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Bloomberg Businessweek

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CAN'T

LEAVE HOME WITHOUT IT

The strange obsession with Chase's Sapphire Reserve card

p52


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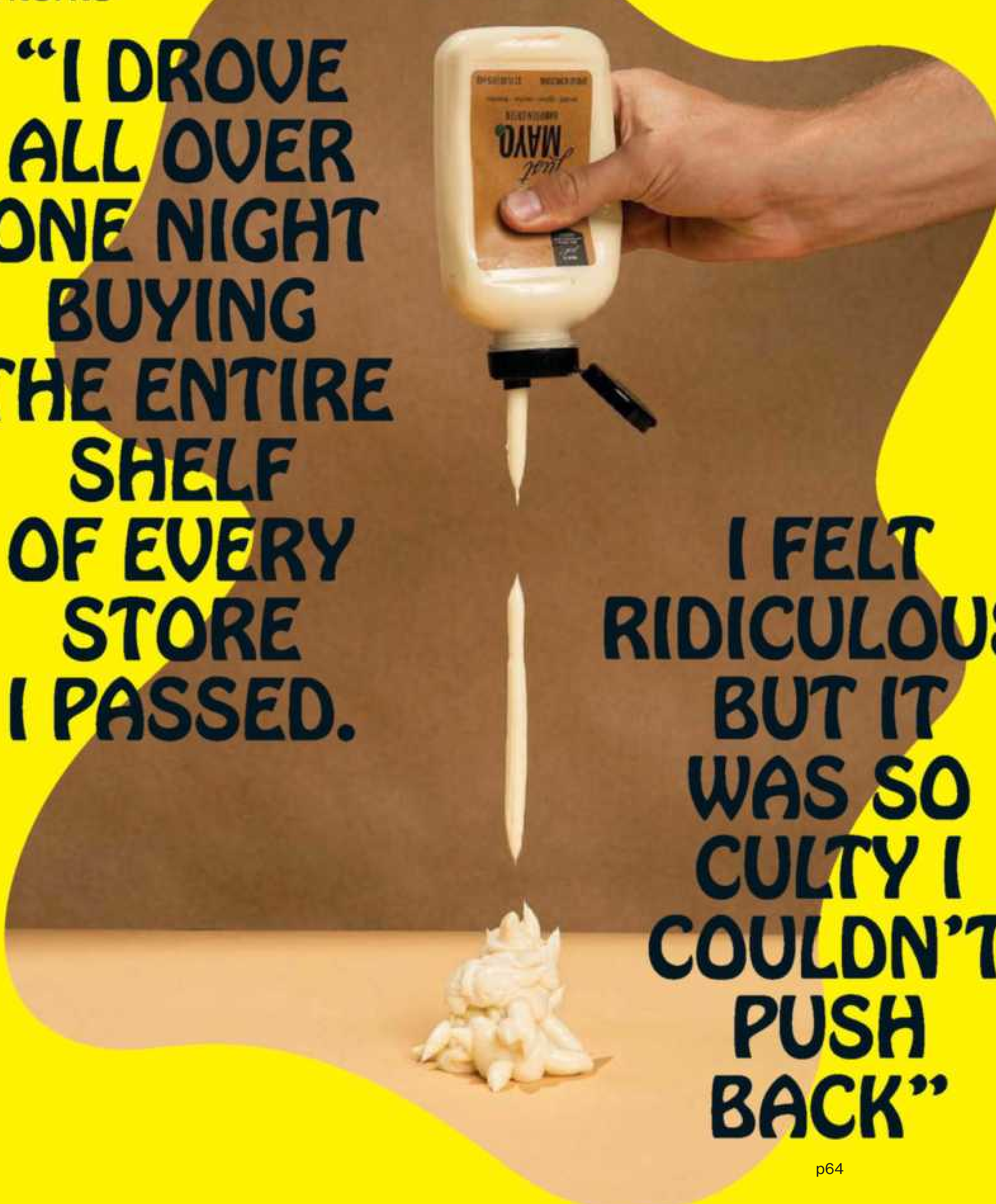


“I DROVE ALL OVER ONE NIGHT BUYING THE ENTIRE SHELF OF EVERY STORE I PASSED. I FELT RIDICULOUS, BUT IT WAS SO CULTY I COULDN’T PUSH BACK”

“When I go to dinner, there might be three cards that get thrown down. They’re all Chase Sapphire”

“Tencent’s culture is like a shark womb. It’s not as deadly, but it makes every member adapt faster and be more competitive”

“I don’t think our young Marines were set up for success. This is not a good-news story. I am being straight up with you”

PHOTOGRAPH BY CAROLINE TOMPKINS FOR BLOOMBERG BUSINESSWEEK

Bloomberg Businessweek

September 26 — October 2, 2016

Cover Trail

How the cover gets made

Domestic Cover

1 "The story is on the Chase Sapphire card and its newest version, the Reserve. Its customer base is particularly loyal, to an almost obsessive degree."

"Obsessed with a credit card? Seems almost…unnatural."

International Cover

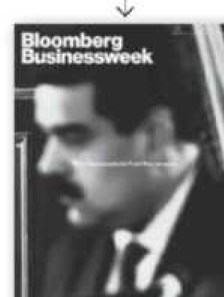
1 "We go into why Venezuela isn't on the verge, despite recent cultural shifts."

"Why?"

"Many reasons, mostly pointing toward a man with a very distinctive mustache."

"Tom Selleck?"

"Try again."



COVER AND COVER TRAIL: DOMESTIC EDITION: PHOTOGRAPH BY FINLAY MACKAY FOR BLOOMBERG BUSINESSWEEK; ILLUSTRATION BY JUSTIN METZ; INTERNATIONAL EDITION: CARLOS BECERRA/BLOOMBERG

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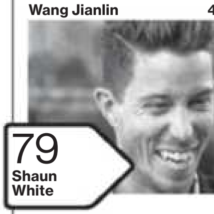

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Corrections & Clarifications
Listener data cited in "Pop Culture Unites Us—and Divides Us" (The Electorate, Sept. 19-Sept. 26, 2016) were collected by Jumpshot, rather than the Bulleit Group.

HELICOPTER: COURTESY U.S. AIR FORCE; KOTAGIRI: PHOTOGRAPH BY GRAHAM WALZER FOR BLOOMBERG BUSINESSWEEK; WHITE: ROY ROCHLIN/GETTY IMAGES

The Best of Both Worlds

There's a winner in the public vs. private cloud model debate: hybrid

When cloud computing first became a hot topic, one major talking point for CIOs was whether their businesses should utilize a public or private cloud deployment model. The debate continued as cloud vendors made pitches for their various products, and recommendations about which deployments best suited a wide range of companies that wanted to use the latest technology to optimize their business strategies.

That debate is over, according to David Shacochis, Vice President of Product Management at CenturyLink, who points out that many companies now agree that a hybrid computing model offers the widest range of benefits. "From the point of view of the market as a whole, I'd say the debate is settled," he explains, "and the right answer for most companies is to use some mix of public and private strategies."

But Shacochis adds that choosing a hybrid solution is also the first step in a new debate, since there are many different organizational, technological and strategic ways of implementing a hybrid cloud deployment. The choice of a particular model will inevitably be driven by a company's customers and the requirements of the business.

> **"The right answer for most companies is to use some mix of public and private strategies."**
>
> — David Shacochis, CenturyLink

"Beyond the notion of cloud computing, there are many other aspects of information technology and enterprise architecture that customers need to take into account," he explains. "Those could be the layer of skill, humanity and service management that is going on at the workload and managed services layer, or the network access, the data center operations or any of the other elements that IT departments are typically responsible for. That's all encompassed when we use the phrase 'hybrid IT.'"

An optimal hybrid IT environment strikes the best balance between managing on-premise and off-premise computing with efficient networking and data storage, and gives organizations the advantage of customizing their infrastructures and solutions to meet their specific data, security, regulatory, scalability and capacity needs.

Broad network access to the public cloud enables an enterprise to use it as a logical extension of the physical data center. As workloads may be deployed across varied environments, interconnectivity between those environments must be seamless. These requirements play to CenturyLink's strengths as a global communications, hosting, cloud and IT services company with more than 55 data centers in North America, Europe and Asia, and a robust fiber network.

"CenturyLink's cloud platform differs from other providers' in that our primary business is network connectivity and managed IT services," Shacochis explains. "We have a platform that allows us to continually innovate and offer new ways of delivering network connectivity and managed IT services, while still letting customers participate with a public cloud at a purely data-center-infrastructure level."

Besides providing private network connections between various hosted environments, CenturyLink offers every type of cloud modality, including public clouds; private clouds with automated provisioning; managed hosting environments; and colocation, so each customer can effectively manage a hybrid infrastructure that offers agility and scalability, as well as the best platform on which to deliver its applications.

"We feel that we unlock more value for customers by having that end-to-end offering that stretches all the way from managed IT services through data center infrastructure, all the way down to the network and the platform strategy we use to stitch it all together," says Shacochis. "Our goal is to do efficient IT service management on behalf of our customers to enable expansion of their IT, and we want to run efficient and secure global networks for them."

— John O'Mahony

PHOTOGRAPH BY HIROSHI WATANABE | GETTY IMAGES

Why Venezuela Isn't on the Verge

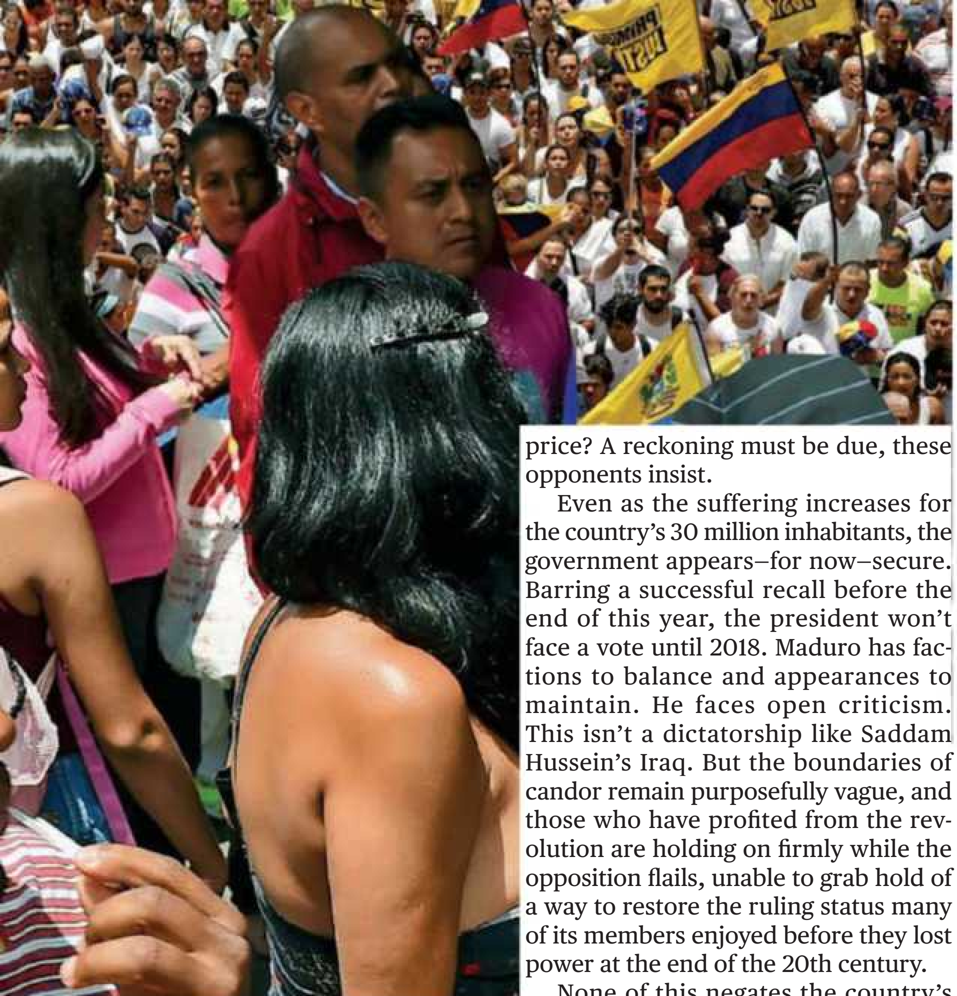
By Ethan Bronner and Andrew Rosati


Despite massive protests and growing economic desperation, the Maduro government hasn't lost power

The judge is shaking. Never mind that she's sitting in her office dressed with the tasteful elegance of a jurist, a large painting of Venezuela's national hero, Simón Bolívar, on one wall, watercolors on another. She's just returned from an event at the Supreme Court, which should be a monument to the objective application of law. But the gathering was a political rally with singing and dancing and a fervently applauded speech about the need to emasculate the nation's legislative body—the single institution not in the hands of the ruling socialist party.

"I don't know how my colleagues live with themselves," she says, her hands trembling as she removes her eyeglasses, rubs her temples, and then shuffles some papers. "Government ministers and military officers go freely up to the constitutional chamber," she says, where high court justices hear the most important cases. The president hasn't lost one in

PHOTO ILLUSTRATION BY 731; PHOTOS: RONALDO SCHEMIDT/AFP/GETTY IMAGES (2); MARCO BELLO/REUTERS (1); CARLOS GARCIA RAWLINS/REUTERS (2);



years. After the opposition sat three lawmakers whose election was disputed, the court declared the legislature essentially illegitimate.

From a distance, Venezuela, with its crashing oil prices and alarming shortages, appears on the brink of political upheaval. Almost 1 million people marched in Caracas on Sept. 1 to pressure President Nicolás Maduro into allowing a referendum for his recall. The overturning of leftist populism—sweeping across commodity-dependent South America from Argentina to Brazil to Peru—seems on its way here, the country where the movement had its most elaborate flowering.

But the infuriated judge illustrates something that's been insufficiently appreciated: The levers of power—the judiciary, the military, the oil, the election commission that must decide on the recall referendum—are firmly in the hands of the president. Among analysts and Maduro's opponents, there is a tendency to overstate how near to collapse things are, out of understandable frustration and wishful thinking. Can a government, no matter how much oil it has underground, ignore the laws of markets, make a mockery of its institutions, spin half-truths, and pay no price? A reckoning must be due, these opponents insist.

Even as the suffering increases for the country's 30 million inhabitants, the government appears—for now—secure. Barring a successful recall before the end of this year, the president won't face a vote until 2018. Maduro has factions to balance and appearances to maintain. He faces open criticism. This isn't a dictatorship like Saddam Hussein's Iraq. But the boundaries of candor remain purposefully vague, and those who have profited from the revolution are holding on firmly while the opposition flails, unable to grab hold of a way to restore the ruling status many of its members enjoyed before they lost power at the end of the 20th century.

None of this negates the country's harsh reality. Hunger is gnawing away at this nation, which, with the world's largest proven petroleum reserves, was one of the 20 richest in the 1970s. Inflation is in high triple digits—its largest bill is worth a dime, requiring brick-thick packets for simple transactions. Residents line up all day to buy corn flour. Kidnappers are thriving; wealthier Venezuelans leave jewelry at home and ride behind tinted car windows. Yet the opposition, despite an overwhelming legislative victory last December, hasn't gotten a single significant law past challenges in the courts. As pale follow-up demonstrations to the Sept. 1 march revealed, it remains splintered and disorganized. Life gets harder, but there's little reason to expect a change soon.

Venezuela is a land of natural bounty. Oil fills its depths. Mango and avocado trees grow along the side of the road. The Caribbean whispers offshore. Venezuelans often say this abundance has led to a charming if chaotic passivity. For two decades after the late 1970s, an oil bust led to exceptional suffering for the poor. Then, Lieutenant Colonel Hugo Chávez, with his Robin Hood promises, blew the doors off elite control of the nation with a victory in the 1998

“Chavismo is a fantasy.... But we must realize that many people still identify with that fantasy”

elections. Psychiatrist Cecilia Carvajal recalled that she and the other doctors in her large private Caracas clinic openly expressed alarm. Then she noticed the happy faces of her department's secretaries. “That was when I realized we had no idea of the resentment,” she says.

Chávez did. He expropriated land and industries and replaced judges, officers, and oil executives. He called it the Bolivarian revolution and declared it would relieve suffering and inequality. Chávez died in 2013 after picking as his successor Maduro, a man with far less charisma who has had to contend with plunging oil prices and a radically shifting regional outlook. His popularity is barely 20 percent. In some ways, he's the equivalent of Raúl Castro to Fidel, but, unlike Raúl, he shows few signs of economic pragmatism. He seems inclined to tighten state controls, not loosen them, and to attack the U.S., not seek detente with it. No senior official in the Venezuelan government agreed to speak for this article.

Henri Falcón was once part of the revolution. As a military officer in the early 1990s, he became a Chávez supporter and then a popular mayor of Barquisimeto, about 350km (200 miles) to the southwest of Caracas. In 2008 he announced his intention to run for governor. Chávez heard about it.

“He called me the next day,” Falcón recalls, sitting on the patio of his official residence in a plaid shirt and baseball cap. “He said, ‘Henri, what is this I hear?’ I said, ‘Yes, Mr. President. I plan to run.’ He said, ‘Henri, listen carefully. What you say and what you do is based on what I say and what I do.’ ” The next year, after winning the election for governor, Falcón grew tired of parroting the official line. He has since joined the opposition. “Chavismo is a fantasy,” he says. “What is socialism with hunger? But we must realize that many people still identify with that fantasy.”

Alejandro Riera used to. He was one of Chávez's biggest benefactors in the colonel's 1998 bid for the presidency. Riera served as Chávez's first minister of agriculture, quitting after he saw where things were headed. Standing in his 11th-floor apartment outside Barquisimeto, Riera points to fallow fields where sugar cane grew for generations. “The government ruined it,” he says. Riera owns farms. A dozen years ago, 30 armed soldiers came to one of them, 500 hectares (1,236 acres), and claimed it for the state. He protested. A message came back: “This is your contribution to the revolution.” The land was never put to use, however. When he last saw it a year ago, overgrown and fallow, he says tears came to his eyes.

Ignoring reality is getting harder for everyone. The emergency room in Barquisimeto’s government hospital, built for 25 patients, now has 70. Supplies are dwindling, so a man with a broken leg is fitted with a cardboard splint. Zuli Molleja is visiting her 18-year-old son, who broke his hip and burned his face in a workplace accident. Family members helped her pay for the surgical gowns, the bandages, the cotton, and sterile solutions. Patients, even poor ones, are now responsible for their own medical supplies.

Ruy Medina, chief medical officer, says he got only 3 percent of his budget request from the government this year. There used to be eight functioning sonogram machines; now there are four. And 28 ventilators are down to 16. Patients with cancer are dying for lack of chemotherapy drugs. “In my 51 years at this hospital,” the 76-year-old doctor says, “this is the worst I have ever seen it.”

As the economy crumbles, the Maduro government is using most of its resources to pay overseas debts. While all institutions have had to cut back, the military gets the most leeway. The government depends on it for crucial support as discontent increases. The armed forces have always played a key role in Venezuelan politics, but Chávez pulled the poor, the rural, and the dark-skinned into their ranks and promoted trusted fellow officers. A third of today’s governors are from the military, as are almost half of the ministers. Companies have been created for officers, one way that Maduro, a nonmilitary man, has tightened his alliance with the Chavista base.

“Chávez created a new identity for the military, a new doctrine,” says Rocío San Miguel, president of Control Ciudadano, a citizen watchdog. She says he gave it a new motto, a new ideology, and increased pathways to career success. Today there are 1,200 generals, she says, compared with 300 when Chávez took over.

Dissidents in the military are few. One, a retired officer, communicates

The president’s firm control of most institutions has stymied the opposition

with us over an encrypted messaging app and asks to meet outside a shopping mall. From there, he drives his pickup to a dingy cafe on a secluded road. “I know the owner,” he says. Formerly a colonel in the National Guard with almost three decades of service, he wants to talk about the way in which Chavismo has usurped the military.

He tells of being obliged to sit through daily lectures on anti-imperialism rather than defense strategies. He was asked to meet with Colombian rebels across the border and noticed something he wasn’t supposed to: truckloads of cocaine. He reported it, but nothing happened. And when a corporal moved in two doors down from him, he couldn’t understand how his new neighbor could afford his lifestyle. He found out the corporal was trafficking in illicit goods at the airport and providing a cut to the right people. Leave it alone, the colonel was told. (The U.S. Department of the Treasury has identified a number of what it calls Venezuelan drug kingpins, including senior members of the military. One of them, Néstor Reverol, was recently named justice minister. Maduro has said the charge is a “U.S. conspiracy.”)

National guardsmen, the colonel notes, were once told their job was to keep competing political groups from clashing on the street. Now, he says, they’re instructed to side with the Chavistas. A force whose motto used to be “Honor is our currency” now declares, when its members salute, “Fatherland, socialism, or death. We will prevail!” The military is studying crowd control. Much of its new equipment consists of water cannons and small Chinese-made armored vehicles, says Ciudadano’s San Miguel.

Although some in the opposition hope officers will join an antigovernment movement, San Miguel doesn’t believe it will happen: “Military commanders today are Chavistas and are compromised by their collusion with the government,” she says. “The military will not move one centimeter without the prospect of an alternative power structure.” The opposition has little grasp of Venezuela’s military culture.

The revolution’s absorption of the judiciary and military is echoed by its approach to the state oil company, Petróleos de Venezuela, or PDVSA. After an attempted military coup in 2002, Chávez fired about half of PDVSA’s employees, replacing them with neophyte loyalists. One senior analyst who remained for a dozen years more says he witnessed PDVSA slowly losing independence, turning into a political branch of Chavismo and spending its income on campaigns for officials at all levels, even mayor.

The analyst watched as executives were instructed to don shirts of Chavista red and join street demonstrations. He was once asked to prove that a production study of his “favored the revolution.” At a meeting at the central bank he spoke of fiscal stability, and his boss told him to “stop that IMF talk.” He has, leaving his position a couple of years ago for a think tank.

The challenge for the opposition lies not only with the judiciary and military—finally—but also with the shantytown of Antímano. On a recent Saturday morning, long lines of hundreds of people form outside food markets and drugstores here. Up a hill in western Caracas, Antímano has running water only three days a week. Roads are steep and cracked; steps, uneven; pipes, exposed; electric wires, jumbled around makeshift poles. Gang violence plagues daily life. This is where, one imagines, the opposition could build a following.

Nestor Alvarado, a 48-year-old truck driver, is shirtless in his doorway. Inside is his wife, Yajaira, their six children, and eight grandchildren. She remembers when there was plenty. Now, she says, “you have to kill yourself for a kilo of rice or a couple bags of pasta.” Is she angry at the government? At Maduro, yes, but she honors the memory of Chávez and expresses mistrust for the opposition. For 15 years she cleaned the house of a woman who spoke derisively of the poor right in front of her. Returning such people to power will not improve her situation, she says: “They are only interested in governing for themselves.”

Maduro’s approval rating is so low, there’s no way he would win an election, even if he retains some of Chávez’s support among the poor. The opposition proved that by taking the legislature. But as it has learned, it will be difficult to dislodge Maduro until the next election in 2018, as long as he maintains tight control over all other state institutions. B —*With Noris Soto and Fabiola Zerpa*

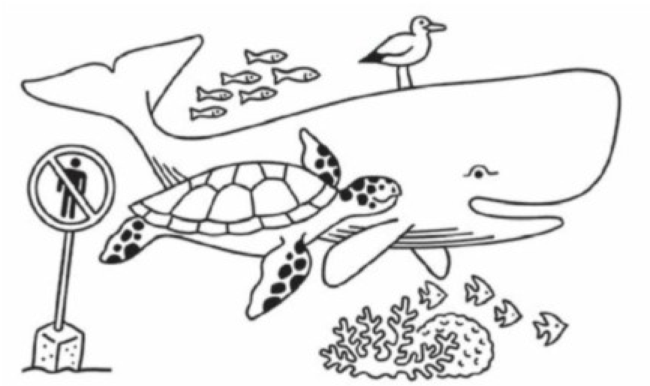
Bloomberg View

To read Mark Gilbert on a new "Ukrainian chicken moment" and Matt Levine on love, friendship, and public accounting, go to

Bloombergview.com

The Benefits of Protecting the Oceans

Even as more marine tracts are preserved, fishing and conservation can co-exist



Most people will never glimpse the vast underwater mountains and canyons off Massachusetts' Cape Cod that President Obama designated as a national monument on Sept. 15. The same goes for the hundreds of thousands of submerged square miles that the U.K., Ecuador, Costa Rica, and other countries have just protected, as well as the half-million square miles near Hawaii that Obama recently set aside.

But everyone benefits when underwater tracts are put off limits to commercial fishing and mining, because doing so is one of the best ways to help marine life flourish. It's not just humans who profit: The seas are home to 80 percent of all species on the planet, and countless other creatures, including 3 billion people, directly rely on the ocean for food.

Ensuring that these ecosystems stay healthy is getting harder, as the oceans absorb excess carbon dioxide and as overfishing escalates, aided by advances in deep-water fishing technology. Carbon dioxide turns the water more acidic, threatening the survival of shellfish. Hundreds of species are endangered, and populations of large predatory fish are dropping.

To slow and eventually reverse the destruction, governments have taken to forming preserves. With the actions announced at a recent conference in Washington, protected areas now encompass some 3.5 percent of the ocean, up from less than 1 percent in 2000. Studies suggest the reserves make a difference. No matter how large or small, or whether they are in tropical or temperate waters, reserves allow marine life to grow larger, denser, and more diverse. And nearby fisheries rebound.

Plans are in place to expand reserves much further. A 1992 treaty obliges governments to protect 10 percent of coastal and marine areas by 2020. And earlier this month, 129 governments pledged to work toward protecting 30 percent of the ocean by 2030.

"Protected" doesn't always mean fishing is entirely banned. Increasingly, governments—especially local governments—are encouraging sustainable fishing. Fishing rights, or "catch shares," are granted in return for cooperation in limiting catches, an approach that's helped restore fisheries off five continents.

Illegal and unregulated fishing continues, unfortunately, often in waters far beyond national boundaries. More needs to be done to tighten port security to ensure that imported fish are legally caught and to trace seafood accurately enough that consumers can know what fish they're buying.

A new satellite-driven interactive tool called Global Fishing Watch (developed with support from Bloomberg Philanthropies) will enable governments to track tens of thousands of fishing vessels worldwide and detect illegal fishing. It's an encouraging step in what will need to be a sustained effort to keep the oceans healthy and productive.

How to Read Median Household Income

The news is good, but American families still make less than before the 2007 crisis

The 99 percent did surprisingly well in 2015: That's the message of two recent U.S. Census Bureau reports. It's good news—and a reminder of the link between rising employment and higher living standards. But it doesn't mean all is well in the economy.

The Current Population Survey says that median household income went up by an inflation-adjusted 5.2 percent in 2015, the largest rise since records began in 1967. The separate American Community Survey puts the increase at 3.9 percent. Both report that poorer households saw some of the biggest gains.

Rising employment appears to have driven the improvement as much as surging wages. The median earnings of male, full-time, year-round workers went up by just 1.5 percent, according to the CPS. Wage growth is starting to pick up but isn't yet signaling a tight labor market or impending inflation.

Another thing worth bearing in mind: At $56,516, median household income in 2015 (as estimated by the CPS) still fell short of where it was in 2007, before the recession. And monthly data produced by former Census officials at Sentier Research suggest the growth stalled in the first half of 2016.

That's worrying. Rising household incomes have been propping up the broader economy. Without strong growth in consumer spending, the U.S. would have dipped back into recession in the first half of this year as business investment and government spending declined. Real gross domestic product grew at an average annualized rate of less than 1 percent in the first half of the year, and inflation remained well below the Federal Reserve's 2 percent target.

The economy is still limping. That's partly because policymakers have relied too much on the central bank to support growth and done too little to spur public and private investment. Both things will have to change to sustain the rise in household incomes.

ILLUSTRATION BY TOMI UM

American Red Cross

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Movers

By Kyle Stock

Ups

▲ Unilever agreed to pay $700 million for Seventh Generation, a maker of **plant-based cleaning products**, which had about $200 million in sales last year.

$266b

▲ Total currently invested in so-called 529 plans—**the highest ever for the tax-exempt college savings funds**. The average account has reached an all-time high of almost $21,000.

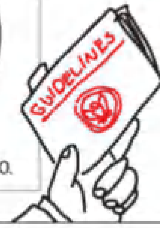
▲ GlaxoSmithKline tapped as its next CEO Emma Walmsley, head of its consumer health-care unit. (Think toothpaste, not pills.) When Walmsley takes over in March, she'll be the **first woman to helm a top-tier pharma company**.

▲ **Baltimore said yes to $660 million in public financing** for a 260-acre project that will include a new headquarters for Under Armour. CEO Kevin Plank said the $5.5 billion development will create thousands of jobs.

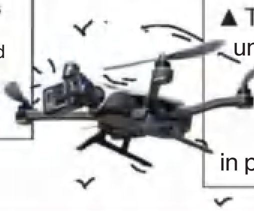
▲ A consortium of universities including MIT unveiled a

$28m

plan to launch a **fleet of autonomous boats in the canals of Amsterdam** next year. The project, for both cargo and passengers, is dubbed Roboat.



▲ GoPro unveiled its first drone, a $799 quadcopter intended **to gradually steer the company away from cameras**.



▲ The Obama administration unveiled **new guidelines for driverless cars**. Among other things, automakers will have to show what safety measures are in place when an autonomous system fails.

Microsoft approved a plan to buy back almost 10 percent of outstanding shares
$40b

The Postal Savings Bank of China in Hong Kong was poised for the largest IPO in two years
$7.4b

Australian and Chinese sovereign funds bought the Port of Melbourne
$7.3b

Starting price of an NFL Super Bowl ticket
$5,500

Days it took ultra-runner Karl Meltzer to cover the 2,200-mile Appalachian Trail, a new record
46

Downs

▼ Officers stand in formation in front of protesters in Charlotte on Sept. 20. Authorities used tear gas to disperse an overnight demonstration that broke out after **an officer fatally shot Keith Lamont Scott** at an apartment complex.

▼ A ruptured pipeline sent **gasoline prices in the Southeast up at least 21¢** per gallon. Six states relaxed restrictions on fuel transportation to shore up supplies.

▼ Retired ski racer Bode Miller, who recently announced plans to return to competition, **sued ski maker Head USA**, claiming it's blocking his comeback. The company, which supplied Miller's skis for a decade, says if he uses other equipment it will be a breach of his contract.

▼ Donald Trump used

$258k

from his charitable foundation **to settle lawsuits involving his for-profit businesses**, according to the *Washington Post*. The Trump campaign said the report is inaccurate.

▼ Deutsche Bank became the **riskiest major bank in the world**, according to leverage ratios compiled by the FDIC. It's fighting a U.S. government demand for

$14b

to settle probes into its mortgage-backed securities business.

▼ The U.S. Securities and Exchange Commission **accused hedge fund manager Leon Cooperman and his Omega Advisors of insider trading**. Cooperman allegedly used his status as a major shareholder in Atlas Pipeline Partners to get a tip on a pending infrastructure sale, sending the stock up more than 30 percent. Cooperman, through his lawyers, denied the charges.

Cases of Eggo waffles recalled by Kellogg because of potential listeria
10k

Canadian workers who would've been part of a strike narrowly averted by General Motors
3,900

Norwegian drivers who sued Tesla for delivering cars that allegedly weren't as fast as promised
126

Consecutive months of decline in Swiss watch exports
14

Amount that SeaWorld Entertainment saw its shares tank after suspending its dividend
-6%

"'Cross-selling' is shorthand for deepening relationships."

▼ **Wells Fargo CEO John Stumpf** at a Senate hearing about 2 million bogus accounts his employees created for unwitting customers.

CLOCKWISE FROM TOP: COURTESY GLAXOSMITHKLINE; COURTESY MIT; SUSAN WALSH/AP PHOTO; JEFF SINER/THE CHARLOTTE OBSERVER/AP PHOTO; JOSH EDELSON/AFP/GETTY IMAGES

be?

▶ With trade talks looming, Britain's PM keeps her cards close

▶ "There has been worryingly little discussion of this vital issue"

Lawmakers in Britain's Conservative Party trying to figure out what their new prime minister, Theresa May, thinks about Brexit—or indeed anything—have a nickname for her: Theresa Maybe.

It's a moniker the French and Chinese governments might appreciate after they were left hanging for weeks about whether the U.K. was going to sign off on the $24 billion Hinkley Point nuclear plant in Somerset, which the two countries are jointly financing. Having surprised them by announcing a delay in July, May gave no clues regarding her thinking. As recently as two weeks ago, the French thought her silence meant the deal was off. Then on Sept. 15, she gave it the green light.

Likewise, on the central question facing Britain, the U.K.'s exit from and future relationship with the European Union, May has offered little about her priorities, beyond saying she wants some level of control over immigration. Every question is met with the same answer: "Brexit means Brexit."

That kind of response partly reflects what her Brexit Secretary David Davis called "the most complicated negotiation of all time." But it's also characteristic of May's approach to decision-making. "This is the way I operate," she told reporters while on her way to China in early September. "I don't just come in and say, 'I just made a decision.' I actually look at the evidence, take the advice, and then consider that and come to my decision."

The Conservative leadership contest that made May prime minister was shorter than anticipated and shed little light on who she is. Under the original timetable, the winner would not have been announced until September. But in the chaos that followed Britain's June 23 referendum to quit the EU, May won by watching all the other candidates implode. She found out she was to be prime minister within an hour of finishing the first of what was supposed to be a series of speeches to introduce herself to the country.

Even though Tory MPs were grateful to have certainty over their summer vacations, not to mention a leader with some gravitas, many have since

CHRISTOPHER FURLONG/GETTY IMAGES. DATA: BLOOMBERG

India's James Bond now serves as national security adviser 18

The costliest firefight still rages in Big Sur 20

realized the extent of their ignorance about her plans for the country. In particular, what level of distance does she want from the EU? Does she seek access to its single market? What is she prepared to sacrifice to get that?

To the Tories determined to get as far away from the EU as possible, there are reasons to be suspicious of May. Although she appointed three "Leave" campaigners to top positions—Davis to oversee Brexit, Boris Johnson as foreign secretary, and Liam Fox as trade secretary—May was on record during the referendum campaign as wanting to stay in the bloc, and she's since talked about ensuring that Brexit doesn't damage Britain's exporters. The chief concern is that the U.K. won't be able to negotiate a new free-trade accord before it falls out of the EU. In that event, commerce would automatically be governed by the World Trade Organization, which would impose steep tariffs on British manufacturers selling into the EU and cut off banks and other service providers entirely.

Before the referendum, the U.K. Treasury called this a "shock scenario," estimating that it would cause a 7.5 percent loss of economic output over 15 years and result in 800,000 job losses in six years. The U.K. could drop its taxes on European products to zero and hope other countries follow suit. But WTO rules require it to then do so for other WTO members, undermining Britain's ability to negotiate deals elsewhere. "There has been worryingly little discussion of this vital issue," says Carsten Nickel, an analyst for Tenro Intelligence in Brussels.

That risk is fanning calls for May to seek a short-term agreement, perhaps similar to Norway's trade pact, to protect the economy and win time to secure a more permanent deal. "The U.K. can potentially be relatively nimble in extracting itself from the EU," says Stephen Adams, a partner at Global Counsel in London and a former adviser at the European Commission. "The question is, how quickly can it replace the status quo in terms of cross-border trade with a new framework?"

It took seven years for the EU to negotiate one with Canada, and it still hasn't been ratified. Greenland took three years to leave the EU in the early 1980s, and most of its talks were focused on fishing rights. Prior to becoming chancellor of the exchequer, Philip Hammond said triggering Brexit and crafting a new trade pact could take six years, time that May doesn't appear to have. Indications suggest that she'll begin the Brexit process in early 2017, after which the U.K. will have two years to leave the EU.

Those who worked with May when she was an MP suggest she isn't one to rush tough decisions or be swayed by her own party. Former Deputy Prime Minister Nick Clegg, who took his Liberal Democrats into coalition with the Conservatives in 2010, spent five years in government with May. Clegg says he dealt directly with Cameron and not Tory ministers. The one exception was May, because the leadership couldn't get her to do what they wanted, he says. "So every two weeks, I would have a meeting with her, and we would work through a lot of issues and then whittle them down. By God, it was hard work," Clegg says. "But when we'd reached an agreement, she'd stick to it." —*Robert Hutton and Simon Kennedy*

"This is the way I operate. I don't just come in and say, 'I just made a decision.' I actually look at the evidence, take the advice, and then consider that and come to my decision." —*Theresa May*

The bottom line Failure to reach a free-trade pact before exiting the EU could cause a 7.5 percent loss to Britain's economic output over 15 years.

Energy

Nigeria's Nightmare: Not Just Low Oil, No Oil

- **Militant attacks cut production, pushing Nigeria close to recession**
- **"The last two years have been terrible. It's a mess"**

Cheap oil was always going to be a problem for Nigeria. Since the early 1970s, Africa's most populous country has been one of the world's biggest crude suppliers, averaging about 2 million barrels a day. The 2000s were particularly lucrative, as high prices for oil and other commodities attracted billions in foreign investment and pushed Nigeria's economy to an 8 percent annual growth rate.

All oil producers are getting fewer dollars per barrel these days, but Nigeria has a bigger problem: Militants have stepped up attacks on pipelines and export terminals, cutting the country's oil production by 30 percent since January, to 1.4 million barrels a day, a three-decade low. As oil revenue has dried up, so has the country's supply of dollars, which it needs to pay for the $22 billion in food it imports each year. Double-digit inflation has set in, leading the central bank in June to deregulate the currency, the naira, which has since crashed 40 percent against the dollar. Nigeria is now poised to enter its first recession since 1991. In August, Vice President Yemi Osinbajo said it's the worst economic crisis the country has ever faced.

Infrastucture is in tatters, and blackouts are becoming more common. Islamist militant group Boko Haram has wreaked havoc in the northeast, killing tens of thousands of people and leaving 250,000 children in need of food. Other militant groups with names such as the Niger Delta Avengers are targeting oil facilities run by **Chevron**, **Shell**, and **Eni**.

Nigeria's 36 states are so cash-strapped that many teachers, pensioners, and civil servants have gone months without pay. The governor of Imo, in the southeast, home to about 4 million people, announced a three-day workweek for civil servants, telling bureaucrats to farm on the other two. Nigerians are scrimping on protein in their diet, says the head of **Nestlé**'s local operations. French construction company **Bouygues** has halted some projects and plans to do less work for the government because of the risk of not getting paid. "The last two years have been terrible," says Andre Guillou, Bouygues's vice chairman in Nigeria. "It's a mess." ▶

◀ Foreign investors once drooled over Nigeria's prospects. Fidelity Investments promoted "MINT" in 2011, saying Mexico, Indonesia, Nigeria, and Turkey were the emerging markets of the future, an opinion reinforced by Jim O'Neill, the former Goldman Sachs economist who coined the previous four-letter investment craze, "BRIC," for Brazil, Russia, India, and China. Before the oil crash in 2014, McKinsey forecast that Nigeria had the potential to grow 7 percent a year through 2030. In July the International Monetary Fund forecast Nigeria's economy would shrink 1.8 percent in 2016.

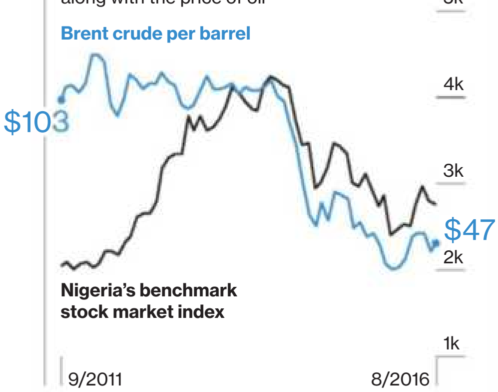
Although Nigeria was always going to suffer from a drop in oil prices, the government's bungled response has made it worse, says Martina Bozadzhieva, an analyst at Frontier Strategy Group, which advises multinationals such as **Coca-Cola** and **General Electric**. President Muhammadu Buhari, a stern military ruler who seized power in a coup in December 1983, was elected last year on a wave of optimism that he would fight corruption and revive the economy. He took almost six months to form a cabinet and didn't approve the 2016 budget until May.

Buhari leaned on Central Bank Governor Godwin Emefiele to peg the naira to the dollar, ostensibly to stop food and transportation prices from rising. Instead, inflation has soared to an 11-year high of 17 percent as businesses struggle to pay foreign suppliers for machinery and raw materials that aren't available locally.

"The confidence in Buhari is very quickly evaporating," Bozadzhieva says. "Firms are close to that point where they say: 'You know what? This is a disaster.' It's OK to have an oil price drop. But there are countries that have managed it much better." —*Paul Wallace and David Malingha Doya*

Live by the Barrel...

Nigeria's stock market has dropped along with the price of oil



The bottom line After years of oil-driven economic growth, Nigeria is facing a 30 percent drop in crude output and its first recession since 1991.

Diplomacy

The Ex-Spy Shaping India's Foreign Policy

▶ **Doval has advocated a nationalist agenda and a stronger military**

▶ **"He's known as an Indian James Bond"**

He spent seven years undercover in Pakistan, recruited rebels as informants in disputed Kashmir, and once disguised himself as a rickshaw driver to infiltrate a militant Sikh group. Now, Ajit Doval may be the second most powerful person in India after Prime Minister Narendra Modi, who appointed him his national security adviser in 2014. "He's known as an Indian James Bond—he has this larger-than-life persona," says Sadanand Dhume, a resident fellow at the American Enterprise Institute in Washington. "There are tales and stories and legends attached to him that are very unusual in a national security adviser."

Since being named to the job by Modi, Doval, who retired as director of the Intelligence Bureau in 2005, has supported a tougher and more nationalist stance against hostile neighbors such as Pakistan and China. Shortly after taking office, Modi dispatched Doval to Afghanistan as his special envoy. Doval is heading up talks with China over India's disputed frontier that borders parts of Kashmir and Tibet. In December 2015 he flew to Bangkok for a meeting with his Pakistani counterpart in an unsuccessful effort to restart peace talks between the two nuclear-armed nations. Doval holds more sway than the ministers of defense and foreign affairs—and his choice of policy directions will have huge economic ramifications.

As part of its Silk Road initiative, China is pouring $45 billion into a transit corridor that cuts through disputed territory claimed by both India and Pakistan. India fears those investments, which include building railways, pipelines, and power plants throughout the region, will enrich Pakistan at its expense. "Every strategic issue in this region involves security in a way that it doesn't in other regions," says R.K. Sawhney, a former director general of military intelligence who's known Doval for almost two decades. "As the profile of the country grows, the profile of the national security adviser grows."

Among Doval's most famous exploits was his part in a 1988 intelligence gathering operation that helped flush Sikh separatists from the Golden Temple in Amritsar in northwestern India.


His name is Doval... ...Ajit Doval

According to Karan Kharb, a retired army officer who was one of the National Security Guard commandos trying to end the standoff with the Sikh militants, Doval posed as a rickshaw puller to gain entry to the temple. He convinced the separatists holed up inside that he was a Pakistani operative who'd come to help them in their goal of establishing an independent country called Khalistan.

Indian commandos had stormed the temple twice in the previous four years, including an assault in 1984 that left hundreds of soldiers and religious pilgrims dead, prompting outrage among Sikhs worldwide and leading to the assassination of then-Prime Minister Indira Gandhi by her Sikh bodyguards. She had ordered the attack.

At the 1988 siege, police had estimated there were no more than 40 people inside the temple. But Doval returned from his undercover visit saying there were at least 200. He persuaded the government to drop plans for a raid and instead cut off the water and electricity supplies, Kharb says. Nine days later, the militants surrendered.

Doval's influence with Modi has drawn criticism from opposition ▶

SUSHIL KUMAR/HINDUSTAN TIMES/GETTY IMAGES. DATA: BLOOMBERG

Big Sur, Calif.

$205,946,263

Cost of fighting the Soberanes Fire as of Sept. 18

The Soberanes Fire has burned through more than 123,000 acres since July 22, sparked by an illegal, unattended campfire in Garrapata State Park. It's become the costliest fire to fight in U.S. history, not adjusted for inflation, and federal officials don't expect to have it contained until Sept. 30. —*Esmé E. Deprez*

◀ politicians and fueled discontent inside Modi's administration. "The country wants to know, who is running foreign policy? A spy called Doval or diplomats?" tweeted Ashutosh, a leader from the Aam Aadmi Party, after Modi flew to Pakistan on Christmas Day last year to meet Prime Minister Nawaz Sharif in a surprise visit that local media said Doval orchestrated. "The country is not safe with a spy running diplomacy," Ashutosh said. Doval's office said he wasn't available for an interview. A spokesman for the prime minister's office declined to comment.

"Doval wields more influence than previous national security advisers in part because of his credibility and experience in intelligence and security matters," says Sameer Patil, who served in the prime minister's national security council secretariat under the previous Congress party government.

Short, trim, and bespectacled, Doval shuns the limelight and rarely appears in public. No government website carries his profile. A biography distributed at a lecture he gave in August 2015 in Mumbai stated he was born in 1945 in Garhwal, in a northern region now called Uttarakhand, and that he earned a master's in economics before joining the national police force.

Doval moved from the police to India's internal intelligence agency in 1972, where he spent three decades, including stints in Jammu and Kashmir, a restive region of India's north. He was also posted to the U.K. Doval, who is fluent in Urdu, the official language of Pakistan, told an audience of businessmen and accountants in 2014 that he lived undercover there for seven years. He underwent plastic surgery to remove signs his ears had been pierced–an indication of his Hindu roots. "I haven't seen anyone else at his level who would continue to come into the field," says S.S. Virk, former director general of police in Punjab, who took part in the 1988 Golden Temple operation.

In 2009, after retiring from the Intelligence Bureau, Doval founded the Vivekananda International Foundation, which has a stated mission of "promoting quality research" and has become a retirement destination for intelligence officials and government bureaucrats. From its red sandstone and concrete headquarters in a tony district of Delhi, Doval courted foreign diplomats and high-ranking defense officials, dispensing hawkish, nationalist views that resonated with Modi's Bharatiya Janata Party. In white papers the foundation published during that time, he argued for a more assertive foreign policy and a beefed-up military. He warned of India's "eroding maritime preeminence" in the Indian Ocean, spoke of Pakistan's attempts to influence Afghanistan and the Taliban, and said China's development was "not an assured peaceful rise." "India has a mindset that, where it hits, it punches below its weight," he said in a 2015 lecture. "We have to increase our weight and punch proportionately." —*Natalie Obiko Pearson*

The bottom line Modi's national security adviser supports a tougher stance in discussions with neighbors on disputed borders.

Edited by Matthew Philips and Cristina Lindblad
Bloomberg.com

MICHAEL FIALA/REUTERS. DATA: U.S. FOREST SERVICE


BREITLING *for* BENTLEY
BREITLING
Breitling *for* Bentley chronographs stem from an encounter between two exceptional brands, two worlds dedicated to performance, two identical passions for excellence. Crafted by Breitling with an extreme concern for perfection, they combine highly distinctive designs, opulent finishing and mechanical movements chronometer-certified by the COSC, a token of superior precision and reliability. Breitling *for* Bentley: the best of two worlds.
BENTLEY GMT
LIGHT BODY B04 S
breitling*for*bentley.com

Samsung's $2b Mis

▶ **The company's Note 7 is on fire—and not in a good way**

▶ **"They were rushing to beat Apple, and they made a mistake"**

Earlier this year, when managers at **Samsung Electronics** began hearing rumors that the next iPhone wouldn't have any eye-popping innovations, it sounded like an opening for the South Korean company to leap ahead of archrival **Apple**. So its top brass, including phone chief DJ Koh, decided to accelerate the launch of a phone that they were confident would dazzle consumers, say people familiar with the matter. They pushed suppliers to meet tighter deadlines, despite loads of new features, another person with direct knowledge says. The Note 7 would have a high-resolution screen that wraps around the edges, iris-recognition security, and a more powerful, faster-charging battery. Apple's taunt that Samsung was a copycat would be silenced for good.

Then it all backfired. Just days after Samsung introduced the Note 7 in August, reports surfaced online that the phone's batteries were bursting into flames. By the end of the month there were dozens of fires, and Samsung was rushing to understand what went wrong. On Sept. 2, Koh held a grim news conference in Seoul where he announced Samsung would replace all 2.5 million phones shipped so far. But even the recall, which analysts estimate may cost the company as much as $2 billion, drew criticism over Samsung's lack of clarity on how and when customers can replace their devices. "This is creating an enormous problem for the company—for its reputation and ability to support its customers when there's a problem," says David Yoffie, a professor at Harvard Business School and a board member at Intel.

Samsung declined to comment on whether it moved up the Note 7 launch to beat Apple's. "Timing of any new mobile product launch is determined by the mobile business division based on the proper completion of the development process and the readiness of the product for the market," the company said in a statement.

The crisis is straining a management team that's been without clear leadership for more than two years. Lee Kun-Hee, the Samsung patriarch who's chairman of both the electronics unit and the broader conglomerate, suffered a heart attack in 2014 and has been hospitalized ever since. His son, Jay Y. Lee, is heir apparent but hasn't taken his father's title because Korean culture precludes such a move while the elder Lee is alive. As a result, no one appears to have the authority to take responsibility and hammer out solutions.

"The battery issue arrived at the worst moment for Samsung, and it seems like there was a delay in reacting to this communication crisis," says Thomas Husson, a Forrester Research analyst. In its statement, Samsung said it's replacing Note 7s as quickly as possible: "For us at Samsung, to earn consumers' trust back is very important."

Samsung has two primary lines of premium devices, the Galaxy S and the larger Note. When the Note was unveiled in 2011, its massive screen was a surprise hit with customers seeking the added real estate to watch videos, play games, and browse the web. Samsung pretty much had the high end of the oversize smartphone market to itself until Apple followed with its large iPhone 6 Plus in 2014.

The Plus's debut put pressure on

Cartier turns back time, exiting ultraluxe watchmaking 25

My goodness, my Guinness—with juniper dandelion, and sage 26

Samsung to defend its turf, and it moved up the 2015 introduction of the new Note from September to August, just weeks before Apple unveiled the iPhone 6S. Samsung's engineers met the deadline, but Apple still grabbed market share. In December, the chief of Samsung's mobile division was replaced. Then Koh, who'd managed development of several Galaxy phones, took his place on the hot seat.

Expecting a mundane iPhone 7, the younger Lee and Co-Vice Chairman G.S. Choi huddled with Koh and executives of other Samsung affiliates, which make semiconductors, smartphone screens, and batteries. They agreed to a slew of new features, including an improved screen and stylus—then approved a launch date 10 days earlier than last year's model, according to a person familiar with the matter.

Smartphone makers for years have been trying to satisfy consumer demands for long-lasting devices that charge faster. That increases manufacturing challenges and raises the risks of defects. The iPhone 7 Plus has a 2,900-milliampere-hour battery, which provides 13-15 hours of use. Samsung opted to give the Note 7 a 3,500 mAh one, compared with 3,000 mAh for its previous model. According to a person with knowledge of the matter, the main battery supplier for the Note 7 was **Samsung SDI**, which is 20 percent owned by Samsung Electronics.

As the launch date approached, employees at Samsung and suppliers stretched their work hours. Suppliers were under more pressure than during previous launches and were pushed harder than by other customers, according to a person with direct knowledge of the matter. One supplier says Samsung employees repeatedly changed their minds about specifications and schedules. Some Samsung workers began sleeping in the office to avoid time lost in commuting, the supplier says. Samsung declined to comment on whether deadlines were moved, reiterating that products are only introduced after proper testing.

An executive at one carrier says his team started testing an early Note 7 model in May and had the usual amount of time to check its capabilities. They focused on antenna performance and data speeds and didn't uncover the battery problem, the executive says.

But when customers started using the phones, the fires began—and photos and videos of charred handsets were plastered across the web. Executives at Samsung headquarters in Suwon were in shock. Choi, the co-vice chairman, gathered senior managers, demanding to know what went wrong, according to one of the people familiar with the matter. The phone division pointed fingers at Samsung SDI, while managers there argued the problem could be elsewhere, including in the phone design or insulation. Samsung says there's no debate on the issue, and the phone unit has taken responsibility.

Internally, there was a debate about whether to do a full-blown recall or to take less dramatic steps, like a battery replacement program. Then on Sept. 1, an engineer wrote on the company's internal online bulletin board. "Please recall all Note 7s and exchange them with new ones. I don't have to get my PS," he said, referring to his profit sharing, or bonus. "It's humiliating."

Another worker wrote on the bulletin board that Samsung had trained everyone at the company never to compromise on customer service—the elder Lee once famously burned thousands of faulty cell phones rather than sell defective products—and the company needed to live up to that standard. Koh soon apologized to employees and the next day went public with a full recall.

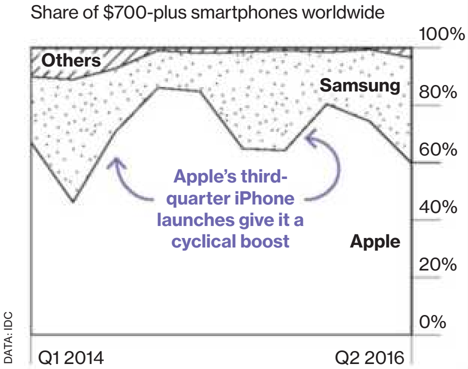
Samsung's most complete explanations of what went wrong have come in reports to government agencies in Korea, China, and the U.S. The initial conclusions indicated an error in production that put pressure on plates within the battery cells. That in turn brought negative and positive poles into contact, triggering excessive heat that caused the battery to explode.

Elliot Kaye, chairman of the U.S. Consumer Product Safety Commission, was more explicit when his agency announced an official recall on Sept. 15. He said the battery was slightly too big for its compartment and the tight space pinched it, causing a short circuit. "Clearly, they missed something," says Anthea Lai, an analyst with Bloomberg Intelligence. "They were rushing to beat Apple, and they made a mistake."
—*Yoolim Lee and Min Jeong Lee*

The bottom line Samsung sought to leap ahead of Apple's new iPhone. But its accelerated debut of the Note 7 resulted in a costly recall.

Trying to Bite the Apple

Share of $700-plus smartphones worldwide



Apparel

Using DNA Markers To Spot Bogus Fabrics

▶ **Fake Egyptian cotton is common. This test may change that**

▶ **"So what do the suppliers do? They cheat"**

In a small laboratory housed in a biotech incubator 90 minutes east of New York City are six bins tightly packed with sealed plastic bags of men's dress shirts, sheets, and tufts of cotton ready to be spun into yarn. The materials are waiting to be DNA-tested with the same rigor you'd find in an FBI crime lab. But rather than seeking clues in a murder, the forensic scientists at biotech company **Applied DNA Sciences** are looking for a unique DNA stamp in the fibers to see whether the textiles are, in fact, made of the premium cotton their labels claim. ▶

◀ The products have been sent to Applied DNA Sciences by a group of retailers and manufacturers trying to avoid the fate of **Target**, which recalled 750,000 fake Egyptian cotton sheets and pillowcases after discovering they contained a less expensive form of cotton. Following Target's move, **Walmart** said it would also offer customers refunds on Egyptian cotton sheets made by the same manufacturer, **Welspun India**. **JCPenney** and **Bed Bath & Beyond** are investigating their products. Welspun, which is being sued for consumer fraud in federal courts, said it's adopting new labeling practices and has hired Ernst & Young to audit its supply process.

It's been an open secret among experts in the cotton industry that products often labeled as 100 percent Egyptian or Pima cotton are made in part or entirely of cheaper cotton.

Cotton production in Egypt has tumbled in recent years because of poor management of the seed supply, and in California, drought conditions over the past few years have slashed output of Pima cotton, a premium U.S.-grown plant similar to Egyptian cotton. But demand from consumers for goods made from the expensive fibers—a set of Egyptian cotton sheets can retail for three times the price of those made of common upland cotton—and the desire for ever-lower prices have remained.

To keep up, some suppliers have been substituting or blending in cheaper cotton, says James Hayward, Applied DNA Sciences' chief executive officer. In the case of Pima cotton, 83 percent of tested products labeled as 100 percent Pima were made entirely or partially of another type of cotton, according to a study by the company this year. "Customers want a better and better price, and the retailer applies that same pressure all the way through the supply chain," says Hayward. "So what do the suppliers do? They cheat."

The results: customers angry that a shirt is rougher than expected or a bedsheet has frayed all too quickly, and retailers at legal risk for false marketing. "This is a bottom-line issue now," says Nate Herman, a senior vice president for supply chain for the American Apparel & Footwear Association. "Not only have [consumers and retailers] been paying too much for years, it is a brand reputation and a legal liability. Those are the worst things you can have."

In its raw form, Egyptian and Pima cotton feel and look slightly different from coarser upland cotton, and their longer fibers can be seen under a microscope. But once cotton is processed, it's almost impossible to tell the difference among Egyptian, Pima, and upland varieties even under a microscope, because the long fibers get broken down during weaving, dyeing, and sewing. Sometimes the width of the thread can be used to determine the type of cotton, since upland cotton can't be spun as thin, according to Cotton Inc., a group representing upland cotton growers. While DNA testing can determine the species of some cottons, there's currently no test to tell the country where the cotton was grown, the group says.

That's why manufacturers are trying new ways to ascertain that the premium-priced cottons they purchase actually go into the products that reach retailers' shelves. This year, a handful of retailers started selling cotton that had been marked with a DNA tagging system, similar to what's been done with olive oil, Super Bowl footballs, and fine art. The technology, developed by Applied DNA Sciences, uses tiny genetic markers that are sprayed on the cotton at the gin just before being packaged and sent to be turned into yarn. The markers bind to the plant's fibers and act as a microscopic bar code that can be tracked throughout the production process, which can involve more than seven steps in as many countries. At each stop on that journey, samples are collected and sent to Applied DNA Sciences' lab for testing to ensure the DNA tags are still there and another cotton hasn't been substituted.

In the past year, the microscopic stamps have started to appear on products carried by some of America's largest retailers. Indian textile manufacturer **Himatsingka Group**, which makes products sold under the Calvin Klein Home brand at department stores and the Kirkland Signature brand at **Costco**, started tagging the California Pima cotton in its products in 2014. Bed Bath & Beyond started selling its first DNA-stamped cotton product this year—a down comforter with a Pima cotton lining. "We have arrived at the beginning of a new era when it comes to protecting product integrity," says Leah Drill, a spokeswoman for Bed Bath & Beyond.

At the Applied DNA Sciences lab, run by a molecular biologist who spent most of her career working in medical examiners' offices, a group of four researchers will test an average of 30 samples a week sent in from clients. Each gets its own case number and a file that can be more than 40 pages long. As demand for tagging and testing has spiked following the Target incident, the company is looking to ramp up its capacity to run 100 samples a day.

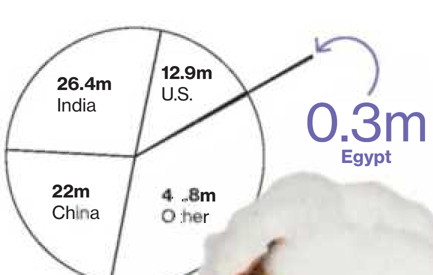
One reason DNA tagging hasn't been more widely adopted is because of the expense and complexity, says Herman. While Applied DNA Sciences won't disclose the exact cost of using its process, the company says the DNA tagging and tracking adds just a "few pennies" per pound to a manufacturer's expenses. CEO Hayward says the bigger cost increase for apparel makers comes from suppliers charging them more once they're forced to deliver

Faded Fabric

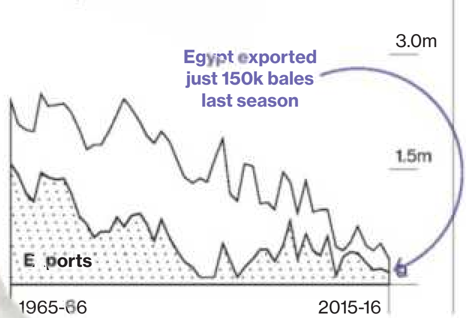
Supplies of Egyptian cotton are small—and shrinking

Global cotton production, in bales

2015-16 growing season



Cotton production in Egypt, in bales



GETTY IMAGES; DATA: U.S. DEPT. OF AGRICULTURE

100 percent premium cotton. There is "no silver bullet" yet, so retailers are closely tracking only a small fraction of cotton in their products, says Herman. "It has been very difficult. It is just going to take time." —*Shannon Pettypiece*

The bottom line Retailers are using DNA tagging to verify their use of Egyptian cotton, for which sheet sets can run triple the cost vs. regular sets.

Luxury

Cartier's Watch Dreams Run Out of Time

- **A move upscale, including $600,000 watches, didn't tick**
- **"Cartier wasn't taken seriously enough" among connoisseurs**

For more than a century, Cartier has sold elegant, if simple, timepieces such as the Tank, which starts at about $2,500—a bargain by Swiss watch standards.

A decade ago, Cartier invested millions to build one of Switzerland's largest watch factories and create a fine-watch unit. The jeweler jumped into the segment for connoisseurs known as "complicated pieces," which sport analog mechanisms such as calendars that adjust for leap years and require painstaking handcraftsmanship. The effort culminated last year in the Rotonde de Cartier Grande Complication Skeleton, a glass-backed confection priced at more than $600,000.

Since then, Chinese demand for deluxe timepieces has collapsed. On Sept. 14, Cartier's parent, French luxury house **Richemont**, said first-half profit will fall about 45 percent, a level Chairman Johann Rupert called "unacceptable." In recent months, Cartier has cut jobs and bought back unsold inventory from retailers. Now it's shifting its emphasis back to more affordable pieces. The retrenchment is a cautionary tale for the industry—a reminder that luxury demand is ephemeral and that stretching a brand beyond its comfort zone carries considerable risk. "Cartier has a very classic style, and that alone is already perceived as a status symbol," says ▶

◀ Manfred Abraham, a partner at consulting firm BrandCap in London. "Consumers still get the same impact with a £2,000 watch as they do with an £8,000 watch, because people will still say, 'Oh my God, it's a Cartier!' "

Cartier began its push upscale in 2008 with a division led by Carole Forestier-Kasapi, a watch industry veteran who'd worked at **Audemars Piguet**. While Richemont doesn't say how much it spent, it probably invested about €150 million ($167 million) in Cartier's watch business, with about a third of that focused on higher-end complicated timepieces, estimates Jon Cox, an analyst at investment house Kepler Cheuvreux. In the following years, Cartier developed dozens of movements—the engine of a watch—to improve its reputation and show that it belongs in the same league as ultraluxe brands such as **Breguet**, **Patek Philippe**, and **Vacheron Constantin**, which have built complicated timepieces for more than a century.

Unlike the brands it was chasing, which focus almost exclusively on watches, Cartier has a broad luxury portfolio of fragrances, sunglasses, and leather handbags. "In the man's connoisseur world, Cartier wasn't taken seriously enough," says Patrik Schwendimann, an analyst at Zuercher Kantonalbank. "To change an image can take decades."

The Ballon Bleu line, introduced in 2007 and favored by the Duchess of Cambridge—the former Kate Middleton—was a hit that may still account for as much as half of Cartier's Chinese sales. Later collections never gained the same traction, according to Zuzanna Pusz, an analyst at Berenberg, a German private bank. "Cartier was blinded by the boom in China," Pusz says.

The Chinese government's campaign against extravagant spending and corruption has crimped demand for watches there. In Europe, terrorist attacks have cut the numbers of free-spending tourists, who account for a big chunk of sales. Cartier has had three chief executive officers in the past half-decade, as earnings growth at the jewelry business fell sharply from rates exceeding 40 percent.

Cartier joins **Bulgari**, **TAG Heuer**, and **Tiffany**, all brands that have tried to extend their range of Swiss watches and later backtracked. Cartier this year introduced a lower-priced collection for men, called Drive, which starts at about $6,000. At a watch show in Geneva in January, the company plans to present a selection of less expensive models with fewer complications, including more aimed at women. "We have to slim down into the real demand of the market," says Rupert, the Richemont chairman. "The world currently has an excess of every manufactured good." —*Corinne Gretler and Thomas Mulier*

The bottom line After Cartier's unsuccessful try at super-expensive timepieces, it's back to making just really expensive ones.

Beverages

On Tap at Guinness: Strawberry Porter

▶ **Megabrands seek to win back drinkers with craftlike innovation**

▶ **"I wanted to produce a lager that I would drink myself"**

Ale infused with juniper, sage, and dandelion. A strawberry and basil porter. A beer brewed with lactose, giving it a smooth, creamy feel on the palate. Such concoctions sound like the brainchild of a startup in Boulder, Berkeley, or Berlin? Think again. The beers are on tap at the Open Gate Brewery, a small-batch pub on the back side of the vast **Guinness** plant in central Dublin. "We've got license to do anything we want," says Peter Simpson, the master brewer in charge of the project.

And by that, he really means anything. When an American brewer named Heather came for a visit, they honored her with a beer flavored with heather. A member of the Guinness team loves plums; a damson plum brew followed. And for a brewer's wedding? Ferment to Be, a beer made something like champagne, with a secondary fermentation in the bottle. Simpson's team cooks up test brews almost daily and offers pub-goers a new beer every two weeks or so.

Open Gate highlights Big Beer's efforts to cope with the growing popularity of the offerings of small startups. Craft brewers now account for 20 percent of the $106 billion U.S. beer market—and almost all the growth the industry has seen in the past decade. Jean-François van Boxmeer, **Heineken**'s chief executive officer, has said the threat from craft beer is one of his company's greatest challenges. Analysts say **Anheuser-Busch InBev**'s ongoing acquisition of rival **SABMiller** is aimed at countering craft. Those concerns have spurred the industry's giants to buy into smaller brewers, whose products are often sold with little mention of their corporate parentage. InBev, for instance, owns Goose Island Brewery and Four Peaks Brewery, and SABMiller makes Leinenkugel's and Blue Moon.

But lately, the big names have started experimenting with new brewing processes, unexpected ingredients, and historical recipes to establish craft cred while preserving the megabrands they've spent decades nurturing. Heineken has introduced H41, brewed with yeast harvested in Patagonia, the first installment in a series of new flavors the company calls Lager Explorations. And **Carlsberg** offers Rebrew, based on yeast extracted from 19th-century bottles found in the cellar of the company's 140-year-old laboratory in Copenhagen. "Craft is growing at double-digits as consumers look for something new—new taste, new flavors," says Flemming Besenbacher, chairman of the Carlsberg Foundation, which controls the beermaker.

432%

Increase in the number of U.S. craft breweries from 1995 (794) to 2015 (4,225)

DATA: BREWERS ASSOCIATION

While Guinness has had an experimental brewery at the Open Gate site since the 1960s, it only recently started to produce the fanciful creations that are the hallmark of craft brewers. "We're not craft, but we're not mainstream lager either," Mark Sandys, the executive in charge of the beer business at **Diageo**, the owner of Guinness, says over a pint of ale at Open Gate. "We're somewhere in between, and Open Gate lets us experiment with how far we can go in either direction."

The place looks something like a high school chemistry lab. The work benches are covered with scales, beakers, and graduated cylinders. A refrigerator has 28 varieties of hops. There's a storeroom with 50-kilo bags of cassava, sorghum, banana starch, and other ingredients for Diageo-owned breweries across Africa. The pub has lines that can produce 30-liter and 30-keg batches. The smaller lines are used to test ideas, while the bigger ones turn out beers that will be sold at Open Gate.

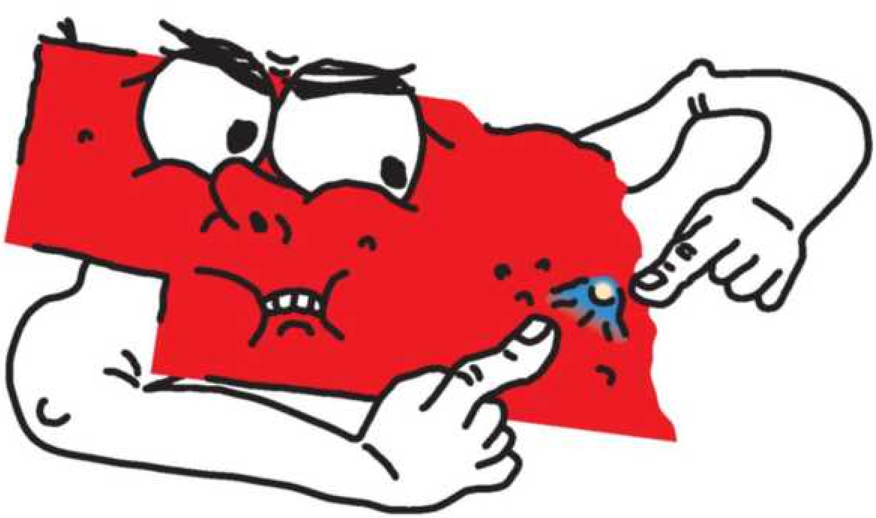
Since December, the pub has been open to outsiders on Thursday and Friday evenings. Customers pay €6 ($6.75) for a flight of four half pints, and additional beers run €5 a pint. The sales are enough to cover the cost of running the place but usually not the beers' ingredients. Simpson says he may start hosting meetings of homebrewers, where hobbyists can get together and sample each others' creations alongside whatever the pros at Guinness might dream up. Customers are given forms to critique the brews, though most have little chance of ever being commercialized. "If we were to make this commercially, we'd use every strawberry in Ireland," Nick Doyle, a Guinness "brand ambassador" and bartender at Open Gate, says of the strawberry porter the pub sold this summer.

A handful, though, will be rolled out to a broader market. Before the pub opened to outsiders, Simpson came up with Hop House 13, a malted lager made with hops from Australia and the U.S. "I wanted to produce a lager that I would drink myself," he says. And two years ago the crew at Open Gate created West Indies porter, a Guinness sub-brand based on a recipe found in a logbook from 1801. Today, Simpson says he has high hopes for a rye pale ale, created for the company's Christmas party and sold at Open Gate since last winter. "We're very fortunate that the craft brew wave happened," Simpson says. "Without it, we wouldn't be able to do what we're doing."
—*Thomas Buckley and David Rocks*

The bottom line After years of ceding share to upstarts, Big Beer is seeking to bolster its craft cred with traditional recipes and new flavors.

Edited by James E. Ellis
Bloomberg.com

The Little Blue Dot Irritating Nebraska's GOP



▶ Team Clinton is trying to win Omaha's single electoral vote, with a little help from Warren Buffett

▶ "My goal is to have the turnout here be the highest…of any district in the country"

Nebraska Democrats love talking about the Blue Dot. Formally known as the 2nd Congressional District, the Blue Dot hugs the state's eastern border with Iowa, encompassing Omaha and its suburbs—an outpost of liberalism in an otherwise red state. In 2008 voters in the Dot went for Barack Obama while the rest of the state backed John McCain. Because Nebraska splits its electoral votes by congressional district, Obama got one from the Dot, becoming the first Democrat to win an electoral vote in the state since Lyndon Johnson in 1964.

Obama failed to repeat his victory in 2012, when Republican Mitt Romney carried the Dot by seven points, thanks in part to redistricting that shifted many black and Latino voters into the 1st Congressional District, making the Dot much less reliably blue.

Hillary Clinton is determined to take back the Dot, and its single electoral vote, this year. Her campaign has had staff in place there since early summer and had opened two offices in Omaha by the end of August. By early September, the campaign had recruited more than 400 volunteers and was running near-daily phone banks. Trump's campaign has an office in Lincoln, the state capital, but has yet to establish a presence in the Dot. "We're seeing that Congressional District 2 is really in play, largely

ILLUSTRATION BY 731

Goodbye, Clinton Global Initiative. Hello, Concordia! 31

because of the disillusionment of Republicans with their candidate," says Crystal Rhoades, chair of the Democratic Party in Douglas County, which includes Omaha. "So I think that's positive for us."

Republicans have repeatedly tried to undo the state's vote-splitting law since it took effect in 1992. There have been multiple attempts to return Nebraska to the winner-take-all system used by every other state except Maine, which has assigned Electoral College votes by congressional district since 1972. The most recent one was defeated in a legislative committee in April.

Democrats in the Blue Dot were delighted, but the party has shown little interest in passing electoral vote-splitting in other states. "From the perspective of the Democratic Party, this one goes under the heading of Be Very Careful What You Wish For," says Paul Landow, a longtime Democratic operative who's an assistant professor of political science at the University of Nebraska at Omaha. "You may think that this is a really good idea in Nebraska or, say, Iowa—that's got some heavily Democratic districts. But do you want to make this change in California or New York?"

The answer so far has been no. Following Romney's electoral loss in 2012, Republican legislators in Virginia and Pennsylvania introduced bills to drop the winner-take-all system but were defeated by Democratic opposition. If the system used in Nebraska and Maine had been in place nationwide in 2012, Romney would have carried 275 electoral votes, according to a *Washington Post* estimate, enough to win the White House, rather than the 206 he won. (Romney lost the popular vote nationwide by about 3.5 million.)

Following the 2010 census, Nebraska Republicans redrew the boundaries of the Blue Dot to include not only Douglas County, home to almost 30 percent of all Nebraskans, but also the conservative western half of Sarpy County, south of Omaha. Before the 2014 midterms, state Democrats commissioned a D.C. consulting group to

"We're seeing that Congressional District 2 is really in play, largely because of the disillusionment of Republicans with their candidate." ——*Douglas County Democratic Party Chair Crystal Rhoades*

develop a strategy for taking back the district, which mainly focused on voter registration. Working alongside labor groups, the party registered 10,000 new voters, many of them Latino. They succeeded in ousting eight-term Republican Representative Lee Terry and electing a Democrat, Brad Ashford—one of only two Democrats to defeat a sitting Republican congressman that year.

State Republicans haven't shown much interest in matching the Democrats' organizing efforts. Jon Tucker, who heads Douglas County's GOP, says their main focus will be on making sure voters know their polling places and publishing a candidate slate online.

Democrats have maintained a narrow registration advantage in Douglas County—128,477 as of Sept. 8, compared with Republicans' 127,286—but that's more than erased by their 20,000 voter deficit in Sarpy County.

In August, polling by Ashford's Republican challenger, Don Bacon, showed Trump almost six points ahead of Clinton in the Dot, even as he trailed her in national polls. Bacon, a former brigadier general in the U.S. Air Force, has nevertheless attempted to distance himself from Trump. His finance chair, Hal Daub, a former congressman who represented the Blue Dot in the 1980s before becoming mayor of Omaha, says: "Mr. Bacon's millstone is arguably Trump, but less so all the time. A day is a year, a week is a decade."

Nebraska's Republican governor, Pete Ricketts, endorsed Trump in May. Ricketts is the son of Joe Ricketts, founder of the Omaha-based TD Ameritrade brokerage. According to adviser Brian Baker, the senior Ricketts plans to give $1 million to a pro-Trump super PAC in the coming weeks despite the family spending $5.5 million trying to block the New York real estate mogul's bid for the nomination earlier this year.

1,191

Democrats' registration advantage over Republicans in Douglas County, Neb., as of Sept. 8

Nebraska Democrats have their own billionaire, Warren Buffett, who has endorsed Clinton and made small contributions to the local Democratic Party committee. He appeared at an August rally with Clinton in Omaha. He announced a website that will connect drivers with voters who need a lift to the polls on Election Day. Buffett pledged to drive at least 10 people himself in a rented trolley bus. "My goal is to have the turnout here be the highest percentage of potential voters of any district in the country," he said. Clinton responded with an enthusiastic promise: If Buffett has his way in November, "Warren and I will dance through the streets of Omaha together!" —*Jillian Goodman, with Zachary Mider*

The bottom line Democrats hope to score an electoral vote in Nebraska after Republicans failed to return the state to a winner-take-all system.

Public Finance

Add Cops Now, Find The Money Later

▶ **Chicago is dealing with a spike in murders amid a pension shortfall**

▶ **"When there's a crisis, there's money that is always found"**

In response to a rise in violent crime this year, Dallas and Denver are moving to put more officers on the street. In Chicago, where there's been an almost 50 percent spike in homicides since January, Mayor Rahm Emanuel has been stuck trying to figure out where to get the money to beef up the city's police force in the face of a projected $138 million budget hole.

On Sept. 21, Police Superintendent Eddie Johnson announced the city will hire almost 1,000 officers over ▶

the next two years, a reversal of Emanuel's strategy of covering policing needs with overtime shifts.

The city currently has 12,500 police officers, second only to New York, with 35,800 in uniform. Murders are on pace to top 600 by December, the highest annual total in 15 years. That body count outstrips those of New York and Los Angeles combined. There've been more than 2,500 shootings this year, an average of one every two hours.

Most of the violence is in black and Latino neighborhoods. "This is a crisis," says Diane Latiker, founder of Kids Off the Block, an antiviolence group in the South Side neighborhood of Roseland. "When there's a crisis, there's money that is always found by all means necessary."

The decision to increase the number of police comes a week after the City Council voted to raise water and sewer fees to shield the municipal pension fund from insolvency. That move came on the back of a record half-billion-dollar property tax increase approved last year to prop up police and firefighter retirement funds, and a hike in telephone surcharges to bolster laborers' pensions. The four retirement funds are still short a combined $33.8 billion of the $43.9 billion in total liabilities. Chicago must pay about $1 billion into the pension funds from its budget in 2017.

Emanuel, a Democrat whose public approval rating has been driven into the low 30 percent range by the unpopular tax increases and escalating crime, is scheduled to address Chicago's violence in a speech on Sept. 22. The mayor has indicated he will push for stiffer gun laws as well as additional spending on technology and social programs for young people. "It's not a one-nail issue," Emanuel said in public remarks on Sept. 14.

City spokeswoman Molly Poppe says the mayor's 2017 budget will include more money for policing: "Adding more resources to police at this time is an important priority, and it will be funded." She says there will be no new general tax hikes, including property, sales, or gas levies, to pay for additional police hiring.

Laurence Msall, president of the Civic Federation, a Chicago nonprofit that tracks state and municipal finance, says it will be tough for the mayor to keep that promise. "The city's pension obligations are crowding out all other priorities," he says.

Emanuel has made some progress since winning reelection last year. The city's $138 million deficit is the smallest in 10 years, and all four public pensions are on track to reach 90 percent funding in about 40 years. But the city's unfunded liabilities could grow for the next 15 to 20 years, according to Moody's Investors Service. Once all the levies are phased in, 40¢ to 45¢ of every budget dollar may go to paying pensions and municipal debt service, Moody's estimates.

Republican nominee Donald Trump said in August that Chicago police could stem this year's violence by being "much tougher." That prompted Johnson, the police superintendent, to respond, "If you have a magic bullet to stop the violence anywhere, not just in Chicago but in America, then please, share it with us."

Through the first half of this year, murders are up in 29 of the nation's largest cities, though crime overall remains at historically low rates nationwide. Dallas, where a sniper gunned down four police officers in July, is considering hiring 549 new officers over the next three years. Denver Mayor Michael Hancock on Sept. 12 proposed adding 48 officers in his 2017 budget, following downtown violence.

Chicago's woes

The city will pay about

$1b

next year into four separate pension funds. To cover that, the City Council increased telephone surcharges in 2014, adding about

$35m

a year in revenue. A 2015 property tax increase raises levies by

$543m

over the next four years. On Sept. 14 the City Council voted to raise water and sewer taxes to generate an additional

$240m

annually by 2020.

An Aug. 31 sit-in to protest Chicago's increase in homicides

FROM LEFT: JOSHUA LOTT/GETTY IMAGES; MOLLY RILEY/AFP/GETTY IMAGES

"Urban issues are on nobody's front burner," says Milwaukee Police Chief Edward Flynn, whose city erupted into rioting in August after an officer shot and killed a black man. "Most of our state legislatures are hostile. Congress has been hostile, and it's all on the backs of local taxpayers to deal with the issue." —*Tim Jones and Elizabeth Campbell*

The bottom line Facing a $138 million budget deficit for 2017, Chicago Mayor Emanuel is moving to stem crime without hiking taxes.

Quoted

"If I am the spoiler in this race, yippee! This is something that needs spoiling in a really big way."

Libertarian presidential nominee **Gary Johnson** at a Bloomberg Live event in Washington on Sept. 21, when asked about his potential impact on the election

Philanthropy

Successors Angle to Fill A Clinton Initiative Void

▶ **The Concordia Summit offers A-listers the chance to rub elbows**

▶ **"Our ultimate objective is on-the-ground impact"**

The Clinton Foundation has thrown its last Clinton Global Initiative, the star-studded conference on the margins of the United Nations annual General Assembly meeting. But the do-gooders, executives, heads of state, and other influencers who've flocked to the Clintons' annual New York gabfest need not fear: There's another conference happening in the same city in the same week and with a similar agenda. It's even attracted a lot of the same people who've attended the Clinton event in the past, including Madeleine Albright, Cherie Blair, and George Soros.

The Clinton Global Initiative is being shut down by the foundation as part of a plan for "eliminating legitimate concerns about potential conflicts of interest" after Hillary Clinton became the Democratic nominee, Bill Clinton blogged on Aug. 22. Both the expiring Clinton enterprise and the up-and-coming Concordia Summit illustrate a deep truth of human nature: Famous people like to spend time around other famous people. Unfamous people also like to spend time around famous people. So if you can assemble a critical mass of famous people and keep them in one place for long enough, you have a chance of igniting a powerful chain reaction of fame and charity. Another example of successful ignition: the World Economic Forum, which overstuffs the Swiss ski village of Davos each January.

From the first Clinton Global Initiative meeting in 2005, it was no shock when people crowded the Clintons' events. It's more surprising that they're turning out for the Concordia Summit, put on by a pair of near-nobodies. Co-founders Nicholas Logothetis, 28, and Matthew Swift, 30, became friends at Salisbury School, a boarding school in Connecticut, where they earned credit for taking over a campus burger joint. "They took it very seriously. It was a bustling business," says Danielle Sinclair, the school's communications director.

The school buddies moved on to Washington, where Logothetis went to George Washington University and Swift attended Georgetown. One year, Swift successfully bid at charity auctions for lunch dates with former Polish President Aleksander Kwasniewski and former Spanish Prime Minister José María Aznar, both of whom were then teaching at Georgetown. Swift's bids totaled less than $200. He brought along Logothetis. "They mentored us. It was the support of people like them that gave us some validation," Swift says. "Also, we're really annoying," Logothetis adds.

With the two former world leaders as bait, Swift and Logothetis were able to reel in other A-list and B-list political types in 2011 for their first Concordia Summit—taking its name from the Roman goddess of harmony. Bill Clinton himself stopped by in 2012. This year the event featured the likes of Warren Buffett, T. Boone Pickens, and retired General David Petraeus, as well as Albright, Blair, and Soros. The early financing came from the **Libra Group**, which is owned by Logothetis's family and is involved in aviation, energy, finance, hospitality, real estate, and shipping. Since then, Logothetis and Swift have added smaller monthly events and expanded their annual budget to about $4 million, with support from foundations, individuals, and corporations including **JPMorgan Chase** and **Delta Air Lines**.

Concordia isn't just talk-talk-talk, Swift and Logothetis say. They have a research arm and aim to nurture partnerships between the public and private sectors. On Sept. 20 they announced a joint initiative with Winrock International, a charity founded by the late Winthrop Rockefeller, to end slave labor in the fishing industry, starting in Thailand. The plan is to exert influence through the supply chain. In a news release, Logothetis said he was "thrilled" by the effort: "While convening and research are important, our ultimate objective is on-the-ground impact."

That's what the Clintons say, too. "While this is the final year of CGI, we are incredibly proud of the work our members will continue to do for years to come as a result of their commitments to improving lives worldwide," Ed Hughes, its deputy director, said in a written statement. —*Peter Coy*

The bottom line The Clinton Global Initiative is ending its run, giving social entrepreneurs an opening to attract power seekers and do-gooders.

Edited by Allison Hoffman
Bloomberg.com

September 26 — October 2, 2016

The Foxconn of the Auto Industry

Magna's safety-testing facility in Germany

▶ **Contract carmaker Magna wants to build the hardware for a self-driving future**

▶ **We want to be able to say, "Look, this is where we think the transportation market is going"**

At the end of a tree-lined boulevard in rural Ontario sits an imposing castle with steep slate roofs and white stone gables. The surrounding gardens and a spiral staircase are more Château de Fontainebleau than Detroit factory, but if **Apple**, **Google**, or **Uber** decides to build a self-driving car, this may well be the first stop.

The castle is the headquarters of **Magna International**, the world's biggest contract car manufacturer. The Canadian company, with a market value of $15.8 billion, develops and builds vehicles for **BMW**, **Daimler**, and **Jaguar Land Rover**, among others, when their factories can't meet demand. Now Chief Executive Officer Don Walker has set out a plan to be the world's one-stop shop for autonomous and electric car production. As traditional companies such as BMW and potential new entrants like Google and Apple increasingly focus on the software behind driving, and riding, contract manufacturers such as Magna have a great opportunity to pick up the work of making the hardware.

Walker's vision for Magna looks a lot like Foxconn, the world's biggest electronics contract manufacturer. "Becoming a carmaker is extremely difficult," he says. Developing a new car can cost several billion dollars and involve hundreds of players. BMW's various models typically have 30,000 components from 469 suppliers. Turning to an industry veteran like Magna, Walker says, can minimize those costs. "Most people end up coming to talk to us at some point," he says. At its factory in Holly, Mich., north of Detroit, some 600 employees make 10 million cameras annually for almost every major car brand, from Ford to Honda.

Magna makes rear-facing cameras for most big car brands

Last October, Walker gathered five of his executives at his Toronto apartment for a brainstorming session. What, he asked, is Magna's role in a world where ride-sharing, autonomous cars, and electric motors might dominate? "We had a couple

CLOCKWISE FROM TOP LEFT: KIÊN HOÀNG LÊ/BLOOMBERG (1); GRAHAM WALZER/BLOOMBERG (3); BLOOMBERG (1); PHOTOGRAPH BY MARK SOMMERFELD/BLOOMBERG (1)

A robot tests seats at the safety facility

of beers, I think we had a couple of shots of tequila," Walker says. "It was all about product strategy, geographic strategy, and what's going to happen in the future of electrification."

After 12 hours, the group concluded that Magna needed a concept car that could serve as a calling card. Walker asked Chief Technology Officer Swamy Kotagiri to set up a think tank of 25 experts across Magna's various divisions, from seating to chassis, drivetrain to electronics. "Our intent is to draw on these islands of expertise and manage and create something," Kotagiri says. The team has two years to come up with an autonomous, emission-free vehicle that can hold four to five people.

"Rather than be reactive to somebody coming and giving us a spec and then seeing what can Magna do," Kotagiri says, "we want to be able to project a vision to say, 'Look, this is where we think the transportation market is going, here's what Magna can bring to you as a platform.'" He says the prototype is still in the early design stages.

Contract manufacturing is just one source of Magna's $35 billion in annual revenue. After starting a Toronto toolmaking shop in the late 1950s, Austrian immigrant Frank Stronach built the company into the world's fourth-biggest car parts maker, supplying companies in the U.S., Europe, and Asia. The contract business is based in a factory in Graz, a medieval town in the foothills of the Austrian Alps whose most famous son is Arnold Schwarzenegger. There on adjacent assembly lines, Magna builds the Mercedes-Benz G-Class SUV and is preparing to produce the BMW 5 Series. The factory, which Magna acquired in 1998, has been building the G-Class for 37 years, and some parts of the process bear traces of old methods: The chassis is still hand-mounted by burly men in full protective bodysuits and welding helmets.

The BMW line, on the other hand, is heavily automated. Magna's team is testing a "collaborative robot," which helps glue the fin, a type of antenna, to the top of the car. The task is much harder for a human to do with consistent reliability, since the adhesive needs to be applied evenly.

Such hardware experience is something that upstart carmakers, like Apple or Google, would need to outsource. "It's extremely important for tech companies to go the route of partnering with a contract manufacturer," says Arun Kumar, a consultant at AlixPartners who advises Fortune 500 companies on strategy.

Some automakers "are very clear about it, saying five years from now the core of the engineering in the manufacturer is going to be software," says Kotagiri. "Five years ago they would have said the core of the engineering is engine/transmission." The shift has led to deals across the auto and tech industries. Uber is working with **Volvo Cars** to create a fleet of self-driving cars; **Fiat Chrysler** has teamed up with Google to build 100 self-driving prototype hybrid-powered Chrysler Pacifica minivans. And although it's never confirmed it explicitly, Apple is developing an autonomous car. About a dozen Magna engineers have been working with an Apple team in Sunnyvale, Calif., to develop a vehicle, according to one person familiar with the arrangement.

Autonomous controls in a retrofitted Cadillac

Tesla shows the challenge of building a car brand from scratch. The electric car maker, which is investing in autonomous car technology, doesn't outsource any of its production. It has been bedeviled by delays and glitches since its founding.

"Tesla has done a very good job, they've got a vehicle that people love, but it's a very small volume and very specific," Walker says. To assume "that new entrants are going to come in and dominate this industry in five years is craziness in my opinion."

—*Alex Webb, Gerrit De Vynck, and Elisabeth Behrmann*

The bottom line Magna, which builds cars for Mercedes and others, wants to be the go-to outsourcer for upstart automakers like Apple.

Data Mining

The Browns Know a *Lot* About Their Fans

▶ **From where they live to how they watch and what they buy**

▶ **"The goal is to unify all the breadcrumbs"**

If you watch the **Cleveland Browns**, there's a good chance they're watching you, too.

For about a year, the National Football League team has been compiling extensive profiles of its fans. **YinzCam**, a Pittsburgh-based software company, has helped the Browns merge disparate data streams from sales of concessions, merchandise, and tickets into a central database that's organized as a set of individual fan files.

The profiles contain personal data, as well as details on games attended, team apparel bought, and food and drinks consumed at the stadium. The files also show the time a fan has spent on the team website, articles read, and videos watched. Much of the data come via the team's mobile app, which YinzCam—"yinz" is Pittsburgh slang for "you all"—designed and built. The files also include data the Browns get from Fanatics, the biggest online sports apparel retailer, and Ticketmaster, among others. "The goal is to unify all the breadcrumbs and create a complete identity for each fan," says YinzCam founder

◀ Priya Narasimhan. "You can look at people with different preferences and give each of them an experience to match those preferences."

The team says the information has helped it devise ways to ring up more sales and is helping the Browns better cater to fans. "Now that we're learning about them, we're using the data to try and make it the best experience possible," says David Jenkins, the Browns' chief financial officer. The team first turned its attention to season ticket holders. YinzCam dug into the data to identify which season ticket accounts were at risk of not renewing. The determination was based on several factors—how far the ticket holder lives from the stadium, the number of games he or she attended, and spending patterns. YinzCam also helped the team to survey fans about communication preferences, and examined data about how they typically interact with the Browns.

In the past, the team called its biggest fans to ask them to renew. "The more you call people, the less likely they are to renew or change their behavior," says David Giller, a member of the Browns' analytics team. So the Browns cut back on the phone calls and instead sent text messages, e-mails, and push notifications. As a result, Giller says, the team held on to about $1 million in season ticket sales it would have otherwise lost, a critical savings for a small market team like the Browns. "The well is just not that deep," he says. "If we burn every lead in the barrel, we're stuck."

The Browns also looked at how to adjust its merchandise and concessions promotions. Earlier research found that sending food discounts in a random e-mail blast to fans resulted in a 7 percent jump in spending at FirstEnergy Stadium. The team decided to use YinzCam's predictive analytics to identify fans who are more likely to use the discount. The targeted outreach led to a 33 percent rise in spending, or about $33,000 per e-mail promotion.

YinzCam launched in 2007 as a mobile app developer, working with more than 150 sports properties around the world. Narasimhan says the company is talking to other teams about delivering similar data and hopes to add a dozen more as clients in the coming year, but declined to name any.

The Browns' next project will use data about their fan base to persuade companies to sign on as sponsors. "We're now at the edge of this frontier," says CFO Jenkins. Three years from now, "we'll be better at making this a personalized experience." —*Eben Novy-Williams*

The bottom line The Cleveland Browns say a data initiative has helped them increase ticket and merchandise sales.

Development

Fierce Culture Drives Tencent's Success

▶ **Founder Ma Huateng rewards internal competition**

▶ **It's "pretty cool when you win something, no matter how small"**

Tencent Holdings' ubiquitous WeChat emerged in 2011 after founder Ma Huateng encouraged employees to compete against one another to create a mobile messaging business. WeChat now has more than 805 million users who employ it for texting, playing games, paying bills, and buying money-market funds.

The blockbuster service helped turn Tencent into the biggest publicly traded company in China, with a market value of about HK$2 trillion ($258 billion). Ma wants to repeat that success as Tencent moves into live-streaming video. Workers in six units have developed broadcast platforms to compete for funding internally and in a live-streaming video market that's expected to grow ninefold, to almost $13 billion, by 2020. "Tencent's culture is like a shark womb," says Andy Mok, managing director for tech industry recruiter Red Pagoda Resources in Beijing, explaining how some unborn sharks cannibalize siblings in the womb to ensure their survival. "It's not as deadly, but it makes every member adapt faster and be more competitive."

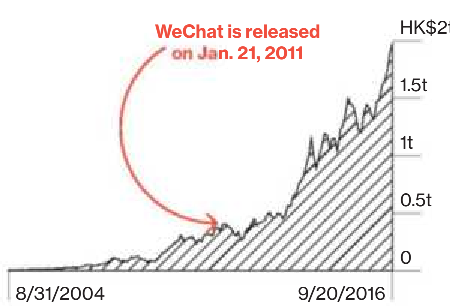
Ma, China's third-richest person, said in December that internal competition drives innovation. Besides the live-streaming services, all of which launched this year, his Shenzhen-based company operates at least four music apps, has three virtual-reality businesses, and owns two film units. "At Tencent, there isn't a real clear line about who can't do what," says Ross Liang, a general manager at Tencent's Social Network Group. Ma, through a Tencent spokesperson, declined to comment.

The live-video business is potentially one of the most lucrative of Tencent's new projects. Services including **Twitter**'s Periscope and **Facebook** Live let users broadcast themselves in real time while eating at a restaurant or test-driving a car. Those apps are banned in China, creating a huge market for about 200 domestic competitors. There are streaming services from **Alibaba Group** and **Baidu**. The biggest, according to researcher iiMedia, include **Momo**, **YY's Me**, and **Inke**. China-based live-streaming startups have raised $750 million in capital, estimates researcher Zero2IPO.

The Chinese market was valued at about 9 billion yuan ($1.3 billion) last year and could reach 85 billion yuan by 2020, according to HSBC, when the number of active users is expected to reach 491 million. "Competition in China's internet space is so tough,

China's Blue Chips

Tencent market value, in Hong Kong dollars



The biggest companies in mainland China

Company	Sector	Market value*
❶ Tencent	Internet	**HK$1.98t**
❷ Alibaba	Consumer services	**1.96t**
❸ Ind. & Com. Bank	Banking	**1.81t**
❹ China Constr. Bank	Banking	**1.48t**
❺ PetroChina	Oil and gas	**1.47t**
❻ Ag. Bank of China	Banking	**1.17t**
❼ Bank of China	Banking	**1.12t**
❽ Ping An	Life insurance	**0.75t**
❾ China Life	Life insurance	**0.68t**
❿ Sinopec	Oil and gas	**0.67t**

*AS OF SEPT. 20, 2016; DATA: BLOOMBERG

where you have copycats whenever a new product emerges, so it's probably good for [Tencent's] employees to experience some of that firsthand," says Rawen Huang, founder of Petrel Capital Management, which invests in tech startups.

Each of Tencent's live-video units–eGame, live.qq.com, kg.qq.com, Huayang, Now, and Qzone Live–covers a specific interest, from sports to karaoke, for an audience of about 656 million who access the internet via smartphone. The businesses need to establish themselves before Tencent commits money for marketing and recruiting, says Liang, who also runs Qzone Live. That product attracted more than 17 million viewers for a May broadcast of a charity fundraiser that included celebrity performances.

Competition is emphasized early in a Tencent employee's tenure. Workers are told to look for products emerging in the industry. Failure to spot trends means a colleague has outsmarted you, a shameful burden, says Alex Bai, a former Tencent product director who now works for Baidu. Bai is skeptical of how effective the strategy is. "It's a lot of incremental innovation," he says.

Ideas often come from the bottom up, and employees are rewarded with cash prizes, from 500 yuan for redesigning an interface to 1 million yuan for more challenging projects. Bai once received 300,000 yuan for improving the advertising business. "It's considered pretty cool when you win something, no matter how small," he says.

At Tencent's monthly meetings, hundreds of staffers, from vice presidents to new hires, discuss their latest projects. Ma sometimes shows up; company President Martin Lau often does.

Deciding which service will win more funding is sometimes an informal process. Lau often joins a business unit's WeChat discussion group; Ma sometimes does, too. They'll pepper employees with questions, Liang says.

Says Bai: "They want the teams to run free for a bit because they don't know which team will come out with the better product." —*Lulu Chen*

The bottom line A hypercompetitive culture has helped Tencent produce blockbuster services and made it China's biggest tech company.

Edited by Dimitra Kessenides
Bloomberg.com

FROM LEFT: PHOTO ILLUSTRATION BY 731; PHOTOS: GETTY IMAGES (3); COURTESY MICROFABRICA (4); ILLUSTRATION BY 731

Innovation

Microfabrication

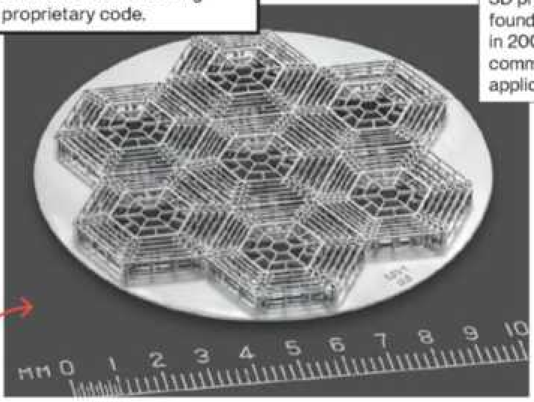
Form and function
Microfabrica produces millimeter-scale precision parts and devices—biopsy forceps, tiny clocks—through a method known as electrodeposition that's similar to the process used to make computer chips.

Innovator Michael Lockard
Age 58
Title President and COO of the 100-employee design and manufacturing company, based in Van Nuys, Calif.

1.
Design Components and devices are developed using commercial design software modified using proprietary code.

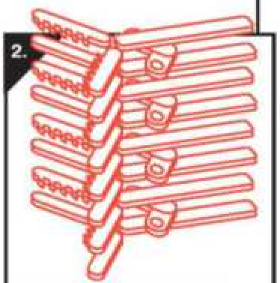
Origin Lockard and fellow 3D Systems alumnus Adam Cohen conceived of the idea for semiconductor-style 3D printing and founded Microfabrica in 2000 to research commercial applications.

Customers Aerospace companies such as Lockheed Martin and major medical device companies that Lockard declined to name.



Biocompatible tissue scaffolding

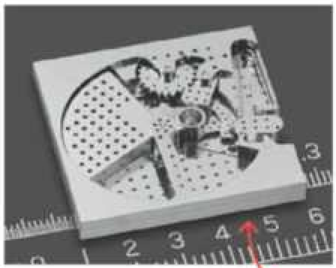
2.



Production From 4 to 50 layers of metal alloys and polymers are deposited on the surface of a ceramic wafer. Hundreds to thousands of devices can be made from the metal alloys on a single 4- or 6-inch wafer.

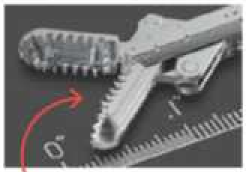
Cost $1 to $100 per item, depending on the size and number of layers.

Funding Darpa invested in 2000. Microfabrica raised $65 million from various investors through 2008. CEO Eric Miller says the company has been profitable since 2014.



.5cm mechanical clock

Actual size



.9mm-diameter biopsy forceps

3.
Delivery Wafers are separated from the finished products and can be reused. Products are shipped to customers in gel packs or test tubes filled with alcohol.

Next Steps

Miller says the company is designing tissue dissection and removal devices at its development office in Santa Clara, Calif. Christopher Ober, director of Cornell's NanoScale Science & Technology Facility, says Microfabrica's process is the only one he knows of that uses advanced semiconductor manufacturing techniques to produce complex metal devices. "Its strength is that like the production of computer chips, it makes multiple copies in parallel, and not by the one-at-a-time approach of conventional 3D printing." —*Michael Belfiore*

The Short Arm of the Claw

▶ Senators want Wells Fargo to pull back pay it awarded to top executives

▶ "Once it's out the door, it's hard to get back"

Wells Fargo Chief Executive Officer John Stumpf faced a grilling before the U.S. Senate Banking Committee on Sept. 20. The senators wanted to know how the bank had let its community banking unit spin out of control, with employees creating 2 million unauthorized customer accounts to meet sales targets. They also wanted to know whether the bank would claw back any of the millions of dollars received by Stumpf and other executives, including Carrie Tolstedt, who ran community banking before announcing her retirement in July.

The answer from Stumpf was maybe. The trickier question is: How much? Some kinds of pay are easier to take back than others. For example, during her three-decade career, Tolstedt received about $77 million in shares and vested options, in addition to cash bonuses and stock sales. Wells Fargo's clawback policy, like those of most U.S. companies, doesn't allow it to go after that money unless there is a restatement of financial results. Although the bank has been fined $185 million by regulators, the phony account practices resulted in only $2.4 million in fees, which is unlikely to trigger an earnings restatement for a bank with revenue of $86 billion last year.

In cases of reputational damage, Wells Fargo can recoup unvested stock awards—that is, shares that can't be cashed in until a future date. Tolstedt, whose retirement was announced in July, has about $19 million of those. That's no small sum, but it's just a fraction of her total awards of at least ▶

CLAW: CREATIV STUDIO HEINEMANN/GETTY IMAGES; MAN: IZABELA HABUR/GETTY IMAGES

$96 million. More than 5,000 Wells Fargo employees have been fired over the unauthorized accounts.

Executive-pay clawbacks first became a hot issue after the 2008 financial crisis. It's one way to deal with finance's "I'll be gone, you'll be gone" problem—bankers taking risks that lead to higher bonuses today but may result in problems years later. Clawback policies have grown more common, with 76 percent of the biggest banks around the world having them, up from 44 percent in 2010, according to a 2016 poll by Mercer, a compensation consulting company.

During the past two years, only 10 percent of companies polled by Mercer used the policies to reclaim compensation that's already been paid. Such penalties "are easier said than done," says Charles Elson, director of the University of Delaware's John L. Weinberg Center for Corporate Governance. "Once it's out the door, it's hard to get back."

In some European countries, labor laws prevent such clawbacks. And even in countries like the U.S., where a company can reach back for past pay, doing so can mean lengthy and expensive lawsuits. "I would guess that there are some situations where the board concludes that the expense and energy of a potential legal battle is simply not worth the potential recovery," says Michael Melbinger, a partner specializing in employee benefits and executive compensation at Winston & Strawn.

Even the Securities and Exchange Commission's proposed clawback rule, put forward in 2015 to fill a requirement in the Dodd-Frank financial reform law, allows a company not to go after pay if legal fees and other costs threaten to be more expensive than the compensation they're trying to collect.

The exceptions tend to be extreme cases. **JPMorgan Chase** went after traders who lost $6.2 billion in a scandal dubbed the London Whale after the nickname of one of the traders. In addition to canceling unvested bonuses, the firm asked traders to return some cash they'd already received. All but one agreed to do so, and JPMorgan sued the holdout in a case settled three months later. The bank recovered more than $100 million in cash and unvested stock, according to its 2012 annual report, equal to two years' compensation for the four former employees.

Recouping unvested rewards is easier to pull off, and more common. There's even a word for it: A **malus**, as in, the opposite of a bonus. In Mercer's survey, 90 percent of big banks had some clause to rescind unpaid incentives for reasons ranging from misconduct to negative business results. Half of the banks polled applied their malus policies for individual performance or misconduct in the past two years.

The antibonus: An unpaid incentive rescinded by a company

The world's largest banks have introduced deferred-payment schemes for most executives, giving boards bigger pots of earned-but-unpaid bonuses they can cancel if they discover bad behavior. European authorities have gone further, introducing rules extending bonus deferral periods, and U.S. regulators this year proposed mandatory deferrals of three to four years for top financial executives. The U.K. approved rules last year requiring banks to defer all bonuses for senior management for seven years.

Deferred pay presents its own problems—people tend to undervalue money they won't see for years, so the threat of losing it may not be an effective deterrent. The new U.K. rules are also toughening up the harsher, reach-into-the-banker's-pocket form of clawbacks. They allow financial firms to take back pay from as long ago as 10 years in cases where "material failures" are discovered. London-based **Standard Chartered** recently said it's considering whether to recover bonuses paid to 150 senior managers responsible for losses the bank incurred this year.

At the Senate hearing, Wells Fargo's Stumpf said decisions about clawbacks will be made by the bank's board. "The board has the tools to hold senior management accountable, including me and Carrie Tolstedt," he said.

"The board has the tools to hold senior management accountable, including me and Carrie Tolstedt."
—John Stumpf, Wells Fargo CEO

Accountability will be in the eye of the beholder. The senators clearly weren't looking only at Tolstedt's unvested $19 million. Referring to the dismissed Wells Fargo staffers, Indiana Democrat Joe Donnelly said, "That's like firing the guy throwing coal in the engine and letting the captain go strolling off to a $100 million new ship."
—Caleb Melby and Yalman Onaran

The bottom line More banks are adding clawback provisions for executive pay, but it's still uncommon to take back past bonuses.

Energy

What Do You Do With a Spare Deepwater Rig?

▶ **Transocean makes a risky decision to shut off the engines**

▶ **"These drillships were not designed to sit idle"**

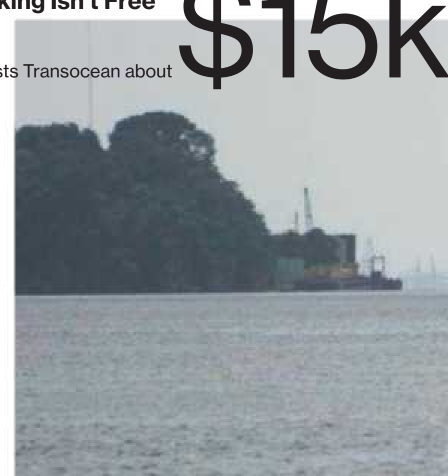
In a far corner of the Caribbean Sea, one of those idyllic spots touched most days by little more than a fisherman chasing blue marlin, billions of dollars worth of high-tech oil equipment bobs quietly in the water.

They are deepwater drillships—hulking vessels with giant oil rigs that tower high above the deck. They're packed tight in a cluster, nine of them in all. The engines are off. The 20-ton anchors are down. The regular crews are gone. For months now, they've been parked here, 12 miles off the coast of Trinidad and Tobago, waiting for the global oil market to recover. Crude is trading at about $44 a barrel, down from more than $90 in mid-2014.

The ships are owned by Switzerland's **Transocean**, the biggest offshore-rig operator in the world. And

Parking Isn't Free

It costs Transocean about $15k



while the decision to idle much of its fleet would seem logical enough given the collapse in oil drilling activity, Transocean is taking a risk. No one, it turns out, has ever shut off these ships before. In the two decades since the more advanced vessels hit the market, there had never been a need to. And no one can say for certain what will happen when they flip the switch to turn the ships back on.

It's a gamble that Transocean and a couple of smaller rig operators felt compelled to take. Warm stacking—keeping the motors running on idle drillships—typically costs $40,000 a day. Cold stacking—turning the engines off—costs as little as $15,000 a day.

"These drillships were not designed to sit idle," says Willard Duffey Jr., an electrician who spent two decades with Transocean. The *Deepwater Pathfinder*, which Duffey served on for four years, was among the first to be parked off the Trinidad coast. The ship made the voyage there from the Gulf of Mexico about a year ago. Duffey was one of the last men aboard before the engines were turned off. He fretted constantly —"did I do everything I could?"—as he flew back home.

The drillships have a price tag of $500 million each. Below the water line sit a half-dozen Rolls-Royce thrusters; they push in opposing directions and are coordinated by satellite to keep the rig hovering over wells lying as far as two miles underwater. On deck, there's a robot that can be sent down to work a screwdriver or a wrench on the seabed, at depths no human could survive. And the 220-foot tall, dual-activity oil-drilling derrick can simultaneously lift and lower gear including a diamond-studded drill bit, a five-story-tall blowout preventer, and a heavy-drill pipe. It can handle as much as 5 million pounds of equipment—equal to the weight of some 20 blue whales—going up and down at one time.

These elements are what make turning the ships back on so daunting. Chip Keener, whose rig-storage consulting firm advises Transocean, compares it to what would happen if you left a high-tech car parked in the garage for months. The battery would be dead, sure, but then there would also be a slew of crucial settings to reprogram. On a drillship, there are thousands and thousands of them. "It's a big deal," says Keener.

For now, cold stacking has done well for Transocean, which owned the rig **BP** operated in the 2010 Gulf of Mexico explosion and oil spill. With the help of the cost savings, the company posted a profit of $77 million in the second quarter, surprising investors who'd been bracing for a loss. Still, many deepwater rig operators haven't been willing to cold stack—**Noble Corp.**, **Rowan Cos.**, and **Pacific Drilling**, to name a few. Chris Beckett, chief executive officer of Pacific Drilling, says the unknowns are just too great and the cost to keep the ships running are manageable at about $10 million a year.

Almost half of the world's available floating rigs are out of work today, and industry analysts expect that number to climb. Large oil companies—the rigs' customers—are spending less on drilling in high-cost offshore areas and canceling work contracts early. At the same time, new rigs that were ordered in recent years keep rolling out of shipyards. Bloomberg Intelligence estimates as much as $56 billion worth of offshore rigs, from those designed for shallow water to the ones built for great depths, are under construction.

Aboard the *Pathfinder*, which Transocean was able to lease out for more than $680,000 a day back in 2014, a handful of seamen recruited locally make the rounds, in part to ward off criminals. They're joined every once in a while by Transocean mechanics sent to monitor the ships. The company's chief operating officer, John Stobart, recently visited. According to CEO Jeremy Thigpen, Stobart came away encouraged.

"His belief is, 'Listen, we're going to be able to reactivate these rigs in a timely and low-cost manner,'" Thigpen said at an energy conference in September. Transocean is prepared to wait for that day. According to officials in Trinidad, the contract that the company is negotiating to lease seabed space could extend to 2020.
—David Wethe

The bottom line While Transocean is saving money by cold stacking drillships, no one knows what will happen when it turns them back on.

… per day, per ship, to hold deepwater rigs with their engines off.

But with oil trading at $44 a barrel, they could be here for a while…

MARK ANTHONY/BLOOMBERG

Investing

The Prof Who Made a Monkey of Wall Street

▶ **Now he wants to make investment advice cheap and automated**

▶ **"Believe me, there are plenty of smart people behind the robots"**

Burton Malkiel has been saying the same thing about investing for more than 40 years. What's new is that a big chunk of the financial industry now admits he was right all along.

In 1973, Malkiel, a Princeton professor, published the first version of his investment guide, *A Random Walk Down Wall Street*. He wrote that "a blindfolded monkey throwing darts at the stock listings could select a portfolio that would do just as well as one selected by the experts." Since most investors can't beat the market average over time, he argued, they'd be better off in some kind of low-fee fund that ▶

simply held all of the stocks on a widely followed index. Problem was, no such retail fund existed.

When a new fund company called **Vanguard** finally rolled out the first index mutual fund three years later, Ned Johnson, then the head of **Fidelity Investments**, spoke for most money managers when he told the *Boston Globe*, "I can't believe that the great mass of investors are going to be satisfied with an ultimate goal of just achieving average returns."

Things changed ... slowly, and then all at once. That first fund, the S&P 500-mimicking Vanguard 500 Index grew to a respectable $3 billion in assets in its first 20 years. But when it turned 40 years old on Aug. 31, it had more than $200 billion in assets, making it the third largest mutual fund, behind two other Vanguard index funds. From the end of 2007 through 2015—that is, since the financial crisis—domestic equity index funds saw a net inflow of investor money as active stock pickers grappled with outflows. About 34 percent of all fund assets are now in index trackers. Fidelity, though still a believer in the idea that managers can beat the markets, now advertises how inexpensive its own index funds are.

"This was an idea that was thought of as heresy or utter stupidity and now many realize it was the right way to go," says Malkiel, in an interview at Princeton, where he is now a professor emeritus of economics. Weak performance has made life hard for managers who still actively pick stocks: According to the latest data from S&P Global, fewer than 15 percent of active large-cap stock funds beat the market index over the past 10 years. Index funds reliably deliver the market's return minus yearly fees that may be 0.10 percent of assets or less, compared with stock funds' average of 1.3 percent.


Malkiel

Malkiel, 84, is now chief investment officer at **Wealthfront**, a Silicon Valley startup that's become one of the leading robo-advisers—firms that use index funds to build automated investment plans for a fraction of the fees charged by traditional advisers. Just as index funds brought down the cost of investing, robo-advisers will bring down the cost of advice, says Malkiel, who spent 27 years on the Vanguard board. "The one thing I know is that the less I pay the purveyor, the more there will be left for me," he said.

Malkiel grew up without money in the Roxbury neighborhood of Boston during the Depression, and went to Wall Street after stints at Harvard and the Harvard Business School. He rejected a career in academia, at first, because he was tired of being poor.

On Wall Street, he noticed that if you followed the recommendations of the bright, talented stockpickers he worked with, you rarely made money. He also saw that brokers recommended to customers the funds they were paid the most to promote. Malkiel left Wall Street for Princeton in 1960 but never left the business world behind. He estimates he has served on the boards of 30 different organizations over the years, including two biotech companies where he still holds a seat.

Jack Bogle, founder of Vanguard, says Malkiel "was the best director we have ever had." Robert Arnott, cofounder of California investment strategist **Research Affiliates**, recruited Malkiel to serve on his advisory panel. "We wanted someone who is a critic of our ideas, who was willing to be bluntspoken," says Arnott. He got his wish. Arnott is a proponent of so-called smart beta—a variation on indexing that Arnott and others think will lead to better performance. Malkiel calls smart beta "smart marketing."

Adam Nash, chief executive officer of Wealthfront, says Malkiel played a critical role in creating one of the firm's most successful products, a system for maximizing the tax losses investors can claim in a given year. Malkiel says computers can do that job better than humans.

Automated advice is still a relatively tiny business, but Malkiel thinks that, as with indexing, the services will win over the skeptics. "You hear people say, 'Do you want a robot managing your money?' " he says. "Believe me, there are plenty of smart people behind the robots."

A Random Walk has sold more than 1.5 million copies in 11 editions. Even professional stockpickers concede that they have to do a better job if they are going to hang on to assets. An investment management company "has to do something that a computer can't easily replicate, and it has to justify its fee through higher return or lower risk," William Nygren, manager of the $15 billion Oakmark Fund, wrote in a June report to shareholders.

Malkiel is convinced most managers can't do that. The bet has gone his way for four decades running.
—*Charles Stein*

The bottom line Once an oddity, index funds are now one-third of fund assets. Burton Malkiel was one of the first to see it coming.

Real Estate

Flipping's Back ... With Crowdfunding

▶ **It took one real estate investor 12 hours to raise $1 million**

▶ **Inexperienced players could "end up wishing they hadn't played"**

Alex Sifakis never raised so much money so quickly. Over the past two-and-a-half years, the house flipper from Jacksonville, Fla., crowdfunded nine deals totaling $9 million through the online lending platform **RealtyShares**. Financing one deal for $1 million in July took him just 12 hours. "Generally, raising money takes so much time," Sifakis says. "This offers so much flexibility and time savings. It's so much better than going to family offices, banks, or Wall Street firms."

House flippers and property developers are increasingly turning to websites that match people who need money with people

Art of Failure

The exhibit opened on Sept. 15, the eighth anniversary of the Lehman Brothers collapse, and runs through bonus season

"Capitalism has to forget these failures in order to continue." —*Mandiberg*

40 Rector St., New York Since 2008, artist Michael Mandiberg has collected logos of fallen financial institutions. The insignia are meant to represent power and stability, he says, "and yet they are quickly erased from our collective memory." He used a laser cutter to burn the designs into used finance books he bought for as little as $1—"one step from being thrown out." The 527 books are on display in a vacated Lower Manhattan office, in a work titled *FDIC Insured*. —*Ross Kenneth Urken*

looking to lend. **LendingClub** and **Prosper Marketplace** popularized this approach for consumer loans. Platforms like RealtyShares, **LendingHome**, and **Patch of Land** do something similar for real estate.

For riskier ventures, such as building new homes or buying, renovating, then selling existing homes, investors are finding quick backing that can be difficult to get from banks. Of course, faster isn't always better: The well-oiled mortgage machine of the mid-2000s made homebuying a snap, with disastrous results.

Most crowdfunding sites cater to investors and developers, not everyday homebuyers. Still, the ease of fundraising through nontraditional lenders could be a warning sign, says Erik Gordon, a law professor at the University of Michigan at Ann Arbor. "Whenever you see a big difference between the terms on which you can raise money in one market vs. another market, something is wrong in at least one of those markets," Gordon says. "It usually is the market with the least experienced players, and they usually end up wishing they hadn't played."

Handy funding comes as house flipping is undergoing a resurgence. In the second quarter of this year, 39,775 investors bought and sold at least one house, according to Attom Data Solutions. That's the most since 2007. Sifakis says he's borrowing money at 14 percent per year over two-and-a-half years.

After the exhibition, the books will sell for $500 each

Builders are also availing themselves of money from the internet. Crofton, Md.-based **Caruso Homes** used RealtyShares for new homes in Raleigh, N.C., and Washington, D.C. Wall Street isn't interested in small and midsize deals to finance single-family developments, says Jack Haese, Caruso's chief financial officer. That makes crowdfunding a better way to fund some of the company's projects.

So far, defaults are low for the lending platforms. But the companies are in the early stages. Patch of Land says it's originated more than $180 million in loans, and RealtyShares said it's raised more than $200 million for real estate deals. LendingHome won't say how much it's generated—the company started financing individuals only this year. Those totals are peanuts compared with other online financing platforms such as LendingClub.

Jeff Bullian, a Boston-based consultant, has put his money into about 30 deals on RealtyShares and in a handful of others on different websites. He says he invests an average of $10,000 in each one for returns of about 10 percent to 20 percent. Only one has gone bad so far, he says. The platform, which Bullian declined to identify, went to bat for investors so everyone could get their money back along with a small return, he says.

The U.S. Securities and Exchange Commission requires that individuals who want to lend through the sites meet certain conditions, such as an annual income of $200,000 or a net worth of $1 million. Minimum investments are generally $1,000 to $5,000. The companies say they're selective about the projects that can be financed through the sites. Of the prospects brought to RealtyShares, only about 3 percent are selected to be listed, says Chief Executive Officer Nav Athwal. Patch of Land generally requires borrowers to provide personal guarantees and to put at least 20 percent of their own money into deals, according to AdaPia d'Errico, its chief marketing officer.

Sifakis, the Florida flipper, sees the crowdfunding sites amplifying his buying power. "The amount of money you can raise isn't limited by anything but their investor base," he says. "And the investor base is growing and growing." —*Heather Perlberg*

The bottom line Online lending services make real estate deals faster and more flexible—which may prove a mixed blessing.

Edited by Pat Regnier
Bloomberg.com

MALKIEL: PETER FOLEY/BLOOMBERG; INSTALLATION: COURTESY MICHAEL MANDIBERG/DENNY GALLERY, NYC; ILLUSTRATION: 731

SPECIAL SECTION!

BLOOMBERG FIFTY MOST INFLUENTIAL

These men and women move markets. They make interest rates swing, stock prices crater, and bond yields soar

When compiling a list of who commands the most power in financial markets, some decisions are easier than others. Jamie Dimon is an obvious choice—he heads the world's most valuable bank, after all. Same goes for Zhou Xiaochuan, because when you run the People's Bank of China, moving markets is part of the job description. You'll find both on Bloomberg's 50 Most Influential—now in its sixth edition and appearing in *Businessweek* for the first time—along with a few unexpected names, to keep things interesting. The list's publication is timed to coincide with our Most Influential Summits on Sept. 28 in New York, London, and Hong Kong.

As in previous years, we began by asking dozens of reporters and editors in Bloomberg bureaus to nominate candidates. Then a panel of senior editors vetted and voted, narrowing the field from more than 100 names down to 50. From this effort comes the list you now hold: a group of individuals who, singularly or collectively, drive some of the major trends sweeping the world of finance.

Naturally, there are some usual suspects. Fed Chair Janet Yellen can soothe or ruffle markets with a phrase. Some corporate leaders can push a stock up or down just by talking. That's why Warren Buffett makes the list. Technology executives Elon Musk and Travis Kalanick create buzz, but what matters is the capital that flows to where that excitement is bubbling up.

Investors move markets, too, though sometimes markets move against them. You won't find many hedge funders on the list this year, with most having underperformed the S&P 500. Our ranking rewards recent performance more heavily than lifetime achievement. So it's not enough to have made billions for your investors in the past if it looks as if you're losing your touch.

The importance of Xi Jinping can't be overstated, as he pulls the levers of an economy that, for better or worse, is the biggest source of global growth. By contrast, current events landed Theresa May atop our list. The Brexit vote that precipitated her rise was an economic and political shock. The U.K.'s uncoupling from the European Union will matter greatly in the world of finance, and it's May who has to manage this messy divorce.

Some of the individuals on our list exert influence because they help shape public opinion: Economist Joseph Stiglitz continues to lead the debate about economic inequality. And who but John Oliver can get people engaged in Puerto Rico's municipal debt crisis?
—*ROBERT S. DIETERICH*

1. THERESA MAY
Prime minister
U.K.

Amid the financial, political, and economic turmoil that followed the June 23 referendum, May won power and quickly declared that "Brexit means Brexit," even though she had been in the "remain" camp. She has everything to gain if she can negotiate thorny matters, such as whether banks, insurers, and investment firms will be able to continue doing business in the EU from their London bases. At stake is the City's status as Europe's premier financial center.

tie

2. HILLARY CLINTON
Candidate for U.S. president

If she wins, the financial world will be watching to see who has greater influence over her policymaking—Clinton's Wall Street benefactors or the Bernie Sanders supporters she's been trying to woo. One key test will be how she follows through on her promise to "make sure the wealthy, Wall Street, and corporations pay their fair share in taxes."

2. DONALD TRUMP
Candidate for U.S. president

If he wins, the financial world will be watching to see how sincere he is in his opposition to free trade, which the Republican Party has embraced for decades, and in his commitment to tackle the national debt (without cutting Social Security). Another key question is whether he'll follow through on his pledge to dismantle the Dodd-Frank bank regulations.

4. XI JINPING
President
China

Until the Brits ushered in a new period of uncertainty in Europe, all eyes this year were on China. Xi is walking a tightrope: He's pledged to keep annual economic growth from falling below 6.5 percent through 2020 and prevent rising debts from spiraling out of control. If he wobbles, world markets will cringe.

5. JEFF BEZOS
Founder and CEO
Amazon.com
U.S.

Bezos's influence is evident from the moves his rivals are making. Walmart, which has about four times the revenue of Amazon (and a market valuation that's one-third less), is spending $3.3 billion to acquire Jet.com, a not-even-close-to-profitable e-commerce startup that one day might help it compete with Amazon. China's Alibaba has introduced its own version of Amazon Web Services, the cloud division that is now the U.S. company's fastest-growing and most profitable unit. Stay tuned to see how FedEx and UPS respond to Amazon's plan to assemble its own fleet of airplanes and maybe a swarm of drones. It's been a good year for Bezos's bottom line, too: This year he displaced Warren Buffett as the world's third-richest man. The Bloomberg Billionaires Index estimates his net worth at $68 billion.

6. ANGELA MERKEL
Chancellor
Germany

"We can do this" was the motto Merkel favored to rally support for her government's open-border policy on refugees. Germans are not so sure. Voters, anxious over whether Germany can absorb more than 1 million asylum seekers, have punished Merkel's Christian Democrats in recent local elections. So far she's refused to back down, fueling speculation she may not seek a fourth term in federal elections in 2017. At this point, though, nobody has emerged to mount a credible challenge to the leader of Europe's largest economy.

7. MARIO DRAGHI
President
European Central Bank
Italy

Don't fight the ECB. When Britons voted to exit the EU, Draghi didn't blink and kept up his bond-buying bonanza. Markets responded, driving yields on corporate and sovereign debt lower. Draghi's whatever-it-takes attitude has held the troubled euro zone together during his almost five years on the job. The Italian banker has warned that the growth outlook for the 19-member bloc remains "tilted to the downside" after the U.K.'s vote. From his perch in Frankfurt, he'll be doing all he can to nudge it the other way.

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8. JANET YELLEN
Chair
U.S. Federal Reserve

Give her a nod as the steward of a long and, at this point, steady recovery. Growth in the U.S. may be a bit disappointing, but it inspires envy among the leaders of other major economies. Yellen's calm approach has been right for the times. When she finally got around to that first hike in benchmark rates at the end of last year, it didn't derail the expansion or destroy the markets as some naysayers had predicted. And she's refused to rush the next increase. Her most remarkable feat may be that she's kept the critics at bay in a time of growing political polarization. The Fed has been less controversial in the current presidential race than it was during the 2012 cycle.

9. WARREN BUFFETT
CEO
Berkshire Hathaway
U.S.

The Oracle of Omaha has a thing for hidden champions: companies that aren't quite household names but are leaders in their industries. Among the more than a dozen acquisitions Berkshire Hathaway has done this year are a Danish business that makes processing equipment for the poultry industry and a jewelry e-tailer in Boston. That's not to say Buffett has lost his taste for high-profile stocks: Berkshire increased its stake in Apple by 55 percent during the second quarter, when the share price dipped on expectations that slower customer upgrades and competition from China would take a bite out of iPhone sales this year.

10. SERGIO MORO
Federal judge
Brazil

Moro and his team of prosecutors and investigators have spent more than two years tracking an almost $2 billion graft scandal across four continents. Their efforts helped tip Brazil into its worst recession in a century and created the political climate for the ouster of President Dilma Rousseff. Investors are beginning to look beyond the corruption probe, however. Brazil's benchmark stock index is up more than 30 percent this year, a sign that a recovery is coming.

11. ELON MUSK
Co-founder and CEO
Tesla Motors
U.S.

Musk's plans for commercial space exploration suffered a setback recently when a mysterious fire on the launchpad at Cape Canaveral destroyed a SpaceX rocket and its satellite payload. A fatal accident with a Tesla on autopilot has drawn scrutiny from safety regulators and prompted criticism that Musk overhyped the automaker's self-driving technology. Tesla shares are down since it first announced its plan to acquire SolarCity in June, amid governance issues and cash-flow concerns. And then there's the question that might matter most in the end: Can his flagship business turn a profit? Musk is pushing hard to prove it can, but analysts are deeply split over whether the sky's-the-limit company has a shorter runway than its leader realizes.

12. BILL McNABB
CEO
Vanguard Group
U.S.

The man who's been running one of the world's largest investment companies for almost a decade is so low-profile he doesn't have a Wikipedia entry. But Vanguard's influence continues to expand as retirees and other investors pull money out of actively managed funds and put it in low-cost index funds—Vanguard's specialty. The company took in a record $236 billion last year and is on track to beat that in 2016.

13. JAMIE DIMON
CEO
JPMorgan Chase
U.S.

The leader of the world's most valuable bank has spoken out against Brexit and in favor of the Trans-Pacific Partnership trade pact. He's also downplayed concerns that his industry is about to get upended by the growing legions of fintech startups. In a Bloomberg interview in March, he suggested some large banks can innovate on their own or in partnership with new players. (JPMorgan has teamed up with online lender OnDeck.) He noted that regulators aren't about to give fintech companies a pass. Said Dimon: "We like our hand."

14. ZHOU XIAOCHUAN
Governor
People's Bank of China

He's been running China's central bank for almost 14 years and may go down in history as the man who turned the yuan into a global currency. The journey began when Zhou scrapped the decade-long peg to the dollar in 2005, a move that helped set the stage for China's emergence as an economic superpower. As politicians in the West bash Beijing for keeping the currency artificially undervalued (hello, Donald), China's currency has gained more against the U.S. dollar since the end of 2005 than any other in Asia, except for Singapore's dollar. On Oct. 1 the yuan will join the greenback, the euro, the yen, and the pound in the International Monetary Fund's basket of reserve currencies. Sure, there have been hiccups along the way—such as last year's unexpected, and therefore market-shocking, devaluation—but ask any currency trader, and he'll tell you the yuan has come a long way.

15. LLOYD BLANKFEIN
CEO
Goldman Sachs
U.S.

Blankfein's influence may rest, in the end, on how well his company can adapt to the structural changes sweeping Wall Street. Revenue was lower in 2015 than in 2006, when he became CEO, and it's forecast to drop further this year. So Goldman's boss is cutting costs and reducing head count. He's also expanding into retail banking and pushing technological change.

16. LARRY FINK
Founder and CEO
BlackRock
U.S.

Name a company, and BlackRock, with its $4.6 trillion under management, is likely among the largest holders of its equity or debt. That means Fink has a platform to speak out on the issues he cares about, such as governance. Earlier this year, in an open letter addressed to American and European CEOs, he counseled them to plan and invest for the longer term—both for the good of the economy and for the benefit of shareholders who are saving for retirement—rather than maneuver for short-term gains.

17. JACK MA
Founder and chairman
Alibaba
China

Short sellers ganged up on Alibaba this year, helped by a U.S. Securities and Exchange Commission investigation of the company's reporting and SoftBank's plans to sell down its stake in the Chinese e-commerce giant. The stock remains below the peak it reached right after going public in 2014. But Ma isn't retrenching. His privately held Ant Financial Services Group, which oversees a growing slate of financial products and services, recently got an investment that values it at $60 billion. And Goldman Sachs is projecting that Alibaba's fledgling cloud service could be pulling in $5 billion a year in revenue by 2019, making it the global No. 2 behind Amazon.

18. JAY Y. LEE
Vice chairman
Samsung Electronics
South Korea

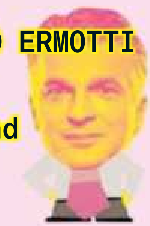
The Samsung *chaebol*'s role in the Korean economy can't be overstated: Revenue across all of its units equals about 20 percent of Korea's gross domestic product. Running the show these days is Jay Y. Lee, the eldest child of the company's founder, who has been ill since 2014. Developments at Samsung Electronics, which generates about 70 percent of the group's revenue, are being watched closely to size up the younger Lee's leadership. When the company found that its new Galaxy Note 7 phones have batteries that can burst into flames, Lee won praise for acting decisively with a recall that could cost as much as $2 billion—but the damage to Samsung's reputation continues to spread.

19. LORETTA LYNCH
U.S. attorney general

Under Lynch, the U.S. Department of Justice has kept an aggressive antitrust posture, scuttling several proposed mergers. Perhaps more surprising, Lynch has staked out an expanded role in fighting global corruption. A sweeping federal indictment of the officials who run international soccer helped topple FIFA President Sepp Blatter. Now Lynch's prosecutors are seeking to recover more than $1 billion in assets that were allegedly siphoned out of Malaysia's state-run 1MDB development fund. Neither Prime Minister Najib Razak, who has ties to the fund, nor Goldman Sachs, which sold billions of dollars of debt for 1MDB, is being targeted. It's harder to ignore a scandal when the DOJ's wonderfully named Kleptocracy Asset Recovery Initiative is chasing it down.

20. CARL ICAHN
Chairman
Icahn Enterprises
U.S.

What other activist investor has tackled targets as diverse as Apple and Herbalife, and won? Icahn exited his Apple stake earlier this year with the shares much higher than they were three years ago, when he first invested and started pushing CEO Tim Cook to return money to stockholders. At tiny Herbalife, he appears ready to double down on a bet that was motivated in part by his antipathy to Bill Ackman's effort to paint the company as a pyramid scheme. Herbalife shares have almost doubled since Icahn started buying, and now he's considering launching a tender offer to take the company private.



21. SERGIO ERMOTTI
CEO
UBS
Switzerland

In the race to reinvent Swiss banking, Ermotti has a head start. He moved quickly after he was given the top job in late 2011, stressing wealth management, shrinking investment banking, and cutting costs. That paid off for a few years, though the earnings rebound lost momentum in 2015. UBS has dramatically outperformed rival Credit Suisse during Ermotti's tenure, but nothing's easy in European banking. Among the concerns: Wealthy clients from developing countries are pulling their money, fearing increased scrutiny from tax authorities.

22. Jeffrey Gundlach
Founder and CEO
DoubleLine Capital
U.S.

Gundlach's Los Angeles-based investment firm passed $100 billion in assets in June. His fearless prognostications and record of prescient calls make him influential beyond DoubleLine's size. In January he forecast that gold would reach $1,400 this year and that oil would plateau below $50. He also predicts a President Donald Trump. Gundlach warns that bad times are coming, assets are overpriced, and interest rates have hit bottom. Bet against him at your peril.

23. JOHN STUMPF
CEO
Wells Fargo
U.S.

Wells Fargo has distinguished itself mostly by what it doesn't do. Stumpf's bank is simpler than its East Coast rivals, with less investment banking and trading and, until recently, less of a propensity to run afoul of regulators. Now Stumpf faces the biggest scandal of his career after Wells Fargo paid $185 million to settle complaints that employees opened accounts customers didn't know about. He's stumbled as he's addressed the scandal, initially blaming low-level employees—5,300 have been fired for improper conduct. The bank's shares have been so battered that Wells recently lost the title of world's most valuable bank.

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24. MARY ERDOES
CEO
J.P. Morgan Asset Management
U.S.

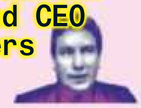
Erdoes's track record of growth at the bank's $2.3 trillion asset-management unit has fueled speculation that she could be a successor to Jamie Dimon. She serves on the bank's 10-person operating committee but has kept a low profile until recently. She took a bigger role this year in an initiative to promote corporate governance best practices. And like BlackRock's Larry Fink, she's been speaking out about how corporate short-termism goes against the interest of individual investors, including her clients, who are trying to build a nest egg for retirement.

25. MASAYOSHI SON
Founder and CEO
SoftBank
Japan

Born in Japan to Korean immigrants, Son has said his humble origins helped fuel his ambitions. Today he presides over a large collection of telecommunications assets and web-based businesses and has a personal net worth of $12 billion, according to the Bloomberg Billionaires Index. Although he once said he'd retire at age 60, Son shows no intention of handing over the reins as that date fast approaches. In July, SoftBank placed a big bet on the future of the internet of things with its $32 billion takeover of ARM Holdings, a chip designer in the U.K. Analysts weren't happy about the hefty premium, but Son, who's made some visionary investments in the past, may prove them wrong.

26. CHARLIE SCHARF
CEO
Visa
U.S.

Online payment services such as PayPal and its younger, hipper brother, Venmo, were once viewed as a threat to older financial companies. But now, Visa and PayPal have agreed to make nice over fees and data-sharing. The day after their deal was announced in July, Visa shares climbed and PayPal's slid, a sign that Scharf may have gotten the better deal in the high-stakes negotiations, clamping down on practices by PayPal that could have cut the card network out of some transactions.



27. PAUL TAUBMAN
Founder and CEO
PJT Partners
U.S.

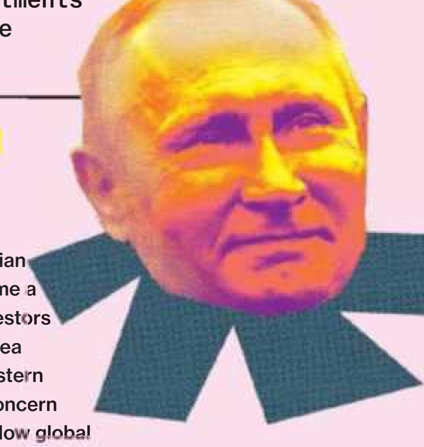
Taubman's compensation totaled $164 million in 2015, according to the Bloomberg Pay Index, making him the financial industry's highest-paid executive. To be fair, Taubman, who founded his own boutique investment bank in 2013 after years as a rainmaker at Morgan Stanley, is being compensated more like a startup entrepreneur than a bank CEO. The big payout is related to last year's spinoff of PJT Partners from Blackstone Group and is almost all in equity.

28. MARK CARNEY
Governor
Bank of England
Canada

With the Brexit vote, the Canadian economist who leads Britain's central bank suddenly had a crisis to test his mettle. So far he's cut rates and resumed the bank's bond buying. Carney has had to defend his actions before Parliament, amid criticism from some pro-Brexit Conservative politicians who say he's overreacting. "We're very much not out of ammunition," he told lawmakers in London this month, adding, "nor are we trigger-happy."

29. JOSEPH STIGLITZ
Professor
Columbia
U.S.

The Nobel prize-winning economist is a source of inspiration for young people who were part of the Occupy Wall Street effort five years ago and were with Bernie Sanders this year. But Stiglitz's ideas are also winning over more mainstream figures. Lines from a manifesto that he wrote for the Roosevelt Institute, a small think tank in New York, have worked their way into Hillary Clinton's stump speeches. The opening lines of the report, titled *Rewriting the Rules of the American Economy*, read: "Inequality is not inevitable. It is a choice we make with the rules we create to structure our economy."



30. VLADIMIR PUTIN
President
Russia

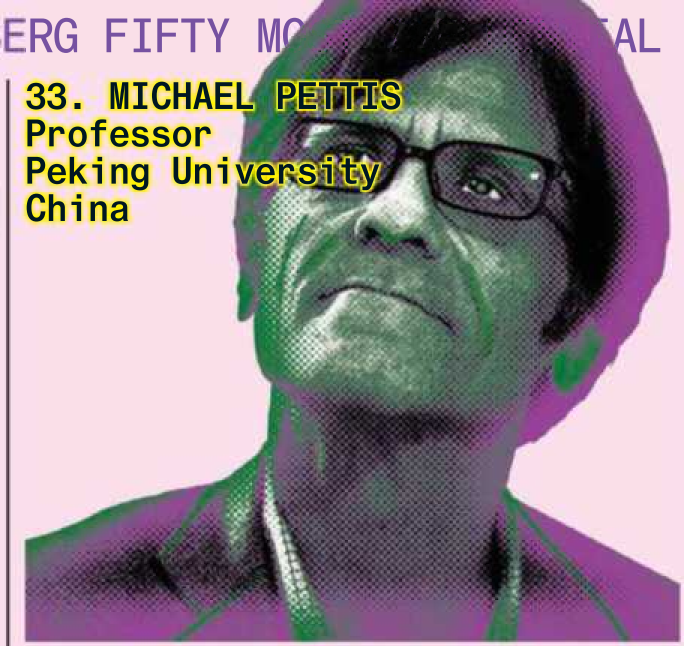
Sure, he's isolated, and the Russian economy has pretty much become a no-go for U.S. and European investors in the wake of his annexing Crimea and stirring violent conflict in eastern Ukraine. But Putin shows little concern about the effects sanctions and low global energy prices are having. In a Bloomberg interview, he cited significant new investment in Russia's oil and gas industry and the adequacy of his financial resources. "We absolutely have enough gold and foreign currency reserves," he said. And so the world waits to see what Russia's president will do next, with a bit of dread about the economic and financial turmoil he can cause—in oil markets, in the border states of eastern Europe, in the Middle East, and maybe even in the U.S. presidential election.

31. STEPHEN SCHWARZMAN
Co-founder and CEO
Blackstone Group
U.S.

Over the course of three decades, Schwarzman has built the largest manager of alternative investments—a category that includes just about anything that's not stocks, bonds, or cash—with $365 billion in assets. It's long been a heavyweight in private equity and more recently has amassed one of the world's largest real estate portfolios. Oh, and Schwarzman, already the wealthiest man in private equity, is widening the gap with his peers, taking home an estimated $734 million last year, mostly in dividends from his 20 percent stake in the company.

32. PAUL SINGER
Founder and co-CEO
Elliott Management
U.S.

His New York-based hedge fund oversees about $28 billion of assets and has delivered annualized returns of around 13.5 percent a year since 1977, often by taking activist positions or investing in distressed assets. Singer's 13-year-long campaign to get Argentina to make good on defaulted debt probably brought him more attention than anything else he's done. Last year he also shined a spotlight on the merger of two Samsung affiliates that increased family control of the group. In politics he's one of those billionaires who is courted early by Republican presidential candidates. Singer backed Marco Rubio in the race for the GOP nomination and has not jumped in with Trump since his man dropped out, preferring to spend on congressional races.



33. MICHAEL PETTIS
Professor
Peking University
China

A prolific blogger and commentator, Pettis is one of the most prescient and outspoken economists working in China today. The onetime Wall Street banker started warning that China was seeing unsustainable debt growth about a decade ago. His bearish calls seem more prophetic than ever, as rising levels of nonperforming loans stoke worries that the world's second-largest economy could be headed for a financial crisis. Pettis's influence stretches beyond markets: His music label, Maybe Mars, is helping China's underground rock bands get exposure overseas.

34. LAEL BRAINARD
Governor
U.S. Federal Reserve

Brainard, a former undersecretary for international affairs at the U.S. Department of the Treasury, has been advocating the internationalist line of thought at the Fed. Over the past year she's repeatedly called attention to the increasingly complex economic and financial linkages that bind the world's largest economies, to argue that decisions on U.S. interest rates must take into account a broader array of factors than inflationary pressures from tight labor markets at home. In a speech in June she warned that "cross-border financial transmission is likely to be amplified" as long as interest rates set by major central banks remain near zero—a point that the financial shudder caused by the Brexit vote soon confirmed. Brainard's name comes up often as a possible Treasury secretary should Clinton win the election.

35. MARC BENIOFF
Co-founder and CEO
Salesforce.com
U.S.

Benioff got on the right side of a trend when he founded his company on the principle that software was a service, not a product, and best delivered over the internet. That was in 1999, before cloud computing had become a thing. More recently he's used the economic clout of Salesforce.com to oppose state laws allowing discrimination against LGBT individuals. After Indiana enacted such a measure in March 2015, Benioff announced that Salesforce would cancel all employee programs and travel in the state. Governor Mike Pence, now Trump's running mate, backpedaled and the law was amended. Benioff continues to speak out on how companies should fight discrimination.

36. ROBERT GORDON
Professor
Northwestern University
U.S.

A Bloomberg reporter once counted up the references in the footnotes of Fed Chair Janet Yellen's speeches and found Gordon cited more than any other economist outside the central bank. Gordon has long argued that an exceptional period of U.S. growth from 1870 to 1970 resulted from one-off productivity boosts, such as the invention of the internal combustion engine and the advent of air travel. He says more recent tech innovations, such as the internet and the cell phone, probably won't have anything like the same positive effect.

37. MARGRETHE VESTAGER
European Union competition commissioner
Denmark

The daughter of two Lutheran ministers, Vestager is big on fairness, which you could argue is a prerequisite for her job. She has questioned whether DuPont's planned takeover of Dow Chemical will hurt farmers by creating monopoly power in seeds, pesticides, or fertilizers and accused Google of using its dominance in phone operating software to advance its other mobile products. The Danish lawmaker has also used competition law to argue that some of the EU's member states are illegally favoring some companies with tax deals. Last month she ordered Ireland to recoup as much as €13 billion ($14.5 billion) in back taxes from Apple.

38. RUTH PORAT
CFO
Alphabet
U.S.

Porat, formerly Morgan Stanley's chief financial officer, has been credited with bringing banker discipline to the geeks and gurus at Google. Alphabet shares have climbed more than 40 percent since Porat landed in Mountain View in May 2015, to the point where the purveyor of Android mobile software now rivals the maker of the iPhone in market capitalization. Of late, even the "moonshot" companies in the Alphabet universe—such as those focused on connected-home devices and high-speed internet service—have begun feeling Porat's gravitational pull over their budgets.

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39. MARK ZUCKERBERG
Co-founder and CEO
Facebook
U.S.

The fifth-richest man in the world (his net worth is up 22 percent this year) continues to dominate social media. His company boasts a portfolio of successful products—Instagram, Messenger, and WhatsApp—in addition to the original. And it's aced the transition to mobile, the source of 84 percent of Facebook's ad revenue. So Zuckerberg has breathing room as he tries to figure out virtual reality, for example, or react to the phenomenon of Facebook users streaming live—and sometimes disturbing—news from their phones.

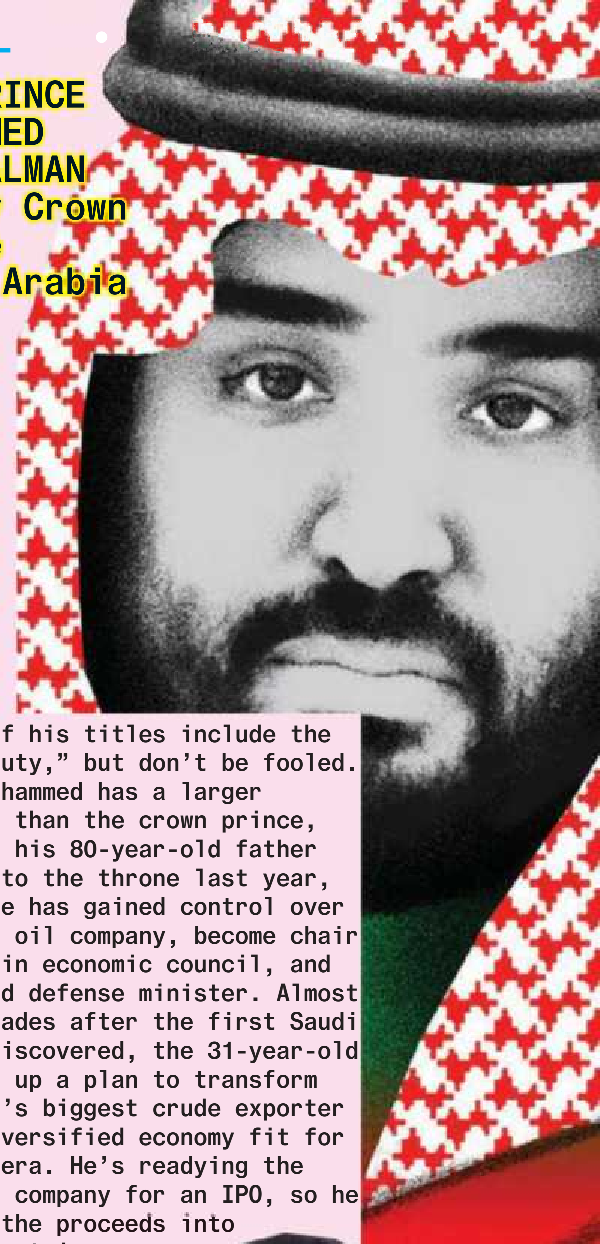
40. TRAVIS KALANICK
Co-founder and CEO
Uber
U.S.

Kalanick has raised $15 billion-plus in debt and equity, making Uber the most valuable startup ever. In addition to courting investors, he's fighting his way through legal, regulatory, and labor issues that make the technical challenges of a ridesharing network seem comparatively simple. There have been stumbles, as Kalanick's bias is to run the hurdles fast. Now he's in a rush to get driverless cars on the road.

41. JORGE PAULO LEMANN
Co-founder
3G Capital
Brazil

Lemann's canny dealmaking attracted Warren Buffett as a partner in the Heinz buyout in 2013 and the merger of Heinz with Kraft in 2015. But where the Swiss-Brazilian investor really excels is in running the companies he buys. He imposes strict discipline, he cuts costs, and he fires people. The upshot: Shares of Kraft Heinz have outperformed similar consumer stocks and the S&P 500 as a whole since the merger was completed in July 2015.

42. PRINCE MOHAMMED BIN SALMAN
Deputy Crown Prince
Saudi Arabia



Several of his titles include the word "deputy," but don't be fooled. Prince Mohammed has a larger portfolio than the crown prince, and since his 80-year-old father ascended to the throne last year, the prince has gained control over the state oil company, become chair of the main economic council, and been named defense minister. Almost eight decades after the first Saudi oil was discovered, the 31-year-old has drawn up a plan to transform the world's biggest crude exporter into a diversified economy fit for the next era. He's readying the state oil company for an IPO, so he can pump the proceeds into other industries.

43. WANG JIANLIN
Founder and chairman
Dalian Wanda Group
China

China's second-richest man, with a net worth of $33 billion, according to the Bloomberg Billionaires Index, has been a buyer throughout his career, assembling the country's largest property company. His Dalian Wanda Group is becoming a giant in entertainment as well. The owner of AMC Entertainment, already the world's largest movie theater operator, is bidding for Carmike Cinemas in the U.S. and buying Odeon & UCI Cinemas Group in the U.K. Then there are the 15 theme parks Wang plans to build by 2020 and the agreement to build a $9.5 billion culture and tourism project in northeast China.

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IT'S LIKE LEAVING
THE OFFICE EARLY
ON A FRIDAY.
AND COMING BACK
ON A WEDNESDAY.
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*Available at participating Lincoln Black Label Dealers only. **2017 MKZ equipped with available 3.0L engine and AWD. Horsepower rating achieved with 93-octane fuel.
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THE 2017 MKZ.
Work isn't going anywhere. You, however, are a different story. From the comfort of an impeccably crafted Lincoln Black Label* interior, you're now in command of more than just your schedule. A 400 horsepower,** twin-turbo engine will make sure of that.
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44. RAJ CHETTY
Professor
Stanford
U.S.

Chetty has scooped up a lot of honors early, including the prestigious John Bates Clark Medal for outstanding economists under 40 and a MacArthur Foundation genius grant. The Stanford professor has been called a pioneer for his use of large data sets to analyze social and economic questions, such as the effects of tax policy, and the impact outstanding teachers have on their students. A Bloomberg analysis found that winners of the Clark prize have a 1-in-3 chance of eventually winning the Nobel Prize in economics, so it's highly likely Chetty will continue collecting medals.

45. KEN MOELIS
Founder and CEO
Moelis & Co.
U.S.

Moelis likes to say that because it's smaller and more focused than its rivals, this boutique investment bank can better play the role of "trusted adviser"—a phrase that hints at some of the conflicts of interest that bedevil bigger companies. Turmoil in banking has guaranteed that a steady stream of talent is available as the almost 10-year-old company bulks up. Its shares have outperformed the likes of Goldman Sachs and Lazard in the past year. Plus, Moelis is on the short list of boutiques that may be tapped to help manage the mega-IPO of Aramco, Saudi Arabia's oil monopoly.

46. BLYTHE MASTERS
CEO
Digital Asset Holdings
U.S.

The idea behind Masters's fintech startup is that blockchain, the software that makes bitcoin possible, is ideal for executing and settling financial transactions. The Australian Securities Exchange has signed on to work with Digital Asset Holdings to replace its settlement system. Masters, a pioneer in derivatives during a long career at JPMorgan Chase, is attracting high-powered talent from large banks to build her team.

47. MARY BARRA
CEO
General Motors
U.S.

In her three years on the job, Barra has presided over a sales and profit rebound. In July, GM reported record second-quarter earnings. And her new products include an electric car with Tesla-like range. Investors remain skeptical, amid rising concern that global vehicle sales may be softening. GM shares are below where they were when Barra became CEO.

48. JIM COULTER
Co-founder and co-CEO
TPG Holdings
U.S.

With co-founder David Bonderman having relinquished some of his duties in 2014, Coulter is the key player at TPG. Recent investments in Uber, Airbnb, and Spotify look more like venture capital than private equity. This year, TPG raised a $10.5 billion fund, its first since before the financial system crackup in 2008.

49. LARRY SUMMERS
Professor
Harvard
U.S.

The phrase "secular stagnation" dates to the 1930s, but the reason we're talking about it today has a lot to do with Summers. The Harvard economist, who was secretary of the Treasury under Bill Clinton and an economic adviser to President Obama, sees tepid growth ahead and argues that stimulative fiscal policy is more likely to help than additional monetary medicine.

50. JOHN OLIVER
Host
Last Week Tonight With John Oliver
U.S.

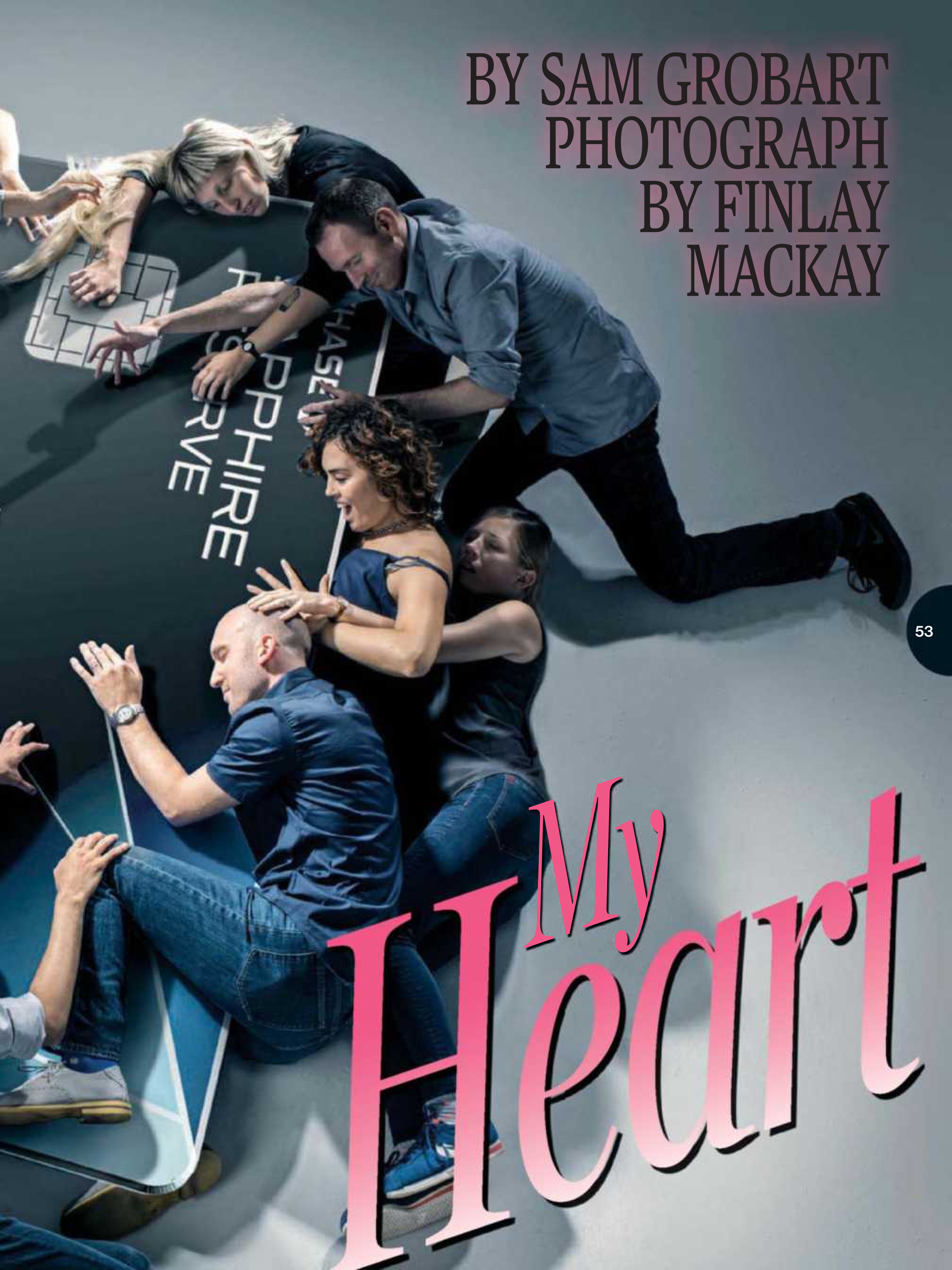
His sweet spot as a comedian is the manic explanation of complex financial matters, delivered with outrage and interspersed with hilarious digressions. This year, in his third season on HBO, Oliver covered topics as arcane as subprime auto lending, special borrowing by governmental districts, and credit reporting standards. His segment on Puerto Rico's debt debacle has racked up more than 5 million views on YouTube.

END OF SPECIAL SECTION!

PHOTOGRAPHS: BLOOMBERG (2); GENERAL MOTORS (1); GETTY IMAGES (2); STANFORD UNIVERSITY (1).
ILLUSTRATIONS BY STEPHANIE DAVIDSON, BRAULIO AMADO, NEJC PRAH

You Swiped

HOW CHASE TURNED A CREDIT CARD INTO AN OBSESSION



My Heart

BY SAM GROBART
PHOTOGRAPH BY FINLAY MACKAY

Somewhere in the middle of Ohio there's a nondescript office park, the kind you could drive by for years and never really notice. One of the buildings in that park is basically windowless; you might mistake it for a warehouse or, if you were feeling exotic, a data center. The only thing that's remarkable about the structure, signaling there's something of great value inside, is an imposing floor-to-ceiling metal turnstile in a guarded vestibule.

This building is a modern-day mint. It's where JPMorgan Chase, the largest issuer of credit cards in the U.S., manufactures around 60 percent of the 95 million cards it issues each year. The company requires visitors to keep its exact location secret. For more than 15 years, the facility has hummed along, embossing numbers onto plastic cards and stuffing them into envelopes. During that time, only three things have really disrupted BAU, Chase-ese for "business as usual": the Target data breach of 2014, which required the factory to quickly reissue millions of cards; the industrywide 2015 switch from magnetic-stripe cards to ones that include microchips; and in August the frenzied demand for the company's newest offering—the Chase Sapphire Reserve.

Ned Lindsey, Chase's managing director of customer fulfillment, runs the Ohio plant and a sister facility in Texas. On Aug. 24, Lindsey noticed something strange—card requests were coming in at an extremely high rate, all for the Reserve. "We were seeing demand that was eight- to tenfold more than what we expected," he says. Lindsey, it seems, doesn't read credit card blogs. Since July, a fever had been building on social media among points-and-miles obsessives aware that Chase was preparing a premium card—one that would sit above its already-popular Sapphire Preferred, and offer rewards to match. Almost a month before Chase introduced Reserve, the community discovered the card's perks through some leaked information: a sign-up bonus of 100,000 points, triple points on travel and dining, airport lounge memberships, and credits that offset a $450 annual fee, among other goodies. Of course, like its Sapphire Preferred brethren, the card would have a weighty metal core that creates what is known in the trade as "plunk factor." Plasticheads got the vapors. "When I first heard the details," wrote Brian Kelly, aka The Points Guy, probably the most influential card blogger, "I had to sit down, because it sounded way too good to be true." The Sapphire Reserve, wrote another, Ben Schlappig, is "beyond a no-brainer, possibly the most compelling card we've ever seen." On Reddit, a user shared that Chase had accidentally published a Reserve application link, and thousands of applications poured in before the page was deactivated. By the official launch date of Aug. 23, anticipation had built to the point that the Chase site was bumrushed by a horde of deal-seekers.

"I had to sit down, becau

In Ohio, Lindsey brought in extra staff and added shifts. "We had to have a backup plan to the backup plan," he says. The plant ran hot for about three weeks. During that time, Chase burned through its inventory of metal cards—a stock that was supposed to last 10 to 12 months. (The company declined to say how many Preferred or Reserve cards it's issued.) To continue to sate the appetite for the Sapphire Reserve, Chase had to switch to standard plastic cards as placeholders. The bank says it's now sent out as many plastic cards as metal—two years' worth of cards, gone in less than a month.

When the first cards were shipped, some customers posted "unboxing" videos on YouTube, reverently exhibiting terms-and-conditions pamphlets to the camera. The videos have garnered more than 60,000 views; the Reddit thread has 10,000 comments. The hype usually reserved for a new iPhone was now being applied to a high-interest line of credit. And until mid-September, Chase hadn't spent a dime on advertising.

Chase is not the first issuer to offer a big-annual-fee-but-mucho-points card. American Express and Citibank have been playing in that part of the market for years. But Chase has entered at the right time—when a growing community of enthusiasts will do the company's marketing online for free—and with the right card, one that assiduously checks every box the modern credit card deal-hunter cares about. None of this happened by accident. The process to create new credit cards is little different from the research Procter & Gamble does to develop a new laundry detergent or Honda does to develop a new crossover SUV. A credit card is a means of payment and the extension of a loan, but it's also a collection of perks and points that confer experiences and status upon its user, as well as an object people typically touch several times a day. In a country with more than half a billion credit cards already in circulation, it's not a given that any new combination of attributes will work.

Chase had already learned a thing or two about how to make a card more than a card. The Sapphire Preferred, introduced in 2009 with a $95 annual fee, was the reigning "It card" before Reserve came along. One especially devoted cardholder is Bryan Denman, a 35-year-old New York creative director, who has taken advantage of Preferred's perks to treat his girlfriend to Chase-sponsored private dinners at the restaurants Craft, Rebelle, and Le Bernardin, as well as to get good seats at venues like Madison Square Garden. Denman recognizes that loyalty to a credit card is unusual. "Everyone's brought up to distrust their credit card company," he says. "You don't want to be on the phone with them; why would you want to spend the night with them?" But his experiences with Chase have conferred upon Denman the zeal of a convert. "I am a complete fanboy," he says. "I'm

TRIPLING DOWN ON BONUSES

	American Express Platinum	Chase Sapphire Reserve	Citi Prestige
Annual fee	$450	$450	$450
Annual travel credit	$200	$300	$250
Points bonus	None	3x on travel and dining	3x on travel, 2x on dining
Sign-up bonus	40,000 points (after $3,000 in purchases in the first three months)	100,000 points (after $4,000 in purchases in the first three months)	40,000 points (after $4,000 in purchases in the first three months)

PREVIOUS SPREAD: PHOTO ILLUSTRATION BY JUSTIN METZ se it sounded way too good to be true”

telling everyone to get this card.” He's not alone. “When I go to dinner, there might be three cards that get thrown down. They're all Chase Sapphire.”

At Chase, finding the Bryan Denmans of the marketplace is a task led by Gordon Smith. When he's not restoring classic sports cars—like a 1969 Jaguar E-Type from England, where he grew up—he's in charge of the company's card and consumer-banking divisions. Having previously headed up the U.S. card business for American Express, Smith joined Chase in 2007. When he got there, he saw that the bank's card business was little more than a consumer-finance operation. In that context, he says, “a customer doesn't think about themselves really as having the credit card. They think about themselves as having the loan.” This wasn't where Smith wanted his credit card division to be. A card that people think of as only a loan is not a card customers have a relationship with, much less a card they want to use all the time. “They could keep the card itself in a shoebox, not necessarily in their wallet,” says Smith.

At the same time, the marketplace was going through an upheaval. The financial crisis led banks to step back from offering plastic to anyone with a pulse, and many Americans drastically cut their credit card bills. The Credit Card Accountability Responsibility and Disclosure (CARD) Act of 2009 placed numerous restrictions on how issuers could penalize or otherwise dun their members for exorbitant fees, erasing billions from the low end of the market. Cards for more affluent consumers were a safer bet.

The right kind of card in this environment would have to be, as they say in the credit card industry, “top of wallet”—something you use frequently as your preferred method of payment. The reason has to do with the fact that card issuers can make money in two ways: interest and fees or interchange. The recession and the CARD Act made the interest-and-fees strategy a much harder proposition. “It was clear that revolving-credit cards were not going to be the moneymaker they once were,” says David Robertson, the publisher of the *Nilson Report*, an industry newsletter.

Interchange became the way to go. Someone who uses his card all day, every day, for everything from a cup of Starbucks to a new Rolex Submariner, is allowing his issuer to collect a small fee on every transaction. That fee—the interchange—is higher for premium cards such as Chase's Sapphires. The fee is higher still when the card is used at a luxury retailer, which is more likely with a high-end card. And since the fee is something charged to the merchant, not the shopper, it saves banks from incurring more consumer wrath.

For all these reasons, Chase decided to pursue a premium strategy. But a premium credit card would have to be something different in 2009 than when they first came about in the 1980s and '90s. That market was effectively established and defined by American Express, which had launched cards like the Platinum in 1984 and the black Centurion card in 1999. Its top-shelf cards came with hefty annual fees ($450 and $2,500, respectively) but also a complement of perks and services that, it was suggested, could almost change the laws of nature to meet your needs. Dedicated concierges could secure last-minute reservations at popular restaurants; Centurion cardholders could be greeted at international airports and whisked through customs and immigration.

In the throes of the Great Recession, Chase judged that luxury would have to be cloaked in understated virtue, not sybaritic excess. The modern affluent customer was more Joni Mitchell than Joan Collins: more casual, more discreet—millionaires with minivans. To attract that kind of customer, a new credit card would have to offer a sense of being a sound financial choice. One way for Chase to do that would be to lower the annual fee from hundreds of dollars to $95. “When you look at where you're going to price something, on a per-unit basis it can be very profitable obviously with a high price, but you're going to find a much smaller group of people who will find the product attractive,” says Chase's Smith. “How do we price it in such a way that it would be economically viable for us, but the customer will look at it and say, ‘You know what? I have to pay a fee, but that's good value.’ ”

That value can also be emphasized by a robust rewards program. The dirty little open secret of those older elite cards was that, for all their swagger and status, they were actually pretty lousy at rewarding their users. “With the American Express Platinum, you get one point per dollar on all purchases other than travel purchases from American Express's travel agent,” says Jason Steele, a writer for CompareCards.com. “Yet with less expensive annual fees, there are cards that could get two times or three times for every dollar you spend.”

Keeping track of miles and points used to be the domain of road-warrior obsessives, who could debate the relative merits of rewards programs with Talmudic specificity, but collecting and using rewards has gotten decidedly more mainstream. Credit card review sites—many of which earn commissions on driving leads to issuers' websites—act like an accelerant when a new card catches fire. They rank high in Google searches and dominate discussion boards. ThePointsGuy, the site Kelly runs, now has close to 3 million unique visitors every month, which makes it about as heavily trafficked as Bleacher Report, the popular sports site.

Many points-granting cards rely on a complex system of rotating bonus categories. The Citi Dividend card, for example, gives 5 percent cash back on Hilton hotel rooms and car rentals in the current quarter; in October, the offer shifts to Best Buy and department store purchases. With Sapphire, Chase opted for simplicity. “What these customers tell us,” says Pam Codispoti, the president of Chase's branded cards division, “is that rewards matter, but while we want them to be very valuable, we actually don't want to do a whole lot of work to understand the rules and regulations around them."

Chase introduced the Sapphire Preferred card in 2009 with double points in two large categories: dining and travel. The card also allowed users to transfer their points to a broad range of frequent-flier programs (at the cost of undercutting its existing range of co-branded cards with United Airlines). The moderate fee, generous points, and partner network got the Sapphire Preferred noticed, and as consumer spending began to rebound after the recession, it came to be regularly cited on card-enthusiast sites as one of the all-around best.

> **"The weight raises customers' dopamine levels," McQuay says of the metal card**

Chase's emphasis on value dovetails with the psychology of what the company refers to as the "new affluent": a segment of the population that is well-to-do but still in its prime earning years. For them, it's more important to be savvy than fancy. More Kirkland vodka from Costco, less Stolichnaya Elit. "You feel smart with this card," says Kelly, describing the image of the first Sapphire card. "You're 'in the know.' You're not flashy."

The design of Chase's Sapphire Preferred card, which has now been extended to the Reserve, has been a surprisingly powerful asset. Sapphire cards are nearly featureless on the front, with little more than a chip, the cardholder's name, and some discreet branding. The numbers are flush on the back, but what always gets remarked upon is the card's weight. With a metal core sandwiched between two pieces of plastic, the Sapphire Preferred has noticeably more heft than a regular, all-plastic card. Chase won't say what materials are used, but Lindsey, the plant director, says the form factor costs "5 to 10 times as much as a standard card"; chip-enabled cards cost around $2 to make.

"I have the Chase Sapphire Preferred, and virtually nothing gives me more pleasure when I pay and the cashier notices how gorgeous that card is," says Sean McQuay, the credit card expert at NerdWallet, a personal-finance site. (He has since gotten a Reserve; "the sign-up bonus was too good to ignore," he says.) "Chase has basically realized that the weight raises customers' dopamine levels. Being able to get into my brain every single time I swipe my card—there's literally nothing better a marketer could want." Chase's neurotransmitter strategy has had a positive effect on its bottom line: In 2007, the bank's card-services division reported net income of $2.9 billion; in 2015, that figure was $3.9 billion.

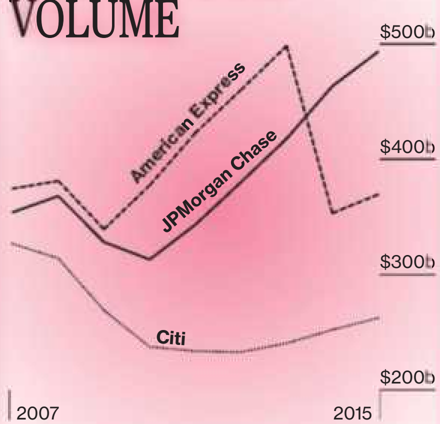
As the Sapphire Preferred became a success, Smith assembled new teams at Chase to determine what kind of card would appeal to an even wealthier slice of consumers. The market seemed ready: Both Citi and Amex had cut some perks from their high-end cards, such as airport-lounge access and free rounds of golf, disappointing some cardholders. Perhaps they'd be interested in a new card?

From the beginning, though, it was clear that the new, upmarket card would share the Sapphire name, which was a new step for the company. "What Chase had done largely before is come out with completely new names" for new cards, says Smith. "So all that brand equity that you built up was effectively gone." With Sapphire, Smith is trying to develop a platform. Always the car enthusiast, he thinks of Sapphire Preferred as Chase's BMW 3 Series, and the Sapphire Reserve as the larger, more luxurious 5 Series. "We wanted Sapphire to stand for the things that it always stood for but give us the space to keep growing and evolving it," he says, "so that the brand name of Sapphire would still resonate with customers and stay relevant."

Smith knows enough about cars to know that above the BMW 3 Series and 5 Series is the flagship 7 Series. While Chase hasn't said whether it intends to move even further upmarket, it would not be at all surprising if the bank followed Sapphire Preferred and Reserve with, say, Sapphire Premier. That would be a pure play to the affluent, no "mass" required. Already, competitors such as Barclays have launched new cards like the Gold Luxury Card, which comes with a $1,000 annual fee but is actually less rewarding than the Sapphire Reserve. At the top of the heap is American Express's Centurion, which commands exorbitant fees ($7,500 as an initiation fee, followed by a $2,500 annual fee) for those lucky enough to be invited to join. If Reserve sustains its momentum, a move into more rarefied incomes may be next. "I think a number of issuers think that Amex is ready to be run down," says the *Nilson Report*'s Robertson.

Fortunately for Chase, it's getting new cardholders while they're young—to a surprising degree. When it was originally conceived, Reserve was expected to attract a slightly older customer, but Chase says the majority of applicants have been millennials. Kelly thinks Sapphire has transcended the surly bonds of personal finance. "They've built a lifestyle brand out of it," he says. Perhaps that's Chase's greatest accomplishment: It has managed to make Sapphire a modern, desirable credit card for people who would otherwise not care about their credit card. "They've managed to take something from being a stupid card you carry in your wallet," says Denman, "to a part of your identity, like the clothes you wear." —*With Ben Steverman*

U.S. CREDIT AND CHARGE CARD VOLUME



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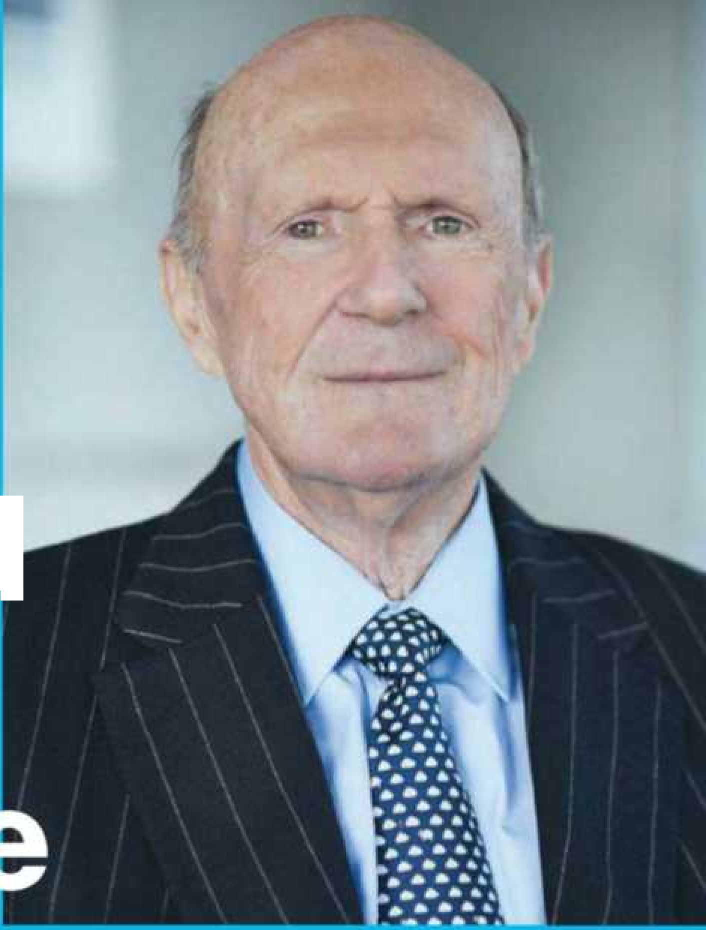
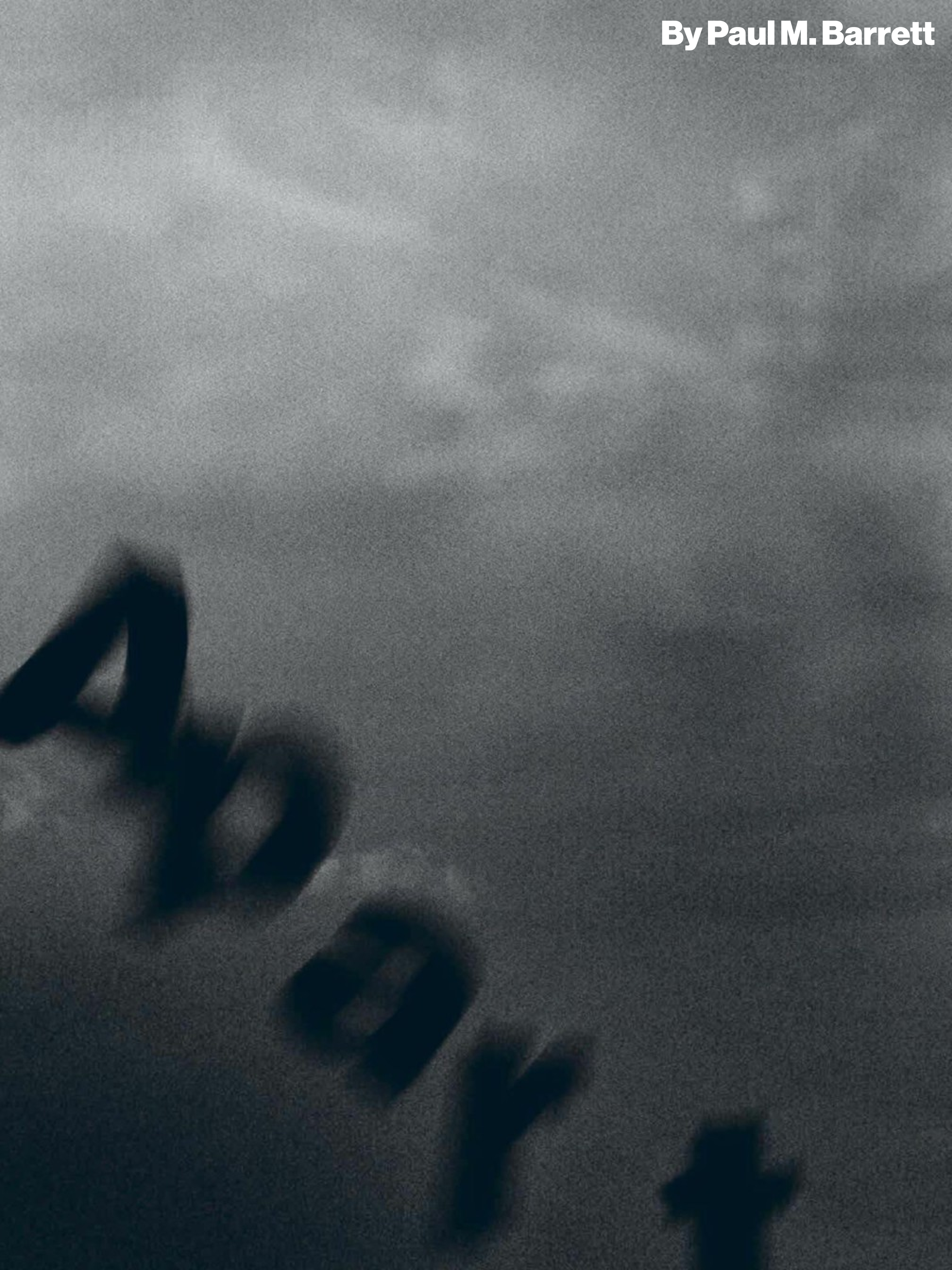


Sea Dragon and Super Stallion helicopters keep killing U.S. troops in fiery crashes. An investigation into a tragic consequence of the U.S. government budget sequester

By Paul M. Barrett



On the frigid morning of Jan. 8, 2014, an MH-53E Sea Dragon helicopter, call sign Vulcan 543, rose from the tarmac at Naval Station Norfolk, its two massive rotors biting the cold air as it left on a training mission over the slate-gray Atlantic. The largest, most powerful chopper in the Pentagon's fleet, the Sea Dragon transports personnel and supplies and performs minesweeping operations. Its three turboshaft engines allow it to drag mine-detection gear the size of a Humvee through ocean waves.

Lieutenant J Wesley Van Dorn piloted Vulcan 543. He and his co-pilot, Lieutenant Sean Snyder, were joined in Virginia that morning by a crew of three, including Petty Officer Second Class Dylan Boone. A day earlier, the aircraft hadn't been cleared to fly, because its instruments had frozen solid after it was left outdoors. Vulcan 543 had spent the night defrosting in a hangar. The air was still frigid when the men climbed aboard, with wind chill pushing temperatures down into the single digits, and their breath steaming inside the cockpit. When the crew turned on the cabin heater, Boone recalls, it began "spitting out small fireballs." Unfazed, they fiddled with the device and got it cranking. Crew members tended to have a fatalistic view of the 53E. "Eventually the horse will have to be taken out and shot," Boone says. Meanwhile, he adds, "you are constantly making things work for you because you [have] to get those flight hours in."

About an hour into the training flight, a much larger fireball erupted behind the co-pilot's seat. "There were flames everywhere," Boone says. "The smoke was debilitating. In 8 to 10 seconds, we were in the water." The pilots didn't even have time to radio for help.

Boone was knocked unconscious by the impact, and came to underwater. Much of his scalp had been sheared off, and he was suffering from other injuries as well, but he managed to swim to the surface, where he clung to some wreckage until he was plucked from the sea about 30 minutes later and taken to a hospital by another helicopter, along with Van Dorn and a third airman. Snyder and another crew member had died in the crash. Later that day, Van Dorn, who had suffered multiple severe injuries, passed away, too.

Navy investigators later attributed the fire to a bundle of old electrical wires that had rubbed against a fuel line, causing it to spring a leak. According to Navy statistics, it was the 18th noncombat disaster involving loss of life or at least $2 million in damage that the Sea Dragon had been involved in since it was introduced in the mid-1980s. The helicopter's rate of 6.35 major failures per 100,000 flight hours is about three times the overall naval aviation average. "The aircraft has a poor safety record for crashes and other mishaps," concedes Captain Pat Everly, the immediate past commander of the three 53E squadrons based at Naval Station Norfolk. Recent mechanical upgrades and additional support personnel have remedied the shortcomings, he says, adding, "It's a challenge" to keep 53Es in shape to fly, "but once they're in the air, they're safe."

There are reasons to be skeptical of such claims, not least that a nearly identical helicopter flown by the Marine Corps, the CH-53E Super Stallion, has suffered setbacks as well. In June 2015 an internal review found that the inventory of Super Stallions was "astonishingly depleted" in numerical terms and in an "appalling state of readiness." On Jan. 11 the officer in charge of a 53E squadron based in Hawaii was relieved of his command, in part because mechanical problems were limiting flight hours. Three days later, two Super Stallions collided off the Hawaii coast during a nighttime training mission, killing all 12 Marines aboard. The cause of the crash is still under investigation.

No longer in production, the 53E heavy-lift helicopters are a case study of the broader fatigue affecting the U.S. military's air fleet. After two post-Sept. 11 wars and recent Pentagon belt-tightening, the Sea Dragon and Super Stallion are "worn out and in need of replacement," says Todd Harrison, a defense analyst at the Center for Strategic and International Studies, a Washington think tank. But Sea Dragons are scheduled to continue to fly until at least 2025, and Super Stallions until at least 2029. The obvious question is why.

At 100 feet long and 30 feet tall, the 53E's bulk is immediately impressive. The aircraft are the only helicopters in the Pentagon's fleet with enough muscle to hoist a 26,000-pound armored vehicle or pick up and carry nearly every aircraft in the Marine Corps' inventory. On the ground, as the 53E's rotors speed up, it's hard to doubt this. The vibrations are gut-rattling. Once aloft on a calm morning, however, the beast moves with surprising smoothness. During my command-approved fly-along, the two pilots and two aircrew are the picture of brisk competence. The cabin's innards—its tangles of wires and fuel lines—are fully exposed, rather than hidden behind panels as they would be in a commercial aircraft. Every metal surface is slick and grimy. Small drops of hydraulic fluid leak from a spot on the ceiling. Asked about this, an aircrew member just shrugs.

The 53E has a 620-mile range, a top speed of 200 miles an

PREVIOUS SPREAD: PHOTO ILLUSTRATION BY 731; GETTY IMAGES (1); U.S. NAVY (1); THIS SPREAD: FROM TOP: COURTESY U.S. NAVY; COURTESY U.S. MARINE CORPS

Marines use a CH-53E Super Stallion to lift a Humvee during an exercise at California's C

"We're Marines. We know we put our lives at risk. That's the job. But you don't want to do it unnecessarily"

Van Dorn saw his job as more "family-friendly"

hour, and can be refueled in flight. Its manufacturer, Sikorsky Aircraft, has made helicopters since the 1940s, including the SH-60 Seahawk, the UH-60 Black Hawk, and the green-painted presidential helicopters designated Marine One. (The company was acquired by Lockheed Martin last year for $9 billion.) The Marine Corps began acquiring Super Stallions in 1981 to move equipment and troops—up to 55 soldiers at a time. The Navy followed suit five years later. During the first Gulf War, in 1991, Navy 53Es found and destroyed undersea mines; more recently, they've been deployed to deter Iran from mining the Strait of Hormuz, a vital Middle Eastern oil-shipping channel. The Marine variant helped establish the first U.S. land base, Camp Rhino, during the post-Sept. 11 invasion of Afghanistan and served long, rugged duty in that country and in Iraq.

The Navy has 28 Sea Dragons; the Marines, 147 Super Stallions. "It's a really good design," says Lieutenant General Jon Davis, the Marine Corps deputy commandant for aviation.

That design, however, is dated. Pilots describe the 53E cockpit as "steam gauge" because many of its instruments are vintage analog, as opposed to digital. And over the years, a variety of mechanical flaws have surfaced. Faulty bearings at the base of the main rotor were linked to crashes that killed four Sikorsky test crew members in 1996 and four sailors in 2000. The Pentagon replaced the problematic bearings in all 53E aircraft and installed temperature- and vibration-monitoring equipment to warn pilots if friction was building dangerously. In 2001, Kaydon, the Michigan-based company that had supplied the original bearings, admitted in a federal court settlement with the Department of Justice that its employees had falsified inspection records, although it denied liability for the crashes.

hocolate Mountain Aerial Gunnery Range in 2015

Davis acknowledges that with complicated weapon systems, "you episodically see something [like the bearings flaw] that pops up. They shouldn't happen, but they do occasionally. And we fix it."

But other alleged problems cropped up. Four sailors died in a separate fire and crash in 2003 in Southern Italy. Relatives of the dead sued Sikorsky two years later, alleging a recurring problem of hazardous exhaust backflow in the 53E No. 2 engine. Sikorsky denied liability but settled confidentially out of court. As a remedy, the Pentagon improved overheating-alert systems and fire-resistant fuel lines. Caroline Dennis, a Sikorsky spokeswoman, says via e-mail that the company doesn't comment on past or pending litigation, but adds, "We stand behind the products and will continue to work with our customers to provide safe, reliable helicopters to the U.S. military."

The Pentagon brass has been planning for the Sea Dragon's retirement since at least the late 1990s, but a proposed "sunset date" of 2005 kept getting pushed back. Smaller helicopters can't safely tow bulky antimine gear, and mine-tracking robots designed to be launched from new Navy vessels have so far proved ineffective. "The Navy decided to keep the 53Es but didn't reinvest in the community" that flies and supports them, says Commander Mike Kafka, a Navy spokesman. "The community, it's fair to say, suffered some degradation."

Van Dorn, the pilot who died in the 2014 training mission out of Naval Station Norfolk, grew up in Greensboro, N.C. He'd hoped to become a Navy SEAL after graduating in 2007 from the U.S. Naval Academy, but he didn't complete the special-operation force's notoriously demanding training program. Reevaluating his priorities, he chose to fly 53Es because he saw the job as "family-friendly," says his widow, Nicole. Sea Dragon pilots deploy relatively infrequently to Asia and the Middle East, and the work hours at the 53E squadrons based in Norfolk are considered civilized.

When he arrived at Norfolk in 2010, Van Dorn discovered that part of the reason for the low-key environment was that a lot of crucial work wasn't getting done. "Our maintenance departments do not have the bodies or knowledge required to keep our aircraft and [antimine] gear operating properly," he observed in a handwritten note from 2012 that Nicole had typed up and stored on the family laptop. "Instead of admitting there is a problem," he added, "skipper after skipper has continued to fudge numbers because they didn't want to be the whistleblower." Laxity characterized his squadron. He felt that training missions weren't adequately preparing crew for the battlefield: "Guns in the windows? Body armor for the pilots and air crewmen? I've never even seen this equipment, let alone used it when flying."

Events that summer confirmed Van Dorn's prescience. There were three Sea Dragon crashes, one of which, in Oman, led to two deaths. In response, Navy brass removed a Norfolk squadron commander for failure "to strictly enforce appropriate operational, maintenance, and safety standards." Speaking to the *Virginian-Pilot* newspaper, Todd Flannery, the captain who took over supervision of the Norfolk 53E units, attributed the crashes to "an atrophy over a long period of time," adding: "It was a failure of leadership. It was a failure of maintenance. It was a failure of operations."

Around the time of the crashes, Van Dorn was flying 53E training missions in South Korea, and things weren't running right. Mechanical breakdowns limited flight time. Continually short of spare parts, ground crews had to cannibalize from non-operational aircraft called hangar queens. "I want to get flying," Van Dorn texted to his wife, "but I also need to fix maintenance so I don't die while flying."

"Let's focus on the not dying," Nicole typed back. She was at home in Virginia Beach, looking after their infant son and expecting a second child. "You're the best diaper changer I know," she told him.

Eighteen months later, Van Dorn was dead. He was 29 years old. "What's so hard to deal with, still," says Nicole, "is that Wes saw the maintenance and morale issues, but they ended up leading to his death anyway."

The Navy investigators who found that wiring near the front of the cabin chafed against an internal fuel line went on to conclude that the friction caused an electrical charge to ignite pressurized fuel mist escaping from the damaged line. The Navy conceded that none of its routine inspection protocols specifically obliged maintenance crews to scrutinize electrical wiring for dangerous proximity to fuel lines. "We never imagined this issue," Petty Officer Boone says. "We never looked for it."

This kind of chafing posed a potential danger in all Sea Dragons, the investigators found. Worse, they concluded, "the discovery of this defect is a leading indicator that other age-related discrepancies that could lead to loss of aircraft and crew in the future may be present."

Suing the government over military accidents is generally difficult. In December 2015, Boone, Nicole Van Dorn, and the wives of the two other men killed in the crash sued Sikorsky for installing defective electrical wiring. However, the Navy's inattention to the gear and description of the chafing problem as "age related" appear to make the lawsuit a long shot. (Sikorsky's Dennis declines to comment on the suit.)

In the wake of its findings in the 2014 crash, the Navy vowed, again, to make its heavy-lift helicopters safe to fly. Almost exactly a year later, however, a Sea Dragon suffered an ominously similar incident over the Arabian Sea. Two sets of wiring that were rubbing against each other had worn down their protective coatings, causing an onboard generator to short out. The aircraft was forced to make an emergency landing in Kuwait; there were no injuries.

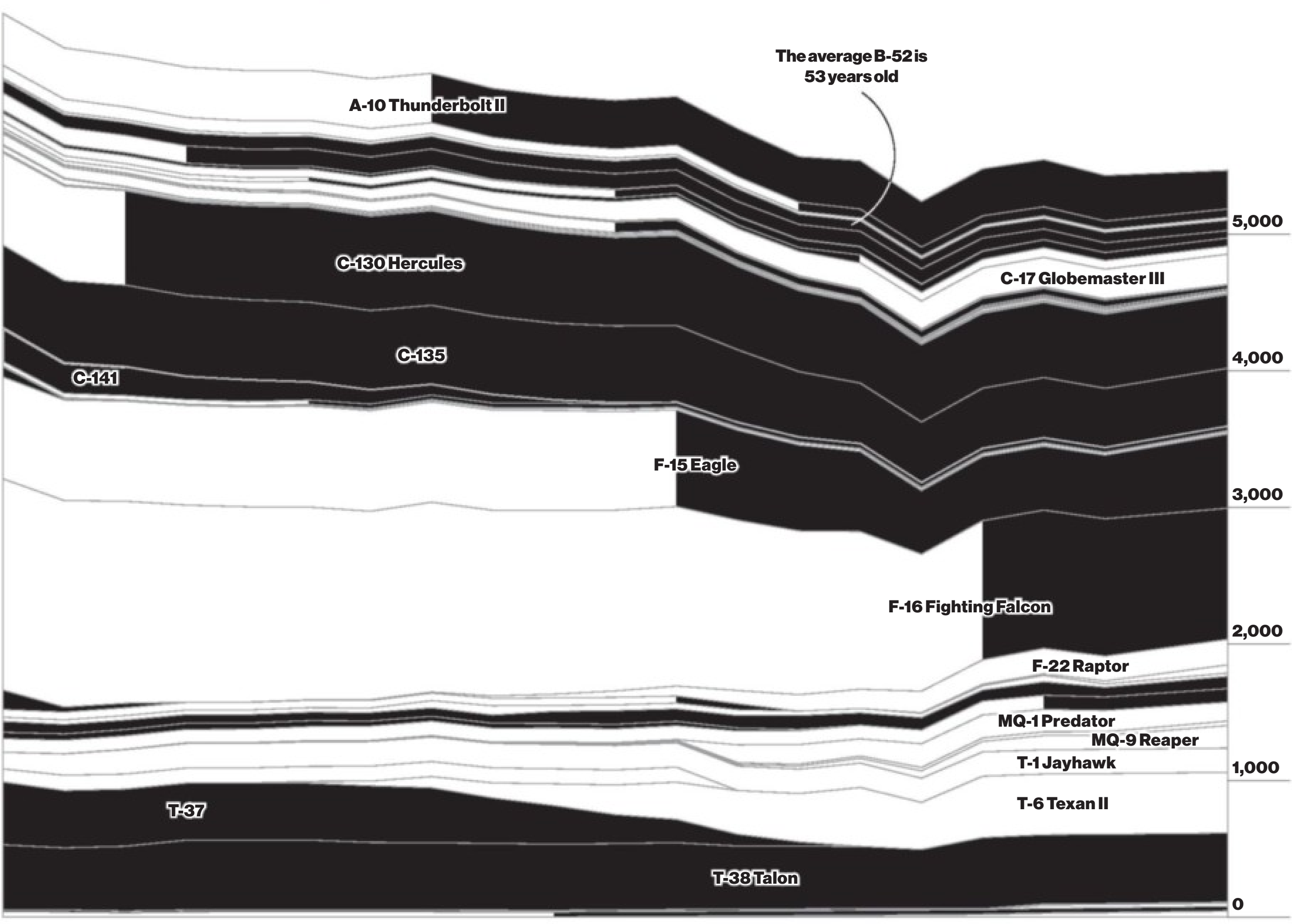
Despite the supposed high-priority initiative to repair wiring in all 53Es, the job didn't get done correctly. Spot checks of Marine helicopters revealed that maintenance crews hadn't spent nearly enough time to remedy fire dangers. A Jan. 28, 2015, internal Marine Corps PowerPoint presentation—first reported by the *Virginian-Pilot*—said that 70 percent of Super Stallions that had been checked still presented the kinds of perils that killed Van Dorn and his colleagues. "The risk of cabin fire was not mitigated, and the hazard of chafing on fluid-carrying lines and wires was not eliminated," the presentation concluded.

The Navy and Marine Corps say that these failures have now been addressed. "Not all of the maintainers had acted with the necessary urgency, so a new bulletin was issued making clear

The U.S. Air Force Is Also Going Gray

Like some of the 53E helicopters used by the Navy and Marines, much of the Air Force fleet is older than its pilots.

Average age of aircraft: □ 1 to 20 years ■ 21 years or more



DATA: AIR FORCE MAGAZINE ALMANAC

"What's so hard to deal with, still, is that Wes saw the maintenance and morale issues, but they ended up leading to his death anyway"

what had to happen," says Kafka, the Navy spokesman.

James Skelton, a Marine 53E pilot who retired in 2014, places responsibility higher up the chain of command than mechanics and other maintainers. "Among the commanding officers, there's a visceral reaction to this kind of warning: deny it, avoid it," he says. "We're Marines. We know we put our lives at risk. That's the job. But you don't want to do it unnecessarily."

In July 2014, not long before he retired, Skelton circulated a letter to senior aviation officers at his base in New River, N.C. "The legitimate concerns of key leaders within the maintenance department are being disregarded," he wrote. "It is imperative that we not only address the material condition of multiple aircraft on the flight line, but that we also address the maintenance culture of the squadron."

The reaction? "It was rejected summarily," Skelton says. "The COs don't want to hear that kind of thing."

Asked for comment, Captain Sarah Burns, a Marine Corps spokeswoman, says: "Our objective is not to discredit James Skelton or the motivation behind the letter. The issues and discussion took place in regards to deployment issues, and they were resolved amicably and professionally then."

Davis says that as a general matter, such concerns did reach his ears, prompting him to commission a self-assessment called the Super Stallion Independent Readiness Review. Carried out with the assistance of the consulting firm Booz Allen Hamilton and released in June 2015, the review reinforced Skelton's scathing critique. It was this report that found the fleet to be in "an appalling state of readiness."

In support of this conclusion, the report's authors observed that only 27 percent of Super Stallions were "mission capable," compared with 71 percent of the Army's comparable Boeing Chinook heavy-lift transport helicopters. They also noted that, as Super Stallions were "reset" upon return from the Middle East, the Marine Corps allotted only 935 man-hours of maintenance and $100,000 to each aircraft. The Army, by contrast, invested 6,000 man-hours and $1.2 million in each of its helicopters.

With so many 53Es grounded for repairs, pilots lose valuable experience. "Poor CH-53E availability is costing the Marine Corps an entire generation of aircrew and contributing to the destruction of community morale," the review found. "Verified anecdotes are rampant of pilots returning from six-month deployments with 30 total flight hours"—a small fraction of what they should be logging.

"If pilots aren't getting their hours because older aircraft are stuck in maintenance, that's going to lead directly to mishaps," says Christopher Harmer, a former Navy pilot who flew the SH-60 Seahawk search-and-rescue helicopter and now is an analyst with the Institute for the Study of War. "Is that going on with the 53E? I think that's very likely."

"I don't think our young Marines [flying the 53E] were set up for success," says Lieutenant General Davis. During an hourlong interview in a Pentagon office decorated with model planes and photos of Davis with comrades from a 36-year career in military aviation, the Marine deputy commandant for aviation speaks in a blunt, almost confessional manner. "This is not a good-news story," he says. "I am being straight up with you."

On the day we speak, a cover story in *Stars & Stripes* questioning Marine readiness across the board is being displayed on news racks in the Pentagon food court. The article includes a quote from testimony given by another top Marine general before the Senate Armed Services Committee: "We are concerned about an increasing number of aircraft mishaps and accidents."

Davis doesn't dispute any of it. He recounts a humanitarian mission in April 2015 to help earthquake victims in Nepal. "We didn't take the 53Es," he says, "because the 53Es were broken." Helicopters with smaller payloads went instead, including a UH-1Y Huey that crashed into a Himalayan mountainside, killing six Marines and five local residents who were aboard.

He declines to speculate on what caused the crash off Hawaii in January 2016, citing the ongoing investigation. But, he acknowledges, "that squadron was not flying the hours it should have been leading up to that mishap. They had challenges in the maintenance department." Pressed on the matter, he adds, "That squadron was underperforming compared to other squadrons that were all underperforming."

One reason the 53Es are in such bad shape, Davis says, is that the Marines tried to repair their largest helicopters in Iraq and Afghanistan, rather than bringing them home for more thorough attention. Another reason is that the Corps responded to the 2013 "sequester," which entailed $1 trillion in governmentwide spending cuts, by almost halving its budget for aviation maintenance and spare parts. "That was a Marine Corps decision as to how to respond to the sequester," he says, "and we're paying the price now." To keep its aircraft operating, the Pentagon has gone to lengths that include buying decommissioned Japanese 53Es for their engines and parts and reviving two airframes that had been retired to an Arizona aviation "boneyard."

The 53E helicopters aren't unique. "Airplanes are falling apart," Air Force Chief of Staff General Mark Welsh III said in a speech in September 2014. "I don't care if it's B-1 oil flanges that are breaking and starting fires or F-16 canopies cracking. There are just too many things happening because our fleets are too old." The average age of B-1 bombers and F-15 fighters is 27 years; B-52 bombers, on average, are more than 52 years old. Newer planes, including the F-35 stealth fighter, are coming online, "but not quickly enough to replace aging 20th century aircraft, some of which are older than their pilots," says Mackenzie Eaglen, a military expert at the American Enterprise Institute.

Overall, the Marine Corps has been hardest hit by the problem of aging aircraft. Since January 2015 there have been 24 deaths in six noncombat Marine mishaps—a five-year high for such fatalities.

Davis insists the Marines are addressing the problem. This year the service began a three-year, $650 million "reset" program for their entire aviation fleet, and about a third of that money was budgeted for 53Es. The repair work has begun, at a cost of $1.5 million per helicopter. These tired heavy-lift aircraft will be relied upon to take Marines and their gear ashore for many years to come.

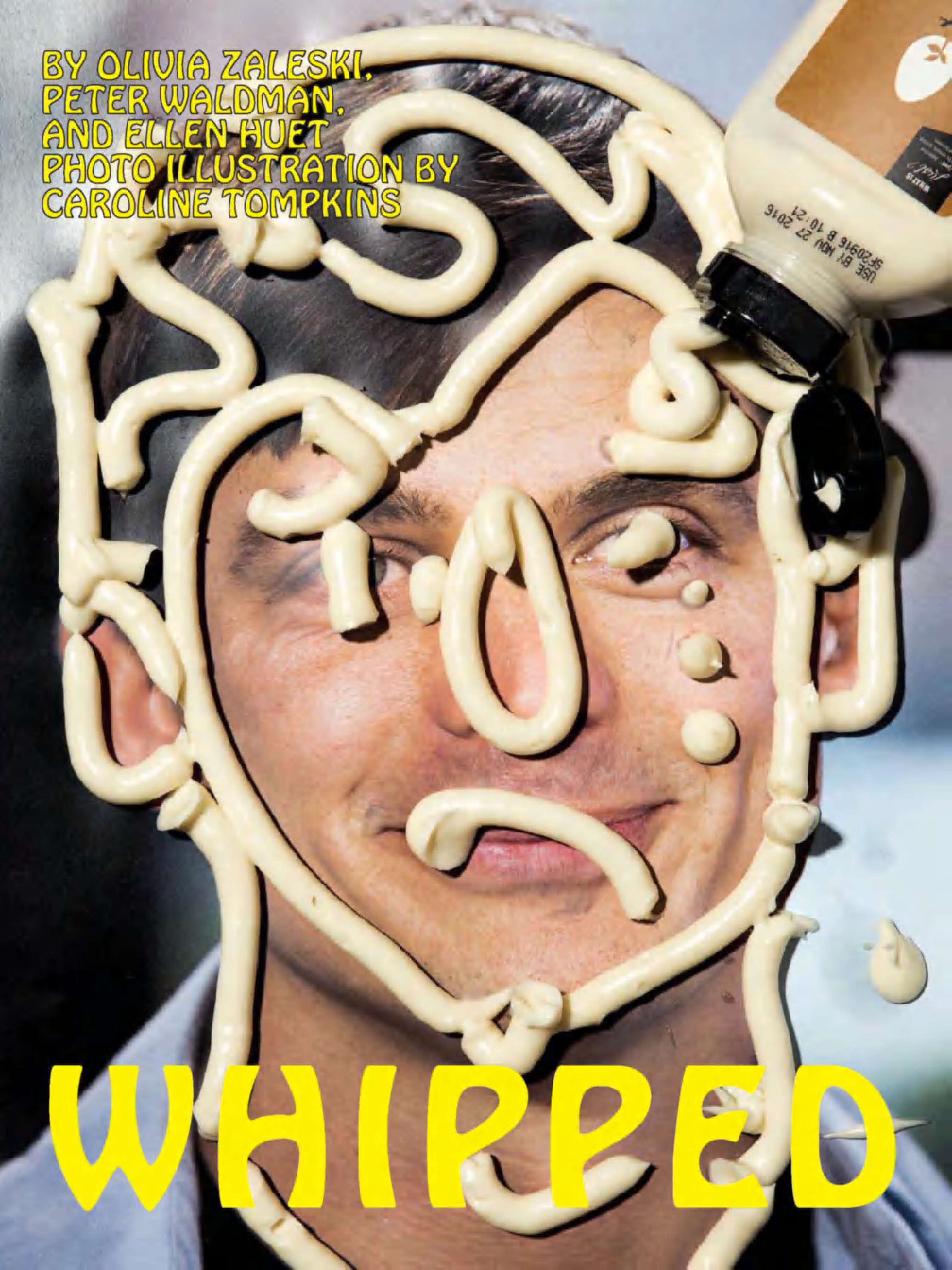
Showing its faith in Sikorsky, the Marine Corps plans eventually to replace the 53E with the same manufacturer's 53K, now in development, which will be able to transport three times as much weight as its predecessor, according to Davis. The Pentagon is expected to pay $26 billion for 200 53Ks. The start of the replacement process has been pushed back from 2015 to 2019, though, and the changeover won't be completed until 2029 at the earliest. For at least the next 13 years, patched-up 53Es will remain on the job. "This airplane has plenty of life left in it," Davis says. Ⓑ

HOW A VEGAN-MAYO MAKER CONVINCED SILICON VALLEY HE WAS RUNNING A WORLD-CHANGING TECH COMPANY

Hampton Creek's Josh Tetrick

MIRACLE

BY OLIVIA ZALESKI, PETER WALDMAN, AND ELLEN HUET
PHOTO ILLUSTRATION BY CAROLINE TOMPKINS



WHIPPED

In April employees at Hampton Creek, in San Francisco, received a stunning e-mail. With Earth Day coming up, Sofia Elizondo, vice president for business operations, wanted colleagues to know about some changes in the vegan-food company's sustainability profile. For years, Hampton Creek had trumpeted its environmental credentials, crafting a story that had produced a cultlike following among green-minded foodies and a wave of excitement among Silicon Valley investors. The company's Facebook page said a 30-ounce jar of Just Mayo, its signature product, saved 80 gallons of water, a full bathtub's worth. It also makes vegan cookie dough and cookies: A Cookie Calculator on the company website showed that a single egg-free, dairy-free Hampton Creek chocolate chip cookie saved 35 grams of carbon emissions and almost 7 gallons of water, compared with a nonvegan cookie.

Except, the e-mail said, that was wrong. Hampton Creek had hired a consulting firm, Lux Research in Boston, to do a full audit of the environmental impact of its products. Lux found that, as a colleague of Elizondo's said in a later e-mail, "the numbers look pretty different to the ones we've previously been using." Lux had examined the footprint of all of Hampton Creek's ingredients, not only the egg and dairy replacements. Employees were told to trash the old numbers and start limiting claims to individual ingredients. "You can say something like: 'Pea protein saves 1.3 gallons of water for every jar of 30 oz Just Mayo,'" Elizondo wrote.

Hampton Creek never publicly admitted its numbers were wrong. It scrubbed its site of sustainability claims, and the Cookie Calculator vanished. Such quiet backpedaling might be forgivable at many young companies—overeager math isn't unheard of in Silicon Valley. But at Hampton Creek, it fits a pattern of mistaken or exaggerated claims that may prove to be deliberately deceptive.

In August the U.S. Securities and Exchange Commission and the Justice Department launched probes of Hampton Creek for possible securities violations and criminal fraud. The investigation follows an Aug. 4 Bloomberg article that revealed the company deployed a national network of contractors to secretly buy back Just Mayo from grocery store shelves. Hampton Creek denies any wrongdoing. When news of the SEC inquiry became public, the company's founder and chief executive officer, Josh Tetrick, wrote in an e-mail, "We're aware of the informal inquiry and we'll be sharing the facts, as opposed to the inaccuracies reported by Bloomberg." The company declined to comment on the DOJ investigation.

Tetrick used supermarket sales figures much as he used the environmental claims—to raise venture capital from a cast of billionaires including Salesforce.com founder Marc Benioff, tech investor Vinod Khosla, Hong Kong developer Li Ka-shing, and entrepreneur and venture capitalist Peter Thiel. Investments in the company have reached almost $220 million, he told his employees in an all-hands meeting a few days after the Bloomberg article appeared.

Every entrepreneur has a story. Tetrick's was eggs. In 2011 his company—essentially just him and a vegan chef, operating out of Los Angeles—landed $500,000 in seed funding from Khosla Ventures to develop a plant-based substitute for chicken eggs. His pitch: He would liberate billions of hens from the fetid misery of overstuffed cages—and in the process save water and grain and cut carbon pollution. Profane, charismatic, and built like the linebacker he once was, Tetrick became a tenacious evangelist for eliminating animal protein from the world's diet. (It's "Just" Mayo as in "righteous," not "simply.") At the same time, he billed Hampton Creek as more than a food company. What it was learning in the lab and through computational analysis about plant-based proteins would make it a sustainable-food power, not just a company with a handful of niche products. It's the kind of big thinking that pays. Tetrick told his employees he was negotiating a new round of financing that would soon make Hampton Creek one of Silicon Valley's vaunted unicorns—private companies valued by investors at $1 billion or more.

First, though, he'll have to fend off the feds. Tetrick contends that the mayo buyback program was primarily for quality-control purposes and cost just $77,000. Two of his famous investors, insisting on anonymity because the company hasn't authorized them to speak publicly, say PwC confirmed Tetrick's explanation in a recent audit. But Bloomberg has reviewed contractors' receipts for hundreds of Just Mayo purchases not represented in a Hampton Creek spreadsheet that Tetrick says covered the entire buyback program. A former accounting employee who worked with the company's profit and loss statements says costs for the buybacks were included in several expense categories on the P&L, including one line item called "Inventory Consumed for Samples and Internal Testing." As buybacks surged in 2014, Hampton Creek expensed about $1.4 million under this unusual category over five months, compared with $1.9 million of net sales in the period. A company spokesman says all buybacks were expensed elsewhere as "sales and marketing costs." He wouldn't comment on why Hampton Creek spent so much money consuming its own inventory in samples and testing.

While the company's contractors raced from store to store, surreptitiously buying Just Mayo off the shelves, Tetrick kept promoting the product's success and raising more money. "We're the #1 selling mayo in Whole Foods," he wrote in an e-mail to investors that August. The previous month, according to the P&L statement reviewed by Bloomberg, Hampton Creek spent $510,000 for Inventory Consumed for Samples and Internal Testing. The company had total sales that month of $472,000.

"Everyone knew about the buybacks," says the former employee, who agreed to speak only on the condition of anonymity because of a severance agreement he signed with Hampton Creek. Along with other employees at headquarters, he did buybacks himself. "I drove all over one night buying the entire shelf of every store I passed," he says. "I felt ridiculous, but it was so culty I couldn't push back." The buybacks, he says, were separate from the quality-control program Tetrick cited in response to the initial revelations.

In 2014, Tetrick was called out by one of his high-profile investors, Ali Partovi, who went to work for the company as a liaison to potential investors. He lasted nine days before objecting to Tetrick's sales projections and telling the board the CEO was deceiving investors. "It's only a question of time before the consequences catch up with us," Partovi warned Tetrick in an e-mail. "If an investor discovers it during due diligence, we could lose financing and run out of cash. If they don't, they'll realize they were duped within months, and they might have a case for fraud."

Tetrick's first partner, Dave Anderson, was the owner and chef at Madeleine Bistro, a popular vegan restaurant in Los Angeles. From the beginning, Anderson says, Tetrick emphasized that they needed a technology angle, with patents, to please

PREVIOUS SPREAD: TETRICK: DAVID PAUL MORRIS/BLOOMBERG (2)

venture capitalists. Tetrick moved the company to San Francisco in 2012. His two-story apartment in the South of Market district doubled as the company's research and development lab and test kitchen. It quickly became a sustainable-food showcase for activists, environmentalists, and big thinkers and spenders. When he wasn't showing VIPs around the space or serving up fresh samples of the lab's latest attempt at an eggless scramble, Tetrick paced the apartment on his cell phone headset, cajoling investors for everyone to hear. When he scored funding, say three former employees, he'd hang up and celebrate with jubilant profanity, like a character in *The Wolf of Wall Street*.

Javier Colón was an operations manager at Hampton Creek from 2012 until Tetrick fired him in 2013. They sparred, Colón says, over Tetrick's attempts to change some employment contracts without the workers' consent. Early Hampton Creek contracts gave employees three months of severance if they were let go. Tetrick wanted to change it to three weeks, and in some cases did so, contracts provided to Bloomberg show. In a posting last year on Medium, a site where members of the tech community regularly publish pieces of opinion and explanation, Tetrick acknowledged having altered the terms of employee contracts and said he'd honored the original terms. Colón brought an unfair labor action against Hampton Creek with California regulators and settled privately.

Colón, who was friends with Tetrick's girlfriend, says she broke up with him after discovering Tetrick was sleeping with a Hampton Creek employee. Colón says he saw references to the affair in an unexpected way: His mobile phone broke, and Tetrick told him to take one from a pile of older phones that were company property. On the company phone, he says, he found a text exchange between Tetrick and his ex. She was furious. She demanded Tetrick fire the employee he'd slept with. Tetrick refused, texting, "Khosla would hang me—it is a huge lawsuit." After some back-and-forth, Tetrick wrote, "I do not want drama at work—I cannot lose this company. I cannot." In the Medium post, Tetrick acknowledged, "I did date a team member."

"HE WAS SUCH A DUDE—REALLY RAW, SUCH A PRESENCE, ENTIRELY AUTHENTIC. I HONESTLY FELT BLESSED TO HAVE MET HIM"

In 2013, Tetrick raised an additional $5 million from sources including Khosla, a co-founder of Sun Microsystems; Founders Fund, which is led by PayPal co-founder Thiel; and a venture fund led by Kat Taylor, a philanthropist and co-CEO of a progressive bank called Beneficial State Bank. Bill Gates didn't invest directly, but he featured Tetrick in a blog and video about re-engineering the world's food system to feed the 9 billion people expected to populate the planet by 2050.

Tetrick told a great life story, with some embellishments. Raised in Birmingham, Ala., by his mom, a hairdresser, he dreamed of playing pro football and often talks about playing for West Virginia University, though he was only on the practice team, which rarely dressed or traveled. After college and law school, he spent three years working on the ground in Africa, though he says in numerous interviews it was seven. He participated in the Fulbright U.S. Student program but didn't complete it. He embraced veganism and animal welfare under the tutelage of his best friend, Josh Balk, senior director for food policy at the U.S. Humane Society in Washington.

In 2011 and 2012, Hampton Creek's scientists and chefs struggled to meet Tetrick's initial goal: an egg substitute he could sell to industrial food manufacturers such as General Mills and Kraft. So he hired a Silicon Valley lab, Mattson, to develop one from Canadian yellow pea protein and modified food starch, a common vegan formulation. In 2013 his chefs used that to develop what Tetrick considered a superior eggless mayo, and he redirected the company to start with that. Soon he scored his first big order: Whole Foods agreed to carry Just Mayo that fall.

The media loved Tetrick, taken with his blunt passion to make vegan food affordable and appetizing even to his own Twinkie-eating dad. In a December 2013 article, "Bill Gates' Food Fetish," *Forbes* called Tetrick's mission to make the egg obsolete "Silicon Valley solutionism at its finest." The same month, *Mother Jones* said Tetrick's scientists "are on a single-minded quest to hack the egg and its 22 functional properties."

Tetrick went back to investors in early 2014. Hampton Creek, he told them, was on the precipice of breathtaking growth. He based his case on two main propositions: that his scientists were finding plant proteins capable of making numerous delicious foods with dramatically less environmental impact than animal products, and that it was cheaper to produce food from plants than from animals. Hampton Creek had a huge cost advantage, the company said in a pitch deck provided to potential investors. Its plant-based egg equivalent cost about half as much as a real egg. In the case of Just Mayo, that meant Hampton Creek could easily undercut Unilever's Hellmann's and Best Foods brands and grab a significant share of the $2 billion U.S. mayonnaise market.

From those assumptions flowed visions of vegan grandeur. Hampton Creek's 2014 sales would reach $28 million, the deck forecast. Just Mayo alone would bring in $13 million; vegan cookie dough would add $10 million; and Just Scramble, an eggless egg product, would contribute $5 million. (Just Scramble still hasn't been introduced.) The company would be profitable immediately, with a gross profit margin of 15 percent. By year five, revenue would hit $1.1 billion, with a gross profit margin of 41 percent.

Led by Li's Horizons Ventures in Hong Kong, investors put in an additional $23 million in February 2014, bringing cumulative investment in Hampton Creek to about $30 million. That valued the company at $80 million, Tetrick told employees. The money came just in time: According to an internal accounting document, after losing about $3.5 million in 2013 trying to develop a product, Hampton Creek had only $78,000 left in the bank.

Flush with new cash, Tetrick bulked up R&D and hired seven data scientists, led by Dan Zigmond, who'd been Google's data chief for YouTube and Maps. While Zigmond gave media interviews and helped woo investors, his team of six Ph.D.s—a mix of biochemists and experts in artificial intelligence—grew frustrated with the paucity of plant data to analyze. The research was "super, super basic," consisting mostly of mixing and matching plant extracts to see what worked, says a former member of the team. "There was no attempt to infer causality," he says. "That's not really science."

Still, in August 2014, Tetrick told investors in an e-mail that "the application of machine learning to plant biological data is increasingly becoming the focus of our tech platform." A year later, after Hampton Creek completed another fundraising round, its biggest yet, four of the seven data scientists were gone, including Zigmond, now director of analytics at Facebook and co-author of the new book *Buddha's Diet*. He praises Hampton Creek's ambition and perseverance but says he left to work for a company more focused on data science. "I didn't want to feel like a sideshow," he says. The company says it has 58 professionals working on food science—and it claims the latest data suggests its cookie may be better for the environment after all.

Tetrick's own strength has always been marketing, and in 2014 the company developed a powerful ground game. Working through the Humane Society, Hampton Creek recruited cadres of impassioned young vegans, environmentalists, and animal welfare activists eager to proselytize for Just Mayo and serve samples in store aisles. The Creekers, as Tetrick called them, were more than 100 strong and earned about $12 an hour. They got pep talks from Tetrick or other managers on weekly conference calls and shared their considerable passion on their own Facebook pages. Hampton Creek played brilliantly to these millennials' sense that the world's agro-industrial complex was evil. Dolloping spoonfuls of Just Mayo on crackers inside grocery stores, the Creekers proudly wore black T-shirts with a question emblazoned on their backs: "What would you attempt if you knew you could not fail?"

Tetrick was asked in an interview with *NextShark*, a digital business and technology publication targeted at young Asians, about the most important lesson he'd learned as an entrepreneur. His answer: "That all the rules that we have set, all the rules about how fast we can build a brand, all the rules about who we can raise money from, all the rules about how many people we can hire or not hire, how fast you can go in terms of research and development, every single rule that you think exists, is probably wrong and was probably created by people no smarter than you and no smarter than me. We can look at all those rules and totally ignore them and do whatever we want."

In January 2014 a Creeker on the West Coast, who asked not to be identified, received an assignment in an e-mail under the subject line "Secret Shopper Squad Stores." She was directed to buy 20 bottles a week of Just Mayo from each Whole Foods store in a large territory. She was also told to hide what she was really doing. Under the heading "BACKSTORY," the e-mail said, "You are working for a catering service, which chooses Just Mayo because of its amazing taste and because it is really good for people with allergies. We avoid saying the word vegan because we want everyone to think of Just Mayo as a mainstream mayo."

After the secret purchases, the e-mail instructed, she should open one or two bottles at home to check for quality—specifically, whether the mayonnaise had separated. If the jars were all right, she could donate the rest to a food bank or give it to friends. "Do not return them to Whole Foods," the e-mail said. It also included a link to a quality-assurance survey the Creeker was supposed to fill out for each store. But no one noticed when she didn't do it. Within weeks she had bought so much Just Mayo that her friends and local food banks couldn't handle any more, so she began dumping it. She spent almost $12,000 purchasing the product, she says, and she could tell the buybacks had nothing to do with quality control. "But I really didn't think about it because I cared so much about the cause."

With the buyback program in full swing, Tetrick celebrated the product's success. "Wow! Some @WholeFoods are selling 100+ jars of #justmayo/day," he tweeted on Jan. 30. Four months later, a company tweet said: "Proud to announce that #justmayo is now the #1 selling mayo at @wholefoods."

By then, Tetrick had moved on to a much bigger conquest: Safeway stores. On April 22, Caroline Love, who ran Hampton Creek's corporate partnerships and is now vice president for mission, sent an e-mail to a group of Creekers who'd been specially selected, she said, for the Safeway assignment. First, she thanked the unit, which became known inside Hampton Creek as the special projects group, for their "hard work in Whole Foods." Then she tried to inspire them. "We are winning because of you," she wrote. "We are reinventing the food system because of you. We are changing the world because of you."

"This is mainstream," she continued. To ensure "huge sales out of the gate" and "put an end to Hellmann's factory-farmed egg mayo," Love gave the Creeker elite five days to purchase "*at least*" 12 jars of Just Mayo at Safeway stores assigned to them. Use the self-checkout lane or multiple cashiers to avoid suspicion, she instructed. And don't wear Hampton Creek gear—"This is an undercover project." There was no pretense of quality monitoring. Subsequent assignments were for 20 jars per store.

Creekers did buybacks throughout 2014 and into 2015, according to five of them. They hit Costco, Kroger, Target, and Walmart stores, in addition to Safeway and Whole Foods, former employees say.

Another West Coast Creeker says Tetrick was like a religious pastor who inspired his charges—many of them women under 35 like her—with his vision of fixing a corrupt corporate food system. "He was such a dude—really raw, such a presence, entirely authentic," she says. He made this Creeker feel like she could make a difference in the world. "I honestly felt blessed to have met him," she says.

Her first buyback assignment was in April 2014. That year she hit multiple Safeways, purchasing more than 500 jars of Just Mayo in all. Quality control never came up, she says. She donated the jars to hospitals, passed them out to friends, and finally started leaving boxes on the street. Now she suspects she was helping commit fraud, and it gnaws at her.

"Why was I willing to work so hard for so little money?" she asks. "Why did I do things that made me really uncomfortable, that I knew weren't right? I'm really struggling with those questions."


A Creeker's photograph of one day's mayonnaise haul

In late July, two Bloomberg reporters visited Hampton Creek's offices to ask about the buyback program. Having outgrown Tetrick's home, the company occupies a 90,000-square-foot former cookie factory in San Francisco's Mission District. When reporters arrived, Jordan Tetrick, Josh's younger brother, who also works for Hampton Creek and is engaged to the company's communications director, was out front walking his golden retriever puppy.

Once upstairs, the reporters sat across from Josh Tetrick on bar stools at the edge of a large room filled with young employees. Another golden retriever puppy, this one Josh's, nestled nearby. A huge poster of Tetrick and Gates loomed above, inscribed with the word "LEAP" in red letters. On the kitchen fridge was a photo of Tetrick in his football uniform.

He said the company had spent only $77,000 on buybacks, all for quality control. He summoned two employees to explain the program and showed the reporters a spreadsheet of Creeker survey results to prove his point. Asked several times why some of the assignment e-mails hadn't mentioned quality control, Tetrick repeatedly deflected the question. Finally, he left for a few minutes and returned with Love, the former Creeker handler. Love said the e-mails didn't always mention quality control, and asked Creekers to disguise themselves during buybacks, because the company wanted the Creekers to have a genuine customer experience.

A few days later, the reporters asked Tetrick to explain another mystery: Why were hundreds of purchases Bloomberg had documented using Creeker receipts not among the $77,000 worth of buybacks in Hampton Creek's quality-control spreadsheet? Tetrick didn't answer; he asked for more details about which purchases were missing. Bloomberg, to protect its sources, didn't provide specifics.

Part of the answer may be buried on Line 62 of that profit and loss statement from 2014: Inventory Consumed for Samples and Internal Testing. The line is blank from 2011 through February 2014. From that March through July, the entries total $1.4 million. Hampton Creek's spokesman says the category did not include buybacks; it covered samples sent to customers and potential customers and tested in-house. He declined to elaborate.

Ali Partovi suspected something was wrong shortly after joining Hampton Creek in September 2014. He and his twin brother, Hadi, are among Silicon Valley's most successful angel investors. Their parents, scientists from Iran, fled the Islamic Republic when the boys were 11. Both earned computer science degrees at Harvard. In the 1990s, Hadi co-founded Tellme Networks, which he sold to Microsoft for $800 million; Ali co-founded LinkExchange, which Microsoft bought for $265 million. The brothers were early investors in Dropbox, Facebook, and Airbnb, among other companies, and founded the nonprofit Code.org, which promotes programming instruction in U.S. public schools.

A big believer in greening the food chain, and now an investor in Hampton Creek competitor Clara Foods, Ali Partovi grew smitten with Hampton Creek after meeting with Tetrick in 2013 and seeing his pitch deck. The Partovis invested in Hampton Creek in 2014. That September, Ali joined the company as a senior executive. His main responsibility was fundraising, particularly helping land Hampton Creek a "tech company valuation" in its next round, e-mails show.

Partovi dug in to the company's financials. A week later, he sent Tetrick an e-mail documenting his belief that Hampton Creek was misleading investors and board members and risking potential fraud lawsuits. As of that August, the company was on pace to have less than $4 million in sales in 2014, not the $28 million projected in the pitch deck, and it was losing more than $2 million a month, according to an internal P&L statement. Partovi recommended revising the 2014 sales forecast for investors to $7 million to $9 million. Deceiving investors is a big mistake, he warned Tetrick. "This path is especially dangerous because the farther one goes down it, the harder it is to pull back," he wrote. "Hadi and I personally feel duped."

The Hampton Creek spokesman says Tetrick told Partovi that investors were made aware of the company's financial performance on a regular basis. The two men met, and Partovi resigned. He had been at the company nine days. He notified Hampton Creek's two outside board members, from Khosla Ventures and Horizons, that he suspected Tetrick was misrepresenting the company's finances. Both firms stuck by the CEO, and the board launched no formal investigation. The board reviewed documents provided by the company, spoke with both Partovi and Tetrick, and concluded that "no further action was warranted," according to a spokesman for Khosla and Horizons. "Frankly, Josh is the company," says one investor close to the board.

Partovi didn't push the matter. After resigning, he declined to sell his Hampton Creek stake back to the company under the terms offered, and he complimented Hampton Creek in an interview on CNBC in March 2015. Eight months later, Partovi sold his shares to Benioff at a profit. Two people familiar with the transaction say Partovi told Benioff he believed Tetrick had been dishonest with investors. Hampton Creek says Partovi "made no allegations of fraud" when he sold.

Founders Fund, after hearing of Partovi's sudden departure, asked Tetrick for a copy of Partovi's resignation e-mail. The fund had been planning to lead Hampton Creek's next round of financing with a $20 million investment, but after reading the e-mail, it withdrew, according to a person involved in the investment decision. Khosla Ventures and Horizons, the company's two largest investors, stepped in to co-lead the funding round.

Tetrick pleaded with Founders Fund to make at least a token investment, lest other investors get spooked. Founders agreed to put in $500,000. The Hampton Creek spokesman says the company never received a term sheet from Founders Fund to lead the financing round and Founders Fund "continues to be supportive" of the company. Ultimately, Hampton Creek raised $90 million, bringing its valuation, Tetrick told employees, to $190 million. Its value had more than doubled in 2014, the year of the Creeker buybacks.

Tetrick's pitch deck to investors this past March forecast revenue of $106 million for 2016, nearly four times the 2015 sales. When he gathered his employees in August, he announced that a recent funding round had raised $100 million, at a valuation of $750 million, according to someone who heard him speak. The next financing round, which would anoint Hampton Creek a unicorn, was ready to go to the board any day, Tetrick said. Investors, he said, would include a German media group, some large funds from the U.K., existing investors in Asia, and a wealthy person in Silicon Valley.

After Tetrick spoke, an employee asked what the Creeker program was for.

"These are 100-plus people who gave a f--- about your company, who helped us get to where we are right now, who worked their asses off to make this happen," Tetrick answered. "These are the people we're talking about." B

COURTESY: CREEKER IN CALIFORNIA

BRIEFS THAT HOLD THEIR OWN / A MESSY MANIFESTO / NATIONAL PARKS TO SEE NOW / SHAUN WHITE WEARS BLACK

ETC

The MiXmAstER

Spotify's Matt Ogle is perfecting the art of the playlist

By Devin Leonard

Until recently, Mike Perry assembled engines at a Volvo plant in Skovde, a medieval city in Sweden. But Perry wanted to be a famous DJ. At night he labored in a recording studio, writing and producing songs in a lush, throbbing style known as tropical house. It sounds like Jimmy Cliff was tweaked by Avicii, the electronic dance musician.

Perry was 30 and hadn't had a breakthrough, so it looked as if he'd be on the assembly line for years. Then, in April, he released a track called *The Ocean*, a bit of escapist pop. It wasn't long before he noticed the Spotify link to his song all over social media. *The Ocean* became so popular on the streaming service that Perry quit his job and spent the summer performing in Europe. Now he has almost 15.5 million monthly Spotify listeners, a number he still finds inconceivable. "It's just opened so many doors," he says.

At a certain point, Spotify contacted Perry's music manager to explain how the service had transformed his client from autoworker to house music luminary in months. It was simple: It had a lot to do with Spotify's music-recommendation technology. The company keeps track of what you listen to. Then it uses algorithms to see which other playlists contain the same songs—and other songs that are on those lists but not on yours. Then it feeds you those new cuts in a personalized playlist, Discover Weekly, which is refreshed every Monday. Once *The Ocean* began showing up in Discover Weekly, Perry's days at Volvo were numbered.

Like *The Ocean*, Discover Weekly, which made its debut in July 2015, is a hit. Matt Ogle, Spotify's erudite product lead for recommendations and discovery, says 40 million users have tried it, streaming more than 5 billion songs. "It's moving the needle, especially for small-to-medium indie artists," Ogle says. It's also helped Spotify increase its monthly users from 75 million to 100 million at a time when it's being challenged by Apple Music, the rival streaming service, and when artists such as Taylor Swift and Beyoncé are withholding their work from Spotify because they say it's stingy with royalties. It's easy to see why Discover Weekly has taken off. Listeners have access to more music than ever—but that's overwhelming. "Even though you can search across Spotify, people don't like to spend too much time searching," says Rahul Telang, co-author of *Streaming, Sharing, Stealing: Big Data and the Future of Entertainment*. Discover Weekly eliminates search altogether.

Spotify and Apple are divided on how to make finding music easier. Apple Music relies heavily on human curators to pick songs. Spotify has those, too, but it's more focused on algorithmic recommendations. In the past, such tech-driven music-discovery functions were weak, often suggesting artists and songs that people already knew and liked. What makes Discover Weekly different is that it unearths new cuts from among other users' playlists that you will adore. "We have a long belief that people were superior to algorithms," says Bob Lefsetz, author of the *Lefsetz Letter*, an online report on the music business. "What we have found is that Spotify's algorithms are astonishingly accurate." If that's the case—and it appears to be—the power in the music industry may soon shift from traditional forces such as label executives and radio programmers to streaming savants such as Ogle and his teams of engineers.

Finding music on the internet may seem relatively new, but it's been around long enough that Ogle, 36, has spent his entire career doing it. It's a Thursday afternoon in August, and he's sitting in a glass-walled conference room named Blue in Green (in honor of the classic song performed by Miles Davis) in Spotify's New York office. He looks like a grad student with his tortoiseshell glasses, blue shirt, black pants, white sneakers, and no socks.

Ogle grew up in Canada and went to the University of Alberta, where he double-majored in English and computer science. He plays piano and maintains a Twitter feed of quotes from the novels and short stories of Raymond Chandler. He also runs an e-mail newsletter that recommends a daily poem. "It conveys the biggest impact with the fewest words," he says of poetry. "A lot of things I work on are about finding the simplest thing that can evoke emotion in people."

After graduating from college in 2004, Ogle went to work in London for Last.fm, a British online radio provider that suggested bands, songs, and concerts. Last.fm was revolutionary—for its day. "Ten years ago, we were going, 'People who play Beck also play Radiohead,'" he says. "We were

75m

Total Spotify users, June 2015, the month Discover Weekly debuted

20m

Paid subscribers, June 2015

100m

Total Spotify users now

40m

Paid subscribers now

5b+

Total songs streamed on Discover Weekly

17m

Total Apple Music subscribers

4m

Total Tidal subscribers

PREVIOUS PAGE: PHOTOGRAPH BY EVA O'LEARY FOR BLOOMBERG BUSINESSWEEK at that Amazon level of, 'People who bought this also bought toilet plungers.'" In 2011, Ogle left Last.fm to open a London office for the Echo Nest, a Boston-based online music company that created algorithms that customers such as Spotify used to make recommendations.

At the Echo Nest, Ogle created his own online music recommendation applications. He came up with one in 2011 called Drinkify that paired artists and cocktails. It directed Prince fans, for example, to get pumped up with a blend of cinnamon-laced Red Bull and Finlandia vodka. Drinkify attracted media interest, but Ogle decided it was too much trouble to turn it into an actual product. "There are a lot of issues monetizing anything to do with alcohol," he says, sighing. Ogle ran into different obstacles when he co-founded a music-related social network in 2012 called This Is My Jam. The problem: It was designed for PC users when everyone was listening to music on smartphones.

His friends at the Echo Nest didn't hold Ogle's failures against him. In 2014, Spotify acquired it and put him in charge of new-music discovery offerings. Ogle's first assignment was to fix Spotify's moribund Discover page, which fewer than 3 percent of users bothered with. "The experience wasn't very good," he says. "First you have to find the screen, and then you have to look at the grid of albums and go, 'Well, that cover looks interesting.' Then you click on it and have 12 tracks. Which one do you play? There was no way to explore it quickly." But engineers messing with the page had come up with something promising at a company "hack" week: a method of generating personalized mix tapes by tapping into user-generated playlists.

Ed Newett, the engineer who came up with the prototype, gave Ogle a demonstration. Ogle was delighted when the first track to surface was a tune he'd never encountered by Jan Hammer, the Czech-born jazz-fusion synth pioneer from the '70s. "It hit all my sweet spots," he says. "I was like, 'This feels like a deep cut. This feels like a person picked it for me.'" The challenge for Spotify was translating the tech into something more welcoming than the Discover page. That's where Ogle came in. "Without Matt, we wouldn't have made it an actual product," Newett says. Some engineers wanted to send users a personalized playlist every day. After Ogle got involved, the group decided that once a week would be better and chose Monday, to give people something to look forward to when they returned to work.

One of the early mockups of Discover Weekly spewed out as many as 100 songs at a time. Ogle balked. "If someone showed up on your doorstep with a five-cassette set, you might think, Ugh," he says. "We kept making it shorter until we landed on two hours of music, about 30 songs." The team also decided to include a few familiar covers or tracks so listeners would be more willing to sample unfamiliar ones. "A discovery service needs to be anchored in something so you'll have confidence in it," says Dave Rodger, Spotify's vice president for product engagement and Ogle's boss.

On the eve of Discover Weekly's unveiling, Spotify arranged for 30 journalists to test the service–and it promptly wiped out all the writers' other playlists. Luckily, Spotify's engineers were able to re-create the deleted ones in three hours, averting what might have been a PR snafu. There was more drama on the way. Every Sunday, Ogle and his team would create a playlist for each of Spotify's 75 million users and store it on a database maintained in Sweden. Early on, the playlist surge overwhelmed the system. It wasn't unusual for Ogle to get calls at 4 a.m. on Monday mornings from angry Swedish colleagues who were trying to keep the database from crashing. It got so bad that one Monday in September 2015, the system failed, and Spotify wasn't able to update any Discover Weekly playlists. But by Tuesday the problem was fixed, and everybody got new music. Afterward, Ogle and his teams calculated how many songs Discover Weekly devotees had streamed in three months. It was more than a billion. "We popped open a bottle of champagne," Newett says. Since then, they've expanded into new kinds of personalized playlists. In August, Spotify unveiled Release Radar, which surfaces the latest songs by people's preferred artists.

Ogle says users are streaming fewer of their old favorites and listening to newer acts instead. That should hearten unknowns who fantasize about being the next Mike Perry. But it should unsettle big record companies and their star acts. The more Spotify steers people to independent artists, the more negotiating power it has with the labels and music-publishing companies to which it currently pays 70 percent of its revenue in royalties. Spotify declined to say how much money Discover Weekly generates.

The company is in contract negotiations with the three biggest labels, Universal Music, Sony, and Warner Music Group. They take issue with Spotify's free, ad-supported tier, which doesn't compensate them as richly as its paid-subscription one that has 40 million users. But Spotify needs all the users it can get, because it hopes to go public soon. The more it can mint its own stars, the less it needs the labels' glittering rosters. "This is very strategic," says Mike Doernberg, chief executive of ReverbNation, an online music company that works with emerging artists. "The best thing Spotify can do is popularize more artists so it becomes the gatekeeper of consumption."

Ogle is giving Spotify more weapons to fight off not just Apple but Pandora and Amazon.com, which are expected to start rival services in the coming months. Ogle doesn't sound worried. He's noticed that Discover Weekly users often address the service on Twitter as if it's a friend who knows them intimately. They're even forgiving when Spotify's algorithm misfires. Ogle could be talking about Amber Reyes, who recently tweeted: "Nice @spotify you made up for the horrible discover weekly playlist last week. I love every single song on this weeks. #epic #nice save." Ⓑ

One of the **early mockups** of **Discover** Weekly **spewed out** as many as 100 songs **at a time.** **Ogle** balked. "If someone showed up on your **doorstep** with a five-**cassette** set, you *might* think, **Ugh**"

DATA: SPOTIFY; APPLE; TIDAL

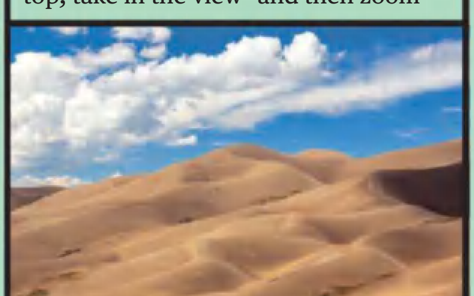
American Beauties

The National Park Service just turned 100. Here are seven ways to celebrate. By Maridel Reyes

⬇ For the X Gamer
Great Sand Dunes National Park and Preserve
Colorado

Set against the Rocky Mountains and surrounded by grasslands, wetlands, and forests, the otherworldly Great Sand Dunes are the tallest in North America, rising to 750 feet. Rent a sand sled at Great Sand Dunes Oasis *($20 per day; alamosa.org)*, climb to the top, take in the view—and then zoom down. When you reach the bottom, cool off in Medano Creek.

Stay here: Adjacent to the park's southern border, the Zapata Ranch is a rustic but luxe resort and spa on a working 103,000-acre bison and cattle ranch. *Starting at $460 per person, per night, all-inclusive; zranch.org*



⬆ For the history buff
Mesa Verde National Park
Colorado

This park, a Unesco World Heritage site, turns 110 this year (the government established it a decade before the National Park Service was formed). It provides a glimpse into the life of the ancient Pueblo people, who lived in the area for more than 700 years. Mesa Verde is the largest archaeological preserve in the country, with about 5,000 sites, including cliff dwellings and villages built into the mesa walls. Book a 90-minute twilight photography tour *($20; recreation.gov)* of Cliff Palace, the largest dwelling.

Stay here: Set 15 miles inside Mesa Verde, Far View Lodge has a breezy-casual Southwestern vibe and panoramic views into three other states: Arizona, New Mexico, and Utah. *Starting at $130 per night; visitmesaverde.com*

For the adventurer
National Park of American Samoa
American Samoa

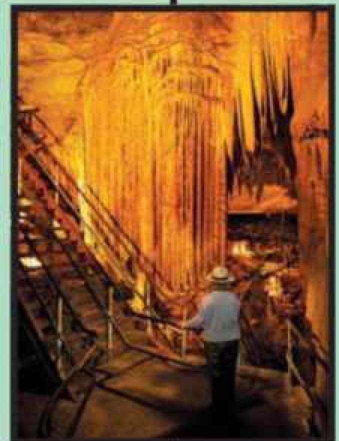
With 13,500 acres—4,000 of which are marine ecosystem—across three volcanic islands in the South Pacific, the park aims to preserve the Samoan culture, Polynesia's oldest. Start at Vatia Village near the capital, Pago Pago. *(Flights from Honolulu on*

GETTY IMAGES (6)

Wigwam Village Inn #2 at Mammoth Cave National Park

Hawaiian Airlines take roughly six hours and run about $950; hawaiianairlines .com.) From there, hike the Mt. Alava trail among fruit bats and birds. Take a rest at the halfway point, a coconut and banana plantation, then head to the summit for a sweeping view of Tutuila Island.

Stay here: The only U.S. national park in the Southern Hemisphere, it's also the only one that offers a homestay program, where visitors can bunk with locals. Sleep in a *fale*, a traditional thatch-domed house, and learn how to pole or net fish, harvest coconuts, and weave tree leaves into decorative mats. *Starting at $50 per night; nps.gov/npsa/learn/ historyculture/homestay.htm*



➚ For the spelunker

Mammoth Cave National Park

Kentucky

About 90 miles south of Louisville is the longest cave system known in the world: Almost 400 miles of it have been mapped so far. Book a guided Wild Cave spelunking tour *($55; recreation .gov)* of the Unesco World Heritage site to climb and crawl through limestone formations that shape a labyrinth of spooky caverns.

Stay here: Retro-kitschy Wigwam Village Inn #2 has 15 painted concrete teepees, arranged in a semicircle, with hickory beds and cane furniture from the 1930s. *Starting at $45 per night; wigwamvillage.com*

For the island hopper

Channel Islands National Park

California

Hop a catamaran *($59 per person; islandpackers.com)* and cross the Santa Barbara Channel to these five isolated islands that stretch off the coast from Los Angeles north to Santa Barbara. Despite the mainland's proximity to the islands (the closest to shore is about an hour away), this 250,000-acre park is visited less often than the other three islands in the archipelago. Pack a picnic lunch to enjoy in Santa Cruz Island's secluded Scorpion Anchorage cove, or book a three-hour sea kayak tour with Channel Island Outfitters *($144, including lunch; channelislandso.com)* to cruise by beaches, explore caves, and snorkel through kelp forests in the marine reserve.

Stay here: Back in Santa Barbara, the hilltop Belmond El Encanto has been a Hollywood favorite since the 1920s. Recently it went through a seven-year renovation that restored the original Craftsman-style and Colonial bungalows and added an infinity pool and spa. *Starting at $725 per night; belmond.com*

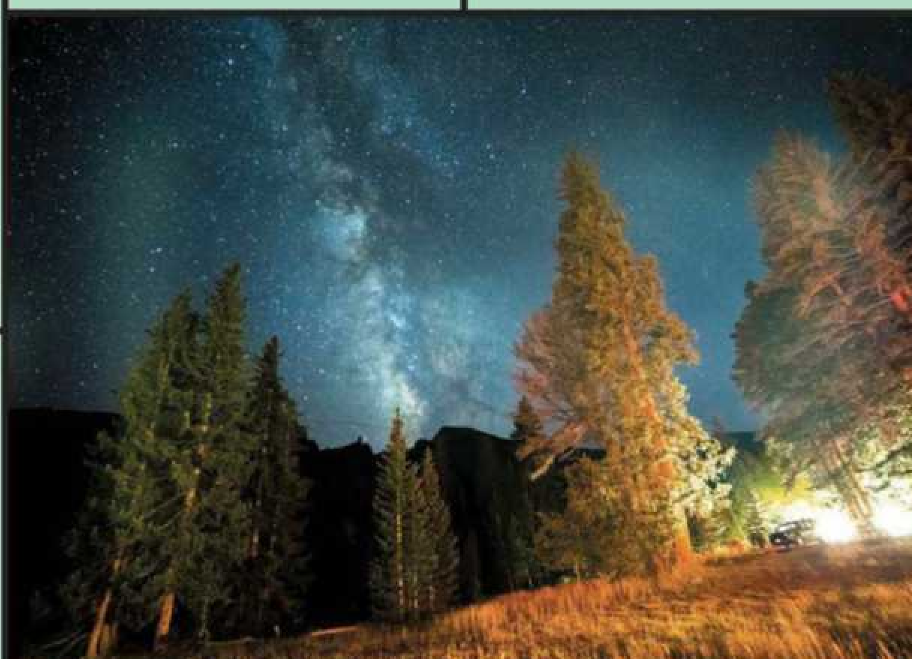
➘ For the stargazer

Great Basin National Park

Nevada

Near the Utah border and far from any light pollution, this spot is popular with amateur astronomers. On a clear night, you can see thousands of stars in the Milky Way and the Andromeda galaxies with the naked eye. Late September into early October is the best time to view Andromeda; it's also when the aspen trees are ablaze with color and visitors can gather pinyon pine nuts to take home.

Stay here: Just outside the eastern boundary of the park is Hidden Canyon Retreat, a modern-rustic property with a stream running through it and frequent deer, wild turkey, and golden eagle sightings. *Starting at $134 per night; hiddencanyonretreat.com*



For the equine enthusiast

Assateague Island National Seashore

Maryland and Virginia

Assateague, about 10 miles south of Ocean City, Md., is open year-round. Almost 40 miles of Atlantic coastline offer wide beaches, plus salt marshes and maritime forest. Relax on the sand while wild horses stroll through waves or feed on grass. (No riding!) You'll also encounter red foxes, deer, and birds such as egrets.

Stay here: Get back to humanity at the elegant Atlantic Hotel, a 120-year-old B&B in a grand Victorian building. *Starting at $125 per night; atlantichotel.com*

THE PAMPERED PACKAGE

Guys, it's time to put the family jewels in a proper pouch
By Gordy Megroz

It was 2006, Trent Kitsch was salmon fishing in Alaska, and he had a problem. "My package was stuck to my legs for hours," he says. "The whole trip I kept thinking, I have to reinvent men's underwear. There has to be a better way." Kitsch, who at the time was 26 and in business school at the University of Western Ontario, hired a local fashion student to help create a design that would prevent stickage. Companies such as 2(X)ist had installed pouches for added room—and a more pronounced presentation—but Kitsch didn't think they solved the Alaska dilemma.

After 14 prototypes, he settled on perpendicular mesh panels inside a pouch that he incorporated into a brief and a boxer brief; the panels envelop a man's privates and provide a protective barrier against the inner thighs. Kitsch took out a $20,000 loan and poured all of it into his new company, Saxx. (He's nothing if not subtle.) By 2009, the shorts were in Sports Shack, a major Canadian retailer. In 2010 he sold Saxx to No Limits Group, in Vancouver, which owns several other niche-apparel makers.

Mesh-paneled underwear might sound gimmicky, but it's no joke: In the past two years, Saxx's revenue has grown 250 percent; it's forecast to reach $40 million in 2016. "We have an 85 percent adoption rate when people try our underwear," says Chief Executive Officer Tim Bartels. The company has signed endorsement deals with the Chicago Cubs' Jake Arrieta, last season's Cy Young Award winner—he was already wearing the underwear and reached out to the company—and Kevin Love, who won the 2016 NBA championship with the Cleveland Cavaliers.

In May, Saxx began shipping globally, and Nordstrom recently tapped it as an "emerging brand" and placed it in 60 stores throughout North America. "They have a really interesting take on men's underwear" and were able to convince the industry of their innovation's value, says Min Park, Nordstrom's buyer for men's emerging brands.

Whether Saxx's design makes a lasting dent in the $2.9 billion men's underwear market remains to be seen. At this point, its sales account for only a little more than 1 percent of that figure. Other smaller companies are developing similar technologies: In 2012 a former No Limits employee broke off to found MyPakage, which employs a "keyhole" design to "cradle the male package." Stance, which made its name making socks for the NBA, now sells underwear that employs a "wholester."

Major players would need to adopt a similar design for these crotch-comfort innovations to go mainstream. "The men's underwear category grows in spurts," says Marshal Cohen, chief retail industry analyst for NPD Group, a market research company. "When something comes along that makes underwear more comfortable or sexier, and it's imitated, numbers go up." That was true when Calvin Klein introduced a more stylish brief 30 years ago. And it was also true when the boxer brief was introduced in the early 1990s. The latest uptick in market growth came in the year ending last February, when the industry gained 2 percent. That was spurred largely by compression underwear, performance garments that keep muscles warm and better supported during athletics. Under Armour introduced the style, and Nike, Adidas, Jockey, Tommy John, and others soon adopted it.

Saxx has expanded its offerings to include nylon performance underwear.

Saxx's boxers (Vibe modern fit, $31.95) look pretty standard, but it's what's on the inside that counts

The compression is in the rear and legs; the pouch maintains the company's patented design. In January it will begin selling a running short. "Luke's Locker, a store in Texas, was cutting out the liner of running shorts and selling a pair of Saxx underwear with them instead," CEO Bartels says. "We decided it was a good idea." And, he adds, Saxx is only two years away from making women's undergarments. "Obviously," he says, "it won't include panels." B

PHOTOGRAPH BY CAROLINE TOMPKINS FOR BLOOMBERG BUSINESSWEEK; COURTESY SAXX

Your

OCTOBER HOROSCOPE

By Ashleigh D. Johnson

Take time to develop your professional relationships.

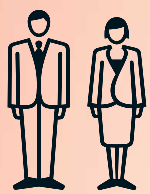
You'll have the mojo to work on them after Mercury moves into sociable Libra on the 7th. Remember: Diplomacy and compromise get you further than force and bluster.

The 15th, when the full moon is in Aries (the sign of leadership), is a good moment to think about making a change to solidify your authority. People often leave their job, make cuts to staff, or cancel planned agreements during a full moon. But be wary of getting into arguments, as full moons also encourage erratic, impulsive behavior. This one will be particularly close to Uranus, which rules freak accidents. Be careful around sharp objects, too.

On the 18th, Venus, the planet of love and prosperity, moves into broad-minded Sagittarius—look out for international opportunities.

The sun moves into Scorpio on the 22nd; Mercury follows it on the 24th. Scorpio rules investments, inheritances, and other money that's not earned income. Check on your investment portfolio and strategize for 2017. Mercury governs sales, marketing, and communications. You can also use these days to reel in new clients by being honest and saying what other companies won't. If you're confused about what existing clients want, ask them. They'll give you the deep, dark truth.

The month wraps up with a new moon in Scorpio on the 30th. Scorpio is an intense, intuitive sign. Follow your instincts heading into November, and you may see new possibilities open up. Ⓑ



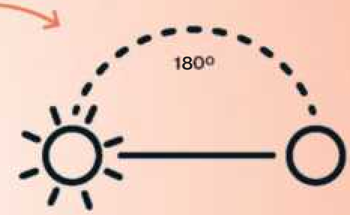
Three of the least compromising bosses in recent film and TV history. ——*David Walters*

Ari Gold, *Entourage* (2004-11)
Played by Jeremy Piven
"You're sorry, Lloyd? You have no idea how sorry you're going to be! I am going to destroy you. I am going to erode every fiber of your spirit! You no longer exist. You are dead to me, and the town will know that anyone meeting with you, speaking with you, or even nodding to you on the street will be dead as well! So die, Lloyd. Die! Die! Die!"

Miranda Priestly, *The Devil Wears Prada* (2006)
Played by Meryl Streep
"Tell Richard I saw the pictures that he sent for that feature on the female paratroopers, and they're all so deeply unattractive. Is it impossible to find a lovely, slender female paratrooper? Am I reaching for the stars here? Not really."

Mr. Pitt, *Seinfeld* (1994-98)
Played by Ian Abercrombie
"I want a decent sock that's comfortable that will stay on my foot!"

As of Aug. 31, investment strategists at Research Affiliates, in Newport Beach, Calif., expect emerging markets to return 7.3 percent after inflation over the next decade, vs. 1 percent for the S&P 500.



During a full moon, the sun, which rules the self, forms a 180-degree angle, aka an "opposition," with the moon, the ruler of emotions. This pits the two bodies' energies against each other.

In the forthcoming update to *Working With Difficult People* (TarcherPerigee, $16), authors Amy Cooper Hakim and Muriel Solomon identify 10 types of problem colleagues. But do you know how many subgenres of annoying humans exist? Just four chapters' worth:

Narcissists, bullies, ruthless monsters, raging bulls, cyberbullies, enviers, intimidators, ambushers, hotheads, revengers, quitters, dictators, fame claimers, moochers, crushers, knee-jerkers, competitors, rule benders, commandants, hypocrites, weasels, backpedalers, forked tongues, brain-pickers, backstabbers, underminers, saboteurs, foxes, bluffers, instigators, slave drivers, connivers, camouflagers, flatterers, imposers, duck and divers, operators, bootlickers, snitchers, rumor mongers

CHAOS THEORIES

Is it better to be messy or neat? By Rebecca Greenfield

We live in an age that shuns clutter. Cleanup guru Marie Kondo's manifesto for ridding yourself of anything that doesn't bring you joy, *The Life-Changing Magic of Tidying Up: The Japanese Art of Decluttering and Organizing*, has spent almost 100 weeks on the *New York Times* how-to best-seller list. We hate clutter at the office, too. A 2012 survey by hiring firm Adecco found that 57 percent of workers judge colleagues by the state of their desk, and according to a 2011 CareerBuilder survey, almost a third of employers are less likely to promote people with a disorganized workspace.

I keep a messy desk. So when *Messy: The Power of Disorder to Transform Our Lives* (Riverhead Books, $28), by Tim Harford, landed on top of my somewhat precarious book pyramid—next to my yoga towel, behind a disposable coffee cup—I hoped it would help justify my surroundings. And it does, kind of.

Harford, who wrote the 2005 bestseller *The Undercover Economist*, has an expansive definition of "mess." He writes that "the success we admire is often built on messy foundations" and highlights the virtue of improvisation over a plan: Martin Luther King Jr. didn't use prepared remarks for the "dream" portion of his "I Have a Dream" speech. Harford describes the power of lateral thinking—musician Brian Eno, for example, uses a card game called Oblique Strategies to help performers break creative blocks. And sometimes, he refers to those things that don't bring us joy.

Whether your piles are good or bad isn't the issue, Harford writes. His thesis is that there's no intrinsic value in being neat. A pile of papers on a desk isn't a random mess; it's a logical one. The papers you touch the most end up on top. They're "full of clues about recent patterns of working," he says. If clean is de facto better than chaos, how do you explain that some of history's greatest minds labored in their own disarray? Albert Einstein, Alexander Fleming, and Abraham Lincoln were slobs, and all they gave us was the theory of relativity, penicillin, and America. (The subtitle of *Messy* is too strong. Disorder in the service of preserving the union is one thing. Disorder so I can procrastinate among dried-out pens, books I'll never read, and snack wrappers is another.)

EINSTEIN, FLEMING, LINCOLN—ALL SLOBS

What matters, Harford says, is that you get to choose how to surround yourself, because that's what leads to the most happiness. He cites a study in which researchers at the University of Exeter created four office environments that varied in degrees of austerity and autonomy. Workers showed greater productivity in the space with more rather than less stuff, but the most productive environment was the one that gave employees control: They got 30 percent more done than those in the uncluttered space and 15 percent more than people in the office filled with plants and photos. People toiling away without any control over their surroundings not only hated their job, office, and company but also complained of physical discomfort, such as feeling too warm.

The appeal of Kondo's decluttering method is that it provides an organizing principle. But it turns out the path to success doesn't have to be so organized. For now, I'm going to leave my yoga towel where it is and assume my bosses are enlightened enough to promote me. Ⓑ

Critical Mass

A random ranking of recent bad behavior

Most Worst

PASTA WITH A SIDE OF PASTA, PLEASE

Olive Garden sold 21,000 $100 Never Ending Pasta Passes in less than one second. Pass holders in 2015 showed up 28 times on average during the seven-week promotion, because unlimited pasta four times a week is good for you, right?

NOT LIVING UP TO YOUR NAME

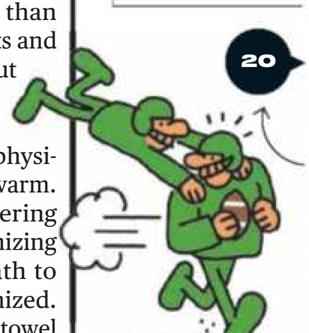
Adblock Plus, which was invented to protect us from annoying online ads but started allowing "acceptable" ads years ago, said it will make even more ads acceptable. Which is unacceptable.

INTERNET EXPLORERS

New York City is disabling web browsing on internet kiosks in part because some people were lingering and watching pornography. No one, of course, could have predicted that would happen.

PAY NO ATTENTION TO THE SCORE

The NFL is again putting teams in bright Color Rush jerseys to distract from its awful Thursday night games. The good news: When a matchup has two teams in the same dominant hue, one will wear white, so colorblind people can watch this year.



Least Worst

ILLUSTRATIONS BY TIM LAHAN

SHAUN WHITE

30, founder, WHT Space, Los Angeles

You're a snowboarder. Now you're doing a clothing line?
I had a boys' collection at Target, but the clothes I was making I wasn't wearing anymore. I'd moved into a different space. That's how the idea for WHT Space happened.

Black shirt, black jeans, black sneakers, too?
When you switch from leather-soled shoes to sneakers, it's a whole new world. I'm like, "Let's walk home! Let's walk to the next meeting!"

Your watch is gold, though.
It's the Oyster Perpetual I bought during a crazy time in my life. I felt like, I want to feel better right now. I guess people call it retail therapy.

White wears rings he got for winning snowboarding gold in Turin (2006) and Vancouver (2010)—and the 2014 Sochi Olympics team ring

How long ago did you cut your hair?
Maybe four years ago? I ran into Carrot Top a while later, and he gave me this look like, "Oh, man, good for you, you escaped."

Are those paint drips on your T-shirt?
They are. For the launch, we did these leather jackets—you can see them on the wall. On one of them, we turned the jacket on its side and let the paint drip. It turned out so well, we put it on T-shirts.

What does the picture behind you say?
Before the 2006 Olympics in Turin, I was partying with this Finnish snowboarder, Heikki Sorsa. He disliked this other snowboarder, Antti Autti, and wanted me to beat him for the gold.

His teammate?
Yeah. He wrote something like, "If Shaun White beats Antti Autti for gold at the Olympics, Heikki Sorsa will buy Shaun White a flight to Finland." A buddy of ours kept it and got it framed for me. I did win, but I haven't collected.

Your jeans are giving me a Johnny Cash vibe.
I'm particular about my legs, man. These are the perfect straight leg. I got snowboard legs, and these fit me at my quads.

PHOTOGRAPH BY BRIAN GUIDO FOR BLOOMBERG BUSINESSWEEK

Interview by Jason Chen

PEGGY CHERNG

Co-chair and co-chief executive officer, Panda Restaurant Group

"I got a master's in math and a Ph.D. in electrical engineering. I specialized in computer simulation."

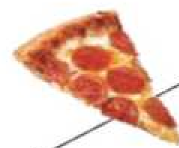
In grad school, 1973

Education

Clementi Middle School, Hong Kong, class of 1966

Oregon State University, Corvallis, class of 1970

University of Missouri, Columbia, classes of 1971 and 1974



"The biggest shock was food. I had never had pizza or Mexican."

"I had three children and wanted to spend time at home. My husband is the founder; I was running day-to-day operations."

With her daughters, 1989

Work Experience

1975–77
Engineering specialist, McDonnell Douglas

1977–82
Technical engineer, software department manager, Comtal-3M

1982–96
Operations manager, Panda Restaurant Group

1997–2003
President, CEO, Panda Restaurant Group

2004–Present
Co-chair and co-CEO, Panda Restaurant Group

"We built a system to simulate a battlefield for the Air Force. I enjoyed it, but sometimes I had to stay until 4 a.m. to get the design done."

"In the '90s, Panda Express expanded from malls to street locations. That helped us grow rapidly. We opened Hibachi-San in 1992 to capture the market potential for Japanese food."

"It's challenging to work with your spouse. You need to compromise. But it's gotten easier. Now we realize each other's strengths."

With her husband in an engagement photo, 1975

With her husband, Andrew (left), and then-CEO Tom Davin, 2008

"My oldest daughter is chief marketing officer, my second daughter manages investments for the Cherng Family Trust, and my youngest works with the Panda Charitable Foundation."

"We have more than 1,900 restaurants and are moving into India, Dubai, Korea, and Guam."

Life Lessons

1. "It's important to establish a development program so people can grow into the position they aspire to." **2.** "Focus on promotions from within." **3.** "A company is built on people first, guests second, and financials third."

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