




TURKISH AIRLINES



HOSPITALITY MORE THAN JUST A WORD

True hospitality comes from the heart.
From a genuine desire to make sure our guests always feel totally at home.

A STAR ALLIANCE MEMBER 

A Clear Stance

White paper clarifies China's position on trade talks with the U.S. By An Gang



The author is an op-ed contributor to *Beijing Review* and a researcher with the Pangao Institution.

Sino-U.S. trade negotiations took a sharp downturn at the beginning of May. The Donald Trump administration accused China of "breaking the deal" reached previously, and increased tariffs on Chinese goods worth \$200 billion from 10% to 25%. Moreover, the Office of the U.S. Trade Representative is currently accepting public comments regarding a proposed tariff hike on another \$300 billion worth of Chinese goods.

Along with the trade friction, the U.S. has intensified suppression of Chinese technology industries. On May 15, Trump signed an executive order—"Securing the Information and Communications Technology and Services Supply Chain"—declaring a national emergency and prohibiting U.S. enterprises from using telecommunications equipment made by companies deemed a threat to national security.

Facing mounting and aggressive pressure from the U.S., China responded with a combination of countermeasures, and on June 1, new duties of 10%, 20% and 25% on U.S. goods worth \$60 billion took effect. In addition, on May 31 the Ministry of Commerce announced that the Chinese government will establish a list of "unreliable" entities. Foreign enterprises, organizations and individuals that do not comply with market rules, violate the spirit of contracts, block or cut supplies to Chinese firms for noncommercial purposes or seriously damage the legitimate rights and interests of Chinese enterprises will be added to it. The move came after President Trump signed an executive order on May 15 that effectively bans electronics giant Huawei from U.S. supply chains.

As the world's largest producer and supplier of rare-earth minerals—key components of smartphones, jet engines and cameras—China could potentially cut off supplies that are needed by huge swaths of the U.S. economy, if

it deems it necessary.

It is clear that China's countermeasures aim to defend its national interests. "China is open to negotiations, but will also fight to the end if needed," stated a white paper, "China's Position on the China-U.S. Economic and Trade Consultations," published June 2 by China's State Council Information Office. "China will act rationally in the interests of the Chinese people, the American people and all other peoples around the world," it continued. "Guided by a spirit of mutual respect, equality and mutual benefit, the two countries should push forward consultations based on good faith and credibility in a bid to address issues."

Concerns

Chinese Vice Premier Liu He, head of the Chinese team during the China-U.S. Comprehensive Economic Dialogue, raised three concerns from the Chinese side after the 11th round of trade talks in Washington, D.C. in May. Failing to reach consensus on these three concerns was the major reason for the breakdown of this round of negotiations.

First, China called on the U.S. to remove all additional tariffs imposed on Chinese exports. Since these tariffs are the starting point of bilateral trade friction, they should all be lifted when an agreement is reached. Second, China's purchases of U.S. goods should be realistic; the U.S. should not make purchase demands impossible for China to satisfy. Third, a proper balance should be struck in the text of the agreement.

The State Council Information Office white paper reiterated China's position on these concerns: "Both China and the U.S. should see and recognize their countries' differences in national development and stage of development, and respect each other's development paths and basic institutions. While no one expects to resolve all

Huge Potential

According to China Customs, trade in goods between China and the U.S. grew

from less than
\$2.5 billion
in 1979

to
\$633.5 billion
in 2018,
a 252-fold
increase



In 2018, the U.S. was China's **largest** trading partner and export market, and the **sixth-largest** source of imports

According to the U.S. Department of Commerce, in 2018 China was the **largest trading partner** of the U.S., its **third-largest export market** and its **largest source of imports**.

During the 10 years from 2009 to 2018,



China was one of the fastest-growing export markets for U.S. goods, with an annual average increase of

6.3%

According to Chinese figures, two-way trade in services rose from

\$27.4 bln

in 2006

to
\$125.3 bln

in 2018,

a **3.6-fold increase**

China's services trade deficit with the U.S. reached

\$48.5 bln

in 2018



Over the past 40 years, two-way investment between China and the U.S. has grown

from near
zero

to approximately

\$160 bln

According to the Chinese Ministry of Commerce: By the end of 2018, accumulative Chinese business direct investment in the U.S. exceeded

\$73.17 bln

The paid-in investment by the U.S. in China was

\$85.19 bln

by the end of 2018

In 2017, the total annual sales revenues of U.S.-invested companies in China were

\$700 bln.

with profits exceeding

\$50 bln

issues in one single agreement, it is necessary to ensure that an agreement satisfies the needs of both sides and achieves a balance.”

Chinese President Xi Jinping and U.S. President Donald Trump are likely to meet on the sidelines at the Group of 20 summit that will be held in Osaka, Japan at the end of June. The meeting is expected to play a role in managing and controlling bilateral differences and friction, but is unlikely to produce an agreement. Since tensions are flaring not only in economic and trade relations, but also in overall bilateral ties, the window of opportunity for China and the U.S. to reach an agreement might not reopen until the 21st Asia-Pacific Economic Cooperation forum in Chile on November 11–17. Thus, it is anticipated that China and the U.S. will engage in negotiations while fighting, as trade friction becomes a longstanding issue between the two countries.

Adjustment

Actually, the more severe challenge that China faces is the U.S. adjustment of its strategy toward China. In 2018, the Trump administration unveiled its National Security Strategy, which

described China as a “strategic competitor.” Since then, U.S. government departments have joined in efforts to contain China on many fronts, as the White House has encouraged various administrative branches to make policies and initiate actions to strengthen the containment of China. On May 7, the U.S. House of Representatives passed the Taiwan Assurance Act of 2019 without objection, making its already shaky one-China policy more fragile.

In the framework of America’s Indo-Pacific Strategy, the U.S. military has mounted strategic containment efforts around China’s periphery in a provocative manner, leading to confrontations in the western Pacific, especially in the South China Sea, with the possibility of armed conflict rising.

Earlier, Chinese strategists believed that a cold war between the two countries could be avoided. Now, many forecast that some form of cold war may be imminent, and that a technology cold war—which is much worse than trade friction—is actually happening. Moreover, experts now believe that U.S. strategy toward China has fundamentally changed, and that

the recent U.S. strategic adjustment toward China was not Trump’s personal choice alone, but a cross-party, long-term strategic decision to suppress China’s development in order to maintain U.S. superiority.

Going forward, competition between China and the U.S. will not be simply about national interests or geopolitical gains. Instead, it will be a race between two sets of development models, values and orders. Even if a trade agreement can be reached, it will not be the end of bilateral trade and economic friction, but only the start of a larger-scale and longer-term strategic game.

Willpower

The U.S. demands in negotiations are not realistic, including the purchase of U.S. goods far beyond China’s capability, extensive revision of China’s domestic laws and acceptance of U.S. supervision and verification. Such requests touch on China’s core interests. China has to persist in achieving a two-way balance, resist pressure from the U.S. through countermeasures, fight on different fronts, such as trade, technology and other fields, and accumulate strength. China will also enhance its fundamental research capability for indigenous innovation and nurture the domestic market as it turns pressure into opportunities.

By doing so, it will transform its own development and international cooperation model. In this sense, the trade friction and technology war initiated by the Trump administration is helping to forge consensus among the Chinese, and giving rise to a strong cohesion to power the country forward.

As it encounters extensive changes, from economic to security areas in both domestic and external arenas, what China needs most is solid willpower and reform momentum. After several rounds of pressure tests, China’s confidence in coping with the trade friction and its derivatives is recovering. The white paper pointed out that “The fundamental solution to economic and trade tension is to grow stronger through reform and opening up.”

The white paper also stressed China’s confidence. “With the enormous demand from the domestic market, deeper supply-side structural reform will comprehensively enhance the competitiveness of Chinese products and companies. We still have sufficient room for fiscal and monetary policy maneuvers,” it reassured. “China can maintain sound momentum for sustainable and healthy economic development, and its economic prospects are bright.” ■

Severe Impact

The U.S. tariff measures led to a decrease in the volume of China’s exports to the U.S., which fell by

9.7%

(y.o.y.)

in the first four months of 2019, dropping for

five months in a row



In addition, as China has imposed tariffs as a countermeasure to U.S. tariff hikes, U.S. exports to China have dropped for

eight months in a row



According to Chinese statistics, direct investment by Chinese companies in the U.S. was

\$5.79 bln in 2018,

down by

10%

(y.o.y.)

Paid-in U.S. investment in China was

\$2.69 bln in 2018,

up by only

1.5%

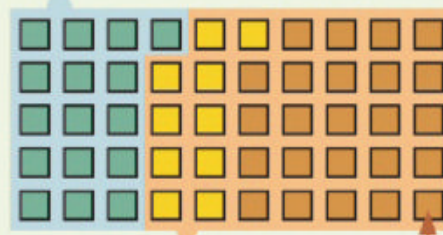
(y.o.y.),

compared with an increase of

11%

in 2017

In 2018, when economic and trade friction worsened, only **16 U.S. states** increased their goods exports to China.



34 states exported fewer goods to China, with **24** of them seeing a double-digit decrease.

The Midwestern agricultural states were hit particularly hard. Under tariff measures, exports of U.S. agricultural produce to China decreased by

33.1%

(y.o.y.),

including a

50% drop
in soybeans

(Source: *China’s Position on the China-U.S. Economic and Trade Consultations*; designed by Pamela Tobey)



Fix the overload.



Fix the overload.



Fix the overload.



Fix the overload.



Fix the overload.



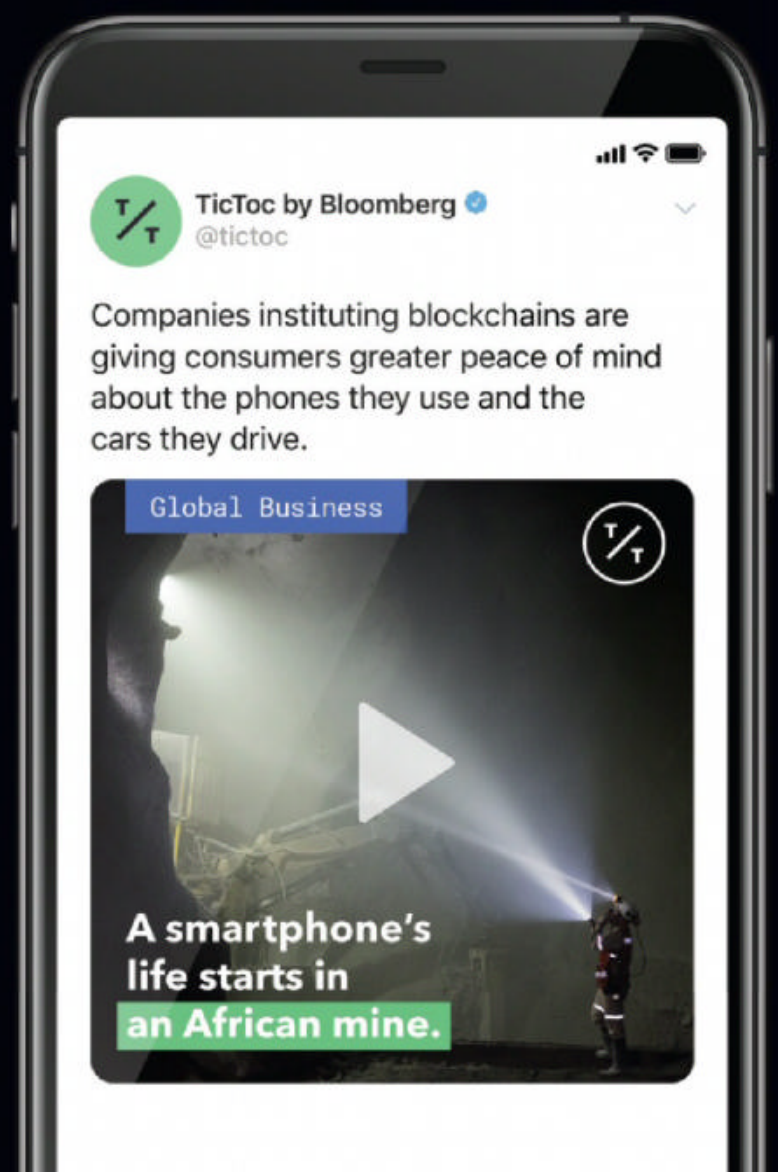
Fix the overload.

Find the focus.

TicToc by Bloomberg

Global news for
the world we live in now

follow @tictoc   



IT'S TIME TO RETHINK OIL & GAS.

As we enter the fourth industrial age, the world's demand for energy-based products is increasing at an unprecedented rate. Our goal is not simply to keep up, but to stay ahead of the curve.

In practical terms this means fostering a dynamic, performance led, commercially minded corporate culture that applies the latest technology and optimizes our resources, including, most critically, our human resources.

We are giving this mission a simple name:

OIL AND GAS 4.0



TECHNOLOGY

We are applying AI, Big Data and block-chain to enhance our efficiency and maximize our performance.



PEOPLE

We are making ADNOC an employer of choice for a highly skilled, digitally native workforce.



SUSTAINABILITY

We are mitigating our environmental impact by embracing and scaling breakthrough technologies.



PARTNERSHIPS

We are expanding our partnership model to include new players from the public sector and private equity.



◀ Canopy Growth CEO Linton at company headquarters in Smiths Falls, Ont.

FEATURES

- 46 **Unlocking the Secrets of the Animal Mind**
Why Silicon Valley is hiring neuroscientists who study birds, mice, and fish
- 52 **Canada's Cannabis King**
Bruce Linton wants the world's biggest pot company to grow much, much bigger
- 58 **A Legal Loophole May Set the Solo From *Free Bird* Free**
Some famous licks from pre-1978 recordings may not be protected by copyright

| | | |
|---------------------------|----|---|
| ■ IN BRIEF | 9 | Huawei's damage estimate; the Fed hints at a rate cut |
| ■ AGENDA | 10 | NATO ministers meet in Brussels; Putin visits the Vatican |
| ■ OPINION | 10 | Give the FDA the power to regulate cosmetics |
| ■ REMARKS | 12 | Beijing isn't the only threat to Hong Kong's future |
| 1 BUSINESS | 16 | Walmart and the mainstreaming of Ellen—and queer culture |
| | 19 | The Supreme Court may weaken gains for gay workers |
| | 21 | China's LGBTQ community finds a haven in Chengdu |
| | 23 | A gay-friendly workplace doesn't always travel with expats |
| | 24 | <i>Pose</i> is a big step for queer artists. But it's only one show |
| | 25 | John Browne on rising to BP CEO while in the closet |
| | 26 | Out in the C-suite: 11 top executives on why it's important |
| 2 TECHNOLOGY | 28 | Will people trust Facebook with their wallets? |
| | 29 | A Japanese company's radical management experiment |
| 3 PERSONAL FINANCE | 33 | What investors can learn from a star manager's troubles |
| | 35 | The latest thing in funds: Higher fees, more restrictions |
| | 36 | Credit Karma tries to balance karma and revenue |
| 4 ECONOMICS | 38 | Boston's glittering new waterfront rises—as does the water |
| | 40 | Trump's misguided finger-pointing on currencies |
| | 41 | Automation threatens millions of developing-world jobs |
| 5 POLITICS | 42 | One thing is certain—the Osaka G-20 meeting won't be dull |
| | 43 | Colombia's high-stakes fight against cocaine |
| | 45 | ▲ The Long Campaign: Kamala Harris courts progressives |
| ■ PURSUITS | 63 | Massive food forges are the hottest thing in cooking |
| | 66 | Protein-packed moringa pumps up healthy meals |
| | 67 | Five barbecue sauces that'll have you breaking tradition |
| | 68 | Food, wine, and wilderness in the Columbia River Gorge |
| | 70 | There are no shortcuts to making great barbecue |
| | 71 | Summer treats that pop, from Pretty Cool Ice Cream |
| ■ LAST THING | 72 | The deindustrialization of American beer |



45 ▲ The Long Campaign: Kamala Harris courts progressives

How to Contact
Bloomberg Businessweek

Editorial
212 617-8120
Ad Sales
212 617-2900
731 Lexington Ave.,
New York, NY 10022
Email
bwreader
@bloomberg.net
Fax
212 617-9065
Subscription Customer
Service URL
businessweekmag
.com/service
Reprints/Permissions
800 290-5460 x100
or email
businessweekreprints
@theygsgroup.com

Letters to the Editor can be sent by email, fax, or regular mail. They should include the sender's address, phone number(s), and email address if available. Connections with the subject of the letter should be disclosed. We reserve the right to edit for sense, style, and space.

Follow us on social media

Facebook
facebook.com/
bloomberg
businessweek/
Twitter
@BW
Instagram
@businessweek



Cover:
Photograph by
Eric Helgas
for *Bloomberg Businessweek*;
prop stylist: Elyse
Remenowsky



BY CHOOSING SPAIN YOU WILL HAVE INVESTED IN STABILITY

There are many ways of writing the future.
Ours is written in *future perfect*.

That's why it is the moment to invest in a country
that looks ahead as one of the main economic engines in the eurozone.
The moment to invest in a country full of opportunities.

More info: www.tesoro.es

VALORES DEL TESORO: LETRAS | BONOS | OBLIGACIONES


In Spain, the future is written in *future perfect*.



Abu Dhabi Accra Amman Amsterdam
Athens Bangalore Bangkok Beijing
Beirut Cairo Calgary Cape Town
Caracas **The** Charlotte Chicago **global**
Copenhagen Denver Doha Dubai
Dublin Düsseldorf Edinburgh Frankfurt
Geneva Hanoi Helsinki **standard** Hong
Kong Houston Islamabad Istanbul
Jakarta Jerusalem Johannesburg
Karachi **for** Kiev London Luxembourg
Madrid Manila **business** Melbourne
Mexico City Milan Montreal Moscow
reporting. Mumbai Munich Nairobi
New Delhi New York Osaka Oslo
Ottawa Prague Rio de Janeiro Riyadh
San Francisco **Follow it all.** Santiago
Seattle Shanghai Singapore São
Paulo St. Petersburg Stockholm Taipei
bloomberg.com/subscriptions Tallinn
Tel Aviv Tokyo Toronto Toulouse
Vancouver Vienna Vilnius Warsaw
Washington D.C. Warsaw Wellington
Zagreb Zurich **Bloomberg**

● Donald Trump ordered an additional 1,000 troops to the Middle East.

Tensions with Iran are rising after attacks on two oil tankers in the Strait of Hormuz. The buildup comes as Acting Secretary of Defense Patrick Shanahan withdrew from consideration to take over the post on a permanent basis.

● The U.S. Federal Reserve signaled on June 19 it's leaning toward at least one rate cut by the end of the year, citing soft business investment, "uncertainties," and inflation below its 2% target. It was still raising rates as recently as December.

● Embattled Deutsche Bank is considering its next major overhaul.

People familiar with the plan say the company may shutter its U.S. equities trading and create a noncore unit to wind down as much as €50 billion (\$56 billion) in assets.

● "I don't think anybody sane enough wants to take up this job. [You need] to look after Hong Kong interests as well as the nation's interests."

Bernard Chan, a top adviser to Hong Kong Chief Executive Carrie Lam, when asked by Bloomberg TV if he wanted to take over for her. Lam has been under pressure to resign after millions of protesters successfully delayed an extradition bill her Beijing-backed government was trying to implement in the city, which enjoys special legal and economic status under Chinese rule.

● French police questioned Michel Platini, the former European soccer chief, on June 18 as part of a corruption probe into the selection of Qatar to host the 2022 World Cup. He denies any wrongdoing.



● Huawei estimates that U.S. sanctions will clip its revenue by about **\$30b** over the next two years. The smartphone maker is said to be preparing for a drop of as much as 60% in overseas shipments, as Google cuts it off from Android updates and apps from Gmail to Maps.



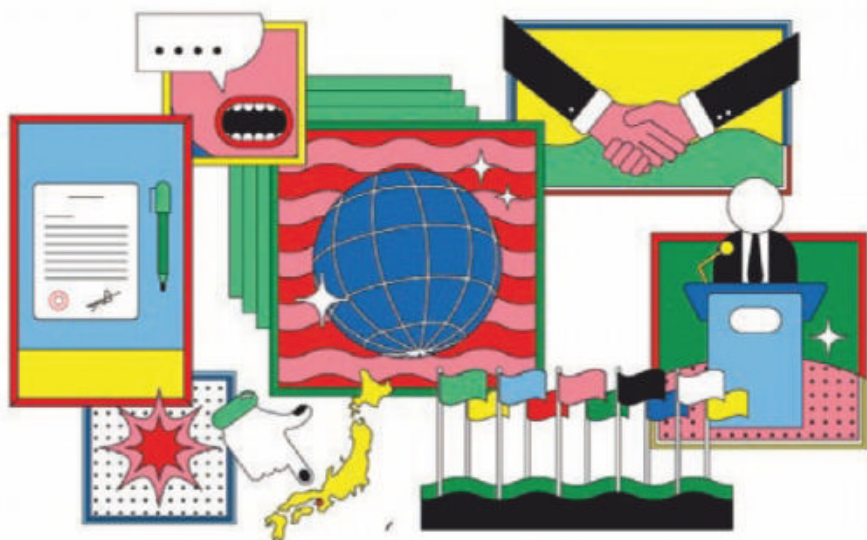
● At the Paris Air Show, Boeing made a comeback, selling \$36 billion in jets, including 200 of the currently grounded 737 Max 8. But Airbus stole its thunder, racking up almost \$44 billion in orders for its new A321XLR and other planes.

● The nine nations with nuclear arsenals, including the U.S., Russia, Israel, and North Korea, owned **13,865** nuclear weapons collectively at the start of 2019, according to the Stockholm International Peace Research Institute. That's down about 600 from 2018, as the U.S. and Russia reduced their forces.

● Facebook unveiled plans to launch its own cryptocurrency. Libra will be supported by established government-backed currencies and securities to avoid the massive fluctuations in value associated with Bitcoin and other virtual currencies. ▷ 28

● French billionaire Patrick Drahi, who made his fortune in the telecommunications industry, is bidding **\$2.7b** for auction house Sotheby's. Rival Christie's is owned by another French billionaire: François-Henri Pinault.

- Lufthansa's shares fell as much as 12% on June 17 after it cut its profit forecast because of weak demand in Europe.
- Brazilian conglomerate Odebrecht, with assets ranging from construction to oil and gas, filed for bankruptcy protection.
- Pfizer will spend \$10.6 billion to acquire Array BioPharma, which makes a promising targeted chemotherapy.
- Deposed Egyptian President Mohamed Mursi, 67, died of an apparent heart attack during a court hearing.



► Trade War Tête-à-Tête

Leaders of the biggest economies convene on June 28-29 in Osaka, Japan, for the Group of 20's annual summit. President Trump has floated having an extended meeting with his Chinese counterpart, Xi Jinping, to look for ways to defuse the trade war between the two countries. ▷ 42

► Pope Francis receives Russian President Vladimir Putin for an audience on July 4, their third meeting, as the Vatican and the Russian church seek to improve ties.

► NATO defense ministers meet on June 26-27 in Brussels. Among the hot topics: Turkey's planned purchase of a Russian missile system.

► OPEC+ (the oil cartel plus 10 other producers, notably Russia) will meet on July 1-2 to discuss output cuts, possibly prolonging curbs till the end of the year.

► Indonesia's Constitutional Court will rule on June 28 on opposition candidate Prabowo Subianto's petition challenging the reelection of President Joko Widodo.

► On June 27, Mexico's central bank reviews its interest rates. They stand at a decade high of 8.25% and will likely remain there through 2019.

► The Glastonbury music festival kicks off on June 26, with performances from The Cure, Janet Jackson, and Miley Cyrus—and a sunny forecast.

■ BLOOMBERG OPINION

10

Dangerous Beauty

● Asbestos-tainted cosmetics should lead to new oversight powers for the FDA

The beauty industry has come a long way since the days of arsenic scrubs and lead-based face creams. But maybe it hasn't come far enough. Earlier this year the U.S. Food and Drug Administration confirmed that asbestos—a known carcinogen that's unsafe at any level—had been found in eye shadow, foundation, and other makeup products marketed to preteen girls. Even worse, because the FDA had no power to force a recall, some tainted products may have remained on sale across America long after the danger was reported.

The tale of the asbestos-tainted makeup shines a bright light on the failures of cosmetics regulation, which is so lax even the industry itself is pushing for stronger oversight. While FDA regulations forbid “poisonous” and “filthy, putrid, or decomposed” substances in cosmetics, the agency knows little about what's in them. Beauty companies aren't required to disclose ingredients or where their products are made. Except for color additives, the FDA neither tests cosmetics before they go to market nor requires companies to do their own testing. The situation might have gone undiscovered had a Rhode Island mother not sent her 6-year-old daughter's glitter makeup kit to a lab.

What's more, once the FDA learned of the tainted

makeup, it had no authority to force a recall. It could only request that retailers do it themselves. One chain, Claire's, “refused to comply” with the request, the agency said in a remarkable name-and-shame press release in March—more than a year after the independent lab first identified problems. Claire's issued a recall shortly after, but it was not to be the last. The chain pulled another children's makeup kit from shelves earlier this month after FDA testing again found asbestos.

Self-policing isn't good enough. The FDA has long called for stronger oversight—and now Congress may be willing to act. The bipartisan Personal Care Products Safety Act, introduced by Senators Dianne Feinstein and Susan Collins, would require companies to submit ingredient lists to the FDA. Feinstein says the bill would also “require complete label information to be posted online, including ingredients and product warnings.” Leading cosmetics firms such as Estée Lauder Co. are backing the bill, alongside the American Academy of Pediatrics and the Environmental Working Group.

Some advocates wish the bill went further. The measure wouldn't require all cosmetics to undergo premarket testing, as it should. The reformed system would still be far less stringent than the European Union's, which has banned more than 1,000 ingredients in personal-care products. And the law would prevent states from adopting stricter laws (though current state standards would be grandfathered in). For now, however, compared to almost no oversight at all, the bill is a big step forward. It deserves support. **B**

Written by the Bloomberg Opinion editorial board

It's up to you, curl up or
STRETCH OUT

FLY BETTER

Enjoy a restful sleep and arrive refreshed after unwinding in our fully flatbed seats. Just one of the many premium amenities our Business travelers enjoy. Find out more at emirates.com/us

EMIRATES BUSINESS


Emirates®



One Big Step

● People power may have put off an extradition bill, but the city’s future is still at risk from China—and Singapore

● By Matthew Campbell, Brendan Scott, and Benjamin Robertson

Hong Kong’s protesters have won one round. A big one. And on Sunday, June 16, they gathered—perhaps 2 million strong—to press their advantage.

The day before, pro-democracy activists had forced Chief Executive Carrie Lam into a humiliating retreat over a law that could allow extradition to China. But over the longer term, there’s little question Hong Kong’s Beijing-backed government intends to keep chipping away at freedoms many of its people regard as sacred. For that reason and others, the city’s future looks less secure than at any point since the U.K. returned it to Chinese control in 1997. It faces something of a perfect storm: instability and fear of Chinese domination within its borders; the development of more sophisticated companies and financial markets in Beijing, Shanghai, Shenzhen, and other mainland cities; and perhaps, above all, the rise of Singapore as a serious challenger in almost every industry.

Hong Kong remains a cosmopolitan metropolis of 7.5 million with a secure place on any list of great global cities. But after managing to mostly defy predictions of a business exodus after the handover—and thriving under the 50-year

promise of “one country, two systems” made by the Chinese to allay concerns—its moment of reckoning may have finally begun. The hundreds of thousands of demonstrators who took to the streets to stop the law, which Lam put on hold on June 15, were fighting to preserve the special status that underpins their city’s prosperity. “Once you have a law like this on the books, all bets are off,” says David Webb, an investor and analyst based in the city who advocates for stronger corporate governance. If implemented, it would be “bound to deter some talented professionals from moving to Hong Kong in the first place. If they cannot assess the risks, they will err on the side of caution and build their careers in other places.”

An apologetic Lam admitted her government mishandled the rollout of the extradition legislation, which would create a process for sending criminal suspects from Hong Kong to countries it has no extradition treaty with, including China. To opponents, the law would have ended Hong Kong’s status as a refuge for mainland dissidents while exposing businesses, investors, and ordinary people to a Chinese justice system they regard as capricious and corrupt. Lam, who’s led Hong Kong’s quasi-democratic government since 2017, said it presents no threat to law-abiding citizens and was drafted without China’s involvement. Opposition activists found that claim laughable, noting that President Xi Jinping’s administration had repeatedly spoken out in support of it. There’s no timetable for reintroducing the legislation, though Lam says she believes it’s still necessary.

Extradition could do more than make life in Hong Kong dangerous for Xi’s political opponents. Some investors fear that mainland commercial disputes might escalate into



for Hong Kong

trumped-up criminal charges that could be used to target businesspeople living in or visiting Hong Kong. Washington, D.C.-based Freedom House wrote in its 2019 *Freedom in the World* report that, in addition to overall Communist Party control of China's courts, "many judges complain about local officials interfering in cases to protect powerful litigants, support important industries, or avoid their own potential liability." If an extradition bill were enacted, one of the smartest investments might be Singapore real estate, says Richard Harris, the CEO of Hong Kong-based Port Shelter Investment Management. What makes Hong Kong special, he says, is that "we are in China but not in China."

Hong Kong's unique position—a haven of the rule of law and free debate on the doorstep of a phenomenally lucrative market that enjoys neither—was being eroded well before this month's drama. Since the 2014 Occupy Movement protests to demand universal suffrage, which took over a swath of the city center for more than two months, the government has jailed pro-democracy activists, prevented candidates who hold similar views from running for office, and banned parties from advocating independence. Last year officials took the unheard-of step of refusing to renew a visa for a Western journalist, Victor Mallet of the *Financial Times*, who'd presided over an appearance by a pro-independence activist at the famed Foreign Correspondents' Club. And in the absence of an extradition arrangement, at least two people apparently have been abducted from Hong Kong soil by Chinese agents—both of them dual citizens of China and Western countries.

"I believe that Hong Kong is being changed for the worse by the constant encroachment of mainland governance," says

Carson Block, founder of short seller Muddy Waters Capital LLC and a frequent critic of Chinese companies. "The West once held out hope that the mainland would become more like Hong Kong. Clearly the opposite has happened."

Hong Kong is significantly more open than the most prosperous mainland cities. But foreign governments now question whether there's still a meaningful distinction between Hong Kong and China proper in certain areas of policy. In November, Australia barred CK Group, a Hong Kong infrastructure giant, from buying a domestic pipeline operator, finding that the A\$13 billion (\$8.92 billion) deal would be against national interest. The U.S.-China Economic and Security Review Commission has recommended reassessing Hong Kong's privileged access to U.S. technology imports, on the grounds that Beijing's actions "run counter to China's promise to uphold Hong Kong's 'high degree of autonomy.'"

As the extradition debate intensified, a bipartisan group of U.S. lawmakers introduced the Hong Kong Human Rights and Democracy Act, which would impose sanctions on officials involved in abductions and require the U.S. Department of State to annually reassess whether the city remains autonomous. The implications of a negative verdict would be significant. Under U.S. legislation dating to before the handover, Hong Kong is treated distinctly from China in trade matters: For example, it's not subject to the Trump administration's tariffs on Chinese goods. Removing that status could be devastating, both in its direct effects on issues such as technology transfer and as a signal to international companies.

Lam conceded that her government had underestimated the anxiety about the extradition plan. A peaceful march ▶

◀ on June 9 drew an estimated 1 million—comparable, as a percentage of the population, to almost 9 million people taking to the streets in the U.K. (Police put the figure at 240,000.) A June 12 follow-on was the most tumultuous since Occupy. Determined to avoid another long-term takeover of city streets, the police launched almost twice as many canisters of tear gas as they had in 2014 and also fired beanbag rounds and rubber bullets. “This time is actually quite different,” said Yan Chen, a 24-year-old who works in e-commerce and took part in both sets of demonstrations. She was catching her breath in a park in the financial district after inhaling tear gas. “Police are trained, more equipped, and willing to use weapons.”

Yet while protests often prove fruitless in Hong Kong, these demonstrations have made a difference. As marchers gathered on June 12, the Legislative Council, or LegCo, canceled planned debate on the bill. And Lam’s retreat came as activists were in the process of planning their June 16 march. That demonstration swelled the streets in greater numbers than the first protest, with marchers now calling for a full retraction of the extradition bill and for Lam’s resignation. The chief executive said that the Beijing government—for which the Hong Kong crisis added to headaches over a slowing economy and a bruising trade war with the U.S.—supported her decision to suspend the process but didn’t order it.

Business reaction played a significant role in her climb-down. On June 13, the General Chamber of Commerce, Hong Kong’s oldest business organization, which supports the extradition bill in principle, urged “restraint from all parties” to ensure “this issue will not undermine business confidence in Hong Kong and our international reputation.” The American Chamber of Commerce in Hong Kong warned earlier this year that the proposed law would “reduce the appeal of Hong Kong to international companies,” calling its reputation for legal impartiality “a priceless treasure.”

Chinese political pressure isn’t the only threat to Hong Kong’s status. Due in part to wealthy mainlanders using its real estate as a de facto safe deposit box, Hong Kong has the world’s highest housing costs, with the average property fetching \$1.24 million, according to CBRE, almost double New York’s figure. Those prices are the largest factor in Hong Kong’s being one of the most unequal societies in the world, with some 20% of the population below the poverty line—many forced to live in tiny “cage homes,” compartments fashioned from wire mesh that hold a single bed. Some of the more fortunate get “coffin homes,” which have solid walls but little more space.

With the manufacturing that catalyzed its postwar boom largely decamped to cheaper locations on the mainland or in Southeast Asia, Hong Kong has struggled to spark new industries. It’s largely failed to become a technology hub: It isn’t easy operating a bootstrapped startup in a city where a smallish apartment can rent for more than \$5,000 a month. Nor have U.S. giants such as Netflix, Facebook, or Google set up a major local presence. None of them can operate freely in China’s sealed-off digital market, making Hong Kong’s status as a gateway—already diminished, since many companies

that do have significant Chinese business prefer to put local headquarters in Shanghai or Beijing—irrelevant.

Where they do have large offices is Singapore, which serves as a key base for all three, as well as Amazon.com Inc., Microsoft Corp., and others. It’s making an aggressive play for Hong Kong’s title as Asia’s leading business destination, pitching its stability, clear skies, and gleaming infrastructure to tech and biotech companies, consumer-goods manufacturers, and global banks, Hong Kong’s bread and butter.

In most rankings, the contest is pretty much a wash. Hong Kong is the larger financial hub by a whisker, according to the 2019 edition of the Global Financial Centres Index; Singapore wins on ease of doing business, with a second-place ranking in the World Bank’s most recent tabulation, two spots ahead of its rival. Singapore has also shed at least some of its reputation as a sterile expanse of spotless, gum-free sidewalks and spacious shopping malls. It’s still orderly, certainly, but it’s also increasingly dynamic, with hopping downtown nightlife and a busy calendar of festivals and sporting events.

There’s nonetheless an irony to businesspeople fearful of narrowed freedoms in Hong Kong considering a relocation to Singapore, which is arguably no more free. Overt protest is rare, and the mostly government-controlled press gives a wide berth to controversial subjects. The ruling People’s Action Party has never lost an election, and while the internet is uncensored and the courts transparent, public debate is constrained. Defamation laws have been used against local and foreign critics of the government, and human-rights groups have condemned a law on “online falsehoods” that would allow ministers to compel corrections to web content.

Indeed, Singapore’s system is one that Communist Party figures have occasionally suggested China could emulate. A more Singaporean future for Hong Kong would almost certainly appeal to Xi, who’s sought to exercise a tighter grip on society than any recent leader. “It’s in Beijing officials’ DNA that they want to control things, and an unruly Hong Kong is just not acceptable to them,” says Michael Davis, a fellow at Washington’s Wilson Center and an activist who fought a 2003 effort to introduce pro-China legislation. “They think in the long term they can run Hong Kong without so much dissent, so they want to slowly bring it into the fold.”

Despite the retreat on extradition, further confrontations are inevitable. There’s no evidence Xi believes central control should stop at the city’s borders. But Lam’s reversal will embolden protesters, who’ve just learned that the right combination of popular discontent and business concern can still make pro-Beijing forces back down, at least temporarily.

“Young people are coming back to the front line,” says Kim-wah Chung, a professor at Hong Kong Polytechnic University who studies social policy. “Most of them are not organized, but they are determined, and they are angry.” Unlike earlier generations of activists, he says, they have no hope of pushing the mainland toward democracy at the same time. Instead, “they want Beijing to keep the promises they made to Hong Kong.” **B** — *With Blake Schmidt*

HEAR

THE

MUSIC.

EXPERIENCE THE USA

NEW ORLEANS, LOUISIANA



VisitTheUSA.com



VisitTheUSA.com/Music

1

Pride
Special
Report

BUSINESS

16



Why Walmart Loves Ellen

● The talk show host has an unlikely partner in the retail giant

Ellen DeGeneres is on television every weekday. Sometimes she's on twice. Her daytime talk show, *The Ellen DeGeneres Show*, brings in more advertising revenue than Dr. Phil's and Kelly Ripa's combined, and her prime-time special, *Ellen's Game of Games*, gets consistently good ratings. DeGeneres produces movies, voices a popular Pixar character, has her own digital content network, and has earned at least \$500 million on endorsement and TV deals, according to a Bloomberg Billionaires Index analysis. She has her own lifestyle brand and last year formed a partnership with Walmart Inc. to create a clothing and accessories line that's awash in American flags and rainbows and is sold in 2,300 Walmart stores. "I'm still gay, by the way. It's really working out for

me now," DeGeneres said in her Netflix stand-up special last year.

That the largest U.S. retailer finds value in aligning itself with a 61-year-old lesbian who has a recurring segment on her talk show called "Oh, Straight People," is, in many ways, a testament to how thoroughly Americans have accepted LGBTQ rights. It's been 50 years since the Stonewall uprising in New York marked the start of the modern gay rights movement. Almost two-thirds of Americans support same-sex marriage, Gallup polls show, the opposite of what they reported when DeGeneres first came out two decades ago. The chief executive of America's first trillion-dollar company, Apple Inc., is gay, and yet iPhones still fly off the shelves. Walt Disney Co. this year had its first gay characters on both its youth cable channel and in its latest *Avengers* film. According to GLAAD, 8.8% of prime-time TV characters are gay, bisexual, transgender, or queer. Walmart even has a Pride shop online.

Such mainstreaming of LGBTQ products, characters, and culture would have been unthinkable 22 years ago, when DeGeneres publicly came out. Back then, being gay almost killed her career.

DeGeneres had spent the first few decades of her life pretending to be someone she wasn't. Her stand-up rarely included jokes about dating or relationships, as if she were avoiding the issue. That changed in April 1997, when she came out in an interview with *Time* magazine, which put her on its cover along with the headline "Yep, I'm Gay." That month 42 million people watched her character come out on her sitcom, *Ellen*. The episode—with Oprah Winfrey guest-starring as her therapist—was funny, well-received by critics, and enthusiastically celebrated by lesbian, gay, bisexual, and transgender fans. Advertisers felt differently.

"Everybody warned me. My publicist, my manager, my agent. Everybody making money off me said, 'Don't do it,'" DeGeneres said in her Netflix special. The blowback hit her fast and strong. Evangelical pastor Jerry Falwell called her "Ellen DeGenerate." A bomb scare, which cleared the TV studio shortly after the episode's taping, was the first of many threats against her. Advertisers soon backed out. "We don't think it is a smart business decision to be advertising in an environment that is so polarized," a spokeswoman for Chrysler told the *New York Times*, explaining the carmaker's decision to pull commercials from the show.

One *Ellen* episode was even slapped with a parental advisory warning after her character shared a platonic kiss with a woman. Soon after, ABC canceled the show, and the job offers stopped coming. "If I'd been fully aware of all the consequences—that the public was going to hate me and the press was going to attack me, that I was going to lose a lot of people—maybe I wouldn't have done it," she told writer Eric Marcus in early 2001, when she was still struggling to get back on TV. "But I didn't feel like I had a choice."

DeGeneres's rare act of honesty couldn't change the fact that the 1990s were a bleak time for the LGBTQ community. AIDS was killing thousands, primarily gay men. In 1996, President Bill Clinton signed the Defense of Marriage Act, banning federal recognition of same-sex marriages. Two years later, a gay student, Matthew Shepard, was tortured and killed in Laramie, Wyo. DeGeneres spoke at a vigil for Shepard held on the steps of the U.S. Capitol in October 1998. "This is what I was trying to stop," she said, in tears. "This is exactly why I did what I did."

At the time, no company better represented the cultural climate DeGeneres was hoping to change than Walmart, the multibillion-dollar enterprise co-founded by Sam Walton, who taught Sunday

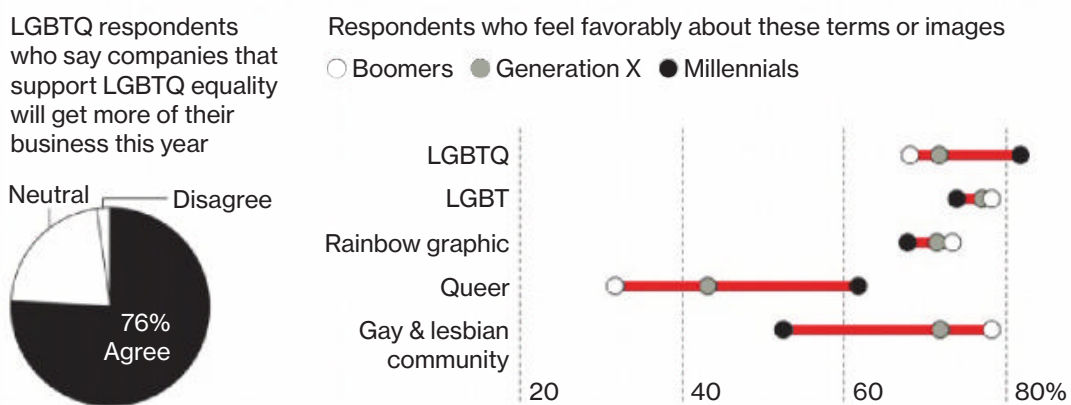
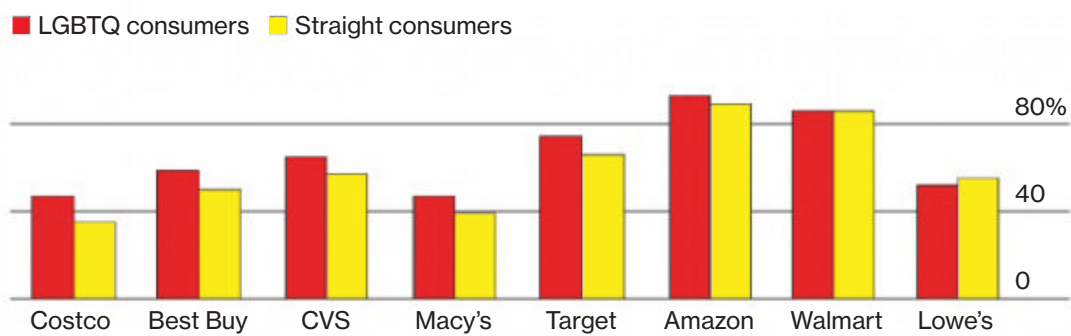
school at his Presbyterian church and preached a Christianity-laced corporate gospel of service, respect, and sacrifice.

"If you want to reach the Christian population on Sunday, you do it from the church pulpit," Ralph Reed, the architect of the politically powerful Christian Coalition, once said. "But if you want to reach them on Saturday, do it at Walmart."

In the 1990s the company refused to sell albums that contained swear words; even John Mellencamp's heartland rock was censored. Then in 2001 female employees accused Walmart of denying them promotions and equal pay in a litigation campaign that evolved into a class-action lawsuit. (In 2011 the U.S. Supreme Court ruled that the then 1.5 million-women-strong group couldn't be considered a class; individual lawsuits have since been filed and are ongoing.) In sworn statements, women at Walmart said they endured comments such as "God made Adam first, so women would always be second to men." A spokesman for Walmart says the allegations "are not representative of the positive

More Businesses Fly Rainbow Flags

Share of LGBTQ and straight respondents who shopped at these retailers in the past year



DATA: KANTAR, COMMUNITY MARKETING INC.

experiences millions of women have had working at Walmart" and it will defend itself against the claims.

Walmart's revenue and profit soared, but by the mid-2000s the company was grappling with withering criticism of its business and labor practices. It also wanted to break into urban markets such as New York City and Chicago, where social attitudes are more liberal. So, Walmart changed. In 2006 it plunged head-first into LGBTQ activism by ►

◀ joining the National Gay and Lesbian Chamber of Commerce (NGLCC), donating to gay-friendly charities, and hiring a consulting firm that specialized in marketing to gay consumers. Not all of the company's 1.3 million employees liked the stance. Nor did Christian conservative groups, which called for a boycott over the Thanksgiving weekend. Walmart quickly caved. In 2007 it dropped the NGLCC partnership and released a statement saying that it would "not make corporate contributions to support or oppose highly controversial issues unless they directly relate to our ability to serve our customers."

"I was mad. I was very mad," NGLCC co-founder and President Justin Nelson recalls. "They have spent years correcting that mistake."

For the next few years Walmart shied away from anything related to gay rights. In 2013, for example, it declined to join Disney, Nike, and Starbucks in urging the U.S. Supreme Court to overturn the Defense of Marriage Act. A year later the company seemed to have a change of heart. It opposed a 2015 bill in its home state of Arkansas that would have allowed businesses to discriminate against gay customers on religious grounds. It earned, then lost, then won back a perfect score on the Human Rights Campaign's Corporate Equality Index, a highly regarded measure of LGBTQ-friendly workplaces that companies often use as a recruiting tool.

Earlier this year, a Walmart commercial featured two gay men shopping together. The American Family Association criticized the ad, saying Walton was "probably turning over in his grave." Walmart, it noted, had almost always sided with Christian conservatives in the past. "At least with a company like Amazon, we knew they were liberal from the outset," a statement on its website said. "But this seems more like a betrayal from a well-known friend."

DeGeneres's comeback started in 2001 when she hosted the Emmy Awards, which had been postponed twice after the Sept. 11 attacks. Her characteristically upbeat and self-deprecating jokes brought much needed relief in somber times. "They can't take away our creativity, our striving for excellence, our joy," she said. "Only network executives can do that." The audience gave her a standing ovation.

With that, DeGeneres was back in Hollywood's good graces. A second attempt at a sitcom was short-lived, but then came a best-selling book and voice-over work as Dory in Pixar's animated hit *Finding Nemo*. Still, her sexuality was considered controversial. When her talk show debuted in 2003, DeGeneres remembers a station manager saying, "No one is going to watch a lesbian during the day."

That prediction was quickly proved wrong—the show won the Daytime Emmy for outstanding

talk show four years in a row—and DeGeneres soon became a coveted corporate sponsor. American Express Co. hired her first, in 2004. Then came a J.C. Penney Co. deal that prompted the threat of a boycott from a group called One Million Moms, which objected to the retailer's use of a homosexual spokeswoman. (J.C. Penney stuck by DeGeneres.) Today DeGeneres has a lifestyle brand, ED by Ellen, that was born out of the work she and her wife, actress Portia de Rossi, do of buying, renovating, and selling Los Angeles mansions. What started as a home decor line has expanded into clothing, accessories, and pet products. Macy's, Nordstrom, PetSmart, and Bed, Bath & Beyond carry the line, which has an annual revenue in the nine figures.

"Her power of influence makes her truly extraordinary," says Matt Fleming, director of celebrity acquisition at the Marketing Arm. According to surveys by the agency, DeGeneres is as well-known and liked as Paul McCartney. With an average of 2.9 million viewers per day according to Nielsen, her daytime TV show pulls a surprisingly diverse audience. It's 74% female, consumer insights firm MRI-Simmons estimates, but otherwise mostly matches the general population in age, race, and education.

"Ellen is the Oprah of our era, in the sense of how much she dominates the category," says Dan Wilch, a consultant at Magid, which conducts an annual study of daytime TV.

Walmart's partnership with DeGeneres gives the retailer a widely popular ally in its battle against Amazon. It carries both ED by Ellen and EV1, DeGeneres's clothing brand, which comes in a wide range of sizes and looks like a cheaper version (everything is \$30 or under) of the kind of pants-and-jean-jacket outfits DeGeneres wears. Walmart declined to provide sales figures for EV1 but says it's "pleased" with the line. "Ellen is Ellen," says Janey Whiteside, Walmart's chief customer officer. "She appeals to all ages. She's great."

DeGeneres's clean-cut, friendly image is reassuring for brands in a marketing era when any misstep could prompt a social media backlash. As Jeff Greenfield, co-founder of advertising analytics firm C3 Metrics, puts it, "Ellen is safe." She loves animals. She dances. She often has her wife of more than a decade on as a guest. "Even when we talk with very conservative brands, they don't shy away," says Stacy Jones, CEO of the product placement firm Hollywood Branded. "She is a family brand." —*Ben Steverman and Matthew Boyle, with Tom Metcalf*

THE BOTTOM LINE Walmart's partnership with DeGeneres is a testament to how mainstream businesses have embraced LGBTQ culture and consumers.

Why It Could Be the Worst of Times, Too

● After decades of legal wins, the U.S. Supreme Court may erode LGBTQ worker protections

For two decades, most of the LGBTQ movement's highest-profile victories have come at the U.S. Supreme Court. In 2003 the justices issued a ruling legalizing gay sex that dissenting conservative Justice Antonin Scalia warned would set the stage for nationwide legalized gay marriage. Within 12 years, his prediction was realized. The court made marriage equality the law of the land—reflecting and accelerating a sea change in straight Americans' views and treatment of their LGBTQ neighbors.

But next year the high court could deal LGBTQ people a painful blow: wiping out lower-court rulings that shield them from getting fired for who they are. In a trio of cases this coming term—involving a child welfare worker, a skydiving instructor, and a funeral director—the Supreme Court will hear arguments on whether it's legal for bosses to discriminate against LGBTQ employees. Contrary to what many Americans now assume, no federal law explicitly prohibits firing workers simply for being gay or transgender. Nor do the laws of most states—including some populous ones such as Texas and Ohio. (Only 21 states and Washington, D.C., have laws that explicitly prohibit private companies from firing workers for being gay or trans; another one restricts anti-gay firing but not anti-trans dismissals.)

Jimmie Beall learned that the hard way in 2003, when she was abruptly terminated from her position as a public school teacher in London, Ohio, a few weeks after receiving a glowing evaluation. Beall, a lesbian who taught government to high schoolers, says she learned from local parents about rumors she was fired for being gay and was shocked to learn no law specifically prohibiting that. An email later surfaced from the superintendent to the school board alluding to Beall's sexual orientation while discussing not bringing her back for another school

year. "I thought, They can't do that, because that would be illegal—there's protection against discrimination," says Beall. "It never occurred to me that there wasn't."

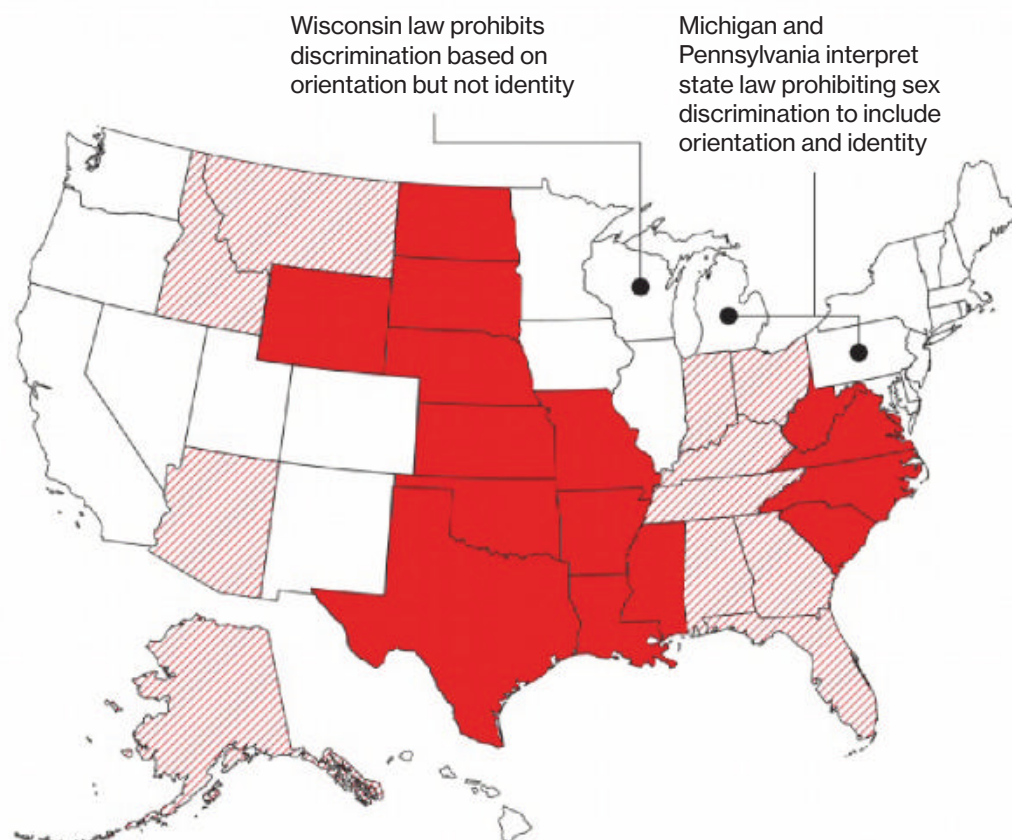
Despite the lack of explicit protection for LGBTQ workers, Beall filed a lawsuit arguing that because she was a public employee, firing her for her sexual orientation violated the Constitution. In 2006, after a new superintendent took over and a judge ruled Beall's case could proceed, the school district agreed to settle the case and establish a non-discrimination policy. But Beall says she assumed that before too long the state of Ohio or the federal government would prohibit anti-gay discrimination across the board. "I never imagined that, this many years later, we still would not have the same protections that everybody else already has."

In recent years, some courts have ruled that the 1964 Civil Rights Act's ban on sex discrimination also implicitly prohibits bias based on sexual orientation or gender identity. "When a male employee is fired because he has a husband and he would not be fired if he were a woman who had a husband, then he was fired because of his sex," says Jennifer Pizer, law ►

On the Basis of Orientation or Identity

Status of LGBTQ employment discrimination law

- States with laws prohibiting discrimination based on sexual orientation or gender identity
- ▨ States with no such law but within a federal circuit that's interpreted the U.S. ban on sex discrimination to restrict bias based on orientation or gender identity
- States with no law specifically prohibiting discrimination based on orientation or identity



◀ and policy director for Lambda Legal Defense and Education Fund, which pursues LGBTQ rights cases. “When a trans woman was acceptable at work presenting as a man but was fired when she presented her true gender, which is female, she was fired for being the wrong kind of woman.”

Citing past precedent that discrimination for not conforming to sex stereotypes is a form of illegal sex discrimination, several federal circuit courts have embraced such arguments, creating a patchwork of protections covering their jurisdictions. Next year the justices could either extend those protections nationwide or wipe them out. So in states that haven’t passed laws prohibiting anti-LGBTQ bias but have been covered by federal appeals court precedents restricting it—including Florida, Georgia, and Indiana—a Supreme Court ruling could give companies that don’t want LGBTQ people in the workplace a green light to fire them. “There won’t be a question mark anymore,” says Beall. “And because of that, I could see a whole lot more people discriminating.”

President Trump’s appointment of Justices Neil Gorsuch and Brett Kavanaugh, which made the Supreme Court more conservative than it’s been in a generation, could turn the tide. “My instincts suggest that this is an uphill battle,” says Anthony Michael Kreis, a visiting professor at Chicago-Kent College of Law who’s helped draft pro-LGBTQ legislation. The prospect of a Supreme Court loss raises the stakes for action in Congress, where Democratic allies have tried unsuccessfully for decades to pass a law that would explicitly ban anti-LGBTQ bias. “I don’t have a lot of confidence that the court will protect LGBTQ Americans from discrimination,” says Rhode Island Democratic Representative David Cicilline.

On May 17 the House finally passed the Equality Act, a sweeping bill Cicilline sponsored that would beef up the Civil Rights Act by prohibiting sexual orientation and gender identity bias in employment, as well as in education, credit, federal programs, housing, jury service, and public accommodations such as hotels and restaurants—even if the Supreme Court rules that the original law didn’t do any of those things. The bill’s supporters include more than 200 large employers such as Amazon.com, Apple, Coca-Cola, and Marriott. Facebook Inc. Chief Operating Officer Sheryl Sandberg said in an online post that “no one should face discrimination because of who they are—and we hope Congress passes this legislation.”

After proposing narrower bills and fighting among themselves on questions such as whether to pursue the rights of gay employees separately from those of trans workers, liberal lawmakers and activists unified in 2015 behind the more-ambitious

Equality Act, which they say better highlights and addresses the full spectrum of discrimination LGBTQ people still face. In a survey this year by the Public Religion Research Institute, 69% of Americans—including majorities in all 50 states—expressed support for legislation protecting LGBTQ people in hiring, public accommodations, and housing.

But in Congress, like the Supreme Court, the fate of anti-discrimination protections now rests with conservatives. Republicans command a 53-47 majority in the Senate, and even if Democrats were to take back that chamber and the presidency, advancing



the Equality Act would require either abolishing the Senate’s 60-vote filibuster rule or mustering enough GOP support to reach the 60 votes. The same day the Democratic-controlled House passed the Equality Act, Mike Lee, a Republican senator from Utah and a Judiciary Committee member, called it “counterproductive” legislation at a time when “Americans are becoming more tolerant every day” anyway.

Conservative groups including the Heritage Foundation, the nonprofit that Trump said helped develop his roster of potential Supreme Court picks, are hoping LGBTQ activists get rebuffed by both the judiciary and the legislature. If Congress did pass the Equality Act, says Emilie Kao, who directs Heritage’s Richard and Helen DeVos Center for Religion & Civil Society says, it could infringe on management prerogatives such as the ability to dictate what’s worn by an employee, including those who have “a belief that they are of the opposite sex.”

Oregon Democrat Jeff Merkley, who sponsored the Equality Act in the Senate and is working to secure GOP support, says he hopes the Supreme Court’s coming LGBTQ cases will help draw national attention to the bill: “The issue of having full opportunity in our society, of having full freedom, shouldn’t depend on the whims of a conservative court.” —*Josh Eidelson*

THE BOTTOM LINE More than half of U.S. states allow some form of employment discrimination against LGBT workers. GOP opposition means Congress is unlikely to change that.

The San Francisco Of Sichuan

● Chengdu is the place where businesses are tapping China's LGBT community

It's 11 p.m. at AMO, an underground lesbian nightclub in Chengdu, and 17 women—in androgynous clothing, their hair closely cropped—line up at the front door to welcome partygoers. Among them is Yang Yang, 25, who started working at AMO (Esperanto for “love”) more than three years ago when she moved to the Sichuan capital in the southwest of China. In that time she's earned enough to buy a 645-square-foot loft. “I can have fun and drink while making money,” says Yang, who'd trained to be a kindergarten teacher. “How much better does it get than that?”

Yang, her workplace, and her apartment are all part of China's growing rainbow economy: the ecosystem of consumers, companies, and workers that serve the nation's LGBT population. State media estimate that this segment of the nation's economy is worth \$300 billion a year—making it the world's third-largest after Europe and the U.S., they say—fueling a consumer base that companies are eagerly, if cautiously, trying to tap.

“Companies are getting braver, but they can do more and will do more as they grow more accustomed to the market,” says Darius Longarino, a senior fellow at the Yale Law School Paul Tsai China

Center who studies LGBT issues. “I understand their caution, because things can change with the snap of a finger. And there's a perception that in China nothing's allowed unless it's explicitly allowed.”

A world away from Beijing, Chengdu has become a haven for the LGBT community, whose members are drawn to the relaxed, open vibe. The city sits in a basin surrounded by mountains, which kept it isolated for centuries. Fertile ground and abundant natural resources allowed it to stay mostly self-sufficient, with an attitude that's both “mind your own business” and “anything goes.” The city of 16 million, best known internationally for its pandas, was voted the gay capital of China in a recent poll by gay dating app Blued. Less-expensive rents have lured young people, cultivating a hip, progressive culture that's spawned San Francisco-style cafes filled with millennials. Economic growth is comfortable, with last year's 8% expansion well above the national rate.

“Before I got into college, I probably had never met anyone who is gay, but here this feels like home because all our close friends are gay or bi,” says Katherine Guo, 19, a university student who moved to Chengdu from Guangzhou, a commercial center farther south. “When I was back home, I never told anyone I was bisexual—literally nobody.”

While there aren't official statistics on Chengdu's LGBT population, the nickname “Gaydu” has stuck. A 2018 study by Tongle Health Counseling Service Center, the oldest nongovernmental organization serving its gay community, estimated there were 140,500 gay men in the city. Although China decriminalized homosexuality in 1997 and removed it from an official list of mental disorders in 2001, gay, ▶



◀ Employees greet patrons at AMO in Chengdu

◀ lesbian, and transsexual individuals still live in a gray area. There's no law against being LGBT, but no rules protect against discrimination, either. China doesn't recognize gay marriage.

Still, established companies have tried to reach out in subtle ways. Earlier this year, Starbucks Corp. sold rainbow-themed mugs and tumblers that were snapped up. The items included the phrase "Love Is Love," with no explicit mention of LGBT rights. In 2015, after the U.S. legalized gay marriage, Alibaba Group Holding Ltd., its online shopping site Taobao, and Blued held a competition to send seven same-sex couples to Hollywood to get married. They received more than 400 submissions. This year, brands including Bayer, Coach, Diesel, Old Navy, and Shake Shack supported the ShanghaiPRIDE week.

In Chengdu, small companies make everything from cellphone cases emblazoned with rainbow colors to designer condoms, and one entrepreneur launched two lesbian-friendly apartment buildings in 2016. (Members of the LGBT community say they sometimes feel they need to hide their sexual orientation from landlords.) Shops on Taobao cater to lesbians such as Yang, who call themselves T's (for "tomboys"), selling masculine clothing in female sizes. Companies offering surrogacy services often hand out flyers at LGBT events.

Still, success depends on toeing the line. *Gaydorado*, a mobile game that lets players star as a heartthrob in a gay-friendly metropolis, has about 20,000 daily active users who spend several million yuan per month on in-game items. But it doesn't have the government license required for domestic distribution, and Chinese players must use a technical loophole to gain access.

The right approach is key, especially since the government can be unpredictable—supportive at times, then punitive when invisible lines are crossed. In 2017 popular lesbian dating app *Rela* was shut down after it backed an event in Shanghai to raise awareness for LGBT rights. (It later relaunched.) At other times, the authorities have sought to highlight their tolerance. When China hosted the Summer Olympics in 2008, state-run news agency Xinhua ran a feature promoting night-spot Destination as "Beijing's hottest gay club."

"It's kind of a message to the Western world that LGBT in China, they're not really living in a very oppressive environment," says Edmund Yang, who founded the bar 15 years ago. It's since grown into a gay institution—a four-story complex with an outdoor cafe, art gallery, multicultural center, and clinic that offers free HIV testing.

Blued says there were about 70 million LGBT people in China in 2016, based on the estimate that



◀ Yang Yang

roughly 5% of the global population is LGBT. But most don't live an out-and-proud lifestyle: A United Nations Development Programme study of sexual orientation in China that same year found that only 5% of sexual and gender minorities have come out.

Chengdu and other second-tier cities with large LGBT populations, including Chongqing and Hangzhou, are largely ignored by corporate marketers, according to operators of gay and lesbian establishments. "I think a lot of big companies don't do anything outside Beijing and Shanghai because they don't know that Chengdu and Chongqing have a big LGBT population," says Kate Thomson, who manages *Underground*, an LGBT-friendly bar in Chengdu that hosts a weekly pride night. "You can get away with more in Chengdu because it's under the radar."

In a survey of more than 7,500 LGBT individuals in China conducted by Blued and gay rights organization Danlan, more than half of respondents indicated that corporations' support for LGBT policies play the biggest role in influencing their purchasing decisions. Consultant LGBT Capital estimates those consumers have a purchasing power of \$541 billion.

One company betting on that rainbow economy is AMO, which also has clubs in Beijing, Shenzhen, and Chongqing. It plans to open one in Shanghai this year and expand to more cities in 2020. "When we first opened, we didn't expect demand would be so great even though Chengdu is dubbed the 'nation of LGBT,'" says Xiao Bai, who manages the clubs nationwide. "The desire to find a place to relax, have fun, and date is very strong." —*Sharon Chen and Han Miao, with Zheping Huang and Dandan Li*

● Estimated size of China's LGBT economy

\$300b

THE BOTTOM LINE A UN study found that only 5% of China's LGBT population live their diversity openly. But there's a growing gay and lesbian public presence in second-tier cities such as Chengdu.

The Unequal Gay Expat Life

● Policies of multinationals can clash with local anti-LGBT laws

For Alexander Dmitrenko, 42, it was a purchase to cement the ties to his adopted home. He's spent most of his career crossing borders: An ethnic Ukrainian born in Russia, Dmitrenko has graduate degrees from universities in Budapest, New York, and Toronto, and he's an attorney for Freshfields Bruckhaus Deringer, a law firm with headquarters in London. For the past four years, he's specialized in corruption investigations from the firm's Tokyo office. "I love Japan with all my heart," he says, which is one reason he bought a vacation home on a remote island about an hour by plane from Tokyo.

Yet there was a problem. To purchase home insurance, he needed a next of kin living in Japan. Dmitrenko is gay and has a partner, but as far as the insurer is concerned, he has no local relative, because the government doesn't recognize same-sex unions. "So I have no insurance," he says. In a country that is earthquake-prone, that's bad enough, but Dmitrenko says it's just one instance of the daily doses of discrimination he and his partner face. "There are whole areas of rights where we are invisible in the law," he says. "It hurts."

Discrimination of the kind Dmitrenko faces is increasingly a problem for multinational businesses operating in countries with vastly different policies toward LGBT people. Although more than two dozen countries have legalized same-sex marriage, some 70 nations have anti-LGBT laws, and many more have discriminatory policies. That's pressuring global companies, which depend on being able to move talented employees around the world, to find ways to help workers and their families in countries that lack protections for LGBT people.

The problem is particularly complicated in Japan, which is a laggard compared with most other developed economies. Within the Asia-Pacific

region, Taiwan in May recognized same-sex marriage, following earlier moves by Australia and New Zealand. Hong Kong's top court on June 6 took a big step in that direction, ruling same-sex couples married elsewhere were entitled to benefits straight couples receive. Lower courts are now hearing cases challenging the city's same-sex marriage ban.

Although Prime Minister Shinzo Abe's cabinet hasn't promoted LGBT equality, 11 municipalities certify same-sex partnerships for couples, according to Nijiuro Diversity, an organization advocating for LGBT people in Japan. Tokyo last year passed an anti-discrimination law covering sexual orientation and gender identity, and Japan's major opposition parties on June 3 submitted a bill calling for marriage equality.

The American Chamber of Commerce in Japan joined groups representing businesses from Australia, Canada, Ireland, New Zealand, and the U.K. to call for an end to the same-sex marriage ban. Liberalization would benefit all companies doing business in Japan, they said in a statement released in September, arguing that countries with marriage equality "have a competitive advantage over Japan because they offer LGBT talent a more inclusive environment."

Goldman Sachs Group, Morgan Stanley, and Barclays have endorsed the call for marriage equality in the country, as have Amazon.com, Coca-Cola, and General Electric. Nissan Motor, Sony, and Nippon Life Insurance were among more than 100 companies to receive a gold ranking in an annual survey of policies for LGBT employees by Work With Pride, a local advocacy group.

Some companies go to great lengths to help. Moriaki Kida, an executive for EY Japan in Tokyo who's set to become chief operating officer on July 1, married his husband in New York in 2014. Two years later, EY transferred Kida back to Japan. His British husband, unable to get a spousal visa, relied on student and short-term permits and frequent trips outside Japan to avoid overstaying. EY compensated the couple for the extra costs and eventually came up with another solution: The company hired Kida's husband, enabling both of them to live in the country. Not everyone can get that kind of help, of course. "I feel fortunate, but I feel a little guilty," Kida says.

Even a company as big as Panasonic Corp. has challenges. It's had an anti-discrimination policy since 2016 and offers gay couples the same spousal benefits as straight ones. Last year it chose a gay man, Laurence Bates, as general counsel and a member of its board. Bates, 61, and his husband have two children adopted in the U.S. Japan recognizes only his husband as the parent, so Bates ►

● Countries with national laws criminalizing same-sex relations between consenting adults or nonconforming gender expression

- Algeria
- Antigua and Barbuda
- Bangladesh
- Barbados
- Bhutan
- Botswana
- Brunei
- Burundi
- Cameroon
- Chad
- Comoros
- Cook Islands
- Dominica
- Egypt
- Eritrea
- Eswatini
- Ethiopia
- Gambia
- Ghana
- Grenada
- Guinea
- Guyana
- Iran
- Jamaica
- Kenya
- Kiribati
- Kuwait
- Lebanon
- Liberia
- Libya
- Malawi
- Malaysia
- Maldives
- Mauritania
- Mauritius
- Morocco
- Myanmar
- Namibia
- Nigeria
- Occupied Palestine
- Oman
- Pakistan
- Papua New Guinea
- Qatar
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and the Grenadines
- Samoa
- Saudi Arabia
- Senegal
- Sierra Leone
- Singapore
- Solomon Islands
- Somalia
- South Sudan
- Sri Lanka
- Sudan
- Syria
- Tanzania
- Togo
- Tonga
- Tunisia
- Turkmenistan
- Tuvalu
- Uganda
- United Arab Emirates
- Uzbekistan
- Yemen
- Zambia
- Zimbabwe

can't sponsor visas for his family. Unlike many foreigners following a same-sex spouse who rely on short-term tourist visas, Bates's husband was able to get a student visa and later qualified for a work visa after starting a small trading company. Says Bates: "If push came to shove and we needed help, there might be something the company would be able to do, but it's always an open question."

Younger people accustomed to equal rights are less willing to accept such uncertainty. A colleague of Dmitrenko's at Freshfields, Australian Rachel McCafferty, 25, left Japan in February after a temporary assignment. She'd wanted a longer-term job there but reconsidered. "To live in a society where you don't enjoy the same equal rights makes me feel you're not entitled to the same happiness as everyone else," she says. She now works in London, where she lives with her girlfriend. —Bruce Einhorn

THE BOTTOM LINE Big companies increasingly rely on moving talent around the globe. The anti-LGBT laws in 70 nations can complicate those relocations.

Hollywood Still Struggles to Catch The Rainbow

● The FX TV hit *Pose* is a landmark for trans creators. But it's a lonely achievement

Steven Canals has been deep in preparation for his first time directing an episode of prime-time television. The Bronx, N.Y., native is working on the second season of *Pose*, a show he writes and co-created that has critics generally elated. The opportunity to now direct, he says, "is incredible."

The FX Networks show has the largest number of trans actors in series regular roles in TV history. It's an urban fantasia, a soap wherein larger-than-life glamazons fight battles on the dance floor, pantomiming to themes like "executive realness" and "royalty." Fans took to social media during the Season 2 premiere to share GIFs of characters such as Angel Evangelista, a Puerto Rican sex worker played by trans actor Indya Moore, and quips from sharp-tongued emcee Pray Tell (Billy Porter). The stars have drawn attention everywhere—magazine covers, fashion campaigns, red carpets—and the show was just picked up for a third season.

The Golden Globe-nominated drama mixes ethereal costumes with the gritty reality of poverty and the AIDS epidemic in 1980s New York. Set against a backdrop of Trump-style wealth and leaning heavily for inspiration on the documentary *Paris Is Burning*, it captures the life of black and Latinx trans and other queer outcasts who built maternal "houses" that took in LGBTQ youth. In its second season, the story moves to 1990, when Madonna's *Vogue* thrust the dance scene into the mainstream.

Canals, an openly gay Afro-Latinx screenwriter who wrote the pilot in 2014, spent years being told it was too niche and not commercial enough, before being discovered by Ryan Murphy, the co-creator of *Glee* and *American Horror Story*, in 2016.

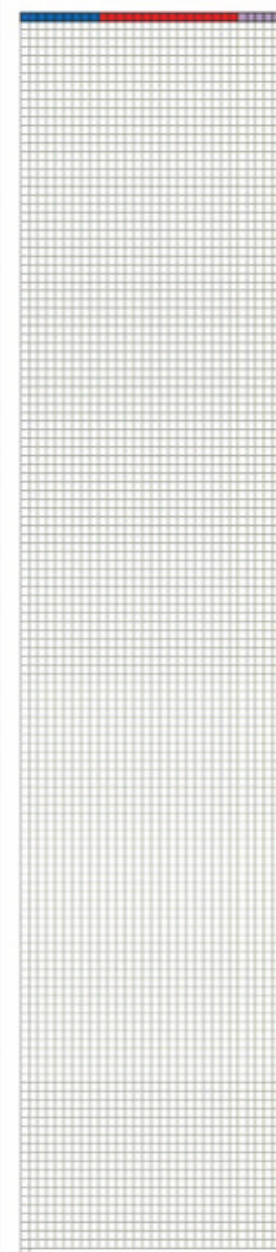
"The reality is that we still aren't seeing a lot of trans narratives being told," Canals says. He notes there's been progress in inclusion for LGBTQ people as a whole in Hollywood, and gay men and women in particular, but "we're not doing great when it comes to representation of folks who are bisexual, and certainly I don't think we're doing great when it comes to trans representation either."

The numbers back him up. A 2018 study by the University of Southern California's Annenberg Inclusion Initiative found transgender people largely absent from Hollywood films and that only 1% of all characters in 1,100 popular films from 2007 to 2017 were from the LGBTQ community. There wasn't one trans character across the top 100 movies of 2017. TV is more inclusive, with the percentage of LGBTQ series regulars on broadcast prime-time scripted programming reaching an all-time high of 8.8% in 2018, says GLAAD, the LGBTQ media advocacy group. The producers behind *Transparent* and *Vida* have sought out LGBTQ writers and actors.

"You have a show like *Pose* out in the world that

● LGBT characters among the 4,403 roles in the 100 top-grossing U.S. movies of 2017*

- Lesbian
- Gay
- Bisexual



is well received and has found an audience, and so suddenly everyone thinks, ‘Well, trans people are doing great.’ But that’s only one show,” Canals says. “Last year we had a little over 500 original pieces of scripted content. I think we could do better.”

Chuck James, a founding partner at talent agency ICM Partners, says that in recent months he’s seen an increase in requests for actors to fill LGBTQ roles in mainstream dramas and for more actors who are

LGBTQ themselves. For the stars of *Pose*, Canals wants recognition of their work as actors, without qualification. “These trans women are not playing trans, they are playing a woman who happens to be trans,” he says. “There is so much more that makes these characters who they are.” —*Anousha Sakoui*

THE BOTTOM LINE Hollywood is getting slightly better about supporting work by queer writers, producers, and actors, but the LGBTQ community is still vastly underrepresented.

Hiding in The Corner Office Closet

● A conversation with former BP CEO John Browne, now chairman of L1 Energy Holdings, on the price of not being out in corporate life

Bloomberg Businessweek: How were LGBT people treated when you first started working?

Lord Browne: I was born a long time ago, 1948, and while I was at university, it was still illegal to be gay and actually have gay sex. You could go to prison. The law changed halfway through my time there. But before then, people were terrified to be anything other than totally straight, otherwise you could be blackmailed or you could find yourself in terrible trouble. So the law changed, and nothing actually happened. The behavior of many years was still there—that basically people did not approve of people being gay. They thought they were weak. They thought they were unreliable. They thought they were people that really shouldn’t be part of a business world, an academic world, a commercial world. So everyone pretended to be straight, and, indeed, so did I.

So, in the closet...

I was, you know, the son of an Auschwitz survivor. She told me two important things: One is, never tell anyone a secret, because they’ll surely use it against you. And the second is, never be a member of an identifiable minority, because when

the going gets tough, the majority always hurts the minority. And in her experience, that was spot on. So I [had] a straight public life and a deeply secret gay life, which I rarely indulged in. I kept two lives separate, like many people, and I made sure they never collided.

You knew from the start you’d have to stay in the closet?

Yes, and I knew that, because all references to gay people were pejorative. Everyone used gay jokes. It was a time when some important British politician before my time said, “Well I thought men like that would take a glass of whisky and a revolver and do the right thing to themselves in their study.” You know, kill themselves. And that was the way people thought about it.

Was there anything unique about the energy industry?

The energy industry was certainly macho, that’s for sure. And I say that was clearly the case, because there was almost no women in the business. I remember one woman engineer that I was with when I joined BP. She was a brilliant engineer and quickly left because she couldn’t stand the environment. It was a macho environment, but it was not the only industry. Until quite recently, Silicon Valley was a pretty tough place to be—people said frat house. It was sort of not appropriate either for women or for gay people. And sometimes these go hand in hand. Industries have struggled so long to get gender equality. We’ve been at it 60, 70, 80 years, and we still haven’t achieved the right level. For LGBT we started much later, so it’s hardly surprising it’s behind. It really takes time for people to believe that they’re safe to be who they are.

What is the importance of role models?

I never had a role model. A successful role model is the single-most important thing, because it’s more powerful than lecturing people or the corporate brochure which says, “We stand for equality, we stand for inclusion, we stand for diversity.” They’re important things to say, but actually the most important thing is seeing: “I can see her, I can see him, and they are being themselves.” That’s ►

◀ really important, and I think that makes people feel safe. In corporations you need to have the right attitudes [and] policies, but, importantly, people need to see that people are really included. It's always as strong as the weakest link. So if a person is excluded, then people don't believe.

Is there anything you wished you would have known about how the business world treats LGBT people when you started your career?

At the time I joined, I presumed that absolutely everybody treated LGBT badly and they were excluded. Today, I think if I were making a selection of a company, I really would want to press and see just how attitudes toward gay people have been developed and have things really changed? When I wrote my book *The Glass Closet*, we found a couple of women who were going through a recruitment fair. In recruitment—this is lawyers and bankers—and they were asking about LGBT activity. We asked them whether they were gay, and they said, “No we're straight, but actually we're interested to see how people are dealing with LGBT inclusion, because if they did that really well, then chances are they do gender even better.” I think there's an important serious point here, which is about attitudes in mind about difference, inclusion, and diversity. It's an attitude of mind that then comes through real activity on the ground.

And CEO models...

It's quite difficult if you're trying to find a role model CEO. In the S&P 500, the only one I know is [Apple Inc.'s] Tim Cook. Maybe there's one or two others. There should be, say 5%, 25 CEOs at least. So either they're in the closet, which is possible and very stressful for them and sad in that they're not role models. Or it is the case that boards still remain very conservative and like to make sure they don't take risks with people who aren't just like them.



◀ Browne

You came out in an unplanned way...

Very unplanned: I was outed.

How would you have preferred to come out?

I come back to role models. I [wished I'd had] people who were in business who were openly gay who could have come to me and said, “John, times have changed.” Because what I hadn't realized in my head is that times had changed. And I believed firmly that all the things I thought that were signals given to me in my career had not changed—that everybody was the same, that attitudes hadn't changed. So I wish I had a role model that could have come to me and said, “John, I think we all know you're gay. It's just that none of us were brave enough to come and tell you.”

You wish someone would have approached you like that?

I wish someone would have. But they didn't. I had persuaded myself that the only protection I had was to remain in the closet, and that was

Rainbows Come in Pinstripes, Too

Since Stonewall, the number of out executives has soared. These 11 discuss why that's important.



Jim Fitterling, CEO, Dow

Don't be afraid to live your own life. I would never tell anyone to come out when they don't feel comfortable. But I know from experience there is a toll you pay when you try to hide part of yourself and that the perceived pain of coming out is often worse than the reality.



Matt Ryan, chief marketing officer, Starbucks

Starbucks supports inclusion and diversity, because it's the right thing to do, but there's also a business benefit: You tend to attract the very best people to the company when inclusion is not an issue.



Roy Hunt, senior vice president, Gap

As I came out and I realized that this burden that I carried for such a long part of my life was being lifted off my back, I also realized that I became a much better leader and better person, and it just changed everything.



Gigi Chao, vice chairman, Cheuk Nang Holdings

Knowing that a potential employer is friendly to the community and stands for equality is an important motivator. And being able to bring our full selves to work takes away the pretense and fear.



Alan Joyce, CEO, Qantas Airways

I'm a member of our LGBTQ network at Qantas, Illuminate. I attended the last conference and sat in the audience, not on the stage, because I wanted to listen and learn from what others have experienced.

completely wrong. I like to think today the glass is definitely half full. It may not be totally full, but half full compared with half empty.

What is the biggest fear you think gay people feel about coming out in business?

They feel several things, and I still feel this. One is, it's an extra factor that gets in the way of promotion [and] your career development. Secondly, they still think that attitudes of clients and those outside major cities are still quite old-fashioned and they object to gay people. So that would change the way they deal with their official relationships. Thirdly, they may not have told their families, so that's another factor that gets in the way of being open about yourself. We're sitting here in London talking about this, and there are many gay people that can be openly gay. New York, San Francisco, Los Angeles. But if we went north of here to the countryside, then attitudes might change. If we went north of New York City, it might change. If we went east of San Francisco or Los Angeles, things might change. So we are, to an extent, affected by the metropolitan environment we live in, where there are a lot of diverse people, and people are much more inclusive. I think attitudes take a long time to change.

Is there a personal anecdote about your coming out that sticks with you?

When I was outed, I decided that I would resign from BP, so I resigned, because I felt that I could neither take the company through what was going on nor did I feel entirely the board was completely happy with this. So I resigned, and I decided to leave BP through the front door. They said, "Are you sure you don't want to go to the back door?" I said, "No, no I'll go through the front door. I always come through the front door."

The reception?

I've never seen press like that. The whole of St.

James's Square [was full]. And then I got into a car and went to my apartment followed by paparazzi on motorbikes. As I got into my apartment, people were on ladders and on the trees trying to take photographs. So I had to shut the blinds. For three days I was under siege. And actually after three days, as they say, there was huge coverage around the world. But the English expression is, "yesterday's news is today's fish-and-chips wrapper," and I was then [that] fish-and-chip wrapper on Day 4. So I decided to go out. I went out shopping along King's Road and what happened was an eye-opener for someone who thought they were going to lose all their respect and their friends. People started stopping me and saying things like, "We're right behind you" and "We support you." I was quite emotional, and I couldn't handle it, so I had to go back to the apartment again. Then what really sorted it out, I had a deluge of supportive mail, and I realized then that life had changed and that people look at you as who you are, not who you think you should be. And it changed everything.

Have you taken on the role of mentoring or bravely confronting someone about their hidden sexuality in the way you wanted someone to do for you?

Yes, it hasn't always worked. But I've helped people through, just to remind them that it's not as if it's an existential threat—it's the reverse. But people do think that. What you build in your head after many years is a very complex picture of what you think people will do to you if things change. And it's not surprising. It's just that some secrets are more difficult to keep than others. Some are more damaging to keep. In some ways, would I like to have been outed the way I was? No. But thank goodness I was. Thank goodness I was because I can't imagine what it would be like to have perpetuated that lie.

—Interview by Kelly Gilblom

"I wish I had a role model that could have come to me and said, 'John, I think we all know you're gay'"



Sue Baines, director of U.K. debit card optimization, Barclays

[Having] a diverse and inclusive firm's a great way of retaining colleagues. I'm loyal as a consequence of opportunities I've had and the support I've had as a visible and senior out lesbian.



Christopher Bailey, ex-CEO, Burberry Group

Fashion can be a very accepting industry. As I get older, I realize how fortunate I was. There's been so much progress, but I can't imagine how much harder it still can be in some industries that aren't in city centers. It can take a tremendous amount of inner strength.



Dax Dasilva, CEO, Lightspeed

In tech... we really have the opportunity to bring diversity as a strength. We must create seats at the table for diverse viewpoints, knowing that difference is a teacher. Solutions for the future come out of diverse perspectives.



Inga Beale, ex-CEO, Lloyd's of London

For advice, I would say, be yourself; bring your whole self to work. Please don't go back into the closet—because you will be the one who fundamentally suffers for it. And if you're out at work, you and your business will benefit.



Sander van 't Noordende, group chief executive, Accenture

The young professional who is out is also a role model, so being visible matters, because that shows the way for others. Be out and be natural about it, because ultimately people will figure it out, and it's OK.



Kim Culmone, senior vice president, Mattel

The higher you go up, the less diverse the space becomes. I feel an enormous responsibility to take that empathy I got from growing up different from the majority... [to sound] the voice of the perhaps marginalized.

CAN YOU

TRUST

● Facebook's cryptocurrency will put user trust to the test

When Facebook Inc. recently unveiled Libra, its long-awaited cryptocurrency, the company used the announcement as a chance to convey just how much care has gone into the digital asset. David Marcus, the former PayPal Holdings Inc. president who's the social network's blockchain boss, said at a June 11 preview held under the vaulted ceilings of the old San Francisco Mint that libra was a unit of measure in ancient Rome and is the astrological symbol for balance and justice. "Freedom, justice, money," Marcus said. "Basically everything we want this endeavor to become."

Whatever the spin, once the currency becomes available in the first half of 2020, Facebook will collect more consumer data and dig deeper into its users' digital lives. As it continues to apologize for the many ways it's breached people's trust, the company is asking users to take a huge leap of faith on Libra. "Are people going to feel safe using Facebook as their digital wallet?" asks Dave Heger, an analyst at Edward Jones Investments. "When you start talking about money and the potential loss of money, I would think a lot of people would be pretty skeptical just based on the recent history that the company has had."

Regulatory pressure on Facebook has never been greater. The Federal Trade Commission is finalizing an investigation into its privacy practices, which the company has said could lead to a fine up to \$5 billion.

A

Edited by
Dimitra Kessenides
and Madeleine Lim

Libra!

Presidential hopefuls Elizabeth Warren (D-Mass.) and Bernie Sanders (I-Vt.) have called for investigations into the big tech companies and the power they wield over Americans' lives. Facebook co-founder Chris Hughes has said the social network should be broken up. Reacting to the Libra announcement, Ohio Senator Sherrod Brown, the top Democrat on the U.S. Senate Committee on Banking, Housing, and Urban Affairs, said, "We cannot allow Facebook to run a risky new cryptocurrency out of a Swiss bank account without oversight. I'm calling on our financial watchdogs to scrutinize this closely to ensure users are protected."

Facebook hopes to dispel the concerns, first, by keeping its social media and payments data separate. It's created a subsidiary, Calibra, which will build and maintain the digital wallet products, including the currency, and will store users' financial data. Calibra will know when you send money to a friend or buy a new pair of shoes, storing that information on its own proprietary servers. The social network won't have access to that data. That separation, Marcus said, is important for building greater consumer trust and to win regulatory approval. "There needs to be a super clear demarcation," says R.A. Farrokhnia, a professor at Columbia Business School who specializes in cryptocurrencies and financial technology. "There are very clear rules on using financial transaction data for purposes other than facilitating a payment, and I'm sure Facebook will be held to a higher level of scrutiny given just the past history."

The vision for Libra is global. Consumers will eventually be able to convert government-backed money into Libra through the Calibra wallet, which will exist inside WhatsApp and Facebook Messenger. The wallet will also exist as a stand-alone app, so you won't need a Facebook account to access the currency. A big part of Facebook's pitch is that Libra will even work for the billions of people around the world who don't have a bank account. Some day, Facebook hopes, Libra will be accepted as payment by brick-and-mortar merchants.

Facebook's second concession is that it won't control Libra. It has joined with more than 25 companies, including PayPal Holdings, Visa, and Uber Technologies, to form the Libra Association, a governing body that will oversee the currency and manage its reserve, which will back the coin one-to-one—the reserve, composed of bank deposits and short-term government securities, will equal the value of Libra on the market. The association is an effort to "level the playing field," Marcus said. Each association member, including Facebook, will have a single vote on

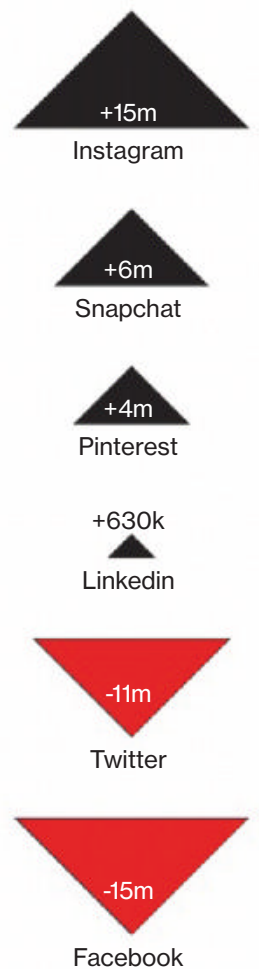
important decisions regarding the currency, like how and where the currency will be issued.

Marcus says he expects the Libra Association to expand to include 100 companies by the coin's debut. Once Libra becomes available, a user will be able to spend it through other digital wallets owned by competitors including PayPal and Visa. "If this becomes a utility that many other companies build products on, that's success," says Christina Smedley, Calibra's head of marketing and brand.

The real test of how this will affect privacy will come when Libra makes it to market in 2020. The Libra Association tasked with managing the coin hasn't yet drafted a charter, which will stipulate how the currency is backed, distributed, and governed. Calibra has been in talks with regulatory bodies and central banks in numerous countries, according to Marcus. Farrokhnia says U.S. regulators, such as the Securities and Exchange Commission and the Commodity Futures Trading Commission, are watching very closely to ensure consumers will be protected. "The regulatory aspect of this should not be underestimated," Farrokhnia says. "But Facebook is Facebook. They have a ton of resources at their disposal." —Kurt Wagner

THE BOTTOM LINE With regulatory pressure on high, Facebook wants to diversify with cryptocurrency Libra. Experts wonder if the company has learned any lessons from its privacy missteps.

● Change in U.S. users, 2017-2019



Boosting Profits by Billing Employees

● At Tokyo-based Disco, everything has a price, including meeting rooms and desks

Hiroyuki Suzuki couldn't be happier that his company is charging him and all other employees about \$100 an hour to use meeting rooms. "People really cut back on useless meetings," says Suzuki, 37, who works at chip-equipment maker Disco Corp. and is one of the company's 5,000 employees taking part in a radical experiment in business management.

At Disco, everything has a price, from office desks and PCs to a spot for your wet umbrella. Teams bill each other for their work, while individuals operate as one-person startups, with ►

◀ daily auctions of work assignments and battles for the best ideas in the aptly named “Colosseum.” Payments are settled in a virtual currency called “Will,” with balances paid in yen at the end of each quarter. “We’ve created a free economic zone, just like what exists outside the company,” says Toshio Naito, who designed the program and has continued to work on it since its implementation in 2011. “Work should be about freedom, not orders.”

The approach has so far paid off. Disco’s operating margin has risen to 26% from 16% since the experiment was implemented eight years ago, and its profitability is the envy of the industry. Its share price has almost quadrupled in that period, to roughly 16,000 yen (\$148), giving the company a \$5 billion market value. Thanks to bonuses, worker pay is more than double the national average of 4.7 million yen, and in 2017, Disco was the first to win a new government award for creating an ideal workplace.

Yet despite its proven success and dozens of inquiries and training sessions with other companies, none have adopted the idea so far. Engineers have quit, complaining the approach detracts from their ability to focus purely on research. Others have been driven away by the never-ending pressure to perform to get a bonus. And big payouts aren’t guaranteed, which means enduring a high-pressure work environment without much of a benefit. The relentless focus on quarterly profits can encourage short-term thinking, says Takashi Shimizu, a professor at Waseda University in Tokyo who studies accounting and management systems. “Senior management must not get trapped in a short-term loop,” he says. There’s also a cultural challenge. It took about five years for staff in Japan to adjust, and workers in the U.S. and China still haven’t fully embraced the approach, Naito says.

But those who adapt emphasize the freedom to shape their own day and the value placed on their efforts and their own time in particular. They say the ruthlessness of a hardcore free-market approach is diluted in a setting where people work side-by-side. “It’s become like second nature,” says Naoki Sakamoto, a Disco factory worker in Hiroshima. “Being able to measure everything creates more interest and confidence.”

Disco, founded in 1937 as Dai-Ichi Seitoshō Co., began by supplying cutting tools to the Japanese military prior to World War II. Its saws and diamond blades have since been used to cut everything, even moon rocks brought back from the Apollo 11 mission. Today, it’s the world’s largest maker of equipment that slices and dices silicon ingots and wafers before they’re converted into electronic chips. Like

many manufacturers, Disco spent decades looking for ways to boost efficiency, settling on an approach based on Kyocera Corp.’s Amoeba Management, which operates its thousands of internal teams as individual companies (amoebas). Disco, under Naito’s guidance, extended that autonomy to individual employees and called it “Personal Will” (from which the virtual currency’s name is derived).

At the heart of the program is a compensation system that meticulously tracks how much every person and team contributes to earnings. Workers receive a base salary, which they augment by earning Will for completing tasks. Quarterly bonuses can rival a year’s pay for top performers, says Naito. “It’s enough to buy a foreign-brand car every year,” he says. “We call it the ‘Will Dream.’”

Earning virtual currency begins at the team level, where bosses allocate a portion of the group’s Will budget to each task they must complete. Team members then use an app to bid in an auction for those jobs. Assignments that don’t attract any bids often turn out to be unnecessary, Naito says. And managers who’ve misused or abused the system have been abandoned by their workers, who are free to move to other teams.

Groups pay each other to complete tasks. Sales teams pay factory workers to produce goods, who in turn pay engineers to design products. Once a sale is made, it generates a certain amount of Will that trickles through to everyone in the supply chain, including human resources and IT support staff. “For example, today I paid Will for this meeting room and also for Naito to come in and spend his time to talk to you,” Sumio Masuchi, head of Disco’s press team, tells Bloomberg reporters. “But once your article is published, I’ll get Will for generating publicity.”

There’s a penalty system for inefficient behavior, which includes piling up unnecessary inventory or even working late. Overtime hours have fallen 9% since penalties were implemented in 2015, aligning with the Japanese government’s goal to improve work-life balance. “Economic forces are doing all the things managers used to spend time on,” says Naito. Employees can earn extra Will by helping each other: A parent who wants to see a kid’s baseball game can pay a colleague in the currency to finish a report. A software engineer can earn extra by offering coding skills to another team. Creating Excel macros or translation work are typical requests.

Then there are the daily competitions in the Colosseum, a 200-seat auditorium at headquarters where employees and executives make bets on ideas that have been implemented by the teams to increase profits. Any employee can make

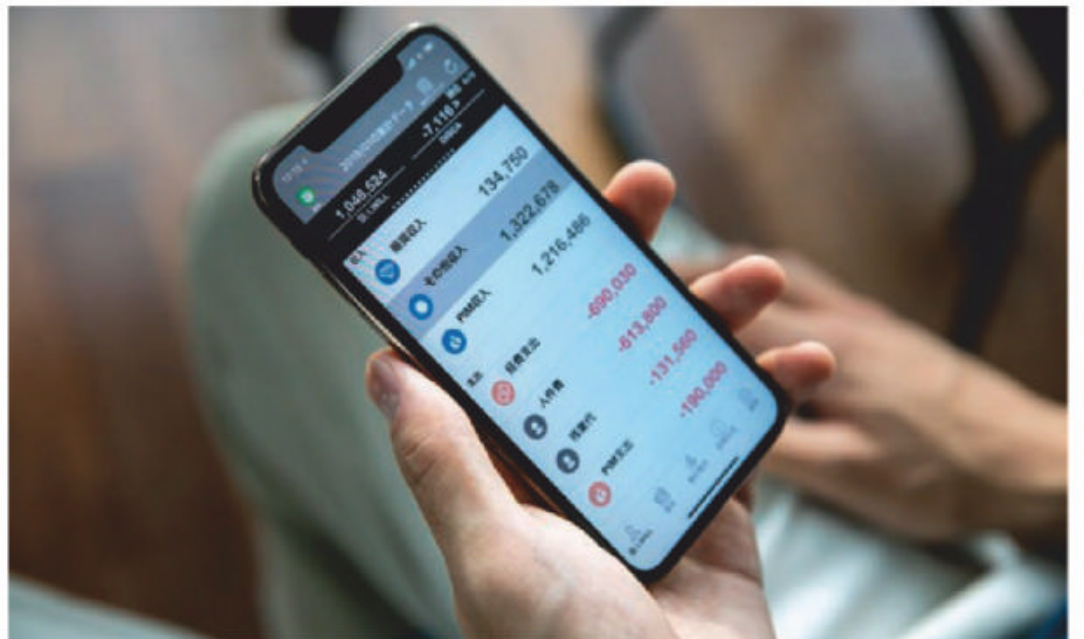
“He wanted a system like in *Final Fantasy* or *Dragon Quest* that would make work fun but also strengthen the company”



a presentation, and the 1,400 proposals last year included everything from faster manufacturing techniques to better ways to organize trash bins. Presenters face off, with each side making a one-minute speech. Employees use an app to bet Will on the idea they back, with an upside limit of 200,000 Will (about \$1,800) for each battle. The side attracting the most support wins, with victors receiving the wagers made by losers. The beaten team might revise its idea and return to the fray, using feedback from Chief Executive Officer Kazuma Sekiya, who watches the battles and comments on all the ideas. About a dozen battles are held daily, and the most popular ones can attract wagers in the hundreds of thousands of dollars. If that sounds over the top, at least one winner in the past was probably worth it: an internal policing system to catch intellectual property violations.

Naito, who studied law, trained as an accountant in his first job at a large milk producer, where he became interested in organizational management. At Disco, he worked on ways to improve productivity until Sekiya told him to take inspiration from video games: “He wanted a system like in *Final Fantasy* or *Dragon Quest* that would make work fun but also strengthen the company.” The most important element Naito borrowed from the gamer world was the idea of scoring everything in the same way games reward high scores, to re-create the spirit of fun and competition.


The company’s latest experiment is an internal crowdfunding platform where anyone can pitch



business ideas. Colleagues who back a project with Will may, if it works out, earn a return one day. It’s a fast way to test concepts, as initiatives that attract funding are a good indicator of promising ideas, Naito says. Or sometimes it’s just about pride: One project that attracted funding was to buy ad space at a professional baseball stadium in Hiroshima, home to Disco’s main factory, for marketing purposes. About 400 workers pooled \$140,000 of their own bonus money—or about \$350 each—for the privilege to see their company’s logo after work, even though the impact on the company’s bottom line seems doubtful at best. —*Yuji Nakamura and Yuki Furukawa, with Jason Clenfield*

▲ Naito and the Disco app

THE BOTTOM LINE: Disco’s experiment with capitalism-on-steroids has boosted margins and won government accolades. Yet no other company has adopted the approach.



**SOONER
THAN
YOU
THINK:**

Bloomberg

September 5, 2019
Singapore

BE READY FOR THE *IMMINENTLY* POSSIBLE.

Artificial intelligence, once considered the stuff of science fiction, is increasingly influencing our daily lives. Companies and governments are investing heavily in AI-related technologies, which could unlock up to US\$15.4 trillion in annual business value worldwide. The potential is limitless. So are the consequences.

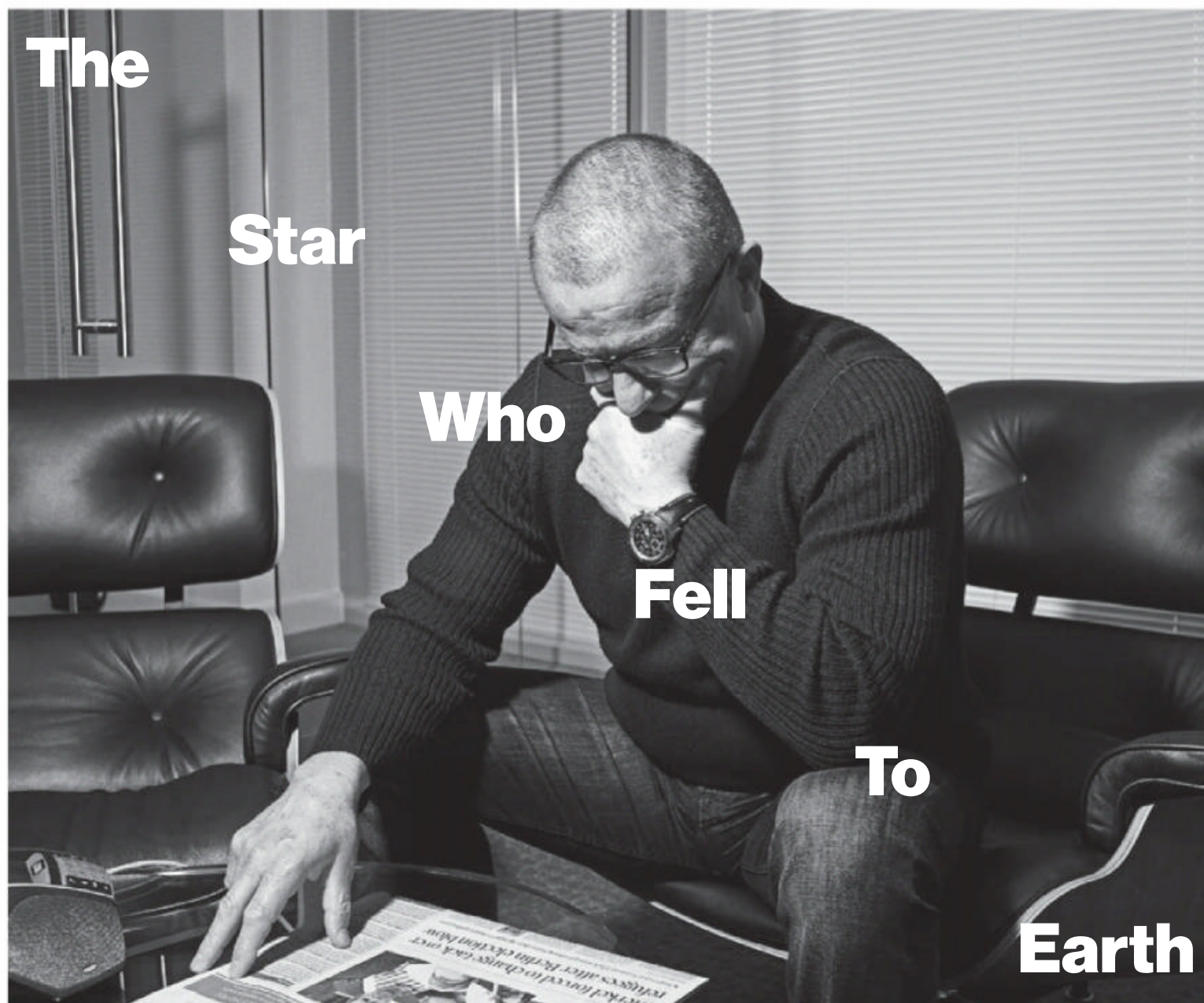
This September in Singapore, join Bloomberg Live for a deep dive into the technologies challenging many of the basic assumptions of our daily lives – and the very notion of what life is.

Sponsored by:



REGISTER NOW

bloomberglive.com/STYT-Singapore-2019



The

Star

Who

Fell

To

Earth

● The crisis at a popular British stock fund holds lessons for investors everywhere

Neil Woodford is a famous fund manager in the United Kingdom. At a time when individual investors are pouring money into anonymously run index funds, there aren't many of those left anywhere in the world. He now faces a crisis after he froze investors' redemptions in his flagship U.K. fund, LF Woodford Equity Income, which has fallen about 22% in the past year. The freeze—a rare step for a fund aimed at ordinary investors—is supposed to buy him time to offload a bunch of “unquoted and less liquid” stocks in the fund's portfolio, according to his firm's website.

It's a dramatic reversal of fortune for Woodford, a Warren Buffett devotee who built up a cult following by correctly calling major swings in technology, tobacco, and other stocks over decades. And fund investors everywhere, including in the U.S., can take away several important lessons from his flameout, financial advisers say.

It points to the potential hazards of funds that invest in obscure, hard-to-sell assets, and to the need for a healthy skepticism about celebrated money managers.

“Investors are prone to latching on to star managers, believing they've got the individual as the secret sauce, and that only they can potentially outperform the market,” says Todd Rosenbluth, director of exchange-traded fund research at CFRA Research. “People are fallible. Investments move in and out of favor. You should be buying a fund, not putting money to work for a specific manager.”

Woodford, through an external spokesman, declined to comment. The Oxford-based stock-picker has been managing money since at least 1987. He made his name at investment manager Invesco Perpetual, where he helped build up about £33 billion (\$42 billion) in assets over almost 26 years and was among the biggest investors in U.K. stocks.

He was so well-regarded that on the day in 2013 that he announced he was moving on, Invesco shares slumped more than 7%. St. James's Place, a U.K. wealth manager, took £3.7 billion of its ▶

◀ clients' money out of Invesco and parked it with Woodford just as his firm, Woodford Investment Management, was getting going. "We weren't backing Woodford Investment Management, and we weren't making a statement about Invesco," St. James's Place Chief Executive Officer David Bellamy said in 2016. "We were with Neil." (St. James's Place, whose investments weren't in Equity Income, cut its relationship with Woodford after the freeze.)

In his first year on his own, Woodford's Equity Income fund gained 16%, beating all 50 of its peers tracked by Bloomberg. He has maintained a bullish stance on Brexit's impact on the British economy, a contrarian position that helped keep his venture in the spotlight even as returns faltered.

In the firm's early days, Woodford focused on picking large, liquid stocks. Over time he moved toward smaller companies. What started as a gradual shift dramatically altered the profile of his fund. In the most recent portfolio disclosure before he froze assets, Woodford had allocated almost all of his fund's assets to small and medium-size companies, according to Morningstar data. Some investments, including BenevolentAI and Industrial Heat, weren't even listed on a major exchange.

"If you own an actively managed fund, you have to know what is held in the fund," says Joshua Mungavin, a financial planner at Evensky & Katz/Foldes Financial Wealth Management in Coral Gables, Fla. "If the stocks owned by the fund are thinly traded or not traded on the public markets, then you know there is always a risk the fund could become as illiquid as its underlying assets." In other words, you might find that you can't take your money out when you want it.

The Equity Income fund was hit by declines in a number of its positions, including listed stocks such as the online real estate service Purplebricks Group Plc and consumer lender Provident Financial Plc. The poor performance led investors to pull money out, and its assets dropped by £560 million in May alone. The withdrawals began to put pressure on Woodford. To avoid becoming a forced seller of shares—and potentially having to accept fire-sale prices—the firm said at the start of June that the fund was freezing redemptions.

In the U.K., funds are allowed at most 10% of their assets in unlisted securities. According to the U.K.'s Financial Conduct Authority, the fund temporarily breached that limit twice in early 2018. Some companies in which Equity Income owned shares were later listed on the International Stock Exchange on the small island

of Guernsey, helping the fund to stay within the rules. On June 18 the watchdog agency said it was investigating events that led to the freeze.

Woodford isn't the first fund manager to run into liquidity problems. When the U.K. voted to leave the European Union in 2016, the country's largest real estate funds froze almost £9.1 billion of assets as investors rushed to get their money out. M&G Investments, Aviva Investors, and Standard Life Investments all stopped withdrawals from the funds devoted to illiquid property assets. Those funds later reopened after markets calmed.

In the U.S., there's Third Avenue Management, a mutual fund company founded by legendary value investor Marty Whitman. The firm managed as much as \$26 billion in 2006, but it was hit hard in 2015, when its Focused Credit mutual fund imploded. As the crisis escalated, the fund, which invested in junk bonds, banned withdrawals. It was finally liquidated in 2018, with shareholders getting about 85% of the fund's value at the time it shut its doors.

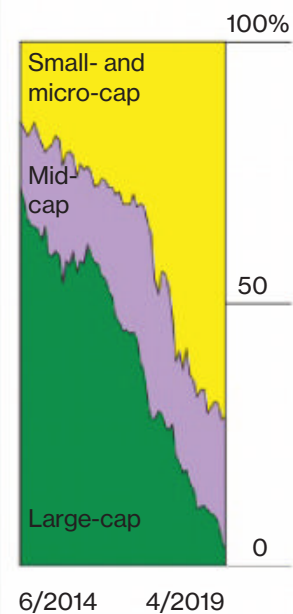
The U.S. Securities and Exchange Commission says investments in illiquid products should be no more than 15% of a fund's net assets. But concerns about funds investing in potentially hard-to-sell assets remain on both sides of the Atlantic. Federal Reserve Chairman Jay Powell and Bank of England Governor Mark Carney have noted in recent speeches that some investment funds hold illiquid debt securities. At the same time, fund companies are offering new products designed to make withdrawals harder, so that they can own more thinly traded assets (see the following story).

What happened to Woodford is still extremely rare, especially for an equity manager. But even setting aside the withdrawal freeze, the fund's poor performance will be a piece of evidence for those who argue that most investors are better off putting their money in a diversified index. And it shows that even investors who do want to try to beat the market would be wise to spread their bets. "Woodford's story is simply one more painful reminder of the importance of diversifying—not only among different asset classes such as stocks and bonds but also among the different management firms who invest in them," says Bruce Colin, an independent wealth manager based in Rancho Palos Verdes, Calif. "Individuals who choose to invest with a single fund manager, particularly one with a near celebrity-like following, should be particularly attentive to the risks they are courting."

—Suzy Waite and Annie Massa

THE BOTTOM LINE It's unusual for mutual funds to tell investors they have to wait to get their money out, but it can happen when managers take risks on hard-to-sell assets.

● Woodford Equity Income fund allocation, by size of company



Funds That Lock Up Your Money—On Purpose

● Interval funds make withdrawals harder so they can make wilder investments



The hottest thing in investing for the past decade has been low-cost exchange-traded funds, which investors can hop in and out of anytime the market is open. So here's a strange proposition: How about buying a fund with higher fees and restrictions on when you can take out your money?

Some big asset managers think investors are ready to take that offer. Pacific Investment Management Co., Blackstone Group, Ares Management, and even BlackRock—the ETF giant—have all introduced “interval funds” in the past two years. Interval funds restrict total withdrawals to a range of 5% to 25% of fund assets in a specified period, such as once a quarter. James Seyffart, a Bloomberg Intelligence analyst, likens them to the Hotel California, with a twist: “You can only sometimes leave.”

What's in it for investors? Fund companies say interval funds have a chance to deliver higher returns by capturing what's known as the illiquidity premium. Because they don't have to be able to redeem shares on a moment's notice, interval funds can build their portfolios on thinly traded commercial mortgages, loans, private equity debt, and other high-yielding, high-risk assets usually available only to wealthy individuals and institutional investors. Conventional mutual funds can also buy some of the assets interval funds hold, but they have limits on how far they can go. “Our goal has been to democratize access to alternative strategies,” Eric Mogelof, Pimco's head of wealth management, says about interval funds.

That access doesn't come cheap. For example, the Pimco Flexible Credit Income interval fund has an expense ratio of more than 3% of assets per year,

or about three to four times as much as the firm's most popular bond mutual fund, Pimco Income, depending on the share class. Interval funds' costs are steeper because it's expensive to pick and trade the assets they buy, according to Mogelof.

There were 56 interval funds with a total of \$25 billion in assets as of May 31—that's twice as many funds and twice as many dollars as there were in the category two years ago. Investors have been drawn to the funds in part because low interest rates have dragged down returns on more conventional investments. Pimco Flexible Credit Income, whose portfolio includes mortgage-backed securities, Italian bank debt, distressed utility debt, and consumer and student loans, has earned an annualized 8.4% since its launch in February 2017. That compares with 5.4% for the liquid Pimco Income fund over the same period.

Other interval funds include one from Pimco that specializes in junk-grade municipal bonds and a new BlackRock fund that invests in corporate debt. Interval funds are sold mainly through intermediaries such as advisers. “Retail investors without financial advisers that are point-and-clicking to buy may not understand what they're getting,” says Evan Stoff, a senior research analyst with Vivaldi Asset Management in Chicago, which uses interval funds. He says the funds' main value is to add diversification to a broader portfolio.

While restricting redemptions can reduce volatility, interval funds can still lose money. The largest is the \$4.8 billion Stone Ridge Reinsurance Risk Premium Interval Fund, which invests in insurance-related assets. It lost almost 9% in the fourth quarter of last year after insurers were forced to cover damages from California's wildfires, according to Interval Fund Tracker, a website that follows the funds. Stone Ridge President Ross Stevens didn't respond to requests for comment.

Some of the assets interval funds tend to buy may be getting riskier. One example is leveraged loans—or loans to businesses with less-than-stellar credit. They've expanded in recent years to a \$1.2 trillion market, and terms on the loans have gotten looser as yield-hungry investors have poured in. Federal Reserve Chairman Jerome Powell recently said he doesn't think these loans pose a ►

● Total assets in interval funds as of May 31

\$25b

◀ threat to the financial system, but he's concerned that a chunk of them is held by regular mutual funds that have to meet investors' demand for liquidity. "Widespread redemptions by investors, in turn, could lead to widespread price pressures," Powell said in a May 20 speech, "which could affect all holders of loans." Including, presumably, some interval funds.

Then again, such disruptions can also create opportunities. Michael Arougheti, chief executive officer of Ares Management Corp., says his firm's interval fund bought discounted assets in 2018's volatile fourth quarter, when managers of more liquid funds had to sell to cover outflows. "As the old expression goes, liquidity's always there when you don't need it," says Arougheti. "And then, when you need it, it's never there at the price you want." Interval funds are designed to depend less on liquidity but only work for those investors who can afford to give some of it up. —*John Gittelsohn*

THE BOTTOM LINE Interval funds are costlier and more restrictive than regular mutual funds, but their pitch is that they can invest in assets others can't.

Credit Karma Wants To Earn Your Love

● The credit website's flat-fee structure should improve its product recommendations

Credit Karma is a website that allows users access to their credit score for free and provides recommendations for credit cards. That's a business that depends a lot on its users' trust.

Here's how the website works: Log on and you get an easy-to-digest overview of what's on offer. You provide some personal information, and in return you get access to your credit score and analysis of the main drivers of that score; you can also file disputes if something's incorrect. Other freebies include alerts for any changes to your credit score, plus the usual financial calculators and educational tools. Credit Karma crunches your data to make product recommendations that match your credit profile, which means a higher likelihood of approval, and may also help you save by giving you a lower interest rate. That's how the company makes

money: If you get approved for one of its recommended products—from credit cards to personal and car loans, as well as car insurance—the provider pays Credit Karma a fee.

Until 2018, cards that paid the company higher fees could get preferential treatment in their placement on the site. As a result, users have become skeptical. "I don't think the recommendations they make are necessarily good recommendations, I think it's mostly just to generate revenue, but hey, that keeps it free, I guess," 26-year-old customer George Rimakis says. Rimakis has been a customer for more than two years and logs on a couple of times a month, mainly to view his credit report.

Ken Lin, a co-founder, is well aware of that sentiment. But he says the company initially had no choice. It just wasn't big enough to be able to avoid offering incentives to the lenders—marketing executives at large online loan providers wouldn't even meet with its executives. In the early years, it also didn't have a proven track record of attracting potential borrowers. "It took us the better part of 12 years to get here," Lin says.

"Here" means more than 30 million users logging in every week to check their credit score and potentially sign up for financial products, according to Lin. Customers tend to skew younger, with more years of financial needs ahead. That's put the power back into Credit Karma's hands, which now charges the same flat fee for every card on its site, based on credit score and product category (rewards or travel, say), and plans to introduce the same structure for all its products. The only way to get higher placement is to offer consumers a better deal. "Trust is going to be the hallmark of success for Credit Karma," Lin says.

The ramifications of its new approach are still unfolding. While the company's revenue is on track to hit \$1 billion this year, according to a person who's seen its financials, that's been driven by a rise in users to 100 million from 75 million in late 2017, before the change was introduced. Given that Credit Karma isn't the only game in town, it will have to make sure providers remain onside, says Sarah Prohm, financial-services managing director at credit card marketing tracker Competiscan. "I think Credit Karma's concern would be that card issuers aren't seeing enough returns," Prohm says. If a competitor emerges with a more attractive offer for providers, it'd be easy for Visa or American Express to flip the switch. —*Julie Verhage*

THE BOTTOM LINE Credit Karma wants to live up to its name while its services remain free. Its success will depend on keeping card issuers onside.



● Lin

"It took us the better part of 12 years to get here"

We reinvented the piggy bank.

2.30 %
APY*
High-Yield
Account

Get unlimited withdrawals,
no fees, and no minimums.
Get secure with FDIC protection.
Get bigger returns with 2.30%
Annual Percentage Yield.
Ready to earn more?



INTRODUCING PERSONAL CAPITAL CASH™

Visit personalcapital.com/cash

*Personal Capital Cash is offered through Personal Capital Services Corporation, which is not a bank. To participate in the program, you must open an account at UMB Bank, Na, Member FDIC. The Personal Capital Cash™ Annual Percentage Yield (APY) as of 06/11/2019 is 2.30% APY (2.27% interest rate). The calculation for APY is rounded to the nearest basis point. The interest rate and APY are variable and subject to change at our discretion at any time without notice.



● Developers scramble to protect 1,000 glittering acres from climate change

On a balmy June morning, a gathering of local dignitaries welcomed the latest jewel to Boston's new Seaport District: a 17-story tower that will house 1,000 Massachusetts Mutual Life Insurance Co. employees. In a display of artistry and engineering, the \$240 million building will have an undulating glass facade designed to reflect the harbor's rippling waters, as if it had risen fully formed from the ocean's depths. Massachusetts Governor Charlie Baker marveled that he'd officiated at three or four groundbreaking here in just a few weeks. "Do you get to keep all that tax revenue?" he joked with Boston Mayor Marty Walsh.

Only a decade ago, Boston's Seaport District,

located just southeast of downtown, was little more than a crazy quilt of outdoor parking lots and warehouses. Then the city began recruiting startups and big corporations to what it dubbed a new "Innovation District," and the area sprouted offices for General Electric, Amazon.com, Vertex Pharmaceuticals, Fidelity Investments, and PricewaterhouseCoopers, as well as luxury condominiums, museums, and some of the city's hippest restaurants.

What no one mentioned at this month's event is Boston's poor timing. No American city has left such a large swath of expensive new ocean-front real estate and infrastructure exposed to the worst the environment has to offer, says Chuck Watson, owner of Enki Research, which assesses risk for insurers, investors, and governments. The expansion totals 1,000 acres, an area bigger than Manhattan's Central Park.

Boston Harbor already floods a dozen times a



◀ Some major Seaport District developments, according to BLDUP.com (left to right)

100 Pier 4 Blvd.
Luxury condo with 369 units

200 Pier 4 Blvd.
13-story office building; headquarters of consultant BCG

100 Northern Ave.
17-story office tower; law firm Goodwin Procter is the anchor tenant

130-140 Northern Ave.
Will house 106 upscale condos and some ground-floor retail

One Marina Park Dr.
Multi-use office building; one of the first developments on the 21-acre Fan Pier waterfront site

50 Liberty St.
120-unit condo on Fan Pier; also houses Davio's, a 15,000-square-foot megarestaurant

11 Fan Pier Blvd.
17-story office tower; headquarters of Vertex Pharmaceuticals

at Risk Romance

year, up from two or three times in 1960, according to William Sweet, an oceanographer with the National Oceanic and Atmospheric Administration (NOAA) in Silver Spring, Md. Record high-tide floodwaters during a storm last year trapped motorists, closed a nearby subway station, and proved that Seaport dumpsters can float.

“There is a lot of hubris,” says Spencer Glendon, an economist and senior fellow at Massachusetts’ Woods Hole Research Center, which studies climate change. “There is nothing more exciting for a city government than seeing lots of tall buildings going up and going to lots of ribbon-cuttings. Everyone knows South Boston keeps flooding, and they keep building.”

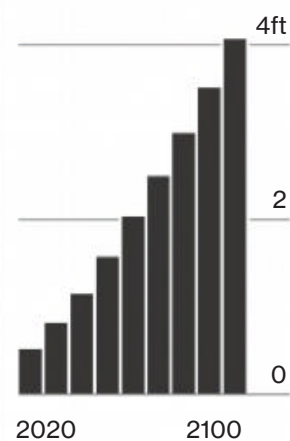
Corporate executives and city officials are now scrambling to protect the Seaport. It won’t be easy: The area is a man-made peninsula that was born almost two centuries ago when workers started filling in tidal flats with rocks, dirt,

and trash. “We’re proposing infrastructure that we believe will protect the city,” says Richard McGuinness, a senior planning official working on Boston’s response to climate change.

Developers are elevating ground floors, putting electrical and other critical equipment on higher ones, and investing in salt-water-resistant materials and flood barriers. Boston is planning a series of sea walls, berms, and other structures that will act like a barricade against Mother Nature. The city this month opened an elevated playground near Boston’s Children’s Museum that will double as the first such water barrier. It still needs to raise as much as \$1 billion for Seaport defenses.

Other cities are taking similar steps. New York City has raised \$20 billion in public money for, among other things, sewer improvements and a Staten Island sea wall, and Mayor Bill de Blasio has said he needs at least \$10 billion more for projects to protect Lower Manhattan, including ▶

● Projected sea level rise in Boston’s Seaport District*



◀ extending the island up to 500 feet into the East River. In Miami, voters backed a \$400 million bond issue that will help finance protections across the city. San Francisco is spending hundreds of millions of dollars to rebuild its 100-year-old sea wall.

Boston is especially vulnerable to the rising sea level and the fierce storms known as nor'easters. Since 1980 it's experienced the most high-tide flooding of any city along the East Coast, according to NOAA's Sweet. By the end of the century, Boston Harbor could be 2 to 4 feet higher than it is now.

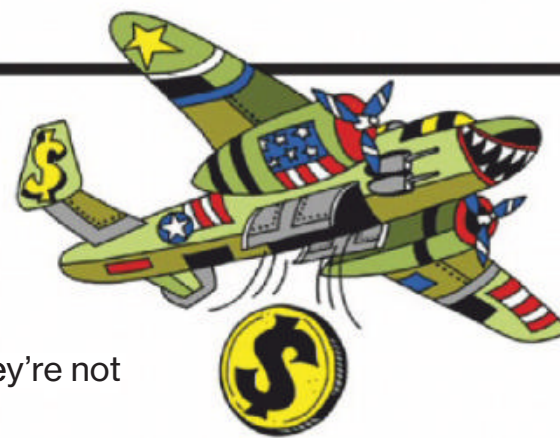
To prepare for the watery onslaught, WS Development, the Seaport's biggest developer, is building up the ground beneath its projects. The Massachusetts company is juggling \$3 billion in projects—7.6 million square feet of hotels, stores, restaurants, and offices, including a tower for 2,000 Amazon.com Inc. employees. At the \$360 million St. Regis condo tower, now under construction, the lobby floor has been designed

so it can be permanently raised by four feet as flooding worsens, according to developer Jon Cronin. He's hopeful that his neighbors and the city will follow suit. "We don't want to be the only building in the middle of an island," he says.

The new MassMutual building, which will be completed in 2021, will be equipped with so-called aqua fences, portable water barriers that can be assembled in a matter of hours. Roger Crandall, MassMutual's chief executive officer, says other countries have been able to protect themselves from the ocean. Why not Boston? "Our species has been engineering against the seas for a long time," he says, noting that he'd recently visited the Netherlands. "There's a cost to it—make no mistake—but there's also a cost of picking up and moving development further inland."
—Prashant Gopal and Brian K. Sullivan

THE BOTTOM LINE Boston's Seaport District may become a testing ground for climate change adaptation, as city officials work with developers to safeguard billions of dollars in new investment.

Warmongering?



● Trump says Europe and China are purposely weakening their currencies. They're not

It's usually not hard to tell when a war has started: One nation crosses another's border with soldiers, tanks, and planes. Currency wars are tougher to call, partly because there isn't even a clear definition of what they are. Keep that in mind when evaluating President Trump's accusations against central banks in Europe and Asia, such as this June 18 tweet: "Mario Draghi just announced more stimulus could come, which immediately dropped the Euro against the Dollar, making it unfairly easier for them to compete against the USA. They have been getting away with this for years, along with China and others."

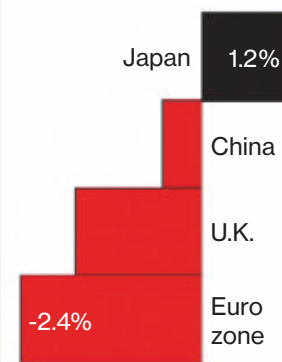
Trump is right on two scores. The euro really did decline against the dollar, to \$1.12 from \$1.16 a year ago, after Draghi, the outgoing president of the European Central Bank, said "additional stimulus will be required" if the economic outlook for the 19-country euro zone doesn't improve. Trump is also correct that a cheaper currency would likely boost the region's economy by making exports from the euro zone cheaper abroad, and by making imports from the U.S. and elsewhere more expensive.

But many economists disagree with Trump that Draghi is doing something wrong. It would be legitimate for the ECB to cut interest rates, they argue, to stimulate domestic economic growth by lowering borrowing costs for consumers and businesses. Of course, cutting rates would likely reduce the value of the euro, which adds to the stimulus, but that's a side effect, not the goal. "We don't target the exchange rate," Draghi said during a June 18 panel discussion in Sintra, Portugal.

Let's say the depreciation of the euro managed to worsen the U.S. trade deficit enough to slow down the American economy. The Federal Reserve could respond by cutting interest rates to rev growth. That would incidentally lower the value of the dollar, returning it to its previous exchange rate with the euro. But as in the case of the euro, a weaker greenback would be a side effect of the lower rates, not a primary goal.

It might look like a zero-sum stalemate when two trading partners both cut interest rates, leaving the exchange rate where it started. But it's not.

● Percentage change in nation's currency vs. the U.S. dollar*



WHAT IS AVAXHOME?

AVAXHOME-

the biggest Internet portal,
providing you various content:
brand new books, trending movies,
fresh magazines, hot games,
recent software, latest music releases.

Unlimited satisfaction one low price

Cheap constant access to piping hot media

Protect your downloadings from Big brother

Safer, than torrent-trackers

18 years of seamless operation and our users' satisfaction

All languages

Brand new content

One site



AVXLIVE ICU

AvaxHome - Your End Place

We have everything for all of your needs. Just open <https://avxlive.icu>

It's an overall loosening of monetary policy, which is good for growth in both countries, says Brad Setser, a senior fellow at the Council on Foreign Relations. "In principle," he says, "that's just a coordinated easing that increases the level of demand."

Trump's argument that China is manipulating its currency is even weaker than his case against Europe. Far from pushing down the value of the yuan, the People's Bank of China has been countering market forces to slow its decline. China has kept the benchmark one-year lending rate at 4.35%, where it's been since October 2015, in spite of economic softness that might seem to justify a cut. Also, China's holdings of foreign reserves haven't risen appreciably, as they would if China were trying to drive down the yuan by selling it and buying other currencies. "The available evidence suggests that China is trying to avoid a currency war," Setser says.

Chinese leaders don't want a weaker currency, even if it gives a short-run economic boost, says Marc Chandler, chief market strategist at Bannockburn Global Forex LLC in New York. The country's long-run objectives are "to move up the value-added chain" and encourage the Chinese "to work smarter, not harder," Chandler wrote in a June 18 note to clients. Competing on price through a cheap yuan would keep China stuck in its low-tech past.

How would anyone know if a country really were playing unfair by depreciating its currency? One telltale sign is the central bank buying lots of foreign currency to reduce its own currency's value, even though the country has a big surplus in trade and investment income with the rest of the world. China was guilty of that behavior up until early 2014. Singapore, South Korea, and Thailand have also intervened at various times in recent years to suppress their currencies' value.

Today one of the chief currency offenders is Taiwan, Setser wrote in a June 18 research note. The Taiwanese central bank says it had \$464 billion in foreign exchange at the end of May. That's more than the holdings of bigger nations such as Brazil, Germany, and India. (According to a description on the central bank's website, the value of the Taiwan dollar is determined by forces of supply and demand, though "when the market is disrupted by seasonal or irregular factors, the Bank will step in.")

It seems, then, that Trump may be pointing his finger in the wrong direction. But since the president seems to have an expansive view of what constitutes unfair trading practices, the tweets against Europe, China, and others are likely to continue. —Peter Coy

THE BOTTOM LINE Trump says the U.S.'s biggest trading partners are waging a currency war to gain economic advantage. There's little evidence to support his case.

Women on the Firing Line

● Female workers in developing countries are most at risk of losing their jobs to automation

The conventional wisdom used to be that businesses in nations with low wages and growing labor pools would have little incentive to invest in robots and artificial intelligence. No longer. Two-thirds of jobs in the developing world are at risk from these technologies, according to the World Bank. And in Southeast Asia at least, women will fare worse than men, losing more of the existing jobs and landing fewer of the higher-skilled ones that emerge. "That was what really stood out—women are really at high risk," says Phu Huynh, an economist with the International Labour Organization in Bangkok. He co-authored a 2016 study that concluded that 61% of working women in Cambodia, Indonesia, the Philippines, Thailand, and Vietnam are on shaky ground as new technologies become more pervasive.

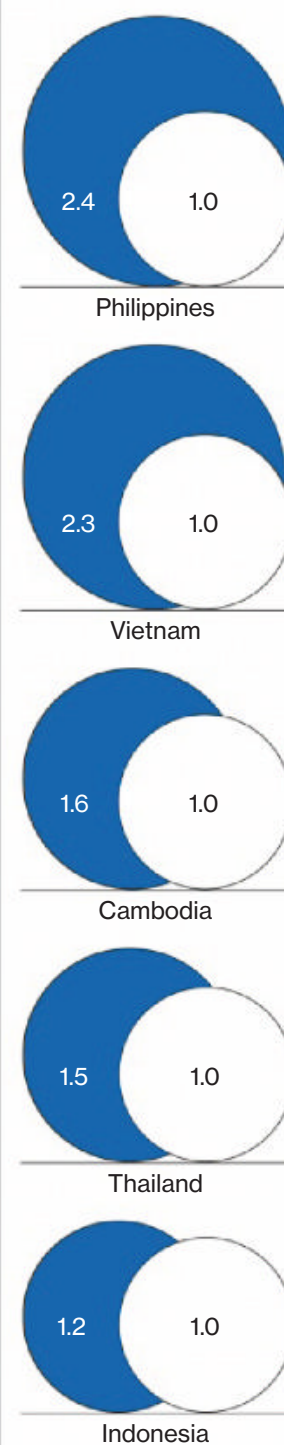
It's a global phenomenon. "Women, on average, perform more routine or codifiable tasks than men across all sectors and occupations," according to an International Monetary Fund paper from October.

But new technologies also create entirely new occupations with higher wages. "The story is way more complex than people realize," says Sameer Khatiwada, an economist at the Asian Development Bank who co-authored a recent report on the impact of successive waves of automation on employment in Asia. For one thing, rising incomes will fuel demand for more products and services, creating jobs even in sectors with high degrees of automation, he says.

Male applicants will have an edge in landing those new positions, however. While younger women in Asia have enjoyed huge gains in education and basic cognitive skills training, they still lag men in technical training, science, technology, engineering, and mathematics, even in more advanced nations such as Singapore and South Korea, says Cyn-Young Park, an analyst in the ADB's Economic Research and Regional Cooperation Department. "They are very much entrenched in the name of culture, in the name of religion, in the name of so many traditional things," she says. —Henry Hoenig, with Ditas Lopez and Claire Jiao

THE BOTTOM LINE Two-thirds of jobs in the developing world are at risk from new technologies. In Southeast Asia, women in call centers or back offices are particularly vulnerable to automation.

● Relative risk of job being automated
■ Women
□ Men



What's a Global Economy Between Friends?

Trump and Xi have turned this year's G-20 into a high-stakes showdown

There was a time in the not-too-distant past when “G” summits were earnest, even turgid affairs, at which worthy matters were discussed in polite sitdowns between the leaders of major economies. That was before Donald Trump, of course. If the American president has done anything during his time in office, he's added drama, spice, and the dual tensions of consequence and uncertainty to the once-carefully scripted art of international summitry.

And yet, as the leaders of the Group of 20 countries prepare to gather in Japan on June 28-29, Trump is outdoing even himself. His threats to escalate a trade conflict with China into a total economic war have turned the Osaka summit into arguably the most consequential since the ones

surrounding the 2008 global financial crisis. As if the stakes weren't high enough, Trump also has the trade gun barrels aimed at the European Union and Japan, two allies he's threatened with auto tariffs—not to mention his public fuming about both euro zone and Chinese monetary policy.

For all of that, the biggest event in Osaka is likely to be a sideline meeting between Trump and Chinese President Xi Jinping, which financial markets will be watching carefully. After playing down its likelihood, Trump raised expectations on June 18 when he tweeted that, after a “very good telephone conversation,” the two leaders would hold an “extended meeting” during the summit.

The best-case scenario laid out by officials and analysts from both countries is that the meeting



might yield a pause in any new U.S. tariffs and a resumption of the talks that broke down in May. While such a truce would extend the uncertainty of the past year, it would at least offer the hope of short-term peace.

The worst-case scenario would turn the simmering trade tensions into a new cold war. If the meeting is derailed before it begins or if the two leaders merely fail to reach a firm agreement, the world will have to confront an escalating conflict between the two largest economies, with all the damage that would entail in tumbling financial markets and a further slowing of global growth.

The latter possibility cannot be dismissed. The two leaders have strikingly different approaches to negotiations, which have caused them problems in the past. Trump, with his freewheeling style, likes to keep people across the negotiating table off balance. Xi is seen as far more cautious, and those around him have resisted the idea of putting him into a meeting where the outcome hasn't been carefully choreographed.

What some in China see as Trump's bullying approach may also make it harder for Xi to bend to U.S. demands for reforms on everything from industrial subsidies to intellectual-property enforcement. By "claiming publicly that he has Xi over a barrel," as he's done repeatedly, Trump has embarrassed Xi when he should be courting him, says Robert Daly, a China expert and former American diplomat who's now at the Wilson Center in Washington. The more the Chinese leader is boxed in, the less likely he is to make a deal that might be viewed as a surrender, analysts in Beijing argue.

Matthew Goodman, who once prepared President Barack Obama for G-7 and G-20 summits from a seat on the National Security Council, says it's still too early to call a new cold war. Even as Trump has dialed up the heat on China—and proxies such as tech giant Huawei Technologies Co.—you can still make the case, Goodman says, that the goal is a fairer form of economic interdependence, as it's been for the past 40 years. At the same time, he says, one might wonder: "Are we now on a different path?"

Clete Willems, who until April served a similar role for Trump, is optimistic that the U.S. and China will close a deal by the end of the year. It's in both countries' interest, and Trump's recent rhetorical escalation and tariff threats are more about pushing for an agreement than a decoupling, he says. "As long as the administration stays focused on China and avoids inadvertently undermining support for its China strategy by raising tariffs on other countries, I think the U.S. show of

strength helps incentivize China to make a deal."

A big clue to the U.S. approach could come in a June 24 speech by Vice President Mike Pence, one of the administration's most unforgiving public voices on China. Should Pence deliver a repeat of the hawkish speech he gave last year at the conservative Hudson Institute in Washington, in which he presented a vision of all-encompassing conflict with China, it may be a signal that Trump has no interest in compromise.

Meanwhile, though he's arguably China's most powerful leader since Mao Zedong, Xi is facing economic and political troubles at home that limit his room to maneuver. As the Chinese economy appears to be weakening, a sweeping trade war would mean more pain. The mass protests in Hong Kong that forced the local government to back away from passing a new extradition law have highlighted concerns over Xi's authoritarian ways. So has the internment of Muslim minorities in the far western province of Xinjiang.

Of course, it's not clear Trump's hand is as strong as he believes, either. His tariffs are increasingly unpopular, and damage from them is beginning to show up in economic data. He and Xi each face opposing pressures at home: to stand strong and to resolve the fight before the economic destruction mounts. A truce may emerge from Osaka. Even if it does, though, turning it into a longer peace is likely to be difficult. —*Shawn Donnan and Peter Martin*

THE BOTTOM LINE Trump says he's looking forward to meeting with Xi, but that's no guarantee a conversation will produce results that will calm global investors.

"I think the U.S. show of strength helps incentivize China to make a deal"

A Casualty of the War on Drugs

● As Colombia struggles to curtail cocaine production, Trump threatens to cut off aid

Tara, a bomb-sniffing dog with the Colombian anti-narcotics police, failed to detect the land mine, and the explosion flung officer Jose Carvajal high into the air. When he tried to stand up, Carvajal found that his legs would no longer obey. "When I looked down, my right foot wasn't there," he ►

◀ says. “The mine took my leg off below the knee.”

The 23-year-old policeman was one of a group of officers protecting workers digging up coca, the raw material for making cocaine, near the cartel-dominated town of Tarazá in the northern Andes. U.S. President Donald Trump has effectively threatened to cut off loans and other forms of aid to Colombia if it can’t restrain cocaine production, which has more than tripled since 2013.

President Iván Duque’s government has stepped up eradication programs, but the armed groups that profit from the illegal trade are fighting back, planting homemade mines on footpaths and between coca shrubs to protect their investment. At least 11 people have been killed and 84 injured in operations to eradicate coca this year.

The sacrifices Carvajal and his colleagues made might not be enough to appease Trump, who said in March that Duque has “done nothing for us.” The U.S. Office of National Drug Control Policy will publish its annual report in the coming days. If cocaine production continues to hit records, Trump may follow through on his threats to “decertify” Colombia as a partner in the war on drugs. This would lump the U.S.’s closest Latin American ally in the same rogue category as Nicolás Maduro’s Venezuela. Under the Foreign Assistance Act, it would also mean that the U.S. would end most economic aid and automatically vote against Colombia’s getting loans from lenders such as the World Bank.

From 2000 to 2012, Colombian coca production fell about 70%, and Peru briefly overtook the country as the world’s biggest producer. But production has soared since then, according to United Nations figures. The trouble picked up in 2015 when the World Health Organization issued a report calling the herbicide glyphosate probably carcinogenic, leading the government to suspend aerial spraying of coca crops. Duque wants to resume the spraying but faces political and legal challenges. Meanwhile, Colombia is growing enough coca to produce almost 1,400 tons of cocaine a year—more than Peru and Bolivia combined.

Decertification is “a more real possibility this year than in any past year,” says Adam Isacson of the Washington Office on Latin America, which studies human rights in Latin America. If coca production rises even 5%, he says, Trump is likely to ignore advice from Latin American experts in the U.S. Department of State who’ve argued against decertifying the country.

It wouldn’t be the first time he’s ignored them. In March, Trump said he’d cut hundreds of millions of dollars in aid to El Salvador, Guatemala, and Honduras over their failure to curb migration

to the U.S. In May he said he’d impose a tariff on all Mexican goods unless Mexico took significant steps to halt immigration from Central America. An eleventh-hour agreement prevented the tariff from taking effect. “The president has been frustrated with the increase in coca production and cocaine production and trafficking ever since he came to office and has looked for ways to signal his frustration,” says Tom Shannon, who was Trump’s under secretary of state for political affairs until June 2018. “The frustration is felt not only at the White House but also in our Congress.” White House representatives didn’t respond to a request for comment.

The U.S. House of Representatives last month recommended that Colombia get \$457 million in aid next year, after receiving \$418 million in 2019. In its 2020 financing plan, the Colombian government said it plans to borrow \$1.6 billion from multilateral lenders. If it were cut off from multilateral loans, the government would have to rely more on issuing bonds, resulting in higher borrowing costs, says Camilo Pérez, chief economist at Banco de Bogotá.

Shannon says decertification would be a mistake, especially because Colombia has been a key ally in the Venezuela crisis. It could turn Colombia into “a pretty reluctant partner” on some issues, he says.

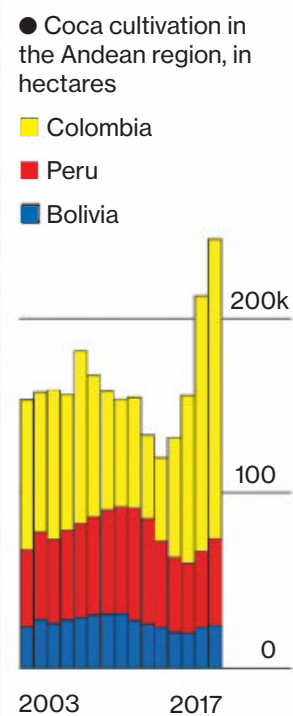
Colombians used to be treated like “pariahs” over drugs, says former Colombian President Andrés Pastrana. In the mid-1990s, not only was the country decertified, but the president at the time, Ernesto Samper, had his U.S. visa revoked after it became known that drug traffickers financed his campaign.

Pastrana oversaw the start of the multibillion-dollar counternarcotics plan known as Plan Colombia with President Bill Clinton. The U.S. has given Colombia more than \$10 billion in aid since the program began, more than to any other country outside the Middle East and Asia. But Colombia now produces more cocaine than when the plan started.

Carvajal and his fellow officers are on the front line of the battle to reverse that trend. His unit didn’t have any morphine, so he had to wait in agony for a helicopter to lift him off the mountain. Doctors at the hospital in Montería amputated his other leg. Tara was unhurt, but it was her second major blunder, and the police put her up for adoption.

Today, Carvajal spends most of his days in physiotherapy and learning to walk with prosthetic limbs. “It’s frustrating having lost my legs so young,” he says. “Drugs bring a lot of negative consequences, and not just to people who consume them.” —*Matthew Bristow*

THE BOTTOM LINE Colombia is one of the U.S.’s most important Latin American allies, and suspending aid would do significant damage to that relationship.





The Issue

- Sell a progressive social platform while also defending her record as a prosecutor to doubtful voters

Kamala Harris rose through the political ranks as a prosecutor in California. Now a U.S. senator running in the Democratic race for president, she's having to defend her background against some in the party who question her progressive credentials.

From the start, her decision to become a prosecutor was met with skepticism. "At best, my family members thought it was a curious decision," Harris said on June 14 at the 100 Black Men of America gala in Las Vegas. Even before she announced her campaign for president, critics referred to Harris derisively as a "cop" and pointed to her record in California—including her support for legislation that would allow prosecutors to charge parents over their child's truancy, her opposition to a 2015 bill that would have mandated the attorney general's office investigate officer-involved shootings, and her inconsistent stance on the death penalty—as reason for suspicion.

On the trail, Harris has been

The Stops

- Las Vegas
- 1 Immigration roundtable
- 2 Fight for \$15 rally
5 mi.
- 3 Women's meet-and-greet
- 4 100 Black Men of America gala
8 mi.
- 5 Campaign rally

trying to flip that narrative, emphasizing efforts she made to send low-level drug offenders into rehabilitation instead of prison and institute racial bias training for police officers. "I want to be the person who helps fix things, and I've grown up knowing the biases that have informed our criminal justice system," she recalled telling her

family as she defended her career decision. "There is frankly not a black man I know, be he a relative, a friend, or a co-worker, who has not faced profiling or discrimination."

During a two-day, five-event swing through Las Vegas, in the early primary state of Nevada, many voters seemed to

be buying Harris's message. Some even said her prosecutorial skills and insights would benefit her as president.

"She knows how to fight for what's needed, and I think that experience will help change what needs to be changed," said Latonia Coleman, 50, of Las Vegas. "So yes, she was a prosecutor, but now she understands what the rules are. She knows how to fight against the rules, and she knows what rules need to be changed."

"If a woman is doing it, we're always going to get criticized," said Monica Jackson, 49, of Henderson, Nev. "If a guy is doing it, 'Oh, he's just tough.' I don't care what color you are. That's just the stigma that's been around forever, but I'm old enough and wise enough to know and not to get baited by somebody else's response to her experience."

Almost six months into a yearlong pre-primary season, polls show Harris in the upper echelon of candidates. Voters are still wading through the vast array of candidates' policies and backgrounds, though, and the first round of debates on June 26-27 in Miami could be a turning point.

Yvette Williams, who chairs the Clark County Black Caucus in Nevada, said the group plans to endorse a candidate this summer. While Harris is among their top choices, they still have questions.

"She'll have to rise above that," Williams, 61, said of Harris's time as a prosecutor. "I don't know what

her core value is. I don't know how she's grown around some of these issues. When she made that decision, what was the basis of that decision? Those are the kind of conversations we want to have with her." —Tyler Pager

Photos by Kareem Black



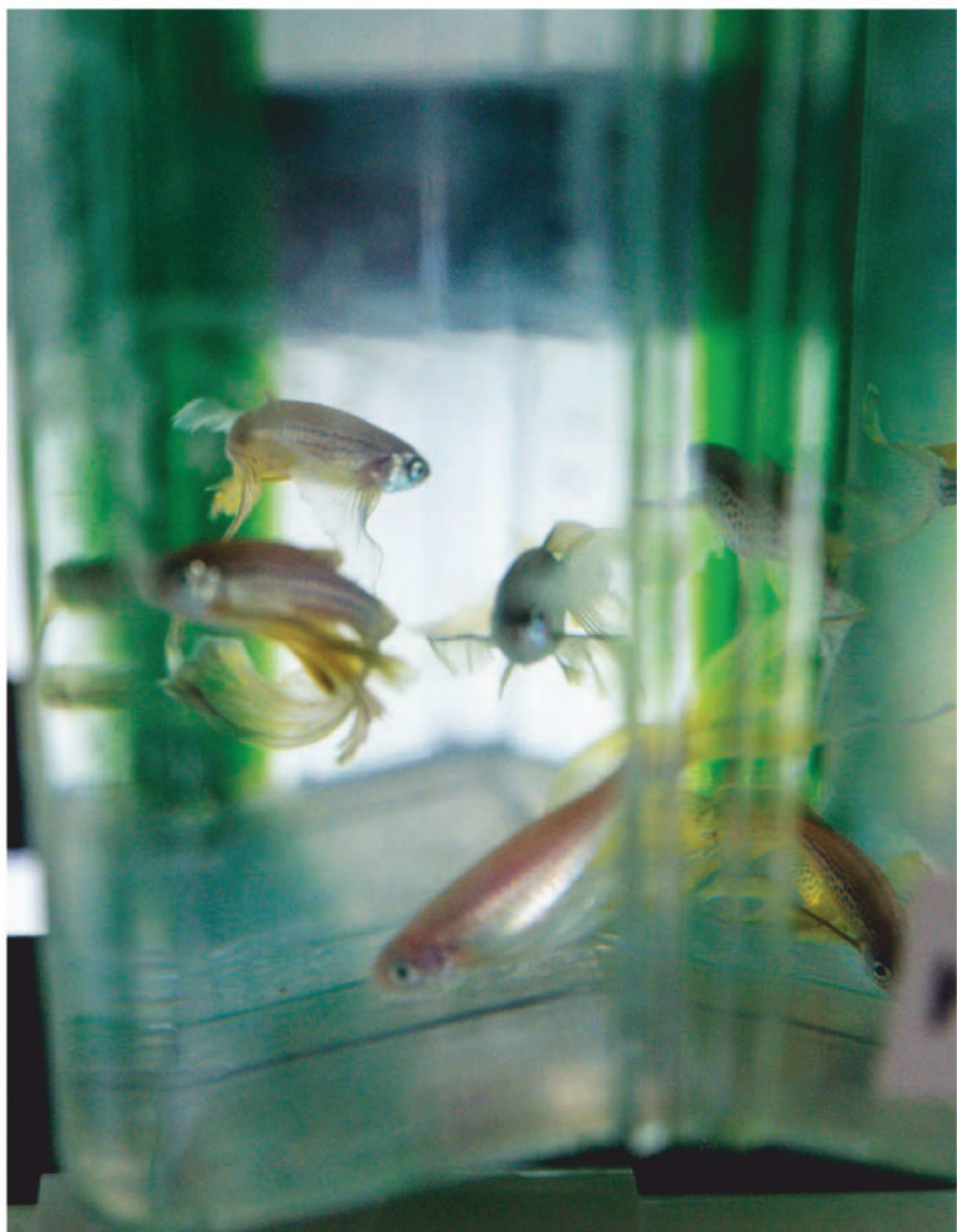
Jackson

What Mice,



Birds,

& Fish



Can Teach a Self-Driving Car

...or the next Siri, or a computer that will read your mind, or any computer, really. Silicon Valley can't hire enough neuroscientists

Jaguar is a mouse. He lives at Harvard's Rowland Institute, where, from time to time, he plays video games on a rig that looks like it belongs in *A Clockwork Orange*. Metal bars position him inside a small platform in front of a metal lever; his mission is to find a virtual box's edges by feel. To do this, he reaches with his right paw to grab the joystick, which can rotate 360 degrees, and maneuvers it until he feels feedback from the machine. When he reaches the right target area—say, an edge of the box—a tube rewards him with a dribble of sugar water.

To track Jaguar's brain activity, researchers have genetically altered him so his neurons emit fluorescent light when they fire. This light is visible through a glass plate fused to part of his skull with dental cement. A microscope affixed above the plate records images of his brain lighting up as he plays. "Within one session, you can teach them new rules and literally watch thousands of neurons learn this process and see how they change," says Mackenzie Mathis, the neuroscientist leading the experiments.

In decades past, Mathis's insights would have served only to advance what we know about mice and brain function. Today, however, she's one of a growing number of specialized animal researchers assisting in the development of artificial intelligence software and brain-computer interfaces. She wants to discover how mice learn, in part because it could inform how we teach computers to learn. Watching mice react to unexpected situations in video games, for instance, could someday let her pass on similar skills to robots.

Other neuroscientists are studying zebra finches' songcraft. Some are becoming expert in the electrical conductivity of sheep skulls. Still more are opting for the classics of high school biology: fruit flies, whose neural setup is relatively simple to behold, or worms, who wring considerable juice from their few neurons. Over the past few years, technology companies have been raiding universities to hire away such people. Apple, Facebook, Google, and Twitter all hired doctoral candidates from one

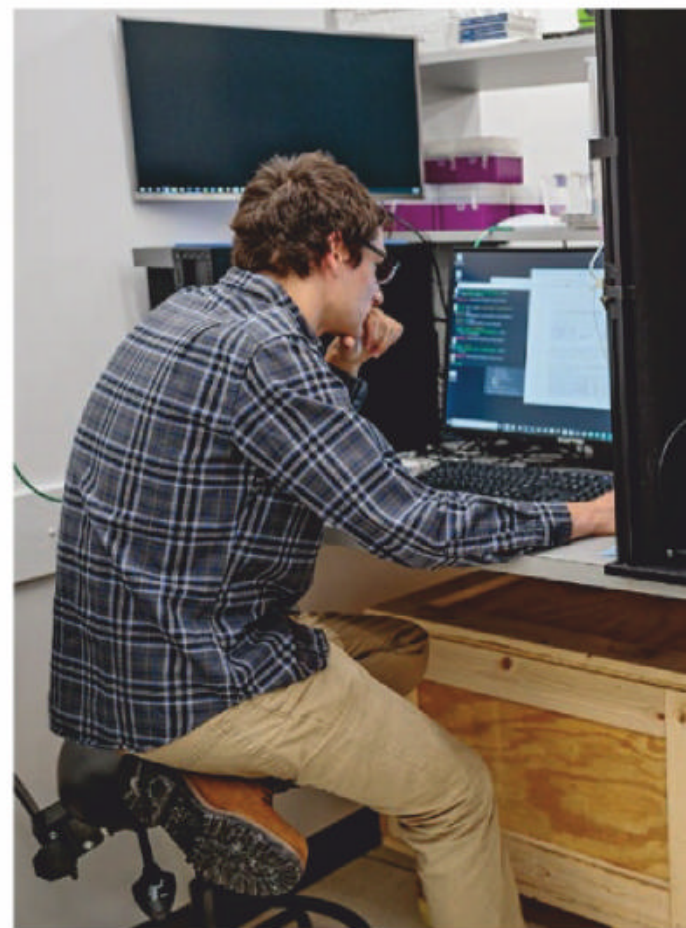
of Mathis's recent fellowship programs, she says. "The Ph.D. students would have jobs before they got their degrees."

Animals have long played important roles in advancing corporate science, of course, particularly for medical treatments. But the leap required to translate insights from the zebra finch's sound-processing anatomy into Siri's voice-recognition software—or mouse gaming into a future when Amazon .com Inc. runs all-android warehouses—is of an entirely different order. With whole new industries at stake, the race to unlock the secrets of the animal mind is getting weird.

In 1958, Cornell neurobiologist Frank Rosenblatt unveiled the perceptron, one of the earliest attempts to mimic inside a computer the architecture of a brain. Its processing elements, which he called neurons, coordinated to figure out, say, whether a particular photo depicted a man or a woman—a primitive stab at image recognition. The lingo used to describe the perceptron stuck, and Facebook, Google, and other companies continue to describe their vast AI computing systems as "neural nets" with millions of neurons working in unison.

The shorthand vastly exaggerates the overlap between the realms of computation and cognition even today. It's tough to replicate something you don't really understand. The true workings of the brain—for instance, how a group of neurons stores a memory—remain elusive to neuroscience, so the neurons' digital counterparts can't help but be flawed imitations. They're rudimentary processing engines trained to perform reams of statistical calculations and identify patterns, with the imprimatur of a biological name.

Still, with the technology industry chasing what's known as artificial general intelligence, or AGI, the walls between the two realms have grown more porous. The implicit goal is a functionally sentient machine that can figure out things by itself, instead of relying on humans to train it, and that independently wants things. To the relief of some ethicists, we're a long way



Mice playing video games are helping out the secrets of neural networks

from AGI, but many computer scientists and neuroscientists are betting that brains will show us the way.

Separately, several companies are battling to build brain-computer interfaces that could help prostheses behave like natural limbs or allow people to download knowledge into their minds. Elon Musk's Neuralink Corp. is one such company; another is Kernel, run by tech multimillionaire Bryan Johnson. Neuroscientists are advising these startups on everything including how to blast information through skulls and make sure electrodes don't cause infections in test subjects.

The scientific principles common to both endeavors are evident at Mathis's Harvard lab. "Here's our mouse palace," she says, opening the door to a room filled with dozens of mice in plastic cages. The animals scamper around, cocking their heads and twitching their whiskers as they inspect visitors. Their clean quarters emit only a mild whiff of rodent. A red light fills the habitat to make sure the creatures, nocturnal by nature, stay awake during the day, ready to contribute to science.

That science includes the virtual-box game and a much harder one that looks like a primitive form of *Mario Kart*. For the latter, a mouse straddles two custom, motorized circular plates, its paws nestled into grooves on either side.



Helping researchers puzzle brains

A screen displays a green pathway with a blue rectangle at the end. As the mouse begins to run in place, trying to approach the blue rectangle, it must steer carefully to stay on the virtual pathway. Like humans, the mice take on a glassy-eyed cast as they play. The sessions last about a half-hour before they lose interest.

The microscopes peering into their brains record an incredible amount of information. “We can cover most all of their sensory, motor cortex, and decision-making areas at the same time,” Mathis says. The researchers sometimes change the games’ rules and controls—for instance, by making joystick pulls result in zigzag motions instead of straight ones—then look for differences in how the neurons light up. Mathis has also been working to shut off subsets of neurons, such as the nodes associated with learning, to check how the remaining ones react. One early insight: When it comes to decoding motion, the sensory cortex seems to play a larger role, alongside the motor cortex, than previously thought. “These neurons are doing a lot more than engaging in one specific thing,” she says.

One of her primary motivations is to learn more about how animals rapidly adjust to changes in their physical environment. When you pick up an object of unknown weight, for example, your brain and body quickly compute what

kind of force is needed to deal with it. Robots can’t currently do that, but one infused with the neuronal learning patterns of a mouse potentially could. Mice are an unusually strong candidate to help bridge the gap, Mathis says. Their brains are complex enough to demonstrate high-level decision-making but simple enough for the researchers to deduce the connections given enough time.

We’ve only relatively recently developed computers powerful enough to capture, process, and analyze the volume of data produced by a subset of the average mouse brain’s roughly 75 million neurons. And it’s only within the last couple of years that AI software has advanced far enough to automate much of the research. Mathis and her husband, Alex Mathis, a fellow neuroscientist, have developed open source software called DeepLabCut to track their subjects’ movements. The application uses image recognition to follow a mouse’s tiny digits as it plays a game and track its reaction to the sugar-water reward.

Scientists used to do this type of work manually, jotting down every sip of water in their notebooks. The software now performs in minutes tasks that once required weeks’ or months’ worth of attentive human labor. “There’s a paper on primates from 2015 where they track quite a few body parts, like knuckles and limbs and one arm, and the monkey has different tasks, like reaching for things and holding them,” Alex says. “The first author of the paper wrote me and said his Ph.D. could have been two years shorter.” More than 200 research centers now use DeepLabCut to follow all manner of animals.

This type of software development and analysis attracts tech companies to neuroscientists just as strongly as their insights about animal cognition. The modern brain researcher has to know how to code and work with incredible volumes of information, much as an AI staffer at Google would to improve an advertising algorithm or the lane-merging abilities of a self-driving car. Animal-centric neuroscientists are also accustomed to working with

unconventional ideas. “You tend to get creative people that are a little bit cowboy,” Mackenzie says. “People who are willing to bet their career on trying to study a black box.”

Tim Otchy doesn’t do mice. He’s a bird man. A research assistant professor at Boston University, Otchy sports a tattoo of a zebra finch on his right forearm. It shows the short, squat bird with a bright orange beak sitting on a branch and gazing pensively at the sky. “I do really like birds,” he says, sitting in an office filled with books—*The Cellular Slime Molds*, *Nonlinear Dynamics and Chaos*, and *Principles of Brain Evolution*, to name a few.

While Otchy was majoring in mechanical engineering at the Georgia Institute of Technology in the late 1990s, he also worked for a company that specialized in automating factory systems. His job was to teach robots to identify things, whether gadgets or auto parts, and sort them as they came down a conveyor belt. “It was just astounding to me how difficult it was,” he says. “These were tasks that children do.” His frustrations left him determined to uncover the inner workings of perception, decision-making, and learning. He left the factory line and, eventually, made his way to neuroscience and the zebra finch.

Songbirds such as the zebra finch have an unusual skill set. Whereas most creatures know instinctively how to make noises, songbirds learn to imitate what they hear, then vary the tunes, demonstrating some semantic understanding of their songs. Decades of research have pinpointed the structure in the finch’s brain, what’s known as the song nucleus, responsible for this behavior. Studying this area has led to rich insights into how neural circuits function, in turn informing other research around how humans move, feel, and emote. Figuring out how the birds imitate one another could help explain how we do the same thing, which could prove important in, say, teaching language skills to a machine.

Otchy works with about 300 birds at a BU aviary. For one experiment, ►

◀ a researcher will outfit a zebra finch with a backpack containing batteries that power a host of electronics attached to its skull. The bird is then placed in a sound booth about the size of a microwave, where it sings for days while Otchy and his team peer into its brain via mechanisms similar to the ones Mathis uses for her mice. As researchers have learned more about the zebra finch's sound processing centers, they've sought to answer increasingly precise questions about its brain. "We don't know how the information of how to ride a bicycle, or fly a helicopter, or speak Japanese, is stored in the brain," Otchy says. "One day, we will have that knowledge."

He came to run this research center, the Gardner Lab, after its namesake, Tim Gardner, took a leave of absence to work at Neuralink, which seeks to augment the

human brain with a superfast computer processor. The departure created considerable buzz among neuroscientists and among students excited by Musk's vision. (Gardner, who didn't respond to requests for comment, is moving the lab to the University of Oregon; he'll stay on at Neuralink part time.) "It's a fantasy at this point, but I find the idea that we could, one day in the distant future, really write information directly into the brain... amazing," Otchy says. "I would love to be able to contribute in even a small way to figuring out how."

Birdsong researchers are among the hottest hires in a wide range of AI fields. After his dissertation at the University of California at Berkeley and a stint at Apple Inc., Channing Moore joined Google's sound-understanding group, where he creates sound-recognition systems as sophisticated as the company's

image-recognition software, capable of distinguishing a siren from a crying baby. At Intel Corp., another Berkeley Ph.D., Tyler Lee, is drawing on his zebra finch research to improve voice processing—the type of technology that ends up in voice-command software such as Siri. "We're trying to ask very similar questions," he says. "How can I take auditory input, process it in a way that I can understand what a person is saying, what is the noise they're in, what's the environment they're in?"

Berkeley professor Frederic Theunissen, who runs the lab where Moore and Lee studied, says many potential applications arise from the focused research he oversees. "It's a special set of skills you gain if you're interested in automatic speech recognition, voice recognition, and so forth," Theunissen says. Voiceprint-based security systems for phones and other devices are one example. Another is noise reduction in phone calls and videos. That application came out of Moore's work with the noise-resistant birds. The neurons of the zebra finch are capable of isolating another finch's song from the surrounding cacophony.

Academics have been trying to declare it the age of neuroscience since the Reagan era, but in the early years of this century, the prospects for a young neuroscience graduate were low, and so were their numbers. Fifteen years ago, American universities counted fewer than 1,500 neuroscience undergrads and handed out fewer than 400 doctorates, according to the U.S. Department of Education. And even with such modest numbers, schools didn't have enough full-time work or grant money to go around.

When Drew Robson graduated from Princeton with a math degree in 2005, his undergrad counselor gave him a memorable piece of advice: Whatever you do, don't pursue neuroscience. Robson ignored it and went on to found the Rowland Institute's RoLi Lab with Jennifer Li, his partner and Princeton sweetheart. They've seen the field grow to the point that U.S. schools now award



The semantic understanding birds have of their songs, if properly understood, could be applied to voice-recognition software

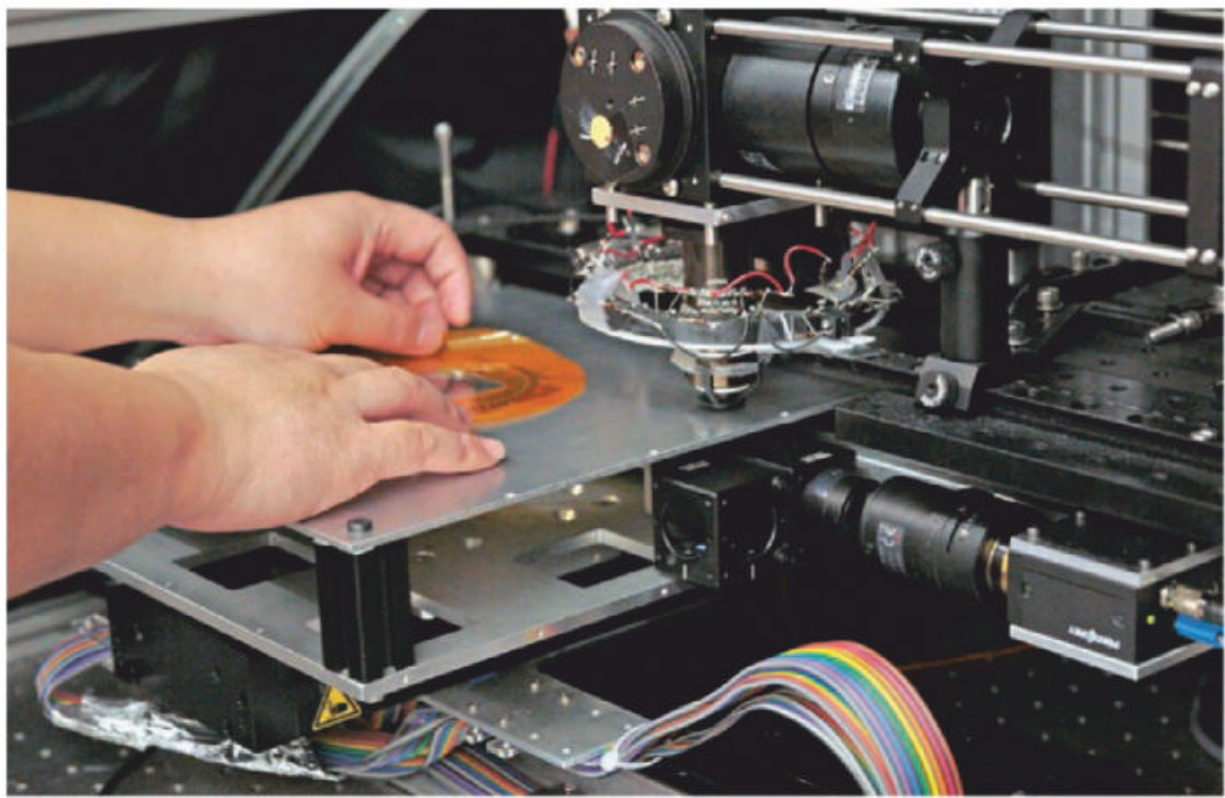
about 5,000 neuroscience bachelor's degrees and 600 doctorates a year. "We've had this explosion of tools in the last 10 years," Robson says.

Team RoLi studies zebra fish, members of the minnow family whose bodies are transparent when they're young, which allows researchers to observe their neurons without skull-plate surgeries and dental glue. A special mobile microscope Robson and Li developed helps them record which neurons are active while the fish swim. To capture different facets of zebra fish behavior, they might vary the current—leading an animal to turn away or swim harder in the same direction.

Like many of their peers, Robson and Li are well-versed in the relationship between brain science and AI technology. Last year the couple bought a Tesla, and they take professional delight in watching the car's self-driving systems evolve. As it dodges other vehicles, it recalls strategies their zebra fish use to achieve goals, such as quickly switching from hunter mode to fast-swimmer mode when they spot a predator. Their deep knowledge of such behaviors could someday inform Tesla Inc.'s neural nets, as the company tries to advance its self-driving technology beyond basic object recognition to humanlike decision-making.

"That's many orders of magnitude more data," Li says. "If you were to use biology, you can essentially cheat and look at what the solution should be without having to reinvent the wheel." Robson says he wouldn't mind trying to help Tesla solve those kinds of problems someday.

The fluid borders between public and private enterprise in neuroscience have opened the question of who'll control prospective mergers between humans and machines. The universities that long performed the most ambitious research are now rivaled by tech companies with access to larger computers and datasets. A fresh Ph.D. can expect to earn about \$50,000 a year at a typical university, whereas private companies are offering well into six figures and a vastly higher ceiling beyond. Chris Fry, another zebra



Harvard post-doc Meng Li prepares a glass chamber with a zebra finch larva on it for imaging on the attached tracking microscope

fincher, was earning \$10.3 million a year as senior vice president for engineering at Twitter within a decade and a half of leaving Theunissen's lab. "There is a massive exodus of talent from academia right now," says Mackenzie Mathis, the mouse researcher. "It's a choice to stay in academia."

Beyond the pay, many neuroscientists are drawn to the private sector because it tends to give them a chance to do more exciting, even weirder work—not to mention a break from writing grant applications. Yet decamping for Silicon Valley can also mean cutting off promising lines of research or leaving colleagues adrift. When Gardner went to work for Neuralink, one of his Ph.D. students switched schools, only to see his next eminent adviser take a leave of absence to work on his own startup.

Li and Robson are heading to the government-funded Max Planck Institute for Biological Cybernetics in Tübingen, Germany, and starting in September. The fish couple stay on the public side because they like the freedom and flexibility of what Robson calls the "playground setting." Yes, the animal experiments can do unnatural things to harmless, helpless creatures. They can also encourage a humanizing perspective—something we might want to see AI exhibit.

Four years ago, before they'd finished their trackable microscope, Li and Robson were using an adhesive gelatin

to keep young zebra fish swimming in place for a couple of hours, to measure how their neurons lit up. One morning the two arrived at the lab to find a big surprise: A larva they'd left swimming was still going 18 hours later, far beyond what they'd expected. "This animal was a champion," Robson says. "Perfect," Li adds. "His behavior was perfect." Because of the rigors of the experiment, the researchers couldn't save their hero for posterity, but they did the next best thing: Li and Robson installed his mom in a special aquarium as their pet. They named her Fred, after Amy Acker's whip-smart character from the TV show *Angel*.

Robson and Li say the development of AI and brain-computer interfaces is going to force humans to become more humane. After all, if one of our goals is to imbue thinking machines with our own morals, we'll have to grapple more than we're used to with what morality is. Questions like: Who deserves the power of enhanced thought? Should a self-driving car choose to save a passenger over a pedestrian? And how smart do machines have to get before they're considered part of that equation? "That's a fundamentally very moral question—how do you value life?" says Li, who studied philosophy as an undergrad.

"It forces us to be rigorous in what our morality really boils down to," Robson says. "You have to commit to something." **B**

Canada

52

‘A Guy’

man's Got

Bruce Linton is having a great time running Canopy, the biggest pot company in the world. (No, he doesn't use his product—and he'd prefer you call it cannabis)

By Susan Berfield and Kristine Owrarn

Photographs by Alexi Hobbs

Bruce Linton doesn't spend much time in his office at an old Hershey's factory in the small Canadian town of Smiths Falls. But when he does, he turns off the overhead fluorescent lights. Natural light is less stressful. He doesn't have a couch in his office, but if he did, it would have two cushions. Not three. Because when he does sit on a couch with three cushions, the middle one can slip out. That's annoying. Linton seems to have thought about all kinds of very specific issues. But, as in the case of the couch, he has his limits. "I have zero interest in a fabric discussion," he tells us. We hadn't asked.

This is Linton's brain not on drugs. Let's get that out of the way. He's the founder and co-chief executive officer of Canopy Growth Corp., the biggest pot company in the world. Linton doesn't sleep very well, but he doesn't use medical marijuana to help. He says he doesn't smoke pot recreationally, either. He doesn't vape. He doesn't eat pot brownies.

After all, Linton has a reputation to protect. He's running a company with a market value of about \$15 billion. He regularly crosses national borders, and he doesn't want to embarrass himself or the industry or the countries where he's allowed to do business. And he doesn't want to get the munchies. "I'm trying to starve myself so I get cheekbones again," he says, "because I'm getting f---ing fat."

Linton is 52, with floppy blond hair and a slight gap between his front teeth. He usually wears faded black jeans, a black Canopy Growth T-shirt, and a jacket with a "Hi" lapel pin. At parties he sometimes wears pink velvet slippers with a marijuana leaf embroidered on each. He used to wear Hawaiian shirts on television. Now in his official corporate portrait he's in a suit and tie.

A few more things. He'd really prefer everyone use "cannabis," the scientific name for the plant at the center of a quickly legalizing global market that could be worth \$32 billion in three years. And speaking of legalizing cannabis, he'd prefer people use more positive words, such as "regulating" and "monetizing." One more: It's tempting to make puns about weed or dope or Mary Jane, but don't. Linton already uses the good ones.

Medical marijuana can be legally prescribed in more than three dozen countries and 33 U.S. states. It's used to treat a rare form of childhood epilepsy, improve chemotherapy patients' appetite, and reduce chronic pain and social anxiety. Supposedly it also helps people sleep better. Adults can legally

purchase pot for fun in Canada and Uruguay and 10 U.S. states. Mexico, New Zealand, and Luxembourg could be next to legalize it for recreational use. But America is potentially the biggest market of all. And America is confusing. For now, the federal government classifies pot alongside heroin as one of the most harmful drugs. It's not sure what to make of cannabidiol, better known as CBD, a nonintoxicating cannabis compound. Research into doses, potency, efficacy, and side effects of marijuana is just beginning in North America. Doctors in the U.S. can't run clinical trials without permission from the Drug Enforcement Administration. Banks in the U.S. can't work with companies that sell marijuana, even in the states where it's legal to do so. Stock exchanges won't list companies that break federal law.

Canopy doesn't operate in the U.S. marijuana market, which is why, in May 2018, it was eligible to be the first pot company on the New York Stock Exchange. But Linton and the other executives weren't allowed to ring the bell. They weren't allowed to take photos with the bell. "Everybody else gets to ring the bell," Linton says. "Our hands got pot on them. I don't know what it is, we just can't touch the bell."

A few months later, Canopy became the first pot company to secure a partnership with a consumer-products conglomerate. Constellation Brands Inc., best known for Corona beer, paid \$4 billion for a 38% stake in the summer of 2018. "It's a tremendous burden," Linton says. "I have to use it." He was only partly joking. In January he announced that Canopy won a New York state license to process and produce hemp—a strain of cannabis cultivated for its fiber and seeds that's

rich in CBD and contains just trace amounts of THC, or tetrahydrocannabinol, the plant's intoxicating chemical essence. Canopy will invest as much as \$150 million in a facility in the struggling town of Kirkwood on the state's southern border.

Then Linton was off to Davos, Switzerland, for the World Economic Forum. It was his first time. He met Tony Blair. He looked for Jamie Dimon. He spoke at the Cannabis Conclave, an industry gathering on the sidelines of the conference. He shared a house with seven others in the business and a bunk bed with Dan Daviau, Canada's top pot banker. He had a great time.

In February, Linton addressed the annual meeting of the food and beverage industry in Boca Raton, Fla. It was his first time at that gathering, too. At the end of the



Canopy sold 17,500 kilograms of recreational and medical pot in 2018.

The company grows marijuana in more than a dozen facilities around the world.



month, Canopy announced it's working with Martha Stewart to create cannabis products—for pets initially—that no one could talk about yet. Snoop Dogg, who licensed his Leafs by Snoop brand to Canopy in 2016 and co-hosts a cooking show with Stewart, introduced her to Linton. Seth Rogen found Linton on his own. In March, Rogen said he'll collaborate with Canopy to sell his marijuana (brand name: Houseplant) in Canada as well.

In April, Linton offered to pay some \$3 billion for the U.S. company Acreage Holdings—when marijuana is federally permissible. Acreage is among the largest U.S. pot companies, with a market value of about \$2 billion. It

has cultivation, processing, and dispensing licenses or agreements in 20 states and manages a chain of stores called the Botanist. It also has former House Speaker John Boehner and former Canadian Prime Minister Brian Mulroney on its board.

Linton says he wants to build a company so big that there's "no question who's No. 1. It's difficult to see who's behind us because they're so far behind." Linton seems to have picked up a thing or two from Silicon Valley. So have his rivals. They have catchy names for their companies: Aurora, Tilray, Cronos, Organigram. They want to take on established multibillion-dollar industries. They call themselves disrupters. "We're disrupting everything from veterinarian care, vet medicines, vegan proteins, OxyContin, opioids, sleep aids, geriatric care, alcohol, sports drinks," Linton says. This is what explains the company's \$15 billion value on the stock market, where promises and potential count. Canopy's actual revenue in 2018 was \$120 million. This year it could be around \$170 million. "For sure, the opportunity is overstated, but what else is exciting right now?" Linton asks.

"OK, let's go on a tour."

We've come to Smiths Falls, an hour's drive southwest of Ottawa across quiet plains of snow, on a late February day to see a cannabis harvest. Smiths Falls was a hard-up city of about 9,000 residents when Linton first visited in 2013. "They made the first Beatles record ever pressed in North America, in an RCA record factory. Gone," he says. "They used to make all the silver film for cigarettes and vitamin packaging. Gone. They used to make all the chocolate bars for all of Canada for Hershey. Gone." Linton saw derelict buildings he could buy on the cheap, high unemployment, and plentiful power, gas, and water. Done deal.

We walk down bright white halls. We swipe our security badges. We view the plants—"moms" and "teens," as they're called—in an almost 2,000-square-foot grow room. "All marijuana plants are female. Every one," Linton says. This gave him an idea for a workplace slogan: "Don't stress out women if you want a super-productive environment."

We meet people. Canopy has 3,400 employees, more than 1,000 of whom work at Smiths Falls. The rest are in its dozen or so facilities in Canada and outside the country. Bilal Razack monitors the systems that keep the growing, drying, and

trimming rooms at the right temperature, humidity, and brightness. "We don't want a single extinction event," Linton says. Growing cannabis on a commercial scale is hard. Mold, fungus, pests: Any of those could cause a crop to fail. Canopy says it's never had a crop failure.

Razack used to grow pot on his own. "I wouldn't say that we hired you because you knew about the plant," Linton says. "But we didn't not hire you because of that." There are many

"For sure, the opportunity is overstated, but what else is exciting right now?"

gray areas in the cannabis business. Linton's employment philosophy is simple: "We don't care if you have had criminal experience," he says. "We care if you don't disclose it."

"Exactly," Razack says.

"OK. This person, he's got things to do. We'll just randomly stop and say hi to people."

As the tour proceeds, Linton describes how he manages those people. "You have to have goals and a culture," he says. "Everybody's hustling around, but everybody is in a good mood." Could that be the marijuana? we ask. "Who knows? They joke: 'We have really high employee morale.'"

We see a room with eight people wearing hairnets and orange gloves who are working with joint-rolling machines. Canopy's engineering team developed the machines over two years and filed patents for them. The machines can roll 1,000 joints an hour; Canopy produces almost 200,000 joints every week. ▶

◀ Canada has allowed adults to use marijuana recreationally since October. Canopy has claimed approximately one-third of the market, outselling all competitors. Its brand is called Tweed, which explains the British names of its strains: Highlands, Bakerstreet, Argyle, Herringbone, Balmoral, Boaty McBoatFace.

“Bruce, can I get your cup?” Matthew Sly, the director of logistics, takes Linton’s coffee and walks us into the distribution center, where as many as 300,000 packages of recreational and medical pot are loaded onto unmarked Brink’s trucks every week and delivered to stores or provincial distribution centers. (Only medical patients get home delivery.)

We stop by the call center, where staff help new users make sure “you don’t end up with a strain that’s ideal for Snoop but not for you.” Canopy sells its medical marijuana under the brand name Spectrum in nine countries, most recently Australia. Doctors prescribe the dose and duration of treatment. Canopy and other providers can suggest strains and discuss potential benefits but can’t make medical claims until they’ve successfully completed medical trials. Canopy says it has about 20 trials planned or under way to test marijuana’s effects on pain, mood, and sleep. It sold about 17,500 kilograms (38,600 pounds) of medical and recreational pot in 2018. Tilray, one of its best-known Canadian competitors, sold about 6,500 kilograms.

While Linton attends a meeting after lunch, we watch a movie about the history of cannabis. The abridged version: People have used it for centuries, including, apparently, Buddha. We sniff terpenes, aromatic chemicals that give cannabis strains their flavors—almond, pine, citrus, and one that we both agree smells like gasoline.

The best way to describe Linton’s career before cannabis is to say he jumped from opportunity to opportunity. Or, as he puts it, “Doesn’t it get, like, superboring to stay doing the same thing forever?” Mostly, though, he operated within the tech industry. For three decades he helped start and run and sell companies involved in everything from telecommunications software to wastewater management.

In 2012 he was married with two kids and living in Ottawa. He had some money and no job. “I had this theory at the time that if I opened 10 businesses concurrently on the venture capital model, I would for sure have one winner,” he says.

Idea No.1 was cannabis. (Idea No.2 was a parking meter app.) Medical marijuana had been legal in Canada since 2001, but the system didn’t require standardization, so research and enforcement of individual growers were a challenge. In

June 2013 the government decided to license companies and regulate a competitive marketplace. Linton saw an opportunity. “As a tech guy, keeping track of things is a lot of what technology’s about,” he says. “So I was like, I should start one, because people like cannabis. They’re going to regulate. I can do that.”

He started looking for potential partners, advice, and money. Only advice was easy to come by. “The first four people I went and talked to about doing this, they all said, ‘You’re an idiot. This is a terrible idea.’” The next person thought more of it. Chuck Rifici had been chief financial officer in the early 2000s at Sitebrand, an online marketing company where Linton was a director. The two agreed to start a cannabis company they named Tweed Marijuana. The “T” is for therapeutic. Linton would be chairman and focus on raising money; Rifici would be president and CEO. They hired a grower from the U.S., an operations manager, someone to handle quality assurance, and Mark Zekulin to do everything else. Zekulin was a 33-year-old international trade lawyer on paternity leave looking for a career change. He liked Linton. He liked the idea of helping patients. But when people asked about his new job, he’d say, “I work in a pharmaceutical company.”

In January 2014, Tweed became the fifth company approved by Health Canada to sell medical marijuana. Three months later, on the final day the new businesses could purchase plants and seeds from individual growers, Rifici was in Kelowna in British Columbia, with a chartered plane ready to carry a shipment. Royal Canadian Mounted Police confiscated it, and Tweed didn’t try to get it back. The National Post recently reported that the company was transporting harvested pot, which wasn’t allowed. The company says it complied with the regulations. “There was a lot of confusion!” Zekulin says. A few days after the incident, Tweed joined Toronto’s TSX Venture Exchange. Its ticker: WEED.

By August, Rifici was gone. Linton fired him—they agree on that. Linton says Rifici couldn’t keep up. Rifici says Linton wouldn’t let him make any decisions. He sued Tweed for wrongful termination, but neither wants to litigate or let the dispute go altogether. Tweed became Canopy Growth in September 2015 after it bought a competitor. Linton named himself founder and told Rifici to stop calling himself a co-founder. Zekulin became co-CEO. “Bruce gets the glory, and I do the work,” Zekulin says. He’s in a company T-shirt, jacket, and jeans, smiling. The first years in a new and highly regulated industry were sobering. Everything took longer and cost more than he and Linton had promised. “It wasn’t BS. We were just wrong or uneducated,” Zekulin says. “Or optimistic—yeah, that’s a much better word.”

Everyone’s optimism increased in the summer of 2018, when Canada announced that licensed companies could begin to sell recreational marijuana that autumn. The sudden end of prohibition—that’s what everyone in the industry calls it—set off a scramble to grow enough weed, develop brands, meet the exacting standards of Health Canada, and overcome

“The first four people I went and talked to about doing this, they all said, ‘You’re an idiot. This is a terrible idea.’”

potential customers' hesitations. "This is a product where people have for decades had, you know, possibly questionable experiences," Zekulin says. "You don't know what you're getting. Your neighbor just brought over a brownie, and the next thing you know, you're hiding under a chair. Or just the opposite: You paid good money for something, and nothing happened."

In the midst of this, Constellation was conducting some serious due diligence in Smiths Falls. The company's wine and spirits business was slowing, and it was looking for other ways to grow. In October 2017, Constellation had acquired a 9.9% stake in Canopy for \$191 million. "Then they spent a year living with us," Linton says. "I just told them, 'Don't slow us down.'" Constellation briefly considered getting into the business on its own, says David Klein, the chief financial officer. Instead, Constellation increased its stake and received warrants that could give it majority control of Canopy.

Constellation has been helping Canopy construct a 197,000-square-foot bottling facility in Smiths Falls. It was a skeletal structure in February. It was supposed to be complete by May. Now Canopy says definitely by fall. Cannabis drinks won't be legal to sell in Canada until mid-December. Linton talks about making a sports drink with CBD and adult beverages with THC. No alcohol will be involved. The world will be a better place. "If I have a choice to hang out with stoned people all night or drunk people, give me stoned people all night all the time," Linton says. "No fights. Good conversation."

Canada's Cannabis Act, which lays out all medical and recreational laws and regulations, is 130 pages long, with another 100 pages of appendixes. Every product has to list the percentage of THC and CBD. The packaging has to include warnings in bright yellow that cannabis smoke is harmful and that driving or operating machinery after using cannabis is dangerous. A company's logo can't be bigger than those warnings. No fluorescent or metallic flourishes. There will be even more rules when companies can sell cannabis beverages and edibles.

Linton wants others to come see what a highly regulated pot market looks like. "I used to die laughing with the *Onion*. You could buy Christmas gifts, and one of the T-shirts said, 'Stereotypes are a real timesaver,'" he says. "I think of that for Canada, because everybody's perception of Canada in the absence of specific facts is, 'Pay their taxes, follow the rules, hold the door open.'" So when officials do come, Linton tells them, "We really like the rules. And we want more rules."

That's why America remains a confounding place for cannabis executives. "Thirty-three states have moved into the market. The federal government and laws are way out of step," Boehner says. In addition to a seat on Acreage's board, he's also honorary chair of the National Cannabis

Stewart and Snoop have a show together—and deals with Canopy, too. She'll be helping with CBD pet products.



Roundtable, whose goal is to make it easier for businesses such as Acreage and Canopy to operate in the U.S. The group supports bills to let banks work with pot companies in states that have legalized use and to free those states from the threat of federal prosecution. "Ninety-five percent of Americans believe that medicinal cannabis should be allowed. I'm not sure you can find 95% of people who believe in God. Sixty-five percent believe in recreational," Boehner

says. "When the American people are for something, elected representatives usually come along."

But momentum for legalization has stalled in New York and New Jersey over social justice concerns. For decades, people of color have been prosecuted more harshly than whites for possession of marijuana. Some legislators want to tie legalization to a social and economic equity plan for those communities. "We are advocates for it," says Kevin Murphy, the CEO of Acreage. "We'll do whatever we can." Linton says Canopy will hire only local companies when it sets up its Kirkwood facility, and every employee will receive stock options.

In the meantime, there's CBD. In late 2018 the Farm Bill legalized hemp and hemp-derived CBD. Linton calls it the gateway drug—for consumers and investors. The oil is supposed to be calming. It's supposed to help with inflammation. And pain. And sleep. It's available in lotions, coffee, smoothies, and hamburgers. It's mostly unproven. The Food and Drug Administration is determining precisely how to regulate it. But Walgreens, CVS, and Kroger already announced they'll sell CBD-infused lotions, oils, and sprays in certain states. Golfer Bubba Watson signed an endorsement deal with an American brand, CbdMD Inc. The research company Piper Jaffray Cos. estimates the American CBD market could be worth as much as \$15 billion in five years.

This is where Martha Stewart comes in. Snoop and his business partner, Ted Chung, told her about Canopy's clinical trial to test CBD's effectiveness in treating animal anxiety. Stewart is devoted to her dogs. She was looking for other business opportunities. "It's the modern thing," she said at a conference for female entrepreneurs in May.

As Linton tells it, he, Chung, and several others joined Stewart in a slow elevator ride in a New York office building in 2017. Linton noticed a stray strand of hair on her shoulder. He plucked it off. "She goes, 'OK, exactly who the f--- are you?' And now we're texting. Martha's the coolest, smartest, most awesome person ever," he says. "I have a crush on her. Like, I'm not joking." Linton says he kept the piece of her hair.

By the end of our day at Smiths Falls, we'd walked 3 miles. We felt a little lightheaded. And we realized that we had unintentionally distracted Linton with our questions right outside the trim room. Instead of going in, we moved on. We never saw the Canopy harvest. **B**

Rock Riff Rip-Off

58



Donna Summer



Bruce Springsteen



Jim Morrison



Marvin Gaye



Jimmy Page



Carlos Santana

Suddenly, the defining portions of many classic songs—guitar solos, bass lines, horn parts—appear not to be protected by copyright. Are you thinking what we're thinking? By Vernon Silver

In a little-noticed moment during Led Zeppelin's *Stairway to Heaven* plagiarism trial, a Guitar God inadvertently revealed that his industry's most famous (and valuable) tunes were up for grabs. It was June 2016, on the third day of the proceedings in Los Angeles federal court, when Jimmy Page took the stand. He faced examination by attorney Francis Malofiy. At issue in the trial was whether Page had stolen the introduction of 1971's *Stairway* from the obscure 1968 instrumental *Taurus* by the band Spirit.

To the frustration of Malofiy, the judge said it was irrelevant whether the songs' album recordings sounded alike. What mattered was whether Page had lifted the Spirit song as it had been written on a single page of music submitted to the U.S. Copyright Office in 1967. The *Taurus* "deposit copy," as it's called, is a spare document handwritten by a record company scribe who listened to the record and then distilled it into only 124 notes of piano music. The reverse engineering was required to comply with U.S. law, which before 1978 allowed songs to be registered only via sheet music "deposited" in Washington. When a pianist performed the *Taurus* deposit copy for jurors earlier in the trial, it didn't sound much like the Spirit record, let alone *Stairway*.

In a bind, Malofiy turned the issue on its head:

"I'd like to pull up Exhibit 2708, which is the *Stairway to Heaven* deposit copy," he told the court. The sheet music appeared, projected on a screen between Page's witness stand and the jury box. "Can you point to where on the deposit copy of *Stairway to Heaven* it indicates the solo?" Malofiy asked, referring to the electric guitar finale that's considered one of Page's crowning achievements.

"I'll have to have a look," Page said, then scanned the first bit. "Um, I think you need to scroll down one more." The second folio came up on the screen. "Please scroll one more," he said as more music appeared. "Please, one more," he said again as the fourth and final bit came up. "OK. That's it. I've read it."

"You would agree that there's no solo on the deposit copy... of *Stairway to Heaven*, which was deposited with the office?"

"Yeah, we—I agree with that. It's not in there, no," Page said.

Malofiy then pointed to the first measure. On the record, *Stairway* begins with a finger-picked introduction—one of the most recognizable musical passages of the past half-century, mimicked by millions of aspiring guitarists. That iconic intro, Malofiy said, "That's not represented in the deposit copy?"

"No," Page said. "You're correct."

Sitting in the courtroom that day, I couldn't believe what I was hearing. Were some of the most famous passages in rock history really not protected by copyright? And did this also apply to any number of other songs whose deposit copies were certainly equally lacking? I felt as if someone had dropped \$100 bills on the ground. Countless unregistered bits of song—guitar solos, bass lines, horn parts, background vocals—could be sitting out there exposed to unscrupulous financial exploitation. Ring tones, TV ads, film soundtracks—or even entire new songs—could be made and sold from these orphaned riffs.

Something had to be done. I would pick up these musical \$100 bills, these bits of song, and for safekeeping stitch them into a composition that I would copyright as mine.

I would call it *Purple Hotel Sympathy for the Stairway to Run*.

Led Zeppelin won at the 2016 trial, but the matter isn't resolved, and the stakes seem to have actually grown. Malofiy appealed, and in September, a three-judge panel on the 9th U.S. Circuit Court of Appeals in San Francisco ordered a *Stairway* do-over trial for procedural reasons. At the heart of the judges' decision was a potentially industry-changing declaration: For pre-1978 unpublished songs, the deposited sheet music "defines the scope of the copyright."

That ruling set off second appeals by both sides. Led Zeppelin asked for the original verdict to be upheld. Malofiy asked the entire appeals court, and not only three judges, to decide on the narrow issue of deposit copies. In early June, the San Francisco appeals court voted to have a rare 11-judge panel rehear the case in September, suspending the earlier appeals decision. The only topic on which the court has asked the parties for briefs so far is the primacy of deposit copies. The litigation has broader implications, undergirding a high-profile New York case in which plaintiffs are demanding more than \$100 million for the alleged theft of Marvin Gaye's *Let's Get It On* for Ed Sheeran's hit *Thinking Out Loud*.

The irony is there may be no winning outcome for Led Zeppelin. As Page's testimony showed, the harder his lawyers push for strict readings of the copyright sheet music, the more they weaken the protection for *Stairway*. They're going all-out, too. The legal team for the band and its publisher, Warner Music Group Corp., wrote in a December filing about "the primacy of deposited sheet music" as a bedrock of their industry and how "contracts are entered into in reliance on the certainty that a copyright protects the copyrighted work."

Their arguments have implications for anyone who made music before 1978. My mission was to learn what was at stake for the old-timers—and also to see the registrations for *Stairway* and the other classic hits I hoped to weave into my own composition. I headed to Washington.

I kid you not, a visit to the card-catalog room at the U.S. Copyright Office can be deeply moving. An online database lists copyrights registered starting in 1978, but earlier records are here on index cards. All songs, books, plays, poems, fabric patterns, photos, movies—pretty much every product of creativity that your parents and grandparents may have seen, read, or heard—have a card that lists its registration number, date, claimant, title, and more. If it's not here, under U.S. law it's almost as if it never existed. (There's an electronic version, but it's in an experimental stage.) Other countries have their own systems, but songwriters from around the world, including Page and Robert Plant, Led Zeppelin's singer, routinely register their works in the U.S. and benefit from the relatively clear lines established by its legal system.

Copyright documentation reveals itself in layers. I used the catalog to order up other records from deeper in the archives, such as original registration papers and the deposited sheet ▶

◀ music, which is largely stored off-site. Interpreting the records requires a basic understanding of the law. For example, pre-1978 songs could be registered as “published,” if the sheet music had been sold to the public, or “unpublished,” as was the case with *Taurus* and the earliest version of *Stairway*. New arrangements can be registered, too, such as the 1979 disco *Stairway to Heaven* I found, registered, as are all versions of the song, under Page’s and Plant’s names.

To my delight, I mostly got what I was looking for: a sampling of deposit copies representing the canon of classic rock. Yet it boggled my mind that the sparse notes of this sheet music could contain the only protected portions of these musical monuments. My excavations dug up glaring gaps between the songs you know by heart and their initial copyright deposit copies:

- The Eagles’ *Hotel California* has two 1976 registrations, neither of which has the plucked guitar intro or the guitar solos from the studio version. A 1977 published version added a piano vocal arrangement with guitar chords. A published version from a 1978 songbook has the intro but still lacks the guitar solos.

- Lynyrd Skynyrd’s *Free Bird*, the album version of which runs more than nine minutes, has an initial deposit copy of only eight lines, registered on Dec. 5, 1973. It contains only lyrics, melody, and basic chords. The only other registration I found was a four-page published piano arrangement from 1975.

- *Born to Run* by Bruce Springsteen was registered as a four-page composition on Sept. 25, 1975, with no trace of its guitar intro or the saxophone solo. Springsteen never registered published sheet music for his most famous song.

- *Riders on the Storm*, the Doors song registered on April 2, 1971, is, like all these others, just chords, lyrics, and melody. There’s no notation of Ray Manzarek’s Fender Rhodes electric piano, which mimics the sound of falling rain. No published version appeared in my searches.

Did the gaps I found mean all those solos were up for grabs? It depends. Making a buck off such tunes carries risk, cautions Peter Jaszi, a professor emeritus at American University Law School in Washington who served on a Library of Congress committee convened in 1993 to study copyright registration and deposit issues. “No one should assume that solos not reflected in the deposit copies of sheet music are necessarily in the public domain,” he says. At the same time, no one should assume they aren’t, says San Francisco-area copyright lawyer Mark Jaffe. “Though it’s not fair, at the time you couldn’t submit the recording as the embodiment of the composition,” he says.

And consider this caveat: A song doesn’t need to be registered to be technically copyrighted. Selling sheet music and marking it with “copyright” or a ©, as the above bands surely did, counts as copyrighting a work, in part because it gives public notice not to plagiarize it. But in court, registering a song gives a songwriter the protection that counts: the right to sue for infringement and claim damages.

Anyone willing to exploit that wiggle room, though, could attempt to profit. In the *Stairway* case, Malofiy claimed that if Led Zeppelin won the deposit-copy argument, a generation of songwriters would face “dire consequences.” To Malofiy’s surprise (and mine), the Led Zeppelin lawyers’ response to

his warning invoked a copyright revolution even more radical than the one I’d been pursuing for my own composition.

A screenwriter couldn’t have conjured more fitting circumstances under which Malofiy would receive Led Zeppelin’s response in the *Stairway* appeal. When the filing came through in December, he was en route to London to buy a piece of *Stairway* history. An auction house was selling the so-called *Stairway to Heaven* console, the recording equipment through which Page recorded the song’s solo. (The auction house was named Bonhams, Zep fans.) Malofiy wanted it for a studio he plans to build with earnings from a \$44 million verdict and settlement he won in October in another music dispute, involving writers of the Usher song *Bad Girl*.

Skimming through the filing on his phone, he couldn’t believe what he saw. “They blew their f---ing foot off,” Malofiy said when I reached him by phone at his London hotel.

Led Zeppelin’s lawyers argued it was irrelevant that bits of *Stairway* didn’t show up in the deposit copy, because they were still protected. Why? Because the law that went into effect in 1978 had a provision that said any unregistered works automatically became copyrighted on that date. They were technically right. But the legislative record shows that line of law was intended as a way to start the clock ticking on copyright expiration for, say, a book manuscript that had been tucked away in a drawer. Instead, Led Zeppelin’s lawyers applied the concept to instrumental solos as mini compositions.

“The guitar solo in the studio recording of *Stairway to Heaven* is not included in the deposit copy, but is plainly original and protectable material,” they wrote in the Dec. 10 filing. “[T]he guitar solo became protected by federal copyright on the earlier of January 1, 1978, or the first public distribution of copyrighted sheet music with the guitar solo.”

I noticed two things. First, the band’s own lawyers weren’t sure if Led Zeppelin had ever published *Stairway* sheet music with the solo. Second, to defend the *Stairway* solo from poaching, they were essentially claiming that every old unregistered solo by every musician ever recorded had become copyrighted in 1978—and that this occurred without any registration. Were that true, every jazz and rock album from most of the 20th century was filled with short compositions by stars and session musicians that were now copyright protected (and owned by whom, it’s not clear). More to the point here, wouldn’t *Taurus* be fully protected by much more than its paltry deposit copy?

Malofiy definitely thought so, and he declared that he finally had Led Zeppelin cornered. He didn’t win the recording console at Bonhams (the final bid of more than \$142,000 had been too high), but he was practically bouncing off his hotel room walls with joy because of Led Zeppelin’s new argument. “By virtue of their stupid f---ing logic, the whole thing of *Taurus* is afforded protection,” Malofiy said. “I can’t believe they fell into that bear trap.”

It was time to complete my own song, which, thanks to information uncovered in the Copyright Office excavations, needed a few adjustments.

It turned out I couldn't use the *Stairway* intro, because even though it had been missing from the brief, "unpublished" deposit copy that Page had examined on the stand, I'd found that fingerpicked portion in the longer, subsequent "first" deposit of published sheet music. Both versions, however, lacked the electric guitar solo from the end of the song. Because the 1909 law says initial deposits need to be "complete copies," I would take the solo as my own. In fact, as far as I could tell, the solo wasn't in any of the 14 versions registered over the decades.

Purple Haze by Jimi Hendrix was a close call. Neither of the first two registered versions from 1967 had Hendrix's instantly recognizable ascending and descending riff played at the start and midpoint of the song. But a version registered in 1980 from a book of tablature for guitarists appeared to close the loop, so that was out. The Rolling Stones' *Sympathy for the Devil* was also out. Even though the original 1968 deposit copy lacks Keith Richards's solo, the song's publishing company, Abkco Music & Records Inc., submitted the record itself to the Copyright Office as a published version of the song after the new law went into effect in 1978, a

Born to Be Wild. Within the Limits of Applicable Law

The bits the author selected from to assemble his song. Listen at Bloomberg.com, then build your own using these riffs and others.

Bruce Springsteen
Born to Run



Eagles
Hotel California



Led Zeppelin
Stairway to Heaven



Lynyrd Skynyrd
Free Bird



The Doors
Riders on the Storm



presumed bulletproofing from which others should learn.

That left rich, usable material from the Eagles, Springsteen, Lynyrd Skynyrd, and the Doors. My new song was called *Free Hotel Riders on the Stairway to Run*.

The two key ingredients: the solos I'd identified as being at risk and humor (because I didn't want to come off as an actual thief). In a first attempt, I recorded the solos on kazoo, then layered them over generic drum beats on Apple's GarageBand app. An unfortunate audience in the office informed me, though, that no recognizable tunes were discernible. My guitar-playing days long behind me, I turned to a sympathetic Bloomberg editor, Ross Larsen, for help. Ross can play. I stitched his versions of the solos into a Franken-song with the public-domain backing tracks on GarageBand. For lyrics, I gathered well-known (but not copyright-registered) phrases from live recordings and had a Stephen Hawking voice generator speak them: "Does anyone remember laughter?" during the *Stairway* section, "What song is it you want to hear?" for *Free Bird*, and Springsteen's "One, two, three" countdown just before the *Born to Run* sax solo, which in our case Ross played on guitar.

As anticipated, the song isn't very good, other than my colleague's fine guitar work. In the end, I didn't attempt to copyright my creation; that seemed a bit much. And I plan to capitulate instantly to any legal challenges, as a purpose of the exercise was to preserve these snippets for their rightful owners.

And then it spun out of control, in a good way. The *Bloomberg Businessweek* design team thought everyone should get a chance to make their own completely new and legal composition from familiar song orphans. A Washington co-worker hit the archives again and came up with more at-risk riffs, from the likes of Donna Summer, Marvin Gaye, Carlos Santana, and the Five Stairsteps. And we built you a toy—check out the online version of this story.

This exercise in musical archaeology had a few purposes (other than satisfying curiosity). One, to show how ill-equipped U.S. copyright law is to govern the business of creativity. Two, to show what's at stake with real songs by real composers if the highest courts define the oldies' copyright protection merely by the skimpy sheet music.

What happens next is in the hands of the courts. Malofiy and the plaintiffs in similar cases are hoping for a compromise whereby the old sheet music is used as a blueprint for a song and musicologists, who already have a role interpreting deposit copies for juries, can use original recordings to flesh out the protected material. Such an approach could, in the long run, be good for Led Zeppelin, too, as the band's tear-down of *Taurus* has exposed how vulnerable its own legacy is.

Which is why the final minute of testimony in the *Stairway* trial three years ago was, in retrospect, the most important. It was a Tuesday afternoon, and Page was on the stand being cross-examined by Malofiy, who at that point had run out of allotted time.

"One last question," Malofiy asked. "If someone took the intro to *Stairway to Heaven*, would you sue?" The judge told Page he didn't have to answer. **B** —With John Voskuhl

SMALLER. FASTER. STRONGER.

Meet the all new SimpliSafe.

It's smaller, faster, stronger than ever.

Engineered with a single focus: to protect.

With sensors so small they're practically invisible.

Designed to disappear into your home

And blanket it with protection.

More than easy to use—downright delightful.

All at prices that are fair and honest.

It's home security. Done right.

"The best home
security system"

WIRECUTTER

APRIL 2018

"...SimpliSafe belongs at
the top of your list..."

CNET EDITORS' CHOICE

3/28/18

"A seamless system"

PCMAG EDITORS' CHOICE

4/2/18



Free shipping for a limited time
at [SimpliSafe.com/bbw](https://www.simplisafe.com/bbw)

SimpliSafe™

ONE GRILL

A Grillworks grill installed at Lilia in Brooklyn

SUMMER FOOD SPECIAL

PURSUITS

63

June 24, 2019

Edited by Chris Rovzar

Businessweek.com

Massive forges handmade in Michigan are changing how top restaurants cook everything from beef to beets

*By Kyle Stock
Photograph by Cole Wilson*

TO RULE THEM ALL

One of the brightest stars in the constellation of fine dining is an idyllic farm just north of New York City. The kitchen monks running Blue Hill at Stone Barns have been known to juice milkweed, pickle ferns, or smoke tomato water.

Lately, however, they've shifted their scientific approach to something more prehistoric. These days, the Blue Hill team grills pretty much everything over an open fire. The shift wasn't planned, or even expected, says executive chef and co-owner Dan Barber. It was largely catalyzed by equipment the restaurant bought from a company called Grillworks, specifically an 8-foot-long open-hearth contraption that looks like a medieval torture rack.

The grill has essentially taken a static endeavor—controlling the heat of a burner—and added three more dimensions: distance, smoke, and the subtle nuances of burning different kinds of wood. “The more variables you can control, the less anxious a chef becomes,” Barber explains. “This grill gives you a kind of uber control, which I'd never experienced before.”

It was, in short, a major upgrade from the little Weber the restaurant had been using. On any given day, the Blue Hill crew will be charring greens, caramelizing fruit, searing beef, and slow-roasting lamb. Beets get buried directly in the coals. “This fall, we'll roast corn over burning corn cobs,” Barber says. “It's weird, man.”

Open-fire cooking has been taking the food world by storm, boosted by the rise of chef celebrities such as Francis Mallmann, who've made a fashion of adding a touch of theater to cooking. It turns out, if one wants to honor preciously grown local ingredients by not changing their flavors too much, burning wood is a good way to do it. “It just hit this zeitgeist,” says food writer Adam Sachs, former editor-in-chief of *Saveur*. “There's a reason this kind of cooking resonates with so many chefs. It's very elemental, very direct, and honest.”

Although there are several companies making food forges, Grillworks is cornering the budding market. Walk into some of the most on-point restaurants in the world, and you'll likely find a Grillworks apparatus front and center in all its shiny, steampunk glory: Lilia in Brooklyn, N.Y.; Marble in Johannesburg; Bopp & Tone in Sydney; the Weslodge Saloon in Dubai; the Hotel Schweizerhof in Zermatt, Switzerland. In Toronto, Neruda opened in November on the shore of Lake Ontario with what it calls the world's largest open-fire grill: a Grillworks Infierno 240, as in 240 inches long, or 20 feet. On a busy night, as many as seven cooks hustle around the 7,000-pound cauldron like tattooed imps, raking the fires and covering the surface with octopus, greens, and dry-aged tomahawk steaks.

This year, Grillworks will sell about 350 grills, at prices ranging from \$4,000 to \$200,000. Half of those units will go to commercial kitchens; only a few years ago, most went to homes. Chef Missy Robbins had one installed when she opened Lilia, her Italian restaurant in the Williamsburg neighborhood of Brooklyn. “It was the first piece of equipment I knew I wanted,” she says. The grill is very simple but “allows for very special cooking.”

The rig, though hectic and massive, has an aesthetic appeal that comes from a bit of clever engineering. The V-shaped rods are slightly inclined so they can funnel dripping juices down into basting pans at the chef's waist. The wheels that raise and lower the grill are linked to a cog that gives a satisfying “clack” at each step. Almost every part of the apparatus, including the fire bricks bordering the hearth, can be removed for easy cleaning or replacement.

Looking at the thing incites

The signature wheel cranks adjust the surface height of the grill

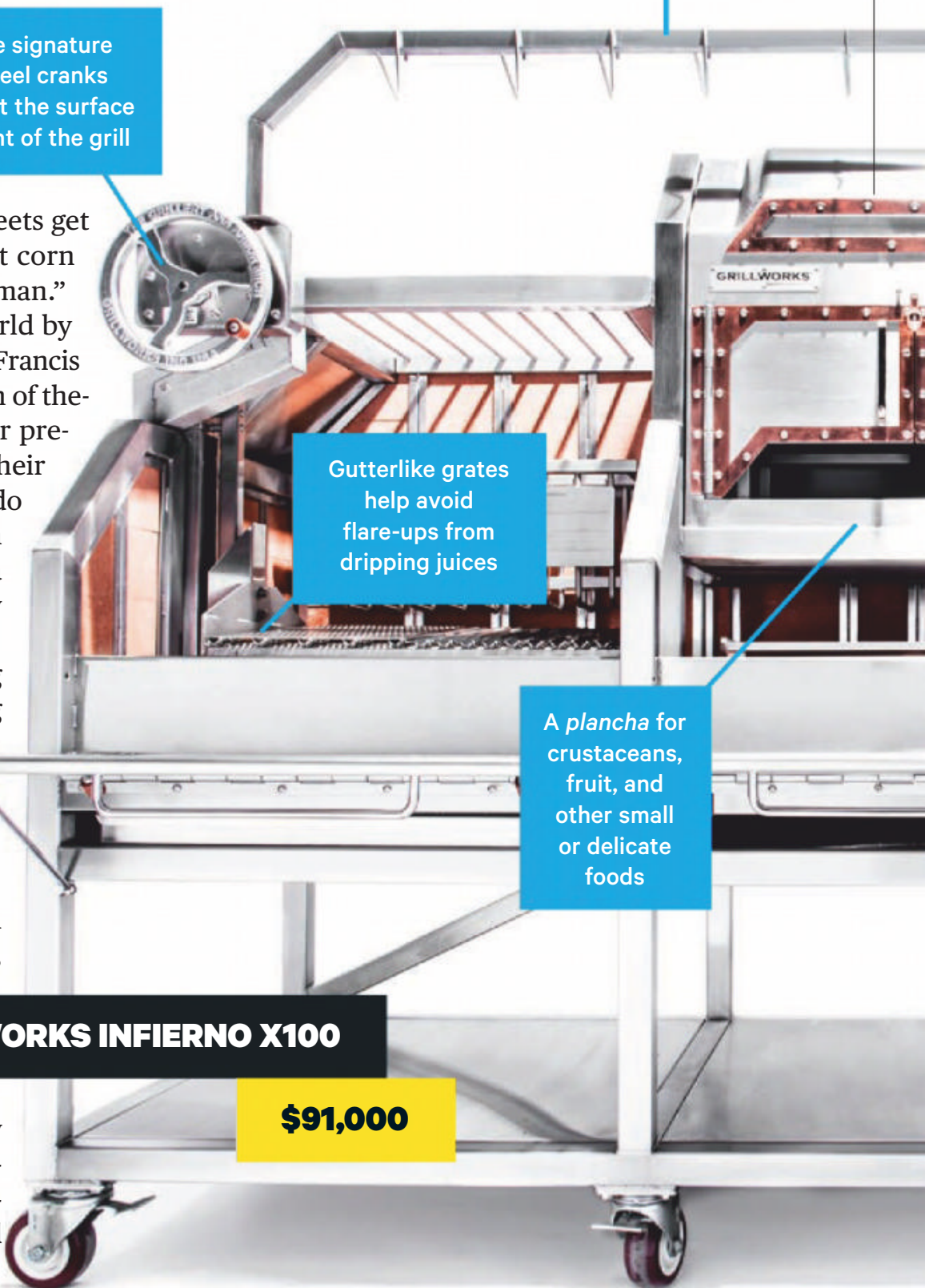
Overhead resting and suspension areas

Gutterlike grates help avoid flare-ups from dripping juices

A plancha for crustaceans, fruit, and other small or delicate foods

GRILLWORKS INFIERNO X100

\$91,000



a common refrain: Why didn't I think of that? You probably could have. Grillworks is the brainchild of Charles Eisendrath, a compulsive tinkerer and wordsmith. In 1974 he ended a globe-trotting career as a *Time* correspondent in Buenos Aires and, with his wife and two sons in tow, decamped to teach at the University of Michigan. But he missed the afternoon-long Argentine meals made on a *parrilla*—a hearth, usually homemade, with a grill that can be raised and lowered.

He soon enlisted some of Michigan's famously skilled metalsmiths to turn his notebook doodlings into a breathing, burning grill. He arrived at a version he liked in 1978 and began casually selling a few, mostly to friends who came over for dinner. In 1984, Eisendrath locked up a patent and began gaining traction in the food world thanks to a lunch invite from James Beard, the famous cook and author. The Eisendraths flew to the Beard estate with a grill, enjoyed a long meal, and were told that the grill would be staying.

But Eisendrath wasn't interested in leaving academia;

Grillworks would be a hobby, a side gig for lazy summer afternoons. "He called it recreational capitalism," says Ben Eisendrath, his son. "He always said he'd only want to run it out of his left bottom desk drawer, and that's what he did."

Eventually, the metalworkers started retiring, and Grillworks cranked to a stop in the late-1990s, right around the time the younger Eisendrath began working at AOL in Washington, D.C. A decade later the tech giant was foundering, and he took a buyout. He was 37 and single and had spent half a career cobbling together esoteric revenue streams for a blundering empire of email. A steel box of fire suddenly looked pretty good.

"I thought, What's the downside?" Eisendrath says. Grillworks was reborn in 2007 with a notebook full of old designs and a waitlist of 20 orders. He gravitated to commercial kitchens, acting as a sort of one-man R&D department, studying how chefs used his product. The grills became slightly more nuanced, more carefully branded, and quite a bit bigger. "I told my guys, 'This is a warship. This is Jules Verne,'" he says.

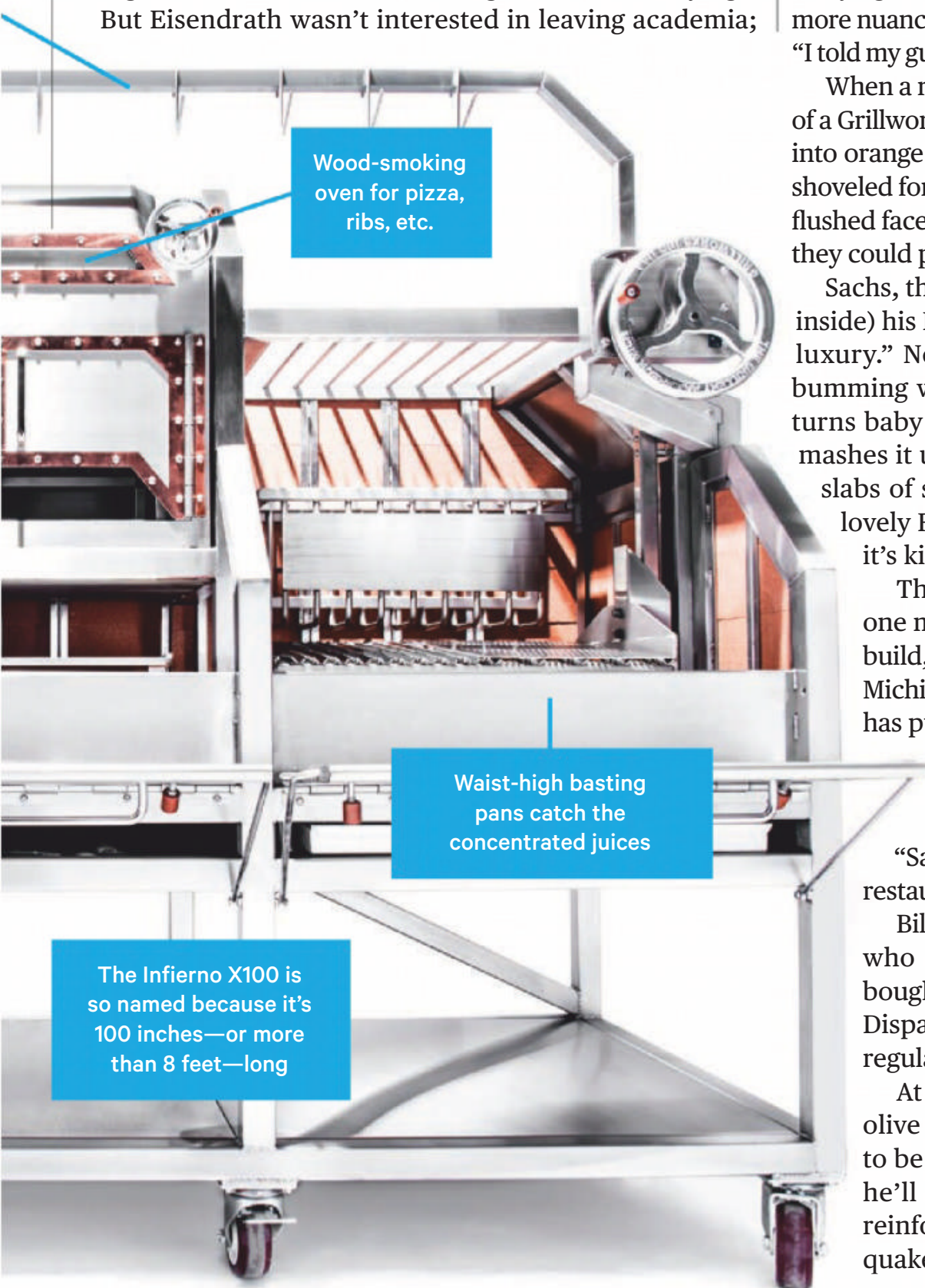
When a restaurant is running at full steam, the entire back of a Grillworks unit is a wall of rippling fire. Wood burns down into orange embers, which fall through metal grates and get shoveled forward under the grill by attentive chefs with pink-flushed faces. Smudged with soot and clad in leather aprons, they could pass for brakemen on a 19th century train.

Sachs, the food writer, had a Grillworks installed in (yes, inside) his Brooklyn home, an expense he calls an "absurd luxury." Nevertheless, he uses it habitually, sometimes bumming wood from the local pizza joint in a pinch. He turns baby pigs on a spit, roasts eggplant and garlic and mashes it up into a "baba ghanouj-type thing," and grills slabs of salmon on top of a thick bed of dill. "I have a lovely French oven on the other side of the room, and it's kind of like an unloved child," he says.

The enterprise is profitable but not as thickly as one might expect. Each grill takes at least 20 hours to build, work that's split among 25 or so welders in rural Michigan. Eisendrath, who's still based in Washington, has put a premium on customer service and has a full-time "grill doctor" on staff in New York, ready to fly to one of the installed machines. Even so, he usually manages 50% revenue growth each year. "Sales are mostly inbound these days," he says. "The restaurants turn into our showrooms."

Bill Langelier, a real estate investor in San Francisco who ordered his first Grillworks in 1983, recently bought his third, a 54-inch model for about \$20,000. Dispatched at various properties, they're all getting regular use. "They are the gold standard," he says.


At his Napa Valley home, Langelier, 75, cooks over olive branches. "I'm sure that these grills are going to be around a lot longer than I will." First, though, he'll have the unit in his Pacific Heights backyard reinforced with steel plates in the event of an earthquake. Then he'll put on some oysters. **B**



Wood-smoking oven for pizza, ribs, etc.

Waist-high basting pans catch the concentrated juices

The Infierno X100 is so named because it's 100 inches—or more than 8 feet—long



The Powder Within

Packed with protein and vegetable nutrition, moringa adds earthy flavor to a any meal

By *Kate Krader*
 Photograph by *Danny Kim*

Superfoods are as common as Avengers these days. The good guys of the kitchen include cholesterol-zapping oats, almonds that tackle heart disease, and chia seeds to deliver a roundhouse to diabetes. Moringa, however, is a more powerful hero than most. Its small, tender leaves contain all nine essential amino acids, making it a complete source of protein. It's also rich in iron, vitamin B6, and potassium.

Originally hailing from northern India and the Himalayas, the fast-growing, drought-resistant tree is now cultivated from West Africa to Mexico for communities that struggle

for food resources. The seeds can also be pressed to make a moisturizing, anti-inflammatory oil that's becoming a staple for vitamin-rich face balms, shampoos, and deodorants.

But moringa is making the most noise at the table. Its vegetal taste is a little like spinach mixed with matcha; in the U.S., it's mostly found in powdered form because the leaves are too delicate to transport long distances. Chefs can use it in dishes to add protein. At Lalito in downtown Manhattan, the powder is sprinkled into \$15 chickpea guacamole; uptown, at the Senegalese cafe Teranga, it features in a \$5 latte. Health-minded chain Vitality Bowls adds moringa to its VB blend, a key ingredient in the Warrior açai bowl, which also includes granola, bananas, and broccoli.

"I've seen it explode over the last four years," says Jed Fahey, assistant professor at the School of Medicine at Johns Hopkins University. He came across moringa in the late 1990s and thought the tropical tree could help support low-income communities.

A fast-growing supplier is Kuli Kuli Inc. of Oakland, Calif. Founder Lisa Curtis was introduced to moringa as a Peace Corps volunteer in Niger a decade ago, when she was a vegetarian without a lot of protein options. The food not only energized Curtis, it also gave her a business idea: In 2014 she started the company with \$53,000 via a crowdfunding campaign. In 2018, Kuli Kuli's sales topped \$5 million. The company, which has planted the trees in Haiti, offers assorted-size packages of powdered moringa, as well as power bars and energy shots. In February, Kuli Kuli closed \$5 million in Series B funding led by Griffith Foods and the Kellogg Co.'s venture capital fund Eighteen94 Capital LLC.

Neil Zevnik, a private chef whose clients have included Reese Witherspoon and Charlize Theron, has become a moringa fan partly because of its human impact: Besides being good for you, it's a sustainable business in sub-Saharan Africa and elsewhere. "I especially like the social aspect of it," he says. "And that's become important to the people I cook for." Zevnik adds it to cold soups and pestos, as well as fruit smoothies to cut the sweetness. Recently he was surprised to find fresh moringa produce at the Hollywood Farmers Market from Thao Family Farm, a favorite supplier to buzzy L.A. restaurants such as Night + Market and République.

It's a far cry from the first time Johns Hopkins's Fahey encountered it in Ghana. "It turned out to be in rat stew," he says. "That's one application I don't need to see again." **B**

TROPICAL SUPER SMOOTHIE

Recipe adapted from chef Neil Zevnik

In a blender, combine 1 ripe medium banana, ½ cup chopped pineapple, ½ cup chopped mango, ⅓ cup light coconut milk, ¼ cup dairy or nut milk, 1 tbsp moringa powder, ¼ tsp turmeric, and a handful of ice cubes. Puree until smooth and serve in cold glasses. Makes two 8-ounce smoothies.



Be Your Own Sauce Boss

Five bottles that will inspire you to rethink your regional allegiance
By Matthew Kronsberg

For pitmasters and barbecue pros, sauce is the coup de grâce on a long, slow cooking process. Sure, it highlights the qualities of the meat they've been sweating over all day (and sometimes all night). But it's also a powerful expression of regional identity—whether a tomato-based Kansas City glaze, a sweet-but-sharp mustardy elixir from central South Carolina, or a splash of North Carolina-style vinegar to cut the richness of whole-hog cooking.

Even within the bounds of tradition, there's room for creativity. Barbecue lore is filled with secret, and not-so-secret, ingredients. Some, such as the Southern sweetener sorghum, have a long history in their region; others, like pineapple or coconut, might make a traditionalist shudder. After an extensive round of testing with brisket, Hawaiian rolls, and more than 30 barbecue enthusiasts here at Bloomberg HQ, we've selected a few favorites that will make you say, in the words of one of our sauce tasters, "Awww, hell yeah!"

LEWIS ORIGINAL RED

Charleston, S.C., wasn't brisket country until the arrival of John Lewis, a pitmaster with Texas bona fides that include Austin's Franklin Barbecue and La Barbecue. This tomato-based sauce works beautifully with his beef brisket, which is available online and arrives fully cooked, frozen, and Cryovaced, ready for reheating. "Very traditional, and just the right amount of sweet" was the consensus from our taste testers. \$8.95 for 12 oz.

THE SHACK SORGHUM

YELLOW MUSTARD Beloved in Staunton, Va., the Shack is known for its ambitious use of Southern ingredients. Sorghum syrup, with a rich, rounded, molasseslike sweetness, balances out the yellow mustard in this sophisticated sauce, which "could double as a really good salad dressing," according to one of our judges. It's equally at home on duck breast or baby back ribs. \$15 for 16 oz.

JONES COCONUT PINEAPPLE SAUCE

If you watched the Kansas City-based episode of *Queer Eye* where the gang transforms

Deborah and Mary Jones ("Shorty" and "Little") and their restaurant, Jones Bar-B-Q, you'll know that getting their classic sauce bottled was a highlight of the season. The tropically tinged version was eyed with suspicion, but even skeptics fell hard for it. "Could go on everything that's edible," one observed. \$7 for 15 oz.

17TH STREET LITTLE KICK

If there's a competition that Mike Mills and his daughter Amy, of barbecue legend 17th Street in Murphysboro, Ill., haven't won, it's probably not worth winning. "Yes, vinegar! Definitely hits you," an aficionado wrote. Little Kick expands on its Mike's Original sauce—savory with ketchup, mustard, and vinegar—with a boost of cayenne pepper. \$18 for three 16-oz. bottles

SAM JONES EAST N.C.

SWEET HEAT Another Jones—Sam, a third-generation pitmaster who excels at North Carolina whole-hog barbecue—designed this extremely thin but zingy vinegar sauce to add to chopped pork after cooking. "Whoa!" was the reaction at our test. "Spicy. Tangy. Amazing." \$7 for 17.25 oz.

GO HERE NOW

Wine in the Wild

Experimental vigneron and a stylish hotel transform the Columbia River Gorge from an outdoorsy day trip to a foodie destination. *By Hannah Wallace*

A decade ago, after graduating college, Jure Poberaj moved to Hood River, Ore. (population 7,806) in search of outdoor adventure. Born in Slovenia and raised in Washington, D.C., Poberaj, now 31, was drawn to the magnificent Columbia River Gorge an hour east of Portland for its mountain biking and world-famous kitesurfing (gusts of wind here, where the river stretches about a mile across, can reach 70 mph). The lively brewery scene didn't hurt either.

As life happens, he met his girlfriend, pastry chef Nina Jimenez, and together they decided to create their own shop, with Poberaj learning how to bake bread by apprenticing around the Northwest. The duo opened the White Salmon Baking Co. four years ago on the sunny Washington side of the gorge, and it's been crowded ever since, its counters

heavy with luscious huckleberry galettes, rhubarb-poppyscone scones, and hearty wood-fired sourdough loaves. As I sat on the patio savoring a messy bacon-avocado toast topped with jammy egg, Mount Hood's snow-capped 11,250-foot peak standing majestic in the distance, Poberaj told me of his plans to convert some of his land in White Salmon into a vineyard.

In 2017 the Eagle Creek Fire razed almost 50,000 acres of forest in the area, leaving many hiking trails closed and causing \$8 million in economic loss to the region, according to a study commissioned by Travel Oregon. Today, as the forest slowly recovers, tourists aren't waiting, particularly foodies seeking out-in-the-wild wine experiences such as tasting natural vintages produced with native yeasts. And as of

May, there's a new stylish place to stay: Society Hotel Bingen.

The Scandinavian-chic property just down the hill from White Salmon, in the blink-and-you'll-miss-it town of Bingen (population 737), is the second Society property from a Portland hospitality group. They converted a 1920s schoolhouse into a book-lined lobby that winks to its past with library carts and a door marked "Principal's Office." The gym still has a basketball hoop and original bleachers—and now some kettle bells and yoga mats. "We want to appeal to the adventurous traveler at various stages of life," says co-owner Matt Siegel.

To that end, there are modern, well-designed bunk rooms and standard rooms with king or queen beds, all with shared baths, while the 20 interconnected private cabins (from \$269) offer kitchenettes and hammocks. A spa—complete with saltwater soaking pool, cold plunge, and spacious sauna—has a bar and several fire pits.

The Wineries

Start your wine-tasting circuit with Savage Grace, about 7 miles west of Bingen in the bucolic community of Underwood, Wash. Winemaker Michael Savage recently bought a vineyard here and is organically farming all 10 acres. Pull up a stool at his new tasting room and gaze down at the spectacular beauty of the gorge as you sip an unexpected 2017 orange gewürtztraminer.

On the other side of Bingen, in Lyle, James Mantone at Syncline Winery makes Rhone-style varietals including mourvèdre, syrah, grenache, and carignan, as well as a bone-dry picpoul and a spicy Gamay noir. Pack a picnic lunch for the picturesque garden under white oak trees.

At Domaine Pouillon, a winding 4-mile drive east past fields with roaming horses and grazing cows, Juliet Pouillon pours her husband Alexis's fruity and biodynamic Alsatian-style wine, edelzwicker. Their first fizzy *pétillant naturel* will be released on Bastille

White Salmon Baking Co.





The new tasting room at Savage Grace

Burn Those Calories

The food and wine may be great, but the best part of the gorge is the outdoors

BIKING

Rent an e-bike from Sol Rides for the 16-mile round-trip journey from Hood River to the hamlet of Mosier via the Historic Columbia River Highway, now a pedestrian and bike path. The 1920s feat of engineering clings to sheer cliffs and burrows through basalt rock.

HIKING

On the Oregon side of the gorge, the popular, short-but-steep Angel's Rest Trail has reopened after the fires, though the forest service still urges caution. Head to the Washington side

for views of Mount Hood. Beginners can try Catherine Creek; the longest trail is just 5.5 miles round-trip. East of Bingen, the 7.8-mile Coyote Wall Trail is more of a challenge and also popular with mountain bikers. For more hikes, the Friends of the Columbia Gorge maintains a detailed list—just remember to be on the lookout for poison oak and ticks.

KITESURFING

For lessons, Kite the Gorge is the best place to find a pro. Private two-and-a-half-hour lessons start at \$285.

Day. (Most tasting rooms don't serve food, but Domaine Pouillon will whip up a cheese or salmon plate on request.)

Back over the bridge to Oregon, a picturesque 10-minute drive east to Mosier, Analemma Wines' Steven Thompson makes some of the best terroir-driven biodynamic wines around—from a single-vineyard sparkling blanc de noirs to a vibrant tinto blend, which tastes of dark red cherry and dried herbs.

Dining and Beer

Resolutely casual Hood River is your best bet for healthy, delicious fare. Start your day with Broder Ost's *aebleskivers*, Danish-style spherical "pancakes" dusted with powdered sugar and served with lingonberry jam and housemade lemon curd. Upstairs, the funky—and reportedly haunted—1912 Hood River Hotel has 41 rooms and suites, many with fantastic gorge views.

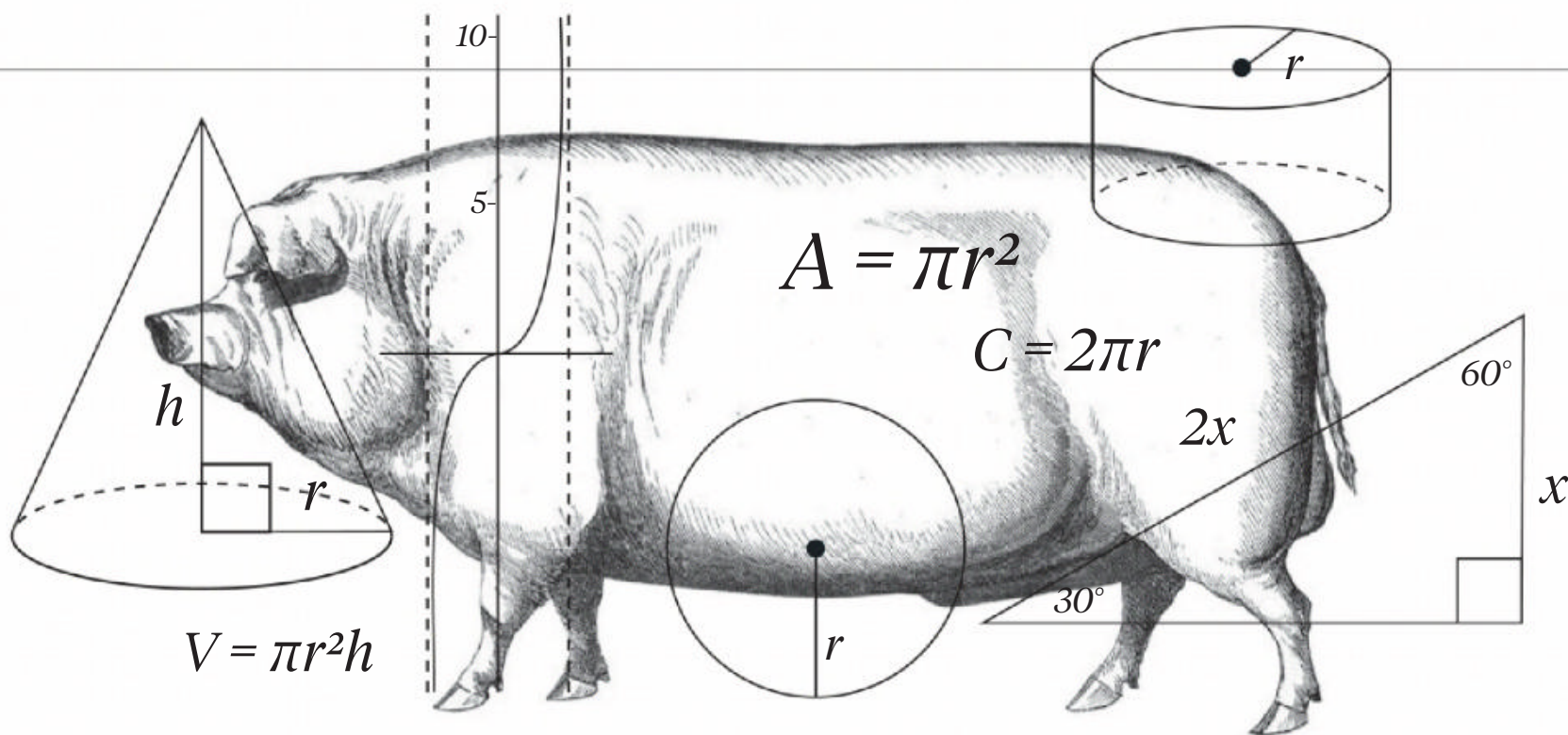
PFriem Family Brewers, one of Oregon's best breweries, offers about 20 beers on tap—from a hazy IPA to a Belgian strong. The new seasonal menu is excellent, too, in which sambal honey kicks up buttermilk fried chicken and a lentil-mushroom veggie burger with spring garlic aioli sets a new standard.

Down the street, New Yorkers Dan and Jenn Peterson opened Ferment Brewing Co. last August. Dan, who cut his teeth at Brooklyn Brewery, makes flavor-packed Belgian and French farmhouse ales as well as lagers, pale ales, and stouts. In a state where hoppy IPAs are king, this is a refreshing change, and the offerings pair perfectly with the Mediterranean-inflected menu of flatbreads and slow-roasted meats—plus Jenn's housemade frozen yogurt.

On the upscale end of the dining spectrum, Celilo still stands strong after 14 years, with skillet-roasted Totten Inlet clams and rich pork sugo over

rye-flour gnocchi, served with purple broccoli sprouts.

But the area's most memorable reservation is high in the hills above town at Hiyu Wine Farm. *Hiyu* means "the big party" in Chinook Jargon, a Pacific Northwest pidgin language, and Nate Ready and his partner, China Tresemer, don't disappoint, bringing in chefs such as Gunnar Gislason from Michelin-starred Dill in Iceland to collaborate on locally legendary dinners. If you aren't in town for one, opt for a lavish family-style weekend lunch. Otherwise, wine tastings are Thursday through Monday by appointment and include seasonal snacks such as Columbia River smelt *escabèche* and griddled pea shoots with cured duck yolk. Ready's field blends are wild experiments in natural wines: Some 120 grape varieties are grown side-by-side, then fermented together. Some Hiyu wines are served at White Salmon Baking Co., where Poberaj pours them at Monday night pizza parties. **B**



Real Barbecue Ain't Easy

The best new cookbooks argue that this fine Southern art requires commitment and complexity. *By Kate Krader*

It used to be simple. At least that's what food TV and culinary magazines would have had you believe about barbecue. With a few simple steps (5! 4! 3!), you could prepare best-ever ribs, chicken, pulled pork, and so on.

Not that Americans haven't always taken barbecue seriously. The debate over tomato vs. vinegar in the universe of sauces (essentially Memphis vs. the Carolinas) is decades old and worthy of a Netflix miniseries. Meanwhile, the vaunted title of "pitmaster" has been around for 80 years, according to expert John Edge. But the true craft was something few tried to master in their home kitchen.

This summer, a handful of cookbooks revel in the time and effort that goes into achieving authentic barbecue. They're the opposite of the fast, all-purpose volumes of yore. These books are the storytelling, podcast versions of cooking; they happily devote entire chapters to what wood to choose.

In *Whole Hog BBQ* (Ten Speed Press, \$30), Sam Jones focuses on one particular recipe: the one in the title. Jones is a third-generation North Carolina barbecue master, whose family started the James Beard Foundation Award-winning Skylight Inn. "Cooking a whole hog doesn't have to be that complicated," he and co-author Daniel Vaughn write. "It's a long process, but with a pickup truck and the right guidance, you could be serving one tomorrow."

It takes about 16 hours to cook a 180-pound pig that feeds around 100. (Jones factors in time for cooks to get a little sleep.) He includes diagrams for building a cinder block pit, but for those who aren't inclined to wrangle a prepped pig into the pit and then figure out how to turn it over around

hour 6, there are recipes from his restaurant Sam Jones BBQ, including pork spare ribs that are brined overnight, rubbed with spices, and smoked, which you can then augment with collard greens, pimento cheese, and other fixings.

Steven Raichlen, author of more than 30 cookbooks and the poster boy for the basics of cooking over fire, takes on the hottest trend in barbecue with *The Brisket Chronicles* (Workman Publishing, \$20). He tells readers to wait out one of the frustrating secrets of the meat-of-the-moment: the "stall" that occurs a few hours into cooking when the temperature refuses to budge. (It's the result of evaporating moisture, which cools the meat.) His recipes run the gamut from burnt ends with smoky barbecue sauce to spice-crusted "old school" pastrami, which calls for a curing salt to get that pink interior and requires 12 days of brining and around 10 hours of cooking.

Paula Disbrowe's *Thank You for Smoking* (Ten Speed Press, \$30) encourages cooks to add the alluring flavor of smoke to every ingredient in their kitchen, offering intricate instructions for smoking pantry items such as spices and garlic. She dedicates considerable space to doing the same for beans and vegetables. (Another giant trend this year: green, or meatless, grilling.)

Even the more conventional *Southern Smoke*, by chef Matthew Register (Harvard Common Press, \$25), still advocates the low-and-slow approach for dishes such as Smoked Boston Butt. He also advises readers to go deep on the details and to buy a notebook to record thoughts on wood and even weather. After all, you'll have plenty of time to think while cooking a 12-hour pastrami. **B**

Pop Stars

These frozen desserts are packed with flavor and pretty enough to frame. *Photograph by Heami Lee*

The Popsicle is a unique treat: It can spark blissful childhood memories even while operating within the constraints of most summer diets. In the case of the vibrantly hued pops from Pretty Cool Ice Cream, it can also deliver satisfaction through looks alone. Star pastry chef Dana Cree, formerly at Chicago's Publican, opened her Logan Square shop in 2018, where she arranges her treats—in flavors such as cucumber-lime (bottom left) or Midwestern classic Blue Moon (top left)—as if they were stylish Parisian pastries.

THE COMPETITION

- Inspired by the fruit-filled Mexican *paleta*, Seattle Pops' \$4 desserts have no artificial flavors or coloring and use organic cane sugar rather than high fructose corn syrup.
- Kombucha is key in the Better Pop (\$6) at Smorgasburg in Brooklyn, N.Y. Available in cherry-sumac, mango-orange, and other flavor combinations, they have a patented 3D design for better biting and sharing.
- Atlanta's King of Pops has created almost 500 flavors since opening in 2010. It also has iced treats for dogs: A case of peanut buttery 24 Lil' Pups runs \$68.

THE CASE

Besides looks, Cree knows a thing or two about taste, and that's where Pretty Cool excels. The Orange Confetti (top right) is the platonic ideal of an old school Dreamsicle festooned with sprinkles; raspberry lime (center right) bursts with ripe fruitiness. There's also a s'more bar (bottom right) in a chocolate shell that will delight guests at an adults-only dinner party or a kid's birthday. *From \$3.50; prettycoolicecream.com*

Even More Drink Options For Your Summer Cookout

By Justin Fox

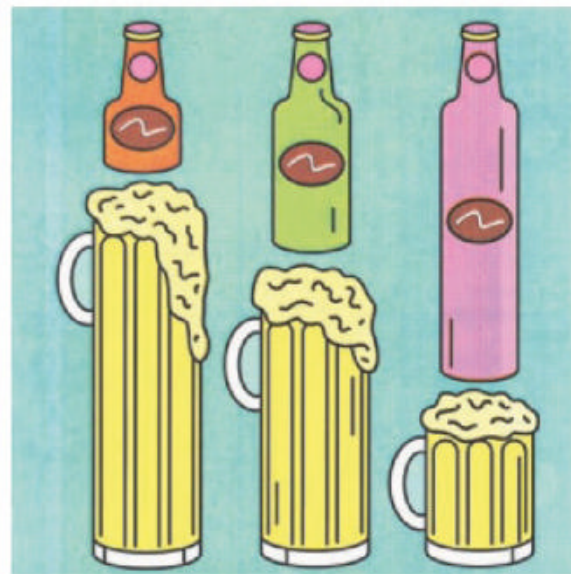
72

In 1873 there were 4,131 breweries in the U.S. Over the next century the number fell and fell, hitting a low—not counting Prohibition, when it went to zero—of only 89 in 1978. It wasn't that Americans had stopped drinking beer; overall consumption was higher than ever. But the business was following the path of so many others in the Industrial Age, consolidating and squeezing ever more out of each manufacturing facility.

Then in the 1980s, something not so typical happened. Craft breweries started opening, eventually by the thousands. Last year there were 7,450 breweries in the U.S., according to the Brewers Association, a craft-beer trade group. Brewery tallies from the Department of the Treasury and the Bureau of Labor Statistics are lower but show a similar growth trajectory, and the BLS estimates brewery employment has more than tripled since 2010, to 80,774 as of December.

Beer consumption, reports beverage data analyst IWSR, fell in the U.S. in 2018 for the second year in a row after several years of virtually unchanged sales. This might mean the brewery boom is destined to stall, but a boom amid falling sales could also be a sign of something more interesting.

Most beer production in the U.S. is still controlled by megaproducers Anheuser-Busch InBev SA/NV and Molson Coors Brewing Co., but even as they've acquired upstart competitors, their market share has declined. The Brewers Association estimates that craft-beer sales rose 3.9% in 2018, with brewpubs and microbreweries (and thus not larger regional breweries) driving all the growth. Beer is deindustrializing. **B** —*Fox is a business columnist for Bloomberg Opinion*



● **THE FLY IN THE FOAM**
As the number of smaller, less-efficient, less-likely-to-be-unionized breweries has exploded, average annual pay for brewery workers has collapsed. In 2009 it was \$72,874; in 2018 it was \$45,007.

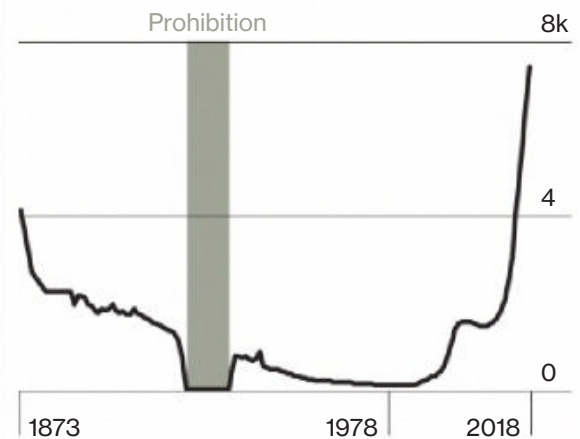
● **U.S. GIANTS LAID LOWER**
Anheuser-Busch and Molson Coors's market share was

64%

in 2018, according to Beer Marketer's Insights, down from 78% in 2008.


● **SLOW AND STEADY**
Real output per hour worked (aka labor productivity) in the beverage industry is down 65% since 2009 as production has shifted from industrial to artisanal.

U.S. breweries



● **THE FALL AND RISE OF BREWERIES**
Small craft-beer facilities are responsible for much of the growth in the number of U.S. producers. Liquor distilleries are multiplying as well: BLS employment data showed 1,002 at the end of 2018, up from 125 in 2008.





Go down 7 metres
and back 1,800 years

LONDON
MITHRAEUM

Bloomberg
SPACE

Discover the Roman Temple of Mithras beneath the streets of the City of London.
Free admission, book now: londonmithraeum.com

12 Walbrook, London, EC4N 8AA