editor Christian Hoard.

The visit was the most bizarre moment in ROLLING STONE'S relationship with West, which dates back to a short 2003 feature just ahead of the rapper's debut album. In that piece, and a handful of others, West proved himself an amazingly unfiltered interview, commenting on everything from his love of NoDoz to his belief that AIDS was created by the government. "He is stream-of-conscious," says writer Lola Ogunnaike. "He's so present, so raw, and that makes him a journalist's dream."

For his first ROLLING STONE cover, in 2006, West infuriated the religious right by posing as Christ for photographer David LaChapelle. Ogunnaike wrote the story after watching West obsessively work on a track for the *Mission: Impossible III* soundtrack in an L.A. studio. "He was so committed to getting every line, stanza or note right," Ogunnaike says. She finally got an interview – after watching him work for 13 hours. Writer Austin Scaggs had to wait even longer when he traveled to London

for another cover story in 2007. Scaggs accompanied West and Rihanna to a strip club and chilled with him backstage, but West was constantly distracted. After a week of this, Scaggs finally interviewed him during a five-hour drive across England. "He had no access to the Internet, and it was so dark he couldn't see out the window," says Scaggs. "Once I had his focus, he was unbelievable."

Weeks after the issue hit stands, West's mother, Donda, died suddenly. "I don't think he was fully able to process that loss," says Ogunnaike. "She'd been his emotional and mental anchor and his biggest cheerleader." After Donda's death, West talked to the press much less; several planned ROLLING STONE interviews collapsed at the last moment. "I was supposed to do a Q&A with him at one point," says Scaggs. "But the whole interview turned into a 40-minute conversation about why he didn't want to do the interview."

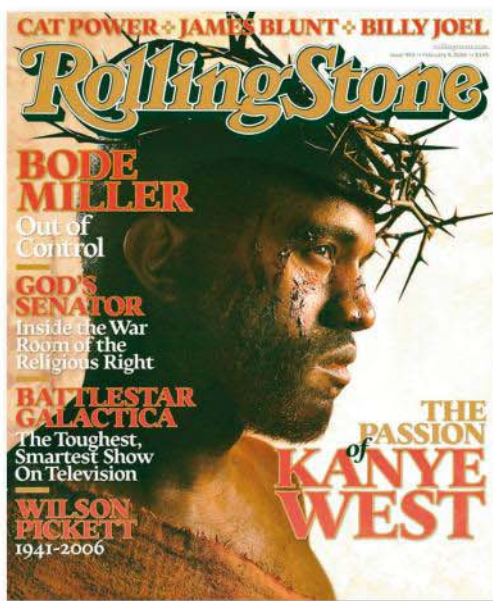
Setting up a story with West was a roller-coaster ride. "He wanted total control over the photo process," says former editor Nathan Brackett. "He also wanted to literally control every piece of type in the article." In 2016, West insisted that his friend Tyler, the Creator shoot his cover photo on his iPhone. After ROLLING STONE declined those terms, West posted the photo to Twitter with the ROLLING STONE logo on top and the baffling cover line KANYE: DOES HE LIKE MUSTARD? ROLLING STONE had to clarify with its own tweet: "While we love Kanye, and have many mustard-related questions for him, this is not an actual cover of ROLLING STONE."

(Kim Kardashian responded: "It Should Be...")

All of which makes West's openness during his office visit more remarkable. After playing his album, West began asking every person in the jammed room to tell him their favorite band or artist. With deadlines pressing, staffers began to excuse themselves. "His publicist was like, 'OK, we are going to go now,'" Kreps recalls. "So I never got to tell Kanye how much I loved the Beta Band."

"Kanye didn't want people to leave," says Brackett. "In a way, you could see it was kind of a metaphor for his whole career. He's this incredible genius, but the force of his personality would eventually wear you down. It's a shame he doesn't talk to the press anymore. He is one of the all-time great interviews."

ANDY GREENE



JESUS CHRIST POSE

"I can't even get endorsements now," West claimed after his controversial 2006 ROLLING STONE cover.

RandomNotes



The Obamas Take a Chance

As president, Barack Obama knew the power of music – he partnered up with everyone from Jay-Z to Bruce Springsteen to get his message out. That hasn't changed: Chance the Rapper headlined the inaugural Obama Foundation Summit, which brought community leaders to Chicago. Chance's set included "First World Problems," which touches on economic injustice and the Flint water crisis. Michelle Obama praised the rapper, saying she considers him a "baby brother."



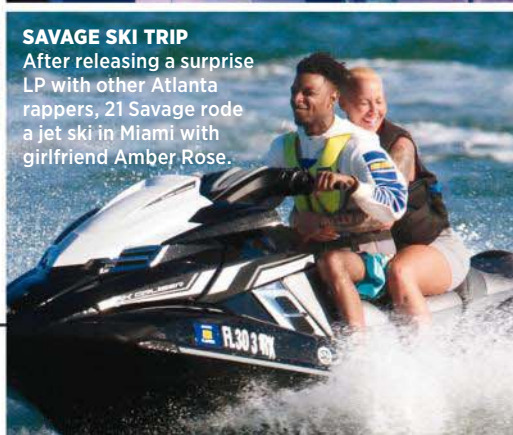
HONKY CATS

Bill Clinton helped Elton John celebrate 25 years of his AIDS foundation. Clinton gave a speech that referenced "Candle in the Wind": "We're all just flickering candles passing through," he said. "It's how we burn that matters."



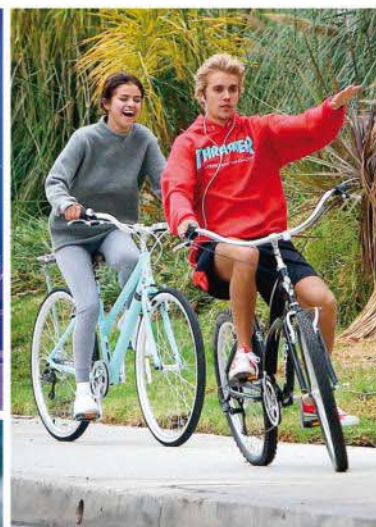
WITH THE BEATLE

Paul McCartney was a surprise guest at Steve Van Zandt's London gig, tearing through "I Saw Her Standing There." Van Zandt calls it "an endorsement of my life's work."



SAVAGE SKI TRIP

After releasing a surprise LP with other Atlanta rappers, 21 Savage rode a jet ski in Miami with girlfriend Amber Rose.



NEVER SAY NEVER

On-again, off-again couple Selena Gomez and Justin Bieber had some wholesome fun in L.A., just days after news got out that Gomez split with the Weeknd. Gomez recently said she has two albums' worth of new music ready.



BIG SPENDER

Days after *Migos'* Offset proposed to Cardi B onstage in Philadelphia with a \$550,000 ring, he continued celebrating in Memphis with friend Yo Gotti.



SHINY HAPPY PEOPLE Longtime friends Michael Stipe and Patti Smith hosted the Pathway to Paris benefit for environmental action, in New York. Smith dedicated her set "to the people of Texas" before welcoming Stipe to the stage for "People Have the Power."

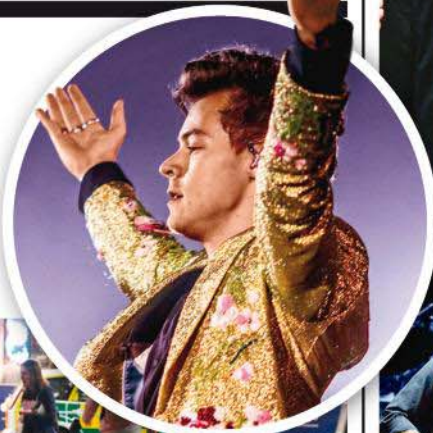


I'M YOUR MAN

Canadian Prime Minister Justin Trudeau hung out with Courtney Love and Lana Del Rey at a Leonard Cohen tribute in Montreal. "Canadians are so lucky," Love said. "He's dreamy."

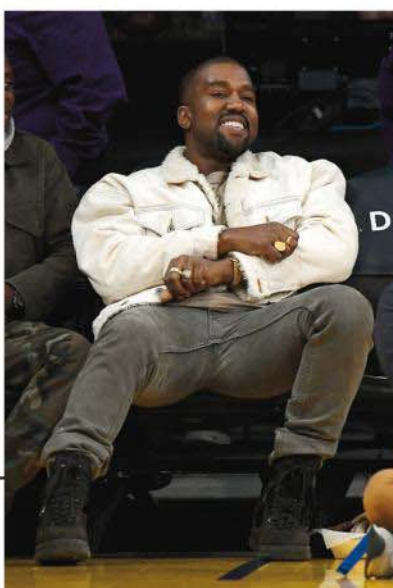
Harry-mania Hits London

Need more evidence that Harry Styles' solo tour is one of the hottest tickets of 2017? Just ask the fans (below) who spent days camping out to score prime spots for a recent show in London.



NEW KID IN TOWN

The Eagles rocked Nashville's Grand Ole Opry for the first time ever, with new recruit Deacon Frey (right). Don Henley (left) discusses the band's new chapter on page 22.



Ye Gets Loose

"Not smiling makes me smile," Kanye West once famously declared. Another thing that does the trick: watching the Lakers beat the Memphis Grizzlies! We're hoping his good mood leads to a 2018 LP; West reportedly spent time in a Wyoming studio this summer.

ANATOMY OF A FAKE-NEWS SCANDAL

Inside the web of conspiracy theorists, Russian operatives, Trump campaigners and Twitter bots who manufactured the 'news' that Hillary Clinton ran a pizza-restaurant child-sex ring

★ By Amanda Robb ★

THE REVELATIONS OVERCAME Edgar Maddison Welch like a hallucinatory fever. On December 1st, 2016, the father of two from Salisbury, North Carolina, a man whose pastimes included playing Pictionary with his family, tried to persuade two friends to join a rescue mission. Alex Jones, the InfoWars host, was reporting that Hillary Clinton was sexually abusing children in satanic rituals a few hundred miles north, in the basement of a Washington, D.C., pizza restaurant. Welch told his friends the "raid" on a "pedo ring" might require them to "sacrifice the lives of a few for the lives of many." A friend texted, "Sounds like we're freeing some oppressed pizza from the hands of an evil pizza joint." Welch was undeterred. Three days later, armed with an AR-15 semiautomatic rifle, a .38 handgun and a folding knife, he strolled into the restaurant and headed toward the back, where children were playing ping-pong. As waitstaff went table to table, whispering to customers to get out, Welch maneuvered into the restaurant's kitchen. He shot open a lock and found cooking supplies. He whipped open another door and found an employee bringing in fresh pizza dough. Welch did not find any captive children – Comet Ping Pong does not even have a basement – but he did prove, if there were any lingering doubts after the election, that fake news has real consequences.

Welch's arrest was the culmination of an election cycle dominated by fake news – and by attacks on the legitimate press. Several media outlets quickly traced the contours of what became known as Pizzagate:

The claim that Hillary Clinton was a pedophile started in a Facebook post, spread to Twitter and then went viral with the help of far-right platforms like Breitbart and InfoWars. But it was unclear whether Pizzagate was mass hysteria or the work of politicians with real resources and agendas. It took the better part of a year (and two teams of researchers) to sift through the digital trail. We found ordinary people, online activists, bots, foreign agents and domestic political operatives. Many of them were associates of the Trump campaign. Others had ties with Russia. Working together – though often unwittingly – they flourished in a new "post-truth" information ecosystem, a space where false claims are defended as absolute facts. What's different about Pizzagate, says Samuel Woolley, a leading expert in computational propaganda, is it was "retweeted and picked up by some of the most powerful faces of American politics."

The original Pizzagate Facebook post appeared on the evening of October 29th, 2016, a day after then-FBI Director James Comey announced that the bureau would

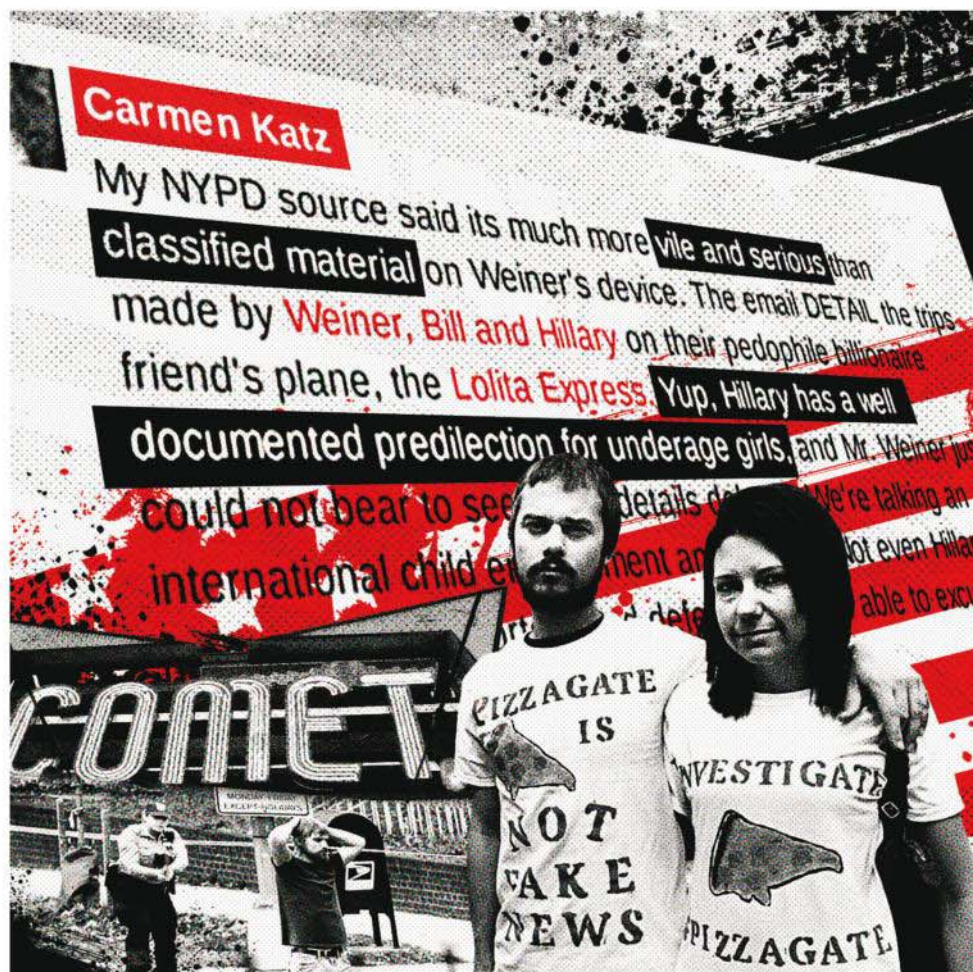
be reopening its investigation into Clinton's use of a private e-mail server while secretary of state. Data from the server had been found on electronics belonging to former Rep. Anthony Weiner (the husband of Clinton's close aide Huma Abedin), who had been caught texting lewd messages to a 15-year-old. On Facebook, a user named Carmen Katz wrote, "My NYPD source said its much more vile and serious than classified material on Weiner's device. The email DETAIL the trips made by Weiner, Bill and Hillary on their pedophile billionaire friend's plane, the Lolita Express. Yup, Hillary has a well documented predilection for underage girls.... We're talking an international child enslavement and sex ring."

Katz's Facebook profile listed her residence as Joplin, Missouri. With a link to a story headlined "Breaking: Hillary Clinton strategy memo leaked: 'Steal yard signs,'" Katz posted, "You know how we handle yard sign theft or tampering in South Missouri? With a 3 prong garden hoe buried in the middle of the back." We found no record of anyone with the name Carmen Katz in the entire state. But searching through her online activity, we noticed another clue: Every time she posted petitions on Change.org, such as "Put Donald Trump's Face on Mount Rushmore," the last signer was invariably Cynthia Campbell of Joplin. Campbell used the same profile picture as "Carmen Katz" on Facebook – that is, the same snapshot of the same cat.

For more than 20 years, a 60-year-old attorney named Cynthia Campbell has practiced law out of her bungalow-style home in Joplin. In April, I began trying to contact her, asking if she was behind the initial Pizzagate post. Within days, the Carmen Katz Facebook account disappeared. I went to Campbell's house to try

“WHAT WAS DIFFERENT ABOUT PIZZAGATE, SAYS A RESEARCHER, IS IT ‘WAS PICKED UP BY SOME OF THE MOST POWERFUL FACES OF U.S. POLITICS.’”

This story was reported with support from the Center for Investigative Reporting and the Investigative Fund.



DIGITAL HOAX Carmen Katz's Facebook post (above) likely set Pizzagate in motion. "Someone or some group possibly took this unwitting woman and made her the source that they need," says Watts.

in person. A large NRA sticker adorned the screen door; on the porch was feline statuary and gardening equipment, including a three-pronged hoe. She didn't answer but later texted and called me. Campbell said yes, she set up the Facebook account, but it was hacked two or three years ago. She never explicitly denied posting the comment that started Pizzagate. Instead, she told me to disregard the NRA sticker – she just “supports hunting.” She also claimed to be a rare Democrat in southwest Missouri. “You don’t say much,” she said. “You don’t stick signs out.”

Social-media accounts are routinely hacked, but the next morning, when Campbell texted me 21 times, she sounded every bit like the user behind the original Carmen Katz post. “Stalking and harassing innocent people who have done nothing to you is wrong, evil and illegal,” she wrote. “You should be helping people get their lives and health back going through such nightmares, not piling on, harassing them, making them feel unsafe and preyed upon.” She threatened to report me to both the ACLU and Best Buy’s Geek Squad. “[P]eople like you don’t give a shit that you

destroy innocent humans’ lives,” she said. “Go back to your soul-sucking job.... You are fake news!”

IT STRAINS THE IMAGINATION TO think how Campbell – a cat lady in Missouri – had pieced together not only the story that Clinton was a sex-trafficking pedophile, but its details: NYPD officials, Weiner’s laptop, Jeffrey Epstein’s private jet. According to Clint Watts, a cyber and homeland-security expert at the Foreign Policy Research Institute, Katz fits neatly into a well-worn blueprint for disinformation campaigns. For a story to gain traction, propagandists plant false information on anonymous chat boards, hoping real people will pick it up and add a “human touch” to acts of digital manipulation. “If you want to sow a conspiracy, you seed it someplace – 4chan or Reddit is a perfect vehicle,” he says, and wait for someone like Katz to take the bait. “Someone or some group,” Watts says, “possibly took this unwitting woman and made her the source that they need.”

On a pair of anonymous message boards, we found several possible seeds of Pizzagate.

On July 2nd, 2016, someone calling himself FBIAnon, who claimed to be a “high-level analyst and strategist” for the bureau, hosted an Ask Me Anything forum on 4chan. He claimed to be leaking government secrets – à la Edward Snowden – out of a love for country, but it wasn’t always clear which country he meant. At various times, he wrote, “Russia is more a paragon of freedom and nationalism than any other country” and “We are the aggressors against Russia.” FBIAnon’s secrets were about the Department of Justice’s inquiry into the Clinton Foundation, which federal prosecutors never formalized. “Dig deep,” he wrote. “Bill and Hillary love foreign donors so much. They get paid in children as well as money.”

“Does Hillary have sex with kidnapped girls?” a 4chaner asked.

“Yes,” FBIAnon answered.

Another possible germ of Pizzagate appeared online about 10 hours before Katz posted her story on Facebook. TheeRANT describes itself as a message board for “New York City cops speaking their minds.” Virtually everyone on the site uses an identity-masking screen name. Favorite topics include police body cameras (bad) and George Soros (worse).

On October 29th, 2016, someone calling himself “Fatoldman” posted that he had a “hot rumor” about the FBI investigation. “[T]he feds were forced to reopen the Hillary email case [because] apparently the NYPD sex crimes unit was involved in the weiner case,” Fatoldman wrote. “On his laptop they saw emails. [T]hey notified the FBI. Feds were afraid that NYPD would go public so they had to reopen or be accused of a coverup.”

Someone posted the news to a law-enforcement Facebook group. From there, a user called Eagle Wings (@NIVIsa4031) posted it to Twitter. Eagle Wings’ profile picture shows a smiling middle-aged woman above the description “USAF Vet believes Freedom Soars.” Among her more influential followers are former deputy assistant to President Trump Sebastian Gorka and former national security adviser Gen. Michael Flynn, who actually shared a separate Eagle Wings tweet last year. Eagle Wings’ enthusiastic following likely has something to do with membership in “Trump’s WarRoom,” a private group of online activists who share and amplify political messages. Participants told Politico’s

Shawn Musgrave that hundreds, perhaps even thousands, of pro-Trump rooms coalesced during the campaign. “The members aren’t stereotypical trolls,” Musgrave tells me. “Most are baby boomers.” A lot are women from the Midwest.

But Eagle Wings is not a typical political enthusiast, says Woolley, who directs research at the Institute for the Future’s Digital Intelligence Lab. She tweets too often (more than 50,000 times since November 2015) to too many followers (120,000 as of November 2017). “Without a shadow of a doubt,” he says, “Eagle Wings is a highly automated account [and] part of a bot network” – a centrally controlled group of social-media accounts. To explain how they work, Ben Nimmo, a fellow at the Atlantic Council’s Digital Forensic Research Lab, uses a shepherding analogy. “A message that someone or some organization wants to ‘trend’ is typically sent out by ‘shepherd’ accounts,” he says, which often have large followings and are controlled by humans. The shepherds’ messages are am-

On Twitter, @DavidGoldbergNY described himself as a “Jew, Lawyer & New Yorker.” The account went live around the time of the Republican National Convention, in July 2016, posting divisive tweets like “Attacking the 1 percent is attacking 43 percent of the Jewish community.” The account’s profile picture – a man with a nose Photoshopped to look very large and hooked – has been used online for more than a decade. Based on the limited threads that have been archived, Woolley says, @DavidGoldbergNY appears to have been, like Eagle Wings, “highly automated” and part of “an organized effort” – possibly a bot network – to spread disinformation. One of @DavidGoldbergNY’s tweets about the Katz Facebook post was retweeted 6,369 times.

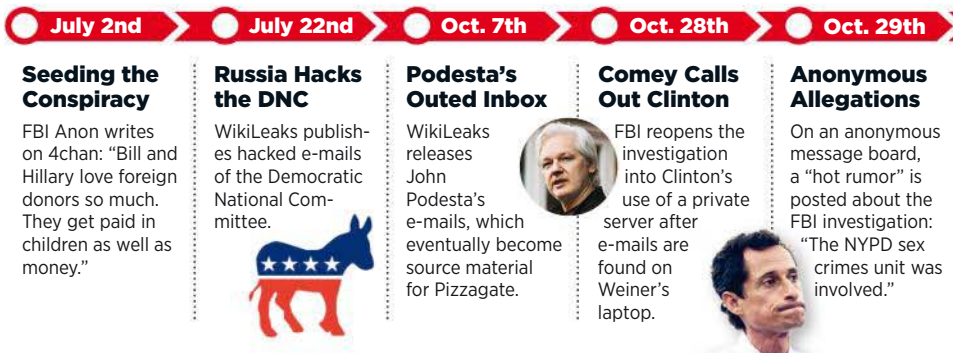
What’s nearly impossible to tell is who ran @DavidGoldbergNY. The handle is not among the 2,752 Twitter accounts linked to the Internet Research Agency, a disinformation shop run by the Kremlin, which the House Intelligence Committee

shared roughly 1.4 million times by more than a quarter of a million accounts in its first five weeks of life – from @DavidGoldbergNY’s tweet to the day Welch showed up at Comet Ping Pong. The vast majority of tweeters in our sample, just 10 percent of all possible hits, posted about the story only a few times. But more than 3,000 accounts in our set tweeted about Pizzagate five times or more. Among these were dozens of users who tweet so frequently – up to 900 times a day – that experts believe they were likely highly automated. Even more striking: 22 percent of the tweets in our sample were later deleted by the user. This could be a sign, Woolley says, of “someone sweeping away everything so that we can’t follow the trail.”

Next, we decided to cross-reference the most frequent Pizzagate tweeters with a list of 139 handles associated with Trump campaign staffers, advisers and surrogates. We also ran our entire sample against the list of accounts linked to Russia’s Internet Research Agency. We found that at least 15

THE LIFE OF A FAKE-NEWS STORY

How Pizzagate went from online rumors to the White House



plified by ‘sheepdog’ accounts, which are also run by humans but can be default-set “to boost the signal and harass critics.” At times, the shepherds personally steer conversations, but they also deploy automation, using a kind of Twitter cruise control to retweet particular keywords and hashtags. Together, Nimmo says, the shepherds and sheepdogs guide a herd of bots, which “mindlessly repost content in the digital equivalent of sheep rushing in the same direction and bleating loudly.”

Whether Katz repeated something a herd of bots was bleating, or repackaged tidbits found on other parts of the Internet, her Facebook post was the “human touch” that helped the fake news story go viral. The “tell,” says Watts, was what happened next. Most of us post into Internet oblivion. But about 12 hours after Katz shared her story, a Twitter user named @DavidGoldbergNY tweeted a screenshot of her post, twice – adding, “I have been hearing the same thing from my NYPD buddies too. Next couple days will be interesting!”

released in November. And Twitter has yet to make public the handles of an additional 36,746 bot accounts its attorney Sean Edgett told Congress have “characteristics we used to associate an account with Russia.” In any case, Russia is not the only one playing this game. “We’ve also had sources tell us that using bot networks has become a common practice among U.S. political campaigns,” says Woolley, a practice that is difficult to trace. “They do it with subcontractors,” he explains. “And the Federal Election Commission doesn’t require reporting for subcontractors.” One thing that does stand out, he adds, is “the more sophisticated bot nets, the ones that are successful at spreading stories, are built by people with a lot of resources. In our experience, across multiple different countries, the people that have deep pockets are the powerful political actors.”

ACCORDING TO A SAMPLE OF TWEETS with Pizzagate or related hashtags provided by Filippo Menczer, a professor of informatics at Indiana University, Pizzagate was

Russia-linked accounts had tweeted about Pizzagate, including @Pamela_Moore13, whose avatar is, aptly, an anonymous figure wrapped in an American flag; that account has been retweeted by such prominent Trump supporters as Donald Trump Jr., Ann Coulter and Roger Stone, the political operative who recommended Paul Manafort as Trump’s campaign manager. (Special Counsel Robert Mueller recently indicted Manafort for money-laundering as part of his investigation into possible collusion with Russian efforts to influence the presidential race.) “Well! Well! Well!” “Pamela Moore” tweeted on November 19th, 2016, above the fake news headline “FBI: Rumors About Clinton Pedophile Ring Are True.”

The campaign’s engagement went far deeper. We found at least 66 Trump campaign figures who followed one or more of the most prolific Pizzagate tweeters. Michael Caputo, a Trump adviser who tweeted frequently about Clinton’s e-mails, followed 146 of these accounts; Corey Stewart, Trump’s campaign chair in Virginia, who

lost a tight primary race for governor in June, followed 115; Paula White-Cain, Trump's spiritual adviser, followed 71; Pastor Darrell Scott, a prominent member of Trump's National Diversity Coalition, followed 33. Flynn's son, Michael Flynn Jr., who followed 58 of these accounts, famously took the bait and was ousted from the Trump transition team in early December after tweeting, "Until #Pizzagate proven to be false, it'll remain a story."

Many of the Pizzagate tweeters had the characteristics of political bots – Twitter handles made up of random or semirandom letters and numbers and twin passions for conservative politics and pets (puppies and kitties win audience, Watts says). Others were all too human. Crystal Kemp, a 50-year-old grandmother who lives in Confluence, Pennsylvania, tweeted about the story more than 4,000 times in five weeks. I reached out to her via Facebook to ask why. "Didn't want Hillary to win at any cost," Kemp tells me, "but liked Trump from day one. I don't really know

Macedonians' most common source material ("Breitbart was best"). Macedonians would've happily copied anti-Trump fake news too, he said. "Unfortunately, there weren't any good U.S. pro-Clinton fake-news sites to copy and paste."

That was exactly how the right-wing-media ecosystem worked during the 2016 campaign, explains Yochai Benkler, who directs the Berkman-Klein Center for the Internet and Society at Harvard. After the election, he and his colleagues mapped about 2 million campaign-news stories. He found that far-right-media outlets were organized extremely tightly around Breitbart and, to a lesser degree, FoxNews.com. "The right paid attention to right-wing sites, and the more right-wing they were, the more attention they got," Benkler says. More extreme sites would distort and exaggerate the claims, but they would use a "relatively credible source" such as Breitbart as a validator. "Because they were repeated not only on the very far-fringe sites but also by sites that are

The story took off. Google Trends measures interest in topics among the 1.17 billion users of its search engine on a 0-100 scale. On October 29th, the day Katz posted the story on Facebook, searches for "Hillary" and "pedophile" ranked zero. Ninety-six hours later, when Hagmann "broke" the story on InfoWars, they scored 100.

In April, Hagmann agreed to meet with me for a look at his "courtroom-ready" documents on Pizzagate. His split-level home in Erie, Pennsylvania, is on a quiet leafy street. In the front yard, there's a small waterfall, a rock garden and a large sign warning that the place is under surveillance. He greeted me in the foyer wearing a suit and tie, his hair slicked back with Brylcreem, and led the way downstairs to his basement broadcast center.

In October 2016, Hagmann claimed, he "communicated" with a friend who knows someone affiliated with the NYPD. The friend of the friend had been on the "task force" that secured Weiner's computer and had copied documents onto a thumb drive



Oct. 29th First Mention on Facebook

Carmen Katz is the first identifiable human on Facebook to suggest the NYPD has evidence of Clinton and pedophilia.

Oct. 30th Fake Intel Goes Viral

On Twitter, @DavidGoldbergNY's tweet of the Katz post is retweeted 6,396 times.



Nov. 2nd Story Breaks on InfoWars

Douglas Hagmann tells Alex Jones on InfoWars that "Clinton did in fact participate on some of the junkets on the Lolita Express."

Nov. 4th Hashtag Is Launched

#Pizzagate goes from goofy posts about Trump eating pizza with a knife and fork to the name of Clinton's sex conspiracy.



Nov. 4th Breitbart Airs Its Scoop

Erik Prince tells a Breitbart interviewer, "Hillary went to this sex island with convicted pedophile Jeffrey Epstein."

Nov. 16th Pizzagate Goes Global

Turkish journalist's tweet goes viral: "USA #PizzaGate shaken by the pedophilia scandals."



Dec. 4th Edgar Welch Opens Fire

Edgar Maddison Welch visits Comet Ping Pong with an AR-15 rifle and shoots open a locked closet of kitchen supplies.

that much about the Pizzagate thing. Everything I tweeted or retweeted was stuff that I found through my own research or from another follower."

Kemp tweeted links to articles from well-known right-wing sites like Fox News and Breitbart. But she also shared stories from obscure outlets like ConservativeDailyPost.com, which appears to be among the fake-news sites that operated from Macedonia during the election. BuzzFeed had found that teenagers in the deindustrialized town of Veles published pro-Trump stories because they were profitable as click-bait. When I traveled to Macedonia last summer, Borce Pejcev, a computer programmer who has set up dozens of fake-news sites – for around 100 euros each – said it wasn't quite that simple. Macedonians don't invent fake news stories, he told me. "No one here knows anything about American politics. They copy and paste from American sites, maybe try to come up with more dramatic headline." Fox News, TruePundit.com, DailyCaller.com, InfoWars and Breitbart, he said, were among the

at the center of this cluster, the right-wing disinformation circulated and amplified very quickly."

DOUGLAS HAGMANN IS A SELF-employed private investigator and host of HagmannReport.com, a webcast that exposes the "New World Order agenda." It was Hagmann who – four days after Carmen Katz first posted the story and six days before Election Day – brought Pizzagate from social media to fake news' largest stage. On the November 2nd broadcast of InfoWars, arguably the most influential conspiracy-theory outlet in the country, with 7.7 million unique visitors to its website a month, Alex Jones asked Hagmann to tell his audience what sources had revealed about the e-mails recovered on Weiner's computer. "[T]he most disgusting aspect of this is the sexual angle," Hagmann said. "I don't want to be graphic or gross here.... Based on my source, Hillary did in fact participate on some of the junkets on the Lolita Express."

"proving" Clinton and her associates were involved in pedophilia. "Now, I can't get him to give me the thumb drive," he said. "Or even admit to the fact that he had it." When I asked how he knew the files existed, he said, "I trust my source."

Hagmann then launched into a synopsis of three decades of rumors that Clinton and her associates are lesbians and perverts. He started with the claims of Cathy O'Brien, a conspiracy theorist from Muskegon, Michigan, who alleged that while held as a CIA sex slave, she was forced to service Hillary Clinton. Hagmann moved on to Clinton's "close" relationship with Weiner's estranged wife, and the allegation that her campaign manager, John Podesta, and his brother Tony resemble sketches of the suspects in the 2007 disappearance of four-year-old Madeleine McCann in Portugal. "Sorry," Hagmann stopped himself. "I know this case is difficult. Circumstantial."

When I asked if he had verified anything, Hagmann shuffled some papers, lifting one sheet by a corner, like a poker play-

er. With apparent reluctance, he turned over a color copy of an image showing a clean, uninjured boy wearing a green T-shirt in a dog cage. The child could have been playing or held hostage. "That might be a disturbing image," I said. "But I don't see what it has to do with Hillary Clinton." He shrugged. "You could say I have dog crap for answers and dog crap for sources," he said, adding later, "I hope you don't think this was a waste."

The following month, at Awaken to the Shakin', a Bible conference in Gurnee, Illinois, Hagmann presented his evidence to an audience of about 40 middle-aged churchgoers. His courtroom-ready exhibits included the Wikipedia entry for "fake news," the New Oxford Dictionary definition of "post-truth," a quote by John Wayne, a photo of people sitting on a couch wearing horse masks, a photo of scars on the fingers of John Podesta. And the kicker – a photo of a decapitated body that Hagmann said was a victim of serial killer Jeffrey Dahmer and another of a sculpture by Louise Bourgeois in Tony Podesta's home, ironically titled "The Arch of Hysteria." The two images, he said, are shockingly similar.

fumed, "When I think about all the children Hillary Clinton has personally murdered and chopped up and raped...yeah, you heard me right. Hillary Clinton has personally murdered children." Jones' video was viewed on YouTube more than 427,000 times. Prince's interview was shared another 81,000 times. On Twitter, the numbers were increasing exponentially – 300 percent in just six days.

LONG BEFORE OCTOBER 28TH, 2016, when Comey wrote to Congress that the FBI would be re-examining Clinton's use of a private e-mail server, her campaign knew they had a huge e-mail problem. In focus groups, voters conflated the case with the e-mails Russian operatives had hacked from the Democratic National Committee and Podesta, her campaign manager. Though U.S. intelligence agencies now agree that a Kremlin-associated group, Fancy Bear, hacked the e-mails – which WikiLeaks began posting less than an hour after *The Washington Post* published Trump's "grab them by the pussy" video – a senior Clinton campaign staffer tells me, "There was

ton "is an abject, psychopathic demon from hell," who "smell[s] like sulfur," he went straight into Podesta's office at the campaign's Brooklyn headquarters. "You're not going to believe it," the aide told him. "Now you're a fucking witch."

It got even weirder after users on 8chan read a Podesta e-mail that revealed that Democratic activist David Brock had dated the owner of Comet Ping Pong pizzeria, James Alefantis. The citizen investigators considered Brock their archenemy – he'd founded Correct the Record, a Super PAC that defended Clinton against defamation by online trolls. Suddenly, they saw sinister meaning in any mention of pizza; for instance, the first letters in the words "cheese pizza" are the same as in "child porn."

Until November 2016, the Pizzagate hashtag had mostly referred to Trump's use of a fork and knife to eat pizza. But on November 4th, two days after Hagmann's appearance on InfoWars, Cassandra Fairbanks, then a reporter for Sputnik News (which U.S. intelligence says spreads Kremlin-directed disinformation), tweeted, "I've literally spent the last hour wondering if podesta ingested sperm

“THE RUSSIANS DON'T CREATE THIS WHOLE MOVEMENT, THEY JUST HARNESS IT,” SAYS WATTS. “WHEN YOU DON'T KNOW WHAT TO BELIEVE, YOU'LL BELIEVE ANYTHING.”

All the same, two days after Hagmann's appearance on InfoWars, Erik Prince, the brother of Trump's secretary of education, Betsy DeVos, "confirmed" that the terrible rumor was true in an interview on Breitbart. Prince is best known as the founder of the private military company Blackwater USA, whose mercenaries shot and killed 17 unarmed Iraqi civilians in Baghdad's Nisour Square in 2007. He donated \$250,000 to the Trump campaign and became an informal adviser on intelligence and security issues, traveling to the Seychelles during the transition to meet with a Kremlin associate in an attempt to create back-channel communications between Moscow and the president-elect. On Breitbart radio, Prince painted a picture sure to stir the far right. "Because of Weingate and the sexting scandal, the NYPD started investigating," he said. "They found a lot of other really damning criminal information, including money-laundering, including the fact that Hillary went to this sex island with convicted pedophile Jeffrey Epstein. Bill Clinton went there more than 20 times. Hillary Clinton went there at least six times."

The right-wing-media system went into overdrive. Prince's story was picked up and embellished by other right-wing outlets, and made its way back to InfoWars that afternoon. Citing Prince's interview, Jones

just more voyeuristic interest in the content of the e-mails than in how they were obtained."

The confusion was encouraged online by the likes of @DavidGoldbergNY. The e-mails on Weiner's laptop had nothing to do with Podesta's Gmail account, but one of his tweets of the Katz post included #podestaemails23. "That hashtag is a flag," Woolley says. "It suggests that @DavidGoldbergNY is attempting to get people to look at something." On message boards, amateur sleuths searched for encoded evidence in the Podesta e-mails. A particular source of fascination was an invitation from the performance artist Marina Abramovic for Podesta to attend a "Spirit Cooking dinner." Allegations started circulating that Clinton consumed semen, breast milk and menstrual blood.

The story still hadn't penetrated Clinton's campaign headquarters. They'd become inured to the avalanche of fake news – the rumors that she was on her deathbed, funding ISIS, even dissed by the pope. But when a Clinton campaign staffer noticed "Podesta Spirit Cooking Emails Reveal Clinton's Inner Circle as Sex Cult with Connections to Human Trafficking" on DangerandPlay.com become "Podesta Practices Occult Magic" on the Drudge Report, and then saw Alex Jones shouting that Clin-

ton "is an abject, psychopathic demon from hell," who "smell[s] like sulfur," he went straight into Podesta's office at the campaign's Brooklyn headquarters. "You're not going to believe it," the aide told him. "Now you're a fucking witch."

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shared Pizzagate tweets was posted by the anchor on November 16th. Roughly translated, it reads, “USA #PizzaGate shaken by the pedophilia scandals.”

Among the users who picked up the thread was Jack Posobiec, a well-known alt-right troll whom Trump himself has retweeted. During the campaign, Posobiec was special-projects director for Citizens for Trump, a never-officially-organized voter-fraud prevention group. Several hours after Önel sent his November 16th tweet, Posobiec went to investigate Comet

clined to comment for this story.) When the restaurant started getting death threats, Alefantis called the police, then the FBI, and got nowhere. “It turns out you can say anything about anyone online,” he says. “It’s your First Amendment right to terrorize.”

Alefantis thought he’d finally scored a victory when *The New York Times* published an article debunking Pizzagate. He learned what the Clinton campaign found out too late. As Harvard’s Benkler puts it, “The right-wing-media ecosystem had become so hyperpartisan, so self-referential

only increased our number. This morning we were numerous, tonight we are legion.” About 145,000 tweets flew that day.

The next day, InfoWars posted a video called “Pizzagate Is Real.” On November 27th, Jones spent a half-hour explaining the story. “Something’s being covered up,” he told his audience. “All I know is, God help us, we’re in the hands of pure evil.” Hours later, he released another video, “Down the #Pizzagate Rabbit Hole.” On December 1st, the show posted “Pizzagate: The Bigger Picture.” In North Carolina, Edgar Maddison Welch was obsessively watching much of this coverage. By the evening of December 4th, he was in solitary confinement in a Washington, D.C., jail.

Nearly a year after the election, in three separate hearings with members of Congress, executives from Twitter, Facebook and Google took turns expressing contrition for hosting Russia’s attempts to manipulate U.S. public opinion. A Facebook vice president said it “pains us as a company” that foreign actors “abused our platform.” Twitter’s general counsel said he too was “troubled” that the power of Twitter was misused.

“There was this concept of ‘Social media is going to save democracy,’” Woolley tells me. “Twitter didn’t envision that powerful political actors were going to use social media in attempts to spread propaganda.” Among the many strange aspects of Pizzagate was the fact that the story went viral after the election. All of the Russia-linked tweets we found were sent after November 8th. Bot networks appear to be tweeting out the hashtag to this day. Woolley suggests it could be an attempt to “bolster” Trump’s position, to “win over people’s hearts and minds.” Clinton had lost the presidency, he says, but “she was not done in terms of her ability to be a representative of democratic ideals, or of the ideals that were oppositional to Donald Trump.”

Watts, the cyber-security expert, doesn’t know if Russia and the Trump campaign colluded on Pizzagate, or anything else. But both camps were clearly opportunistic. “You can’t say that there was no indigenous support,” he says. “The Russians don’t create this whole [alt-right] movement. They just harness it.” Of course, so did Trump. But Watts believes the Russians, at least, are playing for much higher stakes than one presidential election. “The goal is to create division between communities,” he says. “It is making you not trust the state. It’s eroding the mandate of elected officials so that they can’t govern properly. It’s making people want to not participate in democracy because they think it’s corrupt. It’s getting you to either believe that it’s all stacked against you or you just opt out altogether because you don’t know what to believe. When you don’t know what to believe, you’ll believe anything.”



DISINFORMATION AGE Alex Jones’ InfoWars (above) covered Pizzagate before and after the election. “Hillary Clinton has personally murdered children,” the host told his audience.

Ping Pong and another nearby pizzeria. Live-streaming the visit on Periscope, he described evidence of “what’s really going on” – a double pane of glass near an oven, security cameras, a texting cashier. Posobiec paused, worrying his viewers might not understand the situation. “It’s like in the movie *Jurassic Park*,” he said. “Nedry had the shaving cream bottle. And you could press the top and a little bit of shaving cream came out.... The bottom part is where they had the dinosaur embryos.”

The Twittersphere went wild. The previous day, our sample indicates there were roughly 6,000 tweets about Pizzagate. Now, it was closer to 55,000. Alefantis tried and failed to get Facebook and Twitter to remove the posts. (Both companies de-

and so superinsular it often simply ignored information that’s disconfirming.” Instead, right-wing social media referenced mainstream coverage as a way to “legitimate” their claims. On November 21st, the day the *Times* published its story, our sample shows Twitter traffic about Pizzagate hit unprecedented levels: some 120,000 tweets.

Trolls on message boards began posting whole “dossiers” of private information about Comet Ping Pong employees and top Democrats, down to the movies that Podesta ordered on Netflix. On November 22nd, when Reddit banned a Pizzagate subreddit for posting obviously stolen private information, a moderator responded, “We have all made life insurance videos. We have all vowed to continue this fight. You have



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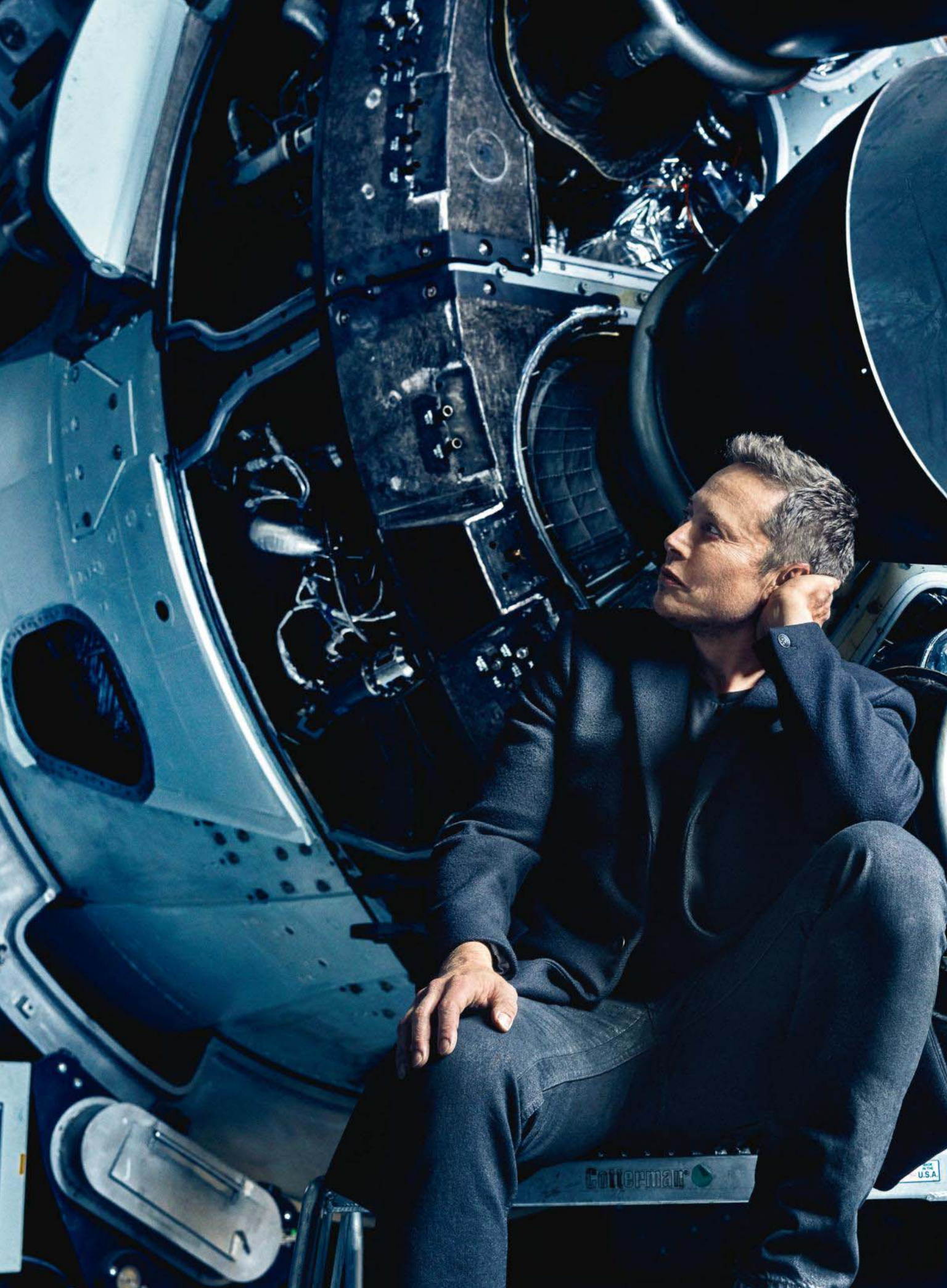


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*The world-
changing
ambition and
lonely heart
of Elon Musk*

BY NEIL STRAUSS

PHOTOGRAPH BY
MARK SELIGER

ROCKET MAN
Musk at SpaceX
in Hawthorne,
California, this fall

IT'S MID-AFTERNOON ON A Friday at SpaceX headquarters in Hawthorne, California, and three of Elon Musk's children are gathered around him – one of his triplets, both of his twins.

Musk is wearing a gray T-shirt and sitting in a swivel chair at his desk, which is not in a private office behind a closed door, but in an accessible corner cubicle festooned with outer-space novelty items, photos of his rockets, and mementos from Tesla and his other companies.

Most tellingly, there's a framed poster of a shooting star with a caption underneath it that reads, "When you wish upon a falling star, your dreams can come true. Unless it's really a meteor hurtling to the Earth which will destroy all life. Then you're pretty much hosed, no matter what you wish for. Unless it's death by meteorite."

To most people, this would be mere dark humor, but in this setting, it's also a reminder of Musk's master plan: to create habitats for humanity on other planets and moons. If we don't send our civilization into another Dark Ages before Musk or one of his dream's inheritors pull it off, then Musk will likely be remembered as one of the most seminal figures of this millennium. Kids on all the terraformed planets of the universe will look forward to Musk Day, when they get the day off to commemorate the birth of the Earthling who single-handedly ushered in the era of space colonization.

And that's just one of Musk's ambitions. Others include converting automobiles, households and as much industry as possible from fossil fuels to sustainable energy; implementing a new form of high-speed city-to-city transportation via vacuum tube; relieving traffic congestion with a honeycomb of underground tunnels fitted with electric skates for cars and commuters; creating a mind-computer interface to enhance human health and brainpower; and saving humanity from the future threat of an artificial intelligence that may one day run amok and decide, quite rationally, to eliminate the irrational human species.

Contributing editor NEIL STRAUSS wrote about "Rick and Morty" in 2015.

So far, Musk, 46, has accomplished none of these goals.

But what he has done is something that very few living people can claim: Pains-takingly bulldozed, with no experience whatsoever, into two fields with ridiculously high barriers to entry – car manufacturing (Tesla) and rocketry (SpaceX) – and created the best products in those industries, as measured by just about any meaningful metric you can think of. In the process, he's managed to sell the world on his capability to achieve objectives so lofty that from the mouth of anyone else, they'd be called fantasies.

At least, most of the world. "I'm looking at the short losses," Musk says, transfixed by CNBC on his iPhone. He speaks to his kids without looking up. "Guys, check this out: Tesla has the highest short position in the entire stock market. A \$9 billion short position."

His children lean over the phone, looking at a table full of numbers that I don't understand. So his 13-year-old, Griffin, explains it to me: "They're betting that the stock goes down, and they're getting money off that. But it went up high, so they lost an insane amount of money."

"They're jerks who want us to die," Musk elaborates. "They're constantly trying to make up false rumors and amplify any negative rumors. It's a really big incentive to lie and attack my integrity. It's really awful. It's..."

He trails off, as he often does when preoccupied by a thought. I try to help: "Unethical?"

"It's..." He shakes his head and struggles for the right word, then says softly, "Hurtful."

It is easy to confuse who someone is with what they do, and thus turn them into a caricature who fits neatly into a storybook view of the world. Our culture always needs villains and heroes,

fools and geniuses, scapegoats and role models. However, despite opinions to the contrary, Elon Musk is not a robot sent from the future to save humanity. Nor is he a Silicon Valley savant whose emotional affect has been replaced with supercomputer-like intelligence. Over the course of nine months of reporting, watching Musk do everything from strategize Mars landings with his rocket-engineering team to plan the next breakthroughs with his artificial-intelligence experts, I learned he is someone far, far different from what his myth and reputation suggest.

The New York Times has called him "arguably the most successful and important entrepreneur in the world." It's an easy case to make: He's probably the only person who has started four billion-dollar companies – PayPal, Tesla, SpaceX and Solar City. But at his core, Musk is not a businessman or entrepreneur. He's an engineer, inventor and, as he puts it, "technologist." And as a naturally gifted engineer, he's able to find the design inefficiencies, flaws and complete oversights in the tools that power our civilization.

"He's able to see things more clearly in a way that no one else I know of can understand," says his brother, Kimbal. He discusses his brother's love of chess in their earlier years, and adds, "There's a thing in chess where you can see 12 moves ahead if you're a grandmaster. And in any particular situation, Elon can see things 12 moves ahead."

HIS CHILDREN SOON LEAVE FOR the home of their mother, Musk's ex-wife Justine. "I wish we could be private with Tesla," Musk murmurs as they exit. "It actually makes us less efficient to be a public company."

What follows is...silence.

Musk sits at his desk, looking at his phone, but not typing or reading anything. He then lowers himself to the floor, and stretches his back on a foam roller. When he finishes, I attempt to start the interview by asking about the Tesla Model 3 launch a week earlier, and what it felt like to stand onstage and tell the world he'd just pulled off a plan 14 years in the making: to bootstrap, with luxury electric cars, a mass-market electric car.

The accomplishment, for Musk, is not just in making a \$35,000 electric car; it's in making a \$35,000 electric car that's so good, and so in-demand, that it forces other car manufacturers to phase out gas cars to compete. And sure enough, within two months of the launch, both GM and Jaguar Land Rover announced they were planning to eliminate gas cars and go all-electric.

Musk thinks for a while, begins to answer, then pauses. "Uh, actually, let me go to the restroom. Then I'll ask you to repeat that question." A longer pause. "I also have to unload other things from my mind."

Five minutes later, Musk still hasn't returned. Sam Teller, his chief of staff, says, "I'll be right back."

Several minutes after that, they both reappear and huddle nearby, whispering to each other. Then Musk returns to his desk.

"We can reschedule for another day if this is a bad time," I offer.

Musk clasps his hands on the surface of the desk, composes himself, and declines.



I WAS TOLD THIS IS IMPOSSIBLE," MUSK SAYS OF TESLA. "BUT I HAVE A CAR. YOU CAN DRIVE IT. THIS IS NOT A FRIGGING UNICORN."





The Visionary

(1) Musk with the Tesla Model 3 this year. (2) In 1998, he founded PayPal with Peter Thiel. (3) Inspecting the Hyperloop, which will transport people from city to city in record time.



"It might take me a little while to get into the rhythm of things."

Then he heaves a sigh and ends his effort at composure. "I just broke up with my girlfriend," he says hesitantly. "I was really in love, and it hurt bad."

He pauses and corrects himself: "Well, she broke up with me more than I broke up with her, I think."

Thus, the answer to the question posed earlier: It felt unexpectedly, disappointingly, uncontrollably horrible to launch the Model 3. "I've been in severe emotional pain for the last few weeks," Musk elaborates. "Severe. It took every ounce of will to be able to do the Model 3 event and not look like the most depressed guy around. For most of that day, I was morbid. And then I had to psych myself up: drink a couple of Red Bulls, hang out with positive people and then, like, tell myself: 'I have all these people depending on me. All right, do it!'"

Minutes before the event, after meditating for pretty much the first time in his life to get centered, Musk chose a very telling song to drive onstage to: "R U Mine?" by the Arctic Monkeys.

Musk discusses the breakup for a few more minutes, then asks, earnestly, deadpan, "Is there anybody you think I should date? It's so hard for me to even meet people." He swallows and clarifies, stammering softly, "I'm looking for a long-term relationship. I'm not looking for a one-night stand. I'm looking for a serious companion or soulmate, that kind of thing."

I eventually tell him that it may not be a good idea to jump right into another relationship. He may want to take some time to himself and figure out why his previous relationships haven't worked in the long run: his marriage to writer Justine Musk, his marriage to actress Talulah Riley, and this new breakup with actress Amber Heard.

Musk shakes his head and grimaces: "If I'm not in love, if I'm not with a long-term companion, I cannot be happy."

I explain that needing someone so badly that you feel like nothing without them is textbook codependence.

Musk disagrees. Strongly. "It's not true," he replies petulantly. "I will never be happy

without having someone. Going to sleep alone kills me." He hesitates, shakes his head, falters, continues. "It's not like I don't know what that feels like: Being in a big empty house, and the footsteps echoing through the hallway, no one there – and no one on the pillow next to you. Fuck. How do you make yourself happy in a situation like that?"

There's truth to what Musk is saying. It is lonely at the top. But not for everyone. It's lonely at the top for those who were lonely at the bottom.

"When I was a child, there's one thing I said," Musk continues. His demeanor is stiff, yet in the sheen of his eyes and the trembling of his lips, a high tide of emotion is visible, pushing against the retaining walls. "I never want to be alone." That's what I would say. His voice drops to a whisper. "I don't want to be alone."

A ring of red forms around his eyes as he stares forward and sits frozen in silence. Musk is a titan, a visionary, a human-size lever pushing forward massive historical inevitabilities – the kind of person who comes around only a few times in a century – but in this moment, he seems like a child who is afraid of abandonment. And that may be the origin story of Musk's superambitions, but more on that later. In the meantime, Musk has something he'd like to show me.

"If you say anything about what you're about to see, it would cost us billions," he says, rising from his desk. "And you would be put in jail."

THE MOST INTERESTING TOURIST attraction in Los Angeles County is one that's not in many guidebooks: It's in the otherwise-untouristed southwestern city of Hawthorne, around SpaceX.

If you walk along Crenshaw Boulevard from Jack Northrop Boulevard to 120th Street, what you will see is a city of the future that's under construction. This is Musk city, an alternate reality, a triumph of futuristic imagination more thrilling than anything at a Disney park. On the west side of the street, a 156-foot-tall rocket towers above SpaceX headquarters, symbolizing Musk's dream of relatively low-cost interplanetary travel. This particular rocket booster was the first in human history to be launched into space, then recovered intact on Earth after separating, and then fired back into space.

On the east side of the street, an employee parking lot has been dug up and turned into the first-ever tunnel for the Boring Company, Musk's underground-honeycomb solution to traffic jams and the

future home of all his terrestrial transportation projects. Then, running for a mile beside Jack Northrop Boulevard, there's a white vacuum tube along the shoulder of the road. This is the test track for the Hyperloop, Musk's high-speed form of city-to-city travel. Taken together, the dreams of Musk city promise to connect the planet and the solar system in ways that will fundamentally change humanity's relationship to two of the most important facets of its reality: distance and time.

But there is a particular building in Musk city that few have visited, and this is where Musk takes me. It is the Tesla Design Studio, where he's slated to do a walk-through of the Tesla Truck and other future vehicle prototypes with his team of designers and engineers.

Outside the door, a guard takes my phone and audio recorder, and I'm given an old-fashioned pen and paper to take notes on. Musk then continues into the building and reveals the Tesla Truck, which aims to help the trucking industry go green. (Musk has even been toying with creating a supersonic electric jet, with vertical takeoff and landing, in the future.) Four key members of the Tesla team are there – Doug Field, JB Straubel, Franz von Holzhausen, Jerome Guillen – and watch with anticipation as Musk explores a new configuration of the cab for the first time.

Guillen explains the idea behind the truck: "We just thought, 'What do people want? They want reliability. They want the lowest cost. And they want driver comfort.' So we reimagined the truck."

This is a perfect example of the idea that Musk-inspired wanna-be visionaries around the world worship like a religion: first-principles thinking. In other words, if you want to create or innovate, start from a clean slate. Don't accept any ideas, practices or standards just because everyone else is doing them. For instance, if you want to make a truck, then it must be able to reliably move cargo from one location to another, and you must follow existing laws of physics. Everything else is negotiable, including government regulations. As long as you remember that the goal isn't to reinvent the truck, but to create the best one, whether or not it's similar to past trucks.

As a result of this type of thinking, Musk is able to see an industry much more objectively than others who've been in the field their whole lives.

"I was literally told this is impossible and I'm a huge liar," Musk says of the early days of Tesla. "But I have a car and you can drive it. This is not like a frigging unicorn. It's real. Go for a drive. It's amazing. How can you be in denial?"

An unfortunate fact of human nature is that when people make up their mind about something, they tend not to change it – even when confronted with facts to the contrary. "It's very unscientific," Musk says. "There's this thing called physics, which is this scientific method that's really quite effective for figuring out the truth."

The scientific method is a phrase Musk uses often when asked how he came up with an idea, solved a problem or chose to start a business. Here's how he defines it for his purposes, in mostly his own words:

1. Ask a question.
2. Gather as much evidence as possible about it.
3. Develop axioms based on the evidence, and try to assign a probability of truth to each one.
4. Draw a conclusion based on cogency in order to determine: Are these axioms correct, are they relevant, do they necessarily lead to this conclusion, and with what probability?

5. Attempt to disprove the conclusion. Seek refutation from others to further help break your conclusion.

6. If nobody can invalidate your conclusion, then you're probably right, but you're not certainly right.

"That's the scientific method," Musk concludes. "It's really helpful for figuring out the tricky things."

But most people don't use it, he says. They engage in wishful thinking. They ignore counterarguments. They form conclusions based on what others are

doing and aren't doing. The reasoning that results is "It's true because I said it's true," but not because it's objectively true.

"The fundamental intention of Tesla, at least my motivation," Musk explains in his halting, stuttering voice, "was to accelerate the advent of sustainable energy. That's why I open-sourced the patents. It's the only way to transition to sustainable energy better."

"Climate change is the biggest threat that humanity faces this century, except for AI," he continues. "I keep telling people this. I hate to be Cassandra here, but it's all fun

and games until somebody loses a fucking eye. This view [of climate change] is shared by almost everyone who's not crazy in the scientific community."

For the next 20 minutes, Musk examines the Tesla Truck. He comments first on the technical details, even ones as granular as the drawbacks and advantages of different types of welding. He then moves on to the design, specifically a driver-comfort feature that cannot be specified here, due to said threatened jail time.

"Probably no one will buy it because of this," he tells his team. "But if you're going to make a product, make it beautiful. Even if it doesn't affect sales, I want it to be beautiful."

ACCORDING TO MUSK'S BEST guess, our personalities might be 80 percent nature and 20 percent nurture. Whatever that ratio actually is, if you want to understand the future that Musk is building, it's essential to understand the past that built him, including his fears of human extinction and being alone.

For the first eight or so years of his life, Musk lived with his mother, Maye, a dietitian and model, and his father, Errol, an engineer, in Pretoria, South Africa. He rarely saw either of them.

"I didn't really have a primary nanny or anything," Musk recalls. "I just had a housekeeper who was there to make sure I didn't break anything. She wasn't, like, watching me. I was off making explosives and reading books and building rockets and doing things that could have gotten me killed. I'm shocked that I have all my fingers." He raises his hands and examines them, then lowers his digits. "I was raised by books. Books, and then my parents."

Some of those books help explain the world Musk is building, particularly Isaac Asimov's *Foundation* series. The books are centered around the work of a visionary named Hari Seldon, who has invented a scientific method of predicting the future based on crowd behavior. He sees a 30,000-year Dark Ages waiting ahead for humankind, and creates a plan that involves sending scientific colonies to distant planets to help civilization mitigate this unavoidable cataclysm.

"Asimov certainly was influential because he was seriously paralleling Gibbon's *Decline and Fall of the Roman Empire*, but he applied that to a sort of modern galactic empire," Musk explains. "The lesson I drew from that is you should try to take the set of actions that are likely to prolong civilization, minimize the probability of a dark age and reduce the length of a dark age if there is one."



IF I'M NOT IN LOVE, I CAN'T BE HAPPY," MUSK SAYS. "WHEN I WAS A CHILD, THERE WAS ONE THING I SAID: 'I DON'T WANT TO BE ALONE.'



Musk was around 10 at this time, and plunged in his own personal dark age. He'd recently made a move that would change his life. It was a wrong decision that came from the right place.

When his parents split up two years before, he and his younger siblings – Kimbal and Tosca – stayed with their mom. But, Musk recounts, “I felt sorry for my father, because my mother had all three kids. He seemed very sad and lonely by himself. So I thought, ‘I can be company.’” He pauses while a movie’s worth of images seem to flicker through his mind. “Yeah, I was sad for my father. But I didn’t really understand at the time what kind of person he was.”

He lets out a long, sad sigh, then says flatly about moving in with Dad, “It was not a good idea.”

According to Elon, Errol has an extremely high IQ – “brilliant at engineering, brilliant” – and was supposedly the youngest person to get a professional engineer’s qualification in South Africa. When Elon came to live with him in Lone Hill, a suburb of Johannesburg, Errol was, by his own account, making money in the often dangerous worlds of construction and emerald mining – at times so much that he claims he couldn’t close his safe.

“I’m naturally good at engineering and that’s because I inherited it from my father,” Musk says. “What’s very difficult for others is easy for me. For a while, I thought things were so obvious that everyone must know this.”

Like what kinds of things?

“Well, like how the wiring in a house works. And a circuit breaker, and alternating current and direct current, what amps and volts were, how to mix a fuel and oxidizers to create an explosive. I thought everyone knew this.”

But there was another side to Musk’s father that was just as important to making Elon who he is. “He was such a terrible human being,” Musk shares. “You have no idea.” His voice trembles, and he discusses a few of those things, but doesn’t go into specifics. “My dad will have a carefully thought-out plan of evil,” he says. “He will plan evil.”

Besides emotional abuse, did that include physical abuse?

“My dad was not physically violent with me. He was only physically violent when

I was very young.” (Errol countered via e-mail that he only “smacked” Elon once, “on the bottom.”)

Elon’s eyes turn red as he continues discussing his dad. “You have no idea about how bad. Almost every crime you can possibly think of, he has done. Almost every evil thing you could possibly think of, he has done. Um...”

There is clearly something Musk wants to share, but he can’t bring himself to utter the words, at least not on the record. “It’s so terrible, you can’t believe it.”



Bad Climate

After Trump abandoned the climate treaty, Musk cut ties and tweeted, “Leaving Paris is not good for America or the world.”

The tears run silently down his face. “I can’t remember the last time I cried.” He turns to Teller to confirm this. “You’ve never seen me cry.”

“No,” Teller says. “I’ve never seen you cry.”

The flow of tears stops as quickly as it began. And once more, Musk has the cold, impassive, but gentle stone face that is more familiar to the outside world.

Yet it’s now clear that this is not the face of someone without emotions, but the face of someone with a lot of emotions who had been forced to suppress them in order to survive a painful childhood.

When asked about committing crimes, Musk’s father said that he has never intentionally threatened or hurt anyone, or been charged with anything, except...in this one case, he says he shot and killed three out of five or six armed people who broke into his home, and was later cleared of all charges on self-defense.

In his e-mail, Errol wrote: “I’ve been accused of being a Gay, a Misogynist, a Paedophile, a Traitor, a Rat, a Shit (quite often), a Bastard (by many women whose attentions I did not return) and much more. My own (wonderful) mother told me I am ‘ruthless’ and should learn to be more ‘humane.’” But, he concluded, “I love my chil-

dren and would readily do whatever for them.”

As an adult, Musk, with the same optimism with which he moved in with his father as a child, moved his dad, his father’s then-wife and their children to Malibu. He bought them a house, cars and a boat. But his father, Elon says, hadn’t changed, and Elon severed the relationship.

“In my experience, there is nothing you can do,” he says about finally learning the lesson that his dad will never change. “Nothing, nothing. I wish. I’ve tried every-

thing. I tried threats, rewards, intellectual arguments, emotional arguments, everything to try to change my father for the better, and he...no way, it just got worse.”

Somewhere in this trauma bond is the key to Musk’s worldview – creation against destruction, of being useful versus harmful, of defending the world against evil.

Things at school weren’t much better than life at home. There, Musk was brutally bullied – until he was 15 years old.

“For the longest time, I was the youngest and the smallest kid in the class because my birthday just happens to fall on almost the last day that

they will accept you into school, June 28th. And I was a late bloomer. So I was the youngest and the smallest kid in class for years and years... The gangs at school would hunt me down – literally hunt me down!”

Musk put down the books and started learning to fight back – karate, judo, wrestling. That physical education, combined with a growth spurt that brought him to six feet by age 16, gave him some confidence and, as he puts it, “I started dishing it out as hard as they’d give it to me.”

When he got into a fight with the biggest bully at school and knocked him out with one punch, Musk noticed that the bully never picked on him again. “It taught me a lesson: If you’re fighting a bully, you cannot appease a bully.” Musk speaks the next words forcefully. “You punch the bully in the nose. Bullies are looking for targets that won’t fight back. If you make yourself a hard target and punch the bully in the nose, he’s going to beat the shit out of you, but he’s actually not going to hit you again.”

When he was 17, Musk left college and moved to his mother’s home country, Canada, later obtaining passports for his mother, brother and sister to join him there. His father did not wish him well, Musk recalls. “He said rather contentiously that I’d be back in three months, that [Cont. on 64]

FISHING TO FEED THE WORLD



**FRESH
CATCH**
Smith at
his farm off
the coast of
Branford,
Connecticut

BREN SMITH

GreenWave
Founder

"We don't use fertilizers, we don't use antibiotics, we don't use pesticides," says Bren Smith, the founder and owner of a 20-acre, fully sustainable seafood farm off the coast of Connecticut. "I don't even have to feed my stock anything." He calls his method 3D ocean farming, and it involves a system of underwater ropes and hurricane-proof anchors that hold huge harvests of kelp, mussels, scallops and oysters. One acre can produce 250,000 shellfish and 10 tons of kelp, a crop Smith is particularly excited about. "Kelp is like a gateway drug," he

says, noting there are possibly thousands of other edible sea plants, many of them with more calcium than milk and more protein than red meat. Kelp can also be used in cosmetics, pharmaceuticals, fertilizers, livestock feed and biofuel, all while converting tremendous amounts of CO₂ into oxygen. "If you covered six percent of the ocean with our farms, you could feed the world and capture all of man's carbon," Smith offers.

He turned to aquaculture in the 1990s, as the North Atlantic cod stock crashed. Organized seafood farming was supposed to be the answer to overfishing, but Smith discovered it was merely another way of abusing the seas — polluting coastal waterways with pesticides and pumping fish full of antibiotics. "We were

growing neither fish nor food," Smith wrote. "We were running the equivalent of Iowa pig farms at sea."

After his oyster farm on Long Island Sound was destroyed by hurricanes, Smith redesigned his infrastructure — growing larvae in tanks on land and then transferring them to "sea socks." The breakthrough has attracted a growing number of corporate partners, like Google and Patagonia, and hundreds of applicants to GreenWave's 3D ocean-farm development program, which guarantees purchase of 80 percent of crops from new farmers for the first five years. "We have requests to start farms in every coastal state, and 20 countries," says Smith — more applicants than it can handle at the moment. By next year, there will be 25

farms in the GreenWave network, including two in California, and the company is in talks about establishing farms in Denmark. "The idea is to actually revive the ocean through our farming methods," says Smith, "and make this as affordable as possible for farmers to do themselves — meaning minimal skills and minimal capital costs." And, perhaps most important, putting people to work in a job they can feel good about. "To pit working-class people against environmentalists is the biggest trick," says Smith. "Everyday people can farm the ocean. It's a job that gives people agency and the fulfillment of growing food, while helping to solve some of our world's biggest challenges: climate change and food insecurity." **JUSTIN NOBEL**



A CIVIL-RIGHTS LEADER FOR A NEW ERA

ANTHONY ROMERO

ACLU Executive Director

As head of the nation's oldest and most prominent civil-liberties organization, Anthony Romero has the distinction of being one of the leading thorns in Donald Trump's side. Since the election, the 52-year-old attorney has overseen legal fights against virtually every facet of the administration's agenda, filing more than 100

FROM TOP: COURTESY OF GREENWAVE; COURTESY OF THE ACLU

lawsuits on issues ranging from the Muslim ban to the rollback of voting rights to eroding the DREAM Act, undercutting LGBTQ rights and fighting for criminal-justice reform. "When civil liberties and civil rights are most imperiled," Romero says, "it's important to go on offense, not just defense." This year, the ACLU's membership has almost quadrupled to roughly 1.6 million; many of these new members are younger people energized to work at the grassroots level. "We are at a place in time when people don't just want to write a check, they want to be put to work to make a difference," says Romero. But first they must get through the Trump presidency. The ACLU has 350 lawyers who bring cases all across the country. "The Trump administration has 19,000 at their disposal," he says, with 11,000 of them working for Jeff Sessions' Justice Department. "Never underestimate the power of the federal government," Romero says. "We need to be smart and strategic, we need to play the long game, and we need to make sure that we hold off the worst over the next four years." **JANET REITMAN**



BRINGING DOWN THE BANKS

SIMONA LEVI

Xnet Founder

Imagine if Occupy Wall Street had actually brought bankers to justice. That, in essence, is what Simona Levi and Xnet, her collective of digital activists, did in Spain. In 2012, following a year of massive protests against inequality and government corruption, Levi set her sights on a Spanish bank whose near-collapse led to a multibillion-dollar European Union bailout.



A TRUE UNIVERSAL HEALTH CARE PLAN

CHASE ADAM

Watsi Co-founder

Four hundred million people worldwide cannot access basic health care. In many developing countries, a chief obstacle is not lack of political will or even funding – it's the crippling inefficiency of no-tech record-keeping that can eat up as much as 40 percent of a health care budget. Patients enroll on clipboards. Their insurance forms languish. Clinics wait weeks to collect payment. "The whole system starts to disintegrate," says Chase Adam, co-founder of Watsi, a tech startup that's set to modernize the monstrous bureaucracy of health care around the world.

In Adam's vision, national health systems in developing countries will soon be able to leapfrog their health systems from the 19th century to the 21st. Watsi has pioneered a system for smartphone-powered health care. "You enroll, your data goes into an application once, you never have to fill out another form," Adam says. The Watsi app would connect to a national database of medical and insurance records, so that when a patient visits any hospital, "they have all your info."

The notion of cheaper, seamless, hassle-free health

delivery would also be welcome in the United States. But Watsi is piloting its health technology solution at a convent-run hospital in Rwibaaale, Uganda. The company began in 2012 as an online crowd-funding site. Back then, people could pitch in to fund surgeries of patients in the developing world – including the Uganda hospital. But soon the dozen or so nuns at the convent asked for some more Silicon Valley know-how. "They'd wanted to start a community health insurance system," Adam says. A skeleton crew of Watsi staff moved to Uganda and began coding. Today, Watsi's system serves 6,000 villagers – with insurance that costs less than \$1 a month.

A San Franciscan surfer, Adam, 31, cut his teeth after college by working on health care in Haiti. A stint in the Peace Corps in Costa Rica spurred him to launch Watsi. The lightbulb went off when he saw a woman on a bus asking for donations for her son's surgery – Adam decided that crowd-funding should serve the need.

Adam compares Watsi's current phase to Netflix's evolution from mailing DVDs to streaming. "Internally, we call it 'cuspy' – it's right on the cusp of being possible," he says. "But what we're doing wouldn't have been possible five years ago." **TIM DICKINSON**

Her group uncovered 8,000 e-mails sent by employees of Caja Madrid and Bankia, revealing "black" credit cards executives used to secretly spend millions on personal travel, parties and luxury items. This year, dozens of the companies' former directors and board members received prison sentences and fines. Another case, spurred by Levi's initiative, charged 33 Bankia executives with misrepresenting the bank's finances. It's a model of activists holding industry accountable that Levi continues to share at protests, seminars and art projects around the world. "To empower people, we need them to know that fighting is worth it," she says. "Optimism is our best revenge." **GILLIAN BRASSIL**



BRINGING SOLAR POWER TO THE MASSES

BILLY PARISH

Mosaic Founder and CEO

The Green Revolution must be financed. And Billy Parish, 36, has built a billion-dollar business that has yoked the financial muscle of Wall Street to the challenge of powering the nation's homes with clean, efficient energy. Solar panels may be getting cheaper, but a single rooftop installation can still cost \$30,000. In the past, homeowners buying panels had to either front the money or work out a loan from a bank. Parish's company, Mosaic, has simplified this market by offering a solar mortgage that customers pay down using the savings from their electricity bill. Even accounting for interest payments of five or six percent, typical homeowners will save tens of thousands of dollars in electricity costs over the life of the system – creating



**CRUISE
CONTROL**
Vogt at the
company's
garage, San
Francisco

DRIVERLESS CARS FOR ALL

KYLE VOGT

Cruise Automation
Founder

The future of driving is automated. The only question is: Which company will bring the first driverless car to your doorstep? Cruise Automation has an advantage that no self-driving startup can match: the industrial might of the world's third-largest automaker. General Motors bought Cruise for more than \$1 billion in 2016. In September of this year, GM announced production of autonomous Chevy

Bolts. But 32-year-old Cruise founder Kyle Vogt admits that the marriage between a disruptive startup and a Big Three carmaker has not been smooth: "Engineers in Silicon Valley think you can whip up software over a weekend to do just about anything. But you can't whip up an automotive assembly plant. I'm guilty of underestimating the challenge."

Vogt founded Cruise in 2013 – after his previous startup, Twitch ("the ESPN of gaming"), was bought by Amazon for almost \$1 billion. For Vogt, Cruise was a return to a boyhood passion. "I got obsessed

with robots at a young age," he says. He competed on *BattleBots* in his teens, and at MIT he took part in a contest to send a driverless truck through the desert. He founded Cruise when struck by the epiphany that "technology had caught up" to his dream for a driverless future. He adds, "It's the coolest thing I could possibly do as an engineer."

Today, Cruise has deployed a fleet of 130 cars. The company's automation technology relies on a diverse mix of sensors – lasers, radios and cameras – to create a digitized "view" of traffic. "You wind up with a really vivid pic-

ture of the world," Vogt says. Cruise cars also benefit from the "hive mind" of its networked fleet: "When one car sees a construction zone, all of the cars have that information. It's as if that car can see around corners."

The biggest promise of automated driving is that it can prevent accidents and save "millions of lives," Vogt says. "Self-driving cars have no blind spots." Eventually, Cruise will deliver "superhuman performance." So will a kid who is 10 years old today never need a driver's license? Says Vogt, "That's very likely."

TIM DICKINSON

a windfall for reducing their carbon footprint. "He's trying to bring to scale the changes we most need," says Bill McKibben, founder of 350.org. "If he was the model for entrepreneurs on our planet, we'd be OK." To date, Mosaic has financed more than \$1 billion in rooftop installations. Parish considers it benevolent capitalism – business that can make money and do good. "It's one of the biggest climate solutions," he says. "And one of the biggest business opportunities on the planet." **T.D.**



THE DEMOCRATS' NEW HOPE

KAMALA HARRIS

U.S. Senate *California*

Kamala Harris might be the frontwoman for tomorrow's Democratic Party. A child of immigrants, with a law degree from UC-Hastings, the first-term senator sports a formidable track record: As California's attorney general, she battled Big Banks, securing a \$25 billion settlement over robo-signed home foreclosures. She put an abusive, for-profit college conglomerate out of business. She even targeted purveyors of "revenge porn." On Capitol Hill, she has co-sponsored Bernie Sanders' "Medicare for All" bill, and won fans for turning the screws to Trump Republicans. In June, Attorney General Jeff Sessions quivered in front of his former Senate colleagues, saying that Harris' tough questions were "[making] me nervous." That seemed to be the plan. During her election-night victory speech last November, Harris said, "When our ideals and fundamental values are being attacked, do we retreat or do we fight? I say we fight." **T.D.**

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1980 Ken Grossman
Founder of Sierra Nevada Brewing Co.



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SEA CHANGE
Dutton beside
a fossilized
coral reef in the
Florida Keys
in 2016

THE FORENSICS OF GLOBAL WARMING

**ANDREA
DUTTON**

**University
of Florida**
Scientist

According to geologist Andrea Dutton, a 44-year-old assistant professor at the University of Florida, fossilized coral might hold the grim answers to the future of our swiftly warming planet. Not long ago, I walked with her through an old limestone quarry in the Florida Keys – the walls were etched with imprints of ancient corals that lived many thousands of years ago, when the seas were much higher than they are today. “I think of myself as a detective,” she says. “By

understanding what happened in the past, we can get a better understanding of what might happen in the future.”

Specifically, Dutton is investigating one of the most important scientific questions of our time, one upon which millions of lives, and trillions of dollars in real estate and other investments, depend: As our planet continues to heat up, how fast will sea levels rise in the coming decades?

Much of Dutton’s research has focused on a period approximately 125,000 years ago, after the last retreat of the glaciers, when temperatures on Earth were almost the same as they are today, but seas were 20 or 30 feet higher. Where did that extra water come from – Greenland?

Antarctica? Understanding how fast those ice sheets collapsed previously might offer clues to how fast they will collapse in the future. Dutton is particularly focused on West Antarctica, which contains enough ice to raise the seas by 10 feet. “If West Antarctica is unstable,” she says, “that could be a very big problem for coastal cities in the future.”

Dutton is not the only scientist interested in this question. But she has pursued it with a kind of urgency that belies her cool manner, traveling the world to seek out well-preserved fossilized coral outcroppings that help her learn the story rising water can tell about the sensitivity of the Earth’s climate. To Dutton, coral-growth rings are like tree rings, and they

can reveal not just how high the water rose in the past, but how fast.

Still, it’s a fiendishly intricate tale – land is always in motion, rising and falling due to pressures from below, and the oceans are pushed around by gravity in mysterious ways. To come up with anything like an “average” sea-level rise for any point in history, Dutton has to factor in a startling amount of physics, from ice-sheet dynamics to glacial rebound of the North American continent. “The more you learn about how the Earth works,” Dutton says, “the more complex it becomes.”

Dutton is a single mom with two young kids. Her Facebook page is full of pictures of their soccer games and stories like the frog that accidentally got pureed in her garbage disposal. “I’m a scientist, and I love my work,” she says. “But I’m not just doing this because I love science. I’m doing this because I care about the future, and the kind of world we’re leaving to our kids.”

JEFF GOODELL



**THE MAGIC OF
MUSHROOMS**

CHIDO GOVERA

The Future of Hope *Founder*

After Chido Govera was orphaned at age seven in rural Marange, Zimbabwe, she attended a program to train young girls in mushroom cultivation, a process that provides food and income while turning agricultural waste into rich compost. Today, at 31, she runs the Future of Hope, which has taught more than 2,500 students (from Berkeley to Mongolia) a remarkably adaptable model that requires only “a bit of water, a bit of free space and some material,” she says. Gallon-size plastic bags are filled with mushroom seed, then placed on shelves. About three weeks later, mature oyster mushrooms are ready to eat or sell – the spent substrate can be recycled as compost. “There’s no one solution to solve all the issues that affect our society,” she says. “I wanted to simplify the art of cultivating mushrooms so it can be accessible to all the people who need it.”

GILLIAN BRASSIL



**PSYCHEDELICS TO
HEAL YOUR BRAIN**

JORDI RIBA

Sant Pau Institute *Scientist*

In Barcelona, a soft-spoken pharmacologist named Jordi

CLOCKWISE FROM LEFT: JOSHUA BRIGHT; COURTESY OF CHIDO GOVERA; COURTESY OF JORDI RIBA



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Riba is at the forefront of a scientific vanguard exploring the medical applications of psychoactive substances. From his lab at the Sant Pau Institute of Biomedical Research, Riba has spent two decades investigating the neurochemical processes behind ayahuasca, a plant-based hallucinogen from the Amazon famous for elaborate visions and heightened emotional states. He's identified possible structural changes in the brains of long-term ayahuasca drinkers, specifically a measurable thinning of the posterior cingulate cortex, a region of the brain associated with the ego. Even more remarkably, last year, Riba discovered that ayahuasca, rich with compounds known as "harmala alkaloids," can promote the creation of new brain cells. If the potency of these alkaloids can be scaled up, he believes, they could provide breakthroughs on a range of currently untreatable neurological conditions, like Parkinson's disease and Alzheimer's. "I'm convinced that in 50 years we'll know a lot more than we do now about the brain," Riba says. "I don't think it will be long before we see psychedelics incorporated into the therapeutic arsenal."

ALEXANDER ZAITCHIK



THE ETHICIST OF SILICON VALLEY

TRISTAN HARRIS

Time Well Spent Founder

When Tristan Harris sold his tech startup to Google, at age 26, he was already uncomfortable with tech's fixation on capturing users' attention. Studies show the average smartphone owner spends more than four hours a day on their device. And engineers in Silicon Valley are only fine-tuning algorithms to



Kirtley
at Helion
Energy

THE ALTERNATIVE ENERGY SOLUTION

DAVID KIRTLEY

Helion Energy
Founder and CEO

For years, fusion energy – which is generated by forcing two atoms together until their cores merge, releasing a shattering amount of energy – has held the promise of a world where electricity could be cheaply produced without the radioactive waste, carbon pollution or geopolitical entanglements of oil and nuclear-fission reactors. Fusion reactions power the sun; it is stored solar energy in compressed organic matter – the ancient remains of photosynthesis – that we burn in fossil fuels. But even among top physicists, re-creating a fusion reaction on Earth – a "star in a bottle" – was dismissed as "the fuel of the future – and always will be."

Helion Founder and CEO David Kirtley is part of a team that developed the "Fusion Engine," a power plant the size of a mobile home that, they hope, will soon be able to power a small town for 10 years using a minuscule amount of raw materials – about a pickup truck's load of isotopes. It's a downscale of power generation roughly

analogous to how the tech industry took centralized supercomputers the size of houses and put them in our pockets.

Recent attempts to capture the power of fusion – like the massive International Thermonuclear Experimental Reactor, a 35-nation effort in the South of France – have sought to maintain a steady reaction in a vast central power plant, where fusion heat is used to boil water to turn turbines to create electricity. This indirect process never sat right with Kirtley: "I thought, 'You're catching a star and you're using it to boil water?'"

Here's Kirtley's major insight: A fusion reaction that repeatedly explodes in the center of a magnetic field wouldn't require boiling water at all. "We don't want a campfire," he says, "we want a diesel engine." His team is inching closer to a machine that generates more energy than it consumes, which they expect to hit in a decade. And if they don't, he says, one of a half-dozen other teams working on fusion will. "In the next 10 years, we're generating electricity from fusion," he says. "I'm just excited as a human being by the plethora of fusion approaches that are happening."

SAUL ELBEIN

keep us using devices more. At Google, Harris took on the title "design ethicist and product philosopher" after his PowerPoint, "A Call to Minimize Distraction & Respect Users' Attention," went viral inside the office. Harris warned of the enormous power a few mostly white male employees wield over a billion minds. "There is this lie that all this stuff is good for people," he says. "What they actually have to do by their stock price is to capture not just the same attention as yesterday, but also more next quarter." Today, he runs Time Well Spent, a foundation fighting the "fundamental misalignment between the industry's goal of capturing attention and what would be best for society." "We have to be willing to confront something as big as the advertising model," Harris says. "We need to serve people, not serve Nike."

TESSA STUART



BUILD UP, NOT OUT

ALEX STEFFEN

'Carbon Zero' Author

Alex Steffen, the author of *Carbon Zero*, thinks crowded megacities could be the ideal frontier for fighting climate change. As cities get denser, their per-capita energy costs drop. By 2050, he envisions humanity scattered among a constellation of walkable urban centers, powered by decentralized green energy, with a largely car-free population living in eco-friendly housing. At a certain point, he says, "people buy efficient and sustainable buildings just because they work better." In the next decade, he foresees a "snap forward," the "start of an inevitable process of the zero-carbon future outcompeting the high-carbon future." The worst mistake we can make "is to think

CLOCKWISE FROM TOP: COURTESY OF HELION ENERGY; COURTESY OF ALEX STEFFEN; COURTESY OF TRISTAN HARRIS

the world of the next 10 years will be like the world of the last 10," Steffen says. The decisions we make now will be "the difference between a planet with serious climate challenges but a bright future and one working with catastrophe." **SAUL ELBEIN**



DIVERSE ARTIFICIAL INTELLIGENCE

DANIEL GROSS

Y Combinator Partner

Artificial intelligence is often associated with dystopian scenarios – from job loss to robotic overlords – but for Daniel Gross, who guides AI startups at Y Combinator, one of the most frightening is a handful of conglomerates controlling a world of thinking computers. At 22, Gross led a machine-learning group at Apple and saw how tech giants dominated the field. "That is bad for the world," he says. The imbalance of power could lead to group-think, data control and extreme social inequality. "I'm personally on this holy mission to ensure there are many startups that are competing, not just five monolithic companies," he says. Earlier this year, he co-founded AI Grant, a nonprofit for experimental projects – fellows are working on everything from file compression to brain scans. "The weirder or more novel," says Gross, "the more excited we are." He believes that onerous or dangerous work, like job-applicant screening and crop harvesting, will be entirely performed by machines. But it's going to take a diverse group of developers. "Every generation needs its existential worry," Gross says. "We can't have just one Borg company doing everything from search results to trucking."

BRIAN EHA

LIVING THING
Benjamin grew bricks from mushrooms for a New York art installation.



ARCHITECTURE WITH ORGANIC MATERIALS

DAVID BENJAMIN

The Living
Founder

When architect David Benjamin decided to call his firm the Living, he intended for the name to refer to his notion of bringing buildings "to life" via digital sensors, moving walls and other forms of computer-aided interactivity. Only later, Benjamin says, did it strike him that the name was literal – that he could bring architecture to life "through actual living things."

Benjamin – who spent a couple of years touring with his indie-rock band the Push Kings before graduating from Columbia's school of architecture – operates like a socially conscious mad scientist. At his Lower Manhattan office, the 42-year-old shows off samples of his work. He used agricultural waste – corn stalks and cobs – to grow organic bricks from mushrooms and to build a 40-foot tower in the courtyard of contemporary-art museum MoMA PS1. When the museum installation was dismantled, Benjamin says, the bricks were broken up, combined with food

scraps, and "in 60 days, it [had returned] to the soil."

When Airbus contracted with Benjamin to build lighter airplane parts (thus reducing its fleets' fuel consumption), he turned to the natural world – specifically, to the lowly slime mold, which spreads adaptively as it searches for food. He created a computer algorithm based on the mold growth, which is supremely evolutionarily efficient. The patterns that emerged from this allowed him to design irregularly shaped plane parts with maximal strength and minimal weight. For

another commission, he plans to attach sensors to mussels in New York's East River; the sensors will change the colors of a series of lights to alert passersby of the water's cleanliness.

Benjamin points out that buildings account for one-third of the world's energy consumption, and that construction waste makes up 30 percent of American landfills. "People ask me, 'Is this material going to last long enough?'" he says. "I like to ask, 'Is this material going to last too long?' Why shouldn't architects design the after as well as the before?" **MARK BINELLI**



HOW TO RID THE WORLD OF CO₂

OPUS 12

Founders

One of the keys to solving global warming is: How can we make carbon pollution useful? Opus 12, founded by former Stanford scholars Kendra Kuhl, Nicholas Flanders and Etosha Cave (from left), has built a reactor to trap the greenhouse gas and convert it into carbon-based compounds that are used to make plastics and liquid fuels. The point, says Flanders, the CEO, is to "recycle our customers' emissions into new products rather than just throwing

that CO₂ away." And Opus 12 isn't the only company doing it: In June, the world's first industrial-scale facility to suck CO₂ out of the air opened in Switzerland (waste will be used to grow vegetables); a plant in India is using captured carbon to make baking soda. "It's never a silver bullet, it's silver buckshot," says Flanders. "Rethinking our economy from being extractive to one that makes use of waste products just makes a lot of sense." **ZOE CARPENTER**

THE NEW FARM-TO-TABLE REVOLUTION: BUGS

JOSH EVANS
ROBERTO FLORE
MICHAEL BOM FRØST

Nordic Food Lab
Researchers

Reducing humans' carbon footprint means reimagining our meat proteins – in other words, bugs. For three years, Josh Evans, Roberto Flore and Michael Bom Frøst traveled the world, cataloging the properties of more than 150 edible species for the Nordic Food Lab, a culinary think tank founded by renowned chefs René Redzepi and Claus Meyer. When they started the project, in 2013, interest in edible insects was exploding. News stories declared them “the next food craze” and the “food of the future,” trumpeting the fact that crickets and mealworms use significantly less land and water than other farmed proteins and produce far fewer greenhouse gases. When the United Nations released a report on edible insects in May that year, it was downloaded more than a million times in a single day.

Nordic Food Lab found that largely missing in all the hype was a fundamental question: taste. “If you want to convince the world to eat insects, you have to consider it from the perspective of the eater,” says Bom Frøst. Many of the foods that were available were freeze-dried or used as a topping. For people to fall in love with a new food group, it wasn't enough to grind up crickets and add



Above: Flore freezing bee larvae with liquid nitrogen. Left: Cricket doughnuts.



peanut butter – they wanted to draw on the culinary traditions that have valued insects for centuries: In Japan, hornets are deep-fried until they puff up and crisp; Kenyans prepare termites by preserving them in honey; in the Mexican state of Oaxaca, tacos can be filled with ant eggs or caterpillars. “In most cases, insects aren't eaten because people are starving,” says Evans. “They're eaten because they're a delicacy.”

Even as Nordic Food Lab brings attention to new edible species, it

hopes to emphasize the risks of scaling production too quickly. “Many of the flaws of raising pork or cows or chicken can easily be repeated with insects,” says Bom Frøst. Plus, if Westerners only embrace Big Agriculture insects, he says, we'll miss out on treats like honey ants, whose abdomens swell with the sweet and sour nectars of desert blooms. Or the 40 tons of bee larvae produced as byproduct in Denmark each year, a delicacy the team describes as “something in between bacon and foie gras.” Because even if the entire world learns to love eating insects, says Evans, “we have to make sure they don't start to taste like cardboard.” **GILLIAN BRASSIL**



**REMAPPING CITIES
FOR CLIMATE CHANGE**

KATE ORFF

SCAPE Studios *Founder*

If our cities are going to survive rising seas, we're going to need someone as inventive as Kate Orff. On the south shore of Staten Island, which was devastated by Hurricane Sandy's storm surge, her landscape-architecture and urban design firm, SCAPE, is constructing a “living breakwater,” a series of barriers and wildlife habitats to make the coast more resilient. A project in Lexington, Kentucky, will turn the footprint of a polluted creek into an interactive path spotlighting the region's unique limestone. In Brooklyn's notoriously polluted Gowanus Canal, SCAPE aims to reintroduce native oysters, as an all-natural filtration system. “It's probably overwhelming for the next generation, given the problems they've inherited,” Orff says. “I try to match this anxiety with projects that enable people to feel like they're participating in a process to change their cities and communities.” **JUSTIN NOBEL**



**HARD PROOF OF THE
BENEFITS OF POT**

SUE SISLEY

Private Practice *Psychiatrist*

When it comes to marijuana, the primary obstacle prevent-

CLOCKWISE FROM BOTTOM LEFT: CHRIS TONNESEN; BRIAN FINKE; ETHAN HILL; MARK PETERMAN

ing widespread medical breakthroughs is a lack of clinical trials. Researchers are only allowed to use marijuana grown by a single farm at the University of Mississippi – the pot is significantly less potent and sometimes arrives at laboratories covered in mold. The approval process for new research requires sign-off from two federal agencies, and often takes years. Enter Sue Sisley, an Arizona physician who has made it her mission to establish the benefits of cannabis while simultaneously drawing attention to the bureaucratic stranglehold hindering research. Her advocacy work helped roll back a number of onerous pot research requirements. This year, even as the DEA began accepting applications for additional growers to compete with Mississippi, Sisley exposed the “sub-optimal study drug” on a *PBS NewsHour* segment. “The U.S. government has systematically impeded this work for years,” she says. “We were forced to become activists. We really just wanted to do the science.”

AMANDA CHICAGO LEWIS



PHILANTHROPY AIMED AT THE WEALTH GAP

DARREN WALKER

Ford Foundation President

The nation's major philanthropies have long operated by noblesse oblige, seeking to blunt the sharp edges of capitalism by funding programs that sustain the poor. Under the leadership of Darren Walker, the Ford Foundation is taking a different tack. “In philanthropy we must move from a perspective of generosity to a perspective of justice,” Walker told a conference in Stockholm in October. “We need to look at the root causes of injustice, of poverty, of cli-

mate change.” Walker began his career redeveloping housing in Harlem, then spearheaded the Rockefeller Foundation's rebuilding programs in New Orleans after Hurricane Katrina. Now leading the nation's third-largest foundation, with a \$12 billion endowment, he is pioneering a model of disruptive philanthropy, targeting the causes of inequality. In April, he announced a \$1 billion investment in socially beneficial businesses, including builders of affordable housing in the U.S. and companies expanding credit in the developing world. “We are putting a significant amount of our money,” Walker said, “where our mission is.”

TIM DICKINSON



CHEAP SCIENCE
Prakash with a paper microscope

HIGH-TECH FOR LOW-COST MEDICINE

MANU PRAKASH

*Stanford University
Bioengineering professor*

Manu Prakash, a Stanford bioengineering professor and recipient of a MacArthur “genius grant” in 2016, was visiting a medical clinic in Uganda several years ago when he saw something alarming: Staffers were using an expensive centrifuge – vital in the detection of diseases like malaria and tuberculosis – as a doorstop. They had

no electricity to power it, he said. Prakash, 37, has grown accustomed to scenes like this while traveling through resource-starved parts of the world. To help, he's devoted himself to what he calls “frugal science: the idea that if you make science accessible and scalable, it will have impacts on global health and education beyond our imagination.”

Prakash's experience in Uganda led him and his team of researchers to develop a cheap centrifuge that anyone could use, despite limited funds and minimal training. First, they

scrutinized a variety of simple spinning toys, eventually settling on the centuries-old whirligig as their model. The result is the Paperfuge: paper discs fitted with tubes that can hold blood samples, connected to twine strings that allow a user to spin the discs at up to 125,000 rpm, thereby separating out, say, malaria parasites. To study those parasites, a user might deploy another ingenious invention of Prakash's, the Foldscope – an origami-inspired paper microscope capable of high-powered imaging,

the component materials of which cost just \$1.

At least 50,000 Foldscopes have been distributed in 135 countries. Someone used one to study air pollutants in China; others have tested for counterfeit drugs and diagnosed animal and plant diseases. Tools like these, Prakash says, represent “a means of creativity. Sometimes we forget how wonderful this world is. If we can bring that to people, we can change their attitudes toward problems. If we make people curious, I'd call it a success.”

JONAH WEINER



IMAGINING A MONEY-FREE SOCIETY

KJ ERICKSON

Simbi Founder

KJ Erickson's online marketplace, Simbi, wasn't necessarily designed for disaster relief. The site hosts 175,000 users, who

offer services like legal advice, language lessons and tantric counseling in exchange for credits to trade in the future. The idea is to offer “a supplemental economy,” says Erickson. “A lot of people are struggling to make ends meet in the dollar-based economy.” But when Hurricane Harvey devastated Houston, she says, “we saw a lot of people posting services related to the hurricane.” On the site's “pay it forward” option, users offered free shelter and other services to displaced victims, a practice that's been repeated in the aftermaths of Hurricane Irma and the Las Vegas shootings. “We became an emergency-relief campaign,” she says.

TESSA STUART

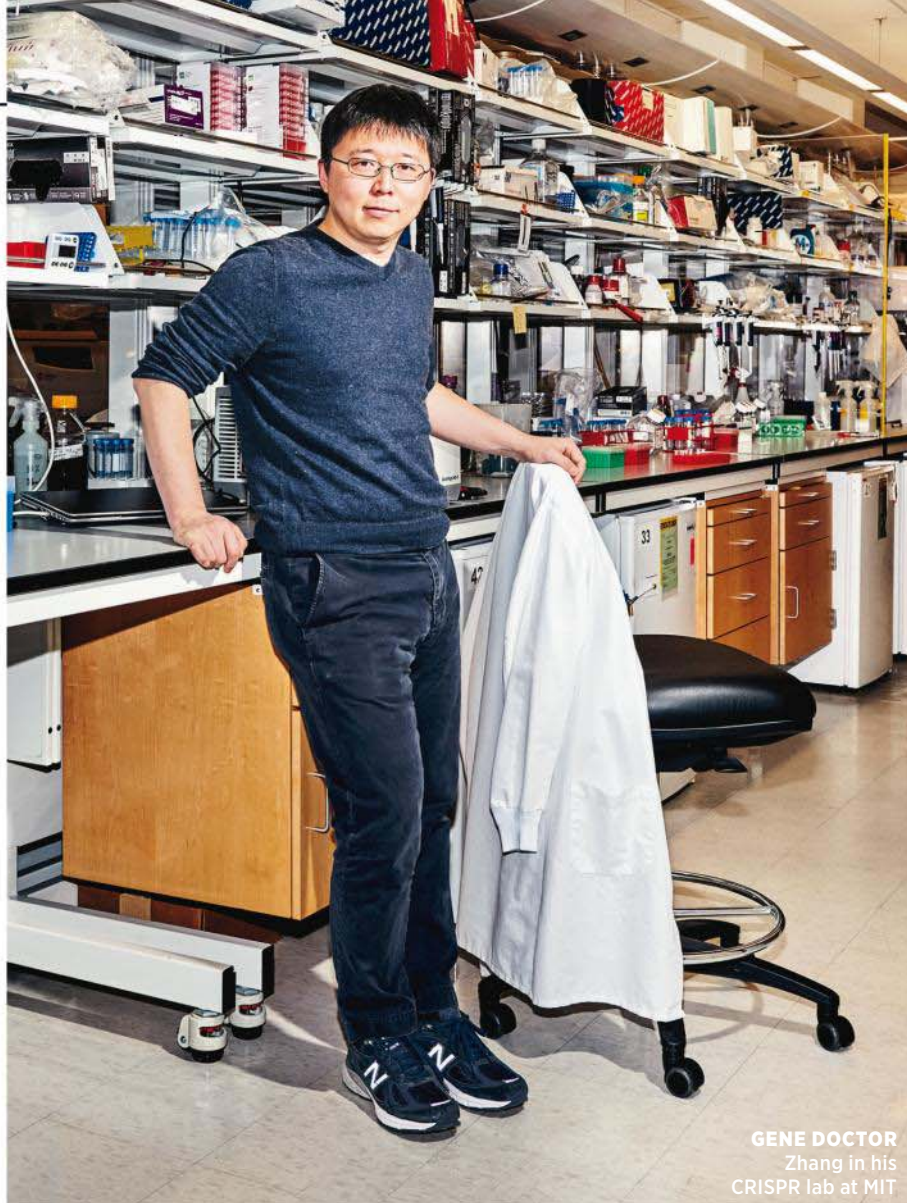


THE ONLINE-SPENDING REVOLUTION

BRIAN ARMSTRONG

Coinbase *Co-founder and CEO*

Before Brian Armstrong launched Coinbase, a user-friendly way to buy, sell and store online currencies like Bitcoin, the only way to purchase cryptocurrency was wiring money to an unregulated exchange in Japan or Slovenia. "It turned out the killer feature everybody wanted," he says, "was to buy and sell using funds from their bank." Coinbase's Bitcoin banking system has since allowed 11.9 million users to exchange more than \$40 billion in digital assets. Already, some employees in nations like Argentina, where the currency is unstable, choose to receive salaries in Bitcoin. This year, Coinbase launched Toshi, a mobile-messenger app designed as a bank replacement, which offers a digital wallet and the ability to send messages and money to other users worldwide. "There's really this gold rush that's going on," says Armstrong. He ultimately sees Bitcoin – or one of its younger rivals – treated as a true global currency. And given cryptocurrencies' inherent security and seamless exchange, Armstrong believes the next step is a thoroughly monetized Internet, where every "like" has a tiny amount of money attached. "If you're a moderator on a subreddit, you're just doing it because you're passionate," Armstrong says. "But in this new world, you can imagine thousands of people earning a living, either curating the content or managing the community or providing insightful answers to people. It makes the GDP of the whole Internet go up." **BRIAN PATRICK EHA**



GENE DOCTOR
Zhang in his
CRISPR lab at MIT

MEDICINE'S NEW FRONTIER

**FENG
ZHANG**

MIT
Molecular biologist

In 2013, when MIT molecular biologist Feng Zhang was just 32, he became the first scientist to successfully edit human cells using CRISPR, a gene-modifying technology that could ultimately be used to fix cellular mutations. The technology is now leading breakthroughs in treating HIV, cancer and neurodegenerative diseases – to say nothing of its potential for re-engineering coral

reefs and harnessing algae's biopower. "It's like a renaissance period," Zhang says. "We have wanted to do this for a long time, and we are now reaching a stage where we can."

CRISPR uses a bacterial system to snip DNA with the simplicity of an Easy-Bake Oven. To treat diseases like leukemia and Alzheimer's, scientists foresee targeting genetic mutations with, well, near-surgical precision. At the same time, the tech is being used to research seed size, advance microscope resolution, modify pig organs and develop virus resistance. An-

other godfather of CRISPR, Harvard's George Church, is investigating whether CRISPR might even revive extinct species like the woolly mammoth – he's splicing its DNA into Asian elephant cells. CRISPR will soon become part of an emerging line of cancer gene therapies. "It's the holy grail for cancer," says Rick Young, whose MIT lab has deployed CRISPR to close in on a key genetic cause of the disease. "We're doing the best work of our careers – we're at the epicenter of a revolution."

Revolutions, though, can go awry. Recently,

DARPA, a military research agency, began funding technology to thwart genetic catastrophes. Intelligence agencies reportedly have started their own development teams as well. "A thousand dollars of CRISPR stuff and a toilet, and you have a bioweapon," says Hank Greely, a Stanford bioethicist. "That makes me nervous."

For now, Zhang is leading a search for genomic tools that could one day surpass CRISPR, systems that work with even greater accuracy, speed and bulk. "It is an exciting time to be a biologist," he says. **BEN WOFFORD**



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CONFESSIONS OF A HIP-HOP ROCK STAR

Chart-topping rapper Post Malone sounds off on race,
his buddy Bieber, and the pleasures of Olive Garden

BY JONAH WEINER PHOTOGRAPH BY *Diwang Valdez*



CONGRATULATIONS
Malone in Atlanta
in October

ROLLING STONE

55

LAST NIGHT, THE new *Call of Duty* came out, and Post Malone was so stoked about it that he parked himself in front of his Xbox until 6 a.m. Right now it's 4 p.m. and he's back at it. It's a sunny Friday in the affluent L.A. suburb of Tarzana, but the shades are drawn in Malone's den to block the light – his wall-size projecting screen is particularly susceptible, he says, to glare.

Malone is only 22, but he's one of the most popular musicians in the country. His single "Rockstar" has been America's Number One hit for four weeks and counting. The track, which features 21 Savage, celebrates a raw brand of hedonism – "I've been fucking ho's and popping pillies, man/I feel just like a rock *star-ar-ar*" – that smudges into fatalism. The music is sparse and chilly; the two actual rock stars Malone likens himself to in the lyrics, Bon Scott and Jim Morrison, both died young.

Markers of Malone's success are everywhere in the house. In the living room, platinum plaques commemorating previous releases lay stacked on his white marble floor opposite a pool table with shiny chrome legs. It is the second-most-outrageous thing in sight, after the enormous framed portrait of Malone as a centaur holding an American flag amid a landscape strewn with crushed beer cans.

Malone is sitting on a white leather couch, barefoot in black Italian fashion sweatpants, wearing an oversize T-shirt with food stains on it. He's fresh off a two-month tour he describes as "exhausting, but it's always cool to meet fans." He adds, "On Halloween, they came dressed up like me, which is easy: Just look homeless."

Behind him, in the kitchen, members of Malone's entourage mill about. There's an almost-empty 1.75-liter jug of Grey Goose, and some lavender-scented Spic and Span, on hand because Malone's French bulldog, Branson, keeps "pissing and jizzing" all over the floor. "He's getting his balls cut off next week," Malone says, ruffling Branson's forehead. "You better jizz it up till then, because your days are numbered."

Also on the counter is the November issue of *Guns & Ammo*, which catches my eye because there's been talk of visiting a gun range later on – something Malone

does often. "I love shooting," he says. "The feeling is pure...inebriation. It's like hitting a punching bag to let off steam."

Turns out that today he just wants to stay in, "but I can show you what I got here if you want," he says, at which point he leads me to a walk-in closet, which is where I learn that Malone owns a disconcerting amount of weaponry. "This is an M14 – the gun Navy SEALs use," he says, placing a chunky rifle in my hands. He takes it back, hands over a Walther PPK – "James Bond's gun" – with decorative engraving down the barrel. Next up are a .44 Desert Eagle hand cannon and an M1911 pistol, then two gold-plated Glocks – "I'd never actually shoot these." Finally, there's his Cobalt AR-15, an assault rifle, specially modified to pass California regulations, that he's particularly proud of. "Looks like something out of Halo, right?"

"PEOPLE HATE
YOU FOR WHAT
THEY DON'T
UNDERSTAND
YOU FOR. IT'S
ABOUT PUSHING
FOR EQUALITY
- IN BOTH
DIRECTIONS."

He ducks into a bathroom to ash the cigarette he's smoking, then makes for his master bedroom, which he shares with his longtime girlfriend, Ashlen. On the floor beside their bed is a pump-action Mossberg shotgun: "Great for home defense." He reaches behind a pillow, fishes out an FN Five-Seven pistol fitted with a laser sight and – to better disorient any home invaders, he explains – a strobe light. He goes behind another pillow, pulls out a Glock 19. "This is for Ashlen. It's supereasy to use."

I say "holy shit" a lot, and ask several variations on a question: Why does he have all these guns? "They're fun, they're practical, and bad shit happens," he says. "If you hurt me, I'm gonna hurt you back." Has anyone made threats against him? He shakes his head. "Just being in the public eye. I have a lot of valuable shit. I have a lot of friends I wanna protect."

Also: "The world is going to shit. They're taking away a lot of our rights. We have a shitty thing going on in the White House – I don't like Trump. But I don't think it's just him. Something's coming."

It is mere weeks after America's worst mass shooting in modern history – a train of thought he anticipates: "A lot of people are sensitive about it these days, but it's an American right to own a gun. It kinda sucks that now we have to live in fear of going out to a concert, but there'll always be bad people, and if bad people want firearms, they'll get 'em no matter what."

I wasn't expecting to debate gun control with Post Malone, but I tell him that, when I learned that the Las Vegas shooter used a so-called "bump stock" to effectively turn his rifle fully automatic, I couldn't understand why anyone would need a weapon like that. Malone contemplates this. "I don't know.... Get tighter groupings, show off your aim to your buddies at target practice?" He ruminates a bit more, then shrugs and smiles. "I don't know, man. I don't have all the answers – I'm just trying to get my money and get out."

MALONE HAS CULTIVATED a hard-partying image, but there's been a dark streak to his music since his 2015 single "White Iverson," which sounds mournful even though it's ostensibly about chasing success. When I mention this downbeat vibe, he nods. "I've always had a loneliness. I've always been anxious." He taps his skull and chuckles. "Big brain. Lot of thoughts."

Even sitting atop the pop charts, he says, "It's easy to feel numb." Not that he doesn't enjoy himself now and then. When "Rockstar" first went to Number One, he says, he celebrated with a blowout meal with Ashlen at Olive Garden: "I love Olive Garden." He has an extravagant loafer collection, including \$1,700 Louboutins with embroidered crests that say LOUBI FOR EVER in gold. "Those are super-ignorant," he says, beaming.

Out in the driveway, there's a shiny white Rolls-Royce Wraith. "You wanna go for a ride?" He pads outside, still barefoot, turns on the ignition. He presses a button and hundreds of tiny fiber-optic lights in the ceiling flash on, like we're in a mobile planetarium. "I'm giving you the hot-chick treatment," he says of the light show. He bursts down his block and hangs a hard right. "This is not a good message, but this car is a great drunk-driver," he notes. "It's got human detection." He sticks his foot outside the driver's side window, lets the breeze blow through his toes.

He was born Austin Post in Syracuse, New York. When he was nine, his dad got a job managing concessions for the Dallas Cowboys, and they moved to Texas. As a kid, Austin turned a Guitar Hero habit into an actual guitar-playing hobby. His tastes were all over the map. In high school, he made a hip-hop mixtape called *Young and After Them Riches*, and played "in a metal

Contributing editor JONAH WEINER wrote about Travis Scott in October.

band and in an indie band." He loves Hank Williams and A\$AP Ferg, Biohazard and Father John Misty. His talent is broad: You can find videos of him covering Bob Dylan's "Don't Think Twice, It's All Right" with convincing tenderness, Rage Against the Machine's "Killing in the Name" with convincing ferocity.

Classmates of Malone's once voted him "Most Likely to Become Famous," but this testified less to his popularity than his eccentricity. For an art class, he made a jokey synth-pop track under the pseudonym Leon DeChino, complete with a video in which he danced in booty shorts and a leopard-print head scarf. At one point he saved up \$800 from his job at a place called Chicken Express and blew it on a pair of Versace loafers: "I was weird."

At his home, the doorbell rings and Malone's Dallas buddy Jason Probst walks in. A few years ago, Probst became an unlikely online micro-celebrity by streaming video of himself and friends playing Minecraft while cracking jokes. In 2014, Probst moved west, renting a house in Encino with some other Minecraft players, and Malone left Dallas to tag along, "chilling and free-loading," he says, hoping that proximity to the music industry might lead to a big break. "I had to make it work," Malone says. "It was that or Chicken Express."

Within a year, he'd talked his way into free time at a studio, where he met the producer FKi 1st, who liked Malone enough to work on some tracks with him. One was "White Iverson," which Malone put on SoundCloud, where it took off – Wiz Khalifa and Mac Miller tweeted endorsements, and Malone soon signed a major-label deal. Six more platinum-certified singles followed. Before long, Kanye West invited Malone to join him and Rick Rubin in the studio, and Justin Bieber picked him as an opening act and sang on his debut, 2016's *Stoney*.

When I ask Malone about Bieber, he calls him "a fucking awesome, great dude" and "a genuine friend." He adds, "He's gotten super-religious recently. Real culty." He's referring to Hillsong, a megachurch that Bieber belongs to. "It's not culty!" Ashlen interjects. "It's a total cult," Malone continues. "He's already given them, like, \$10 million. Those are the worst kinds of people. I used to be super-religious. I believed in God. But now I see through it. It's nice to support something you believe in, I guess, but people are spending so much money, and God doesn't care that

your church has a fucking gold roof." I ask if he's shared these thoughts with Bieber. "We don't talk about this stuff," he says. (A source close to Bieber denies that he's given \$10 million.)

Malone believes that "genre is stupid," so to him there's no contradiction in making a song with Bieber one moment, 21 Savage the next. But some border crossings are more fraught than others, and as a white man who's become hugely successful in a black art form, he's aware of his status as an outsider. He's had to apologize for an old Vine in which he jokingly used the word "nigga"; more generally, he's had to answer to skeptics. The most prominent such en-

– I just didn't like him because at the time I thought he was wack," adding that he loves "Rockstar" and encourages Malone to "keep growing, keep winning" and "give back to the black community in some form.")

I tell Malone that, to my ear, Charlamagne was raising the issues, however confrontationally, of white allyship and cultural appropriation. Malone nods but says that, in his view, he's been the target of so-called reverse racism. "People are gonna hate you for what they're not gonna understand you for," he says. He notes that he supports NFL players who kneel during the anthem. "It's all about pushing for equality – in both directions," he says.

"Especially with the power of music, we can push past the world's flaws and make it a more beautiful place."



JUSTIN TIME

Malone says his friend Justin Bieber is "a great dude," but "he's gotten super-religious recently. Real culty."

counter came in 2015, when the radio host Charlamagne tha God took Malone to task, asking him, among other things, what he was doing to support Black Lives Matter. Malone's answer, he admits, was insufficient: "I guess what I can do to help Black Lives Matter is keep making music.... I don't know," he replied. Looking back, Malone tells me, "I wish I'd said, 'What are you doing for Black Lives Matter?' Some sassy shit to shut him up. Like, maybe my music's not the best, but I know I'm not a bad person, so you're just being a hater."

Malone shakes his head. "He's not a good person. He hates me because I'm white and I'm different. But we're still rocking and we're still successful, and he can't stop it." (Reached for a response, Charlamagne mentions his involvement with various social-justice organizations, and says, "I don't not like people because they're white

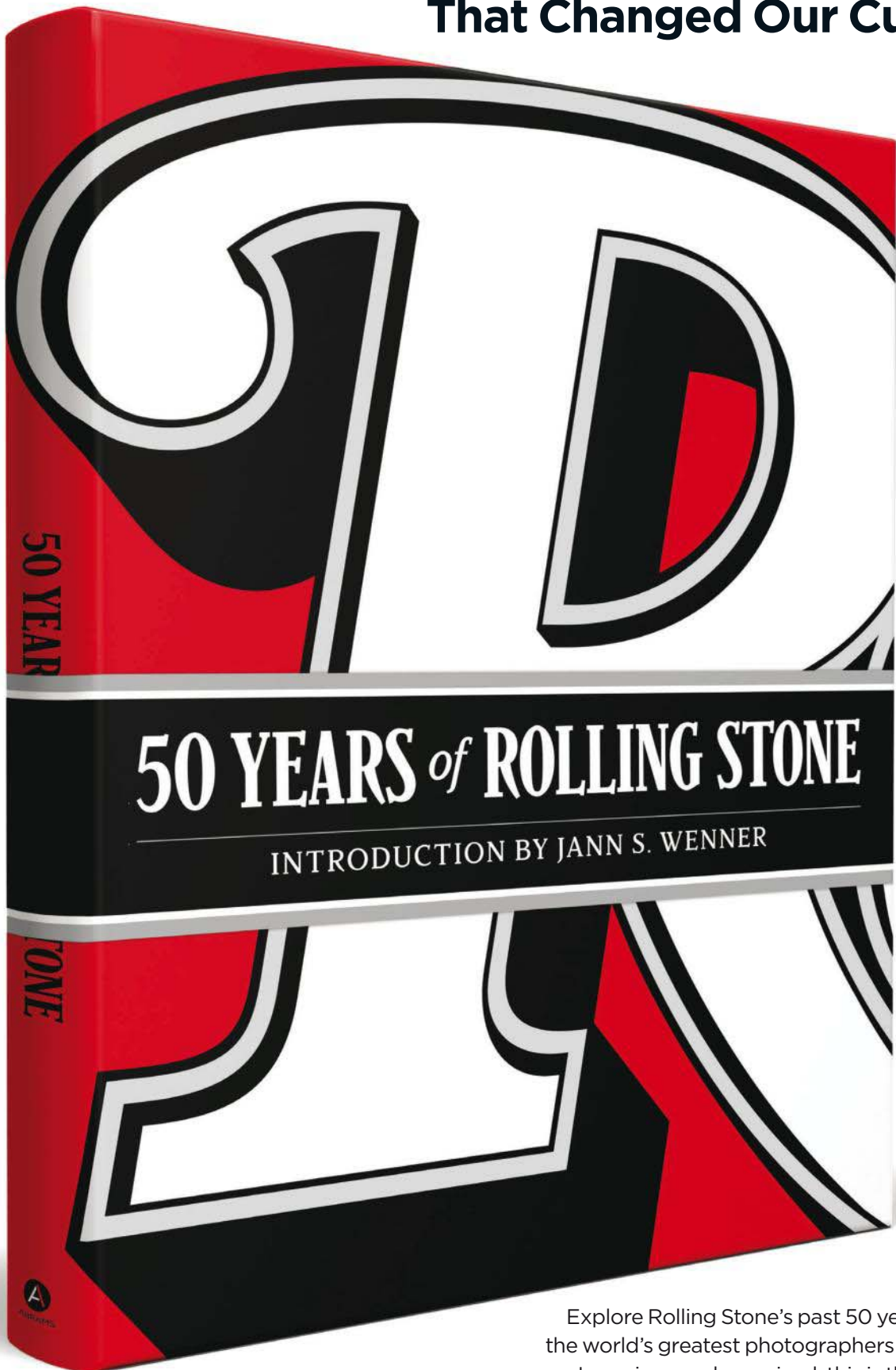
A FEW HOURS LATER, THE sun has set, and Malone has switched from Call of Duty to Ghost Recon to the wrestling game WWE2K18. Besides gaming and gun ranges, Malone binges TV shows like *Power* and *Designated Survivor*. When I ask if he pays attention to the news, he says, "I'm more into alternate news. Shit not a lot of people read, like conspiracy shit. There's crazy shit that goes on that we can't explain. Chemtrails and shit." I ask if his interest in conspiracies is ironic or real. "It's real," he says. "Like, they have a gun that gives you a heart attack, and they can't tell the difference."

It's after 8 p.m. Probst and some of the other guys announce that they're headed out to see the new *Thor*. Malone sticks to his couch. He's enjoying the downtime, he says. When he hasn't been touring, he's been working on his second album. It's nearly finished and is set to feature collaborations with Nicki Minaj, Ty Dolla \$ign, John Mayer and Tommy Lee. "I'm trying to push the genre," he says.

He has no home studio here, but there will be one, he vows, in his next house: a 13,000-square-foot home in northern Utah that he's about to buy for "like, \$3 million." Set on nearly seven acres, it will serve as both a party palace for his homeys – "I'm gonna put in, like, 30 bunk beds" – and a secluded compound for him and Ashlen to hunker down at, playing Xbox together, riding motorbikes, firing off guns that no one else will be able to hear.

"It's free country out there," Malone says. "Like, you can buy suppressors in Utah. You can do open-carry. Walk into the grocery store with a handgun on your hip. Cowboy shit." He grins. "I can't wait." **2**

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Reviews

"They took the crown, but it's all right.
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—TAYLOR SWIFT, "Call It What You Want"

A Darker, Deeper Side of Taylor Swift

The pop mastermind ditches tabloid drama for the most intimate album of her career



Taylor Swift

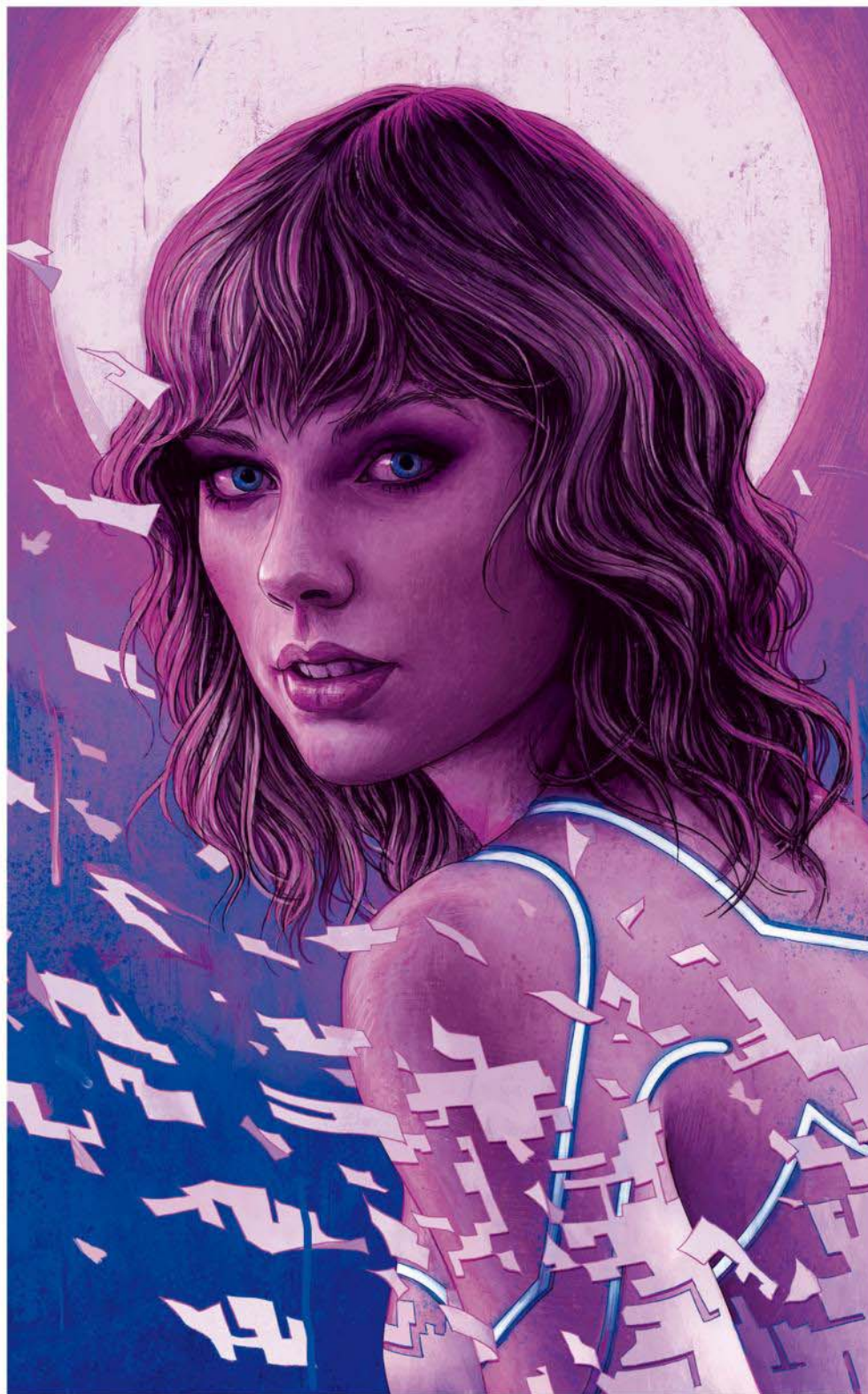
Reputation Big Machine

★★★★

BY ROB SHEFFIELD

"I swear I don't love the drama – it loves me!" Now there's a credo that sums up the Taylor Swift of *Reputation*. So rest in peace, Old Taylor, and for that matter New Taylor, because *Reputation* is New New Taylor. Swift spent most of the past year off the radar, dropping out of the media hustle – a major challenge for a star this relentless about sharing her feelings, not to mention her cats' feelings. Taylor turning off her phone was the equivalent of Leonard Cohen moving to a Zen monastery for five years.

From the sounds of her excellent sixth LP, Swift spent that time going into deeper, darker, more introspective places. *Reputation* is her most intimate album – a song cycle about how it feels when you stop chasing romance and start letting your life happen. As one of the all-time great pop masterminds, she's trying something new, as she always does. But



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Reviews

because she's Taylor Swift, she can't stop being her own turbulent, exhausting, gloriously extra self. Make no mistake, this girl's love affair with drama is alive and well.

The world was expecting *Reputation* to be a celebrity self-pity party, after her single "Look What You Made Me Do." But instead, she's playing for bigger emotional stakes – it's an album full of adult love songs. Gems like "Dancing With Our Hands Tied" are love stories that don't end with a scarf hidden in a drawer. They're full of everyday details – spilling wine in the bathtub, building blanket forts. But they also explore a very contemporary question: What happens to your identity when you stop defining yourself by how strangers see you?

Reputation builds on the synth-pop of 1989 – ingenious hooks blown out for maximum bombast, with production duties split between the team of Max Martin and Shellback ("2 Swedes and a Swift") and Jack Antonoff. There's a surprising amount of sex ("scratches down your back" is a Tay lyrical first) and her first recorded profanity, when she sneers about her exes in "I Did Something Bad": "If a man talks shit, then I owe him nothing." "End Game" is her deeply weird, wildly funny R&B collabo with Future and Ed Sheeran – now there's an odd threesome.

Swift saves up all her bal-lad mojo for the finale, "New Year's Day," which continues her streak of ending each album with a massive tear-jerker. It's the quietest moment on *Reputation*, yet the most powerful – she wakes up after a glam New Year's bash ("Glitter on the floor after the party/Girls carrying their shoes down in the lobby") and reflects on what she has left to call her own, which is the not-so-glam partner she'll be spending this not-so-glam day with. It's a tiny moment between two people, a moment the rest of the world will never notice. And all over *Reputation*, Swift makes those moments sound colossal, the way only she can.



Motor City madman: Kid Rock

Kid Rock's All-American Shock Rock

The good ol' bull god mixes lame jokes and genuine heartland empathy

Kid Rock *Sweet Southern Sugar*

BMG ★★ ★



"I'll fuck you in your ass quick with Taylor Swift's dick," announces Kid Rock charmingly on "Grandpa's Jam," an old-school shock-rap parody marrying toxic content with winking deniability. As comedy or bait for Twitter moralists – even from a pretend Senate candidate who's supped at the White House with our potty-mouth president – it's pretty lame.

But it's on brand for Michigan son Bob Ritchie, heir to the upstart, hot-button entertainment tradition that's given us Iggy Pop, Alice Cooper and Eminem. What's notable about his 11th studio set is how entertaining, even empathetic, it can occasionally be. "Po-Dunk" lovingly raises a glass to "batshit crazy" redneck culture; "Tennessee Mountain Top" is a combo Hollywood Babylon kiss-off and "Sweet Home Alabama"-style mash note; "I Wonder" cross-pollinates Prince and Bob Seger. If "Greatest Show on Earth" is generic hard-rock chest-thumping, "American Rock & Roll" is admirably inclusive corn, and the gruffly touching cover of the Four Tops' "Sugar Pie Honey Bunch" is non-partisan home-ground pride.

WILL HERMES



Maroon 5

Red Pill Blues 222/Interscope

★★★★½

Adam Levine has a good time hanging with the new kids

On the sixth M5 LP, Adam Levine nuances a role he plays well: the Top 40 old soul navigating whatever the pop-music moment throws his way. He works well alongside young talent, trading playful “hey now, baby”s with SZA over crisp brunch funk on “What Lovers Do” and ascending into falsetto sunshine with Julia Michaels on “Help Me Out.” Kendrick Lamar provides a high point simply by showing up for “Don’t Wanna Know.” Whether skating over house beats on “Plastic Rose” or cruising through a ballad like “Denim Jacket,” Levine proves himself a pliant star of Jacksonian ease and Stingly self-assurance.

JON DOLAN



Kelsea Ballerini

Unapologetically Black River

★★★★½

Nashville up-and-comer's second LP mixes pop, tradition

Twenty-four-year-old Kelsea Ballerini filled her 2015 debut with smackdowns of Peter Pan bros and other losers and users – songs that were country by virtue of the banjos and fiddles decorating their stomping choruses. When she opens her new one with “Graveyard,” vowing that the ghost of a broken heart won’t hold her back, you can tell she’s reloaded. Turn up the snares of “Miss Me More” and it could be country trap. Nostalgia and acoustic-guitar haze dampen the bite of “High School” and “Legends,” but “Get Over Yourself” finds her once again hooting at the walls of heartbreak. And her aim is true.

JOE LEVY



Sharon Jones

Soul of a Woman Daptone

★★★★★

A soul queen's powerful posthumous farewell

When Sharon Jones died of pancreatic cancer last year, the world lost its greatest exponent of vintage soul. Recording over her last two years with the Dap-Kings and other longtime sidemen, genre masters all, Jones meets darkness with hope on her final album, now a posthumous treasure. “Matter of Time” envisions world peace; “Come and Be a Winner” is a funky pep talk. It’s easy to read themes of mortality into the lyrics, but this is a stirringly indefatigable farewell. Her own church choir joins in for “Call On God,” and the LP ends heartbreakingly with Jones chuckling or crying – it’s hard to tell. Maybe both.

WILL HERMES



Morrissey

Low in High School BMG

★★★★½

Alt-rock's greatest stand-up comedian has still got it

Pop quiz: Morrissey’s endless, withering disdain for cultural hypocrisy might get wearisome if not for a) his equally relentless tenderness, b) his Wildean wit, c) the truth of his observations. Yes, it’s d) all of the above. “Society’s hell,” he reminds us near the start of his latest LP. “You need me just like I need you.” We do. “Stop watching the news!” he commands. “I just want my face in your lap,” he declares. Lines like “I’ve dined with every bogus music mogul” and “I’m not my type, but I love my bed” are dusted with existential malaise. The backup ain’t the Smiths, but it’s solid. As alt-rock stand-up acts go, he’s still peerless.

W.H.

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By Peter Travers

An Affair to Remember

Call Me by Your Name

Armie Hammer,
Timothée Chalamet,
Michael Stuhlbarg

Directed by Luca Guadagnino

★★★★

HERE'S THE MOVIE OF THE year for incurable romantics. It'll sweep you up on waves of dizzying eroticism and then sweetly and emphatically leave you shattered. Director Luca Guadagnino (*I Am Love*, *A Bigger Splash*), an ardent sensualist, sets the film in northern Italy in the summer of 1983, when even the air is perfumed with wanton possibility. Elio Perlman (a flawless Timothée Chalamet) is 17, multilingual, musically gifted and skilled at flirting with the local girls near the villa of his parents, an American professor (a superb Michael Stuhlbarg) and his translator wife (Amira Casar). Then an intern arrives from the U.S. to assist Elio's father with research into Greco-Roman culture. He's Oliver (a never-better Armie Hammer), 24, a handsome, athletic charmer. At first, the slender Elio is irritated by Ol-



Secret love:
Hammer,
Chalamet

iver's body beautiful and his American slang (always saying "later" instead of goodbye). Then an attraction develops, slowly and irrevocably.

Working from André Aciman's revered 2007 novel, Guadagnino and screenwriter James Ivory keep the film's emotions as naked as its bodies. You may be shocked by what Elio and Oliver do to a juicy peach – bet on those stolen moments taking a forever place in the history of cinema sex. But the point here isn't exploitation, it's connection. With Oliver, Elio feels he can talk about "things that matter."

The beauty part is that these "things" matter to all of us, regardless of sexual orientation, when we're gutted for the first time by that thing called love.

Bring out the superlatives for Hammer and Chalamet, who instill their roles with fire, feeling and teasing humor. Still, it's the film's nurturing compassion that stays with you. Stuhlbarg shines in a crucial scene of wrenching empathy in which a father openly encourages his son to follow his true nature, screw the risks. *Call Me by Your Name* is a transporting love story for the ages, and a new film classic. Let it in. **C**

Performance of the Year

Darkest Hour

Gary Oldman

Directed by Joe Wright

★★★★½

GARY OLDMAN IS ONE OF THE best actors on the planet. And he proves it for keeps as Winston Churchill in *Darkest Hour*, director Joe Wright's rip-roaring take on the prime minister's first tumultuous month in office, in May 1940, when Great Britain is a whisper away from surrendering to Hitler. Oldman is barely recognizable in his Churchill fat suit. But thanks to the makeup artistry of Kazuhiro Tsuji, the flashing mischief



Oldman

in Oldman's eyes pokes through the latex, and his voice catches Churchill's eloquent call to arms against the Nazis. Academy, get busy engraving Oldman's name on an Oscar for a performance that belongs in the Hall of Fame.

Wright's pulsating, provocative drama runs on Oldman's genius as the brawling, baby-faced PM, who terrorizes a young typist (Lily James) and his long-suffering wife (a terrific Kristin Scott Thomas) while using booze to dull his wracking self-doubts. There's much talk about the evacuation of Dunkirk (check Christopher Nolan's epic to actually see it). And Oldman thunders one of Churchill's famed speeches ("We shall fight on the beaches"). But the victory of *Darkest Hour* is finding the flawed human being who carved those words out of the dark night of his soul. **C**

A Searing Epic About a Divided America

Mudbound

Mary J. Blige, Jason Mitchell

Directed by Dee Rees

★★★★½

SET IN HARD-TIMES MISSISSIPPI just before and after World War II, *Mudbound*, based on a 2008 novel by Hillary Jordan, is a fiercely intimate epic about two poor families, one white farmers (the McAllans), the other black sharecroppers (the Jacksons) who work the McAllan land. *Mudbound* reps a new career high for director Dee Rees (*Pa-*



Blige
in crisis

riah, HBO's *Bessie*), a gay black woman with a charged affinity for life on the fringes. Hap Jackson (Rob Morgan) and his wife, Florence (Mary J. Blige), watch a son, Ronsel (Jason

Mitchell), go off to war. Henry McAllan (Jason Clarke) and his wife, Laura (Carey Mulligan), cope with Henry's brother Jamie (Garrett Hedlund) enlisting as a pilot. Ronsel and Jamie

return home with PTSD and an unlikely friendship that results in racist violence. Mitchell is a standout, and Blige radiates grit and grace in a film that grabs you and won't let go. **C**

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ELON MUSK

[Cont. from 41] I'm never going to make it, that I'm never going to make anything of myself. He called me an idiot all the time. That's the tip of the iceberg, by the way."

AFTER MUSK BECAME SUCCESSFUL, HIS father even took credit for helping him – to such a degree that it's listed as fact in Elon's Wikipedia entry. "One thing he claims is he gave us a whole bunch of money to start, my brother and I, to start up our first company [Zip2, which provided online city guides to newspapers]. This is not true," Musk says. "He was irrelevant. He paid nothing for college. My brother and I paid for college through scholarships, loans and working two jobs simultaneously. The funding we raised for our first company came from a small group of random angel investors in Silicon Valley."

Musk's career history decorates his desk. There's an item from nearly all of his companies, even a mug for X.com, the early online bank he started, which became PayPal. The sale of Zip2 resulted in a \$22 million check made out directly to Musk, which he used in part to start X.com. With the roughly \$180 million post-tax amount he made from the sale of PayPal, he started SpaceX with \$100 million, put \$70 million into Tesla, invested \$10 million into Solar City, and saved little for himself.

One of the misunderstandings that rankles Musk most is being pigeonholed and narrowcast, whether as the real-life Tony Stark or the second coming of Steve Jobs. When, at a photo shoot, he was asked to wear a black turtleneck, the trademark garb of Jobs, he bristled. "If I was dying and I had a turtleneck on," he tells me, "with my last dying breath, I would take the turtleneck off and try to throw it as far away from my body as possible."

So what is Musk about?

"I try to do useful things," he explains. "That's a nice aspiration. And useful means it is of value to the rest of society. Are they useful things that work and make people's lives better, make the future seem better, and actually are better, too? I think we should try to make the future better."

When asked to define "better," Musk elaborates, "It would be better if we mitigated the effects of global warming and had cleaner air in our cities and weren't drilling for vast amounts of coal, oil and gas in parts of the world that are problematic and will run out anyway."

"And if we were a multiplanetary species, that would reduce the possibility of some single event, man-made or natural, taking out civilization as we know it, as it did the dinosaurs. There have been five massive extinction events in the fossil record. People have no comprehension of

these things. Unless you're a cockroach or a mushroom – or a sponge – you're fucked." He laughs sharply. "It's insurance of life as we know it, and it makes the future far more inspiring if we are out there among the stars and you could move to another planet if you wanted to."

This, then, is the ideology of Musk. And though basic, it's actually very rare. Think of the other names that one associates with innovation this century: They're people who built operating systems, devices, websites or social-media platforms. Even when it didn't start out that way, the ideology in most cases soon became: How can I make my company the center of my users' world? Consequently, social-media sites like Facebook and Twitter use a number of tricks to activate the addictive reward centers of a user's brain.

If Musk's employees suggested doing something like this, he'd probably look at them like they were crazy. This type of thinking doesn't compute. "It's really inconsistent to not be the way you want

"I don't have all the fucking answers. I'm trying to figure out the actions I can take that are likely to result in a good future."

the world to be," he says flatly, "and then through some means of trickery, operate according to one moral code while the rest of the world operates according to a different one. This is obviously not something that works. If everyone's trying to trick everyone all the time, it's a lot of noise and confusion. It's better just to be straightforward and try to do useful things."

He discusses building a permanent moon base, and further funding SpaceX by creating passenger rockets capable of traveling to any city in the world in less than an hour, a form of transport he calls "Earth-to-Earth." I ask if there's anything that he believes works that surprises people.

"I think being precise about the truth works. Truthful and precise. I try to tell people, 'You don't have to read between the lines with me. I'm saying the lines!'"

On another occasion, I watch Musk at a weekly SpaceX engineering-team meeting, where eight experts sit around a table in high-backed red chairs, showing Musk a PowerPoint with the latest updates to the Mars spaceship design. And while Musk keeps pace on technical details with some of the most brilliant minds in aerospace,

he also adds an element that goes beyond logistics and engineering.

"Make sure it doesn't look ugly or something," he advises at one point. Then, later, "The aesthetics of this one are not so great. It looks like a scared lizard." And, in a characteristically wry moment, "When you land on Mars, you want the list of what you have to worry about to be small enough that you're not dead."

Overall, there's a theme to Musk's feedback: First, things have to be useful, logical and scientifically possible.

Then he looks to improve efficiency on every level: What are people accepting as an industry standard when there's room for significant improvement?

From there, Musk pushes for the end product to be aesthetically beautiful, simple, cool, sleek ("He hates seams," says one staffer) and, as Musk puts it at one point in the meeting, "awesome."

Throughout this process, there's an additional element that very few companies indulge in: personalization. This usually involves Musk adding Easter eggs and personal references to the products, such as making the Tesla sound-system volume go to 11 (in homage to *Spinal Tap*) or sending a "secret payload" into space in his first Dragon launch that turned out to be a wheel of cheese (in homage to Monty Python).

Beyond all this, most maddening or exciting for Musk's employees, depending on which one you ask, is the time scale on which he often expects work to be done. For example, one Friday when I was visiting, a few SpaceX staff members were frantically rushing back and forth from the office to the parking lot across the street. It turns out that during a meeting, he asked them how long it would take to remove staff cars from the lot and start digging the first hole for the Boring Company tunnel. The answer: two weeks.

Musk asked why, and when he gathered the necessary information, he concluded, "Let's get started today and see what's the biggest hole we can dig between now and Sunday afternoon, running 24 hours a day." Within three hours, the cars were gone and there was a hole in the ground.

On the other hand, one thing Musk is notorious for is setting ambitious deadlines that he often can't meet. The Roadster, the Model S and the Model X were all delayed from his original timeline, and now the Model 3 – with its nearly half-a-million-person-long waiting list – is experiencing its own production delays. There are many reasons for this, but Musk summarizes: "Better to do something good and be late than bad and be early." So expect Musk to get it done, just not on time. Because if he can't do it, he won't pretend otherwise.

I EXPECT TO LOSE," MUSK SAYS. HE'S in a three-story building in San Francisco that has only recently been furnished. It used to belong to Stripe, the credit-card payment processor, but now belongs to Musk, who's housing two of his companies there: Neuralink and OpenAI.

These are visions of what Tesla or SpaceX may have looked like when they first began. A small group of excited people working with limited resources to hit a distant, ambitious target. But unlike Tesla and SpaceX, there aren't anything close to road maps toward these goals, nor are they so clear-cut.

OpenAI is a nonprofit dedicated to minimizing the dangers of artificial intelligence, while Neuralink is working on ways to implant technology into our brains to create mind-computer interfaces.

If it sounds like those are contradictory ideas, think again. Neuralink allows our brains to keep up in the intelligence race. The machines can't outsmart us if we have everything the machines have plus everything we have. At least, that is if you assume that what we have is actually an advantage.

It's an unusual day at the office: Musk is showing a documentary about artificial intelligence to the Neuralink staff. He stands in front of them as they sit splayed on couches and chairs, and lays out the grim odds of his mission to make AI safe: "Maybe there's a five to 10 percent chance of success," he says.

The challenge he's up against with OpenAI is twofold. First, the problem with building something that's smarter than you is...that it's smarter than you. Add to that the fact that AI has no remorse, no morality, no emotions – and humanity may be in deep shit. This is the good son's second chance against the remorseless father he couldn't change.

The other challenge is that OpenAI is a nonprofit, and it's competing with the immense resources of Google's DeepMind. Musk tells the group he in fact invested in DeepMind with the intention of keeping a watchful eye on Google's AI development.

"Between Facebook, Google and Amazon – and arguably Apple, but they seem to care about privacy – they have more information about you than you can remember," he elaborates to me. "There's a lot of risk in concentration of power. So if AGI [artificial general intelligence] represents an extreme level of power, should that be controlled by a few people at Google with no oversight?"

"Sleep well," Musk jokes when the movie ends. He then leads a discussion about it, writing down some ideas and bluntly dismissing others. As he's speaking, he reaches into a bowl, grabs a piece of popcorn, drops it in his mouth and starts coughing.

"We're talking about threats to humanity," he mutters, "and I'm going to choke to death on popcorn."

IT IS 9 P.M. ON A THURSDAY NIGHT, and I'm waiting in the foyer of Musk's Bel Air home for our final interview. He walks down the stairs a few minutes later, wearing a T-shirt depicting Mickey Mouse in space. A tall blond woman follows him down the stairs.

He is, true to his words, not alone.

The woman, it turns out, is Talulah Riley, his second wife. They met in 2008, and Musk proposed after 10 days together. They married in 2010, then divorced two years later, then remarried the following year, then filed for divorce again, then withdrew the filing, then re-filed for divorce and finally followed through with it.

Musk suggests doing something rare for him: drinking. "My alcohol tolerance is not very high," he says. "But I tend to be a fuzzy bear when I drink. I go happy fuzzy."

He pours two glasses of whiskey for us,

So what's Musk's ideology? "I try to do useful things that are of value to society," he says. "And make people's lives better."

and the three of us adjourn to his living room, where there's a mechanical Edison phonograph, an Enigma machine and a short-wave radio from World War I on display.

During the interview, Riley lounges on the couch nearby, half paying attention to the conversation, half paying attention to her phone.

Musk is in a different mood than he was at SpaceX, and that's something that those who've come to know Musk observe. One moment, he may be reciting favorite lines from an animated TV show he just saw, the next he may be curtly giving detailed instructions, the next he may be ignoring you while lost in a thought, the next he may be asking for your advice on a problem, the next he may be breathless with laughter while riffing on a humorous tangent for five minutes, the next he may be acting as if you've both never met. And through it all, you learn not to take it personally, because chances are that it has nothing to do with you.

We start off talking, or at least with me trying to talk, about AI, because a few weeks earlier, Musk had tweeted, "Com-

petition for AI superiority at national level most likely cause of WW3 imo."

But when I ask him about that, Musk gets testy. "I don't have all the answers. I'm not saying that I have all the fucking answers. Let me be really clear about that. I'm trying to figure out the set of actions I can take that are more likely to result in a good future. If you have suggestions in that regard, please tell me what they are."

Riley chimes in: "I think just the way it gets couched is that 'Elon Musk says we're all gonna die,' as opposed to 'Hey, let's have some regulation.'"

Musk, it soon becomes clear, is not in the mood to talk about his work. Instead, he has some advice he'd like to offer to the world from his personal experience: "I find one learns lessons in the course of life," he begins with a wry half-smile. "And one lesson I've learned is, don't tweet on Ambien. That's on the record: Tweeting on Ambien is unwise. You may regret it."

Musk grabs a coffee-table book published by *The Onion* and starts leafing through it, laughing hysterically. "In order to understand the essential truth of things," he theorizes, "I think you can find it in *The Onion* and occasionally on Reddit."

Afterward, he asks excitedly, "Have you ever seen *Rick and Morty*?" And the conversation bounces from that animated show to *South Park* to *The Simpsons* to the book *Hitchhiker's Guide to the Galaxy*.

One of the lines from *Hitchhiker's*, Musk says, ended up being Musk Family Rule Number One: "Don't panic."

"The boys were quite skittish about all kinds of things," Riley explains.

"That's our other rule," Musk continues. "Safety third. There's not even a Rule Number Two. But even though there's nothing in second place, safety is not getting promoted to number two."

We're interrupted by Teller, Musk's chief of staff, who informs him that as we were talking, the Hawthorne City Council ended an hours-long debate with a 4-to-1 vote allowing Musk to burrow his tunnel two miles into the city.

"Good," Musk says. "Now we can dig past our own property line. Dig like fiends!"

He laughs at the expression, and I understand now that Musk didn't have me over to talk about his projects and vision. There's nothing to be gained from talking about the problems of science with someone who doesn't understand them. At the end of the day, he just wants to unwind and laugh about the world he's trying to improve.

I leave his home still hearing his chuckles in the doorway, and hoping that when the Mars colony builds its first statues of Musk, they're not of a stiff man with a tight-lipped expression looking out into space, but of a fuzzy bear.

Michael Moore

The filmmaker on advice from Jesse Jackson, fighting back against Trump, and the one that got away

What's the best part of success?

When I sold my first film [1989's *Roger & Me*], I was still getting \$98 a week in unemployment welfare checks. After that, I never again had to follow the orders of someone else. Now, everything I say and do is literally what I want it to be. The audience can trust that the invisible hand of authority, of the profit motive, is nowhere in the mix.

What's the worst part of success?

Probably the attempts on my life. I have documented them. I'm not afraid. I don't live in constant fear. I just would like to have a little more time on Earth.

What's the best advice you've ever received?

I remember being in a church and listening to Jesse Jackson say that you can't get into heaven without a permission slip from the poor. Your life should be evaluated by what you did for those who had less than you.

Who are your heroes?

Any number of artists who march to their own drummer: Salvador Dalí, Bob Dylan, Jonathan Swift, Mark Twain, the Marx Brothers, Kubrick. People who are willing to invent something, to take it to the edge. I tell this to kids in film schools: Make the film you want to make. Out of a nation of 320 million, 319 million may hate what you have done, but if a million love it, you will make \$50 million on your opening weekend. So fuck it. Do what you want to do.

What music still moves you the most?

Springsteen, Jackson Browne, Motown, Iggy Pop, the Clash, Rage Against the Machine, Public Enemy. Anything that tapped into the part of me that wanted to rebel and to stop the evil forces in front of us.

What drew you to Springsteen?

He really captured the voice of a white working-class experience. He's somebody that didn't go to college. We had a similar experience in the sense of growing up in that environment, and his music is extremely moving on that level.

You're from Flint, Michigan. What's the most Flint thing about you?

Bad eating habits. You will never eat a better hot dog than in Flint. We call them Coney Islands. The absolute best bakery is in Davison, Michigan, just outside of Flint. It's called Home Bakery. No doughnut anywhere can hold a candle to these doughnuts. What I also love about Flint is the complete lack of pretension. I have been fortunate enough to see both a thriving middle class in Flint, as well as

the exact opposite of that. The city that created the middle class is now treated like a Third World country.

What advice do you wish you could give yourself at age 21?

Oh, my God... Call Lynn Sharon, and go out with her more.

Who's she?

She was a wonderful, wonderful person. Our first date, she took me to the Floyd McCree Theatre in Flint to a production of the autobiography of Malcolm X. She won my heart at that moment. I just wished her happy birthday on Facebook, but the last time I actually saw her was probably 1990. So, that's my advice:

Follow your heart.

You were about the only political pundit on the left that predicted Trump would win.

I never wanted to be more wrong than with that prediction. I was trying to tell anybody who was connected to the Clinton campaign that she needed to get out to Michigan and Wisconsin.

You know, more than 70 percent of the country is either women, people of color or young adults, or a combination of the three. So of course it shouldn't have happened. The day before the election, *The New York Times* said he had a 15 percent chance of winning. Why would you believe anything *The New York Times* says after that? This is a paper that, like much of the media, has been out of touch. They're still distracted about all the wrong things about Trump, and they are in many ways contributing to his being in office until January 2025.

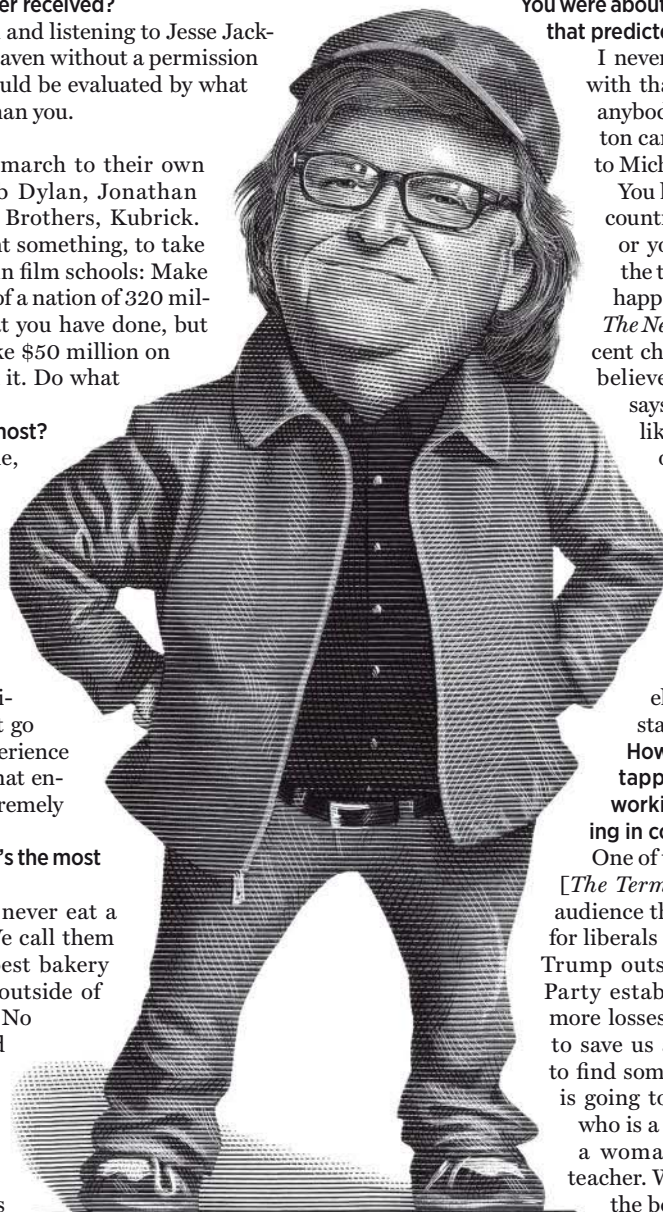
What are the odds Trump gets re-elected?

Fifty-five percent. We will get more popular votes in the next election, but will he win the same states? As of now, yes.

How could Trump be so smart about tapping into the anger of the white working-class people that have nothing in common with him?

One of the things I do early on in my play [*The Terms of My Surrender*] is I tell the audience that they are in a 12-step program for liberals and Democrats. Step one: Admit Trump outsmarted us all. The Democratic Party establishment is going to lead us to more losses. The only people who are going to save us are us. People reading this have to find someone to run in their district that is going to win. Run an Iraq War veteran who is a good progressive Democrat. Run a woman. Run a beloved government teacher. We have to think way, way outside the box.

INTERVIEW BY ANDY GREENE



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