Bloomberg Businessweek
April 16, 2018

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Apologia

Apologia Pro XT

Instagram Has a Facebook Problem

Bloomberg Businessweek

PHOTOGRAPH BY KIRSTEN LUCE FOR BLOOMBERG BUSINESSWEEK

▲ Border fencing near Nogales, Ariz.

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FEATURES

PURSUITS

Correction:
"Noto's Big Job at SoFi" (Finance, April 2) misidentified a SoFi customer who attended a company event in New York City. His name is Imran Vithani.

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Bloomberg Businessweek (USPS 080 900) April 16, 2018 (ISSN 0007-7135) H Issue no. 4565 Published weekly, except one week in January, February, April, June, July, September, and December, by Bloomberg L.P. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Executive, Editorial, Circulation, and Advertising Offices: Bloomberg Businessweek, 731 Lexington Avenue, New York, NY 10022. POSTMASTER: Send address changes to Bloomberg Businessweek, P.O. Box 37528, Boone, IA 50037-0528. Canada Post Publication Mail Agreement Number 41989020. Return undeliverable Canadian addresses to DHL Global Mail, 355 Admiral Blvd., Unit4, Mississauga, ON L5T 2N1. E-mail: bwkcustserv@cdsfulfillment.com. QST#1008327064. Registered for GST as Bloomberg L.P. GST #12829 9898 RT0001. Single Copy Sales: Call 800 298-9867 or e-mail: busweek@nrmsinc.com. Educational Permissions: Copyright Clearance Center at info@copyright.com. Printed in the U.S.A. CPPAP NUMBER 0414N68830

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Hammers, bats, and everything in between.
More than easy to use—downright delightful.
Sensors so small they're practically invisible.
Designed to disappear into your home
And blanket it with protection.
All at prices that are fair and honest.
This is SimpliSafe.
Home security. Done right.
Protecting Over
2 MILLION
Americans
Over 40,000
5-Star Reviews
Over A
DECADE
Of Protection
SimpliSafe
SimpliSafe
Right now get free shipping at
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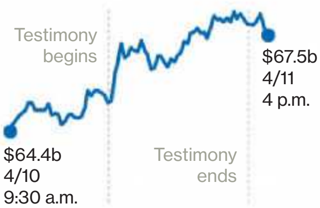
IN BRIEF

Americas

● During his congressional testimony, Facebook founder Mark Zuckerberg saw his fortune grow by $2.4 billion as his comments on the recent data breach buoyed the company's shares. ▷ 50

Zuckerberg's personal wealth



● Mexico's inflation rate slowed in March to 5 percent, the lowest level in a year.

In February the country's central bank raised interest rates a quarter of a percentage point, to 7.5 percent, in a bid to cool consumer prices.

● House Speaker Paul Ryan (R-Wis.) announced he won't run for reelection. Ryan made a mission of fighting the deficit; it's increased every year under his tenure, and by 2020 it's projected to top

$1t

The same day, John Boehner, Ryan's predecessor as speaker, said he's joining the board of Acreage Holdings, a multistate cannabis business.

● Bank of America said it will stop lending to gunmakers that produce assault-style weapons for nonmilitary markets. It becomes the second major bank to rethink its relationship with gun manufacturers after the Parkland, Fla., massacre; in March, Citigroup said it would ban its retail customers from selling bump stocks.

● Nike bought Invertex, an Israeli software startup, for an undisclosed sum. Invertex is best known for developing body-scanning technology.

● The anonymous collector selling a Warhol *Double Elvis* and two Picassos at Christie's in May is, in fact, embattled gambling magnate Steve Wynn, say people familiar with the matter. Picasso's *Le Marin* (above) is valued at an estimated $70 million. In March, Wynn also sold his remaining stake in Wynn Resorts.

Europe

● The value of the ruble plunged as a fresh round of U.S. sanctions took effect.

The measures, targeting some of Russia's richest men and the businesses they run, led Switzerland's Glencore to declare *force majeure* on some aluminum contracts it has with Rusal, a company controlled by sanctions target Oleg Deripaska.

● U.S. antitrust regulators gave Germany's Bayer the OK to buy Monsanto in a deal valued at

$62.5b

The Department of Justice relented once Bayer agreed to sell some of its seed and pesticide assets to BASF.

● European Union antitrust investigators seized documents and computer records from the London offices of 21st Century Fox. The raid presents a new obstacle in Fox's long-delayed bid to take over British broadcaster Sky.

DATA: COMPILED BY BLOOMBERG

Asia

● Swiss drugmaker Novartis said it would purchase AveXis for

$8.7b

The Illinois-based company, which specializes in gene therapy, developed a treatment for spinal muscular atrophy, a disease that affects 1 in 6,000 to 10,000 children.

● The U.S., the U.K., and France weighed their response to Bashar al-Assad's alleged chemical attack in Syria.

The Organization for the Prohibition of Chemical Weapons, an international watchdog, prepared to send fact-finders to the country, as Russia vetoed a United Nations resolution to create a mechanism to examine the attacks, which killed at least 42 people.

● "History shows us that import restrictions hurt everyone, especially the poorer consumers."

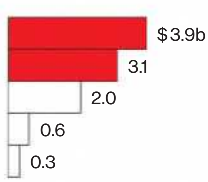
Christine Lagarde, head of the International Monetary Fund, warned governments to shun protectionism in a speech in Hong Kong.

● Airbus will reconfigure its A330 widebodied jet to install napping pods in the cargo bay, the company said. As Airbus tries to fend off smaller rivals, it's angling to hang on to orders for ultralong routes.

● A trade war between the U.S. and China could have unintended consequences for other nations. ▷ 10

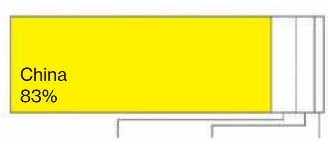
❶ China has threatened to levy an additional 25 percent tariff on U.S.-produced cars. That would hurt neither GM nor Ford—they have joint-venture factories in China—but it will ding the German companies that produce most American-made cars sent to China.

Estimated 2018 revenue from cars built in the U.S. and sent to China



❷ The 25 percent U.S. duty on steel from China and other countries will hurt Australian mining companies such as BHP Billiton, whose iron ore business depends on China's steel mills. Those companies stand to lose if a trade war depresses steel demand.

Destinations for Australian iron ore exports in 2016 and 2017



● Ant Financial Services, the fintech business carved out of Alibaba, prepared to raise

$10b

in a private funding round, Bloomberg News reported. The deal may value Ant at $150 billion, more than any other startup.

● Volkswagen decided to shake up its C-suite, ousting CEO Matthias Müller and replacing him

with Herbert Diess (left), who built his career at BMW. Volkswagen is still embroiled in a criminal investigation into its diesel-emissions-cheating scandal.

Africa

● Egypt's Madinet Nasr Housing is in talks to take over developer Sodic.

The combined company would have about $2 billion in assets in and around Cairo. Shares of both companies rose on the news.

● Camp Mukjar, Darfur's last refugee camp, closed after being in operation for almost 11 years. Since December, more than 4,000 residents have returned to their native Chad.

● On April 11 an Algerian military plane crashed shortly after takeoff, killing 257 people. It was the world's worst aviation disaster in almost four years.

Trade War Jenga

● The collateral damage in a U.S.-China fight could include Australia, Brazil, Guinea, Iran, Japan, Ukraine...

● By Peter Coy

By threatening a tariff war with China, Donald Trump has essentially thrown a deck of cards into the air. We don't know yet where each will land. While it appears that both the U.S. and China would suffer in a trade war, "the pattern of loss is going to be very difficult to predict," says Jamie Murray, Bloomberg Economics' chief European economist.

One of the most powerful laws in economics is the law of unintended consequences. As formulated by the American sociologist Robert Merton in a 1936 paper called "The Unanticipated Consequences of Purposive Social Action," it says that consequences "are occasioned by the interplay of forces and circumstances which are so complex and numerous that prediction of them is quite beyond our reach."

The law of unintended consequences strengthens the case for free trade by explaining that interventions in markets such as jacking up tariffs, however well intended, can make matters worse in ways that no economist or computer model can foresee. That's not a counsel for inaction, but it's a brief for stepping forward carefully. "History has proven that centralized industrial policy is not the most efficient way to run an economy," says Thomas Derry, chief executive officer of the Institute for Supply Management, an organization of purchasing managers based in Tempe, Ariz.

It's well understood that tariffs on imported goods raise prices for domestic businesses and consumers. Even President Trump, who has said trade wars are good and easy to win against countries that run big surpluses with the U.S., acknowledged their short-term downside on New York talk radio in early April, saying, "I'm not saying there won't be a little pain."

What's less familiar is that tariffs are blunt instruments that strike every nation in a supply chain, not just the ones being targeted. There are few interesting products anymore that can simply be labeled "American" or "Chinese." According to the Organization for Economic Cooperation and Development, as of 2011 only two-thirds of China's gross exports consisted of value that was added in China. Japan, the U.S., and South Korea supplied much of the value and therefore earned much of the profit (chart). The iPhone is an extreme example. Only about 1 percent of the retail price of an iPhone consists of Chinese labor costs, according to calculations for the iPhone 7 by Jason Dedrick of Syracuse University and Kenneth Kraemer of the University of California at Irvine.

Globalization almost guarantees casualties from friendly fire. Take the U.S. tariffs on steel and aluminum. Chinese producers buy iron ore for steel from Australia, Brazil, India, Iran, South Africa, and Ukraine, and bauxite for aluminum from Australia, Brazil, and the poor West African nation of Guinea. All will be affected.

It's no easier for the Chinese to target their retaliation. Chinese tariffs on American-made cars seem like a hardship for Detroit. But General Motors, Ford Motor, and Fiat Chrysler make most of their cars for the Chinese market through joint ventures in China. In reality, the main victims of China's tariffs would be the shareholders and American employees of two German companies, Daimler AG and BMW AG. They export cars to China from plants in the South–Mercedes-Benzes in Tuscaloosa, Ala., and BMWs in Spartanburg, S.C.

Or take soybeans. If China puts a 25 percent tariff on American soybeans, several things could happen. The Chinese could keep buying the American beans but pay more for them. Or they could switch to Brazilian soybeans. But Brazil wouldn't be able to ramp up production enough to make up for all the missing American beans, says Vinicius Ito, senior vice president for derivatives at Ecom Trading, a Swiss-based commodity merchant. So American farmers might sell their soybeans to countries that used to be Brazil's customers. Some American farmers might also switch some of their acreage to other crops, such as corn and wheat, which would put downward pressure on the world prices for those crops. American livestock producers could benefit from lower feed prices, says Wallace Tyner, a Purdue University agricultural economist.

As the soybean scenarios show, the global trading system is like a heart that adapts to damage. When one artery is blocked, collateral vessels grow to do its job. Computer models show that the harm of tariffs diminishes over time as suppliers and consumers learn to adjust. But the damage never goes away completely because the tariffs force commerce away from its ideal configuration. A tariff, like any other tax, creates a deadweight loss by stopping transactions that would benefit both buyers and sellers.

The Trump administration is correct that China charges higher tariffs on American products, such as cars, than the U.S. charges on Chinese ones. China unfairly forces American companies to license their valuable patents to Chinese venture partners as a condition for doing business in the country. And China erects nontariff barriers to foreign ▶

China's Exports Aren't Entirely Chinese

In 2011 components and raw materials from other countries accounted for one-third of the value of products shipped from China—and presumably a similar share of the profits.

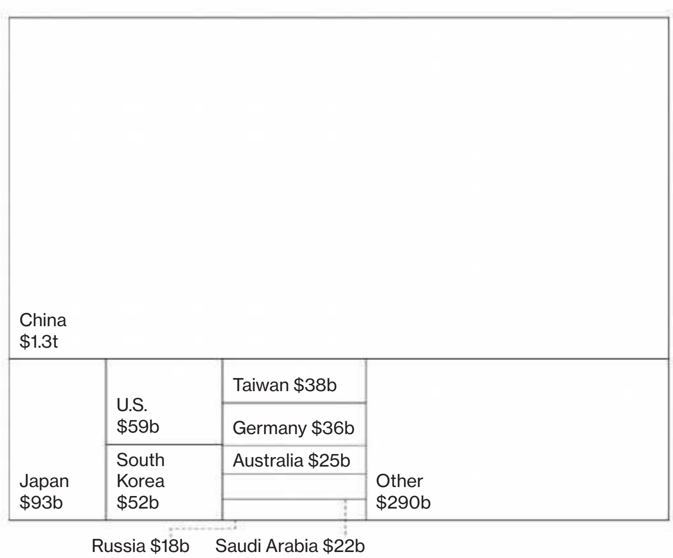


ILLUSTRATION BY CHRIS NOSENZO; DATA: ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

◀ companies to give an edge to favored domestic ones in sectors such as tech and finance.

The question is what to do about it. On April 10, Trumpian toughness seemed like it might be paying off when Chinese President Xi Jinping pledged to cut tariffs on cars and further open the financial sector in his keynote address at the Boao Forum for Asia conference. But ratcheting up the pressure on China as publicly as Trump has done could backfire in the long run. China nurses a sense of national humiliation over the century of foreign domination that preceded the Chinese Communist Revolution in 1949. Bloomberg News reported on April 10 that Beijing has rejected a U.S. request to stop subsidizing industries related to its Made in China 2025 initiative.

While a trade war with the U.S. would be disastrous for China, national pride might impel Xi to fight on. The country has several levers remaining. It could block Qualcomm Technologies Inc.'s pending purchase of NXP Semiconductors N.V. as part of an effort to bolster Chinese chipmakers. It could keep life difficult for American financial institutions and other service providers, which collectively run a trade surplus with China. It could allow—or force—its currency to depreciate, which would make its products more competitive. In extremis, it could stop selling the U.S. rare earth elements, which are used in high-tech magnets among other devices and are produced mainly by China.

The list of Chinese products that the U.S. wants to slap 25 percent tariffs on is bemusing: malaria diagnosis kits, human blood antiserum, chain saws, pump-action shotguns, railroad tracks, and turbo propellers, to name a few. "It's hard to pick up what the rhyme or reason is," says Dartmouth College economist Robert Johnson.

Derry, the CEO of the Institute for Supply Management, says he thinks Trump is playing chess with the Chinese. "It's to create maximum political pressure and get all these issues on the table," he says. Maybe. But American business leaders are getting nervous about the consequences of Trump's threats, intended or otherwise. Even the U.S. Chamber of Commerce, which has been cautious about inviting the president's wrath, posted an essay on its website by its chief economist, J.D. Foster, that included this phrase about the state of the U.S. economy, directed to no one in particular: "This is a rare moment. Enjoy it, and don't screw it up." Ⓑ *—With Keith Zhai, Tatiana Freitas, Gabrielle Coppola, and Toluse Olorunnipa*

■ VIEW

To read Mohamed A. El-Erian on navigating volatility and Noah Smith on Bitcoin's lessons for market bubbles, go to Bloombergview.com

Macron's Battle To Put France Back on Track

● Rail strikes are a predictable response to labor reforms. The president should stand his ground

French President Emmanuel Macron's fight with public-sector rail workers will show how serious he is about economic reform. Unions are promising two days of disruption each week for the next three months unless he abandons his plan to expose the network to a whiff of economic reality. Macron should stand his ground.

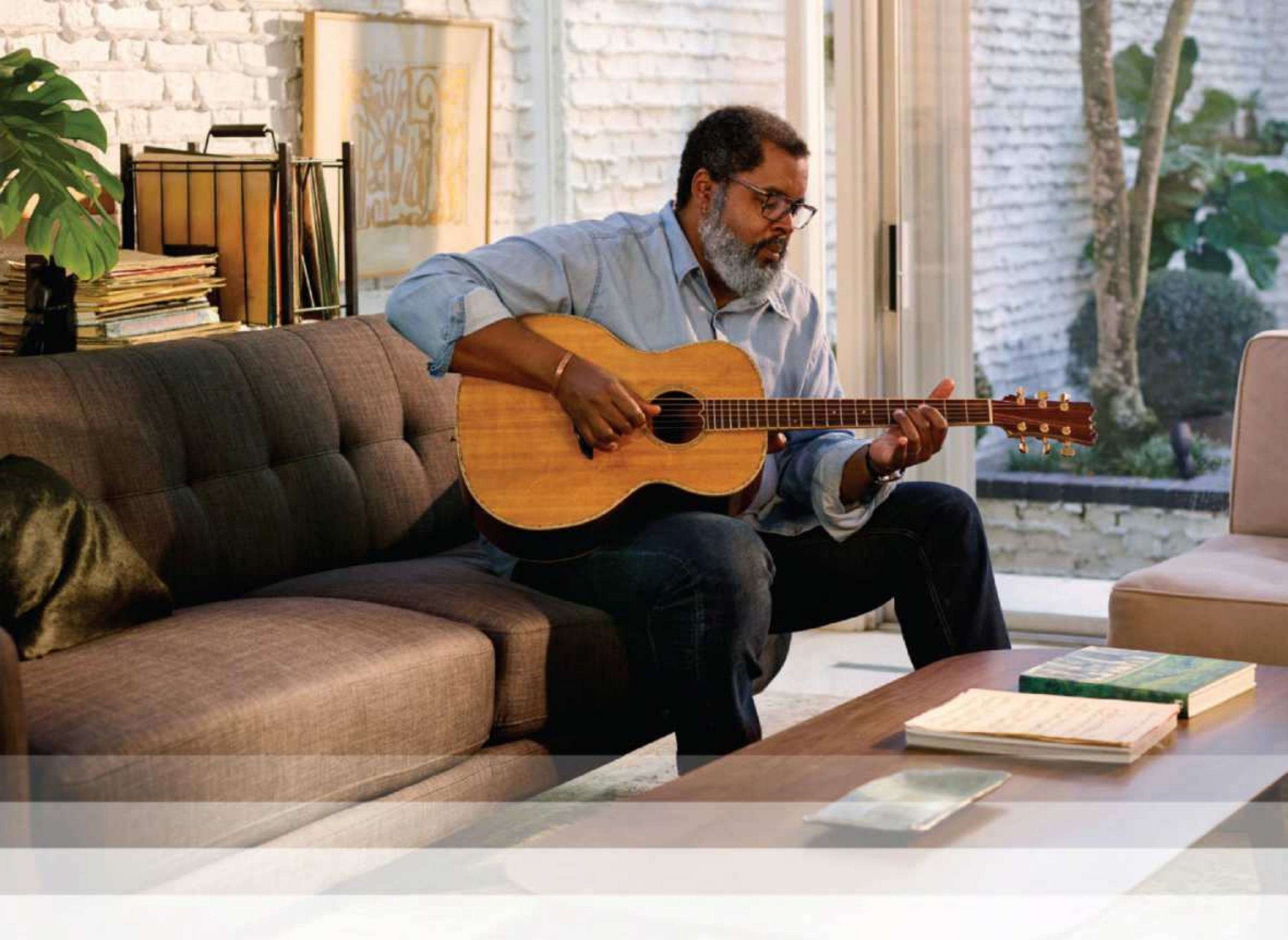
A government-commissioned report published in February showed just how badly France's rail networks are failing. They receive €14 billion ($17.3 billion) in state subsidies each year but still run an annual deficit of €3 billion. Their debt is €45 billion and rising. Despite these outlays, service quality—already worse than in Germany and other European countries—is deteriorating.

Meanwhile, railway workers enjoy lifetime employment, automatic pay increases, free tickets for their families, and retirement at the age of 52. Macron wants to narrow these exorbitant privileges—only for new hires, by the way, not for the workforce as a whole. The unions are refusing to give way.

Employees at state-owned Air France-KLM, garbage collectors in the left-wing CGT union, teachers, nursery workers, and other civil servants have also been striking. Macron has loosened restrictions on hiring and firing, cut business taxes, and proposed wide-ranging changes in education, training, pensions, and other previously forbidden areas. Defeat on his rail proposals would embolden opposition and endanger this broader agenda.

The president has a mandate to stick to his guns. He won office vowing to reduce the bloated public sector, liberalize the labor market, and free the economy to create growth and jobs. His victory was a sign that sentiment in France is moving against organized labor's traditional perks. In office, he's consulted widely and been open—sometimes too open—to tactical compromise, appeasing the Left with gestures of economic nationalism and the Right with tough talk on immigration. The rail strikes are a moment not for more accommodation but for standing firm.

It's easy to forget that only about 8 percent of French workers are unionized. Public support has allowed organized labor to punch far above its weight. Today, the ground is shifting, and Macron needs to press his advantage. The president must convince the country as a whole that he's a better defender of its interests than the unions. Ⓑ



● New medicines are presented at the American Association for Cancer Research meeting in Chicago

● Appliance maker Whirlpool holds its annual shareholder meeting on April 17

● United Continental Holdings, parent of United Airlines, releases first-quarter earnings on April 17

Generics Makers Need a Different Strategy

Plunging prices have led manufacturers to stop producing some common but critical drugs

The mood at the annual generic drug industry confab in Orlando in February was especially somber. The discussion during one panel was all about plunging drug prices, consolidation among drug-buying groups, and the increasingly cutthroat nature of the business. A top executive at Israel-based Teva Pharmaceutical Industries Ltd., the No. 1 supplier of generics in the U.S., which is laying off 14,000 employees and shuttering about half its 80 manufacturing plants, tried to lighten the mood with gallows humor: "Teva certainly has no challenges," said Brendan O'Grady, ▶

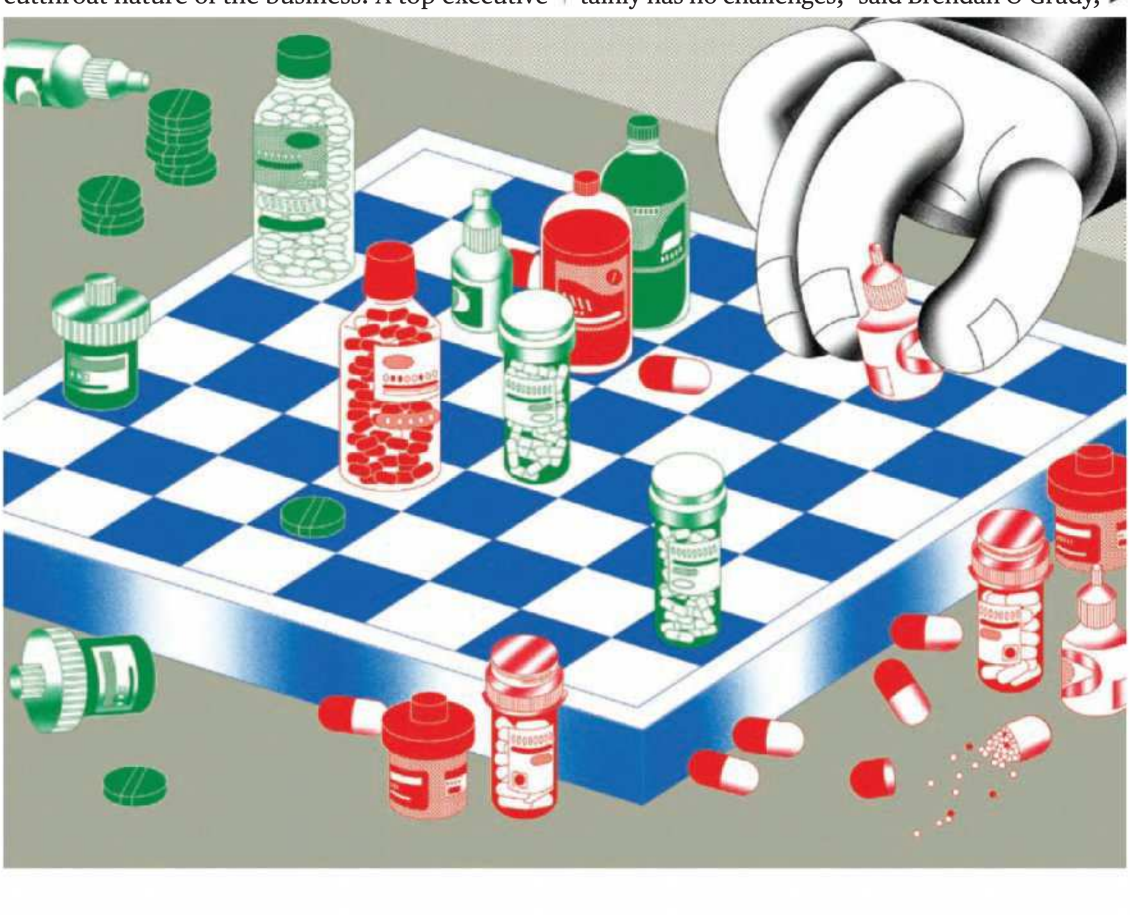


ILLUSTRATION BY INKEE WANG

April 16, 2018

Edited by James E. Ellis and David Rocks

◀ the executive vice president who heads its North American commercial business. The joke hit the mark.

The generic drug industry, which supplies almost 9 of 10 drugs prescribed in the U.S., is in crisis. These companies aren't the superstars making cutting-edge cancer and hepatitis treatments that are priced through the roof. They're the producers of bread-and-butter pills consumers often take for granted: antibiotics, arthritis treatments, medicines for diabetes and high blood pressure. With the profitability of these prosaic pills fading fast, companies are exiting important parts of the business. "We're one of the companies that continues to make antibiotics, and we've asked ourselves for years why we continue to still make them," O'Grady said at the conference.

The industry's woes can be summed up in two words: plummeting prices. Far removed from the pharmacy pickup counter is an arcane world of supply chains ruled by a tightknit band of players forcing prices for most generic drugs lower and lower, both with their increasing purchasing clout and because they're able to select from an ever-growing universe of generic drug suppliers.

The top three manufacturers—Teva, Mylan, and the Sandoz generic drug division of Novartis AG—control only about a third of the market by sales. That leaves lots of smaller players vying for business. Industry executives say new entrants have been popping up—sometimes small outfits led by former managers of other generics companies who hire contract manufacturers around the globe to make their drugs. They sometimes elbow into the market by offering lower prices.

That flies in the face of the public perception that all medical costs are spiraling upward. While many health-care products, including branded drugs—those still under patent—routinely command big price hikes, that's not the case with most generics. A deflation tracker developed by researchers at Evercore ISI Research shows generic drug prices are falling about 11 percent a year, while brand-name drugs are rising about 8 percent a year.

About five years ago middlemen in the drug-delivery supply chain started to form buying consortia to gain more leverage over drugmakers. The consolidation has since become so extreme that just four groups now control 90 percent of drug buying in the U.S. And two of those four are joining forces to purchase generics, which likely will lower prices further.

The squeeze is leading some manufacturers to stop making some critical low-margin drugs. "We have supported the consortiums to the point where we're discontinuing products and shutting facilities," says Paul Campanelli, chief executive officer of Endo International Plc, the fourth-largest generics maker in the U.S. "We are not in the position to provide more price reductions."

Endo has slashed its workforce in half, to about 3,000, over the last 18 months, closing manufacturing facilities in Huntsville, Ala., and Charlotte. The drugmaker's generic division, known as Par, has stopped making 85 products. Endo was one of the biggest producers of the popular blood pressure medication lisinopril, for example, but decided to stop manufacturing it because the drug was no longer making enough money.

"Already this year, Par has had requests for six different products. 'Can you make A, B, C?' The answer is no," Campanelli says. "And even if we could, pricing is still so low we wouldn't be able to bring back a product."

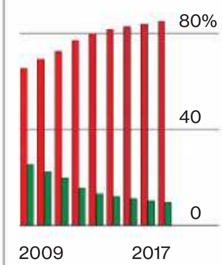
Campanelli didn't specify who asked him to start making the drugs he'd discontinued, but he's likely talking about one of four buying groups: Red Oak Sourcing; Walgreens Boots Alliance Development, known as WBAD; ClarusONE Sourcing; or Econdisc Contracting Solutions. WBAD is in the process of joining forces with Econdisc, which Adam Fein, CEO of consultant Drug Channels Institute, says will combine generic drug purchasing by the second- and fourth-biggest buyers in the market. Such groups buy drugs sold through retail giants like CVS Health, Target, Walgreens, and Walmart. Fein calls the big groups the "Four Horsemen of the Generic Apocalypse" and wrote in a blog post that "the forecast calls for generic pain."

The drug-buying consortia say they're not the problem. "For many complex reasons, generic drug manufacturers are being challenged to become more efficient and institute more nimble supply chains," says Econdisc President Jan Burkett. "The notion that group-purchasing organizations are somehow to blame for generic drugmakers' woes is a red herring."

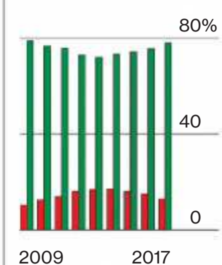
The credibility of generic drugmakers has been hurt by such incidents as the public outcry in 2016 over Mylan's boost in the price of the life-saving, anti-allergy shot EpiPen to about $300 a shot from around $50 when it acquired the device in 2007. There's also a price-fixing probe hanging over the industry: A group of attorneys general from 47 states and the District of Columbia is investigating alleged price fixing among generic manufacturers during past years when prices shot up for specific drugs. Their complaint alleges generic drug company executives agreed to raise or maintain prices

● Prescription sales, U.S.
■ Generics
■ Brands

Share of prescriptions



Share of spending



in tandem over dinner parties, phone calls, and text messages.

Lawmakers are going after the industry, too. A new Maryland law prohibits price gouging in generics and allows the state's attorney general to challenge generic drug price hikes. But executives say these measures couldn't come at a worse time. "We constantly talk about the portfolio of the business eroding in price," says Robert Matsuk, Glenmark Pharmaceuticals Ltd.'s president for North America. "And yet we're getting these new bills about being price gougers."

Glenmark, based in India, is a small player with ambitions to file 15 to 20 new generic drug applications in the U.S. this year. But with prices in retreat, the company may forgo launching a newly approved drug if it doesn't look like it will make money. "The question becomes ultimately how many people are going to exit, and where will the market find a new equilibrium?" says Matsuk.

The losses keep mounting. Sandoz, the third-biggest manufacturer by sales, reported its U.S. revenue slid 17 percent in the fourth quarter of 2017 and cited consolidation among buyers as a reason. Novartis has said it's considering selling off part of the business. Mylan, the second-biggest, said price deflation in the fourth quarter was even more pronounced than in prior quarters. "You get to prices as cheap as dirt, and then you wonder why companies are having to make harsh decisions," Heather Bresch, Mylan's CEO, said at the industry gathering in Orlando.

Before the buying groups formed, drugmakers such as Teva or Endo were able to offset the losses from an unprofitable drug by selling other medicines at a higher markup. Robert Stewart, incoming CEO of Amneal, the No. 5 generic drug company in the U.S. once its pending merger with rival Impax is completed, says that's no longer the case. "There's almost really no benefit to having that full-suite portfolio anymore."

Jeff Watson, president of Canadian generic drugmaker Apotex, says he sees the potential to fill gaps if and when shortages crop up. "We are anticipating more of it, and we are looking at what would be our opportunity to respond."

If shortages do occur, prices could begin to rise. That would be good news for companies—if not for patients.

Paul Bisaro, an industry veteran who will be executive chairman of the Amneal-Impax combination when the merger is complete, said earlier this year that makers of generics need to think about using companies such as Amazon.com, FedEx, or United Parcel Service to get drugs directly to consumers. But that's a long way off.

Until then, the cuts keep coming. As a cost-saving measure, Endo this year decided to move much of its generic research and development division to India from the U.S. On a recent March afternoon at Endo, Campanelli had to step out of an interview for a few minutes to thank a handful of employees for their hard work. It was their last day. —*Cynthia Koons*

THE BOTTOM LINE Generic drugs account for more than 90 percent of U.S. prescriptions. Overcapacity and the emergence of big purchasing groups have slammed manufacturers' margins.

Norwegian Bets New Jets Can Eat its Debt

● Investors are increasingly wary of the airline with $99 New York-London fares. Its CEO says it'll all be fine

As a pilot in the Royal Norwegian Air Force at the height of the Cold War, Bjørn Kjos spent his days chasing Russians out of NATO airspace, a game of cat and mouse that was risky, terrifying—and utterly exhilarating. "It was the best life you can live," Kjos says, running his fingers over one of two model fighter jets he keeps in his office.

● Kjos

These days, the 71-year-old chief executive officer of Norwegian Air Shuttle ASA is again flying perilous skies—though the risk comes from bankers, not the cockpit of a MiG. Norwegian, which has expanded from a low-cost regional carrier into a globe-spanning colossus shaking rivals with trans-Atlantic fares as low as $99, lost almost $250 million in the fourth quarter of 2017—at a time many airlines are seeing near-record profits. Investors, convinced Norwegian's shares are defying gravity, have made it the industry's most-shorted stock. ▶

DATA: IQVIA. KJOS: CHRIS RATCLIFFE/BLOOMBERG

◀ Kjos (pronounced Shoos) blames the trouble on a pilot shortage and engine glitches that delayed the arrival of new jets. Those difficulties were compounded by the cost of preparing 38 new planes for service—the most ever for the company in one year. With $2.9 billion in debt and expenses of $4.5 billion for aircraft in 2018 and 2019, Kjos in March was forced to sell new shares equal to almost a quarter of the company's market value to avoid breaching minimum capital requirements demanded by lenders. This year, he says, things will start looking up. Short sellers "have been betting against us since 2002," when the company began operating as a low-cost carrier, says Kjos, who controls 27 percent of Norwegian. "They're going to lose that bet."

After slowly building the company by flying winter-weary Scandinavians to sunny locales across southern Europe, in 2013 Kjos began offering long-haul flights such as Oslo to New York and Stockholm to Bangkok. Today Norwegian flies 60 intercontinental routes and is on track to have 193 planes by 2019, double the number in 2015. Kjos has established subsidiaries in Britain and Ireland to win regulatory permission for trans-Atlantic and Asian routes from more than a dozen European cities including London, Paris, and Barcelona. And he's establishing a separate unit in Argentina that he aims to expand into a regional carrier with 70 aircraft and flights across Latin America.

Key to his strategy is a fleet of newer, fuel-sipping aircraft. By yearend, Norwegian will have 32 Boeing 787s, a plane made largely of lighter composites that allow it to burn 20 percent less fuel than older jets. And starting next year, he'll get the first of 30 long-range Airbus A321neos, 200-passenger, single-aisle aircraft that can fly for up to eight hours, allowing direct links such as Copenhagen to Boston. "You have to get to a critical fleet size, and a modern fleet, and then you have an efficient operation," Kjos says.

Creating that fleet, though, means piling on debt. In 2012, Norwegian made Europe's largest-ever aircraft purchase, 222 jets with a book value of $21.5 billion—largely financed by loans—to be delivered over the course of a decade. Although Kjos aims to create one of the industry's most-efficient fleets, his expenses per passenger are climbing. That measure of efficiency dropped sharply from 2008 to 2013, before leveling off and then bouncing back up a bit last year. "The investment debate for Norwegian distills down to deciding how quickly it can climb out of this hole," says Andrew Lobbenberg, an analyst at HSBC in London.

Kjos also faces growing competition as rivals old and new mimic his approach. British Airways, Virgin Atlantic, American, and Delta have introduced no-frills trans-Atlantic fares to attract the budget travelers Kjos is after. BA's parent, International Airlines Group, has set up a low-cost unit called Level that's offering long-haul flights from Barcelona and Paris. And Primera Air is flying narrow-body jets across the Atlantic just as Norwegian does, with service to Boston and New York from London and Paris starting this spring.

A maxim Kjos brought to business from his six years as a fighter pilot is to "avoid risk zones," and if you find yourself in one, "always have a Plan B to get out." These days, his Plan B is to sell as many as 120 planes—both recent models and older jets—which Kjos says he can do without compromising operations. That may be wishful thinking, says Bloomberg Intelligence analyst George Ferguson. Though Norwegian might get $1.5 billion or more for the aircraft Kjos wants to sell, many of them would need to be replaced with newer planes if he doesn't want to shrink the airline. That would mean more debt—from increasingly cautious lenders. "As Norwegian's situation gets more difficult, creditors will want to hold more of the company's cash to hedge risk," Ferguson says.

Kjos points out that the airline scrapyard is packed with discount concepts backed by big carriers: BA's Go Fly, KLM's Buzz, and SAS's Snowflake all "melted away," and he predicts the same for newer long-haul projects. Once he replaces older jets with more efficient models, he insists, he can compete with anyone in the industry. "You cannot think you are flying low-cost with a bunch of old aircraft," he says. "In the long run you can never beat low cost with high cost." —*Richard Weiss and David Rocks, with Jonas Bergman*

Less Wiggle Room Than Its Peers

Long-term debt-to-equity ratio as of quarter ended Dec. 31, 2017

*QUARTER ENDED SEPT. 30, 2017; DATA: COMPILED BY BLOOMBERG

THE BOTTOM LINE CEO Kjos says short sellers are wrong to target his airline and that once his fleet of new, fuel-sipping planes is complete, his low-cost model will be unbeatable.

Cattlemen Have a Beef With the USDA

Congress since 1966 has established 22 agricultural industry-backed research and promotion boards, which have funded iconic campaigns such as “Got Milk?,” “The Incredible, Edible Egg,” and “Beef. It’s What’s For Dinner.” So-called checkoff fees to pay for such marketing became mandatory in the 1990s and today add up to about $700 million a year. Now ranchers are suing to end the fee mandate. —*Leslie Patton*

Each time a head of cattle is sold in the U.S., part of the proceeds goes to the beef checkoff fund. Average auction cost of a 1,200-pound steer is about

$1.4k

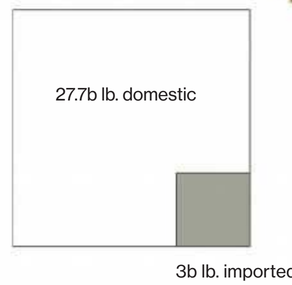
from which

$1

goes to the fund

Ranchers-Cattlemen Action Legal Fund United Stockgrowers of America, a group representing independent ranchers, is suing the U.S. Department of Agriculture in federal court, arguing that the fees violate the First Amendment by forcing its members to subsidize speech with which they don’t agree. Another complaint: The ads also benefit foreign meat sold in the U.S.

U.S. beef market (projected 2018)



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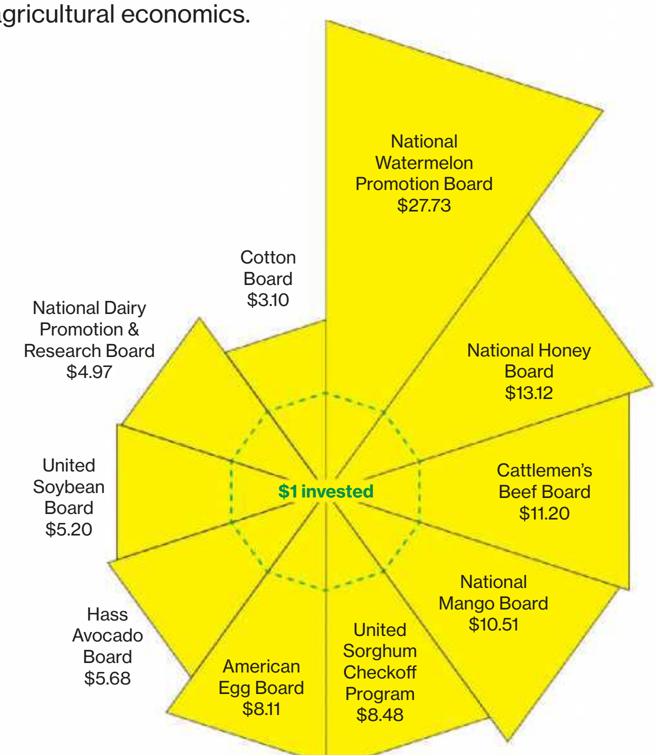
A Texas A&M University study found that, on average, each dollar spent by ag promotion boards yields $9 in additional sales. “The programs are highly effective,” says Gary Williams, professor of agricultural economics.



Boards Mine New Markets

Blueberries recently landed on the menu at steakhouse chain Sizzler USA Inc. in the form of a blueberry lemonade—considered a big win for the U.S. Highbush Blueberry Council, the board that worked on bringing the drink to the 123-outlet chain’s menu. In May, Sizzler will add more blueberries, as part of a spinach salad with almonds and feta.

1.8 lb.

2017 per capita consumption

In March the Sonic fast-food chain introduced Sonic Signature Slingers—cheeseburgers made with a beef and white-button-mushroom patty. A sandwich clocks in at 340 calories, vs. 710 for a regular Sonic cheeseburger, promising all the flavor “with none of the guilt.” The Mushroom Council, a promotion board, helped craft the menu item.

2.9 lb.

2017 per capita consumption

Future Fees?

Organic growers don’t pay into the marketing programs, at least not yet. In 2015 the Organic Trade Association proposed an organic promotion program. The USDA is collecting public comments on the proposal, which it estimates would generate $30 million in fees annually.

ALAMY

● Cybersecurity company RSA hosts its annual industry conference, starting on April 16 in San Francisco.

● IBM reports earnings on April 17. Investors will look to mainframe sales as a bellwether for hardware growth.

● Netflix's quarterly earnings will test whether the company can keep outperforming its subscription goals.

That Kid Playing *Bubble Shooter* Is a Pro

PHOTO ILLUSTRATION BY 731; PHOTOS: GETTY IMAGES (2)

● Esports competitions, like the rest of the video game industry, are shifting to smartphones

For much of the past six years, Andrew Paradise felt like an outsider in esports—a new revenue source in the video game industry, built around enormous multiplayer competitions. Skillz, his mobile esports platform, was small in comparison and deemed fringe by his peers. They were focused on PC games with dazzling, hardware-hungry visuals. Not phones.

But things are different now. At the annual Game Developers Conference held each March in San Francisco, on the day dedicated to esports, one of the first panels focused on mobile game competitions. More than 200 developers visited the Skillz Inc. booth. "Mobile esports was the hottest thing at GDC," Paradise says. "The industry is shifting very quickly."

Esports contests have gone from peripheral affairs to massive spectacles, with investment from billion-dollar game publishers, broadcast TV networks, and venture capitalists pouring into teams adept at PC games. Mobile games such as *Angry Birds* and *Candy Crush* attract more players—2.2 billion worldwide, according to researcher Newzoo—but generally not the kind who'll train for tournaments. Now that phone hardware is good enough to run more complex games, even hardcore players are shifting their attention to phones. Six-year-old Skillz, the mobile esports leader, says it hosts more than 1 million tournaments a day and has doubled its monthly revenue, to $16 million, ▶

◀ in the last nine months, putting it on pace to blow past $200 million in the next year.

Skillz is a central hub that can turn any game into a contest among friends or strangers, either by pitting players against one another or by ranking their scores. The company works with more than 8,000 developers to tweak their games for its 15 million players, who enter tournaments of as few as two people or as many as 10,000 and win prizes based on their results. (Average entry fee: about $2.) Skillz says it matches players based on ability. Cash prizes are paid via check or PayPal, and occasionally a new car or paid vacation is up for grabs. There are also free contests without cash-value prizes.

Newzoo predicts mobile games will account for a majority of game industry revenue, roughly $65 billion, by 2020. Paradise says he expects the $900 million esports business to do the same. "Software follows hardware," he says, "and mobile is the dominant hardware." The average Skillz gamer spends about an hour a day on the platform.

Unlike in traditional esports, most Skillz players are women, Paradise says, including 7 of last year's 10 biggest winners, who each collected more than $200,000. The No. 1 player in 2017, who goes by the handle "yutourmaline," won just shy of $421,000; that would rank her among the top 25 in the better-financed PC esports.

Skillz's players include a diverse group of obsessives, many of whom drip candle wax onto their phones and scrape it off before each match, hoping the remaining residue will improve their grip on the screen. One member of last year's top 10, Harvard sophomore Jennifer Tu, estimates that she spends about 10 hours a week on Skillz as a study break or on the shuttle between classes. Her go-to game is *Solitaire Cube*. "You have to be crazy good to make it big on a popular PC game," says Tu, who also plays *League of Legends*. "Skillz is more low-key."

The son of two tech entrepreneurs, Paradise started coding when he was 6 years old. The following year he built his first video game from scratch in Pascal, an early programming language. He kept playing and thinking about games through the end of his 20s, when he sold mobile checkout startup AisleBuyer LLC to Intuit Inc. for $100 million. He started Skillz soon after with fellow AisleBuyer alum Casey Chafkin, now Skillz's chief operating officer. (Chafkin's brother, Max, is a *Bloomberg Businessweek* staff writer.)

Big-name competitors are moving in on Skillz's turf. In the past month, *Fortnite* and *PlayerUnknown's Battlegrounds*, two of the world's top-grossing computer games, released mobile versions. (As of April 11, they're the two top free apps in the iOS App Store.) Shortly after, Finnish game developer Supercell Oy, last year's highest-earning mobile publisher, announced the formation of a 36-team league that will compete using its superpopular game *Clash Royale*.

Some of the biggest esports teams signed on for the Clash Royale League, including NRG Esports, co-owned by Skillz investor Andy Miller, who's also part owner of the NBA's Sacramento Kings. "I'm really bullish on mobile gaming," says Miller, an entrepreneur who sold Quattro Wireless to Apple. "The tech is there, and everyone has a phone."

Microsoft Corp. and Amazon.com Inc. are experimenting with similar services. Microsoft recently bought PlayFab Inc., which helps developers make and publish games, and Amazon just launched GameOn, a direct Skillz competitor. Paradise says that's validation. "Amazon doesn't enter industries where they don't see massive market opportunities," he says. "And they won't be the last." *—Eben Novy-Williams, with Joshua Brustein*

● The number of (mostly casual) mobile gamers around the world tops

2.2b

THE BOTTOM LINE Skillz, the early leader in mobile esports, doubled its monthly revenue, to $16 million, in less than a year. But it faces tough competition, including from Supercell and Amazon.

Farm to Table? Check the Blockchain

● Food giants are betting on digital ledgers to speed recalls and improve accountability

ILLUSTRATION BY GABRIEL PUNSALANG

Did the chicken you buy at the supermarket have a nice life, roam free, and eat healthy grains? If you're the kind of person who cares, Carrefour SA, the big French grocery chain, has the bird for you. Every chicken it sells under its house brand can serve up its own life story, thanks to the wonders of blockchain software. All you need to do for the deets is scan the label with your smartphone.

This is the same technology that serves as the backbone of Bitcoin and other cryptocurrencies. The grocery giant isn't just trying to appeal to discriminating foodies. It wants to do whatever it can to ensure its products aren't tainted, part of a broader industry trend espousing the as-yet-unproven promise that blockchain can improve food safety.

Nestlé, Dole Food, Unilever, and Tyson Foods are working with their biggest customer, Walmart, to implement a blockchain platform built by International Business Machines Corp. Kroger and JD.com, China's second-largest e-commerce operator, are also using the IBM platform. Carrefour developed its own system in-house. "Blockchain will do for food traceability what the internet did for communication," says Frank Yiannas, vice president for food safety and health at Walmart Inc.

Yiannas cites estimates that for every 1 percent reduction in foodborne diseases in the U.S., the economy would benefit by about $700 million from increased productivity, thanks to reduced illness and fewer days lost at work.

Not everyone is so enthusiastic. Critics say blockchain can be a valuable piece of the food safety puzzle but caution that it can easily be gamed. The online ledger requires manual entries, leaving it prone to human error or intentional manipulation that could compromise the data chain, says Mitchell Weinberg, chief executive officer of Inscatech Corp., which investigates food sourcing for evidence of fraud. "Wouldn't criminals know how to cheat the blockchain?" he asks. "How would it help with anything fluid or ground-up or chemical in nature? Those can be easily adulterated, and blockchain will never know how, when, or by whom."

Issues beyond what the blockchain technology aims to cover were the problem in China in 2008 when melamine, a white crystalline compound used in plastics production, was added to water-diluted milk to raise its protein content. At least six infants died and almost 300,000 fell ill after consuming the altered milk, prompting a massive product recall.

By making suppliers more accountable, proponents say adoption of the technology would help reduce some of the headline-grabbing food tampering of recent years: wood pulp blended with Parmesan cheese, horse meat passed off as minced beef, and plastic mixed into frozen chicken nuggets. Health dangers aside, recalls resulting from such meddling cost the food industry as much as $49 billion a year, according to the Grocery Manufacturers Association. The Washington trade group estimates that 10 percent of the food purchased in the U.S. is adulterated, meaning it's a potential health hazard.

Reducing waste is another goal. Recalls contribute to the 133 billion pounds of food the U.S. Department of Agriculture estimates is lost in the country every year. Total food waste (including things like restaurant scraps) accounts for at least 30 percent of the U.S. food supply, the USDA says.

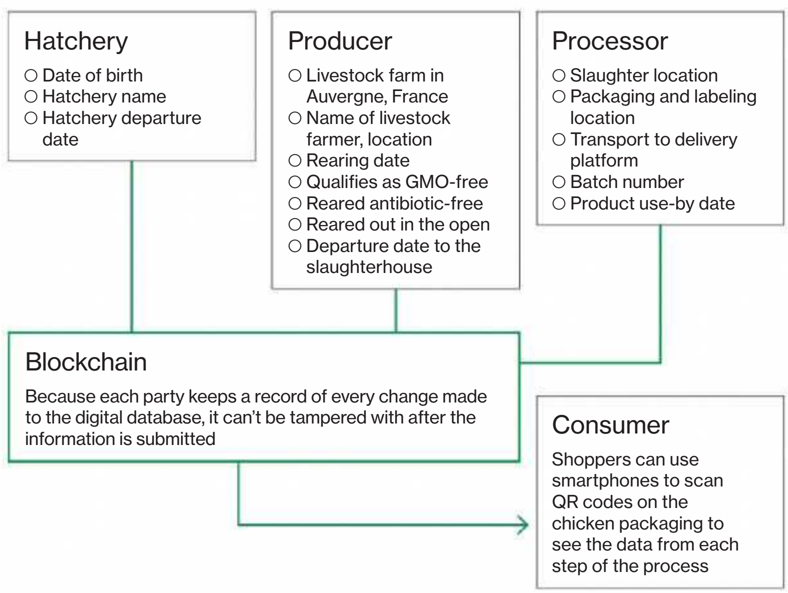
Let's say there's a norovirus or listeria outbreak associated with spinach at your local grocer. The current system may require recalling vast amounts of spinach from around the country, because it's difficult to identify the origin of contaminated food. With blockchain, grocers can quickly pinpoint the source in a single region or even on a single farm.

Once food is in stores, blockchain data—combined with sensors and computer models—could help grocers better gauge the shelf life of produce, according to Donna Dillenberger, an IBM research fellow. Historical information, collected from temperature sensors on the shelf, could be run through predictive models to determine the optimal temperature for, say, strawberries.

Blockchain is making its way to sea as well. The World Wildlife Fund is testing a combination of radio-frequency identification sensors and ▶

Tracing Food Via Blockchain

Agriculture companies are testing the use of blockchain software as a way to establish their products' bona fides. Each party is supposed to provide details related to its link in the supply chain. Here are the data points for a single Auvergne chicken sold by French supermarket chain Carrefour.



DATA: CARREFOUR

◀ blockchain software to track the transport of a tuna from fishing boat to processing plant, according to Bubba Cook, the western and central Pacific tuna program manager. The idea is to discourage the introduction of illegally caught fish into the food supply. It won't be a foolproof system, Cook acknowledges, but it's at least an opportunity to cast some light on the food industry's often-shady supply chain. —*Luzi-Ann Javier*

THE BOTTOM LINE Carrefour is an early adopter of blockchain food safety tech. Walmart and most of its Big Ag partners are investing in similar gear for their livestock and produce.

Science Without the Scientists

● In pilot projects, AI software is filling in for graduate researchers

Inside a lab at Carnegie Mellon University in Pittsburgh, a robot arm lifts a bottle filled with chemical reagents and carries it over a bank of test tubes, where it dispenses a precise number of drops into each one. The arm swivels, replaces the bottle, swivels again, and picks up another container. Gracelessly, tirelessly, the machine thrums on, carrying out test after test. The experiments are part of an ongoing project to determine the ideal chemical makeup for high-capacity electric car batteries. Soon, machines won't just run the experiments–they'll devise them, too.

Over the next few months, an artificial intelligence algorithm will gradually take over the planning of experiments based on the battery test runs. Once fully functioning, this robot graduate student will decide how to modify the concentrations of the ingredients it's testing. "It's automating not only the manual part of doing the experiment but also the planning part," says Brian Storey, the Toyota Research Institute scientist leading the project.

Science has long been considered one of the human activities least likely to be farmed out to robots. That's changing as sensors, sequencers, and satellites churn out digital information by the terabyte. "We just cannot handle the amount of data anymore," says Manuela Veloso, who heads Carnegie Mellon's machine learning department. It's a daily concern for biotech companies and a wide range of other businesses struggling to make sense of the unprecedented swell of raw information.

AI software designed to identify and sort patterns has been deployed across a wide swath of science, from marine biology (identifying wild dolphin vocalizations from hydrophone recordings) to astronomy (detecting the presence of planets from subtle fluctuations in the brightness of thousands of stars). To discover the Higgs boson, the so-called God particle, an algorithm sifted billions of particle tracks generated within the Large Hadron Collider in Switzerland. AI is fast becoming an essential part of university science curricula.

Automating the process of discovery doesn't just free up researchers' time. It could potentially change what sorts of discoveries are made. "I can easily imagine cases in which AI would recommend experiments to try to synthesize a chemical molecule that you wouldn't think possible, but the AI will be able to do it," says Barnabás Póczos, a Carnegie Mellon machine learning professor collaborating on the Toyota project.

Unfortunately, generating novel predictions isn't all that useful by itself. What scientists are after is less what than why–the elegant theoretical formulations that let them understand how the universe works, such as Newton's first law or $E=mc^2$. So far, the neural networks underlying AI software can't really explain how they arrive at their answers.

"We just cannot handle the amount of data anymore"

Humans, in contrast, are pretty good at that. So in the near term, the most promising approach will be for humans and AI to work together. In February, Dutch publisher Elsevier announced a trial collaboration with software maker Euretos, using AI to assess millions of peer-reviewed scientific articles to suggest hypotheses in the field of biochemistry. Academics will cull these hypotheses online, basing experiments on the most encouraging ones. "The vision is that the discussion becomes a much more automated process," says Euretos co-founder Arie Baak.

And after that? "People have wondered if you could have the computer automatically figure out the principles underlying physics," says Toyota's Storey. "I don't think we're going that far out now." —*Jeff Wise*

THE BOTTOM LINE A new world of sensors and satellites has overwhelmed researchers with more data than they can meaningfully appreciate, so they're training software to do higher-order analysis.

A Suitcase That Follows You

The Puppy 1 is a 20-inch-high, 50-pound-capacity, remote-controlled suitcase. It uses sensors to balance itself on two wheels and follow its owner at as fast as 10 mph for about 30 miles on a single charge of its removable lithium-ion battery. The plastic hard-shell suitcase weighs just a few pounds when empty.

Innovator
Clark Wu

Age: 28
Product manager at Mi Ecosystem, a division of Chinese luggage maker Shanghai Runmi Technology Co.

Other features

The suitcase includes a fingerprint-scanning lock, as well as exterior lights that can be toggled to make it more visible. A flexible screen flashes crying or alarm emojis to tell its owner the battery is low—or to alert passersby if it's being stolen.

Origin

Wu, who received a master's in media design at the University of the Arts London, began working on the Puppy 1 in 2016 after specializing in user-interface design at Runmi. Much of the balancing technology comes from partner Segway Inc.

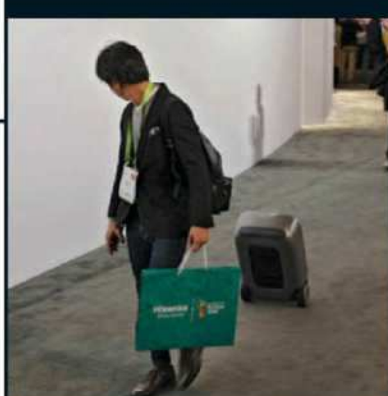
Price

The company says U.S. customers should expect to pay about $500 when the Puppy 1 goes on sale in November.

1 Balance

Unlike smart luggage that needs four or six wheels to stay balanced, the Puppy 1's two wheels help it accelerate quickly to keep up with its owner.

2 Use



The suitcase can be summoned via remote control or smartphone from about 60 feet. With its battery removed, it doubles as a carry-on approved by the Federal Aviation Administration.

Next Steps

Mi Ecosystem says it's negotiating to distribute the Puppy 1 through Amazon.com Inc. and Best Buy Co. Wu, meanwhile, says he's working on a larger suitcase and a backpack that can charge electronics with solar power. Dan Ridsdale, an analyst at Edison Investment Research Ltd., says the Segway technology is what sets the Puppy 1 apart, but he warns that the demo unit appears to have trouble staying upright even when not in a crowded airport. "As a product category," he says, "it looks as if there are plenty of challenges to get through before [the bags] become mainstream."
—*Adam Popescu*

COURTESY MI ECOSYSTEM (2)

LOOK AHEAD

- Investors take the pulse of U.S. regional banks, as Keycorp, BB&T, SunTrust, and others report earnings
- Italian insurance giant Assicurazioni Generali holds its annual shareholder meeting
- Quarterly sales figures for homes in hedge-fund hotbed Greenwich, Conn., will be released on April 19

A More Deutsche Bank

Germany's biggest lender has tried to be a global investment banking powerhouse. The new boss may scale that back

It's been reorganized and recapitalized, refocused and rebooted. For the better part of a decade, Deutsche Bank AG has been trying to retool itself for a tamer era of more regulation and less risk-taking. Now, as Germany's biggest lender installs yet another chief executive officer, it's facing the same old existential question: Should it focus on rebuilding its domestic banking franchises rather than continue trying to be Europe's world-beating answer to Goldman Sachs Group Inc.?

Shareholders have been waiting years for Deutsche Bank to figure out what kind of bank it wants to be. Its European rivals have emerged from the post-crisis gloom poised to reap the benefits of a growing economy. France's BNP Paribas SA said in February it may beat its profitability target in 2020 thanks to rising loan volumes in its home market. Swiss banking giants UBS Group AG and Credit Suisse Group AG have refocused on wealth management. And in Italy, the shares of top lender UniCredit SpA have returned about 25 percent in the last 12 months. Over the same period, the Euro Stoxx Banks Index has risen modestly—and Deutsche Bank shares are down about 25 percent.

The latest turmoil follows a drop in revenue in the final months of last year and a surprise decision to postpone a cost-cutting goal. Chairman Paul Achleitner and his fellow board members decided to oust British CEO John Cryan after less than three years and replace him with Christian Sewing, 47, a Deutsche Bank lifer. At the same time, Marcus Schenck, the deputy CEO in charge of the corporate and investment bank—and a onetime heir apparent to Cryan—quit the company.

Sewing is a lanky German who commutes to the Frankfurt headquarters from a small city close to where he grew up. He'd been a deputy CEO and managed consumer banking operations. His selection is being read in Germany as a sign that Deutsche Bank will be less ambitious in international investment banking. A shift was already under way: A review of the investment bank, known internally ▶

◀ as Project Colombo, is supposed to determine which businesses to cut and which to support. But the sudden change at the top doesn't solve a basic conundrum for the bank. Much as Deutsche Bank might like to refocus and slash costs, the corporate and investment bank accounts for more than half of revenue.

Sewing has said investment banking is still important for Deutsche Bank, and Germany's finance minister, Olaf Scholz, told reporters after an April 11 cabinet meeting that the country needs a bank that's a global player. Many are watching the U.S. investment banking operations, which accounted for 35 percent of the division's €14.2 billion ($17.6 billion) in global revenue in 2017 and has been cited by analysts as ripe for restructuring. "The U.S. investment bank has to be refocused," says Ingo Speich, a portfolio manager at Union Investment Privatfonds GmbH in Frankfurt, which holds shares in Deutsche Bank.

Achleitner said in a statement that Cryan had failed to move quickly enough in executing the turnaround. But Cryan did make progress on key features of his plan. In December 2016 he settled a toxic mortgage case in the U.S. for $7.2 billion. It could have been much worse. The U.S. Department of Justice had initially asked for $14 billion—a number big enough to push the bank's share price to a record low and trigger an exodus of client money. The lower settlement paved the way toward better relations with American and German regulators and buoyed the beleaguered stock price.

Cryan raised €8 billion in a share sale early last year and spun off the bank's asset management unit in March. In jettisoning Cryan so unceremoniously, Achleitner appears to be consolidating power. Not all investors are happy to see that. "It's deeply troubling," says Barrington Pitt Miller, a portfolio manager with Janus Henderson Group Plc, an investment firm that holds shares in Deutsche Bank. "The strategy under the chairman has not worked." Deutsche Bank's stock has fallen sharply during his tenure.

Anxiety is mounting within the investment bank as well. In March, Deutsche Bank ended a two-year bonus drought by making €2.2 billion in payouts to lift morale at the division. Now the ascension of Sewing, who's an unknown within the securities unit, has investment bankers and traders outside Germany feeling wary, says a person who works at the division and asked not to be identified. With the new CEO vowing to pull back from unprofitable areas and pledging to never miss a cost-cutting target, more turmoil and slimmer bonuses seem likely, the person says.

Davide Serra, CEO of Algebris Investments, said on Bloomberg TV just prior to Cryan's ouster that Deutsche Bank has to accept that it can't compete with the big Wall Street firms in the U.S. and needs to shrink its cost base and focus closer to home. Deutsche Bank could free up €7 billion in equity by retreating from businesses in the U.S. such as interest rates and equities, JPMorgan Chase & Co. analysts said in a report sent to investors on April 11.

Unlike some peers, Deutsche Bank can't fall back on a domestic bank generating big profits. The German retail banking industry is a patchwork of state-owned regional lenders, mutualized credit providers, and commercial banks, all of which eke out earnings in a country that largely shuns debt. That's why Deutsche Bank, back in the 1990s, looked beyond its role as a handmaiden for German industry and became a force in global investment banking. By making acquisitions and poaching talent on Wall Street and in London, Deutsche Bank did crack the top tier, notably in fixed-income markets. Yet the institution's swashbuckling ways led to a spate of legal scandals.

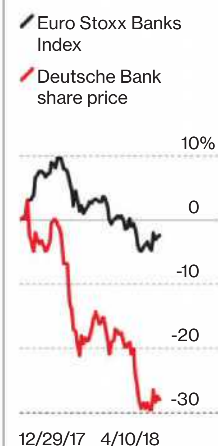
Now Achleitner is trying to bring the institution full circle. In 2016 he and Cryan launched an initiative dubbed Project Oak Tree—the company seems to like code names—to win more lending and underwriting business from German companies and expand its Deutsche Postbank franchise in the country. "The bank is now more strongly led from Germany," Achleitner told German media. "That is important for the day-to-day operations."

Sewing will confront some big internal management challenges. Long composed of quasi-independent fiefdoms with disparate information-technology setups, the bank has been struggling to simplify its unwieldy systems. Sewing also inherits a five-year turnaround plan unveiled by Cryan in late 2015 that's undergone several revisions. The new CEO will now be under pressure to clarify to the market the bank's strategic goals.

Sewing and Achleitner might need something neither can control: luck. In part because of market conditions, revenue has fallen in 8 of the 10 quarters since Cryan took the helm in July 2015. But rising rates and volatility in the markets, which has stormed back amid fears of a trade war, may drive more customers to seek out Deutsche Bank's services. Given the lender's struggles, that could be just what Sewing needs to buy time that Cryan didn't have and bolster Deutsche Bank's fortunes. *—Edward Robinson and Steven Arons*

THE BOTTOM LINE Deutsche Bank is trying to adapt to a world with more regulation and less appetite for risk. But ordinary banking isn't an easy business in Germany, either.

● Change since Dec. 29, 2017



● Sewing

The Winding Road To a Long-Term Stock Market

● Eric Ries is trying to create a new kind of exchange. But do investors really want that?

Two years ago, Silicon Valley entrepreneurial guru Eric Ries hatched a plan to bring one of his boldest ideas to life. His Long-Term Stock Exchange, which he first suggested in the epilogue to his 2011 bestseller, *The Lean Startup*, would address the investor shortsightedness that drives startup founders crazy. Over time he sketched out rules. Companies listing on the exchange would give more voting power to shareholders who stuck around longer. They wouldn't be allowed to link executive pay to quarterly earnings. It turns out, however, that selling Wall Street on a more patient stock market can't be done in a hurry.

Compared with the technology sector, where "move fast and break things" has been the motto, in the realm of exchanges the attitude is more like "move painstakingly slowly and make sure nothing breaks, ever." LTSE has yet even to file a stock exchange application with the Securities and Exchange Commission, though it's taken a step forward by partnering with a small stock market, IEX Group Inc. Ries has faced skepticism not only from Wall Street veterans but also from the tech world. "In Silicon Valley, people don't think change is possible here," says Ries. "People think it's more likely we'll discover time travel."

LTSE recently moved into an office in San Francisco, keeping the neon lime-colored couches and swivel chairs left by the previous tenants. On a recent March day, the cubicles were almost bare, decorated only by copies of Ries's latest book, *The Startup Way*, a guide for large companies to thinking like scrappy upstarts. The LTSE project still exists more as a philosophy than as a business at this point, says Ries, who speaks in the carefully paced manner of a person who's accustomed to holding audiences rapt over PowerPoint presentations. "It is taking a long time," he says. "It has to."

Ries helped popularize the concept of the minimum viable product—a fast, cheap initial innovation to unleash on the market and improve later. But it can't really exist for exchanges: Every aspect of LTSE's model will need approval from the SEC, and the process can easily take more than a year, with regulatory inquiries and public comment.

The LTSE is supposed to be a place where companies and investors can communicate better. Ries is betting companies will pay a premium price—he hasn't said how much—to list on LTSE. The big exchange operators, NYSE Group and Nasdaq Inc., charge tens or hundreds of thousands of dollars for a listing. Some market forces may be at odds with his idea: Among money managers, quantitative stockpicking has gained ground. The importance of communication between management and investors has dwindled, according to Larry Tabb, founder of Tabb Group LLC, a capital markets research firm. "It's less about, 'I sat and I looked the CEO and management team in the eye and I trust them,'" Tabb says. "It's more towards, 'Show me the data, buddy,' and as soon as the data moves against them, they're out of there." At one level, LTSE is designed to insulate companies from such traders. But what if Ries is trying to give investors something they don't want?

▲ Ries

Still, his plan alone has been enough to attract $19 million in funding from the likes of venture capitalist Marc Andreessen and Aneesh Chopra, former chief technology officer of the U.S. in the Obama administration. To get things started, LTSE is working with IEX to add a category on that exchange called LTSE Listings on IEX. The proposed standards for listings were filed with regulators in March. Along with the executive pay standards, voting rights, and other rules, they would require companies to have a board committee focused on long-term growth and to make disclosures about investment in research and development.

IEX is in some ways a cautionary tale. It rode to fame in Michael Lewis's book *Flash Boys* and championed a different kind of stock market ▶

FROM LEFT: KRISZTIAN BOCSI/BLOOMBERG; PHOTOGRAPH BY CARLOS CHAVARRIA FOR BLOOMBERG BUSINESSWEEK; DATA: COMPILED BY BLOOMBERG

◀ reform—curbing the ability of the fastest traders to gain an edge. After a hard-won battle to turn itself into an exchange in 2016, IEX hasn't increased its market share beyond 3 percent of U.S. equity trading volume.

For now, stocks traded on IEX are listed elsewhere. Although IEX once said it could be ready to start its own listings as soon as October, that's been delayed. The biggest executive who said he'd transfer his company listing to IEX, casino mogul Steve Wynn, was ousted from his CEO role at Wynn Resorts Ltd. Sara Furber, head of listings for IEX, said in a statement that "our engagement with public companies continues to be strong and positive," and that its push for trading reforms "demonstrates what a different kind of exchange can achieve."

Ries waves away IEX's challenges. He says he'd consider LTSE a victory if it gets even one company to list. LTSE is focused on wooing initial public offerings and some dual listings, so it doesn't necessarily need to get companies to switch from their current exchanges. But if the big exchanges "thought raising listing standards would lead to more listings and business, I would expect them to give it a try," says Tyler Gellasch, executive director of Healthy Markets Association, an investor advocacy group. "So far, they haven't. In fact, they've kind of done the opposite." For example, NYSE President Tom Farley told lawmakers regulation is making it too difficult to raise money through IPOs.

If it's approved, LTSE will need to comply with strict rules around cybersecurity, manipulative trading, and other threats. Ries says LTSE is a proving ground. "One of the things I like about this process is that it forces me to address all these misconceptions" about his lean startup concept, he says. "Like you can't do lean startup in a highly regulated world, or you can't do lean startup if the thing takes a long time." —*Annie Massa, with Alex Barinka*

THE BOTTOM LINE The Long-Term Stock Exchange wants to encourage shareholders to focus less on short-term ups and downs, but the investment world is moving in the opposite direction.

● Funding raised for LTSE

$19m

Can Humans Understand How Bots Invest?

● A new ETF buys stocks picked by artificial intelligence. That requires a leap of faith

For a guy who built a robot he hopes will banish human emotion from the investing process, Chida Khatua spends a lot of time trying to figure out how it thinks.

Khatua is chief executive officer of EquBot, a San Francisco company that's built an artificial intelligence system for investing. In October, a day before the launch of an exchange-traded fund that uses EquBot recommendations, his team was going over stocks the computer wanted to buy. One name popped out: Brookdale Senior Living Inc., which operates retirement communities and nursing homes. This was when wildfires were burning parts of California, where some of Brookdale's facilities sit.

The trade looked off to Khatua, a former Intel Corp. engineer. But on a second look, it wasn't hard to put together what the computer might have been thinking. News reports and press releases—all fed into the system—showed how Brookdale was responding to the threat. "We found, hey, that senior living facility—they have a very good, organized setup" and could provide backup housing, Khatua says. The ETF bought the stock and made a small profit on the trade. Scanning news wires may not sound like a human equity analyst's idea of deep research, but for a computer it's all data that can be combined with other information to make statistical predictions.

That's the tricky thing about artificial intelligence and investing: If AI has an edge, that's because it's putting together a jumble of information in ways that humans wouldn't. But when people trust their money to a fund, they want to understand how the manager—or computer—makes decisions. A program reads about wildfires and buys a stock after deciding management will end up looking good in a crisis? Talk like that gets some AI purists' hackles up. "It's very important to separate the reality of what's going on from the marketing being put around it," says Andrew

Dyson, CEO of QMA, an investment firm that uses quantitative techniques and big data. "People love a story, right? And there's a real danger that these things are stories, and people have to get beyond the story and actually understand what's going on."

The fund EquBot's model makes recommendations for, the AI Powered Equity ETF, launched in October and has quickly amassed $136 million in assets, making it one of the most successful ETF debuts of 2017. Drawing computational muscle from International Business Machines Corp.'s Watson platform, EquBot's system assesses more than 6,000 U.S. publicly traded companies each day. It scrapes millions of regulatory filings, news stories, management profiles, sentiment gauges, financial models, valuations, and bits of market data. Then it chooses about 30 to 70 stocks for the fund, which is run by ETF Managers Group LLC. It's not the first ETF to use AI in some way—one employs it to spot changes in market sentiment—but backers say it's a pioneer in using the technology to look at multiple components of an investment to build a portfolio. "It's like employing an army of equity analysts," says Khatua.

Since the October launch it's beaten the S&P 500 in 12 weeks and trailed in 13 of them. A Bloomberg analysis shows that after being hurt early on by its bets on smaller and more volatile companies, the ETF recovered by buying bank stocks. Its 3.2 percent total return falls a bit shy of the S&P 500's 4.8 percent. So it's been about average—but that record is much too short to be meaningful. Luck and the behavior of the overall market are the main influences on a diversified portfolio's performance for much longer than most people realize, says James White, CEO of Elm Partners Management, an investment adviser. It could be a decade or more before anyone can say whether EquBot is selecting stocks with more skill than a dart thrower, White says.

EquBot's chief operating officer and co-founder, Art Amador, says he trusts the AI to make a decision and run its course. "From a principle standpoint, we don't want to intervene, we don't want to create any bias under any circumstance," he says. "We didn't tell it, 'Oh, no, you're not going to do this because it doesn't make sense logically.' "

Any AI system is likely to make investment decisions that look puzzling, says Zachary Lipton, an assistant professor in the machine learning department at Carnegie Mellon University. In the strictest sense, a model "is not operating according to logical rules. The model is just spewing out statistical correlations," he says. "It's not giving you logic—there isn't actually a chain of coherent logical reasoning that tells you how to invest in the

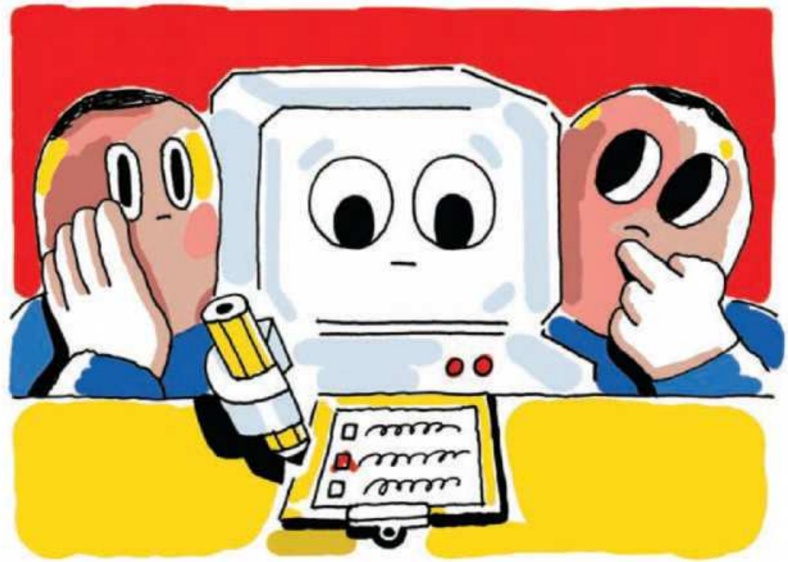


ILLUSTRATION BY THOMAS COLLIGAN

stock market. If there was one, you wouldn't need the model in the first place."

Even so, Amador and Khatua say they run additional checks on the bot's output. One is to make sure that the data is solid—for instance, that the computer isn't scraping a website that recently changed its format, which could cause the computer to misread it. The other is what they call a "sanity test" to see if the choices make sense, based on how the program was trained. "Our core philosophy is that we don't want to create a black box for AI," says Khatua. Their goal is to have a system that operates "the way a good rational investor would think about and go through the process," he says.

The EquBot system is also designed to learn as it goes, according to the team. In the early days of the ETF, small stocks that made sense as slivers of a $5 million portfolio proved too hard to trade when the portfolio's assets swelled. The program eventually learned how to account for a stock's trading volume when deciding what time to buy or sell it, and stopped picking up microcap stocks.

"It's very important to separate the reality of what's going on from the marketing"

Tammer Kamel, CEO of Quandl Inc., an alternative data platform, understands EquBot's system seeing opportunity in California's fire. "That's classic AI," he says. But he warns against caring too much about a program's reasoning. "As long as you persist in sanity-checking the output of your AI, then it will never be smarter than humans," Kamel says. "I get it. In the early stages, you want to see if this thing is incorrectly programmed or has bugs—yeah, you have to watch out for that. But sooner or later, you have to take the reins off and trust in the technology." —*Sarah Ponczek*

THE BOTTOM LINE Artificial intelligence doesn't make decisions exactly like a human stock analyst would, and the track record of an ETF that uses AI is too short to evaluate.

LOOK AHEAD

- Finance ministers convene in Washington for the spring meeting of the IMF and World Bank.
- China reports first-quarter GDP growth on April 16. China watchers expect it to come in at 6.7 percent.
- U.S. retail sales data arrive on April 16. Sales likely rose in March for the first time in four months.

Venezuela's

Nicolás Maduro is trying to hold on to power by

April 16, 2018

Edited by
Cristina Lindblad and
Jillian Goodman

Businessweek.com

Gold Diggers

handing even more of the country to the military

● At an informal gold mill in El Callao

In Venezuela's gold capital, national guardsmen block the roads. Military convoys and motorcycles circle while soldiers keep watch from behind sandbag-fortified checkpoints or patrol wearing balaclavas, rifles in hand.

The military has been fighting for months to superimpose itself over the violent gangs that control gold mining in El Callao, the most dangerous town in a nation fraught with danger. Should the soldiers succeed, President Nicolás Maduro's government will win a beachhead in the mineral-rich region known as Arco Minero del Orinoco. In turning over control of the territory to the armed forces, Maduro has granted them a handsome prize, which may help him secure their much needed support in elections scheduled for May 20. The military's campaign in El Callao, however, has been punctuated by bullets and bloodshed as soldiers raid neighborhoods and attempt to bring gang lords to heel across the 70,000-square-mile region.

Arco Minero del Orinoco is a lucrative franchise, and through it the military has reaped profits both legitimate and illicit by charging miners for services. Soldiers "know that they can benefit from the uniform they're wearing," says Miguel Linares, a trucker who used to run gasoline to power water pumps and equipment at gang-infested mines in the region. "You have to pay," he says. "They can put you in jail."

According to a poll by Datanalisis, a market-research company based in Caracas, Maduro had the support of only about a fifth of the population as of mid-February. With 160,000 members, the military is one of the failing state's strongest blocs. Active and retired officers hold 14 of 32 cabinet posts, and soldiers have replaced many of the 80 leaders of the state oil company, Petróleos de Venezuela SA, whom Maduro began imprisoning in August. The ports have been militarized, and since 2016 the defense ministry has overseen the starving nation's food supply.

Then there's Arco Minero. "It's an incentive for loyalty," says Rocío San Miguel, president of Control Ciudadano, a watchdog group in Caracas. "It's indicative of where the forces of power lie in Venezuela. Military power is hegemonic."

Gold processing ground to a halt after the late President Hugo Chávez nationalized the industry in 2011. Illegal mining grew rapidly, and gangs quickly moved to take over the pits and tunnels to extort profits. Official production fell to a single ton in 2016, according to commodities researcher CPM Group, from a peak of more than 22 tons in 1997. In 2016, Maduro granted the armed forces wide-ranging security powers and allowed them to create a company to provide mining services. Arco Minero produced 8.5 tons in 2017, and Maduro hopes to almost triple that, to 24 tons, by yearend, according to Victor Cano, the mining minister. The military now controls gold resources the government claims are as high as 8,000 tons. If that number is accurate, that would give the country the world's second-largest gold deposits after Australia.

▲ Jose Brito at the grave of his son Carlos, who was killed in El Callao, with Iliana Marino, Carlos's aunt

Venezuela desperately needs the revenue. Gross domestic product is projected to fall about 15 percent this year, according to the International Monetary Fund, part of a cumulative drop that will have almost halved the economy in five years. The central bank has been selling gold to keep the country afloat, drawing down reserves to $6.6 billion, from almost $20 billion at the beginning of 2012, according to Caracas Capital Markets, an investment bank. "Venezuela has been running on fumes for years and hoping the reserve tank would get them to safety," says Russ Dallen, the bank's managing partner.

The Venezuelan central bank buys gold from select brokers, mill associations, and groups of registered miners, dubbed "mining brigades." The state-owned gold processor, Minerven, handles most of the raw material, melting the ore into bars, which military planes take to air bases around Caracas. When the gold arrives, it's presented to officials in ceremonies broadcast on state television. Maduro has been photographed kissing a gold bar at one such ceremony. Armored vehicles transport the bars from there to the central bank.

The gold from El Callao is hard-won. Last year the town ranked as the country's most murderous municipality, according to the Venezuelan Violence Observatory, which estimated a homicide rate of 816 per 100,000 residents. It sits amid mountainous jungle along the Yuruarí River, and gold brokers, jewelry makers, and tool shops line its thoroughfares. Speakers in open-air bars blare salsa music. The national guard controls commerce in the town, as well as the supply of gasoline for generators and water pumps. On the almost 120-mile drive from Puerto Ordaz, the capital of Bolívar state, which encompasses almost the entirety of Arco Minero, to El Callao, there are more than a half-dozen military and police checkpoints.

"It's an area that functions in a completely feudal sense," says San Miguel of Control Ciudadano. Low-ranking soldiers shake down miners and smugglers, while officers exact tribute from armed groups for the right to do business. Those gangs in turn extort anyone wishing to work.

Carlos Alfredo Brito, 27, had been delivering gasoline to illegal miners along with Linares, the trucker, and his brother before a February raid, trying to earn enough money to pay for his mother's epilepsy medication. Linares had negotiated a deal to supply 20 barrels of fuel to a gang leader at a mine called Cicapra, about 25 miles from El Callao. Typically the runners made trips to camps and towns surrounding the mines, for which they were paid in Venezuela's essentially worthless currency. The group of six making the delivery, which included Brito, would be going closer to the actual mine, potentially exposing themselves to gang violence. But they would also be paid in gold.

Brito's mother, Petra Rodriguez, last heard from her son on Feb. 8. She texted Brito to let him know she'd managed to find 11 boxes of medicine and hoped God would watch over him. "Amen, mommy!" Brito responded. "What relief. You have no idea how happy this makes me. I love you."

Linares had already returned home by the time night fell on Feb. 9. His brother and other companions—including Brito—decided to stay at the mine, surrendering their cellphones to the gangsters, who didn't allow them to be used in the area. The army arrived in the wee hours of Feb. 10 and sparked what was one of the deadliest clashes since the campaign's inception. According to a military communiqué obtained by Bloomberg, they killed 18 civilians—including a child. Many were shot in the head and face, according to police photos and death certificates. Soldiers recovered assault rifles, pistols, and grenades, according to the internal communiqué. The document claimed the El Callao residents were resisting authority, but families of the victims insist they were slaughtered. A defense ministry spokeswoman declined to comment.

Cano, the mining minister, says the armed forces respect human rights, but miners must put themselves on the right side of the law. "If they're doing criminal activities, they can't be expected to be treated like saints," he says.

"You have to pay. They can put you in jail"

Families came to collect the bodies from an overheated morgue near Puerto Ordaz; the naked corpses were stacked head to toe on metal trays, with numbers taped to their torsos. Brito had been shot repeatedly in the chest. His family buried him in Soledad, their hometown. —*Andrew Rosati, with Fabiola Zerpa, Ben Bartenstein, Danielle Bochove, and Luzi-Ann Javier*

THE BOTTOM LINE The takeover of Arco Minero del Orinoco is part of a larger effort by Venezuela's president to curry favor with the armed forces.

The Other North Korean Threat

● The nation's isolation won't contain multidrug-resistant tuberculosis

People in China like to joke that North Korea has two lethal weapons: nuclear missiles and tuberculosis.

While the rogue state's nuclear ambitions have long inspired angst—and led to economic sanctions—the threat of TB, the planet's biggest infectious killer, has garnered less attention. With an estimated 130,000 new and relapsed cases in 2016, North Korea is on the World Health Organization's list of nations with the greatest incidence of the deadly lung disease, and doctors warn that an explosion in multidrug-resistant strains could be coming.

In February the Global Fund to Fight AIDS, Tuberculosis and Malaria, a Geneva-based organization that is the biggest financial contributor to TB control in the Democratic People's Republic of Korea, announced that it will close its programs there in June, citing the challenges of working in the country. The fund's withdrawal is likely to lead to "massive stock outs of quality-assured TB drugs nationwide," wrote Harvard Medical School doctors in an open letter to the Global Fund, published on March 14 in the British medical journal the *Lancet*.

Such privation in the past has "led to the rapid creation of drug-resistant TB strains, as doctors ration pills and patients take incomplete regimens," they wrote. Infections that can't be cured with standard drugs are already rife in the country. According to WHO estimates, 2.2 percent of North Korea's new TB infections and 16 percent of relapsed cases in 2016 were caused by bacteria ▶

◀ resistant to the antibiotic rifampicin or at least two other key TB medications.

That may be a gross underestimate, according to a study published last year in the *Journal of Korean Medical Science* that analyzed hundreds of patient sputum samples. More than three-quarters of those that tested positive for TB contained multidrug-resistant strains, and two samples contained extremely drug-resistant strains—a form almost impossible to treat in resource-poor countries such as North Korea. Treatment for patients with multidrug-resistant TB commonly lasts two years or longer and typically involves six months of daily injections and a regimen of about 14,000 pills.

Treatment regimens that are too short or rely on inferior or inappropriate medicines are the fastest route to drug resistance, says Jennifer Furin, a Harvard-trained doctor and researcher who's cared for TB patients for 23 years. The repercussions of cutting funding to programs in North Korea will be felt beyond the country, she says: "This is a politically created problem that will turn into a health catastrophe, not just for the people living in the DPRK, but for everybody in the region."

Chinese authorities are on alert for cases among migrant workers from North Korea. In Dandong, a city in China's northeast that is separated from North Korea by a river, quarantine officials identified 33 TB cases among 9,500 North Koreans screened from 2012 to 2014, according to a government report published in 2014 that recommended heightened surveillance in the area. Local authorities pledged in December to beef up border screening and epidemic management. However, many people who've been exposed to TB develop a latent infection with no symptoms, making it difficult to intercept them at the border.

Just as HIV has helped spread TB in sub-Saharan Africa, chronic malnutrition is fueling the epidemic in North Korea, according to Kwonjune Seung, who was among the authors of the letter published in the *Lancet*. Seung visits a dozen TB centers in North Korea twice a year as medical director of the Eugene Bell Foundation, a Christian charity focusing on treating North Korean patients. A spillover of multidrug-resistant TB from North Korea "would take decades to clean up and could detrimentally affect the public health of bordering countries like China and South Korea," Seung and his colleagues wrote in their letter.

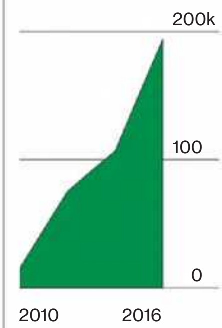
Kim Hyong Hun, North Korea's vice minister of public health, accused the Global Fund of bowing to the "pressure of some hostile forces" in a letter to the organization published on March 13 by the Korean Central News Agency, the official news agency. The comments pointed a finger at a U.S.-led international effort to force the country through the application of economic sanctions to dismantle its nuclear arsenal. The U.S. and North Korea are slated to meet in an historic summit as early as May.

More than 38 countries contribute to the Global Fund, including South Korea and the U.S.; in late March, Congress approved $1.35 billion in funding for the 2018 financial year. In an email, the organization said the decision to suspend programs in North Korea was not motivated by any pressures but rather influenced by concerns about the "unique operating environment" in North Korea, which makes it difficult to ensure that grants are used effectively.

Furin says it's difficult not to see the Global Fund's move as yet another facet of the campaign to isolate North Korean leader Kim Jong Un. "You can't help but think global powers are very concerned about North Korea's erratic behavior, and this is a way to punish the country," she says. "But this is a weapon of destruction in and of itself. TB is an airborne disease. It doesn't stay within borders."
—Li Hui, Peter Martin, and Dandan Li

THE BOTTOM LINE The withdrawal of crucial funds for North Korea is creating conditions for an explosion in drug-resistant strains of the planet's most deadly infectious disease.

● Cumulative tuberculosis cases in North Korea detected and treated



DATA: GLOBAL FUND TO FIGHT AIDS, TUBERCULOSIS AND MALARIA

A Solution to the Housing Squeeze

● U.S. cities are rewriting regulations to enable more granny flats

Alexis Rivas opens his Mac laptop and zooms in on a 3D rendering of a house in Echo Park, a hip neighborhood in Los Angeles. Set off from the main house, there's a small, modern structure that his company, Cover Technologies Inc., hopes to build. "You've got the kitchen here, a little stovetop, fridge," Rivas says as he navigates around the 502-square-foot unit with his cursor. "And then we can take a walk around and go into the bedroom."

It's the kind of design that would typically cost a few thousand dollars in architecture fees, says Rivas, who co-founded Cover Technologies in 2014. The Los Angeles outfit can put together a proposal for just $250, using software to determine whether a specific property meets local and state requirements for adding a backyard unit. If building is allowed, the company designs one of its modular, factory-built structures to fit the plot. Homeowners often hesitate to take on a project like this, Rivas says over the whir of a drill in his company's workshop, because "they're expected to put a lot of time or money into the process without really getting a clear picture of what they can build."

The housing crunch in many West Coast cities has revived interest in an old idea: the granny flat. Often called "accessory dwelling units," or ADUs, the free-standing structures can be manufactured off-site and plunked in a backyard for about $150,000, including permits and site work. Some housing experts are promoting ADUs as a small way to address the affordability crisis in high-cost places such as Seattle, the Bay Area, and Los Angeles.

Lawmakers are warming to the concept, approving legislation to make it easier and cheaper to install ADUs. And unlike some other efforts to increase housing density, these measures generally haven't been met with fierce opposition from antidevelopment groups. Perhaps that's because ADUs can blend into single-family neighborhoods and let homeowners profit by owning rental units. "They might be the single most promising means of upping the housing supply that is also politically feasible," says Issi Romem, chief economist at BuildZoom, a company that mines building permit data to help homeowners find contractors.

Seattle, Vancouver, and Portland, Ore., have all seen applications for ADU permits climb after issuing rules relating to their construction. California is playing catch-up: The state's legislature passed laws in 2016 and 2017 removing parking requirements for ADUs, eliminating some utility connection fees, and streamlining the approval process. Los Angeles issued 721 permits for ADUs last year, a fivefold increase from 2016, according to Attom Data Solutions. San Jose, San Francisco, Santa Barbara, and Oakland also saw upticks last year.

While that interest is notable, ADUs aren't a panacea for a state that for years has failed to keep pace with housing demand. California's economy added 2.3 million jobs over the past five years. But the state issued permits for fewer than 480,000 new residential units over the same period, or about one home for every five additional workers.

Building enough backyard units to narrow the gap between supply and demand in any noticeable way will be challenging. An ADU is "a construction project that needs to go through zoning, regulation, financing," says David Garcia, policy director at the University of California at Berkeley's Terner Center for Housing Innovation. "The typical homeowner's not prepared for that." Many who are considering a backyard unit, he says, will want a "one-stop shop."

A Portland-based startup offers a turnkey solution. Dweller Inc. covers the upfront costs of installing an ADU in return for a 25-year ground lease on the land where it sits. The company is responsible for finding a tenant and captures 70 percent of rental income. "We have the potential for this to be a very commonplace thing," says Chief Executive Officer Patrick Quinton.

▲ A 320-square-foot backyard studio in Los Angeles designed by Cover

COURTESY COVER

Dweller's business model is untested—the company won't install its first company-financed unit until June—as are those of several startups targeting the market. Seattle's CityBldr started a service in March that streamlines the design and permitting process for ADUs. Cover, which has raised $1.6 million from Khosla Ventures, General Catalyst, and Fifty Years, has built only one of its backyard units, though Rivas says it has several in the pipeline.

As these businesses ramp up, they're likely to run into a problem vexing more experienced builders: competition for materials and labor. Steve Vallejos, whose Valley Home Development has been installing prefabricated units in the Bay Area for more than a decade, is building his own factory after his manufacturing partners got busy with bigger projects. Studio Shed, a Boulder, Colo., company that's installed more than 1,000 backyard units, including dwellings and workspaces, is concentrating on developing a network of builders, electricians, and plumbers to install ADUs. "There's almost no upper limit in terms of the available places where people could put them," says Jeremy Nova, the company's co-founder. "That's an opportunity for our business, but it's very hard to find contractors right now." *—Patrick Clark and Noah Buhayar*

THE BOTTOM LINE Seattle, Los Angeles, and Portland, Ore., have logged sharp increases in permits for accessory dwelling units following changes to zoning laws.

LOOK AHEAD

● South Korea's defense minister will visit the UAE to discuss ways to strengthen military cooperation

● Cuba is expected to name a successor to President Raúl Castro on April 19

● On April 18 the House Agriculture Committee begins work on the massive farm bill

● The effort to save the EPA chief's job appears to have worked. For now

During the first week of April, as scandals piled on top of Environmental Protection Agency Administrator Scott Pruitt, it looked like his job was in jeopardy. A handful of lawmakers, including two Republicans, called for him to resign after reports surfaced that he'd rented a Capitol Hill condo on unusually agreeable terms from the wife of a prominent energy lobbyist with business before the EPA. Top administration officials distanced themselves from Pruitt as the White House launched a review of his actions, and Chief of Staff John Kelly told President Trump it was time for the EPA chief to go.

Pruitt was already controversial. The former Oklahoma attorney general, who made a name for himself suing the agency he now runs, had drawn fire for his enlarged security detail, his habit of flying first class, and the $43,000 installation of a soundproof booth in his office, not to mention his disregard for climate science. But this time it felt like a line had been crossed, especially as damaging revelations kept coming, seemingly every hour. Reports surfaced of staff being reassigned or demoted for challenging him and of Pruitt using an obscure law to give two close aides hefty raises over White House objections. When the EPA's general counsel walked back his initial assessment that the rental deal didn't violate federal ethics laws, Pruitt looked like a goner.

What happened next is a testament to the EPA administrator's ties to the business community and how crucial he is to the conservative antiregulation agenda. By the evening of April 5, an aggressive advocacy campaign to save his job had kicked into gear as activists, business executives, and Republican politicians came to his defense.

The campaign went public when FreedomWorks, a powerful right-wing advocacy group, blasted out a call for help to its online community of 5.7 million conservatives, including on Facebook, Twitter, and by email, reminding them of Pruitt's record on rolling back regulations and asking them to call the White House and Congress to support him. The group also promoted a #StandWithScottPruitt hashtag on social media, highlighting it in multiple tweets, including one asserting that he was the victim of a "smear campaign" by the "radical left."

Among those responding was Dallas investor Doug Deason, whose family has given millions to right-wing candidates. He texted and emailed contacts at the White House to make clear he wanted Pruitt to stay. As reports surfaced that Trump's chief of staff had suggested the EPA chief needed to go, Deason got angry. "If that's true, I think Kelly needs to go because he has no spine," he says. "We need to get on the offense."

Back in Washington, conservative leaders including Myron Ebell of the Competitive Enterprise Institute and Tom Pyle of the American Energy Alliance scrambled to find ways to show support, resulting in an open letter from dozens of Republicans hailing Pruitt's work. Soon, what started as an email effort morphed into a full-throated #SaveScott campaign, with prominent Republicans and leaders of the Tea Party movement such as Steve Forbes and Kentucky Senator Rand Paul penning op-eds, posting on Twitter, and picking up the phone to lobby the president against firing the man they see as a champion of deregulation and for whose confirmation they fought. "He's a conservative hero," Deason says. "We burned a lot of chits to get him into that position." They couldn't afford to lose him now.

By the end of the week, Trump had heard from billionaire Oklahoma oilman Harold Hamm and confidant Chris Ruddy, chief executive officer of Newsmax Media Inc., voicing their support. By Saturday night it looked like Pruitt was safe when Trump tweeted that, despite the issues surrounding the security detail and rental agreement, "Scott is doing a great job!"

One factor working in Pruitt's favor is that Trump is unlikely to get anyone like him through the confirmation process again. Senate Republicans warned it would be tough—if not impossible—to confirm a replacement. Given three bruising confirmation battles expected for the president's picks to lead the CIA, the Department of Veterans Affairs, and the State Department, there isn't much appetite for a fourth. Trump "will be forced to nominate someone who is more moderate on the environment, or he will get tattooed in the Senate," says Dan Eberhart, CEO of Canary LLC, a Colorado-based drilling-services company, and a major GOP donor.

Pruitt has emerged as the deregulation star of Trump's cabinet, methodically dismantling rules meant to protect the environment. He's proposed scrapping President Obama's signature plan to cut carbon emissions, is rewriting a water pollution rule, and has quashed an effort to put new limits on methane leaks from oil wells. "Pruitt is the most conservative member of the cabinet, both in temperament and action," says Republican strategist Mike McKenna. "He's also the guy who has done the most for the president's agenda."

His support among Senate Republicans isn't absolute. In a series of interviews, some voiced concerns over his spending habits and the potential blowback. "He needs to stop leading with his chin," says Republican Senator John Kennedy of Louisiana. "This is taxpayer money he is spending, and he needs to treat it like the precious commodity it is. I can support his policies without supporting his behavior."

Environmental groups are stepping up opposition research and a "boot Pruitt" campaign on Twitter. The Sierra Club broadcast a critical ad on Fox News Channel's *Fox & Friends*, which the president watches faithfully. Activists are scouring Pruitt's real estate transactions, records from his tenure as Oklahoma's attorney general, and documentation of his travel for any tantalizing detail. "The environmental movement in total is all in for the removal of Scott Pruitt," says Lukas Ross, a campaigner with the group Friends of the Earth. "You are going to see escalating pressure in the coming days, especially on the Senate side, to get members to commit publicly that Pruitt should be fired."

The government's top ethics official, David Apol, is urging the EPA to investigate Pruitt. At least four probes are under way, and the agency's inspector general's office has been asked to open other investigations into his condo agreement. Another conflict may relate to the man behind some of Pruitt's most controversial security upgrades, including biometric locks in his office and his round-the-clock bodyguards. Pasquale "Nino" Perrotta is a former Secret Service agent who got the job protecting the administrator last ▶

● Pruitt

ILLUSTRATION BY 731; PABLO MARTINEZ MONSIVAIS/AP PHOTO

◀ year after the previous security head questioned some decisions and was reassigned, according to a person familiar with the change.

At issue is an EPA security move that may have enriched one of Perrotta's business partners, Edwin Steinmetz, the vice president for technical surveillance countermeasures at Perrotta's Maryland-based company, Sequoia Security Group Inc. Perrotta is the company's principal, and the EPA's $3,000 contract to search for bugs in Pruitt's office was awarded to Edwin Steinmetz Associates LLC. Perrotta didn't respond to messages seeking comment.

Perrotta played a key role in the agency's decision to guard Pruitt 24 hours a day, a major shift from the typical approach giving administrators only "door-to-door" protection. Now at least 19 agents guard the EPA chief day and night, and the number may be higher depending on travel and other needs.

"Perrotta is at the center of these decisions to spend money in ridiculous ways," says Austin Evers, the executive director of American Oversight, a government watchdog group probing the EPA's security decisions. "The administrator has gone out of his way to pick someone to lead his detail who will say 'yes' to everything and give him the entourage he apparently dreamed of." *—Jennifer A. Dlouhy, with John McCormick and Ari Natter*

THE BOTTOM LINE After the latest round of scandals hit EPA chief Pruitt, a collection of conservative activists, politicians, and donors rallied to his defense to save his job.

Is Canada Building a Bridge Too Far?

● The Trudeau government spars with a U.S. family to put up a span into Detroit

A new front in Donald Trump's trade wars could be the Detroit River and the bridge across it. Opened in 1929, the Ambassador Bridge is a critical trade artery linking the U.S. and Canada. About $100 billion in commerce crosses it annually, a figure just shy of U.S. trade with the U.K. Now the fight to replace the aging span has reached the Oval Office.

Both the Canadian government and the bridge's private U.S. owners, the Moroun family, plan to build rival bridges not far from where the Ambassador connects downtown Detroit with Windsor, Ont. The race has been marked by bad blood and court battles, spanning successive governments in the U.S. and Canada. Patriotic themes suffuse both campaigns. The Canadian bridge is dubbed "the Gordie" after ice hockey icon Gordie Howe. Meanwhile, the Margins have been appealing to Trump's Buy American instincts, asking him to intervene. Matthew Moroun—who took over his family's transport company from his father, the combative, publicity-averse Matty Moroun—wants Trump to rescind a key waiver granted by Barack Obama in 2012 that exempted the Canadian bridge from having to use only U.S. steel.

The saga might get more interesting. Among the bidders vying to build the Gordie is a consortium including Aecon Group Inc., whose proposed takeover by a Chinese company is being reviewed by Justin Trudeau's government on national security grounds. That raises the prospect of a bridge being built into Detroit by a Chinese company, for the Canadian government, under an exemption from Buy American rules, and over complaints from a U.S. company.

◀ Traffic across the Ambassador Bridge over the Detroit River is down 44 percent since 2000

LINDA PARTON/ALAMY

Ending the steel exemption would disrupt plans for Canada's bridge—perhaps fatally. The Gordie is already more expensive than the bridge the Morouns are planning. The Canadian span has been estimated to cost $3.1 billion. The Morouns say their bridge, which would be a six-lane span next to the four-lane Ambassador, would cost $1 billion; they've already spent $500 million. Matthew Moroun argues the Gordie is unnecessary and will never recoup its costs, and that Canada has used its government agencies to undercut U.S. business. "As an American company, we feel like we're being abused," says Dan

Stamper, president of the Moroun-owned Detroit International Bridge Co., which owns the old bridge.

The Ambassador is something of a monopoly—the only crossing in the corridor that can accommodate all traffic. A tunnel under the river is owned by the cities of Detroit and Windsor, but most big rigs don't fit in it. The Marouns bought a controlling interest in the bridge in 1979, prompting litigation with Canada that was settled in 1990. The family collects tolls in exchange for maintaining the bridge, an unusual arrangement for such a crucial infrastructure link.

Plans for the Gordie ramped up under former Prime Minister Stephen Harper, who sparred regularly with the Morouns. His minister of transport, Lisa Raitt, called the bridge issue "the most litigious file I had." She says the Ambassador is crumbling and calls it "a farce of a border crossing," adding she thinks the Morouns' goal was to pursue building a new span to head off Canada's project and avoid losing toll revenue. "The Morouns are not building the bridge, give me a break," she says. (Matthew invited Raitt to watch the company break ground.) The younger Moroun hopes Trudeau will eventually decide not to proceed with the Gordie.

That doesn't sound like Ottawa's intention. Trudeau's infrastructure minister, Amarjeet Sohi, says Canada has bought almost 85 percent of the land needed for the Gordie (the Morouns own some of the remainder) and will choose a builder by June. Sohi says Canada is "proceeding as the initial agreement is designed" and isn't planning on losing its Buy American waiver. Minister of Transport Marc Garneau doubled down. "We need two bridges. We're going to build ours, the Gordie Howe, and the Ambassador Bridge can be built providing they meet certain conditions," he says. "We're not going to change that."

Traffic across the Ambassador has fallen 44 percent since 2000. The Morouns nonetheless say they're ready to start building this summer. Sohi also wants to start the Gordie this year. But the Morouns say Canada is sabotaging them with a poison pill included in the terms to approve the their new bridge: a requirement to tear down the old Ambassador. Moroun says that condition was explicitly meant to delay his project by restarting environmental reviews the family needs to begin construction. But there's little sign the U.S. will intervene. A spokesman for Commerce Secretary Wilbur Ross says the secretary supports growth in that corridor and "understands the importance of robust transportation infrastructure" to U.S.-Canada trade.

Most people just want something built. Canadian lawmaker Brian Masse, who represents a district in Windsor, cites a series of disputes with the Morouns that have riled Canada's side of the river. "It is a microdrama that seems to be dragging the entire North American continent's supply chain downhill," he says. "I just wish that we could actually get to building a bridge." *—Josh Wingrove*

THE BOTTOM LINE The owners of the Ambassador Bridge are lobbying the Trump administration in hopes of undercutting the Canadian government's attempts to build a rival project.

Targeting Russian Money

● Britain tightens controls on billionaires who've made the country a refuge

As the U.S. goes after a handful of Russian oligarchs with its latest round of sanctions, the U.K. is under pressure domestically and from abroad to tighten controls and shed its reputation as a place to launder corrupt money. The U.K. National Crime Agency estimates that more than £90 billion ($127.5 billion) of such money enters the U.K. each year, feeding a vast industry of property companies, lawyers, bankers, and accountants. A lot of that comes from Russia, and ends up in high-end real estate. About a fifth of suspicious property purchases from 2008 to 2015, £729 million worth, were made by Russians, according to anticorruption watchdog Transparency International. "In terms of the levels of financial flows that go through London, it's likely that it's one of the biggest hubs of money laundering in the world," says Ben Cowdock, the group's lead researcher on dirty money in the U.K.

"It's likely that it's one of the biggest hubs of money laundering in the world"

On April 10 the top U.S. sanctions official, Sigal Mandelker, issued a warning while in London, saying U.K. banks will face "consequences" if they continue to do business with blacklisted individuals and entities. "The government's in a very difficult situation," says Tom Keatinge, head of the Royal United Services Institute's Centre for Financial Crime and Security Studies in London. There are "expectations that you're going to be able to roll up billions of pounds of illicit Russian finance."

The U.K. has announced a review of 700 visas granted to wealthy Russians and has a new tool to target corrupt funds, so-called Unexplained Wealth Orders. Regulators used it for the first time in February to freeze two properties worth ▶

◀ £22 million owned by an unidentified individual. Last year the Financial Conduct Authority fined Deutsche Bank AG £163 million—the largest penalty ever in Britain for violating money laundering rules—over the transfer of $10 billion of unknown funds from Russia to offshore bank accounts.

Michael O'Kane, head of business crime at the law firm Peters & Peters, says a number of Russians have recently approached the firm for advice. "I think it's definitely starting to have a chilling effect," he says. "As relations deteriorate between the two countries, they may well start to look at alternative places to go."

Russians, who've long favored the U.K. as a place to send their children to school and for its legal protections, were alarmed even before the U.S. sanctions. The lawyers of two Russian billionaires with homes in the U.K. say their clients had in recent months asked major accounting firms to review their finances, including their income and the taxes they paid, going back at least 15 years. The lawyers say the auditors found nothing improper.

One of the most prominent Russian billionaires in the U.K., along with Chelsea soccer club owner Roman Abramovich, is Alisher Usmanov, who owns a Tudor mansion that once belonged to J. Paul Getty and 30 percent of London soccer club Arsenal F.C. All of Usmanov's U.K. assets "were acquired using earned income received after payment of tax in strict compliance with British law," the Moscow-based businessman's office said in an emailed statement. Usmanov has "all necessary documents, including the reports of legal and audit firms."

Andrey Yakunin, who has a $400 million investment fund in London, says there's a risk of a "witch hunt" in the U.K., though less risk than elsewhere. Yakunin's father, Vladimir, who until 2015 ran the state-owned Russian Railways monopoly, is an ally of Russian President Vladimir Putin. Yakunin, who has British citizenship, has denied getting help from his father and says he can account for how he does business and the origin of all funds to "any regulator." Exiled Russian businessman Andrey Borodin, whose mansion in Berkshire was the most expensive property in the U.K. when it was acquired in 2011, doubts there will be any "big names" among Russians targeted in the U.K. because business tycoons have "a lot of lawyers, consultants, bankers." Yet Russians are likely to shift to other jurisdictions. "They will still send their children to schools in the U.K.," he says, "but they won't keep their money here."
—Henry Meyer, Yuliya Fedorinova, and Irina Reznik

THE BOTTOM LINE More than £90 billion of corrupt money enters the U.K. each year, feeding a vast cottage industry of lawyers, bankers, and accountants.

Sex and Taxes

● Nondisclosure agreements may be hush-hush, but they still have to be reported as income

Something unpleasant lurked inside the $130,000 that Donald Trump's lawyer Michael Cohen paid to Stormy Daniels in 2016: a tax bill. Daniels—whose real name is Stephanie Clifford—would have been obligated to pay as much as $51,480 of that hush money to the IRS. That's assuming she filed jointly with her husband, also a porn actor, and that they made enough to be in the top bracket. The settlement was "definitely taxable to Stormy, unless she had alleged actual physical injury, which she did not," says Ruth Wimer, a Washington lawyer and accountant. On her tax return, Daniels would have been asked to identify the reason for the hush money, but she could have declined to provide details if doing so would have exposed her to liability.

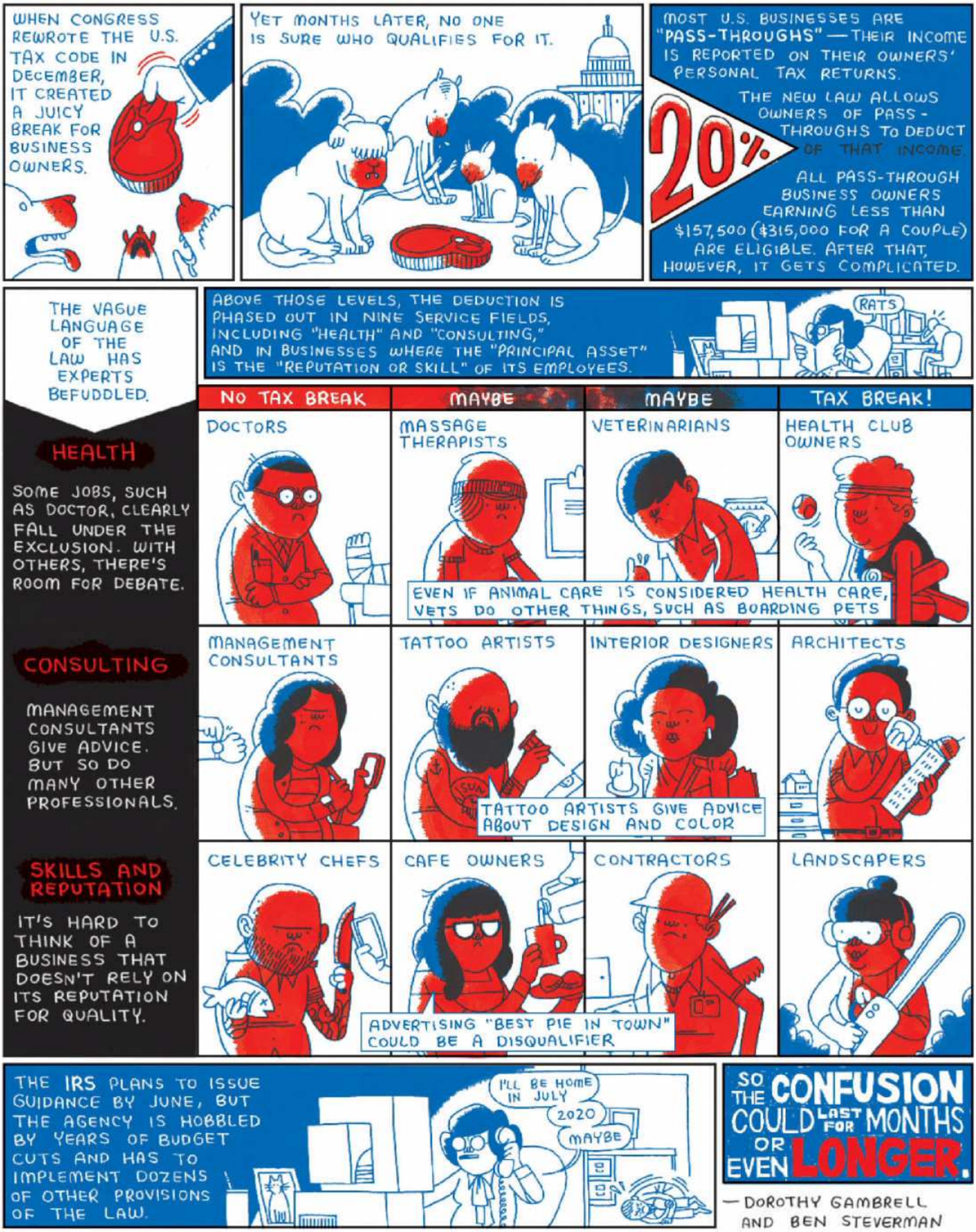
It's not just Daniels. Karen McDougal, the ex-Playboy Playmate who alleges an affair with Trump, would have owed taxes on the $150,000 paid to her by American Media Inc., owner of the *National Enquirer*. Payments with nondisclosure agreements are "very common" in civil lawsuits and litigation, says Ron Burdge, a consumer lawyer in Dayton. How common? "It's hush money, so no one knows."

Cohen scraped up the money through a home-equity line of credit. Until Trump's tax law took effect this year, taxpayers could deduct as much as $100,000 in interest paid on such loans and credit lines, no matter how they used the money. Now the deduction is only for loans used for home improvements. (Cohen has said he's renovating his family's apartment.) Companies and entrepreneurs routinely take deductions for ordinary business expenses. Cohen "could argue that the payment was related to his business or brand," says Brandon Mourges, a tax lawyer in Baltimore.

That would be "a stretch," says James Harbert, an employment lawyer in Chicago. "It's not ordinary practice for a lawyer, without the knowledge of his client, to make a payment to someone for nondisclosure." Also not customary: paying from your own wallet. "That's extraordinary—more in the nature of a gift." And it's not deductible. *—Lynnley Browning*

THE BOTTOM LINE The president's alleged paramours may have been quiet for a while, but the IRS has a claim to any profit they may have made from silence.

Pass-Through Confusion



Small Biz

Reaching Fresh Audiences

Museum Hack's tours are attracting crowds of first-time visitors to America's art institutions

Advising museums on audience development isn't a scenario Nick Gray had in mind when he first turned his hobby—giving friends oddball tours of New York's Metropolitan Museum of Art—into a small business. An entrepreneurial type who founded a web-hosting service while in high school, he always found museums "cold, both emotionally and physically." Then a date led him through the Met with an emphasis on her individual passions—and the museum became a favorite spot.

Gray perfected his tours by pestering friends with feedback forms. Thanks to attention online, he went pro in 2013, settling on a name, Museum Hack, hiring guides, and expanding. Tours of institutions in five cities, with titles such as "Un-Highlights" or "Badass Bitches," soon captured the attention of museum professionals. "There was immediate intrigue with these renegade museum tours," says Andrea Feller, the curator of education for the Arizona State University Art Museum.

The company's seeming irreverence wasn't off-putting to Feller and her colleagues at the ASU museum. In 2017 they hired Museum Hack to help create programming. The company developed an event modeled on the "escape room" trend—real-world adventure games that involve solving puzzles and challenges to "escape" a physical location—designed specifically to attract millennials who often ignored

ASU's museum. The free but ticketed event's 150 slots filled up in 24 hours.

"The number of people who were interested just dumbfounded us," Feller says. "It created a real buzz." Best of all: 70 percent of participants had never been to the museum before.

Museum Hack's core mission is to go after people who think museums aren't for them, Gray says. "We're not preaching to the choir, or trying to get someone who comes once a year to come three times a year. We're trying to get somebody who would never go to the museum."

So a tour tailored to "finance bros," for example, will immediately take them to the most expensive object in the museum, with a blunt ▶

ILLUSTRATION BY NICHOLE SHINN

◀ discussion of its worth—an entry point to engage the newbie audience. This builds word of mouth. Museum Hack charges $59 a person for Met tours, including the full admission fee. (The tours contributed $200,000 to the museum's revenue last year.) Lately, Gray says, consulting for and working with cultural institutions has become the company's fastest-growing line of business, rising from nothing two years ago to almost a quarter of its $2.7 million in revenue in 2017. (The company doesn't consult for the Met.)

This new line of business started after an approach from Norway's National Museum of Art, Architecture and Design. Ethan Angelica, a Museum Hack guide, adapted the company's guide training program into a workshop for the National Museum's 40 docents, pushing them to use more colloquial language, think about tours in storytelling terms, and quickly devise fresh, game-like approaches to familiar collections. "That became the foundation of a lot of the work we've done since then," says Angelica, now Museum Hack's director for creative and consulting. The company served about 50 such institutional clients last year.

"The core audience of museums is aging," says Elizabeth Merritt, founding director of the Center for the Future of Museums at the American Alliance of Museums in Arlington, Va. A 2015 report by the National Endowment for the Arts found that from 2002 to 2012, the percentage of adults who'd visited an art museum fell from 26.5 percent to 21 percent, and those who did go visited less frequently on average. Some museums are laying off staff and reducing hours and programming, rejiggering admissions schemes, or relying on increasingly ambitious gift shops.

Meanwhile, younger museum visitors seem to seek a more personal experience, fashioned partly by their own interests and input, rather than simply absorbing and accepting an institution's curated expertise. A cynic might say that means treating museums as little more than a collection of cool backdrops for selfie-taking.

Museum Hack is creating a midpoint: a creative approach to draw people to the institution that still remains "on mission," as Merritt says. ASU followed its Escape the Museum experiment with another Museum Hack-devised tour dubbed Get Weird. Visitors engaged in figure drawing and danced the Macarena in multiple galleries to earn entrance to a "VIP chill space." It was another hit, Feller says. ASU has made the escape-room event a recurring feature and is planning a Get Weird sequel. "There's a lot of buzz about the programming," she says. "People are asking us about our next events."

For Gray, that's the Museum Hack payoff: Maybe its strategies and events at first sound disconnected from traditional museum reverence, but they can bring in people who never would have guessed how much they might enjoy the museum context. Says Gray: "I don't think anybody before Museum Hack has said, 'We're going to really intentionally go after people who think that they don't like museums.' " —*Rob Walker*

THE BOTTOM LINE With attendance at museums falling, startups such as Museum Hack are teaming up with institutions to create personalized, quirky tours and events to appeal to newbie visitors.

The Quest for Experienced Talent

Smaller accounting firms find riches in professionals who've retired from the majors

Christopher Petermann, a partner at PKF O'Connor Davies LLP, has found a valuable source of talent for the accounting and advisory services company: partners of the largest accounting firms who typically are expected to retire by their early 60s. "We don't have mandatory retirement, and the older people we're hiring are vibrant, with expertise in areas that can help us grow—plus they're helping train younger employees," says Petermann, co-director of the New York-based company's foundation practice.

At a time of low unemployment, it's tough for many companies to find and keep the best talent. Competition is especially steep for accountants and consultants with financial and information technology know-how, as increased financial regulations, tax law changes, and the growth of Big Data and global trade spur demand for specialists. Restless veterans of big accounting firms such as KPMG LLP and Deloitte LLP provide a solution for small and midsize business service companies—among them PKF, Marcum, and WithumSmith+Brown.

Mandatory retirement policies were put in place decades ago when life expectancies were shorter and as a way to make room for younger employees to become partners. Today many accountants and other professionals aren't ready to stop working at 60, at least not entirely. Many want part-time or flexible schedules and are willing to take a salary cut.

"These older partners that large firms are ushering out the door are a talent gift to smaller companies," says Ruth Finkelstein, executive director of the Brookdale Center for Healthy Aging at Hunter College, who's studied older workers. "They don't need to be trained. They have experience and contacts that can bring in new business and important knowledge to pass to younger employees." That includes experience in international business and governance, expertise that small and midsize client companies need and can get from the seniors at lower rates than if they hired big accounting firms.

It's an employment model that companies in many industries could use and benefit from, says Peter Gudmundsson, founder of Dallas-based Hire Maturity LLC, which produces career fairs and runs a job board for what he calls "mature talent." "If you've done tax or audit for decades—or marketing or finance or any business specialty—you have professional networks that are hugely valuable to employers and a willingness to help people coming up the ranks because you're no longer competing for promotions," he says.

Lawrence Baye felt at loose ends when he had to retire in 2015 from a 34-year career at Grant Thornton LLP, where he was a principal. So he was receptive when two years ago a recruiter connected him with PKF, which wanted his expertise in governance, risk, and compliance matters, as well as IT and business operations. "I don't have hobbies and was bored at home—and they welcome veterans here," says Baye, who's working as a consultant at the firm three days a week.

PKF's almost 800 employees range in age from 22 to 82, and many, regardless of how old they are, have flexible schedules aimed at helping them balance work and families. Those at traditional retirement age, such as Baye, can work part-time as consultants.

"I don't want to be promoted, so I'm not clogging the path for younger employees" says Baye, who likes working in smaller teams and informally mentoring younger colleagues. "I tell them what I'm doing and why and to try to envision the end result they want on an assignment, but I also want them to critique me and do their own original work," he says.

The advice that veterans can offer is especially important to MarcumBP, a Marcum LLP unit that works primarily with clients that do business in or with China. The unit has about 90 employees in the country and about 25 in New York. It employs retirees from big companies, each with extensive knowledge about a particular industry such as health care. The veteran hires are training MarcumBP's Chinese staff, who are mostly in their 20s and 30s and, in many cases, studying to

become U.S. certified public accountants.

"We're a small company that's working in an emerging market and can't afford to make a mistake," says Drew Bernstein, MarcumBP's co-managing partner. "The retiring partners we get from big firms are at the top of their game, with expertise that's very hard to obtain—and they're fantastic mentors."

Instead of recruiting from outside, other talent-hungry companies encourage veterans to keep working. New York-based WithumSmith+Brown PC, an accounting and consulting company with about 800 employees ranging in age from their early 20s to 91, requires veterans to step down as partners when they turn 65. But it invites them to become emeritus partners and to keep working as long as they're productive.

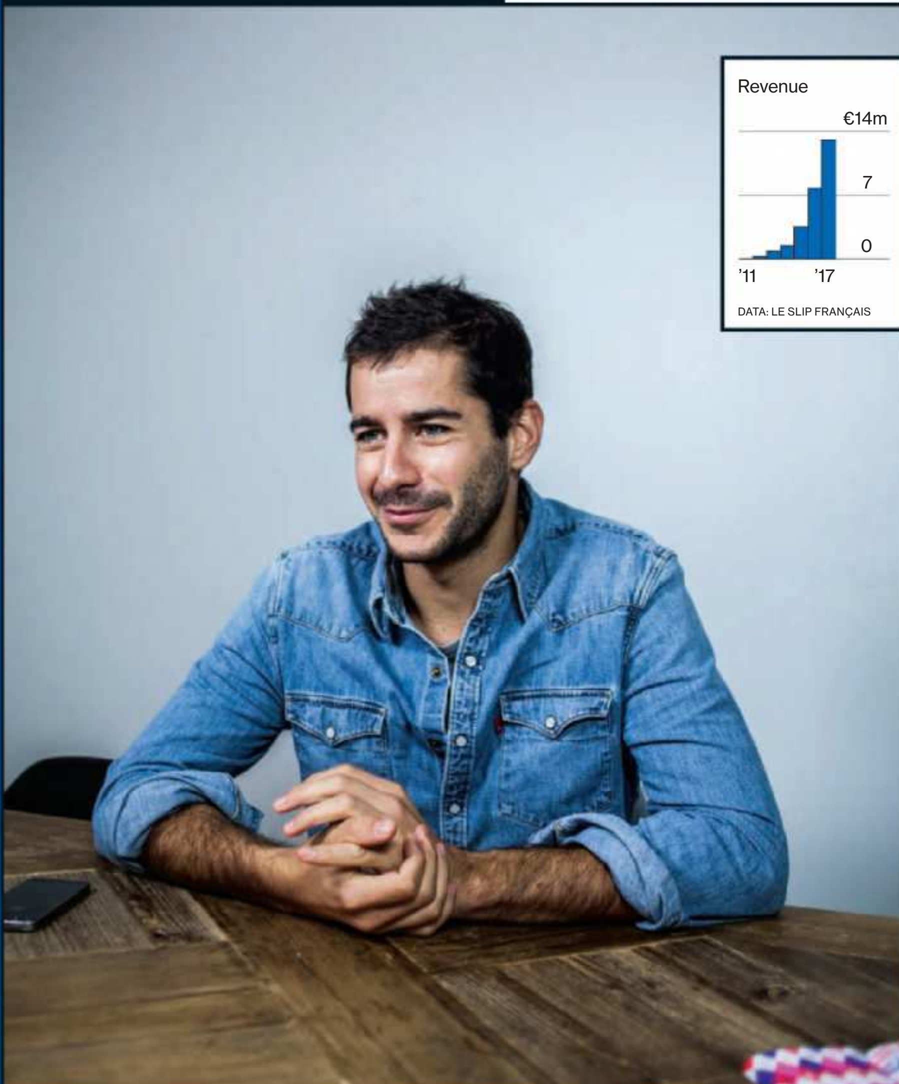
"There's a benefit to having five generations in the workplace, because everyone brings something to the table," says Joan Kampo, director of human resources. "It's not about age. It's about keeping talent in this tight labor market. You can have a 22-year-old who's wise beyond his years and someone in his 70s who's motivated and willing to embrace changes." —*Carol Hymowitz*

THE BOTTOM LINE Small and midsize accounting and advisory service companies are recruiting former partners of big firms, creating an employment model that could benefit other industries.

ILLUSTRATION BY NICHOLE SHINN

Scaling Up

Le Slip Français SA



Guillaume Gibault

Age ● 32	Location ● Paris
Industry ● Fashion, e-commerce	Founded ● 2011

The idea to sell men's briefs came to Guillaume Gibault a year and a half after he graduated from HEC Paris business school in 2009. Sitting with a friend at a Paris cafe, across from the department store Le Bon Marché, Gibault riffed on the types of products he'd consider making and selling. A men's *slip* (French for brief) came to mind—small, a repeat purchase, you don't try it on, "the perfect product to sell online," he says. The friend dared him to try. So Gibault designed the brief, found a factory, and set up a website and social media pages. He sold 600 pairs in less than two months; he sells about 20,000 a month now.

You knew from the start that production would be in France?

Yes. I was thinking of French brands with big international awareness, like Louis Vuitton and Hermès—made in France, local production, high craftsmanship. The know-how is really the DNA of those brands. If I could start a fashion brand online with that same DNA, that seemed cool. We'd use social media to promote savoir-faire.

What was your first big challenge?

Actually producing the underwear. I had a lot of orders and not that many factories ready to go. It was tough for them—second-, third-generation owners of workshops that had to lay off half their staff over the past 20 years—to trust a 25-year-old trying to sell briefs online.

You got a lot of attention right at the start. How did that happen?

In the 2012 presidential election, François Hollande was saying, "Change is now." So I made it "Change your slip, now!" as a joke. It went viral on Facebook. There were journalists queuing outside my grandmother's apartment, where I ran the business for two years, for interviews.

Describe your social media strategy.

What works best is to show how you do what you do every day. Stories about the factories get a great response. We did a Facebook campaign where we painted our label on the roof of one factory, and we took a photo of us and our factory team.

How does the near future look?

We're growing mostly online, but also opening more shops and expanding our line of products for both men and women. There's a great opportunity with women. And we're focused on international growth. Right now, 10 percent of our sales are outside of France. We want to keep changing the world with our briefs. ——*Dimitra Kessenides*

STEPHANE GRANGIER/CORBIS/GETTY IMAGES

Less Trolling, M
Less Conspirac
Lattes  Less P
Puppies  Less
More Makeup T
Breach, More E
Less Scrutiny, M

Instagram, in all its trivial glory, might be the best

lore Posing 

cy, More

Pepe, More

s Politics,

Tricks  Less

Beach 

More Selfies 

hope for Facebook

By Sarah Frier

Through the glass doors, beyond the giant camera logo and before the artisan coffee stand, visitors to Instagram's headquarters in Menlo Park, Calif., are invited to pause and commemorate the moment. Along one wall are three brightly painted dioramas: a night sky, a moonscape, and a pink sunrise with white plastic clouds in the foreground. The depictions, evoking the company's famous photo filters, are joined by arched doorways so guests can step between the three sets, taking a portrait in each.

That this display celebrates a now instantly recognizable form—the selfies shared within Instagram's smartphone app—is a testament to the company's success and cultural impact. But what's missing from this scene is any sign of Facebook.

Since 2012, when Facebook Inc. bought the 13-person company for $715 million, Facebook's way of doing business has been central to the rise of the photo-sharing network. In its earliest years as a Facebook property, Instagram operated out of the same building where founder Mark Zuckerberg worked. Today, Instagram's 700 employees work in offices that lack any visible evidence of its corporate parentage, even though they're just a five-minute bus ride from the mother ship. The company has its own mission statement—"To strengthen relationships through shared experiences"—its own branding, and a corporate culture that's as concerned with creativity and design as Facebook's is with engineering and data. But Facebook did impose its most important belief on Instagram: an obsession with growth.

In Asia and Latin America, Instagram sign-ups have been booming. Later this year, Instagram will likely surpass 1 billion users worldwide. "So few networks get to that size," says co-founder Mike Krieger. "It means you're having a tremendous impact on the world." He says it's still surreal to see Instagram loaded on other people's phones on the train or at concerts. Last year he and co-founder Kevin Systrom enjoyed a moment of shared wonder when they realized that the billion-user milestone was within reach, a "pregratitude moment," Krieger calls it.

When Krieger and Systrom sold their company to Zuckerberg, the great promise of the deal was that whatever trail Facebook blazed, Instagram would follow. Instagram borrowed Facebook's business model—advertising—and it will contribute 18 percent of the parent company's overall revenue this year, according to a recent report from the research company EMarketer Inc. But following in the bigger network's footsteps has lost some of its appeal.

Facebook has more than 2 billion users but has been painfully slow to understand its own impact. The service's algorithm, designed to reward content that elicits emotion, made it a perfect tool for Russian propagandists to spread disinformation during the 2016 election. And Facebook's tendency to introduce products quickly, with little regard for their risks, caused the company to overlook obvious vulnerabilities. On April 10 and 11, Zuckerberg testified before congressional committees about his company's recent disclosure that it had allowed Cambridge Analytica, a market research company connected to the Trump campaign, to access personal data from as many as 87 million Americans. Facebook's stock price is down about 10 percent since mid-March.

Instagram relied on Facebook for its success, but now Facebook may depend on Instagram for its longevity. The app has hosted some unsavory content, including from Russia, but its filtered sunsets and selfie photos make it look benign by comparison. "What if a healthier Facebook is just Instagram?" a *New York Times* columnist asked in January, suggesting the app's emphasis on sharing personal photographs, rather than viral news, as a possible blueprint for Facebook.

There is some evidence for this point of view. Instagram's audience is younger than Facebook's—an advantage from a marketer's perspective. And unlike Facebook, which reported its first decline in users in North America in its most recent quarter, Instagram is still growing in its home market. "Without Instagram, Facebook is a completely different picture," says Jason Kint, chief executive officer of Digital Content Next, a publishing trade organization. Kint says Facebook might soon stop growing internationally, too, meaning that Instagram will be "incredibly important" to the company's prospects.

The idea that Instagram might bail out Facebook has likely been in the back of Zuckerberg's mind. He often says that Facebook should disrupt itself before someone else does, and he regularly celebrates Instagram at Facebook's weekly staff meetings, according to several employees. When executives are asked whether it's bad news that younger users seem disenchanted with the main social network, they respond that younger people love Instagram, and that's good for business overall. This is especially important because data gleaned from Instagram users can be used for targeting advertisements on Facebook, and vice versa.

Most Instagram users are unaware of all this. The service is widely seen as an escape from Facebook, so Instagram has to tread carefully to protect the app's reputation. Krieger, the company's chief technology officer, says he works to spread

Krieger and Systrom designed and coded the first version of Instagram in eight weeks

Instagram around the world while being careful not to repeat Facebook's mistakes. "We're not trying to relearn the same lessons," he says.

Krieger has long been the lesser-known Instagram founder, but his job—to remove any technological barriers for users—has become more vital as the company expands internationally. He was born in São Paulo, Brazil, but his father was an executive at beverage conglomerate Seagram Co., and the family moved frequently, living at times in Portugal, Argentina, and the U.S. He met Systrom when the two were at Stanford, where Krieger majored in symbolic systems, a course of study focused on computers and psychology that LinkedIn Inc. co-founder Reid Hoffman, among other well-known Silicon Valley figures, also pursued.

In 2010, Systrom asked his friend for help building a social network app called Burbn, which at the time was focused on allowing users to "check in" to bars and restaurants. Check-ins were a hot idea, but Krieger helped persuade Systrom to pare back the app to its most popular feature, photo-sharing. The two built the original Instagram prototype in eight weeks, less time than it took Krieger to get his U.S. work visa. The new app allowed people to post square pictures with filters that made them look more artsy and professional.

Krieger saw the app's global potential from Instagram's earliest days, arguing for a design that used as few words as possible to minimize language barriers. The functionality was deliberately spare: Instagram users who opened the app were presented with a simple chronological feed and could like and comment on their friends' photos.

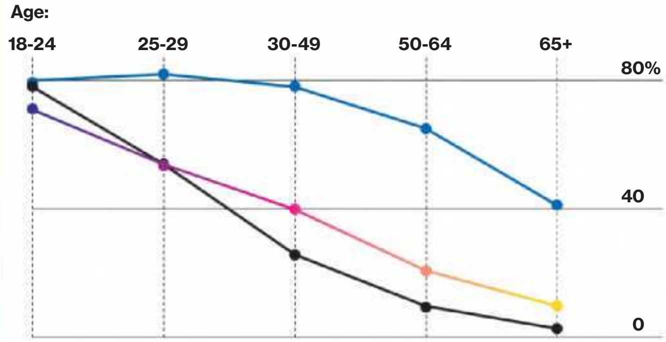
In an interview with *Bloomberg Businessweek*, Krieger—dressed as usual in a button-front shirt rolled to the elbows, with wire-frame glasses and hair combed back with gel—says Instagram is about truly knowing people, even if you've never met them. All of the company's product choices stem from that insight. In Instagram's early years, he says, he followed an account maintained by a stranger in Japan, because the guy had a great dog. (Krieger is married, but much of his own Instagram activity is devoted to another love, his 85-pound Bernese Mountain Dog, Juno.) When Instagram allowed users to post videos in 2013, the Japanese dog owner recorded one with his young daughter. Krieger was suddenly struck by a sense of a deeper connection. "I teared up," he recalls.

One of Krieger's early contributions to the app—a button to let users share other people's posts with followers—was never given to users. That turned out to be a crucial decision. Viral content had been essential to growth at Facebook and Twitter, but as Krieger and Systrom watched people use Instagram without it, they realized that sharing can also lead to a sense of alienation. "It would make people feel like the content in their feed was not what they had chosen," Krieger recalls.

A second important benefit of avoiding sharing revealed itself more slowly: It saved Instagram from the viral effects of sensationalist news and memes. The app became a place where people mostly presented what they'd created or experienced, rather than posting about the day's outrage. The app still makes it almost impossible to link to other websites, a feature that's central to Facebook. Zuckerberg has told Facebook's engineers to build whatever users might want; an early motto was "Move fast and break things." Systrom and Krieger's motto could easily have been "Don't ruin it."

Americans Who Say They Use ...

● Facebook ● Snapchat ● Instagram



DATA: PEW RESEARCH

This was part of the appeal to Zuckerberg, who's consistently sought to acquire or copy smaller social networks. While working on the deal to buy Instagram, which at the time of the acquisition had 30 million monthly users, Zuckerberg had his growth team meet with Systrom and Krieger to go through the company's latest performance data to make sure there were no glaring issues.

It turned out that Instagram didn't really do data. It was "really embarrassing," Systrom says. "We had a dashboard that had a live updating number of who signed up for Instagram per minute. That was growth for us." Once the acquisition closed, only a few months after Facebook's initial public offering in 2012, Zuckerberg installed members of the Facebook growth team at Instagram. They "instrumented the hell out of the app," according to a person familiar with the integration of the two companies. Instagram, employees were told, was "going to hit a wall" someday without Facebook's intervention.

Today at Instagram's headquarters, just a flight up from the lobby in an open space where engineers work, a large screen displays a set of graphs in a grid, charting everything Facebook taught Instagram to measure. This dashboard keeps track of performance in Instagram's newest markets in real time, with blue, green, and orange lines ticking upward as people post to Instagram or comment on friends' photos. Monitors alert engineers if anything is taking too long to load or if a country's cellphone networks are having issues. Listed on-screen is the name of the employee to call in case Instagram, for some technical reason, stops getting more popular.

To outsiders, Facebook left the app relatively unchanged. It was faster and better but remained a simple tool to post photos with artistic-looking filters. Instagram became "proof...that Zuckerberg can turn visions of growth and impact into reality without undue meddling," Michael Hoefflinger, a former Facebook executive, wrote in his 2017 book, *Becoming Facebook*. The "priceless value" of the ▶

Most Americans don't know the identity of Instagram's parent,

Instagram acquisition, according to Hoefflinger, was that it persuaded smart people to work with Facebook, confident that they could maintain creative freedom.

The story behind the scenes was more complicated. In 2015, Snapchat—the photo-sharing app that Facebook had tried to buy years earlier—started stealing Instagram's core audience of American teens. Snapchat's killer feature was known as "Stories," ephemeral video updates that disappeared 24 hours after they'd been posted. People could also put cartoon face masks on selfies and draw annotations, which made the app seem like a fun alternative to Instagram's polished artsiness.

Krieger and Systrom refused to build look-alike functionality until Zuckerberg personally requested it, according to a person familiar with discussions. Zuckerberg worried that if Instagram didn't do something to change its product, such as copy Snapchat, it risked missing out on an entire generation of users. A spokeswoman says Instagram "initiated and drove the creation of Stories internally and was not pressured." Systrom acknowledges there was "tension" over the direction of Instagram, which he's grateful for. Instagram Stories was introduced in August 2016. By the following spring, it was already more popular than Snapchat.

It was one of many major moves Instagram made that year to attract a wider audience. Photos no longer had to be square. The posts would appear in an algorithmic order, like the Facebook news feed, rather than showing up in the order in which they had been posted. Even Instagram's iconic logo, a stylized Polaroid camera, got a colorful makeover. "We had to shift our internal perception of what we thought defined Instagram," Krieger says. The result: Instagram's growth rate accelerated dramatically.

One day last October, Instagram researchers, damp from on-and-off rain, huddled across from a man selling sliced fruit in an open market in Kolkata. For an hour and a half they stopped passersby to ask questions about the app. In an attempt to get honest feedback, they didn't identify themselves as Instagram employees. They'd left their Instagram-branded hoodies in their hotel rooms.

One Kolkata shopper told an Instagram researcher Ashlee Edwards Brinegar that she didn't feel as if her life was interesting enough to post on an Instagram account. She knew about the app because the newspaper always published account handles for celebrities, but she was not a celebrity herself.

This, for Instagram, was a problem worth bringing back to headquarters. In a February meeting, Brinegar presented a slideshow to product and growth executives about problems reaching the fast-growing Indian market, displaying quotes from Kolkata residents about how the app takes up too much space on their phones or simply "doesn't work." Because it became popular in India with celebrities first, Instagram is seen as a destination for professional-looking content. That's scared normal people away from frequent use.

The solution to the last concern, the group decided, was Instagram Stories, the disappearing videos. The format may have started as a Snapchat clone, but Instagram—following the Facebook playbook—is bringing it to markets, including India, where Snap isn't yet strong. During the meeting, Kevin Weil, Instagram's head of product, pointed out that if Instagram got local celebrities and cricket stars to use the less-polished Instagram Stories, it might teach everyone else how to do so. He suggested leaning on Facebook's Indian partnerships team, which had made Facebook a must-have app in the country. "They have a bunch of these relationships they've built up over the years," Weil says. "So it may be worth starting with them vs. our own team."

Krieger says sending engineers to new markets has been crucial to Instagram's expansion efforts, which can't rely on data alone. In Indonesia in 2016, he says, Instagram's Menlo Park-based security team noticed a worrisome pattern in the data. Users were putting up photos and then removing them in quick succession. In the U.S., that's classic behavior of a spammer. But Instagram's contacts in the country told a different story. Indonesians were simply putting up goods for sale, arranging the transfer of money once they were sold, and then deleting the photo. It was a nascent e-commerce business, not a shady marketing tactic.

"They were just using Instagram in a completely different way," says Krieger, who's made a point of visiting growth markets. Krieger and Systrom traveled together to Japan in 2016. Last year, Krieger made his first business trip to his home country; Brazil is now Instagram's second-biggest market. There he visited artisan doughnut makers building their business on the app by posting pictures of their confections, then shipping the treats to commenters via the country's existing network of motoboys, or motorcycle delivery men.

The trips, he says, lay the foundation for Instagram's product planning. "There's some empathy that comes from looking at graphs and saying, 'Wow, in Mexico it takes longer to load an image than in the United States.' And then there's the feeling of actually being there."

In the U.S., Instagram has mostly avoided guilt by association with Facebook. And the parent company has worked to keep it that way. When Facebook's chief counsel, Colin Stretch, appeared before the U.S. Senate Select Committee on Intelligence on Nov. 1, his prepared testimony included a bombshell piece of data: that the 80,000 posts from Russian operatives trying to stir up political controversy on Facebook reached an estimated 126 million Americans.

It wasn't until a senator asked about Instagram specifically that Facebook revealed another number it had prepared. "The data on Instagram isn't as complete," Stretch hedged. But beginning in October 2016, he acknowledged, Instagram posts created by Russian propagandists reached 16 million extra people on the photo app. According to prepared

DATA: EMARKETER, U.N.

which is just fine with Facebook

congressional testimony released on April 9, Facebook now thinks the number was 20 million.

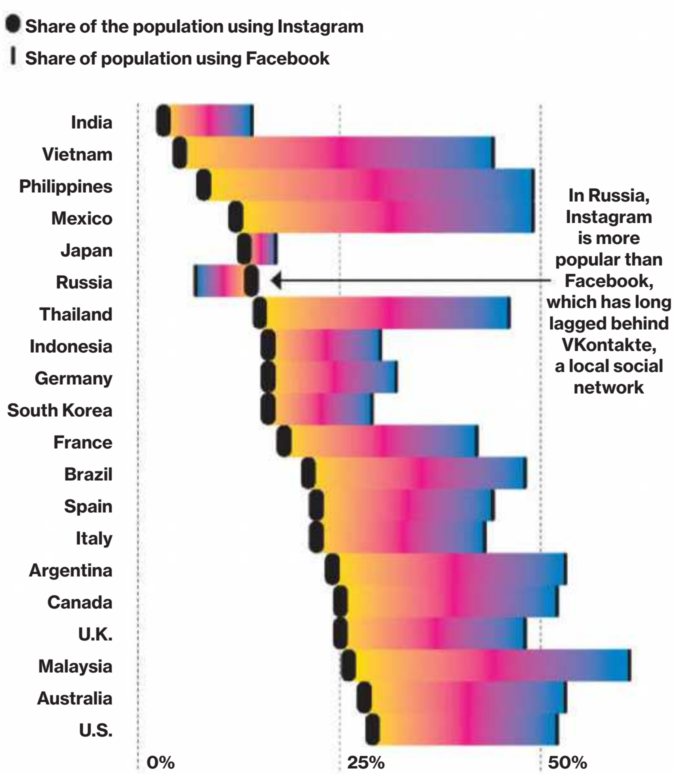
Facebook has boosted Instagram where convenient—in conversations with advertisers, for example—but otherwise hasn't done a lot of co-branding, keeping it separate in the minds of consumers and lawmakers. The majority of Americans don't know about Instagram's affiliation, according to a poll last year by Reticle Research and the Verge. On LinkedIn, when employees change jobs from Facebook to Instagram, they list Instagram as a separate company.

As the Cambridge Analytica scandal spiraled out of control, it touched Instagram only briefly, in tweets from Elon Musk, the SpaceX and Tesla Inc. CEO. Musk said he shut down his Facebook page and the pages of his companies, becoming the highest-profile businessperson to embrace a budding #DeleteFacebook movement. Some of his followers asked, what about Instagram? Instagram was "borderline" but "probably okay," Musk tweeted, "as long as it stays fairly independent."

Since then, celebrities and brands have publicly cut ties with Facebook, including *Playboy* magazine, which pulled its main page from the site after Cooper Hefner, son of founder Hugh Hefner, said Facebook's "corporate policies continue contradicting our values." He made the announcement with a quote overlaid on a soft-focus portrait of himself. It was posted, of course, on Instagram.

That Facebook owns the first- and third-largest social networks—China's WeChat, with a little more than a billion users, is in second place—is undoubtedly a huge advantage, even if it could eventually lead to antitrust scrutiny related to Facebook's dominance of the online advertising market. Google isn't building another search engine, and Amazon isn't building another e-commerce business, but Facebook owns a second social network that could one day be bigger than Facebook itself. Instagram has transformed from a small experiment, an "asterisk" in terms of Facebook revenue, to a "peer" in Zuckerberg's eyes, Systrom says. "Mark, the other day, said it used to just be that Facebook was the large, large majority of activity and revenue, and that's different now," he says. "This is a new normal."

The Reach of Facebook and Instagram



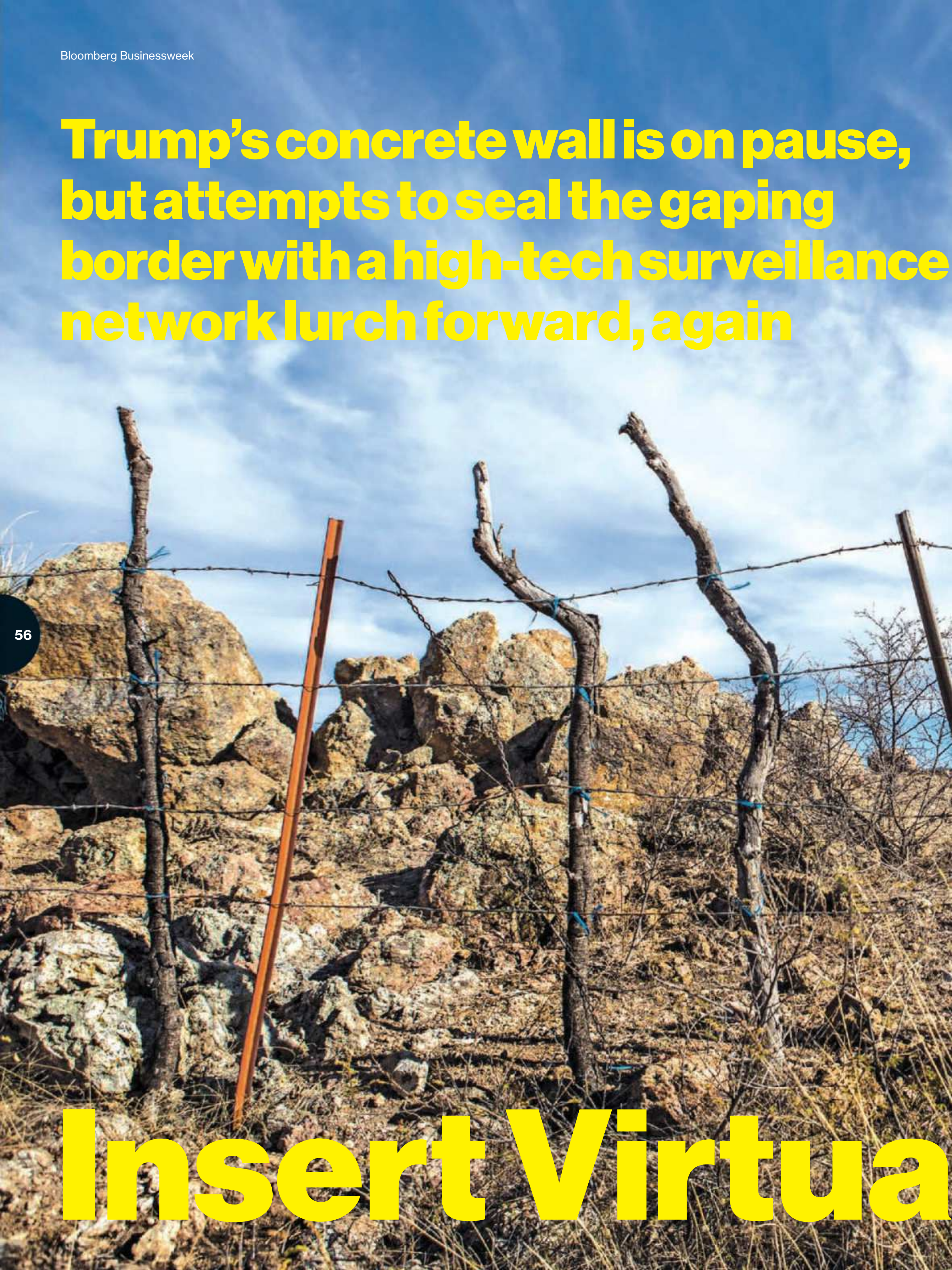
Facebook's detractors warn that instead of serving up a sunnier alternative to Facebook, Instagram could inevitably wind up raising many of the same concerns about privacy and content currently plaguing the larger social network. Roger McNamee, an early Facebook investor who's now one of the company's loudest critics, says Facebook "used its dominant position in social media to grease the skids for Instagram" and has intentionally tweaked Instagram to make it more Facebook-like. Just as Facebook users weren't emotionally equipped to handle fake news, he warns, Instagram users are being exposed to unhealthy visions of what is normal, leading to body shaming and other feelings of inadequacy. "The dark side of social media did not happen by accident," McNamee says. "It's a side effect of conscious design choices made in support of maximizing the profits from advertising business models." Instagram has said that it's focused on the mental well-being of its users.

Krieger and Systrom ran into their first Facebook-related crisis in 2012, shortly after the acquisition. Instagram's original terms of service—the legal document in which social networks typically assert their rights and responsibilities with regard to users' data—had been "basically copied off the internet," Systrom says. So Facebook's lawyers insisted the founders draft a new one.

The Facebook lawyers helped Instagram write new terms. Buried in the agreement was a clause that implied that Instagram could sell users' photos. It captured the attention of internet hordes looking for proof that Facebook was ruining everything. Systrom and Krieger watched the dashboard as deletions spiked. Then they put out a tweet and a blog post announcing they'd removed the offending section and replaced it with the old one. Everything went back to normal.

The terms of service are still not entirely clear all these years later. Before Zuckerberg's scheduled congressional testimony on privacy, Facebook had been doing a companywide review of all its products, making sure, the company says, that it's using data only in ways that benefit users and can be understood by them. In a blog post at the end of March announcing changes to how Facebook explains its policies, a bullet point, with the header "One Company," addressed public confusion about Instagram. From a data perspective, it noted, Facebook and Instagram are the same. Ⓑ

Trump's concrete wall is on pause, but attempts to seal the gaping border with a high-tech surveillance network lurch forward, again



Insert Virtua

By Lauren Etter and Karen Weise
Photographs by Kirsten Luce

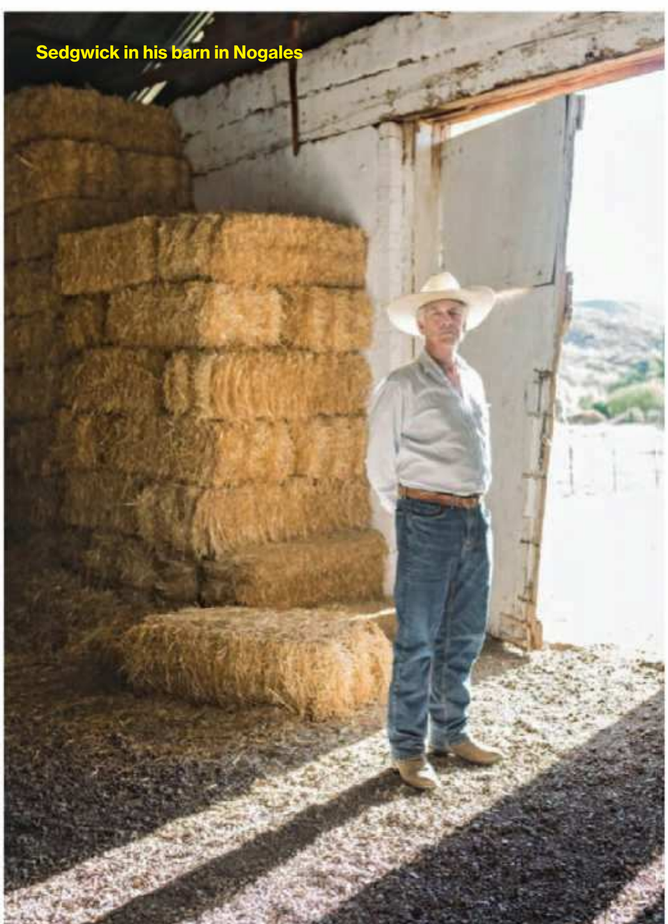
A border fence on a ranch west of Nogales, Ariz.

I Fence Here

Tony Sedgwick steers his red Nissan pickup to the edge of his vast Arizona ranch in the Sonoran Desert, unlocks a cattle gate, and continues rattling south along a dirt road until he reaches the U.S.-Mexico border. He climbs out of his truck and follows the undulating line of towering vertical steel beams as the ground slopes down into a dry riverbed. Here, the beams give way to crisscrossing shoulder-height iron bars. The white-haired cowboy removes his hat, hikes up his Wranglers, scissors over one iron bar, and ducks under the next. "I mean, I'm a 66-year-old man, and I have no trouble going through this fence," he gripes. "You can see the senselessness of this."

After ambling around for a half-hour, Sedgwick spots a white-and-green U.S. Customs and Border Protection (CBP) truck bumping up and down in a cloud of dust. It slows, and Sedgwick tips his hat and waves. The agents nod and drive on. He explains that we probably tripped one of the hundreds of sensors buried in secret locations under his pebble-specked ranch. Sedgwick points to another possibility on a hilltop about a mile away. "You see that little tower there?" he asks. A slender latticed edifice pokes into the blue sky, radar antennas and cameras affixed to the top.

This is the southwest border as it exists today. It's an open wound to President Trump and a significant contingent of his supporters, one that was freshly salted on March 23. The $1.3 trillion budget passed by Congress that day doesn't include the $18 billion Trump's administration requested for a concrete wall. Instead, it provides $696 million to replace old fences and $641 million to build new ones in areas where there aren't any currently–and solid concrete is prohibited.


Sedgwick in his barn in Nogales

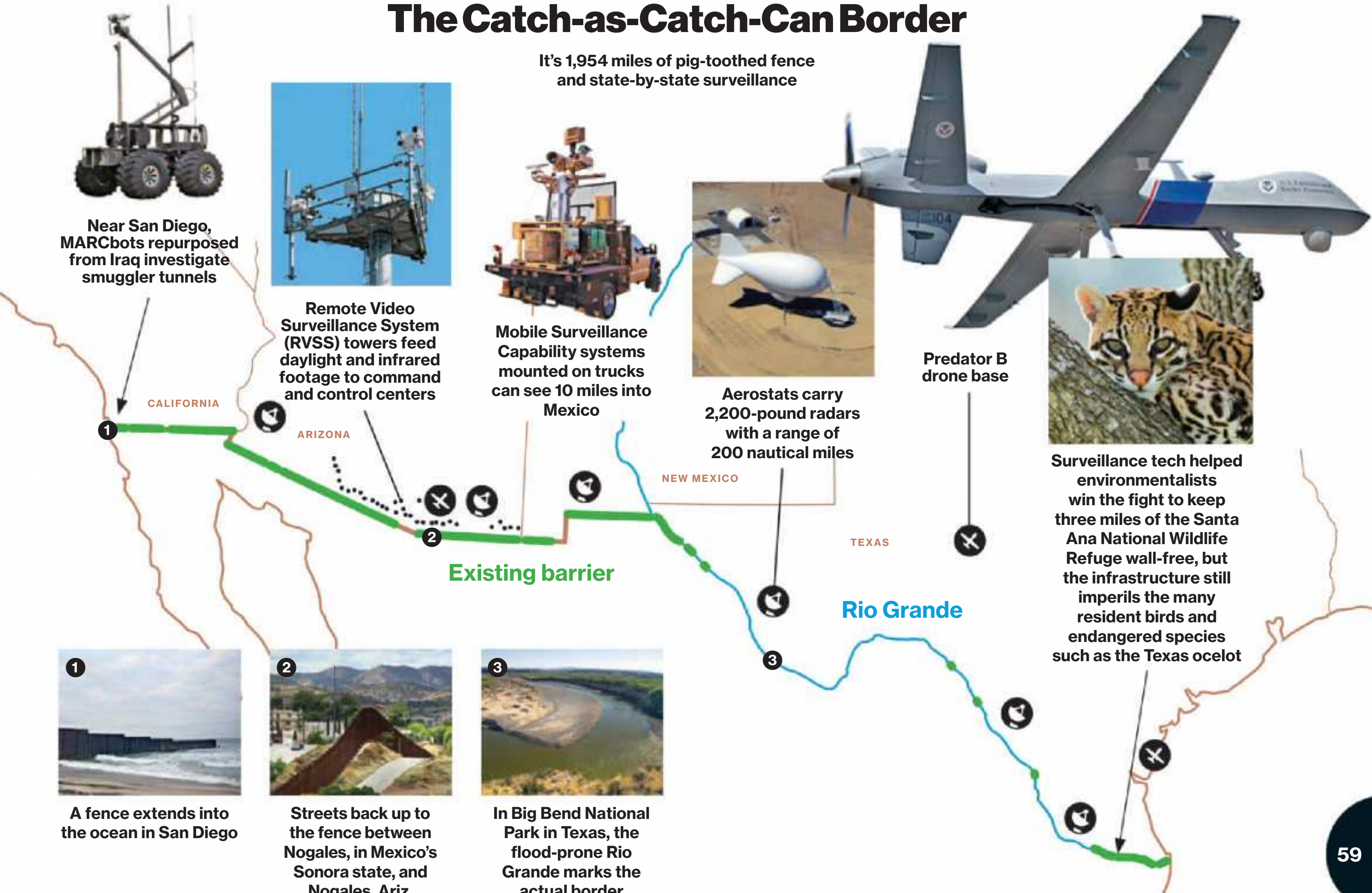
In response to the budget defeat, Trump announced angrily that he'll deploy the National Guard to police the border. He's followed up by signing a presidential memorandum to authorize the deployment of as many as 4,000 soldiers. Strictly from a geographical perspective, it's obvious why the dividing line between Mexico and the U.S. would drive a nativist a little mad. It occupies 1,954 miles of desert, mountains, cities, and valleys from the Pacific Ocean to the Gulf of Mexico and features a hodgepodge of iron bars, barbed wire, concrete blocks, sand levies, stone obelisks, rotting piles of logs, and plenty of wide-open land. An army of about 20,000 Border Patrol agents guards its length on foot and horseback, by all-terrain vehicle and truck, day and night, 365 days a year.

Layered unevenly into this tangle is an electronic perimeter of surveillance towers, 12,000 underground motion sensors, cameras that can spot a jack rabbit hopping through cactuses miles away, long-range radars mounted on distant towers, and Predator B drones whose advanced radar can detect footprints in the sand. Long before Trump signed off on the budget, those closest to him, including his chief of staff, John Kelly, were steering him away from his "big, beautiful wall." There's bipartisan interest in shifting toward more electronic surveillance. Democrats see technology as the wall's lesser evil, despite concerns for the civil liberties of people living within its range. Many Republicans in Congress, especially those from border states, say electronic surveillance promises greater security and, at least in theory, is more cost-effective. The new budget is a win for the tech believers, allotting about $400 million for border technology, including about $50 million for new towers and $20 million for more ground sensors. "Buy more surveillance equipment!" isn't a catchy rally chant, but it looks like reality for now.

Contractors and consultants have been positioning themselves to cash in. Peter Thiel, the PayPal Holdings Inc. billionaire, has raised money for a virtual wall startup founded by Oculus VR creator Palmer Luckey. Called Anduril Industries, after a powerful sword in *The Lord of the Rings*, the company says on its website that it's hiring engineers. Anduril has already paid Heather Podesta and her lobbying company, Invariant, $80,000 to keep tabs on border security funding. The U.S. Department of Homeland Security (DHS), which opened a small satellite office in Silicon Valley in 2015, recently solicited proposals for a miniature facial-recognition drone that could be operated by a touchscreen embedded in the sleeve of a border agent's uniform, as well as for energy-harvesting fabrics and 3D mapping technology. Military contractors whose technology was designed for overseas conflicts are investigating how their wares might be deployed along the border. Already, aerostats (a kind of tethered blimp) used to guard forward operating bases in Afghanistan are watching remote sections of

The Catch-as-Catch-Can Border

It's 1,954 miles of pig-toothed fence and state-by-state surveillance



Near San Diego, MARCbots repurposed from Iraq investigate smuggler tunnels

Remote Video Surveillance System (RVSS) towers feed daylight and infrared footage to command and control centers

Mobile Surveillance Capability systems mounted on trucks can see 10 miles into Mexico

Aerostats carry 2,200-pound radars with a range of 200 nautical miles

Predator B drone base

Surveillance tech helped environmentalists win the fight to keep three miles of the Santa Ana National Wildlife Refuge wall-free, but the infrastructure still imperils the many resident birds and endangered species such as the Texas ocelot

1 A fence extends into the ocean in San Diego

2 Streets back up to the fence between Nogales, in Mexico's Sonora state, and Nogales, Ariz.

3 In Big Bend National Park in Texas, the flood-prone Rio Grande marks the actual border

CLOCKWISE FROM TOP LEFT: COURTESY U.S. ARMY; MIKE CHRISTY/ARIZONA DAILY STAR; COURTESY TELEPHONICS CORPORATION; COURTESY CBP (2); ROLF NUSSBAUMER/ALAMY; ROBERT DAEMMRICH/CORBIS/GETTY IMAGES; MIKE CHRISTY/ARIZONA DAILY STAR; DANIEL ACKER/BLOOMBERG

desert, and wheeled "MARCbots," tested on the battlefield in Iraq, are scouring smuggler tunnels.

Representative Will Hurd, a Republican whose district encompasses 800 miles of the Texas border, says sensor technology has come so far and gotten so cheap that the border should be blanketed with cameras, radar, and fiber-optic cable. "That is not a *Star Trek* scenario," he says. "That's something we should be able to do today."

Yet for all its promise, surveillance technology has become a Bermuda Triangle for border security. The government has devoted a half-century and billions of dollars to creating a virtual wall, but political leaders, America's biggest companies, and laboratories filled with rocket scientists have failed to deliver one that works.

As early as the 1940s government agents introduced a fleet of radio-equipped gyrocopters and built a network of radio transmitters and observation towers to fortify the barbed wire fences built to keep out cattle, immigrants, and bootleggers. But the first major technological experiment in border surveillance grew out of the Vietnam War. In 1970, a Department of Defense engineer traveled to San Diego to see if the seismic and magnetic sensors the Army was deploying to track Viet Cong along the McNamara Line could identify migrants on the border. The government ultimately installed 177 ground sensors, says Iván Chaar-López, whose dissertation at the University of Michigan at Ann Arbor focuses on technology along the border. Over the next half-century, officials came to envision what Chaar-López calls a "system of systems," in which physical barriers, patrol agents, and technology work in sync.

At one point the government deployed a gleaming new Ford Bronco outfitted with electronic surveillance equipment that bounced along stretches of the border. It stood out to the very smugglers the U.S. was trying to bust. One morning agents emerged from their motel room to find the Bronco missing. Soon they tracked it down—sunk in the middle of the Rio Grande. "The message was clear," retired U.S. Air Force Colonel Bill Grimes recalls in his book, *The History of Big Safari*, about secret surveillance missions. "We know who you are and what you are doing."

By the mid-1980s, with oil prices tanking and the Mexican economy sinking into recession, more than a million people a year were caught along the border. In 1993 the U.S. constructed fences—some made of military-surplus steel used for makeshift runways—along 14 miles near San Diego, the busiest point of entry. The following year, Congress, in a rare bipartisan moment, funded Operation Gatekeeper to pay for additional border agents. "We are a nation of immigrants, but we are also a nation of laws," President Clinton said to a standing ovation in his 1995 State of the Union address. "We must do more to stop them." Agents got night scopes to see in the dark, seismic sensors, and an electronic fingerprinting system.

The government also considered dropping invisible dye on immigrants from helicopters to track them and blaring ▶

◀ the sound of barking dogs over loudspeakers. Immigration officials asked Sandia National Laboratories, one of the nation's foremost defense research labs, to recommend other strategies. Officials sporadically plucked advice from the resulting three-volume, 695-page report, not heeding, for instance, the recommendation against investing in expensive advanced technologies that in Sandia's analysis typically "did not provide benefit commensurate with cost."

With the new fences and technology, migrant crossings did plummet in San Diego; instead, more people risked crossing in the deserts of Arizona. According to the Migration Policy Institute: "The Tucson morgue recorded an average of 18 migration-related deaths per year in the 1990s, while in the 2000s it saw almost 200 per year." Next, Congress plowed almost a half-billion dollars into a series of ever more ambitious surveillance programs, such as the America's Shield Initiative and the Integrated Surveillance Intelligence System, known by the unfortunate acronym ISIS. These efforts were plagued by technical problems. Some cameras couldn't pan and hold steady, while insects chewed through components. About 90 percent of ground sensor alerts were false alarms.

After Sept. 11, President Bush marshaled yet another push. The bipartisan Secure Fence Act of 2006 directed the DHS, which had been formed shortly after the attacks, to erect 700 miles of double-layered fencing with room for patrol cars to drive between. (Congress later scaled back the plan.) And Bush introduced the Secure Border Initiative, a multibillion-dollar program to create a bespoke virtual fence of 1,800 towers equipped with cameras and sensors lining the entire 6,000 miles of borders with Mexico and Canada, which would relay data to a central location in Washington, D.C. "We're launching the most technologically advanced border security initiative in American history," Bush said in an Oval Office address.

Boeing Co. won the contract, promising to detect 95 percent of illegal border crossings. Almost immediately, the project fell behind schedule and went over budget. Worse, it barely worked—sensors confused raindrops or leaves blown in the wind for people, an official from the U.S. Government Accountability Office told *60 Minutes*. During a congressional hearing, Joseph Lieberman, the Independent senator from Connecticut, said he was frustrated by the government's inability to "find that mystical point where parallel lines finally meet. It's always just over the horizon, but you never actually get there."

More than $1 billion later, in 2011, Homeland Security Secretary Janet Napolitano canceled the program. The technology ended up covering only 53 miles along the Arizona border. The government is decommissioning the towers and in the meantime has paid roughly an additional $200 million to maintain the program. Boeing has received almost 40 percent of that.

It took an economic shift to accomplish what the virtual fence could not. The Great Recession saw out-of-work migrants return home, and an improving Mexican job market has kept them there. From 2007, when the recession started, to 2011, the number of apprehensions along the border fell more than 60 percent. Last year fewer people crossed than at any point since the early 1970s.

For Trump, these statistics are no reason to claim success in sealing out the "drastic illegal activity" he says is putting the border in crisis. Hard-liners look to one country, and one country only, as a model of success: Israel. Making a pilgrimage to Jerusalem has become a rite of passage for lawmakers interested in border security.

In 2002 bulldozers began uprooting olive groves and pomegranate trees to make way for a system of fencing and barriers intended to prevent suicide bombers from crossing over from the West Bank. Israel's largest private defense contractor, Elbit Systems Ltd., helped design and build what Israel today calls the "smart fence," parts of which circumscribe Jerusalem. In some places the smart fence is a steel-mesh structure topped with razor wire and layered with integrated technologies including sensors, radar, and cameras, augmented by drones. In other places it comprises an invisible network of underground wireless sensors, each with a unique IP address.

"Think of it as IoT, the internet of things," says Haim Delmar, an Elbit senior vice president. "Every sensor has its own logic, it knows where it is, it knows where the other sensors are. They talk amongst themselves to create an understanding of what's happening." Data points picked up by the sensors, such as changes in magnetic fields, temperature, and vibrations, are fed into an algorithm that's grown advanced enough to distinguish between an intruder and an animal or a bush shaking in the wind.

As Israel was isolating Jerusalem, the CBP was formulating its latest modernization scheme. Mindful of the Boeing debacle, the agency required that its new system, called the Arizona Border Surveillance Technology Plan, rely on integrating the feeds from off-the-shelf technology and aim to relay information to local stations rather than Washington. The plan was nothing close to Israel's skin of sensors and advanced capabilities. "Baby steps," says Jeff Gwilliam, a CBP deputy program manager. But it did draw on Israeli expertise.

In February 2014, armed with a proven track record, Elbit's independent U.S. division, Elbit Systems of America LLC, beat out America's largest defense contractors for a $145 million deal to build the most expensive piece of the Arizona plan—the integrated fixed towers (IFT). These 80- to 160-foot-tall structures were designed to carry daylight and infrared cameras as well as radar capable of spotting targets as far as 7.5 miles away, letting agents see if someone has a backpack or long-barreled weapon and track them as they move through bramble.

Elbit has since completed 43 towers in Arizona, including the one on Sedgwick's land. Raanan Horowitz, chief executive officer of Elbit Systems of America, foresees an opportunity to sell the government even more advanced technology, such as foliage penetration radar, and to add the kinds of sophisticated intelligence gathering and listening capabilities Israel uses. "It's not just a bunch of gadgets," Horowitz says.

But America's border is five times longer and far more varied in its topography than Israel's. And there the goal is to prevent all border crossings—with deadly military force if necessary. "In Israel, the main intruders are terrorists," says Gabby Sarusi, an electro-optic engineering professor at Ben-Gurion University of the Negev and a co-founder of a company called SabraFence Technologies that develops sensors for Israel's smart fence. "In the U.S., the main intruders are either smugglers or people that want to live in the United States."

Near the crossing from Nogales, Mexico, into Nogales, Ariz., U.S. Border Patrol agents receive the data transmitted from seven of Elbit's surveillance towers in a cinder block building that once housed a clothing factory—the type of long-gone manufacturing work Trump says he wants to repatriate. The command and control center is at the end of a windowless corridor. "This room," says Public Information Officer Jake Stukenberg, "will go from zero to 100, like"—he snaps his fingers.

One wall is filled with dozens of monitors streaming footage from the seven towers and other cameras. The towers are designed to withstand winds of 10 miles per hour, but on this spring day, the wind is moving at 20 mph and gusting even faster. Red outlines flicker on screens lining the wall, indicating movement. A half-dozen men and women sit in front of workstations, each watching several monitors, panning around the desert miles away. Some of the images are crisp; others quiver enough to make someone beg for Dramamine.

The system depends on the human eye. When there are lots of alerts, the agents must quickly decipher what's happening. "The camera doesn't know," Stukenberg says. If we had triggered a sensor on Sedgwick's ranch, an alarm would have gone off at the Border Patrol station. From there, the agents manning the computers might have pivoted to a camera mounted on an IFT tower and zoomed in to see who was there. It's also possible agents were just cruising by on a routine patrol. Whether it took a half-hour to get to us because we were seen and identified as a low priority or they just stumbled upon us, the Border Patrol isn't telling. "That's the tricks of the trade," says John Mennell, a CBP spokesman.

Last year the Government Accountability Office said the CBP is getting better at procuring and deploying surveillance technology. Still, while the IFT system was under budget, it fell behind schedule, faced a funding shortfall, and didn't function consistently. "The agents are very impressed and very satisfied and highly appreciative of the operational tool they now have," the CBP's Gwilliam says. "Our system is so sensitive sometimes it can pick up birds." The GAO later reported that the DHS can't definitively say how technology has helped spot illegal crossings. A database tracks which systems assist agents in apprehensions, but the reporting is unreliable. Agents in Texas' Rio Grande Valley, for example, have credited IFTs with helping in almost 500 apprehensions. That's even though there isn't a single tower in the state. The parallel lines apparently still aren't converging. B


CBP agents at an integrated fixed tower on Sedgwick's land

THE BIG BET ON SPORTS BETTING

U.K. oddsmaker William Hill's early wager may soon pay off

By Ira Boudway and Eben Novy-Williams

When the Vegas Golden Knights score their second goal against the Edmonton Oilers—a nifty midair redirection of a shot from the blue line—the foghorn blasts and chants of "Go Knights go!" take a couple of minutes to die down. It's a Thursday night in February at the new, 20,000-seat T-Mobile Arena on the southern end of the Las Vegas Strip. "They have cost us a lot of money," says Joe Asher, who's watching in a suite above center ice in blue jeans and a half-zip fleece. Asher, chief executive officer of William Hill US, oversees the largest collection of sportsbooks in Nevada, and the Knights—an NHL expansion team in its first season—have been winning more than expected. Each victory can cost William Hill as much as $250,000, as local bettors have been enthusiastically backing their team.

Not that Asher is complaining. Every bet that William Hill takes on the Knights is a reminder of how far the company has come in gaining a foothold in Nevada. The renowned British bookmaker owns more than a quarter of betting shops in the U.K., but as recently as 2012, it had no U.S. presence. Now it runs 108 of Nevada's 190 sportsbooks and takes in about 30 percent of the state's $250 million annual sports betting revenue.

Pro hockey in Las Vegas is a good omen for William Hill. The NHL's 2016 announcement that it would expand to the city marked the first time one of the four major American sports leagues had blessed it with a franchise. Until then, Las Vegas had always been seen as too risky because of its gambling industry and the potential for games to be fixed. The breaking of this taboo is part of why Asher is confident that sports betting will soon reach beyond Nevada and why William Hill is laying the groundwork to operate in other states. Nationwide, attitudes are changing. Support for legalized sports betting hit 55 percent in a 2017 *Washington Post* poll, the first time a majority had backed the idea. "The U.S. market is going to open up," Asher says. And it could happen soon.

In December the U.S. Supreme Court heard an appeal filed by New Jersey asking the court to strike down the federal law standing in the way. The Garden State has wanted to add sports betting at casinos and racetracks since 2011. But it's been blocked by joint lawsuits from the National Collegiate Athletic Association and the four major leagues, who argue that the plans violate the Professional and Amateur Sports Protection Act (PASPA), the 1992 prohibition that stopped the spread of betting beyond states that already had it; only Nevada, where sportsbooks have been a part of casinos since 1975, has licensed betting houses.

New Jersey argues that PASPA is unconstitutional. The state says the federal government can directly set rules for sports betting or allow states a free hand, but, under the 10th Amendment, can't "commandeer" states to do its bidding. Lower courts have repeatedly sided with the leagues. But the Supreme Court, just by taking the case, seems to find something amiss. President Trump's appointee, Neil Gorsuch, a states' rights advocate, could tip the balance in New Jersey's favor. A ruling is due before the end of the current term in June.

"All signs point to New Jersey prevailing," says Daniel Wallach, a gaming lawyer at Becker & Poliakoff, who predicts that Atlantic City casinos will take bets by the start of the NFL season in September. Traders on political odds market PredictIt give PASPA a 27 percent chance of surviving. If it dies, other states will follow New Jersey's lead: Nineteen have passed or introduced laws to allow betting if the law is overturned. Research firm Eilers & Krejcik Gaming LLC estimates that 32 states with a combined population of more than 215 million would be on board by 2023, creating a $6 billion industry. Asher says William Hill intends to be in every state that opens as soon as the law allows. The goal is for the brand to be as recognized in the U.S. as it is in the U.K., where it's been taking wagers for more than 80 years and now runs 2,342 betting shops.

William Hill began looking for a way into the U.S. as soon as New Jersey started poking at PASPA. According to the company's U.K. management, it was wary of missing the land rush—leagues, casinos, other overseas books, and daily fantasy companies are all now fighting for a piece of the potential U.S. market—but also leery of spending too much to prepare for a day that might never arrive. That's where Asher came in.

Asher, 50, grew up in Wilmington, Del., where his father owned a newsstand. He used to help his dad place bets at local raceways. When his father (now deceased) wasn't playing the ponies, he played cards, shot dice, or bet on the NFL with a bookie. "He couldn't control it," says Asher. "For a very small segment of the population, it's just like alcoholism or opioid abuse." At 16, Asher got a job at Brandywine Raceway, a since-shuttered track outside Wilmington, and by 18 he was calling races at Harrington Raceway—he'd fallen in love with horse racing despite its role in his father's undoing. He worked at tracks while at the University of Delaware, then went to law school and landed a job at the white-shoe firm Skadden Arps, Slate, Meagher & Flom.

In 2003 he left Skadden for a job at financial-services firm Cantor Fitzgerald, which had plans to revolutionize gaming with its bond-trading technology. The company wanted Asher, who'd previously represented the company in a legal case, to lead its efforts in Nevada. Asher left Cantor abruptly in 2007 and started his own company to operate sportsbooks for Nevada casinos. (Cantor sued him for breaching his noncompete obligations; the case went to trial, and Asher prevailed last year.) He called his startup Brandywine Bookmaking LLC, after the bygone Delaware raceway, and raised about $7 million.

By 2011, Brandywine was running 17 books, mostly at smaller casinos off the strip—and losing money. On Sundays during the NFL season, Asher watched the scoreboard, unsure whether he could pay bettors and make payroll. Despite the adage that the house always wins, sportsbooks are a volatile business. If enough games go in unexpected ways, a bookie with a small bankroll can be wiped out. Adding to his problems, the real estate crash had drained locals' gambling budgets. "I picked a terrible time to start a business," Asher says. ▶

PHOTOGRAPHS BY TERRY RATZLAFF FOR BLOOMBERG BUSINESSWEEK; SLIP: LUKE MACGREGOR/BLOOMBERG

◀ A local bookmaker down on his luck was a perfect opportunity for William Hill. In 2011 it agreed to buy Brandywine for $15.7 million and, at about the same time, made deals to buy two of Asher's biggest competitors. All three purchases were contingent on the Nevada Gaming Commission granting William Hill a license, which it did after a year—a first for a British bookmaker. Asher was named CEO of the combined business. William Hill provided cash and technology, Asher provided the local relationships, and the combination of the three operators provided scale. Last year more than $1 billion in bets came in through William Hill's 108 Nevada locations and its mobile app (which only works in-state). The house kept $73 million.

After becoming William Hill's CEO, Asher reached out to a man named Dennis Drazin with a proposition. Drazin—best known in New Jersey from TV commercials for his personal injury law firm—had recently started running Monmouth Park, an almost 150-year-old thoroughbred raceway on the Jersey shore. Monmouth, which was state-run until 2011, was bleeding millions of dollars a year. To keep the track from closing, Drazin wanted to introduce sports betting. In early 2012, at the urging of Drazin and Atlantic City casinos, New Jersey passed a law to make sports betting legal. That summer, as the state moved forward with its plan, Drazin told the local press he was ready to start taking wagers. Before he could, the leagues sued to stop him and won the case in federal court.

Asher, who'd seen Monmouth's story in the press, told Drazin he wanted William Hill to run the track's sportsbook—if it ever opened. In 2013, Monmouth signed a deal giving the company rights to sports betting at the track; William Hill paid $1 million and agreed to split revenue evenly. Monmouth used the money to renovate a cafeteria behind the grandstand, turning it into a 100-seat William Hill-branded bar that, if all goes to plan, will someday be a sportsbook. There's a gleaming semicircular bar with counters on both sides where betting windows would go and rows of tables along windows that overlook the track's parking lot. On an afternoon in March, workmen are hanging brackets for TVs and painting walls blue in the hall beneath the grandstand, where an additional 30 betting windows will go. There's a cafe next to the paddocks where, if betting becomes legal, William Hill has promised to build another sportsbook at a cost of $5 million. "If I really wanted to, I could start taking bets the next day," Drazin says of a Supreme Court win. More likely, he says, it will take a couple of weeks.

After the courts rejected New Jersey's 2012 attempt at legal sports betting, the state tried a second strategy. PASPA says states can't "sponsor, operate, advertise, promote, license, or authorize" the practice. It doesn't say states must ban it. During arguments before the court of appeals in Philadelphia in 2013, lawyers for the leagues, speaking hypothetically, said New Jersey could decriminalize betting and create a free-for-all for bookies as long as it didn't license them. In 2014, the state decided to see if the lawyers were right and passed legislation legalizing betting at casinos and tracks. It didn't include plans to issue licenses, levy taxes, or otherwise regulate the activity—operators would self-govern. The leagues again sued to block the state, and lower courts again stopped it from proceeding. The Supreme Court is weighing this second try.

New Jersey has two clear paths to victory: The high court could overturn PASPA or let New Jersey proceed while leaving PASPA intact. The second scenario would temporarily scuttle plans in other states that have written laws in the event that PASPA falls—while New Jersey's tracks and casinos could take bets with minimal oversight. If that happens, William Hill says it will take bets—and the leagues will lobby furiously for a federal law to establish new rules.

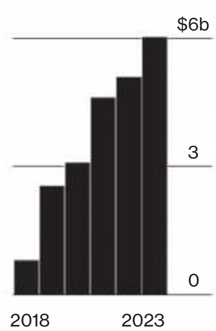
At this point the leagues have mostly stopped resisting sports betting and begun figuring out how to profit from it. In recent weeks, NBA assistant general counsel Dan Spillane, with backing from Major League Baseball, has been trying to persuade state legislators to make sportsbooks pay leagues 1 percent of all wagers placed on their sports. "Betting is built on our games," Spillane said at a Connecticut hearing in March. "If there's a scandal, something that tarnishes the image of the game, that's going to be a cost borne by the sports leagues."

The American Gaming Association, an industry lobbying group, says a 1 percent fee is a 20 percent tax on revenue. In Nevada last year the state's books kept $249 million of more than $4.8 billion wagered, a little better than 5 percent; if leagues kept 1 percent of the total bet, they'd take $48 million of this revenue. The NBA says using Nevada as a baseline is flawed because a multistate market would spur investment and innovation and drive profits higher. Bookmakers counter that margins in every state will be about the same as they are in Nevada, and that if league fees force William Hill and other books to offer stingy odds, bettors will stay in the black market. For now, Connecticut, Kansas, and New York have settled on a compromise fee of 0.25 percent.

On Super Bowl Sunday in February, about 200 people showed up at the William Hill bar at Monmouth to watch the game. The crowd was a mix of college kids, middle-aged couples, and older men who'd come to the track to bet on horses and stuck around. Many weren't waiting for the Supreme Court's approval to bet on sports. A man in a New York Giants jersey said he wagers a couple hundred dollars a week through a college friend. At a nearby table, a twentysomething man in jeans reviewed a combination bet that he made on a website provided by his bookie: $50 that Eagles quarterback Nick Foles would score a nonthrowing touchdown and that the Eagles would win. Near the end of the first half, Foles caught a touchdown on a trick play, and the Eagles won 41-33. His $1,100 payout was delivered by Venmo.

Nobody knows how many bettors there are like this or how much they spend. In 1999, a

Projected size of a regulated sports betting market in the U.S. over the next five years



DATA: EILERS & KREJCIK GAMING


Joe Asher, CEO of William Hill US

congressional commission estimated that Americans illegally bet from $80 billion to $380 billion annually. Eilers puts that at $50 billion to $60 billion, not counting wagers between friends. For William Hill to conquer America, it must persuade some of these gamblers to leave the black market. It won't be easy. Street bookies don't ask for ID, talk to the IRS, or demand money upfront. They offer generous odds and sometimes cut breaks to loyal customers.

Over the past decade, a cottage industry known as "pay-per-head" has sprung up on the internet, making it easy for small-time bookies to offer state-of-the-art online betting. Pay-per-head shops sell software to bookies so customers can bet via app. The companies charge bookies about $10 per week for every active bettor—hence the name. Eilers estimates that 35 percent of illegal bets in the U.S. are made on these services. (Others employ more traditional bookies or bet via offshore sites such as Bet Online or Bovada.) Pay-per-head software lets bookies offer up-to-the-minute odds, a customer service call center, instant accounting, and, most important, "in-play" betting. During NFL games, bettors can place wagers on whether a drive will end in a touchdown. The pay-per-head companies, meanwhile, have at least a fig leaf of legal cover: They don't take bets themselves.

"It's changed the whole business," says A., manager of a company called Premier Per Head, who asked to go by his first initial. "No waking in the middle of the night to take calls." All bookies have to do is find customers and collect and pay out bets. In another world, A. could be pitching his business to Silicon Valley venture capitalists. Instead, he's in a Dunkin' Donuts in Manhattan on a cold March morning. A New York native, A. spends most of the year in Costa Rica, where he and handful of others oversee a full-service call center and other staff. He wears a baseball cap and a gray, Jordan-brand hoodie and seems nervous, repeatedly checking two phones.

A. pulls up Premier Per Head's app. It looks like William Hill's, with a scrolling menu of dozens of sports and thousands of bets. He says he has more than 100 bookies on the service, many of whom have at least a dozen customers. A. doesn't want New Jersey to win its case, but he says he isn't worried about losing business if it does. He estimates that, given the option, about 10 percent of bettors using local bookies would switch to legal providers. "If you have a solid guy," he says, "you trust him, and there has never been a problem, why change it?" At Monmouth, the man in the Giants jersey says he has no plans to leave his bookie if the law changes: "I'm not a degenerate. He's not coming after my family."

The larger opportunity for William Hill is to bring in new bettors. "The black market is about 20 percent of the size that a properly regulated market would be," says Chris Grove, a managing director at Eilers. "There is a lot of money on the sidelines right now." To put it in play, William Hill must find new ways to lure customers. The dream goes like this: A fan watches a Golden State Warriors game on her mobile phone. A window pops up with a yes-no question: Will Stephen Curry score at least 40 points? The fan isn't a gambler, but she likes Curry and wants to add some excitement to the game, so she taps yes. A bookmaker offers a small wager at odds tilted in its favor.

William Hill needs casual bets like these to make the U.S. market profitable. In Europe, the internet has lowered margins for sportsbooks, as online bettors tend to be more sophisticated than those who bet in person. They place larger wagers, win more often, and shop around for odds. In the U.K., William Hill sees 18 percent margins in its shops and less than 8 percent online.

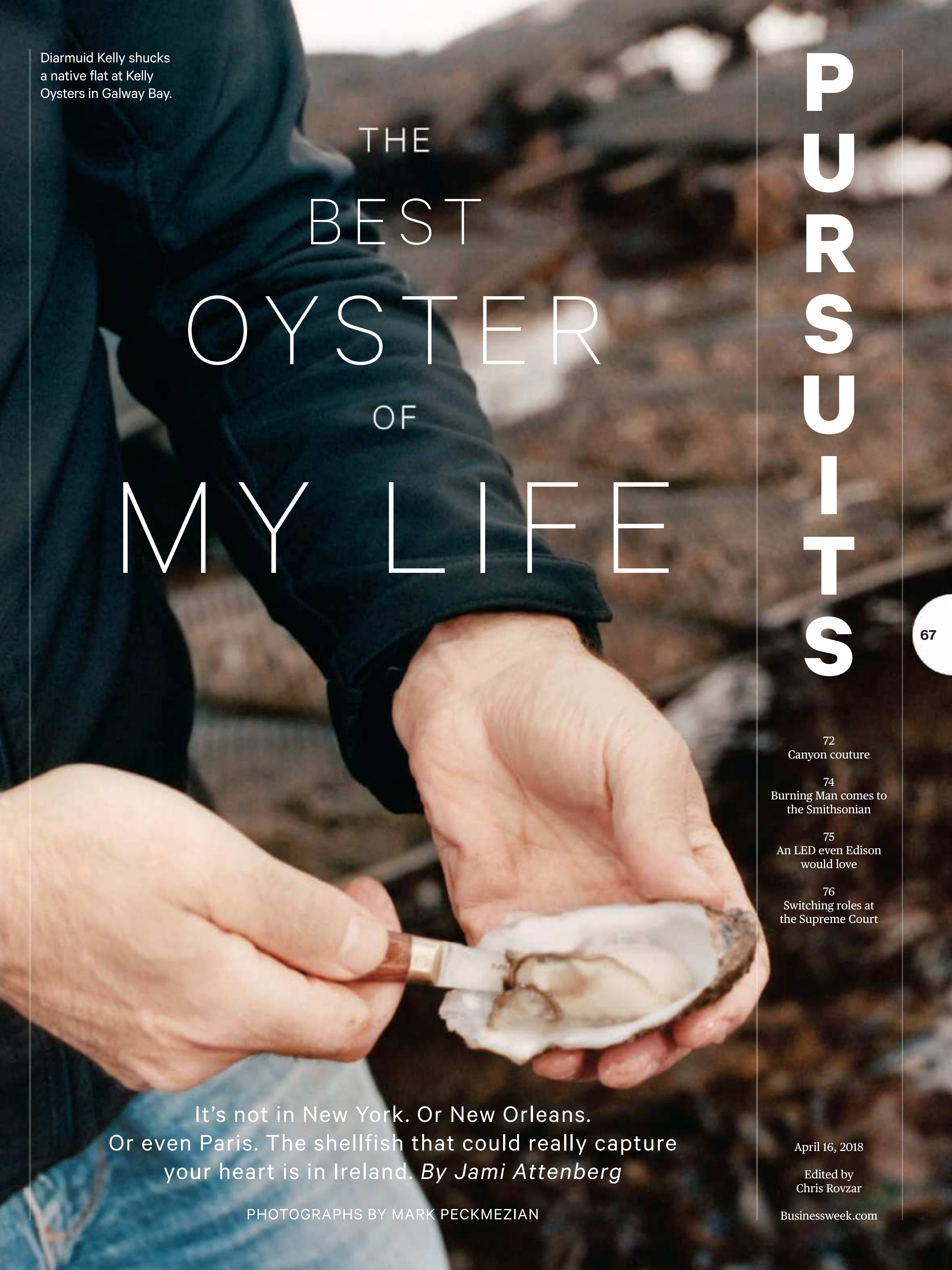
Betting shops in the U.K. are utilitarian spaces, usually a single room with a bet taker sitting behind Plexiglas. As a sop to Brits who saw gambling as a vice, U.K. lawmakers forced the locales to be unwelcoming when they were legalized in 1961. Windows were covered, and there were no seats, drinks, or televisions. Laws have loosened since then—there are TVs and bettors can sit—but the shops still aren't places to linger. In Las Vegas, sportsbooks are designed to drive casino foot traffic. Bettors scan huge boards with the day's odds, fill out paper slips, and hand them to a cashier.

William Hill is updating this old-fashioned model in Nevada. Mobile bettors still must go to one of its sportsbooks to open an account and cash out, but after that, they can bet anywhere in the state with a few clicks. At the company's book, which doubles as a burger bar, in the SLS Las Vegas Hotel & Casino on the northern end of the Strip, new users can prove their identity by scanning a photo ID and taking a selfie to show that they're really there.

By January, 60 percent of money wagered with William Hill in Nevada was via mobile, and about 30 percent of that was on in-play bets. In every inning of every baseball game, bettors can wager on whether a run will score. "We've got guys who will bet $1,000 an inning," says Asher. The company has started offering custom bets on Twitter. People can send in "prop" bets—a yes-or-no proposition about, say, whether the home NBA team will score more than 100 points—using the hashtag #myodds. The oddsmakers will set a line.

During the Knights hockey game in February, William Hill's director of trading, Nick Bogdanovich, has a prop of his own. Two fans are getting married at intermission after the groom proposed during the first period. The team has provided an Elvis impersonator to officiate. "This is bad decision-making right here," says Bogdanovich, who's watching with Asher from the suite and decides to set the "over-under" on years the marriage will last at 1.5. "I am going under," he says.

"Come on, be a romantic," says Asher. "I'm taking the over." B



Diarmuid Kelly shucks a native flat at Kelly Oysters in Galway Bay.

THE BEST OYSTER OF MY LIFE

It's not in New York. Or New Orleans. Or even Paris. The shellfish that could really capture your heart is in Ireland. *By Jami Attenberg*

PHOTOGRAPHS BY MARK PECKMEZIAN

PURSUITS

April 16, 2018

Edited by
Chris Rovzar

Businessweek.com

A few thousand soused revelers are gathered under a massive tent that faces the water as the sun sets across the ocean. Outside, trucks hawk fried seafood. Inside, a cover band draws a crowd to the dance floor with *Brown Eyed Girl*.

It's a scene that could unfold any weekend in my adopted home of New Orleans—though there the music would be better. But I'm in Galway, Ireland, at the World Oyster Opening Championship. It's part of the Galway International Oyster & Seafood Festival, founded in 1954 and held every September, making it the longest-running festival of its kind in the world. Today, this spot is ground zero for the most zealous of oyster lovers, who carry tray after tray of the freshly shucked mollusks to the cocktail tables surrounding the dance floor. They eat, they drink, and they wait for a rousing competition to unfold among the world's best shuckers.

Even among the Irish, Galway has a reputation as a good time—"better than Dublin," my friends told me before I went—where medieval roots meet a boozy Bohemia that commands you to crawl between pubs along winding cobblestone lanes as dead-sexy Irish-folk street musicians provide the score.

Like hundreds of other visitors this weekend, I've come for the oysters. The *Crassostrea gigas* from the Pacific Ocean is popular around here—it's on offer any time of year. But the more exclusive, and more expensive, native "flat" oyster is available only in months that have an "r" in them. This wild Atlantic version is harvested after spawning in the summer, and the supply can last through the winter, until April.

I'd missed my chance to try them the first time I came to Galway, last spring. Fresh off a plane from London, I ravenously tromped from the renovated Eyre Square downtown to the 16th century Spanish Arch. At every restaurant I was told the same thing: "Come back in the fall. You can't get the natives till then."

So like any normal person, I decided to come back just for a bivalve—and time my "r" month to coincide with the September festival. Oyster-shucking champions from the U.K., France, Canada, Latvia, and even as far away as Malaysia would be in town. If you're going to have the best oyster of your life, why not be fed by the most talented hands in the business?

The sole supplier for the festival is Kelly Oysters, a 60-year-old family business and one of 128 oyster enterprises in Ireland. The farm is in Kilcolgan, at the intersection of the Clarinbridge and Kilcolgan rivers. When I visit, brothers (and owners) Diarmuid and Micheal Kelly are standing knee-deep in an inlet of Galway Bay, methodically rocking crate after crate at a spot where shellfish have lived for more than 4,000 years.

Location is an important demarcation among the country's suppliers. At Moyasta, a sustainable farm three hours south in County Clare, they like to say the abundance of algae and phytoplankton in the River Shannon combines with the rich minerals of Poulnasherry Bay to create an ideal oyster-raising environment. Others prefer the shellfish grown near Cooley Peninsula, in the northeast, between the waters of Carlingford Lough and the mountain of Slieve Foye.

"Every region has its own taste," Diarmuid says, as he points out the mountains of the Burren to the south and Connemara to the north. "There's different mountains, different lands, different salinity." He tells me about the limestone in the south, the sandstone in the north, the fields in the east, and two rivers that bring sweet water. I begin to think that oysters' superpowers include turning mere mortals into poets.

These native shellfish (officially known as *Ostrea edulis*) have been growing in colonies off the west coast of Ireland since before humans here kept records. But after European producers overfarmed the native stocks, they brought in more consistent Pacific varieties from British Columbia in the early 1970s. As it turned out, the Irish Atlantic waters are a sublime environment for Pacific oysters—they're the most common oyster in the world, after all, served in Asia, Australia, Europe, and in the U.S. They take only three years to mature, compared with five or six years for native varieties.

Every year, 9,000 tons of Pacifics are harvested in Ireland, compared with 500 tons of the natives. "People think of the two varieties as being in competition with each other," says JP McMahon, chef at the Michelin-starred Aniar restaurant in Galway. "But in a way the Pacifics saved the natives and gave them time to come back."

Chances are you've had an Irish oyster, though you might not know it. The value of their production in Ireland increased from €14 million ($17.3 million) in 2008 to more than €40 million in 2014 after a deadly (to oysters) herpes virus killed stocks in France. Today, about 75 percent of the Pacific oysters produced in Ireland head to France to be "finished," according to a 2017 survey by Bord Bia, the Irish Food Board. Most of those are packed under the French Gillardeau brand, which calls itself the "Rolls-Royce of oysters." The natives, on the other hand, go to purveyors in Dublin, London, or Zurich, "places that know and appreciate the difference," Kelly says. A dozen can run €30 in a restaurant, vs. €20 for Pacifics.

For years, I'd stuck religiously to East Coast oyster varieties from the U.S. (where Irish natives are not available, by the way). I loved mild and meaty Bluepoints and sweet, plump Wellfleets. But I wasn't greedy. Oysters existed in my mind as an appetizer, a special entryway into a bigger meal.

When Kelly hands me my first native flat, though, I'm struck by how smooth and shallow the shell is compared with Pacific varieties, which are cupped deeper on the inside and gnarled on the outside. They grow in the same waters but feed on a different phytoplankton, so their taste is different, too.

When I tip the lush meat, chilled not by ice but by the river, into my mouth, there's a wildness that's hard to define. It's not as hearty or robust as a Pacific, and it has a more delicate salinity. Some people describe it as gamy, the way nonfarm-raised animals can taste. Some call it subtle. For me it's vivid, more like the difference between a funky natural wine and a California chardonnay. Or, if you like beer metaphors, a double IPA compared with Bud Light.

The experience of tasting an oyster handed to you by a farmer feels intimate, as sharing food with another person

NATIVE OYSTERS AT MORAN'S
Unlike the more ubiquitous Pacific oyster, or *Crassostrea gigas*, native flats are smooth on the outside and shallow inside. The meat is delicate and has a wild, gamy taste to it.

A SALTY SPORT
Below left: The exterior of Moran's Oyster Cottage in Clarinbridge. Right: Luca Mantovani, a shucking contender from Italy, competing at the festival in Galway.

Top: Oysters at the Kelly farm are bagged and prepped for the festival. Right: Micheal Kelly checks on the oyster crates in an inlet of Galway Bay. A Pacific oyster will take three years to mature; a native flat can take five or six years.

should. I hold the elegant shell for a bit afterward, with the cool water rushing around me and the sun shining brightly above. This feels like the only way to really enjoy an oyster. And I think, You win, Ireland. This is an oyster I'll never forget.

The greatness of Irish oysters shouldn't be such a well-kept secret, says Aniar's McMahon, who last year also opened Tartare Cafe & Wine Bar in Galway. He'd like to see a protective designation for Irish oysters to give them more promotional potential. "We have some of the best waters," he says. "But we have not given ourselves the time to market it. That would never happen with our beef. We export 90 percent of our beef, and it's always sold as Irish beef. But why don't we protect our oysters and mussels?"

He's right, in a sense: Even at some of my local oyster happy hours in New Orleans, where the emphasis is usually more on volume than variety, I've noticed a sea change in how oysters are labeled on menus. Gulf oysters were Gulf oysters forever, but now you can order "select" versions from specific companies. The same goes for these Irish oysters, which are identified by producer. At Tartare, for example, they're classified as being from Redbank or Dooncastle. It's not enough to be delicious; we crave things to be a certain kind of delicious.

Moran's Oyster Cottage, a thatched-roof shack across the Kilcolgan River in Clarinbridge, is one of the few places around that serves both Pacific and native oysters from the Kellys' farm. Before the festival begins, I go there for lunch. One of the managers, a smiling, bespectacled man named David Small, is competing in the Irish portion of the shucking competition that evening. If he wins, he'll go on to the world competition the next day.

Small's participation in the contest is a big deal inside the restaurant, and the waitstaff is buzzing. Bragging rights are part of the appeal, though there's a trophy and prizes—a sterling silver clock is in the mix. And many shuckers use the competitions as an opportunity to travel. Champions from towns smaller than Clarinbridge can see the world and go to South Africa, China, and the U.S.

Lunch is clams and chowder and crab claws in garlic butter. Everyone is drinking Guinness. And we eat some freshly shucked natives. Here I notice a new set of flavors; some have more of a seaweed taste, others a metallic note.

When we're done, I find Small and ask if he's nervous. "Not yet, but I will be later on when we get onstage, yeah." I tell him I'm rooting for him. "Aye, you can root for us all," he says. Later that night, I sit with a group of his fans to watch the Irish competition. He finishes second timewise, and we're devastated. But, because of the pristine appearance of his oysters, he's announced the winner. We cheer madly.

The next morning, on the way to the opening ceremonies of the festival, I stop at the Saturday Galway Market, which has been in operation since the 1200s. There Micheal "Rocky" Brown sells raw oysters by the sack and shucks them for tourists. Brown has a special take on the experience, one I haven't experienced: He serves them with a dab of buttermilk. He explains the difference between the two Irish varieties in his vernacular: "The Pacific oyster is like if you're drinking milk. And then if you have the native oyster, it's like you're having the cream of the milk."

The opening parade starts at the city center, where a flag squad of children dressed as fish sets the tone. A few young girls lead the way in shawls with green trim and matching headbands, followed by several rows of cheerleaders. A band consisting of only recorders and drums plays the same rambunctious little walking song over and over.

The shucking competitors are also getting ready to march through town to the festival, and they hold their country's flags, posing for pictures. Eamon Clarke, the Canadian champion, from Toronto, looks like the guy you'd meet at a youth hostel in Amsterdam (torn jeans, scruffy beard, a real backpacker vibe). I talk to Honor Allen, the American champion, who's in his early 20s. He tells me the rules are different in the U.S., where speed is the only criterion.

I also meet 25-year-old Maria Petersen from Norway. Her father was a nine-time Norwegian champion, and she's been competing internationally since she was 18. She doesn't eat oysters—she's allergic to them—but as a visual artist, she appreciates the challenge of making them look beautiful. "Most of the guys are muscular and just use force," she says. "I love the finesse of it." She shows me how she wraps her hand with tape before she competes to protect against blisters and cuts.

The fish-clad children lead us through the Saturday shopping crowds all the way to the seaside. The sun we were blessed with the past few days has disappeared, replaced by wind and bursts of stinging rain. The shucking champs, once soft and friendly, now have an edgy, competitive focus.

Under the festival tent, there's a collective inhalation of food and alcohol as attendees order oysters by the dozens. As the shells pile up on each table, I'm reminded of something else McMahon said while we were at Aniar. "I would argue that rather than the potato, oysters should be the symbol of our food," he said. "It's something that we've been eating since the first people came to Ireland. Oysters and seaweed, for me, represent the first foods of Ireland."

I meet one of the judges from the previous night, and he explains the rules. Each shucker gets one shot at 30 oysters, with two to spare. They race to open them the fastest, but presentation counts, too, so even if you finish first, you won't necessarily win. There must be no grit, the meat inside must be intact, and the shells must be displayed in a pristine manner. Essentially, they're to look as they might be served in a restaurant—a beautiful, orderly, alluring array.

A well-coiffed local sportscaster interviews the competitors, who are lined up on a stage prior to their first heat. Anti Lepik, the Estonian champion, is approximately 8 feet tall, and his English isn't great, but he knows enough to say, "I came to win."

Much ado is made of Norway's Petersen, the only woman. She downplays the fuss: Enough already, she came to win, too. The American champ, Allen, has a big grin and is full of Southern charm. His co-workers from Hunt's Oyster Bar in Panama City, Fla., have come along to cheer him, and he gets the biggest ovation.

Suspenseful music—think *Chariots of Fire* crossed with the theme from *Halloween*—signals the start of the show. Each competitor wears a clean white apron. One hand is gloved, while the other holds the dull-bladed shucking knife. Their arms are muscular and defined. The best hands in the world may be roughened with use, a cut here, a scar there, but they're still the strongest and the surest in the business.

During the first heat, the competitors from Malaysia and France are speed monsters, as is the gentleman from the U.K., but I watch him spill an oyster over the side of the tray, then casually slide it back in the shell as if he weren't standing in front of judges and hundreds of people.

I join the David Small cheer squad, but I also keep my eye on Petersen and Allen, who are competing side by side. When they're finished, they take turns examining each other's presentation and congratulate each other on a job well done. I admire their grace under pressure.

Finally, the winners are announced. It took Estonia's Lepik 2 minutes and 15 seconds to shuck 30 oysters, far faster than anyone else, and he receives the speed award. Petersen wins the presentation award.

Clarke, the Canadian with the hostel beard, takes third overall and begins to lead the crowd in "Olé, olé, olé!" Ireland's man, Small, takes second. He smiles shyly as he hoists his trophy. And then, based on the combined precision of his speed and presentation and, perhaps, his absolute hunger to win, Lepik takes home the top prize. The crowd explodes; everybody drinks. I stack the last of my empty shells, an altar of oysters in front of me, as an offering of thanks to the sea. B

"Rather than the potato, oysters should be the symbol of our food. It's something that we've been eating since the first people came to Ireland"

The Rugged Runway

Fashion designers embrace the great outdoors

By Max Berlinger
Photographs by Jessica Pettway

For his spring/summer 2018 collection for the French luxury label Lanvin, designer Lucas Ossendrijver blended his signature relaxed high fashion with items more typically seen on mountainsides: oversize utility shorts with cargo pockets and bungee cord fastenings, hiking pants tricked out with zippers and snaps, fleece jackets, sporty nylon anoraks, and garish, performance-inspired sneakers.

“Personally I like the idea of outdoors but just as an abstract fantasy to start designing,” Ossendrijver says. “I’m not at all into camping or hiking.” Instead, his idea was to create “hybrid” pieces that integrate classic suiting ideas such as a tailored blazer and matching pants with activewear. “The whole collection was based on recognizable, easy-to-understand items from a man’s wardrobe and how to transform them into something new,” he says. “I tried to elevate those items in terms of fashion by changing materials and techniques.”

Meanwhile, outdoor brand North Face has appeared in recent years in the collections of high-end designers, including Junya Watanabe, Sacai, and buzzy streetwear maker Supreme, which just released a metallic North Face parka. Similarly, Columbia, known for its hard-working sportswear, is teaming up with cool-kid labels Kith and Opening Ceremony. In other words, whether you’re planning on hiking this season, expect to at least look like you are.

“There is a very important

Prada suede and nylon boots, *$820; mrporter.com*

Patagonia Torrentshell pullover, *$119; patagonia.com*

Givenchy leather-trimmed nylon belt bag, *$595; mrporter.com*

Lanvin wide multi-pocket trousers, *$1,295; lanvin.com*

conversation about authenticity going on, and those heritage outdoors brands are the epitome of authentic," says Michael Fisher, vice president and creative director for menswear at the trend forecasting firm Fashion Snoops. "They became popular not because of trends but because of how functional and reliable their clothing was over the years. When consumers are being encouraged to buy better and buy less, these brands deserve a seat at the table."

PATAGONIA'S POLITICS

In December 2017 the Trump administration announced it would dramatically roll back environmental protections on 2 million acres of federally protected land in Utah. That day, Patagonia—a company that gives 1 percent of sales to support green causes, among other activist efforts—added to its home page, "The President Stole Your Land." In the following 24-hour period, the brand's sales rose 600 percent. Subsequently, the company filed a lawsuit against the administration, alongside several American Indian tribes. Today, the same words still greet visitors at patagonia.com.

Fisher says his team has seen a big-picture movement from consumers to embrace nature, brought on by a variety of factors. "Topics like climate change, the current administration's change in policy toward protected spaces, and even ecotourism have all driven the conversation when it comes to awareness and appreciation for the great outdoors." As a result, he adds, items that are "technical" and "cozy" have been seeing higher sales.

Sportswear as a category, says Lorna Hennelly of research firm Euromonitor International, is predicted to grow 4.2 percent globally by 2022 (compared with 1.9 percent for other apparel and 2.8 percent for other footwear). "It's really sportswear driving the market," she says. For example, VF Corp.–which counts North Face, Timberland, and Vans among its "outdoor and action sports" brands–reported a 20 percent revenue increase in 2017, to $3.6 billion.

Like Fisher, Euromonitor notes subtle political implications at play: Being associated with these outdoor brands is an implicit endorsement of environmental causes. (If that sounds far-fetched, consider the vocal pro-environmental stances that Patagonia Inc. and Recreational Equipment Inc. have taken.)

With all of this at work, it's easy to see why these outdoorsy influences were visible in the high-end collections of Gucci, Hermès, Louis Vuitton, Prada, Valentino, and, of course, Lanvin. "I feel it's my role as a designer to push fashion further but to still create a wearable product," Ossendrijver says. A pair of his cargo pants is aesthetically edgy–with extra zippers and rivets–but also practical, with a variety of deep pockets.

"As we move forward, I'd expect even more surprising inclusions of technology into these natural fabrics and surfaces," Fisher says. "I see the future actually not looking that futuristic at all but being very much connected to the best parts of the past, with sensory experiences driving the trend." B

PROP STYLIST: KODY PANGBURN

The original *Truth Is Beauty* in situ at Burning Man

Plucked From The Desert

At the Smithsonian, the art of Burning Man charms in a new context. *By James Tarmy*

In a low-lit, second-floor room of a Washington gallery, a cluster of three ceiling-height plastic mushrooms glows in a shifting kaleidoscope of neon colors. At the base of each is a pad that users can press, causing the sculptures to heave, sigh, and expand in and out.

The installation, *Shrumen Lumen* by the FoldHaus Art Collective, was initially on view under the night sky at Burning Man, an annual weeklong festival in the Nevada desert that celebrates the various joys of communal living, 24-hour dance parties, public art, and appreciating said art while on mind-altering substances. The event, wherein a temporary 70,000-person city is erected in a week and disassembled even faster, is so singular that attempts to re-create it at other times of the year have fallen flat.

This is why organizers for the exhibit "No Spectators: The Art of Burning Man" (March 30 through Jan. 21, 2019) faced a steep challenge when trying to transfer works from the desert to a museum context, specifically to the Renwick branch of the Smithsonian American Art Museum. The show's saving grace is that it doesn't try to be about Burning Man; it aims simply to evoke what it's like to interact with the festival's art.

"We're in an 1860s building in the center of Washington, D.C., and it transforms these pieces," says Nora Atkinson, the show's curator. "I'm not trying to re-create the desert, but I do want people to really get a sense of what [being there] means, because that's what the work was created for."

I went to Burning Man once, in 2006. The distances there are so vast and the desert (or playa, in Burner terms) is so empty objects that appear as dots on the horizon slowly reveal themselves to be massive, fanciful sculptures as you approach. Often the art is something you can climb on or enter, and the sense of discovery and playfulness is a thrill. Much of it is burned before the end of the week.

The art at the festival is either commissioned by Burning Man or donated, and every year there are contributions from dozens of artists. Over time, much of the sculpture has taken on some unified stylistic and structural components. First, most of the art at Burning Man is big. There have been, for instance, seven-story-high human figures, a 26-foot-high flame-throwing metal octopus, and a full-scale replication of the skeleton of a Gothic cathedral. Second, the art is almost always lit. Much of the action at Burning Man takes place at night—the lighting, while admittedly dazzling, also helps people avoid running into sculptures.

Monumentality and light displays aren't necessarily a great fit for any interior, but Atkinson cannily includes works just big enough to seem huge. One room, for instance, features a series of steel sculptures by Yelena Filipchuk and Serge Beaulieu, who together work under the name Hybycozo. LEDs light the pieces from within, and there's room to climb inside.

But the transition from the playa doesn't always succeed. One gallery features a custom-made vehicle by the Five Ton Crane collective. The modified bus, which includes a movie theater, would doubtless be a startling sight in the desert. Indoors, it feels slick and gimmicky. Much of the art, though fun, offers surface-level profundity, at best. Marco Cochrane's *Truth Is Beauty*, a statue of a dancer inspired by "feminine energy and power that results when women feel free and safe," would look more at home outside a New Age dance studio.

Atkinson argues the art should be exempt from critique. "I don't think you can judge an artist negatively on work that was created to last for a single week," she says. "These are created specifically for that audience in the desert."

That's not quite fair to contemporary art, which often includes performances and temporary installations, or to the art of Burning Man, which is often quite good. But the point—that these works should be appreciated for their craftsmanship and whimsy—is hard to argue with. Most people won't be able to experience the fun of actually attending Burning Man; "No Spectators" is the next best thing. B

PHOTOGRAPH BY ELEANOR PREGER

An Incandescent LED

The Plumen 003 is an energy-saving, soft-glow-producing bulb that really shines
Photograph by Jessica Pettway

THE CHARACTERISTICS
Eight-year-old London-based lighting company Plumen is giving Edison-bulb purists another reason to finally switch to light-emitting diodes. Its flagship product, the 003, emits as much light as a 60-watt bulb but with the soft ambience of a candle. A sculptural crown of gold-anodized aluminum sits inside a pear-shaped glass that hangs from a simple cloth-wired pendant, also included. Most of the light is projected downward, spotlight-style, but a small portion is reflected onto the cone-shaped crown and then outward. The 2-inch-tall crown's surface is a combination of lenses and reflectors that bounce the light back and forth along the gilt finish, serving as a filter that warms to an incandescent glow.

THE COMPETITION
You can, of course, read by the light of a $2 EcoSmart bulb from Home Depot just as well as you can with the $200 Plumen 003. But you won't want to show an EcoSmart off. The $9 Philips 4.5A19b replicates the exposed filament of Edison-style bulbs with LEDs for a warm effect. The Swell series of pendants, starting at $249 and sold through Design Within Reach, preceded the 003 and uses a similar, but more traditional, technique by housing LEDs in shades lined with a reflective brass interior to mimic an analog light.

THE CASE
The transition from incandescent illumination to energy-efficient LEDs has left many cold because of their harsh, fluorescent-style light, which picks up every crease and wrinkle on your face. But the Plumen 003 retains a soft luster even when it's off. And when on, the bulb produces a textured radiance that gives everything within reach a bit of a Midas touch. *$200; plumen.com*

PROP STYLIST: KODY PANGBURN

Neal Katyal

The former solicitor general once argued for the White House at the Supreme Court. Now he's on the other side. *By Lizette Chapman*

Minutes after President Trump issued his 2017 executive order restricting travel from seven majority-Muslim countries, veteran attorney Neal Katyal was on the phone. By the next morning, some of the world's biggest companies, including Apple, Netflix, and Facebook, had signed on to Katyal's amicus brief opposing the ban.

That striking reversal—Silicon Valley has a long habit of political insouciance—will culminate at the U.S. Supreme Court on April 25, when Katyal argues against the administration in the case *Trump v. Hawaii*. He'll be on familiar ground when he enters the famed wood-paneled chamber. The acting solicitor general from 2010 to 2011, he argued seven cases in front of the court last year—more than any other attorney in the country—and broke the record for cases argued by a minority attorney, previously held by Thurgood Marshall.

When he graduated from Dartmouth College in 1991 and told his Indian immigrant parents he planned to attend Yale Law School, they cried—not because they were proud, he says, but because lawyers are poorly regarded in India and they viewed his choice as an embarrassment. "For them, it was be a doctor or an engineer," Katyal says. He eventually became one of Georgetown Law School's youngest-ever professors at age 27, bringing with him a philosophy he calls "extreme centrism" that was heavily influenced by work during law school with now-Chief Justice John Roberts, who was then in the private sector. He later clerked with Associate Justice Stephen Breyer. "Whatever your politics are, [Katyal has] great legal chops," says Ilya Shapiro, a researcher at the libertarian Cato Institute. "Even if I disagree with him, I take him seriously, and I can't say that about everybody."

Between teaching classes, Katyal wrote rules for the Department of Justice governing the appointment of special prosecutors and served as lead counsel for *Hamdan v. Rumsfeld*, the 2006 case that ultimately did away with military tribunals at Guantanamo Bay. Now tenured at Georgetown, he moonlights as a partner at international law firm Hogan Lovells and runs Georgetown's nonprofit Institute for Constitutional Advocacy and Protection. Created in 2017 in response to what Katyal sees as an overreach of executive power by Trump, ICAP is kind of like a legal SWAT team: Katyal helps to identify and champion cases likely to make it to the Supreme Court; the travel ban is his first to make it all the way. "Every time the president opens his mouth and torches American values, we get calls and emails," he says. "It's now up to the media and courts." Ⓑ

b. 1970, Chicago

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Joined the high school debate team to conquer shyness

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Played himself in an episode of the Netflix series *House of Cards*

ILLUSTRATION BY SAM KERR