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THE HEIST ISSUE

SUMMER DOUBLE ISSUE

Mythical Beasts

China is home to the second-most unicorn companies in the world

By Deng Yaqing

China's new-look economy is gaining momentum. With a focus on entrepreneurship and innovation, a cluster of privately owned and rapidly growing start-ups have provided a boost for the country as it undergoes a momentous shift in the drivers of growth.

According to a study recently released by Deloitte, by the end of June 2017 there were 252 unicorns—startup companies valued at over $1 billion—worldwide, with 106 in the United States and 98 in China, far surpassing the figures for any other country.

"China's innovation capacity is now largely on par with America's, which is reflected by the robust growth of Chinese unicorns. Most of these companies are excellent performers and frontrunners in their respective fields," said Albert Wang, founding partner at Maintrend Capital and former partner at SAIF Partners, in an interview with *Beijing Review*.

On May 3, Xiaomi, a Beijing-based unicorn heavyweight specializing in consumer electronics, filed to go public in Hong Kong, where its IPO could raise about $10 billion in the largest listing globally in almost four years.

Chinese mainland and Hong Kong securities regulators are sparing no effort to improve their listing policies to attract unicorn companies. On June 6, the China Securities Regulatory Commission (CSRC) issued rules for a test run of the issuance and trading of Chinese Depositary Receipts (CDRs). The securities regulator has also released amended rules on IPOs, and a package of measures to support unicorn companies in their domestic issuance of stocks or CDRs. Meanwhile, the Hong Kong Stock Exchange is now permitting innovative, high-growth companies to list using a dual-class share structure, which Xiaomi was the first to apply for.

"Increasing consumption capacity, improving productivity and abundant entrepreneurship have provided the necessary conditions and resources for Chinese companies to grow and prosper," Wang said.

"However, the strict requirements and high threshold for getting listed in the domestic market and the American stock market's lukewarm attitude toward Chinese firms have long denied these companies the opportunity to raise capital in the secondary market. They have no choice but to finance in the primary market, which explains the birth of so many unicorns," Wang continued, predicting that an increasing number of Chinese unicorns will seek to issue IPOs in the Chinese mainland and Hong Kong markets as their businesses grow.

Core competitiveness

Innovation and a favorable business environment have set the stage for China's new era of fast-growing unicorns. Yet, while some of the top companies in this group will find success in the secondary market, other less competent ones could lag behind or even collapse.

"Besides the ability to attract capital, unicorns need to foster and maintain the ability to innovate in order to survive, which focuses more on integration and making use of various market resources than sticking to the development of a certain technology in the laboratory," Gao Yuning, an associate professor with the School of Public Policy and Management at Tsinghua University, told *Beijing Review*.

Such innovation can involve a variety of technologies including those not necessarily developed by China, which can nonetheless be consolidated by Chinese unicorns in an efficient way to form new, secure and effective business models.

"A unicorn should be able to grow into a platform company rather than relying entirely on a single technology, and only in this way can such a company realize sustainable and rapid development," Li Lixin, Managing Director of Northern Light Venture Capital, told *Beijing Review*.

"Many great companies that have gone on to be listed are platform companies, such as Alibaba, Tencent and Didi Chuxing. Such a company represents a certain business environment in which a host of small and medium-size companies reside," said Li.

A unicorn also needs to maintain a leading position in a certain segment of the market and dig deeper into this area rather than blindly seeking expansion, so that it can develop superior services and products to better satisfy market demands, said Gao.

At the heart of a unicorn's competitiveness is its ability to address the urgent needs of consumers, Gao added. Take shared bikes, for example: The companies offering this service do not rely on particularly advanced or hard-to-come-by technology, but they have managed to provide a popular service that people need, and the demand is virtually inexhaustible.

"Competition here is more brutal and fierce than in the American market, so a fast-learning team is indispensable. Financing capacity as well as shareholder structure also play important roles. In some cases, companies that provide products and services of the same quality experience totally different outcomes due to disparities in the above-mentioned areas," said Wang.

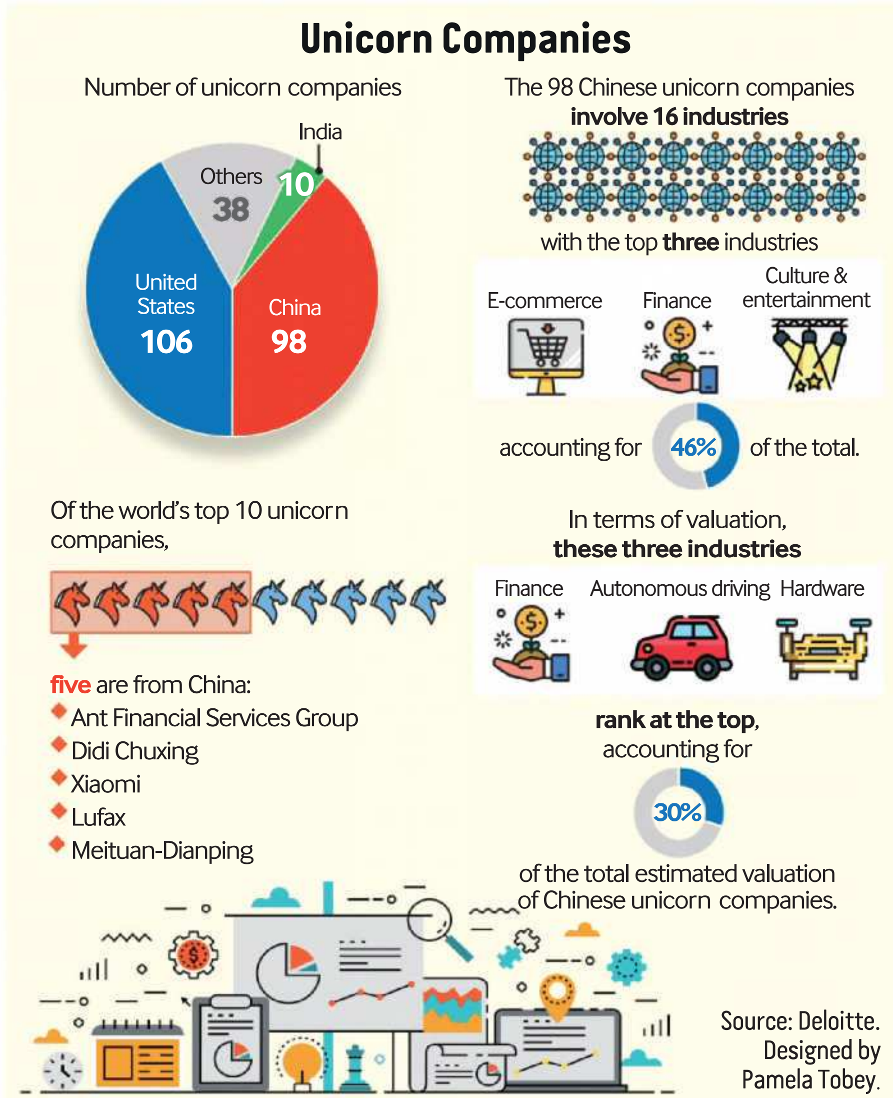
Potential challenges

"Funding and innovation are two essential factors for corporate growth. However, excessive financing and innovation may generate bubbles that, once they burst, may affect the confidence of entrepreneurs, investors and governments," said Wang.

As the struggle among platform companies continues, competition over consumers' attention and business is intensifying.

"What matters is whether a company can create the value that consumers really need. Here value means not economic benefit, but knowledge, entertainment, relaxation and so on," said Gao.

Alongside market value, requirements for corporate social responsibility have steadily risen, as seen by Didi Chuxing's supervision over its ride-sharing drivers



and transactions, and Internet lending platforms' efforts to protect personal data and fend off financial risks, said Gao.

"Moreover, as established unicorns that thrive by adjusting their business models continue to expand their territories, fledgling companies may find themselves squeezed. On the flip side, if technology companies fail to grow fast enough, they will likely be outstripped by industry newcomers with greater momentum," said Li.

Further opening up

There is no doubt that the Chinese government wants to see successful companies choose to go public in the mainland or Hong Kong markets, so that Chinese people can share in the rewards of the new economy.

"In the past, the strict requirements and extensive restrictions of the A-share market deterred numerous unicorns from attempting to get listed at home. Now, with the threshold lowered, a new trend of domestic IPO applications is taking shape, and the international competitiveness of China's capital market will be further improved," said Li.

Conversely, CDRs usually find their way into developed and mature financial markets, and the issuance of CDRs in domestic stock markets necessitates higher requirements for supervision, access to information and investor protection.

Starting June 7, qualified innovative firms can submit applications for CDR issuance to the CSRC under the new pilot CDR program. The CSRC has said it will strictly control the number of enterprises and the volume of funding for the pilot CDR program, and properly arrange the timing and pace of CDR issuance.

"By learning from more mature overseas market, China should establish a comprehensive financial supervision system featuring cross-market and joint operation," said Gao, who also emphasized the protection of intellectual property rights and the release of more tax credits to encourage innovation.

"More efforts should be made in opening up, such as allowing cross-border capital and profit flow for fast-growing privately held companies," said Gao, who expects these enterprises to enjoy the same equal treatment and preferential policies as foreign-funded companies.

"As more Chinese unicorns look to go public by issuing CDRs in the mainland market, there will be a huge demand for capital, while giant companies currently listed in the A-share market will carry out additional issuance. It is beyond the capacity of the present capital market to fill the gap in capital demand," said Li, noting that efforts need to be made to increase the supply of funds.

To address the problem, China needs to broaden its capital sources by allowing more overseas funds to flow into its stock market. According to Wang, in the process of enabling unicorns to go public at home, the Chinese authorities should push for the free convertibility and internationalization of the yuan, and press ahead with the opening up of China's stock market.

At the same time, investor structure should be optimized. "In China's mainland stock market, about 80 percent of players are private investors, while in overseas markets, the majority of market players are institutional investors. It follows that private investors should be encouraged to entrust their money to institutional investors that are more professional, rational and better equipped to withstand fluctuations and risks," said Wang, adding that the country should also allow more private and overseas money to enter the stock market.

"However, the steps toward opening up should be in line with China's current economic stature and global investors' confidence in the country. Otherwise, problems may occur," said Wang, citing rampant speculation on the Thai baht and Russian ruble, which he believes was the consequence of disproportionate opening up. ■

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Going Places℠

◀ Tsirogiannis has tens of thousands of images that help him stop auction houses from selling looted art

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IN BRIEF

Bloomberg Businessweek

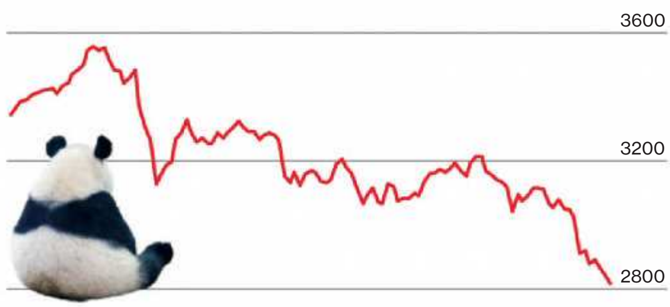
July 2, 2018

By Dimitra Kessenides and Jillian Goodman

● Saudi Arabia plans to pump a record 10.8 million barrels of crude oil in July, topping the previous high of 10.7 million barrels, reached in November 2016.

● China's benchmark stock index has fallen 20 percent from its 2018 high, entering a bear market.

Shanghai Stock Exchange Composite Index



● The White House began its search to replace retiring Supreme Court Justice Anthony Kennedy.

A list of 25 candidates compiled by Trump's team during the 2016 campaign included (from top left) Amy Coney Barrett, Keith Blackwell, Charles Canady, Steven Colloton, Allison Eid, Britt Grant, Raymond Gruender, Thomas Hardiman, Brett Kavanaugh, Raymond Kethledge, Joan Larsen, Mike Lee, Thomas Lee, Edward Mansfield, Federico Moreno, Kevin Newsom, William Pryor, Margaret Ryan, David Stras, Diane Sykes, Amul Thapar, Timothy Tymkovich, Robert Young, Don Willett, and Patrick Wyrick.

● Alexandria Ocasio-Cortez, 28, won the Democratic primary for New York's 14th Congressional District. The organizer for Bernie Sanders's presidential campaign beat Joseph Crowley, who'd been seen as a possible replacement for Nancy Pelosi as leader of the House Democrats.

● Conagra agreed to buy Pinnacle Foods for

$8.1b

in cash and stock, bringing the maker of Duncan Hines cake mix into the home of Reddi-wip. Together, the companies have about $11 billion in annual sales.

● With the threat of retaliatory tariffs looming, Harley Davidson said it would move some of its production to Europe.

The company previously announced plans to build a factory in Thailand after Trump backed out of the Trans Pacific Partnership.

● "We don't have the luck of bordering Ireland."

Greek Prime Minister Alexis Tsipras struggled to tell Bloomberg TV whether he trusts Turkey's president, Recep Tayyip Erdogan, who won reelection on June 24. He added, "It's important for us to have good relationships with our neighbors."

● John Flannery, General Electric's CEO, said the company will leave the health-care business and divest its stake in oilfield service provider Baker Hughes, to focus on power, renewable energy, and aviation. The news led to the stock's biggest two-day rally since 2015.

● The House soundly rejected (121-301) a compromise immigration bill supported by President Trump.

● As the World Cup moved to the knockout rounds, TV ratings in the U.S. were down more than 40 percent from 2014.

● Apple and Samsung settled a seven-year-long patent fight in the U.S. The companies didn't disclose the accord's terms.

● Vanguard filed with the SEC to create two ETFs of stocks that meet environmental and social good (ESG) requirements.

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► Trump Descends on NATO

After disrupting the G-7 gathering in June, the U.S. president heads for the July 11-12 NATO summit, where the agenda will largely revolve around containing Russia. Soon after, Trump plans to get together with Russian President Vladimir Putin for their first official meeting.

► Mexico elects its next president on July 1. In his third bid for the office, populist Andrés Manuel López Obrador is expected to win by a large margin.

► Xiaomi makes its debut on Hong Kong's stock exchange on July 9, after postponing plans for a China IPO.

► Polish Supreme Court judges over age 65 have until July 3 to retire or seek permission from the country's autocratic president to stay in office.

► China's central bank will ease bank reserve ratios by 0.5 percentage points on July 5, unleashing $108 billion of cash.

► Iran President Hassan Rouhani visits Switzerland and Austria to strengthen trade ties, a week after pressing Europe's leaders to stay in the nuclear deal.

► U.S. tariffs against $34 billion of Chinese goods go into effect on July 6. Another $16 billion in duties are still undergoing public review.

■ THE BLOOMBERG VIEW

A Misguided Trade War

● The U.S. president's approach to China is a threat to American prosperity

Donald Trump may sincerely think he's battling to win Americans a better deal on trade with China. In fact, he's making a better deal harder to achieve—and threatening to inflict grave damage on the U.S. economy in the process.

Even as he escalates the fight over tariffs, the president is trying to persuade Congress to go along with his decision to lighten penalties on Chinese telecommunications company ZTE Corp. That was questionable in its own right (because it harmed U.S. credibility in sanctions enforcement), but one possible justification is that it might have encouraged China to offer concessions on trade. The tariff fight has most likely canceled that opportunity, such as it was: No Chinese leader, least of all President Xi Jinping, could be seen to placate Trump under these circumstances.

Meanwhile, Trump's actions are increasingly hazardous to the U.S. economy's health. If implemented, the latest tariffs—taxes paid in the end by U.S. consumers—would hurt American companies and households more than the Chinese. They would be applied in part to finished goods such as electronics and sneakers, directly raising prices for U.S. consumers.

Perhaps the administration thinks China's ability to punch back is limited, since the country doesn't import enough from the U.S. to penalize an equivalent $200 billion in goods. But China can retaliate in other ways—for example, by obstructing U.S. companies operating on the mainland, promoting boycotts of U.S. goods, or throttling the flow of students and tourists to the U.S. China's ability to thwart Trump's geopolitical goals remains as potent as ever—witness North Korean dictator Kim Jong Un's recent surprise visit to Beijing.

There's no need for this reckless unilateralism. Trump's theory of trade is fundamentally wrong. He sees bilateral trade imbalances as evidence of unfair practices. In a world without tariffs or trade barriers of any kind, a roughly similar pattern of surpluses and deficits would still arise. His goal of smaller deficits through better deals is simply delusional.

Granted, the U.S. has valid complaints about specific Chinese trade practices. In remedying these through cooperation rather than a trade war, it would have many potential allies. It would be in China's interests to do more than curb such abuses at the margin and make largely symbolic gestures on trade, as it has until now. Measures to liberalize finance, increase consumption, cut overcapacity, protect intellectual property, and streamline state-owned businesses would support better-balanced growth as well as allay trading partners.

But that doesn't change the verdict on Trump. His clumsy machinations do nothing to advance this prospect. No good purpose can be served by taxing trade, rejecting cooperation, and isolating the U.S. from its friends. Just how much damage Trump might do is starting to dawn on financial markets. He'd be wise to change course before he's forced to. Ⓑ

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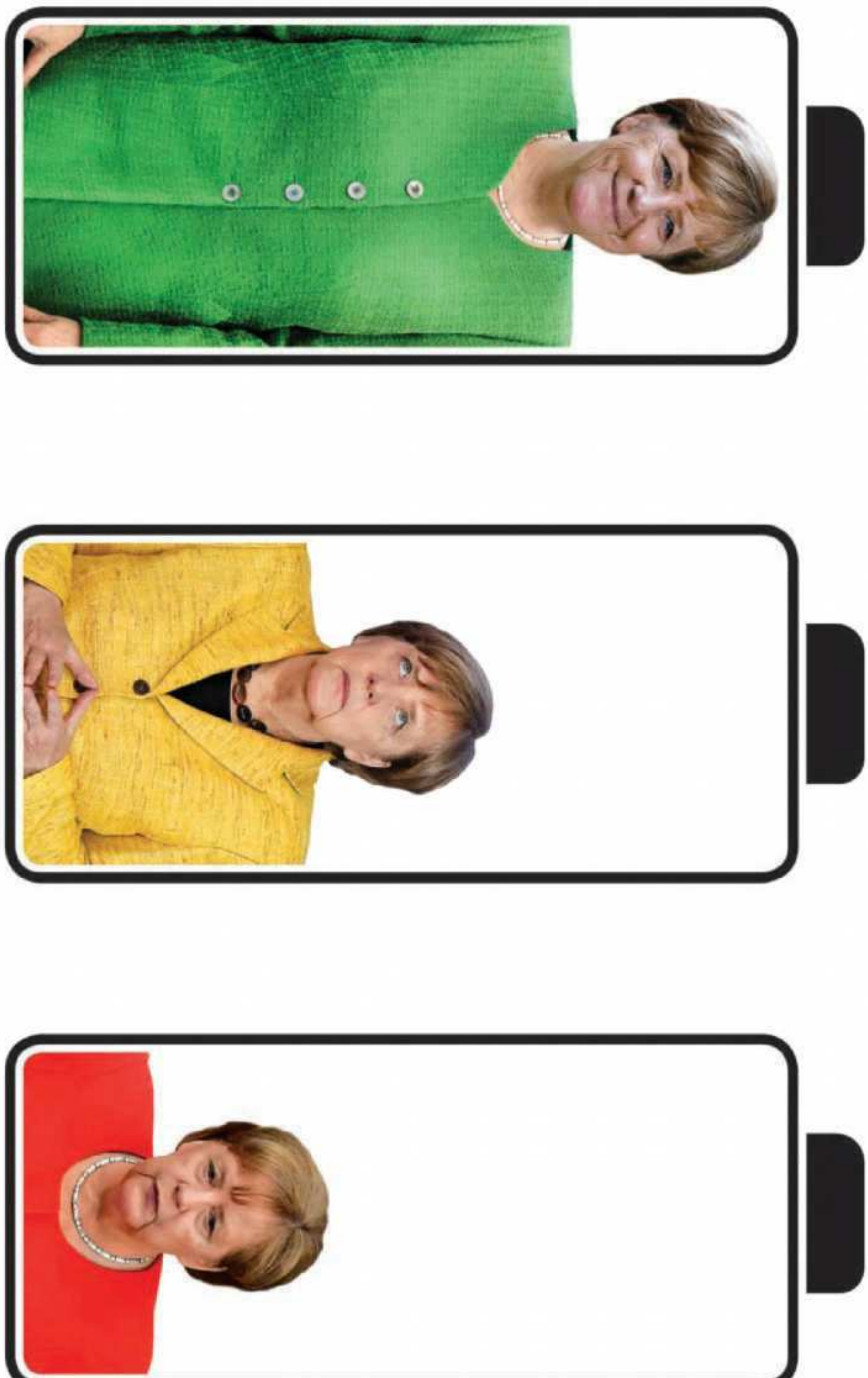

As Merkel's Power Ebbs, Europe's Peril Grows

● The nativism that's swept much of Europe is threatening her in Germany, with huge consequences for the EU

● By Alan Crawford

From her seventh-floor office in Berlin, Angela Merkel is surrounded by uncomfortable relics of Germany's 20th century history. To the east lies the Reichstag building, hollowed out by fire in 1933 in an act of arson the Nazis used as a pretext to cement Adolf Hitler's hold on power. Next door stands the Swiss Embassy, one of the few buildings in the city center to survive World War II almost intact. The line of the Berlin Wall marking the Cold War boundary with communist East Germany is just to the north.

The barbarity represented by those daily reminders has underpinned Germany's you-first approach to neighbors and allies since the federal republic was created in 1949. Germany even gave up its fabled deutschmark, a totem of hard-earned postwar affluence, to forge a monetary union and satisfy French and British fears over its post-reunification muscle.

Now all that risks being cast aside. Like many of its neighbors, Germany is threatening to turn inward. The new Italian government's questionable commitment to the euro may be the current cause of consternation among European Union officials and investors—from Christine Lagarde, head of the International Monetary Fund, to Lloyd Blankfein, chief executive officer of Goldman Sachs Group Inc. But the real black swan is Germany and the prospect of a yawning vacuum in the 28-nation bloc. Don't forget: Germany, which started the deadliest war in history, sits at the center of a continent that—barring the past three decades—has known little but conflict and tumult for centuries.

"The rest of Europe would find, I fear, that this Germany would engage in something much more like American retrenchment. In other words, it would say, 'What's in it for us to be the guarantor of European unity and stability?' " says Constanze Stelzenmueller, Robert Bosch senior fellow at the Brookings Institute in Washington. What's more, she adds, "the public mood might well support a politician who popped up and articulated this kind of position."

The trigger for such a shift would be Merkel's ouster. She's in the throes of the most serious threat to her chancellorship in more than 12 years in office over her liberal stance on migration. If the forces arrayed against her manage to bring her down—and they may try soon—they will demand an about-face in policy. That would mean putting the interests of German voters first and those of European allies a distant second. Euro area bailouts? No thanks. Solidarity on immigration? No longer. Greater EU integration? Forget it. Help for Greece? Don't even go there.

Some in Merkel's Christian Democratic Union never really reconciled themselves with a party leader who broke the mold as both the first woman chancellor and the first from the former communist East. She lacked Helmut Kohl's stature and the party connections of Wolfgang Schäuble, Kohl's heir apparent, who eventually served two terms as Merkel's finance minister. Her management of the euro area debt crisis did her no favors with her base, which grew increasingly frustrated with each successive bailout package. Those same sentiments arose at the beginning of June with criticism from her Bavarian sister party, the Christian Social Union, of Merkel's agreement with France to pursue a euro area budget, which would cede more control of Germans' tax dollars to Brussels.

But it was her open-door policy during the refugee crisis of 2015-16 that provided the accelerant to the sparks of dissent. Bavaria was on the front lines of the influx of more than 1 million arrivals, prompting state leaders to push back against federal policy. Conservative voices grew emboldened after Merkel's flabby showing in last year's election. That vote installed the anti-immigration Alternative for Germany (AfD)—one of whose leaders suggested shooting refugees at the border as a last resort—as the largest opposition party.

Merkel's most vociferous antagonists look abroad with envy. Over the border in Austria, Sebastian Kurz, who was 19 when Merkel came to power in 2005, gained the chancellery last year in an alliance with the far-right Freedom Party. In Hungary, Viktor Orban's brand of anti-immigrant populism won him a resounding electoral victory this year. Italy's populist Lega party entered government after extending ▶

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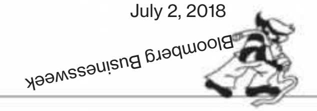

◀ its traditional northern support deep into the south with anti-immigrant rhetoric.

With public opinion shifting, CSU leader Horst Seehofer sensed his moment. Defying Merkel, he threatened to use his powers as federal interior minister to start turning back migrants at Germany's frontiers. If he follows through, the chancellor will either have to perform a humiliating climbdown or sack him, risking a rift with his Bavarian party that could deny her coalition its parliamentary majority.

Seehofer says he'll start rejecting migrants who were already registered in another EU country unless Merkel manages to get a deal that achieves the same result at a June 28-29 summit of EU leaders in Brussels. The outcome is already in doubt: Orban and his allies in Poland, Slovakia, and the Czech Republic, all of which refuse to accept any refugees at all, boycotted a preliminary meeting on migration on June 24.

Migration is "a European challenge that requires a European answer," Merkel says, arguing that Germany would risk undermining EU unity by taking unilateral action on its borders. Acting collectively is "one of the most decisive issues in holding Europe together."

That message falls on deaf ears in Italy, the biggest arrival point for the third straight year for migrants crossing the Mediterranean. There, Seehofer's counterpart, Matteo Salvini, is turning away humanitarian vessels and demanding more help from the rest of Europe.

The paradox is that Merkel might be Italy's best hope for achieving a comprehensive agreement on migration. If she were toppled and replaced by a hard-liner, the new German leader would be unlikely to ignore Salvini's provocations and heed Italy's pleas for help.

No leader is indispensable, and after almost 13 years of Merkel, German voters have a right to call for change. The standoff that threatens her ouster may not come, since Bavaria's CSU is vying to maintain its absolute majority in Bavarian regional elections in October in the face of a challenge by the AfD, and it has little interest in stoking national instability.

But with the political forces massing against Europe—from demagogues to refugees—and leaders in Russia and the U.S. with no qualms about upending trans-Atlantic relations, Merkel looks like she's preparing to fight to hang around for a while longer. Her aim: defend an outpost of consensus-driven politics that appears to be increasingly exceptional in today's world. For Brookings's Stelzenmueller, Merkel's "incremental, dilatory, piecemeal approach" can be "infuriating." That's especially so "when you sense that there's a tsunami approaching the borders of Europe and the levees just aren't high enough."

And yet it was just that approach—derided on all sides—that resulted in a coalition willing to write the checks that held the euro together when Greece's financial troubles promised to blow it up. Starting in early 2010 and through countless make-or-break summits for the next five years, Merkel brought along a reluctant German parliament while holding off urgent calls to do more, faster.

In the end, Greece got some $280 billion in loans, and Ireland, Portugal, Spain, and Cyprus also received financial rescues in exchange for deeply unpopular and painful spending cuts. Youth unemployment in Greece reached 60 percent in 2013; even now it's about 44 percent. Throughout, Merkel held the line, urging everyone "to do their homework." With the help provided by Mario Draghi's European Central Bank, Europe is on the mend.

But years of being belted around have taken their toll. In Italy, Greece, and across swaths of southern Europe, Merkel—held up by fans as Europe's savior—will forever be seen as the relentless enforcer of fiscal discipline, and her political demise would be cheered as the final curtain on the age of austerity.

Officials in France might feel relief that the EU's dominant figure had finally released the bloc's tiller. French President Emmanuel Macron once dismissed Germany's dedication to running up budget surpluses as a "fetish." Many in Poland, Hungary, and Eastern Europe, backers of her emphasis on austerity, would see her fall as a vindication of their hard line on refugees.

The contumely heaped upon the 63-year-old Merkel stands in stark contrast to the image she cultivated at home as she established herself as Europe's indispensable leader. Although she has degrees in physics and chemistry, she was photographed in her early years as chancellor wheeling a shopping cart through her local food store, trailed by her security detail. She even bagged her own groceries and boasted she makes a mean potato soup. She and her second husband, Joachim Sauer, rejected the sprawling living quarters in the chancellery and instead live in her 19th century apartment building in Berlin's central Mitte district.

Yet just as Merkel's ambition—and ruthlessness—were underestimated on her way up, in what must surely be her final term, her ability to hold Europe together is overlooked.

The one place where her European clout is clearly understood is Washington. The dominant image of the Group of Seven summit in Canada was of Merkel in front of her fellow leaders bearing down on an obviously petulant President Trump, sitting with his arms crossed, his chin jutting out. Her standing in Europe is one reason he's so keen to undermine her. In a recent series of factually incorrect tweets, he conflated migration to Europe with crime—as he's done at home—and suggested Merkel was on the ropes as a result.

"The people of Germany are turning against their leadership as migration is rocking the already tenuous Berlin coalition," Trump said. "Crime in Germany is way up. Big mistake made all over Europe in allowing millions of people in who have so strongly and violently changed their culture!"

For the president, "Merkel represents that somewhat old-fashioned, open-borders idealism that's rapidly disappearing in Europe," says Nile Gardiner, director of the Heritage Foundation's Margaret Thatcher Center for Freedom in Washington. "Donald Trump is at heart a Europe skeptic. He's not a believer of the Europe project, while Merkel is the guardian of the Europe project." Ⓑ —*With Nick Wadhams*

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BUSINESS

Netflix has brought Hollywood to its knees. Beating Bollywood may be harder

Addressing a room filled with New Delhi's business elite earlier this year, Netflix Inc. Chief Executive Officer Reed Hastings offered a prediction: His company's next 100 million customers will come from India. The crowd grew silent as the man interviewing Hastings, local entrepreneur Ronnie Screwvala, chuckled. Netflix has fewer than 1 million customers in India, and even aggressive forecasts by analysts suggest the video service will reach only 3 million by 2020. Hastings just smiled mischievously.

Netflix didn't regard India as much of an opportunity when it first expanded there in January 2016. The company has built the world's largest paid online TV network by taking advantage of the proliferation of high-speed internet to deliver a video service that's cheaper and easier to use than cable or satellite TV. But Netflix's average monthly price in India of 500 to 800 rupees ($7 to $12) is twice as much as the average pay-TV offering. Fewer than 10 percent of Indian households with TV pay for a premium TV service that costs more than Netflix. Equally challenging: The vast majority of titles on Netflix's service in India are in English, but films there fare best when in Hindi or Tamil.

Yet India has zoomed up Hastings's priorities in the past two years as local telecommunications companies invested billions of dollars to bring the country online. More than 150 million people have access to broadband of some kind, mostly via their phones.

Indians with access to fixed broadband at home—Netflix's proxy for would-be binge watchers—now number about 50 million, up from 20 million two years ago, company officials say. "Even we couldn't predict the last two years of Indian internet growth," Hastings says. "It's the most phenomenal example anywhere in the world."

Investors value Netflix at more than $170 billion because they believe in its potential to attract customers in the world's largest economies. The U.S. market is already saturated, and growth in Latin America and Europe is under way. China isn't welcoming Western video services, so India represents Netflix's biggest opportunity in Asia.

Since opening an office in Mumbai in 2017, Netflix has hired an executive to oversee scripted programming for India and spent the past 18 months selling itself to local filmmakers. Despite a global diaspora of Indians, taste in entertainment locally is stubbornly parochial. All but 1 of the 20 highest-grossing movies in India are local productions. To curry favor with audiences raised on Hindi fare, Netflix is commissioning original TV shows and movies more quickly than it has in any market, even the U.S. The service has already released a couple of movies in

Edited by James E. Ellis

ILLUSTRATION BY JORDAN METCALF. COURTESY NETFLIX. DATA: NETFLIX, BLOOMBERG, WORLD BANK

2018 and plans as many as 17 projects next year.

In July, Netflix will release its first drama series, *Sacred Games*, an adaptation of Vikram Chandra's novel about the criminal underworld. Bollywood stars Saif Ali Khan and Nawazuddin Siddiqui play a cop and a crime boss whose lives intersect. The show was filmed in Mumbai and is primarily in Hindi, a condition Chandra set. Another U.S. TV network had been lined up for production, but the author was uncomfortable with Mumbai gangsters speaking English. Netflix obliged, convinced the show would resonate with locals, as well as the approximately 50 million people of Indian origin living elsewhere. "We're becoming a global distribution platform for Indian content," says Erik Barmack, head for international original series at Netflix. "The one thing we've seen that we want to steer away from is the idea of global TV being a French cop and an Italian cop and having them speak English."

Barmack's fast-growing division aims to release a new show in a foreign language every day next year, Netflix said at a recent town hall for agents. He spends every day scouring talent factories from Madrid to Mexico City for filmmakers eager to tell a story different from the routine tales of their home country. The Mumbai film community is "as big if not bigger of a world than Hollywood in terms of size and talent," he says.

Barmack's search led to a meeting with Vikramaditya Motwane of Phantom Films, a production company founded by four colleagues tired of Bollywood—the Mumbai-centered Hindi film industry that produces almost 2,000 movies a year, more than anywhere else in the world. Part opera, part circus, and part rock concert, Bollywood movies hew to a formula of music, dancing, and romance.

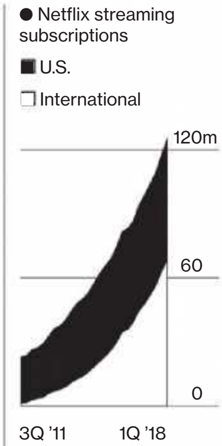
Since childhood, Motwane was more drawn to the drug abusers, hit men, and serial killers of Western cinema and to directors such as Danny Boyle, Quentin Tarantino, and David Fincher. He found a kindred spirit and filmmaking partner in writer and director Anurag Kashyap, who was raised on the noir novels of James M. Cain.

India's studios didn't share their enthusiasm for gritty, violent fare—qualities that often run afoul of censors. The pair's crime thriller, *Paanch*, has never been released, because the Indian censorship board objects to its language, the use of marijuana, and the depiction of masturbation. Netflix executives were drawn to the edginess, however. Kashyap and Motwane directed every episode of *Sacred Games*.

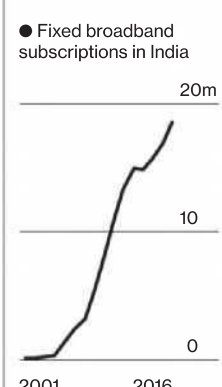
In addition to more-challenging stories, Netflix will also give subscribers on the subcontinent another challenge: higher prices. Pay TV in India consists mostly of low-brow soap operas and sports and costs the equivalent of a couple of dollars a month. "Netflix is at the other end of the spectrum in India," says Mihir Shah, an analyst with Media Partners Asia Ltd. "It's the most premium subscription service." At its current price, Netflix will appeal only to the 10 million or 15 million people who now pay for high-end TV service and have broadband at home, Shah says. Others will watch YouTube on their phone or subscribe to one of many rival services that cost less, such as Amazon Prime Video or 21st Century Fox Inc.'s Hotstar.

Netflix says it has no plans to adjust its price in India, but some subscribers could get lower rates if their local pay-TV and phone operators strike deals with the streaming service, as T-Mobile USA Inc. does for some wireless customers in the U.S. Netflix has discussed partnerships with Bharti Airtel Ltd. and Reliance Jio Infocomm Ltd., two of India's largest telecommunications companies, and has announced a deal with Vodafone Group Plc's India unit to bundle a free year of Netflix with certain mobile plans.

Netflix executives are also anticipating they can overcome the not-invented-here challenge. Netflix has released original series in English, Spanish, Portuguese, Tagalog, and Danish so far this year, with shows in Japanese on the way. Management says many of their international series, including the Brazilian *3%* and the German *Dark*, have been global hits. "It's too simple-minded to think, Well, Bollywood is huge, so they mostly watch Indian content in India," says Todd Yellin, Netflix's vice president for product. "We got Americans to watch a Brazilian show and German show in numbers that are unprecedented. It gives me confidence we can get Indians excited to watch great stories from all the other countries." —*Lucas Shaw*



▼ *Sacred Games*, a crime drama, is Netflix's first original series in India



THE BOTTOM LINE Netflix's growth is topping out in the U.S., but investors are betting it can expand in international markets such as India, where broadband is booming.

Where EV Batteries Go To Retire

● Businesses are devising uses for cells that will be discarded as electric cars age

In the basements of the three towers of a Gothenburg, Sweden, apartment complex, silver cabinets about the size of large refrigerators hold 20 battery modules recovered from Volvo hybrid autos. The cabinets store energy from rooftop solar panels to run the elevators and lights in the common areas. "I was a bit suspicious at first," says Lennart Nord, caretaker of the buildings. "So far, it's worked without a hitch."

The batteries were installed by Box of Energy AB, a Swedish energy-storage company working with Volkswagen AG's Porsche unit and Zhejiang Geely Holding Group Co.'s Volvo Cars to give old batteries a second life and keep them out of the world's landfills.

The first batches of batteries from electric and hybrid vehicles are reaching retirement age. Finding ways to reuse them is becoming more urgent: A global stockpile of aging batteries is forecast to exceed the equivalent of 3.4 million packs by 2025, up from about 55,000 this year, according to calculations based on Bloomberg New Energy Finance data.

General Motors, BMW, Toyota Motor, Chinese automaker BYD, and a clutch of renewable-energy storage suppliers such as Box of Energy, Powervault, and Relectrify are among those trying to create an aftermarket for—and a new revenue stream from—aging batteries. "The car manufacturers have an upcoming problem and one that we are already starting to see: this massive volume of batteries," says Johan Stjernberg, Box of Energy's chief executive officer. "The market will be enormous for second-life applications with storage."

Lithium-ion car and bus batteries can collect and discharge electricity for an additional 7 to 10 years after being stripped from chassis. A typical EV battery retains about 50 percent to 70 percent of its power capacity upon removal, says Tom Zhao, managing director of global sales for BYD Co.'s battery group. By 2025 as many as 75 percent of spent EV batteries will be reused, says Hans Eric Melin, founder of Circular Energy Storage Research & Consulting. "It's just like you can take an alkaline battery out of your flashlight and put it into a remote control, and it'll still be good enough," he says.

China, where about half the world's EVs are sold, is instituting rules in August to make carmakers responsible for expired batteries. The European Union already has such regulations, and the industry expects the U.S. to follow.

Vehicles already are the biggest users of lithium-ion batteries, according to consultant Avicenne Energy. By 2030 there will be a 25-fold surge in battery demand for electric cars and buses, forecasts BNEF. By 2040 more than half of new-car sales and a third of the global fleet—559 million vehicles—will be electric. "The logic behind this is the circular economy," says Cécile Sobole, program manager for Renault SA's EV business. "The battery coming from the electric vehicle will become more and more a part of the energy world."

When EV batteries start to fade, they deliver fewer miles of driving per charge and start requiring more frequent recharging. They will typically be swapped out after about a decade in family cars and about four years in buses and taxis. Even then, they're still ideal for less-demanding tasks such as storing electricity from solar panels and wind turbines and hoarding power from a regular grid connection at off-peak hours, when prices are lower.

Toyota Motor Corp., which makes the Prius hybrid, will install retired batteries outside 7-Elevens in Japan next year. The hybrid cells will store power from solar panels and then use the juice to run the drink coolers, fried chicken warmers, and sausage grills inside the convenience stores. Eaton Corp. has worked with Nissan Motor Co. on smartphone-controlled storage units using retired batteries from the automaker's Leaf EV. With prices for the units

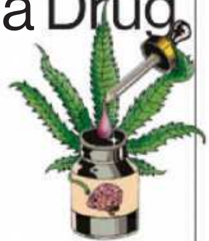
◀ A circuit board sits atop lithium-ion battery cells to be used in a Powervault energy storage system

SIMON DAWSON/BLOOMBERG. ILLUSTRATION BY NICHOLE SHINN starting at $5,000, the companies are targeting sales of more than 100,000 by 2021. Says Hideyuki Sakamoto, a Nissan executive vice president, about the company's wide-ranging retired battery efforts: "We are prepared to develop a business model and make a profit." —*David Stringer and Ma Jie, with Niclas Rolander and Jeremy Hodges*

THE BOTTOM LINE By 2030 there'll be a 25-fold increase in demand for batteries for electric vehicles. Companies are trying to build businesses around the used power cells.

Why the FDA Is High On a Marijuana Drug

● GW Pharmaceuticals' epilepsy treatment is the first pot-derived medicine approved in the U.S.



GW Pharmaceuticals Plc grows about 20 tons of cannabis annually at greenhouses the size of football fields in an undisclosed corner of the English countryside. But you can forget about getting blazed to *Family Guy* reruns with this crop. The plants, genetically modified to remove the psychoactive properties, are used to produce Epidiolex, a prescription drug for children with severe epilepsy. The U.S. Food and Drug Administration approved the treatment on June 25, making it the first prescription medicine derived from cannabis permitted to be sold in the U.S.

The decision is a boost for the U.K.'s biotech industry and bolsters the nation's position, according to the United Nations, as the biggest producer of cannabis for medical and scientific purposes. That's despite the U.K. government's steadfast opposition to legalization of medical marijuana. "It's a watershed event to get FDA approval," says Sasha Kaplun, vice president for corporate development at Auxly Cannabis Group Inc., an investment partnership in Toronto. Approval should help alleviate skepticism among some physicians about the plant's medical uses, Kaplun says.

Epidiolex sales could reach $1.3 billion by 2022, say analysts at Cowen & Co., dwarfing GW's revenue of $17 million last year. In anticipation of approval, investors sent the company's market value soaring to more than $4 billion, making it one of the world's most valuable publicly traded weed farmers, alongside Canadian conventional medical marijuana makers Canopy Growth Corp. and Aurora Cannabis Inc.

GW is eager to distance itself from the craze around pot stocks. At the company's headquarters in London's Mayfair district, a preferred locale for hedge funds, the dress code leans toward suits and ties rather than tie-dyes. Shelves are lined with glass statuettes of cannabis leaves, but they commemorate stock market listings led by blue-chip underwriters such as Morgan Stanley and Bank of America Corp.'s Merrill Lynch. "We're an unusual company, and I get that we probably wouldn't have quite the level of media interest if we were developing something from a source no one had ever heard of," says Chief Executive Officer Justin Gover. "But what is more important is what our medicines do, rather than where they come from."

Patients with Lennox-Gastaut syndrome, a rare form of epilepsy, who took Epidiolex in an advanced clinical test in 2018 were far less likely to experience seizures than those who were given a placebo. The intractable disease puts children at risk of developmental delays and even death.

While the drug can reduce the frequency of seizures, only a few patients saw a complete halt in them, says Shlomo Shinnar, who runs the Comprehensive Epilepsy Management Center at Montefiore Medical Center in New York. "It's effective, but that's not the same thing as making you seizure-free," says Shinnar, whose center has used the drug in clinical trials and through GW's compassionate-use program for patients with few alternatives. "People want to be seizure-free, and if they aren't, they'll try another drug if it comes along."

Epidiolex's active compound, cannabidiol, produces an anticonvulsant effect through its interaction with various ion channels, which are prominent components of the nervous system. GW scientists manipulate four areas of the marijuana plant's DNA to achieve the desired levels of chemicals, breeding it to be high in cannabidiol and low in tetrahydrocannabinol, or THC, the chemical associated with getting high. THC is further reduced to trace amounts during manufacturing.

GW hasn't disclosed what it intends to charge for Epidiolex, but winning approval in the world's largest drug market could ease a stigma that's restricted research into the medical benefits of the pot plant. Says Gover: "There's more to cannabis than people just getting high." —*Thomas Buckley, with John Lauerman*

THE BOTTOM LINE While medical marijuana has been used for years as a pain treatment in many states in the U.S., the FDA just approved the first cannabis-derived prescription drug.

● Forecast of Epidiolex's revenue by 2022

$1.3b

ILLUSTRATION BY BRIAN BLOMERTH

TECHNOLOGY

A.I. Has a Race Problem

▶ Kairos CEO Brackeen

PHOTOGRAPH BY YAEL MALKA FOR BLOOMBERG BUSINESSWEEK

● Facial recognition software still gets confused by darker skin tones

Edited by Jeff Muskus and Robin Ajello

A couple of years ago, as Brian Brackeen was preparing to pitch his facial recognition software to a potential customer as a convenient, secure alternative to passwords, the software stopped working. Panicked, he tried adjusting the room's lighting, then the Wi-Fi connection, before he realized the problem was his face. Brackeen is black, but like most facial recognition developers, he'd trained his algorithms with a set of mostly white faces. He got a white, blond colleague to pose for the demo, and they closed the deal. It was a Pyrrhic victory, he says: "It was like having your own child not recognize you."

At Kairos AR Inc., his 40-person facial recognition company in Miami, Brackeen says he's improved the software by adding more black and brown faces to his image sets, but the results are still imperfect. For years the same problem has bedeviled companies including Microsoft, IBM, and Amazon and their growing range of customers for similar services. Facial recognition is being used to help India's government find missing children, and British news outlets spot celebrities at royal weddings. More controversially, it's being used in a growing number of contexts by law enforcement agencies, which are often less than forthcoming about what they're using it for and whether they're doing enough about potential pitfalls. Brackeen believes the problem of racial bias is serious enough that law enforcement shouldn't use facial recognition at all.

Microsoft, IBM, and China's Face++ misidentified darker-skinned women as often as 35 percent of the time and darker-skinned men 12 percent of the time, according to a report published by MIT researchers earlier this year. Such software can see only what it's taught to see, which has been mostly white men.

In recent months, major vendors say they've diversified their training data sets to include darker-colored faces and have made strides in reducing bias. Microsoft Corp. announced on June 26 that it would release a version of its software tool Face API that now misidentifies darker-skinned women, the group for which it's most error-prone, only 1.9 percent of the time and is 100 percent accurate for other groups. International Business Machines Corp. says its Watson Visual Recognition, which is similarly at its weakest in identifying darker-skinned women, gets it wrong 3.5 percent of the time. Both IBM and Microsoft acknowledge their results haven't been independently verified and that real-world error rates could be different from those for tests using stock images. The makers of Face++ didn't respond to requests for comment.

It's Amazon.com Inc. that may have to worry most about real-world results. On June 15 a group of Amazon shareholders sent the company a letter asking it to stop marketing its Rekognition system to police departments and other government agencies until guidelines are developed to ensure the software isn't leading to civil rights violations. In another letter the following week, Amazon workers asked Chief Executive Officer Jeff Bezos to stop selling Rekognition to law enforcement agencies given "the U.S.'s increasingly inhumane treatment of refugees and immigrants." Amazon declined to comment for this story.

Government agencies have no broadly agreed-upon standards for evaluating facial recognition systems. A 2016 Georgetown University study found that almost none of the law enforcement agencies that use facial recognition require a minimum threshold for overall accuracy, let alone racial disparities. "An inaccurate system will implicate people for crimes they didn't commit and shift the burden to innocent defendants to show they are not who the system says they are," says Jennifer Lynch, senior staff attorney for the Electronic Frontier Foundation, an advocate for civil liberties online.

And the problem isn't just in the U.S. Civil rights activists in the U.K. recently obtained records regarding law enforcement's use of facial recognition. The results were terrible. For example, the South Wales Police, which used facial recognition to screen people at public events, reported more than 90 percent of matches were erroneous. The department says on its website that the use of facial recognition had been a "resounding success." It didn't respond to an interview request.

Makers of facial recognition technology, including Microsoft and IBM, have said the software continues to be a work in progress, with engineers focused on improving accuracy and transparency around how the improvements are being made. They say the technology has helped bust sex traffickers and apprehend would-be terrorists, though they've provided few details.

Andrew Ferguson, a law professor at the University of the District of Columbia and the author of *The Rise of Big Data Policing*, says using the powerful technology while it's still under development with scant regulation is dangerous. Law enforcement agencies have consistently botched their adoption of novel tech. "Police are beta-testing new technologies or piloting new ideas in policing without a vetting process to think through bias or how it might affect citizens' civil rights," he says.

Engineers are improving how they train algorithms as more agencies buy the software, but they may not be able to head off growing pressure for regulation. The authors of the Georgetown report call for laws governing how police departments use ▶

"An inaccurate system will implicate people for crimes they didn't commit"

ILLUSTRATION BY NICHOLE SHINN

◀ facial recognition and recommend that police test regularly for algorithmic bias. In April a group of civil rights organizations said it was "categorically unethical" to deploy real-time facial recognition analysis of footage captured by police body cameras.

Some, including the EFF's Lynch, argue that their concerns will only increase as the technology improves. An accurate image merged with personal information about an individual such as location, family ties, voting records, and the like can be pulled together by authorities using products such as those from Palantir Technologies Inc. to create a digital dossier on people without their consent or knowledge. "Even if we have a 100 percent accurate system, I don't want that system," Lynch says. "That means we can no longer walk around and interact with people without the government knowing who we are, where we are, and who we're talking to." *—Lizette Chapman and Joshua Brustein*

THE BOTTOM LINE Microsoft says it's cut its facial recognition error rate to zero for most demographics, but as with rivals, those numbers could rise in the real world.

Inside Amazon's People's Court

● Workers refereeing one another's firings has raised questions about fairness

Jane was working in Amazon.com Inc.'s Seattle headquarters when she was asked to a meeting with her manager and a human resources representative. Under a program called Pivot, they gave her a document outlining concerns about her work performance and spelled out three choices. She could quit and receive severance pay, spend the next several weeks trying to keep her job by meeting certain performance goals, or square off with her manager in a videoconference version of the Thunderdome, pleading her case with a panel of co-workers while her boss argued against her. Jane, who asked that her real name not be used to discuss a personal matter, chose the last one.

The employee appeal process is Amazon's latest experiment in managing its growing workforce of more than 500,000. When it announced the program last year, the company acknowledged it had been quick to fire people instead of trying to resolve problems in other ways. Executives recognized that poorly defined roles, dysfunctional teams, and peremptory managers were among the factors often left unexamined, according to a person familiar with the matter. Workers facing termination also lacked a forum to discuss such factors, the person says.

Amazon is borrowing a page from union grievance processes that don't apply to most corporate employees. But only about 30 percent of those who appeal their manager's criticisms prevail, meaning they can keep their jobs or seek new ones within the company with different bosses, according to people familiar with the matter. Eighteen months after its debut, the hearing process has created resentment and raised questions about fairness, according to current and former workers as well as attorneys familiar with their situations. "It's a kangaroo court," says George Tamblyn, a Seattle employment lawyer who helped one former Amazon worker plan her appeal earlier this year. "My impression of the process is it's totally unfair."

Amazon declined to share metrics about the program or answer specific questions. "Pivot is a uniquely Amazonian program that was thoughtfully designed to provide a fair and transparent process for employees who need support," the company said in an emailed statement. "When employees are placed in Pivot, they have the option of working with their manager and HR to improve with a clear plan forward, of leaving Amazon with severance, or of appealing if they feel they shouldn't be in the program. Just over a year into the program, we're pleased with the support it offers our employees and we're continuing to iterate based on employee feedback and their needs."

Employees whose direct managers recently changed tend to make compelling appeals, says a person familiar with the process. Workers who lose still get to choose between severance pay or a performance-improvement plan. The downsides of appealing include the stress of litigating a case against one's boss before strangers and trying to get along with a manager after publicly challenging him.

Jane says her manager had recently changed her job and set impossible new goals for her (deadlines within days for projects that required weeks). She had an hourlong meeting with a company-appointed "career ambassador" who listened to her concerns and said she'd have a few thousand words to rebut her manager's complaints about her performance. The ambassador later suggested revisions to her draft, including removing details Jane thought were important for the panel to consider.

Jane had the option of choosing one manager or three nonmanagers as her jury. She got a list of

"There's a huge financial incentive to reduce turnover, if you can do it in a sensible way"

potential panelists in advance, so she could look up their job titles, biographies, and work backgrounds using an internal phone tool and LinkedIn. Employees can dismiss some panelists they worry will be unsympathetic. It didn't help much, she says: At the hearing, the videoconference made it difficult to engage with any of the panelists on a personal level, and she sweat through her shirt. She wasn't invited to watch her boss's presentation, and he got the last word. She waited by the phone until the career ambassador called to tell her she'd lost.

The system could pay for itself by reducing the cost of worker departures. A company with a 10 percent turnover rate—meaning 1 in 10 workers leave each year (a conservative estimate for a tech company)—has to dedicate about 5 percent of its annual payroll to recruit, hire, and train replacements, says Fred Whittlesey, a compensation expert who previously worked for Amazon. For a company Amazon's size, those costs run into the hundreds of millions of dollars. "There's a huge financial incentive to reduce turnover, if you can do it in a sensible way," he says.

Amazon hired dozens of career ambassadors around the world to explain Pivot to employees. Yet the appeal process is so tough to navigate that it's created a steady stream of work for employment lawyers giving consultations to workers preparing for their appeals, say attorneys familiar with the process. Tamblyn says his client was forced to focus on performance issues highlighted by her manager instead of her recent job change within the company for which she had little time to adjust. "The fact that she was hired for one job and switched to another was a very important fact," says Tamblyn. "She wasn't allowed to present her case." Amazon declined to address this specific concern.

Seattle employment lawyer Alex Higgins says he's consulted with about 10 Amazon employees presented with performance-improvement plans. Four of those clients appealed, and one prevailed, he says. But even that client left for another job shortly after because the tension remained with his boss. "It doesn't really provide a long-term solution," Higgins says. "The people on the appeal panel say you're right, and they go away. Then you're still with the same boss, who thinks you aren't doing a good job."

After Jane's career ambassador called to tell her she'd lost the appeal, she had one business day to decide if she wanted to accept about one month of severance pay to leave or attempt to meet the goals of her performance-improvement plan. She chose to keep working. —*Spencer Soper*

THE BOTTOM LINE The employee-appeal process may help Amazon retain more of its 500,000 workers, but so far, panel members side with their peers only about 30 percent of the time.

Man vs. Machine | Lab Technicians

Modular automation from HighRes Biosolutions lets lab technicians quickly disconnect, move, and reconnect mobile carts containing robotic arms and other devices, expanding the range of experiments that can be performed at a single site.

The Benefit

One HighRes system can do the work of 20 to 30 lab techs with fewer errors, enabling faster development of drugs at lower cost, says Chief Executive Officer Peter Harris.

Innovator

Louis Guarracina, 44, co-founder and chief technology officer of HighRes Biosolutions Inc. in Beverly, Mass.

Background

Guarracina, a chemical engineer, founded HighRes in 2004 after leading lab automation at MIT, Harvard, and drugmakers including Novartis International AG.

ALAMY

Tasks

HighRes systems include incubators, freezers, carousels, centrifuges, robotic arms, scales, fluid handlers, and optical sensors, all linked by PC software that coordinates tests on hundreds of thousands of compounds a day.

The Verdict

Will automation replace lab techs? Steven Hamilton, director of education at the Society for Laboratory Automation and Screening, says the already relentless pace of laboratory automation will continue, but he doesn't see fewer lab jobs on the horizon. Instead, to keep pace with automation, "laboratory technicians need more education and more specialized education than they did in past decades." —*Michael Belfiore*

3

FINANCE

Dropping the Cash Bomb

● In property bidding wars, buyers are desperate for an edge. These startups say they'll back you

The most active real estate broker in the Pacific Northwest this year is a former Microsoft Corp. program manager who used to work on Bing. Tushar Garg isn't the typical salesman walking would-be buyers through carefully staged houses. He's co-founder of FlyHomes Inc., a three-year-old real estate brokerage in Seattle that promises to turn its clients into cash buyers.

The idea is relatively simple: A house hunter hires FlyHomes as her broker. When she's ready to bid on a home, she gives the startup a deposit of 5 percent of the bid price. FlyHomes then makes an all-cash offer for the property, using its line of credit from a bank. After the deal is done, it sells the house to the homebuyer once she's gotten a mortgage. In return, the company earns the typical 3 percent commission from the original seller.

In tight housing markets, this pitch can be seductive. Stories of house hunters "losing" several homes before getting a bid accepted are legion in greater Seattle, where prices have shot up faster than any other big metro area in the country for 20 months. Cash has long appealed to sellers, because it gives them certainty and puts money in their pocket more quickly. FlyHomes says more than half its offers are accepted.

In U.S. cities from San Jose to Charlotte, a cutthroat mentality has set in as a shortage of inventory pushes buyers to adopt ever more aggressive strategies. "At first, it was love letters" to sellers declaring how much the would-be buyer adored the property, says Aaron Terrazas, senior economist at Zillow. That was followed by buyers waiving their right to back out of a deal if a home inspection turned up problems or if their financing fell through. People also shortened the time in which they were willing to close. "In these markets," Terrazas says, "buyers are doing whatever they can."

Seattle is adding thousands of high-paying jobs a year as Amazon.com Inc. and other tech companies expand their footprints in town. Yet the supply of single-family homes hasn't kept pace with demand. Homes went into contract on average in just seven

Edited by Pat Regnier

ILLUSTRATION: FRODE SKAREN

days in Seattle in May, according to brokerage Redfin Corp. Things move even faster in Denver. “The inventory problem is not going away overnight,” says Stephen Lane, co-founder and chief executive officer of FlyHomes. “Either we can ignore it, or we can provide a level playing field.”

After the Great Recession, the proportion of homes bought with cash climbed steeply, in large part because deep-pocketed institutional investors began snapping up single-family homes they planned to rent. While that activity has cooled, cash buying is still a major part of the market. Through March of this year, it accounted for about 30 percent of transactions tracked by Redfin. That’s compared with less than 20 percent during the height of the last housing boom.

FlyHomes’ ability to turn clients into cash buyers exploits a quirk in the capital markets that’s arisen since the housing meltdown: Consumers are being put through more rigorous standards when they apply for a mortgage. Meanwhile, it’s comparatively easy for companies—even those with new, barely tested ideas—to get buckets of money from banks, venture capitalists, and other institutional investors.

The VCs at Andreessen Horowitz led a $17 million funding round for FlyHomes in May. Two other companies—Ribbon and Knock—are pursuing similar models elsewhere in the U.S. Meanwhile, startups Opendoor and Offerpad LLC have raised imposing war chests to buy homes in cash and list them for sale. These companies charge a fee in return for the convenience of a fast transaction, but have nonetheless proved popular. Opendoor, which has raised $645 million in equity since launching in 2014, is buying homes at a rate of $2.5 billion a year across 10 metro areas. Zillow and Redfin are experimenting with similar models.

In addition to bringing its financial resources to the table, FlyHomes is trying to make homebuying more efficient by dividing up the various parts of the process and hiring specialists for each step, from negotiators to people who give home tours, Lane says. Garg, the co-founder, has often stepped in at the end and put his name on the sale to the buyer, which is why he catapulted to the top of the broker list in the Northwest. The company also offers its services in the Bay Area, Boston, and Chicago and plans to expand to Portland, Ore., this summer.

Redfin CEO Glenn Kelman says these new ventures are part of a shift in how homes will be bought and sold. “There is just money coming out of every possible part of the world, and it isn’t going toward the consumer,” he says. “It’s going toward real estate businesses who charge the consumer for access to that money.”

Then again, buying lots of homes is risky, even with someone else’s money. “To me a lot of these business models are highly dependent on a hot market where it’s easy to sell,” says Daren Blomquist, senior vice president at Attom Data Solutions. In a less frothy market, buyers “wouldn’t need someone to help submit a cash offer on one end. On the other side of the equation, if you did end up with inventory, it would be harder to unload it.”

Even if home values fall, Lane says, FlyHomes has a buffer for losses because of the deposit it requires and the fee it charges. Nor is it holding inventory for long. The company hopes that if prices cool, customers will appreciate the ways it tries to make buying easier—not just the ability to flash cash. —*Noah Buhayar and Patrick Clark*

THE BOTTOM LINE It’s not always easy for consumers to get a mortgage quickly, but money is abundant for startups that want to step into the homebuying process.

Billionaires Rescue Harvard From Poor Returns

● The richest endowment in higher education lags the Ivy League average, but the school is a fundraising powerhouse

Three years ago, hedge fund billionaire John Paulson offered his alma mater, Harvard Business School, an enormous gift. Nitin Nohria, the school’s dean, responded in a way that would shock most other charitable organizations: Thanks, but we don’t need it. Instead, Nohria suggested Paulson direct the money toward Harvard’s engineering school, according to people familiar with the exchange. So in 2015, Paulson did just that, giving $400 million, a gift the university called its largest ever.

This embarrassment of riches helped Harvard University raise more than $9 billion in its most recent fundraising campaign. That record haul represents a key achievement for Drew Faust, who steps down on June 30 as Harvard’s 28th president after an 11-year tenure. Among other bequests, she secured $150 million from Ken Griffin, founder of hedge fund Citadel Advisors, largely for financial aid. An additional $50 million for biomedical research came from the family foundation of industrialist and investor Len Blavatnik. The foundation of Glenn Hutchins, co-founder of private equity firm Silver Lake, gave $30 million ▶

● Faust

ILLUSTRATION: NICHOLE SHINN; PHOTOGRAPH: DAVID L. RYAN/THE BOSTON GLOBE/GETTY IMAGES

◀ in part to renovate undergraduate dorms.

Such benefactors, in effect, bailed out Harvard from Faust's other legacy: a decade of poor investment performance at the university's $37.1 billion endowment, higher education's largest. During that time, it returned an annualized 4.4 percent, compared with 5.9 percent for the average Ivy League school. By lagging the average, Harvard missed out on about $6 billion in investment gains over the past decade, according to an estimate by Wellesley College economist Phillip Levine. (His model made various assumptions, such as for spending rates.)

Like all elite colleges, Harvard is growing more dependent on a smaller group of superwealthy philanthropists. Almost one-third of the dollar value of gifts to all colleges in the last year came from a dozen donors, according to the Council for Aid to Education. At the same time, the percentage of alumni who give at all to colleges has been falling for two decades. Harvard graduates are far more loyal than those of the typical college; still, only 17.3 percent gave last year, the lowest level since 2000.

Jonathan Hoffman, Harvard class of 1969, says he gave "substantial sums" a decade ago but cut back to $100 a year—and now, nothing—because he didn't think an institution that pays its endowment managers millions of dollars a year needed his cash. He gives to Room to Read and Habitat for Humanity instead. "There are so many organizations in need," he says. Such sentiments may help explain why colleges are getting little sympathy in their attempt to roll back Congress's new tax on the richest endowments.

Harvard says 152,000 families contributed to its fundraising campaign, which it says improves society by expanding access to education and by advancing research. The university is committed to "a better Harvard and a better world," says Tamara Rogers, vice president for alumni affairs and development. Under Faust's tenure, Harvard, for the first time since the 1600s, started naming schools and deanships for donors. It named the engineering school after Paulson. (Michael Bloomberg, the founder and majority owner of Bloomberg LP, which owns *Bloomberg Businessweek*, made a $32 million gift for a leadership program, Harvard announced in 2016.)

Faust's successor is Lawrence Bacow, a former president of Tufts. As for the endowment fund, it got a new chief last year: N.P. Narvekar, from better-performing Columbia. —*Michael McDonald, Janet Lorin, and Ivan Levingston*

THE BOTTOM LINE Harvard's most recent fundraising campaign has brought in more that $9 billion, thanks in part to large donations from Wall Street's elite.

Goldman Sachs Meets Main Street

● Its online lender Marcus aims to be a "teddy bear." But sometimes consumer borrowers end up in a hole they can't get out of

Kade Parker had never heard of Goldman Sachs Group Inc. in 2016, when a letter from the bank offering his wife a loan arrived at his house in Hornbeck, La. (population 480). The 27-year-old oil worker had recently taken a pay cut and needed to reduce his monthly credit card bills. After calling to make sure it wasn't a scam, he says he took out a loan for around $15,000. "We were trying to move some money around, make it easier on us," Parker says. "I told them the situation, they said no problem." Then he got laid off, and a year and a half later he filed for bankruptcy, listing more than $135,000 in unsecured debt, including 10 credit cards and loans from online lenders SoFi, Prosper, and Affirm.

The Goldman Sachs loan came from Marcus, the online banking business the company started in 2016. Marketing to regular people was a surprising shift for Goldman, whose bankers advise on giant corporate mergers, trade for hedge funds, and manage money for multimillionaires. But Marcus has already attracted 1.5 million customers and made $3 billion in loans. It markets itself with direct mail and jokey commercials that paint the company as the responsible alternative to credit cards. Onstage at a CB Insights conference on June 20, Harit Talwar, the former Discover Financial Services executive hired to run Marcus, was reminded that Goldman Sachs was once compared to a "vampire squid" for its financial crisis dealings. Talwar said he'd like Marcus to be called a "lovable teddy bear."

● Number of Marcus customers
1.5m

That's why analysts and investors were surprised in February when Goldman said in a financial disclosure that as many as 20 percent of Marcus borrowers at the end of last year had credit scores lower than 660, which would put them in the subprime category. A spokesman for Goldman says that about 15 percent of its loans are subprime and that many of those borrowers had higher credit scores when they applied. Other customers saw their scores rise. "It's not our role to be

ILLUSTRATION: ANA BENAROYA

preachy, but it is also not our role to try and sell a drink at a bar to somebody who shouldn't be having the next drink," Talwar said at the conference.

Goldman Sachs doesn't disclose much information about Marcus's borrowers. But hundreds have filed for bankruptcy after taking Marcus loans, revealing details about their finances. They aren't a representative slice of Marcus borrowers. Unsurprisingly, since they're the ones who went bust, they're now deep in the red, often listing several credit cards, student loans, and debt to other online lenders. Some have payday loans. Those who filed for bankruptcy in April had an average of $83,500 in unsecured debt, almost twice their annual take-home pay. A handful had filed for bankruptcy before. One schoolteacher in Manassas, Va., appears to have had at least six credit cards and a loan from LendingClub Corp. for $18,750 when Goldman approved him for a $15,000 loan, according to his bankruptcy filing. A man in Springfield, Va., borrowed $34,634 from Discover, $13,691 from Goldman, and $33,354 from LendingClub on his way to incurring $203,757 in unsecured debt. His filing doesn't show the order of the loans. Goldman Sachs declines to say how many of its Marcus borrowers have gone bust. It projects credit losses of about 4 percent per year.

In a way, the company's foray into consumer lending is an opportunity created by the financial crisis. In 2008, a week after Lehman Brothers went under, Goldman became a full-fledged bank holding company so it could gain access to potential Federal Reserve funding that reassured investors. Since then, it's been taking in more deposits. The idea for Marcus came in 2014 at a meeting of the bank's top executives at the home of Gary Cohn, then Goldman's president. Online lenders were growing. Goldman's revenue was down from recent highs, and new regulations threatened to restrict the bank's profitable trading operations. Marcus was a way to put deposits to work. The bank says loans could grow to $13 billion within three years, adding $1 billion to its revenue.

The name Marcus, after one of the firm's founders, was picked to convey "humanity and personalization and freshness and energy," Talwar said at a conference last year. The real Marcus Goldman opened up shop in 1869 and walked the streets of New York in a top hat, buying notes, or IOUs, from merchants at less than their face value.

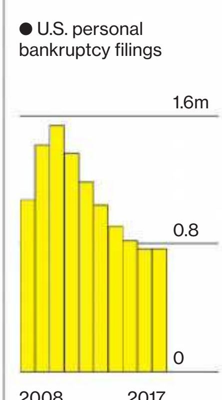
Marcus offers unsecured loans of $3,500 to $40,000 at rates of 7 percent to 25 percent. It doesn't charge origination fees or late fees. Its average loan is for $15,000 over four years with a 12 percent interest rate. Even with Marcus paying an above-average 1.8 percent interest rate to savers, that's a pretty good margin. Customers that *Bloomberg Businessweek* spoke with say they have no complaints, even if the loans didn't fix their financial problems. They say Marcus offered clear terms, sent money fast, and dealt with them politely. "We liked what we saw from them even though Goldman Sachs doesn't always have the best reputation, especially in middle-class America," says Joshua Fellows, 36, who was working at a mobile phone store in Columbus, Ohio, when he borrowed from Marcus. Fellows says his loan let him pay off some credit cards and owe Marcus $250 a month less, but that his bills were still too high, so he ran up his credit cards again.

Today, bankruptcies in the U.S. are at a low ebb. Guy Moszkowski, director for research at Autonomous Research, says that when the economy goes bad, the companies that got into consumer lending most recently generally take the most losses. For example, American Express Co. launched its first credit card allowing customers to carry a balance in the late 1980s. The company said it did a lot of research, but when a recession hit in 1990, it faced more defaults than competitors. "I worry a little bit that Marcus is going to have higher credit costs than they might be bargaining for if we get a recession in the next three years," Moszkowski says.

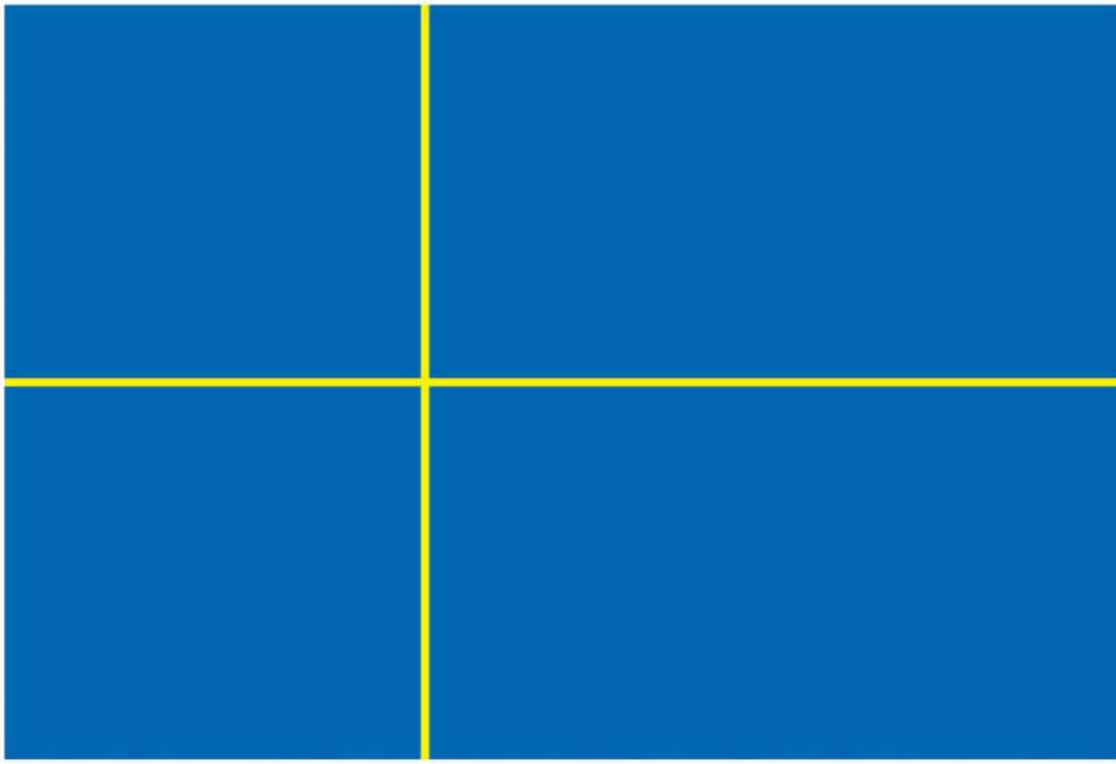
Even if every Marcus borrower stopped paying his bills tomorrow, it wouldn't put Goldman at risk. At its current pace, the bank would earn the money back from other businesses in less than six months. By the time Goldman launched Marcus, there were already a lot of startups offering term loans to consumers—among them LendingClub, Prosper, SoFi, and Best Egg. Goldman has said it can undercut its competitors because as a bank it can use its cheap deposits to fund its loans. Talwar said at the conference in 2017 that Goldman lends only to those who can afford to make their payments on top of all of their existing debt, even if they intend to use the loan to pay off their cards.

Goldman Sachs has said it isn't forcing Marcus to grow as fast as it could and that it's comfortable with the risks it's taking. Chief Executive Officer Lloyd Blankfein said onstage at an event in June that if customers can't pay unsecured loans, Goldman eats the loss—there's no home to repossess. "We will be the ones that will suffer," he said. "If they don't pay us back, we will be the ones on TV you'll feel sorry for." —*Zeke Faux and Shahien Nasiripour, with Sridhar Natarajan*

THE BOTTOM LINE Goldman Sachs is a bastion of elite investment banking, but it's looking for growth by lending to middle-class people at an average rate of 12 percent.



DATA: ADMINISTRATIVE OFFICE OF THE U.S. COURTS



The Thinning Swedish Welfare State

● The system is under strain from demographic changes and the refugee crisis

When the maternity ward at a local hospital in the Solleftea district of northern Sweden was shuttered early last year, expectant parents had no option but to brave a more than 100-kilometer (60-mile) drive to the nearest alternative. That's why local midwives began teaching couples a new skill: how to deliver a baby in a car.

A birthing course in response to leaner times would have been unusual even in a cash-strapped country. But Sweden is in the midst of its longest economic expansion in at least four decades, and the nation's state coffers are brimming. The government, which has posted budget surpluses every year since it came to power, projects a surplus of 0.7 percent of gross domestic product this year and 0.9 percent next year.

"We have money," says Hanna Hedvall, who worked as a midwife in Solleftea's maternity ward for six and a half years. "We may not be able to have specialist care across the country, but here we are talking about rather simple things."

Sweden, with a high birthrate and an aging population, has one of the biggest tax burdens in the world, and the marginal tax rate can reach 60 percent. The taxes are used to fund a system of cradle-to-grave benefits that are among the most generous in Europe. Citizens are entitled to heavily subsidized health care, free education, including university, and more than a year of paid parental leave—plus a pension when they retire. But in recent years, a need for increased welfare spending has coincided with a large influx of refugees. Sweden has absorbed more than 600,000 immigrants over the past five years, many from war-ravaged countries such as Afghanistan and Syria. That's a huge number for a country of 10 million people.

Edited by Dimitra Kessenides and Cristina Lindblad

As in Germany, there have also been reports of rising crime rates, deteriorating schools, and packed health clinics. The number of Swedes having to wait 90 days or longer for an operation or specialized treatment has tripled in the past four years. "The Swedish social contract needs to be reformed," a dozen entrepreneurs, including Nordea Bank AB Chairman Bjorn Wahlroos and Kreab founder Peje Emilsson, wrote in an op-ed in the newspaper *Dagens Industri* on May 31. "Despite high taxes, politics isn't delivering its part of the contract in important areas. We get poor value for money."

It's not only business executives who are complaining. Carl-Fredrik Bothen, a resident of Stockholm who's on a six-month paternity leave to care for his baby girl, worries that his pension may be in jeopardy. "I don't trust welfare at all. I need to build my own capital," he says. "The problem with immigration is that our welfare state is not quite dimensioned for it. Of course we should help people, and we have a good situation here in Sweden, but we can't handle an unlimited amount of people."

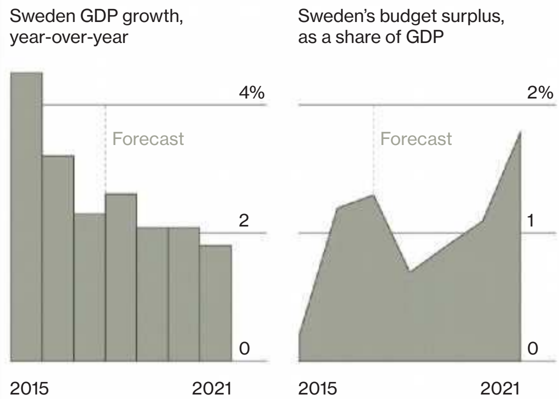
From the vote for Brexit to the election of Italy's new populist government, there have been warning signs across Europe of what can happen if this sort of discontent goes unaddressed. With Swedish national elections set for Sept. 9, polls show a slump in support for the ruling Social Democrats. In two recent surveys, the Sweden Democrats, a party with neo-Nazi roots, commanded more than 25 percent support, though political analysts are fairly confident that established parties will band together to form a government.

Since coming to power in 2014, the Social Democrat-led government has rolled back some income tax cuts instituted by the previous administration, arguing that the country needs to prepare for possible downturns. Sweden's population is expected to rise by 1 million people, to 11 million, in the 10 years through 2028. That's driven by an increase of 231,000 in the number of children and young people and 309,000 in retirees.

The total tax burden in Sweden rose to 44.1 percent of GDP in 2016, from 42.6 percent at the end of the previous government's tenure in 2014. That's the fifth-highest among the 35 countries in the Organization of Economic Cooperation and Development. "I don't think the level of taxes we have today is the absolutely highest we can have," Fredrik Olovsson, a leading Social Democrat and chairman of the parliament's finance committee, said at a recent seminar in Stockholm.

It's hard to imagine such words coming out of

Slowing, But Saving



a politician's mouth anywhere but in Scandinavia. Yet polls show that Swedes' tolerance for taxes is waning: In a February survey by Demoskop AB, the proportion of respondents who say taxes are too high jumped to 45 percent, from 27 percent in 2014.

There's also a general perception that taxpayers are getting less for their money. In the southern part of Lapland, a single police car patrols an area almost the size of Denmark. That might have been enough in the past, but Camilla Appelqvist, a store owner in the village of Dorotea (population 1,500), says times have changed. She's had three break-ins since February in which the intruders cleared out her stock of tobacco and snuff. When she called the police about the most recent incident, at 3:30 a.m., she was told there was no officer on duty and one would be dispatched the next day. "We have put bars on all the windows," Appelqvist says. "We have really caged ourselves in."

In Solleftea, demonstrations against the maternity ward closure are heading into the 18th month, with a small group of protesters trading shifts day and night. To mitigate the ▶

▼ A sign protesting the closure of a maternity ward in Solleftea

ILLUSTRATION BY 731; SPOT ILLUSTRATION BY NICHOLE SHINN; IZABELLE NORDFJELL/TT. DATA: SWEDISH NATIONAL FINANCIAL MANAGEMENT AUTHORITY; STATISTICS SWEDEN

◀ childbirth risks, the regional government started a program in which local midwives are assigned to shadow parents from the first ultrasound to delivery. Three mothers have given birth in their own cars since last year, while 16 others have delivered in ambulances.

Ellen Hedman, an engineer in Solleftea who was expecting her third child last August, thought about packing a tent for her 130km journey to the town of Sundsvall, just in case. The contractions started slowly, she says. They made their journey with the midwife following in her own car. Hedman gave birth at the hospital and returned home the same day. "It's frightening that childbirth isn't more prioritized," she says. "It feels like the whole system is deteriorating." —*Amanda Billner, Rafaela Lindeberg, and Niklas Magnusson*

THE BOTTOM LINE Despite high taxation and budget surpluses, Sweden's welfare system is under pressure from an aging population and hundreds of thousands of refugees.

India's Push to Fast-Track Bankruptcies

● Under a new code, cases must be resolved in nine months instead of the typical four years or more

On the third floor of a government complex in New Delhi, the National Company Law Tribunal's appeals court is crammed with lawyers wearing formal black suits and white neckbands that hark back to the British Raj. Two judges have just been seated by ushers in white-and-gold turbans. The lawyers start arguing. "Everyone knows who his real client is!" one yells, as the crush of surrounding advocates lean in to hear what's going on.

It might not be immediately apparent, but here in this courtroom, billions of dollars—and the reform record of Prime Minister Narendra Modi—are at stake. Before the court on this sweltering afternoon are assets belonging to one of many overextended Indian corporations, the bankrupt giant Essar Steel. One bidder is industry leader ArcelorMittal, which explains the presence here of Aditya Mittal, son of billionaire steel magnate Lakshmi Mittal. The other is a consortium backed by Russian investment bank VTB Capital, which has offered $5.4 billion. (The amount of ArcelorMittal's bid hasn't been disclosed.)

Essar, which owes creditors $7.6 billion, is one of a dozen large debtors that were ordered into bankruptcy court after India's central bank received additional powers to speed the process of winding down troubled companies. More than 2,500 bankruptcy cases are wending their way through India's notoriously slow legal system.

Until the special courts were established by the 2016 Insolvency and Bankruptcy Code, a bankruptcy could drag on for years. World Bank data show creditors in India recover just 26.4¢ on the dollar after 4.3 years; in the U.S. it's 82.1¢ on the dollar in just one year. Under the revised bankruptcy code, a case must be resolved within 270 days—otherwise the company is pushed into liquidation.

Some founders whose companies failed simply fled India. The most famous of these was Vijay Mallya, the flamboyant "King of Good Times" whose Kingfisher Airlines collapsed in 2012, leaving $1.4 billion in unpaid debts. The Modi administration is seeking his extradition from the U.K.

The backlog is a symptom of a much deeper problem. India's banking system is staggering under the weight of $210 billion in bad loans, 90 percent of them held by state-owned lenders, which has stoked fears the country could succumb to a full-blown financial crisis.

Raghbendra Jha, an economics professor at the Australian National University, says the pile of bad loans is a manifestation of India's crony capitalism. "You lend to a firm not because it has a high rate of return but because it has the right contacts," Jha says. "And these things are now being challenged and addressed."

The Reserve Bank of India has been waging a multiyear campaign to get state lenders to

● Creditors' recovery rate in a bankruptcy, in cents owed on the dollar

◀ An Essar iron plant in Hazira, Gujarat recognize nonperforming loans; it's been leaning on bank managers to cut off credit to "willful defaulters"—companies that have stopped servicing their debt even though they have the ability to pay. Modi's administration also has pledged $33 billion to recapitalize state banks.

The government's push to speed up the bankruptcy process has another dimension. Authorities are under pressure to help generate jobs for the 12 million young Indians joining the labor force every year. One way of doing that is to quickly find new owners for idle steel plants and other assets so they can be brought back online.

In India, the implementation of government policy is often chaotic. There aren't enough bankruptcy courts—only 10 nationwide—or judges to hear all the cases promptly and efficiently. At the appeals tribunal in New Delhi, the top judge has complained he can't hire support staff because the salaries on offer are too low. The courtrooms are overcrowded, with people spilling out into the hallway and bags of documents littering the floor.

The government has had to amend the law to stop business owners who default on debts from bidding on their own company's assets in the course of bankruptcy proceedings. In the Essar Steel case, a lawyer representing ArcelorMittal claimed that the VTB Capital-backed consortium was merely a front for the Ruia brothers, a pair of billionaires who control Essar Group, a conglomerate also involved in shipping and oil refining.

More important, some of the cases adjudicated by the tribunals are also getting bogged down in bitter, protracted legal challenges. Tata Steel's winning $5.1 billion bid for bankrupt Bhushan Steel Ltd. is being disputed by a rival bidder. The appellate tribunal recently put the Essar case on hold until late July, allowing the legal process to continue beyond the 270-day limit that would otherwise trigger a court-mandated liquidation.

Despite the problems, some India-watchers are upbeat about the direction the country is moving. "India's new bankruptcy code is now making a significant difference to the speed at which bankruptcy cases are resolved and the amount that creditors are able to recover," says Shilan Shah, a Singapore-based analyst for research company Capital Economics. "This bodes well for India's beleaguered banking sector and the economy more generally." *—Iain Marlow, with Upmanyu Trivedi*

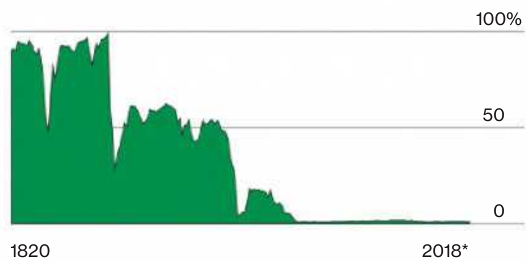
THE BOTTOM LINE Implementation of India's new bankruptcy code has been complicated, but observers are optimistic that it will help reduce pressure on banks and create jobs.

COURTESY ESSAR STEEL; DATA: WORLD BANK

Trade | Trump's Threats

Tariffs on imports were once the chief source of federal revenue. If all Trump's tariffs were imposed, their contribution to government revenue would be the highest since the 1930s. *—Peter Coy*

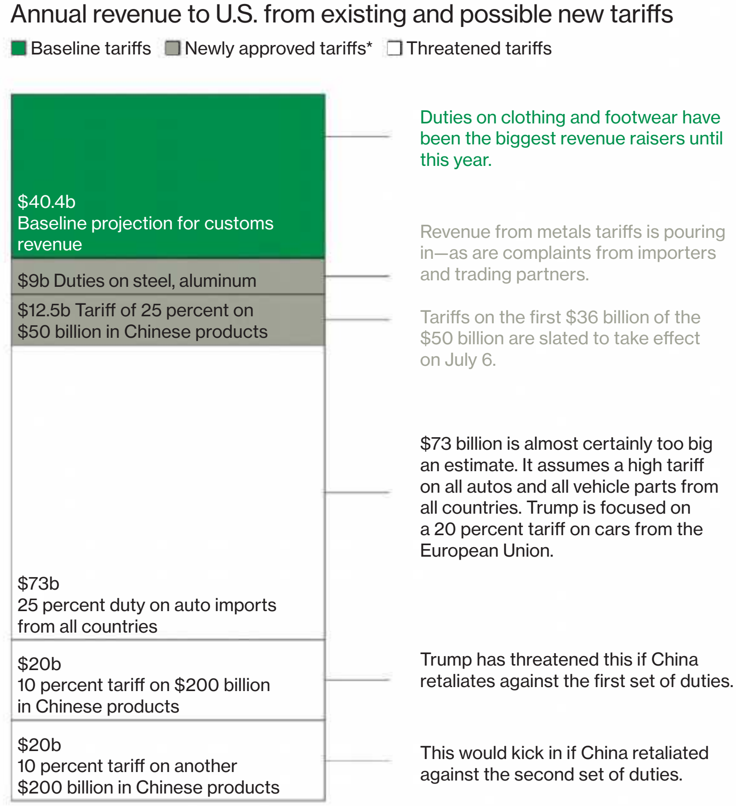
Share of federal revenue from customs duties



Before the tariff fight began, **1.2%** of federal revenue, or **$40b,** was expected to come from tariffs this fiscal year

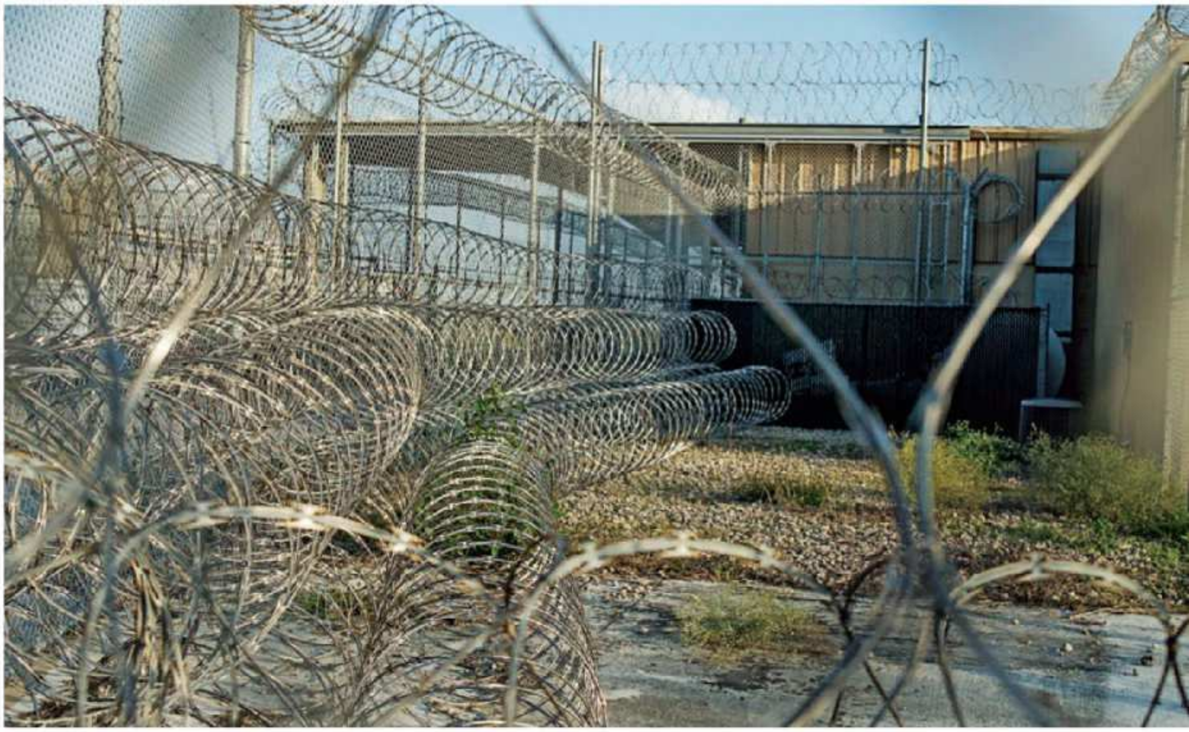
*2018 FORECAST FROM THE OFFICE OF MANAGEMENT AND BUDGET; DATA FOR 1843 ARE INCOMPLETE, SO THE FIGURE SHOWN IS AN AVERAGE OF THE PRECEDING AND FOLLOWING YEARS; DATA: CONGRESSIONAL RESEARCH SERVICE, OMB

Annual revenue to U.S. from existing and possible new tariffs



These Tax Foundation estimates assumed for simplicity that Americans wouldn't curtail purchases. In reality, they almost certainly would.

*NOT VISIBLE: $150M FROM DUTIES ON WASHING MACHINES; REVENUE FROM SOLAR PANEL TARIFFS NOT CALCULATED; DATA: TAX FOUNDATION, OMB



A Second Chance For Prisonville

● An ailing Texas town cheers the reopening of a privately run detention facility for immigrants

Joel Hernandez was promoted to sergeant by private prison operator Management & Training Corp. days before a riot broke out in 2015 at the Willacy County Correctional Center in South Texas where he worked. He escaped with his life—but not his job. Within months of the fiery uproar, the facility, a prison in Raymondville for immigrants awaiting deportation, was shut down. About 400 MTC employees, or 6 percent of the town's entire workforce, lost their jobs. Less than a month later the Obama administration promised the federal government would stop contracting immigration detention to private operators, including MTC.

The decision was a severe blow to this remote area of the Rio Grande Valley, the poorest pocket of Texas. For two decades, first as a resident of Raymondville and then as its mayor, Gilbert Gonzales had witnessed neighboring counties build roads, schools, and housing, while his own economy foundered amid floods, illicit gambling, rampant drug use, and fleeing industries.

Three years on, Willacy County's 11 percent jobless rate is almost triple the state average. Its farmers face the worst drought in decades. The two other prisons in Raymondville—known in the region as Prisonville—remain the biggest employers in a town excited about the prospects of a new Tractor Supply Co. store. But change is coming: President Trump and his hard-line immigration agenda have revived the Willacy County Correctional Center.

Trump, who describes the entry of undocumented immigrants as an invasion, made expanding the country's detention capacity a priority. He signed an executive order four days after his inauguration that enhanced federal agencies' ability to detain some of the 11 million undocumented immigrants in the U.S. He also called for a 40 percent budget increase for Immigration and Customs Enforcement in 2019, to $8.8 billion, earmarking

PHOTOGRAPHS BY JARED MOOSSY FOR BLOOMBERG BUSINESSWEEK

Edited by Matthew Philips

◀ Unemployment in Raymondville is almost triple the state average

almost $3 billion exclusively for detention. Facilities have opened across the country—including one in an old Walmart that's holding about 1,500 children 50 miles south of Willacy County, in Brownsville. As capacity has increased, so has the amount of time detainees spend in prison, to an average of 44 days in fiscal 2018 from 34.5 days in fiscal 2014.

The next weapon in Trump's war on immigration is MTC's building in Raymondville. At the facility on the outskirts of town—about a mile from the local high school on the other side of Interstate 69, which stretches to Brownsville on the border—MTC officials are working to eliminate all remnants of the riot. Massive Kevlar tents were erected within 90 days of President George W. Bush's 2006 order for a new immigrant detention prison. Large enough to hold 2,000 prisoners, the tents were at the center of the 2015 violence and have now been razed. The largest remaining structure could hold 1,200 people before the riot.

Crews zip in and out of the building on golf carts as workers update the grounds and its cells. MTC doesn't yet have a contract with ICE, but a company spokesman says it's in discussions. MTC is so confident, it held a job fair in late May to recruit administrators and guards. Among the applicants was Angie Moreno-Gongora, who worked for MTC until the riot. While employed at the complex, she sued for back wages in a case that was ultimately settled out of court. Now she's ready to go back to work for MTC, if the pay's right. "I want to work for MTC because I tell people, 'Don't tell me I can't find a $15-an-hour job here in Raymondville,'" she says. Moreno-Gongora agrees with Trump that deportations should occur swiftly and en masse. She calls due process "bureaucratic red tape."

When complete, the latest iteration of the correction center will be named the El Valle Detention Facility. It will account for one-third of Prisonville's 3-square-mile campus. MTC says the facility, like its other prisons, won't be used to detain children. And it should be a boon for the community's coffers: Last year, County Judge Aurelio Guerra estimated the county could see about $450,000 a year in additional revenue. Raymondville will benefit from the operation's sewer and water fees. It's unclear how many jobs the prison will create, though it will probably be a fraction of the 400 that were lost.

The facility could eventually become a political liability, just like the U.S. Customs and Border Protection site down the road in McAllen, now a hub for protesters demanding an end to the administration's policy of separating parents and children entering through the southern border. Like many in Willacy County, Mayor Gonzales is a Hispanic Democrat who voted for Hillary Clinton and opposes Trump's immigration policies. He recently toured MTC's facility and says he's impressed with the quality of its steel latrines and their proximity to the sinks. "It's still hard to swallow the pill that Trump won, and because of him a lot of our people will be detained in those facilities," says Gonzalez, who as a child migrant laborer picked cotton in the county. "But sometimes you ▶

"It's tough to turn away opportunities that can help build this community"

◀ have to sway in a direction you don't want to sway in if the sacrifice benefits the economy. It's tough to turn away opportunities that can help build this community."

Joel Hernandez, the former guard, fled for oil country after the Willacy facility was shuttered and now works for refiners across the state. He'd rather not see his hometown continuing to live up to the Prisonville nickname, especially in the service of Trump's policies. "When I come back to town, people here don't know any better," he says. "They don't know there's a big world out there. It's like they're all locked up in there with the prisoners."

Drive through Raymondville, and you see what Hernandez means. The marquee at the local theater has been smashed. Its doors are locked, as are those of most of the storefronts downtown. The rusted silos are infested with mosquitoes; there's no grain inside or livestock nearby. The farms that do exist are profitable, but only because they've leased their land to wind farms. "One more prison won't change any of this," says Ernesto "Lefty" Cavazos, chair of the Willacy County Democratic Party. "But if they're going to do it somewhere, they might as well do it here." —*Kartikay Mehrotra*

THE BOTTOM LINE A town of mostly Hispanic Democrats on the Texas border is supporting Trump's immigration crackdown to boost the local economy by reopening a detention center for immigrants.

The Conspiracy To Snatch Maduro

● Details surface of a failed attempt to oust Venezuela's president and put him on trial

The plot, code-named Operation Constitution, involved scores of captains, colonels, and generals from all four branches of Venezuela's armed forces. The goal was straightforward and seismic—to capture President Nicolás Maduro and put him on trial. The plotters, wearing blue armbands marked OC, were supposed to storm the presidential palace and main military base and stop the May 20 presidential election. Some of the planning took place in Bogotá, but Colombian and U.S. officials, who allegedly knew about the plot and winked from the sidelines, declined to provide active support.

Then something went wrong. In mid-May, several dozen servicemen, including one woman, as well as a couple of civilians, were secretly arrested—some have been accused of treason—and imprisoned by a military court. Many say they've been tortured. The plotters believe they were betrayed, possibly by a double agent. This reconstruction of the conspiracy is based on interviews with one plot coordinator who escaped arrest, two who attended planning sessions, and lawyers and relatives of the accused. All spoke on condition of anonymity, fearing for their safety. Bloomberg also viewed a military court report laying out the government's version of events; it corroborated many of the plotters' accounts.

Details of the failed coup, probably the biggest threat to Maduro in his five years in office, haven't been reported before, though a military blogger in the country has alluded to it. Once rich and relatively democratic, socialist Venezuela has devolved into a dysfunctional, authoritarian petrostate. The country is beset by hyperinflation and severe food and medicine shortages. Hundreds of thousands have fled to neighboring Colombia, which for decades battled Marxist guerrillas backed by Maduro and his predecessor, Hugo Chávez, who himself led a failed coup against the Venezuelan government in 1992. A decade later, as president, he beat back a coup.

Some members of the Venezuelan military say the only hope for a return to stability is to replace Maduro by force. That remains unlikely after the coup's failure. The president holds sway over all major institutions; he's never been a military man but has worked hard to win the loyalty of top brass. And while his reelection in May was widely condemned as fraudulent, it reaffirmed the sense that he's firmly in power. The coup attempt, however, indicates that parts of the security services are roiling with discontent—and Maduro has taken note. At a military parade on June 23 he declared, "It's time to close ranks and dig in against treason! We need a united military loyal to the glorious country of Venezuela and its legitimate commander-in-chief!"

The military tribunal report on the plot, participants say, contains both fact and fiction. Its key assertion is undisputed: In May high-ranking officers from all four branches of the security services attempted an insurrection. But those interviewed reject the most dramatic claims, including that the U.S. and Colombian governments provided financial backing and that there was a separate plot, Operation Armageddon, which called for Maduro's assassination at a military parade in July 2017.

The U.S. has "no intent to destabilize or overthrow the Venezuelan government," says a State Department spokesperson, but wants "a return to a stable, prosperous, and democratic Venezuela." Speaking in Texas in February, as coup preparations were coming to a head, then U.S. Secretary of State Rex Tillerson noted that militaries in Latin America frequently step in during crises. "If the kitchen gets a little too hot for [Maduro], I am sure that he's got some friends over in Cuba that could give him a nice hacienda on the beach," he said. Both Colombia and Venezuela declined to comment.

The military prosecutor asserts that María Corina Machado, a top opponent of Maduro's, took part in the plot. She and the participants say this is fiction aimed at besmirching and possibly jailing her. "This regime is once again trying to incriminate me," Machado says in an interview in Caracas. "I have no connection to these plots. They want to silence my voice, because I have labeled them a narco-dictatorship. I want to be clear: I want Nicolás Maduro out of power immediately. But I want him out alive so he can face the justice that his regime has denied to Venezuelans." Both the government and the plotters have reason to exaggerate as well as to downplay what happened: The plotters want foreign support and more officers to join the next effort and hope to protect those who've been caught. The government seeks to justify a purge, which has begun, while claiming to be in full control.

Participants say the coup was first planned for April 2017 to stop Maduro from expanding his powers over Venezuela's legislature. But an unrelated and much smaller military rebellion caused the participants to pull the plug. Planning continued into 2018, with secret meetings being held in homes in an upscale part of Caracas. At one point, a participant snuck across the border from Colombia wearing a fake mustache and using a false ID.

Elements of discontent among the security forces began to appear a year ago when Oscar Pérez, a police officer and pilot, commandeered a helicopter and lobbed grenades at government ministries. Maduro blamed the attack on Major General Miguel Rodríguez Torres, a former intelligence chief who broke with the government in 2015. Pérez was later killed in a raid. By January, arrests of special forces lieutenants began. In March, Rodríguez Torres and some armored battalion commanders were arrested for attempted insurrection. He remains in prison.

The biggest set of arrests took place around the time of Maduro's reelection. Participants and their lawyers say the authorities picked up a Colombian civilian, the physician boyfriend of the only woman who participated in the coup attempt. They say he's been tortured, though he knew nothing of the plot.

Maduro has carefully cultivated his relationship with the military. Last year, when more than a million people joined antigovernment protests, he relied on his security forces to quash the unrest. Since Chávez's death in 2013, Maduro has handed over large parts of the economy to the military, including top jobs at the state oil producer and control over food distribution. He's promoted hundreds of generals and admirals, and active and retired military officials hold nine of 34 cabinet posts.

▲ Maduro

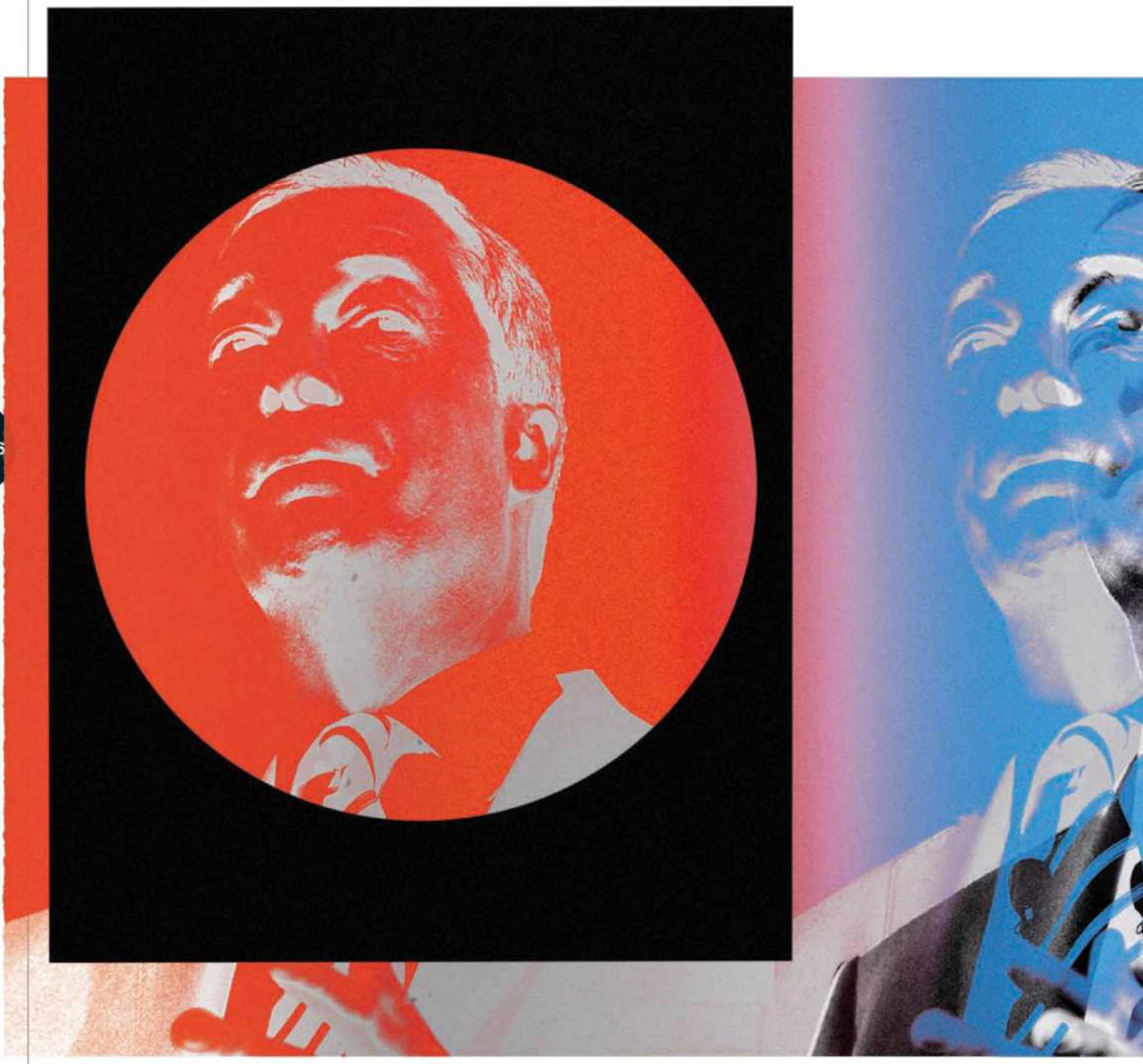
Nonetheless, a person with knowledge of the military says polls run by the intelligence service found Machado has especially high approval ratings among officers. That may explain why the government has tried to link her to the plot. Rocío San Miguel, president of watchdog group Control Ciudadano, says Maduro also maintains control through fear, regularly detaining or purging other officers and soldiers.

"I don't believe this idea that Maduro is holding on by a thread," San Miguel says. "Maduro has developed a state policy of persecution and monitoring within the armed forces. He's paranoid. The government is creating a firewall." —*Ethan Bronner, Andrew Rosati, and Fabiola Zerpa*

THE BOTTOM LINE A military coup to topple Venezuelan President Maduro—the most serious threat he's faced in his five years in office—was quashed when dozens of plotters were arrested.

ILLUSTRATION: NICHOLE SHINN; MADURO: CARLOS BECERRA/ANADOLU AGENCY/GETTY IMAGES

The Brexit S



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Private polls and a timely concession from the face of Leave allowed hedge funds to make millions off the collapse of the pound

By Cam Simpson, Gavin Finch, and Kit Chellel
Photo illustrations by Bráulio Amado

AT 10 P.M. ON JUNE 23, 2016, SKY NEWS PROJECTED THE words "IN OR OUT" across the top of a London building as an orchestral score ratcheted up the tension. "In or out–it is too late to change your mind," declared Adam Boulton, the veteran anchor, seated in a makeshift studio across from Big Ben. "The polls have closed in the U.K.'s historic referendum on EU membership." Election nights are major productions for British broadcasters, but Brexit was bigger, with Sky viewers watching worldwide.

After the dramatic intro, Boulton jumped straight in with an exclusive, announcing that he had "breaking news." Nigel Farage, the global face of the Brexit campaign, had given Sky what sounded like a concession. His photo and a statement filled the screen, as Sky's political editor, Faisal Islam, read Farage's words aloud: "It's been an extraordinary referendum campaign, turnout looks to be exceptionally high and [it] looks like Remain will edge it. UKIP and I are going nowhere, and the party will only continue to grow stronger in the future."

In the next segment, Boulton delivered another exclusive. Joe Twyman, head of political research for YouGov, one of the U.K.'s most prominent polling firms, appeared on set with the results of an online exit poll conducted for Sky. He explained that the firm had been tracking a group of roughly 5,000 voters–and they had moved further into the Remain camp that day. Based on that, Twyman said, "We now expect that the United Kingdom will remain part of the European Union. It's 52 percent Remain, 48 percent Leave, so it's still close and it's still too early to know definitely–but, based on the figures that we're seeing, based on the trends that have occurred, and based on historical precedent–we think that Remain are in the strongest position."

Just four minutes after the polls had closed, and with meaningful vote counts still more than two hours away, Sky had aired a concession from the world's most prominent Brexit backer, buttressed by data from YouGov. In a few hours these "scoops" would prove spectacularly wrong, but in the meantime they spawned worldwide headlines. This one, which ran atop the U.K.'s leading news site, the Mail Online, was typical. Referring to Farage's UK Independence Party, it read: ▶

◀ *BREAKING NEWS: UKIP leader Nigel Farage sensationally concedes DEFEAT within seconds of voting closing as final poll gives Remain the edge 52% - 48% in historic EU referendum*

The news pushed the U.K.'s currency up—herding investors toward a cliff hours ahead of one of the largest crashes for any major currency since the birth of the modern global financial system.

At 10:52 p.m. the pound rose above $1.50 and reached its highest mark in six months. A few minutes later the Sky News economics editor appeared before a giant screen showing the spike. The pound had been rising and falling with poll results for months, he explained. Whether they were on couches in London or at trading desks in Chicago, people watching Sky or reading headlines sparked by its coverage had every reason to think Remain would prevail. But not quite everyone.

For weeks, hedge funds had been buying preelection surveys from polling companies and trading on movements in the pound as sentiment shifted. Now was the big one. For referendum day itself, hedge funds had hired YouGov and at least four other polling companies, including Farage's favorite, Survation. Their services varied, but in some cases the pollsters sold the funds exit-polling data that would have been illegal to give the public. Through these private exit polls, some hedge funds gained confidence that most Britons had voted to leave the EU, or that the vote was far closer than the public believed, and were in the perfect position to earn fortunes by short selling the British pound.

Hedge fund managers, of course, try to beat the market by getting the best information they can. For exit-polling data, that's a tricky business. Pollsters have always sold surveys to private clients, but U.K. law restricts them from releasing exit-poll data before voting ends. While some of the practices discovered by Bloomberg fall into a gray area, the law is clear: It would have been a violation if, prior to the polls closing, "any section of the public" had gotten the same data the pollsters sold privately to hedge funds.

One person with questions still to answer is Farage, a former commodities broker who also worked for a London currency trading company after he moved into politics. He twice told the world on election night that Leave had likely lost when he had information suggesting his side had actually won, meaning there was a good chance he was feeding specious sentiment into markets. He also has changed his story about who told him what regarding that very valuable piece of information.

Bloomberg's account is based in part on interviews over seven months with more than 30 knowledgeable current and former polling-company executives, consultants, and traders, almost all of whom spoke on the condition they not be named because of confidentiality agreements. Pollsters said they believed Brexit yielded one of the most profitable single days in the history of their industry. Some hedge funds that hired them cleared in the hundreds of millions of dollars, while that industry on the whole was battered by the chaos Brexit wrought in global financial markets. Pollsters wouldn't name clients, but at least a dozen were involved, Bloomberg found. The private exit poll that appears to have had the most clients was Survation's. It correctly predicted Leave, according to Farage and other sources familiar with the results.

But it wasn't necessary to get the outcome right to profit. As YouGov's Twyman predicted a Remain victory on Sky, three of his colleagues were watching from inside the London office of a hedge fund. In addition to the public exit poll for Sky, YouGov sold a private exit poll to this fund, the identity of which Bloomberg hasn't determined. Having data that matched what Twyman would later present on television gave the fund's traders an edge for betting on the rise in the pound sparked by his comments, according to sources familiar with the events. YouGov staff code-named its arrangement with the hedge fund Operation Pomegranate. It charged the firm roughly $1 million, according to knowledgeable sources. Separately, YouGov gave Sky its poll for free. The hedge fund did extremely well, according to three sources familiar with the situation.

Two years after the historic vote, the pound is back at $1.32, the bottom of the crash that morning. Inflation is up, and the Bank of England has said British households are poorer than they would be had the vote gone the other way. People remain divided, while the government of Prime Minister Theresa May is deadlocked over how to move forward.

After the world asked how the nation's leading pollsters could have been so wrong, British lawmakers began an inquiry into whether misleading polls, in the referendum and other recent elections, were distorting democracy. But even members of a House of Lords select committee that looked into the subject had no idea that the companies they were probing had essentially become tools for firms wagering on the nation's mood and votes. The Lords' final report, released in April, made no mention of the relationships between pollsters and hedge funds.

George Foulkes, a Labour member of the upper House of Lords, was the driving force behind the select committee. On June 25, he called for a parliamentary inquiry into the "astonishing" practices revealed by Bloomberg. "The case for statutory regulation of polling companies is now overwhelming," Foulkes said.

ELECTION POLLING FOR MEDIA COMPANIES IS LARGELY a brand-building affair for U.K. pollsters. Charging the press little, or even nothing, they use media polls as marketing tools to attract lucrative commercial clients. About 99 percent of the more than £4 billion pounds ($5.3 billion) in annual industry revenue typically comes not from elections but from marketing-related research—such things as, "Do you prefer Coke or Pepsi?" As the Lords committee report explained, election polls were "described by many of the witnesses as a 'shop front'" for their commercial activities.

In 2014, during the runup to the Scottish independence referendum, YouGov published polls that showed nationalists jumping ahead. It set off a panic; nervous investors sent

The survey's accuracy was meaningless; traders just needed to know the results before they went public

the British pound and bank stocks down sharply. Hedge funds quickly began phoning the pollster. If YouGov was conducting another poll before the vote, traders said, they'd be willing to pay for a heads-up just 30 minutes to an hour before publication, according to two knowledgeable sources. Since news of a new poll alone likely would move markets, the survey's accuracy was meaningless; traders just needed to know the results before the public did. YouGov rejected these offers, the insiders said.

Survation saw opportunities. It organized and sold last-minute tracking polls and a syndicated exit poll for the Scottish referendum to some of the world's biggest hedge funds, according to three knowledgeable sources. Clients included Brevan Howard Asset Management, then managing about $37 billion; Tudor Investment; and Nomura Holdings, according to one knowledgeable source. Brevan Howard, Tudor, and Nomura declined to comment for this story.

The morning after the vote, it was clear that Scottish voters had rejected independence overwhelmingly. The YouGov poll that had sparked the most turmoil had missed the mark by 6 points. Survation's private exit poll, however, was accurate enough that its clients had what they needed to profit, according to knowledgeable sources. A lucrative line of business was born for two industries.

In 2015, the Conservatives, under David Cameron, swept to dominance in the U.K.'s general election. Cameron had promised to hold a referendum on the nation's membership in the European Union if he won. Hedge funds realized immediately that if the Scottish campaign had moved markets, a vote on the U.K.'s membership in the world's largest trading bloc might shake them to their core. YouGov started getting hedge fund calls right away, according to sources familiar with the matter. So did other polling companies.

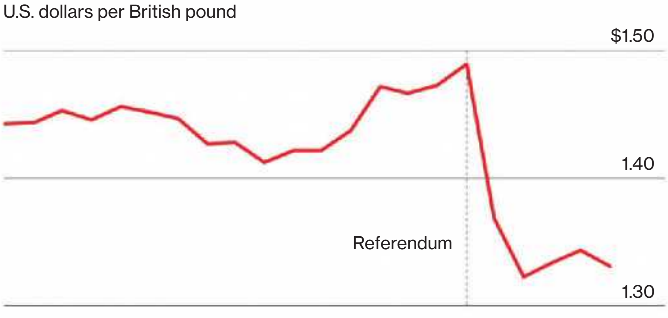
Preelection polling was a given, but there were potential obstacles to hedge fund exit polls. For starters, the major U.K. broadcasters normally air the results of a single, official exit poll at 10 p.m., immediately after voting closes. If this happened for Brexit, it might negate some of the advantages hedge funds had from private polls by giving the world definitive information at 10 p.m. That's because the official exit poll—jointly funded by the BBC, Sky, and ITV, and based on 20,000 face-to-face interviews—is the authoritative projection of the day's voting. It correctly predicted the last four U.K. general elections.

The face of the broadcasters' election-night exit poll, its chief designer and interpreter, is a 64-year-old Scottish professor named John Curtice. He enjoys a rare level of trust across party lines and a cult following among political junkies. After the government set a referendum date, Curtice spoke with broadcasters and they decided the usual exit poll wasn't feasible. They'd made the same call for Scotland. Curtice would later tell BBC viewers that his predictive models relied on a comparable vote, and for Brexit there was none, making a credible exit poll an expensive and difficult proposition. However, hedge funds were spending the money to line up their own private polls—and Curtice was involved.

He told Bloomberg that polling company ICM Unlimited paid him for his work on behalf of a hedge fund called Rokos Capital Management. Curtice said he participated "in a couple of phone calls with Rokos, where the design of the polling itself was discussed, alongside the modeling I was doing." He said he also had discussions solely with ICM. The company conducted an exit poll for Rokos, according to Curtice and another knowledgeable source. Curtice said he didn't help conduct the poll on election day, nor did he help analyze the results. He said his primary role was to help ICM build a model that enabled Rokos to predict the likely outcome of the vote as localities began reporting results. The hedge fund could then calibrate its trading strategy using a mixture of polling data and results as they started coming in after ▶

How the Pound Reacted to Brexit

U.S. dollars per British pound



DATA: COMPILED BY BLOOMBERG

◀ midnight. Alan Kilkenny, a Rokos spokesman, declined to comment for this story.

Curtice also is president of the British Polling Council, a voluntary, self-regulating body that counts YouGov, Survation, ICM, and the nation's other major pollsters among its members. The lack of a formal exit poll for broadcasters made it possible for the group's members to earn record revenue from Brexit, some polling company executives said. "The claim sounds plausible," Curtice said, "but I am not in a position to verify it one way or the other."

Another potential obstacle to hedge fund exit polls may have been more significant: It's a crime in the U.K. to "publish" exit-poll results prior to 10 p.m. Hedge funds wanted data streamed to them throughout the day so their own data experts could track trends and so they could make bets while people were still voting. The law broadly defines "publish" as making any data "available to the public at large, *or any section of the public*, in whatever form and by whatever means" [emphasis added]. Gavin Millar, a public law expert who consulted for a media client about the law in a previous election, said it has never been tested, so conduct potentially triggering charges is a legal gray area. (Millar has represented Bloomberg LP in unrelated matters.) On the books since 2000, the crime carries a penalty of up to six months in prison and a potentially limitless fine, he said.

Inside YouGov, concerns about the law limited the company's potential offerings, according to an email YouGov founder Stephan Shakespeare shared with Bloomberg. YouGov's chief financial officer spoke to lawyers and decided that a single hedge fund could not be considered "a section of the public" but that multiple hedge funds getting the same exit poll might cross the line. Other polling companies appear to have interpreted the law differently.

In the runup to the referendum, a handful of press accounts noted that hedge funds were in the market for, or had hired, pollsters, but none provided details. Bloomberg has confirmed that the following companies were hired to conduct private exit polls: YouGov, Survation, ICM, a Birmingham company called BMG, and ComRes.

Another company, Populus, conducted an exit poll for Michael Ashcroft, the former deputy chairman of the Conservative Party. Ashcroft, who runs a bank in Belize, routinely commissions polls that he later releases to the public, as he did on Brexit. Andrew Cooper, the founder of Populus and former director of strategy for David Cameron, also said his firm was paid to create a polling-based model that enabled a financial client to calibrate trades as results came in after midnight, but he declined to name that client, citing a nondisclosure agreement.

SHAKESPEARE FOUNDED YOUGOV IN 2000. THANKS TO its prolific use of news media polls to draw commercial business, YouGov developed one of the highest profiles of any U.K. polling firm.

In YouGov's early days, a company director tried to get attention by using its online surveys to gamble on a television talent show, *Pop Idol*. The company later banned employees from betting on its work, but pollsters noticed something: Their public surveys were moving the odds set by British bookmakers. YouGov's staff later realized that people could profit off a poll by learning its results in advance, not only by betting on the outcome of the underlying event the poll was meant to predict, according to sources familiar with the events.

As the EU referendum approached, YouGov executives discussed the idea of selling an exit poll exclusively to a single hedge fund for a huge premium—what would become Operation Pomegranate. The hedge fund exit poll would help traders predict the results of the public one YouGov would release on TV later that night, according to two knowledgeable sources. The hedge fund could then make trades with high confidence, because it could predict how Twyman's call would likely move the market, the sources said.

Shakespeare confirmed that the two polls showed the same thing. But he said it was never his company's intention to sell private polls to help clients predict the outcome of a public poll. He also said the "trading strategies of hedge funds are extremely secret. We did not know their strategy and still don't." YouGov's hedge fund client "did not know what the Sky poll would say," he added. "They had their own independent—more detailed and bigger—data. But the outcome was the same."

One reason YouGov could charge so much was that it would air the only public exit poll that night in the time slot normally designated for Curtice's authoritative survey, the sources said. Indeed, YouGov was able to charge much more than what other polling company executives said they collected.

Farage laughed about helping to push the pound higher ahead of the crash. "Yeah, and a good thing—good thing"

SOURCE: GETTY

Shakespeare said the price had nothing to do with his firm's public polling. "We try to get a fair price for our data's superior quality, volume, and detail," he said. He declined to say how much YouGov charged Sky for the broadcast poll, but people on both sides of the transaction said it was free.

Damian Lyons-Lowe, a former hedge fund salesman, started Survation in 2010, in part to gauge the public's support for contestants on Simon Cowell's *X Factor* so he could wager on the outcome, according to two people familiar with Survation's business. The company got its big break in political polling when it was hired by Farage and UKIP after its surveys showed more support for the anti-Europe party than those of more established pollsters.

The organizations grew so close that Survation once based its phone operators in UKIP headquarters, according to a knowledgeable source, and Lyons-Lowe became a friend and key adviser to Farage. "He is a genius—flawed, but a genius," Farage said of Lyons-Lowe in an interview with Bloomberg, declining to elaborate.

On June 23, the day of the EU referendum, Farage and his team gathered at the London home of a UKIP adviser. Their actions that day have been retold in two books, *The Bad Boys of Brexit* and *All Out War: The Full Story of How Brexit Sank Britain's Political Class*. The published accounts differ, but both say that Farage had learned the results of an unidentified financial-services exit poll well before the polls closed at 10 p.m. These accounts also say that Farage learned the results before giving his concession statement to Sky at roughly 9:40 p.m., which the network then aired within seconds of the polls closing at 10 p.m.

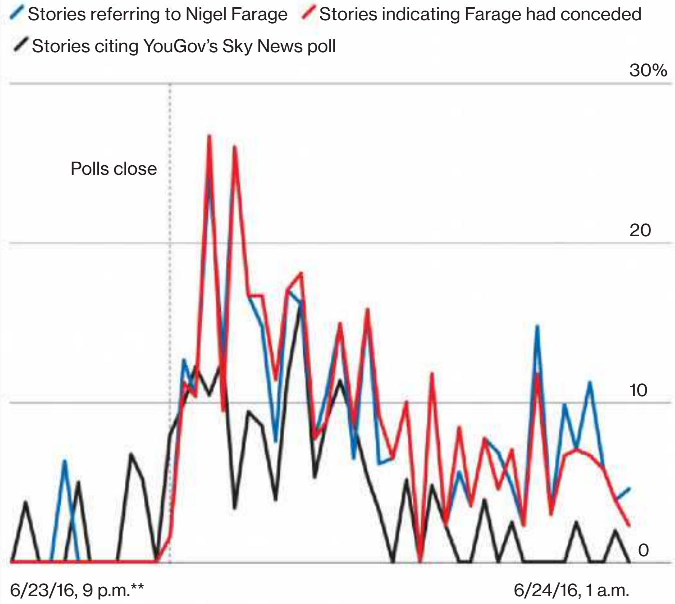
Farage, who hadn't detailed since that night what he learned or how he knew it, told Bloomberg that the only external exit-poll results he received on June 23 were Survation's—and that Lyons-Lowe gave them to him. "He got it right," Farage said of Lyons-Lowe. "And whoever, whichever clientele, whichever City hedge funds paid him that day, did very well out of it."

Farage repeatedly told Bloomberg that he learned the results from Lyons-Lowe's poll only "minutes after" Sky put his market-moving statement on the air just past 10 p.m.—not before. "That would have been, that would have been—for he and I to have spoken ahead of that 10 o'clock—would have been wrong at every level. Wrong for me, wrong for him, just would have been wrong," Farage said. After saying he heard the results from Lyons-Lowe, Farage then changed his story, saying they came not from Lyons-Lowe personally, but from someone affiliated with Survation's operation. In a subsequent telephone interview, Farage again changed his story to say he had indeed spoken by phone with Lyons-Lowe. He said Lyons-Lowe intimated that the U.K. had voted for Leave, but he didn't share specific data. Farage also said that, at the time, he didn't believe what Lyons-Lowe had told him, and that another contact, whom he declined to identify, mentioned other polling showing Remain would win.

In response to questions, Lyons-Lowe released a statement: "Survation Ltd. has established itself as a leading opinion poll and research provider, including in respect of referendums and other elections where innovative methodologies are required. We work regularly for a wide variety of newspapers, private clients, and political parties. Survation Ltd. does not comment on any confidential client work."

Breaking News

Percentage of news stories about Brexit on the night of the referendum*



Farage said his statement to Sky was "a terrible mistake," but he also asserted that he didn't give the network's reporter a true concession. "It was an acceptance that we might not win, but it was hardly, but it was not how—they overegged it. They overegged it. But that's journalism," he said.

He could not explain, however, why he gave a second concession about 70 minutes after the Sky broadcast, which not only echoed his earlier statement but was also more adamant. Farage made the second concession in an interview with the Press Association, a U.K. news cooperative. Its report says: "Mr. Farage told the Press Association: 'I don't know, but I think Remain will edge it, yes. The massive increase in voter registration will be the reason for that.' Asked if he was just experiencing election-night jitters, the UKIP leader replied: 'It is a calm and rational feeling. If I am wrong, I would be thrilled. But it is what we have seen out and about, and what I know from some of my friends in the financial markets who have done some big polling.'" Bloomberg sent a series of headlines based on that interview to its more than 300,000 financial clients around the world.

Farage rejected the idea that his concessions were aimed at moving the markets for anyone. But he also laughed about helping to push the pound higher ahead of its crash. "Yeah, and a good thing—good thing," he told Bloomberg, adding that those "who trade short-term markets and lose money shouldn't complain, because that's the game. That's the game." ▶

*AS AGGREGATED BY THE BLOOMBERG TERMINAL **BRITISH SUMMER TIME. DATA: COMPILED BY BLOOMBERG

◀ THE POUND OFFERED THE SIMPLEST PLAY FOR short sellers looking to profit from the Brexit vote vs. stocks or other assets. That's because currency markets are the deepest, most liquid markets in the world, making them the easiest to trade. In this case, another factor also made it easier. As early as January, banks started downgrading their forecasts for the pound to reflect the risk of a Leave vote. JPMorgan Chase & Co. lowered its estimate to $1.32, and other banks made similar predictions. The marker helped international financial institutions hedge their risks, and it also gave short sellers a target.

There are many ways to bet on a currency crash, but the main vehicle for many hedge funds is derivatives. Their existence means that hedge funds buying exit polls didn't need to get it right. They just needed to be more right than everyone else. Many were, because even exit polls that got it wrong gave hedge funds underlying data that pointed to pro-Brexit trends, according to those involved.

According to one veteran London hedge fund boss, who said he sat out Brexit, having data just one hour before official tallies that showed the vote was close, or leaning toward Leave, would be like a lifetime for an experienced trader. For the best ones, he said, 20 minutes was more than enough.

Derivatives allow traders to benefit greatly from market moves with only a small sum on the table. They are priced to reflect the market's mood, so the Remain sentiment in the polls leading up to the vote, and after Sky's opening minutes, made short bets cheap. The groupthink effect was what traders on currency desks call "keeping the pigs hungry." A short seller needs a world of voracious buyers to think he's the dumb one, for as long as possible.

The effect intensified on the night. The Sky News "exclusives" from Farage and Twyman filled an information vacuum created by the lack of the formal broadcasters' exit poll. The pound was so buoyed that Bloomberg sent out a chart to financial clients worldwide showing the currency "heading for its best week against the dollar since 2009." That was at 11:32 p.m.

Just before midnight, the market got nervous, and the pound dipped below $1.49 for the first time since 10:05 p.m. Just after midnight, Newcastle reported for Remain, but at a much narrower margin than expected.

At 12:16 a.m., the city of Sunderland dropped a bomb—61.3 percent had voted for Leave, instead of the roughly 53 percent predicted by polling models. The pound plummeted one minute later, hitting $1.43.

Inside the office of its hedge fund client, YouGov had three pollsters working through the night. They spoke directly with the hedge fund's analysts, according to an inside account confirmed by Shakespeare. The analysts would duck in and out of the room, asking YouGov's team to quantify, from zero to 100, how confident they were in their latest predictions, according to a source familiar with these events. Having put themselves in a position to profit from the rapid rise of the pound, they could now make money from its fall. At 5:28 a.m. the pound bottomed out at $1.32, the mark cited by JPMorgan back in January.

ROKOS CAPITAL MANAGEMENT, WHICH HAD WORKED with ICM and Curtice, ended up making more than $100 million, or 3 percent of its entire value, in a single day, according to results Bloomberg first reported in the wake of the vote. Brevan Howard, which at a minimum bought exit-polling data from ComRes, made $160 million on June 24 alone.

While the identity of YouGov's Operation Pomegranate hedge fund client remains unclear, knowledgeable sources identified two clients for YouGov's preelection polling. They are Capstone Investment Advisors and Odey Asset Management. Capstone, then managing more than $5.2 billion, made about 1.7 percent of the value of its biggest fund off its Brexit trades, Bloomberg reported after the vote, citing a knowledgeable source. Capstone declined to comment for this article. Odey's eponymous founder is Crispin Odey, who was both a top fundraiser for Farage and a leading contributor of campaign cash to the pro-Brexit side. His firm made about $300 million from Brexit.

In an interview with Bloomberg, Odey said the private polling purchased from YouGov ahead of the vote was valuable, though not definitive, because there was still a high level of uncertainty about the outcome. He said his firm didn't buy an exit poll. "Everyone is going to try to improve the information they have," he said of hedge fund surveys. "That's the arms race." But, he said, it shouldn't be possible for some traders to pay more for better information. "The idea of public markets is that you have equality. If you don't, then one has to be worried about that."

Dawn Hands, managing director of BMG, said her firm "does not comment on the detail of any research conducted privately, nor name any of its private clients." Gregor Jackson, research director at ICM, confirmed that the company had private clients for the Scottish and EU referendums but declined to comment further. A ComRes spokesman also declined to comment.

Capitalizing on a wave of market-moving political volatility stemming from voter discontent across the world, some of the pollsters involved in Brexit have tried to replicate their success beyond the U.K. Survation worked for financial-services firms in the Italian election in March, when two populist Euroskeptic parties won, according to a knowledgeable source. There could be more to come for the U.K., too, with George Soros, among others, pushing for a new EU referendum.

Even if that doesn't happen, Prime Minister May's government remains seized by internal divisions over Brexit, leading to predictions of a new snap election. A pollster who profited off the EU referendum said, "That would be something that would have the potential to move the markets around," because a snap election would really be about implementing Brexit.

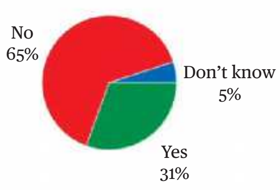
Asked for his prediction, the pollster declined to answer. He said he will keep his opinions to himself until hedge funds come calling again. Ⓑ

THE HEIST ISSUE

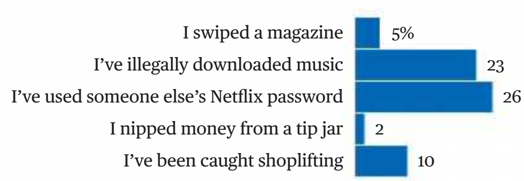
Why make an issue dedicated to stealing, conning, misappropriating, diverting, and swiping? Because it's the best kind of summer reading, that's why. Every heist story is about money. But only the best are also mysteries, and this issue has plenty: the bizarre tale of 50 million pilfered honeybees, a profile of a stolen-art vigilante, the story of a virtual bank heist in India. Plus a guide to crypto-skulduggery, a look at a robber's toolkit, and more. Enjoy. Just don't get any big ideas.

With help from polling company Morning Consult, we did a little survey, trying to understand the basic heistiness of Americans (and also how they protect themselves). We surveyed a nationally representative sample of 2,203 U.S. adults 18+ from June 22-24. The results have a margin of error of +/- 2 percentage points.

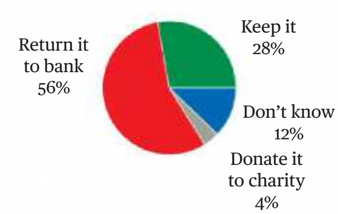
Have you ever stolen something?



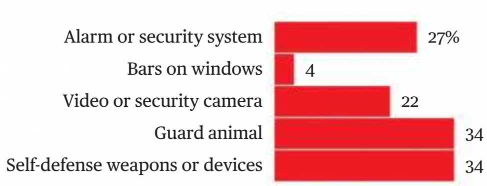
If you said yes, mind telling us what?



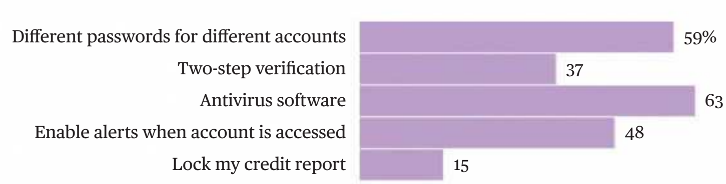
What would you do if you found $100 at an ATM?

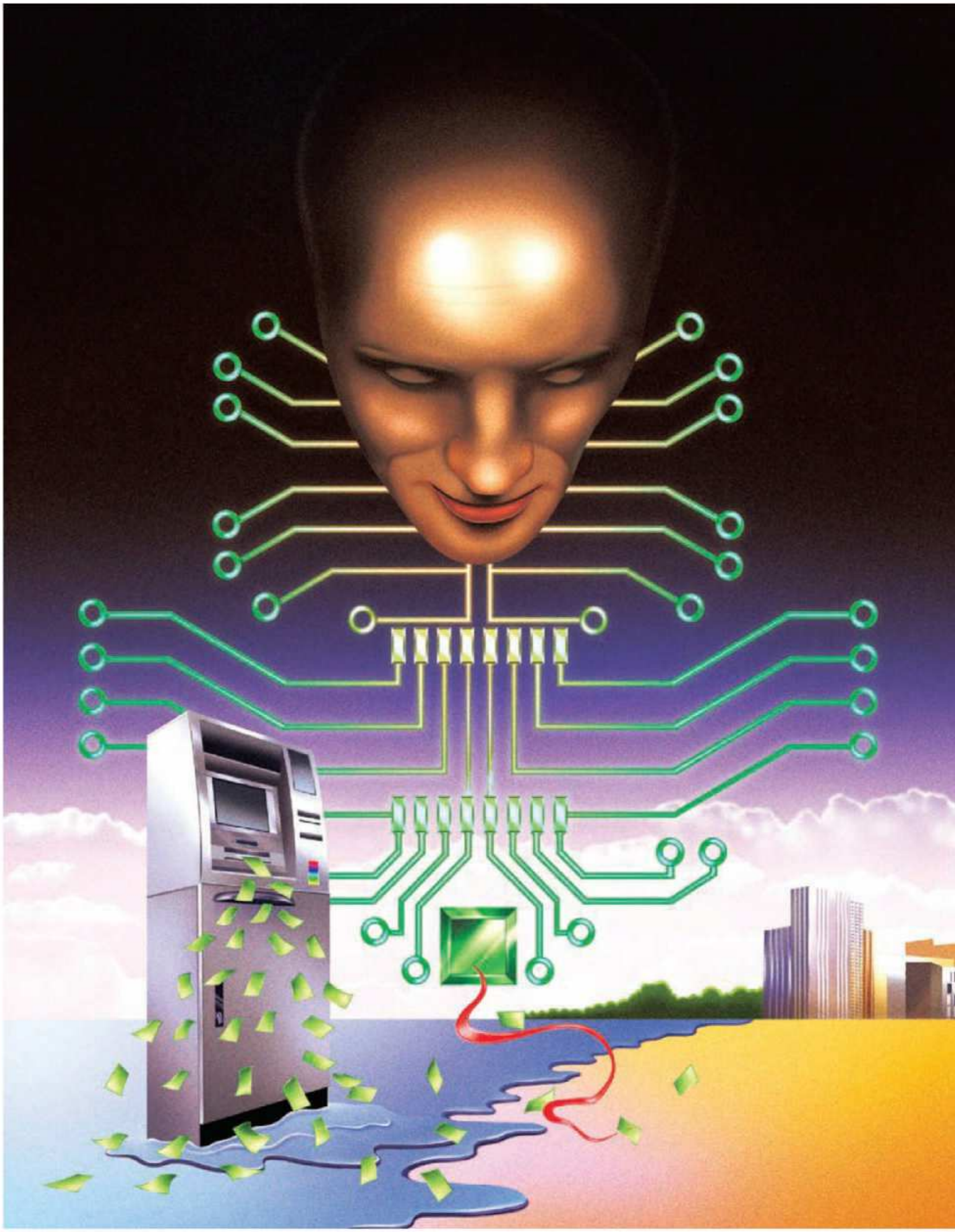


How do you protect yourself at home?



How do you protect yourself online?





GHOSTS

A global dragnet nabbed the alleged mastermind behind the biggest digital bank heist in history. That doesn't mean it's over

By Charlie Devereux, Franz Wild, and Edward Robinson
Illustration by Keith Rankin

IN THE AUTOMATED TELLER MACHINE

As night fell in Taipei on July 10, 2016, most people in the city were hunkered down to ride out the end of a typhoon. Not Sergey Berezovsky and Vladimir Berkman. The two Russians made their way through the rain to an ATM at First Commercial Bank, one of Taiwan's top lenders. Wearing hats and antipollution masks, they loitered at the machine for a moment. Then, as the astonished couple in line behind them later told the police, the ATM started disgorging cash without either man touching it. The men shoved the bills into a satchel and brushed past them. As the Russians drove off in a black sedan, the couple spotted something on the ground: One of the guys had dropped his bank card.

By the time detectives traced Berezovsky and Berkman to the nearby Grand Hyatt the next day, the Russians had already jetted off to Moscow by way of Hong Kong. And they were just two of 15 "money mules" who'd hit 41 ATMs at 22 branches of First Commercial over that stormy weekend, the cops learned, taking 83 million New Taiwan dollars (NT$), or about $2.6 million. Hackers, investigators discovered, had forced the machines to spit out cash.

The Carbanak gang had struck again.

Before WannaCry, before the Sony Pictures hack, and before the breaches that opened up Equifax and Yahoo!, there was a nasty bit of malware known as Carbanak. Unlike those spectacular attacks, this malware wasn't created by people interested in paralyzing institutions for ransom, publishing embarrassing emails, or taking personal data. The Carbanak guys just wanted loot, and lots of it.

Since late 2013, this band of cybercriminals has penetrated the digital inner sanctums of more than 100 banks in 40 nations, including Germany, Russia, Ukraine, and the U.S., and stolen about $1.2 billion, according to Europol, the European Union's law enforcement agency. The string of thefts, collectively dubbed Carbanak—a mashup of a hacking program and the word "bank"—is believed to be the biggest digital bank heist ever. In a series of exclusive interviews with *Bloomberg Businessweek*, law enforcement officials and computer-crime experts provided revelations about their three-year pursuit of the gang and the mechanics of a caper that's become the stuff of legend in the digital underworld.

Besides forcing ATMs to cough up money, the thieves inflated account balances and shuttled millions of dollars around the globe. Deploying the same espionage methods used by intelligence agencies, they appropriated the identities of network administrators and executives and plumbed files for sensitive information about security and account management practices. The gang operated through remotely accessed computers and hid their tracks in a sea of internet addresses. "Carbanak is the first time we saw such novel methods used to penetrate big financial institutions and their networks," says James Chappell, co-founder and chief innovation officer of Digital Shadows Ltd., a London intelligence firm that works with the Bank of England and other lending institutions. "It's the breadth of the attacks, that's what's truly different about this one." ▶

◀ For years police and banking-industry sleuths doubted they'd ever catch the phantoms behind Carbanak. Then, in March, the Spanish National Police arrested Ukrainian citizen Denis Katana in the Mediterranean port city of Alicante. The authorities have held him since then on suspicion of being the brains of the operation. Katana's lawyer, Jose Esteve Villaescusa, declined to comment, and his client's alleged confederates couldn't be reached for comment. While Katana hasn't been charged with a crime, Spanish detectives say financial information, emails, and other data trails show he was the architect of a conspiracy that spanned three continents. And there are signs that the Carbanak gang is far from finished.

Carbanak first surfaced in Kiev, when executives at a Ukrainian bank realized they were missing a bunch of money. Security cameras showed the lender's ATMs dispensing cash in the predawn hours to people who didn't bother to insert cards or punch in PINs. The bank hired the Russian cybersecurity firm Kaspersky Lab to check it out. Initially, the researchers suspected that hackers had infected the machines with malware from a handheld device. "What we found instead was something else," says David Emm, Kaspersky's principal security researcher.

Someone had sent emails to the bank's employees with Microsoft Word attachments, purporting to be from suppliers such as ATM manufacturers. It was a classic spear-phishing gambit. When opened, the attachments downloaded a piece of malicious code based on Carberp, a so-called Trojan that unlocked a secret back door to the bank's network. The malware siphoned confidential data from bank employees and relayed the information to a server the hackers controlled. Delving deeper, the Kaspersky team found that intruders were taking control of the cameras on hundreds of PCs inside the organization, capturing screenshots and recording keystrokes. Soon, the researchers learned that other banks in Russia and Ukraine had been hacked the same way.

The attackers cased their targets for months, says Kaspersky. The Carbanak crew was looking for executives with the authority to direct the flow of money between accounts, to other lenders, and to ATMs. They were also studying when and how the bank moved money around. The thieves didn't want to do anything that would catch the eyes of security. State-backed spies use this type of reconnaissance in what's known as an advanced persistent threat. "In those instances, the attacks are designed to steal data, not get their hands on money," Emm says. When the time was right, the thieves used the verification codes of bank officers to create legit-looking transactions.

By the fall of 2014, the authorities realized they were dealing with something new. That October, Keith Gross, chair of the cybersecurity group for a European bank lobby, called a crash meeting with experts from Citigroup, Deutsche Bank, and other major European lenders. In a meeting room at Europol's fortress-like headquarters in The Hague, Kaspersky researchers briefed the bank officials on what they'd found in Ukraine. "I've never seen anything like this before," Troels Oerting, then the head of Europol's Cybercrime Centre, told the group. "It's a well-orchestrated malware attack, it's very sophisticated, and it's global."

So Europol went global, too, enlisting help from law enforcement agencies in Belarus, Moldova, Romania, Spain, Taiwan, the U.S., as well as bank industry representatives. It set up a secure online clearinghouse where investigators could cross-check data and find links between the thefts, says Fernando Ruiz, head of operations in Europol's cybercrime unit. At the heart of its operation was a lab where technicians dissected the two dozen samples of malware identified in the Carbanak thefts. By isolating unique characteristics in the code, detectives could trace where the programs came from and maybe who was using them. The work led them toward Denis Katana's apartment in Alicante, a four-hour drive southeast of Madrid. "This is what the Spanish police used to open their investigation," Ruiz says.

Carlos Yuste, a chief inspector in the National Police's cybercrime center, took it from there. Yuste, a cerebral veteran detective with salt-and-pepper hair, and his chatty younger partner, Javier Sanchez, started taking a closer look at 34-year-old Katana. He used offshore servers for his computing needs—not unlawful, but unusual. More interesting, he was visited by Romanians and Moldovans linked to organized crime. Yuste ordered surveillance, but he and Sanchez labored to build a case for a wiretap or arrest.

From a distance, Katana appeared to be just another immigrant building a new life in the West. A skinny, smallish man, he shared a modest 1,100-square-foot apartment with his Ukrainian wife and young son and didn't seem to have much of a social life. He wasn't trying to learn Spanish, and the cops never once saw him visit San Juan Beach, the long stretch of golden sand just a few blocks away. He appeared to have a much more active life online, often toiling on his laptop until sunrise.

Slowly, Yuste and Sanchez started piecing together how they believed Katana was working on the Carbanak thefts with three other men in Ukraine and Russia. One sent the malicious emails, another was a database expert, and the third cleaned up the gang's digital footprints, the police

"EVEN IF KATANA WAS THE MASTERMIND, HE WAS JUST ONE say. As for Katana, Sanchez says he handled the most critical and complex task: He allegedly conducted the reconnaissance of banking systems and then shuffled money around the network like an air traffic controller. In his hands, it was art as much as science, the police say. "This guy is in another league, he's like Rafa Nadal playing tennis," Yuste says. "There are few people in the world capable of doing what he did."

Just as the police started to make strides, the Carbanak crew opened another front, says Kaspersky's Emm. In the first half of 2016, the thieves sent spear-phishing emails that looked like messages from legitimate financial institutions. When bank employees opened the emails' attachments, they downloaded malware based on a program called Cobalt Strike, which is designed to let security officers hack their own institutions to find vulnerabilities, like in a war game. The Carbanak-Cobalt gang was able to extract $12 million per heist, says Europol. The thieves' nimbleness was sobering. "Sometimes the investigation looked good," Ruiz says, "and sometimes it looked like we'd reached a dead end."

The Carbanak crew did have one weakness that wasn't easy to finesse: humans. On July 16, 2016, six days after the suspected Russian mules Berezovsky and Berkman allegedly hit ATMs in the wake of Typhoon Nepartak, two other men linked to the thefts landed in Taipei. After clearing customs at Taiwan Taoyuan International Airport, Mihail Colibaba and Nicolae Pencov took a taxi to the central railway station. There they entered the baggage storage facility and, after receiving access codes by text, took suitcases from three separate lockers, according to police. The bags held NT$60 million in bundles of crisp blue NT$1,000 notes. The men then checked into the Grand Victoria Hotel across from the city's mammoth Ferris wheel and holed up in their rooms for the next 24 hours. At about 8 p.m. the next day, they enjoyed a leisurely dinner at the hotel's restaurant. Their job was nearly done. As the pair left the dining room, police confronted them and took them into custody. They'd been under surveillance since they left the railway station the day before.

They have the sloppy tradecraft of their alleged accomplices, Berezovsky and Berkman, to thank for their capture. After the police got hold of the bank card one of the men had dropped the prior Sunday, Hsin-Yi Tseng, a 28-year-old detective in Taipei's Criminal Investigation Bureau, coordinated a citywide sweep to map out the scope of the ATM heists. She had scores of officers scan security camera footage, and her colleagues managed to track down another mule, whom they followed to the railway station. They watched him stash the three cash-stuffed suitcases in lockers and waited to see who came to collect them. It was Colibaba and Pencov, who are now serving four and a half years in prison. Colibaba's iPhone contained photos of stacks of cash in different currencies about the size of the piles in the suitcases, and, Tseng says, email exchanges with a man who appeared to be in charge of the operation. They traced the man to Alicante.

Yuste and Sanchez say Katana didn't ease up on the bank raids. In early 2017, mules extracted $4 million from ATMs in Madrid after Katana allegedly took control of accounts inside Russian and Kazakh lenders. That was a mistake, because it enabled Yuste to get judicial approval to wiretap Katana's phones. The funny thing is Katana didn't need the money, Sanchez says. Katana was laundering his money through a Bitcoin warehouse he'd bought in China, had already converted most of his cash into Bitcoin, and was constructing a mansion in Alicante. "It was a kind of game for him," Sanchez says. "To attack a bank wasn't about 'Let's steal a million dollars.' It was, 'Let's crack the security the bank is putting in our way.' "

Earlier this year the detectives learned Katana and his partners were preparing to up their game with the release of a more potent version of Carbanak. On the morning of March 6, a police officer knocked on the door of his apartment. Katana answered with a resigned look. He didn't resist as more than a dozen armed cops entered and bagged his laptop and other evidence. In addition to jewelry and two BMWs in his name, they found 15,000 Bitcoins, then valued at about $162 million. Law enforcement officials worldwide were jubilant.

Yet experts point out that even if Katana was the mastermind, he was just one guy in a crime that surely must have had many authors. Unlike the bank jobs of yore, digital heists are amoeba-like ventures that divide over and over again as the malware proliferates. "We've already seen the modification of Carbanak and multiple groups using it," says Kimberly Goody, an analyst at security software maker FireEye Inc. "Same case with Cobalt."

In recent weeks, employees at banks in the Russian-speaking world have been receiving emails that appear to be from Kaspersky, the security company that unearthed Carbanak. The messages warn recipients that their PCs have been flagged for possibly violating the law and they should download a complaint letter or face penalties. When they click on the attachment, a version of the Cobalt malware infects their networks. It turns out cyberheists may not die even when their suspected perpetrators are nabbed. Ⓑ

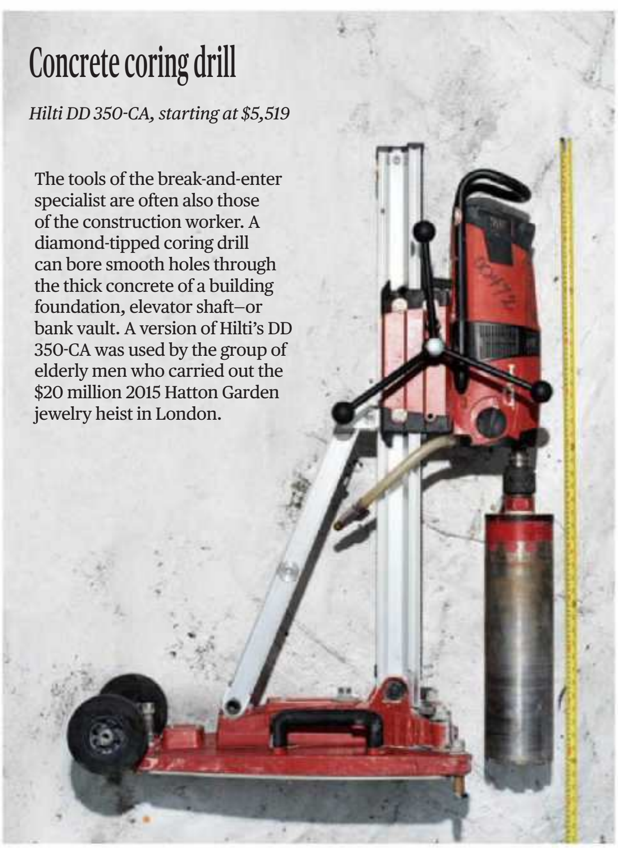
GUY IN A CRIME THAT SURELY MUST HAVE HAD MANY AUTHORS"

THE WHOLE HEIST CATALOG

7 TOOLS FOR DISCERNING BURGLARS (AND 6 TOOLS TO STOP THEM)

A confident criminal can rob a bank with nothing more than a handwritten note, but a truly ambitious theft requires specialized equipment and skills. With help from experts in law enforcement, private security, and safecracking, the author of A Burglar's Guide to the City *identifies some of the hardware thieves use to pull off a break-in—and some things you can use to guard against one.*

By Geoff Manaugh   Photographs by Hannah Whitaker



Concrete coring drill

Hilti DD 350-CA, starting at $5,519

The tools of the break-and-enter specialist are often also those of the construction worker. A diamond-tipped coring drill can bore smooth holes through the thick concrete of a building foundation, elevator shaft—or bank vault. A version of Hilti's DD 350-CA was used by the group of elderly men who carried out the $20 million 2015 Hatton Garden jewelry heist in London.

Everyday hardware

Sometimes the handiest burglary tools are the ones that won't raise suspicions if your backpack is searched. A roofing hammer can rip through drywall, stucco, and shingles. A screwdriver can jimmy open a window or door. "The movies would have us believe it's all superexciting, *Mission: Impossible* stuff, with incredible equipment," says Scott Selby, co-author of *Flawless*, a book about the 2003 Antwerp diamond heist. To abscond with an estimated $100 million in gems, the Antwerp thieves thwarted a million-dollar alarm system using electrical tape to blind a high-tech light sensor, a Styrofoam brick attached to a broomstick to block a motion detector, and a can of hairspray to spoof the vault's thermal alarm.

Estwing shingler's hammer, $30

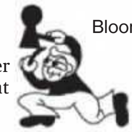
Hilmor demolition screwdriver, $11

3M electrical tape, $2

ILLUSTRATIONS BY NICHOLE SHINN

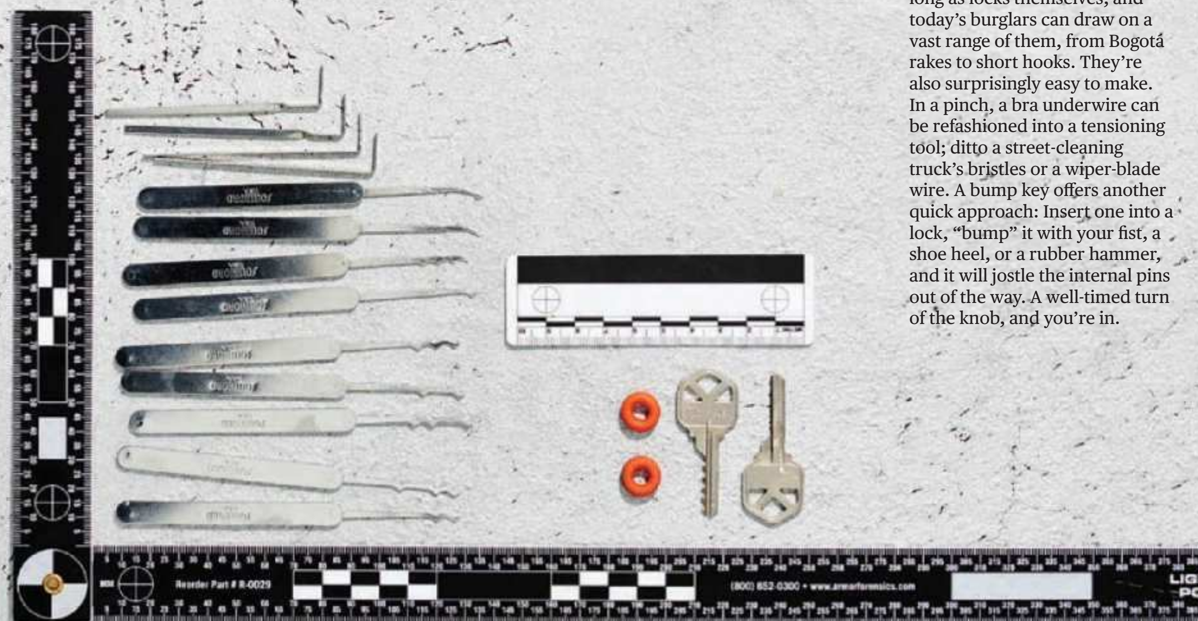
See it on: YouTube, where workers post videos of themselves drilling through thick slabs of concrete, sometimes with heavy-metal soundtracks

See it in: *Midnight Run* (1988), when the bounty hunter played by Robert De Niro enters a fugitive's apartment



Lock picks and bump keys

SouthOrd Pagoda 12-pick set, $39; Kwikset bump keys, $4.25



Lock picking is about patience and finesse, using the right-shaped tool to push internal pins out of the way one by one. Picks have been around as long as locks themselves, and today's burglars can draw on a vast range of them, from Bogotá rakes to short hooks. They're also surprisingly easy to make. In a pinch, a bra underwire can be refashioned into a tensioning tool; ditto a street-cleaning truck's bristles or a wiper-blade wire. A bump key offers another quick approach: Insert one into a lock, "bump" it with your fist, a shoe heel, or a rubber hammer, and it will jostle the internal pins out of the way. A well-timed turn of the knob, and you're in.

Angle grinder

Makita 9557NB, starting at $59

The cutting wheel, or angle grinder, is one of the most versatile tools available, whether you're polishing metal in an auto-body shop or peeling open a locked safe. DeWalt, Makita, and Milwaukee all make models that combine power, portability, and long battery life. The abrasive metal discs of their cutting wheels can make short work of a safe deposit box's hinges, a shopfront's security doors, or a high-security safe. "It just doesn't take long to get through," says Ben Black, a burglary detective with the Los Angeles Police Department.

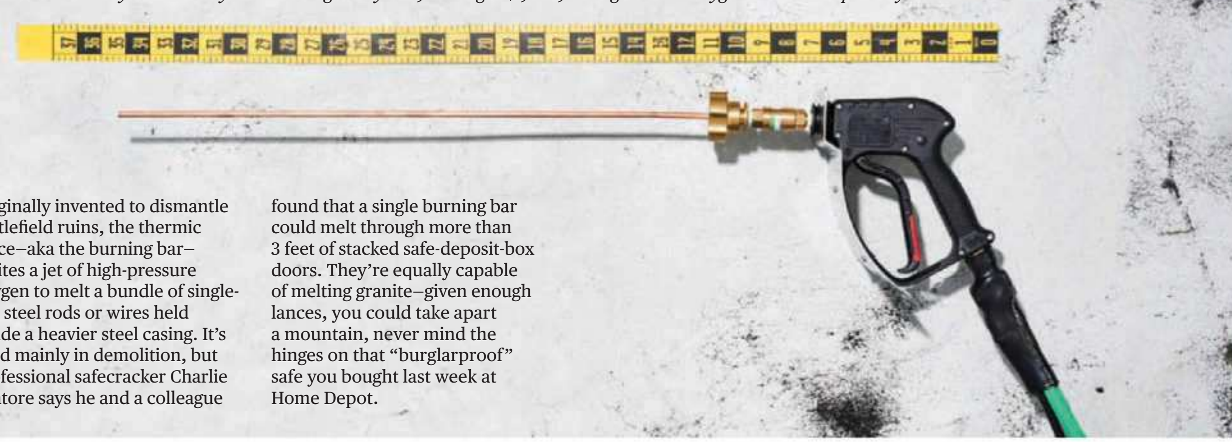
See it in: *Street Thief* (2006), as Malik Bader robs a cinema's cash-deposit safe in a hail of sparks

Sawzall

Milwaukee M18 cordless Sawzall, starting at $249

Thermic lance

Oxylance Sure Cut system and Oxylance Burning Bar system, starting at $1,000; cutting rods and oxygen tanks sold separately



Originally invented to dismantle battlefield ruins, the thermic lance—aka the burning bar—ignites a jet of high-pressure oxygen to melt a bundle of single-use steel rods or wires held inside a heavier steel casing. It's used mainly in demolition, but professional safecracker Charlie Santore says he and a colleague found that a single burning bar could melt through more than 3 feet of stacked safe-deposit-box doors. They're equally capable of melting granite—given enough lances, you could take apart a mountain, never mind the hinges on that "burglarproof" safe you bought last week at Home Depot.

ILLUSTRATIONS BY NICHOLE SHINN

See it in: *Thief* (1981), as James Caan burns into an L.A. diamond vault

The name Sawzall, shorthand for a powerful type of machine known as a reciprocating saw, originated with a device made by the Milwaukee Tool Corp. The saws have a small, ultratough blade that rakes back and forth at high speed. Retired LAPD burglary detective Chris Casey considers himself a grudging admirer: "My favorite tool is the Sawzall. Whoever invented it is a genius." Its criminal potential goes beyond breaking and entering, he says: It's being used to slice valuable catalytic converters off the undercarriages of pickup trucks in a rash of thefts around the country.

Android phone

Google Pixel 2, starting at $649; plus custom signal-capture software

The spread of keyless smart locks, which you open with the tap of a smartphone app, has brought with it a profusion of subversions. Arguably the quickest method is a replay attack, in which the radio signal sent to open a lock is captured by someone hiding nearby, then "replayed" to open the same door. Drew Porter, founder of security firm Red Mesa, warns that these attacks will increase as smart locks catch on. "You can even target police cars," he says.

The Best in Burglar Defense

NETWORKED DOORBELL CAMERAS

Ring video doorbell, starting at $100; Nest Hello, $229

With a network-connected doorbell camera system, a homeowner sitting on a Caribbean beach can see who's ringing her front door and communicate over a loudspeaker, creating the illusion that someone's inside. Complement the hardware by joining a free hyperlocal social network such as Next Door, which lets owners compare notes with neighbors about who's been visiting the block. The forums on nextdoor.com also offer some comic relief, alerting you to smaller dangers such as mysterious smells, backyard wildlife, and neighborhood sex scandals.

ALARMS

Aura starter kit, $199; Bosch ISN-SM-50 seismic detector, starting at $95

Even a basic alarm system can deter a burglar, but high-end financial institutions take more exotic precautions. An air-pressure alarm can sense when the air in a room has been displaced by an intruder's body or a rapidly opened door; a seismic alarm can pick up footsteps or the rattle of a drill. If you'd like your home to feel like a Zurich bank at a fraction of the cost, consider the Aura, an alarm developed by Canadian company Cognitive Systems Corp. that picks up changes in the contours of your home Wi-Fi signal.

HOME SMARTS

ITTS active shooter/critical response course, $525

At International Tactical Training Seminars, retired LAPD SWAT team member Scott Reitz and his wife, Brett McQueen, teach civilians how to deal with a home invasion. Since the school's founding in 1990, ITTS has been imparting brutal truths, from knowing how to burglarproof your home, to safely and legally handling a gun, to applying a tourniquet in the event of a stab or bullet wound. "You don't have to be paranoid, but you have to be aware," Reitz says. "It's about some of the simplest things you can do to ensure your safety and to harden, for lack of a better term, your location and to harden yourself."

HIGH-SECURITY LOCKS

Medeco Maxum, about $300 with installation; Abloy Protec2, about $250; Mul-T-Lock residential cylinder, about $265

If you're concerned about a truly determined intruder, consider high-security locks such as those sold by Medeco, the preferred choice for many U.S. government facilities. Their mechanisms are tricky to pick, their build quality makes them hard to destroy, and their keys are difficult to copy. But no lock is perfect: Security researcher Marc Weber Tobias discovered that he could bypass a Medeco lock using counterfeit keys fabricated from old credit cards.

X6 SAFE

Various manufacturers, starting at $4,400

Most safes are rated for, well, safety, by an organization called Underwriters Laboratory. A TL-15 safe can withstand at least 15 minutes of a sustained tool attack by an expert; a TRTL-30 can survive at least 30 minutes of a tool and torch attack. An X6 rating means all six sides of a safe are equally secure—absent this feature, only the door is truly fortified. The LAPD's Black says it can take 12 hours or more to drill into a TRTL-30X6: "Burglars just aren't going to spend that much time." Most residential safe burglary, he adds, could be eliminated if everyone bought an X6 safe and bolted it to a concrete pad. (An X6 doesn't do much good if a crook can wheel your safe out on a dolly.) Santore, the safecracker, suggests trying the secondary market: Older safes often have higher-quality builds, and deals can be found.

SAFE ROOMS

Various manufacturers, from $5,000 to $100,000 and up

Failing all else, there's the safe room, colloquially known as a panic room, a true inner sanctum promising an impenetrable last-ditch refuge for someone trapped by intruders. High-quality ones can resist explosives; feature dedicated, uncuttable phone lines; and come with gas masks and emergency oxygen in case of a chemical attack. The best are modular and stealthy. The first rule of having a safe room: Don't let anyone know you have a safe room.

THE

FLAW

WED

DIAMANTAIRE

Hollywood stars wore his diamonds to the Oscars. Then he was accused of stealing billions from an Indian bank

By Samanth Subramanian
Illustrations by Gaurab Thakali

Nirav Modi didn't seem like the kind of person who needed to rob $2 billion from a bank. He's a short man, 47 years old and losing hair, the pocket square in his jacket always arranged to fussy perfection. His daintiness befitted a jeweler to the stars. Kate Winslet wore a Modi bracelet and Modi earrings to the Oscars. Dakota Johnson wore a similar set to the Golden Globes. Priyanka Chopra gazed out of Modi advertisements. Naomi Watts attended the opening, in 2015, of his emporium on Madison Avenue. Christie's once put his Golconda Lotus necklace on the cover of its catalog and auctioned it for more than $3 million. His stores—in Las Vegas, Macau, Singapore, Beijing, London—were boutiques of bling, where white light bounced off the arrayed gold and diamonds. He told people he wanted 100 shops by 2025. Last year, *Forbes* estimated his worth at $1.8 billion. A good casting director would have marked him for the role of heistee, not heister.

Even the alleged crime, when it finally broke water in February, appeared to swim against the current of Modi's glamorous life. The money had been taken from Punjab National Bank in 1,213 grinding doses over seven years. It was the biggest bank fraud in India's history, and it came robed in technical jargon: letters of undertaking and Swift bypasses, margin money and "nostro" accounts, core banking solutions and buyer's credit facilities.

But these were just details. In conception, the scheme investigators described was classical, old-fashioned; it relied on inside men, and probably on greasing palms, and certainly on dodging technology more than using it. And it depended on the failure of the notoriously creaky structures of governance for India's 21 state-run banks. These behemoths, which account for two-thirds of the ▶

◀ country's banking assets, are unwieldy and inefficient, vulnerable to heavy hints from corrupt politicians. Their books crawl with nonperforming loans, on which borrowers have stopped paying the interest or principal: $108 billion as of last September. This compelled the government, in October, to announce that it would stuff the banks with $31 billion in fresh capital over the next two years.

Against this backdrop, the con allegedly orchestrated by Modi and an uncle, Mehul Choksi, went off like a Catherine wheel, spraying sparks in every direction. Top-ranking executives have fallen, banking rules have had to be changed, Mumbai's diamond merchants have noted glumly that credit has become harder to obtain. For regulators, the long and durable life of the swindle has forced two uncomfortable questions into view. How high up in PNB did it go? And what further crises are buried within the untidy ledgers of India's biggest banks? For everyone else, though, the more intriguing riddle is: How, and why, would Modi have done it?

Modi's life always had a diamantine glint. He grew up in the Belgian city of Antwerp, the pivot of the world's diamond trade. His father, his family, their people all bought, cut, and sold diamonds for a living. Over the better part of a century, this community—members of the Jain faith, hailing from Palanpur, a town in the western state of Gujarat—has come to dominate the global industry. Nine of every 10 rough diamonds are worked and polished in Gujarat, and Palanpuri Jain families have long dispatched sons and cousins and nephews to Antwerp to tap trade networks and enlarge their businesses. Modi's father moved there in the 1960s. At the dinner table, Modi told the luxury magazine *#Legend*, his family spoke endlessly about diamonds: "It was our way of conversation."

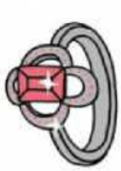
After he became successful, Modi frequently said he'd really wanted to be an orchestral conductor. Instead, he went to the University of Pennsylvania to study finance, then dropped out to apprentice under Choksi in India, Hong Kong, and Japan—earning, according to one report, the equivalent of $52 a month today. Most Gujarati diamond barons are discreet about their wealth, but Choksi, a round man with a jolly smile, liked to talk about his Ascot Chang suits and his yacht. Years later he would take his company, Gitanjali Gems Ltd., public on the Bombay Stock Exchange, recruiting brand ambassadors from Bollywood and opening posh showrooms.

Neither Modi nor Choksi could be reached for this story, and their lawyers declined requests for comment. But a banker who once counted Modi as a client and knows Mumbai's diamond business well says Choksi sought to turn Gitanjali into a boutique retail brand, to elevate it above the rote labor of cutting and polishing that his peers undertook. "Nirav also wanted to be very much like that," the banker says. "He was never called a 'diamond trader.' For him, it was always 'diamantaire.'"

In 1999, Modi founded Firestar Diamond Inc., dealing at first in loose diamonds before expanding into the manufacture of jewelry for retailers around the world. But he wasn't content backstage; he wanted to be out front, bridging the line that divides prosperous customer from opulent product. Eleven years ago, he bought A.Jaffe, the venerable American bridal jewelry brand, for $50 million. Then, in 2010, he created Nirav Modi, an eponymous brand that released limited-edition lines: elastic gold bangles; earrings drizzled with jewels; rings crowned with rare, fat, pink and yellow diamonds; necklaces with names such as Riviere of Perfection and Emerald Waterfall that were made to be murmured by husky-voiced women in advertisements. At least on paper, Modi was the designer of every piece of jewelry sold under the brand. He'd collapsed his empire into his persona.

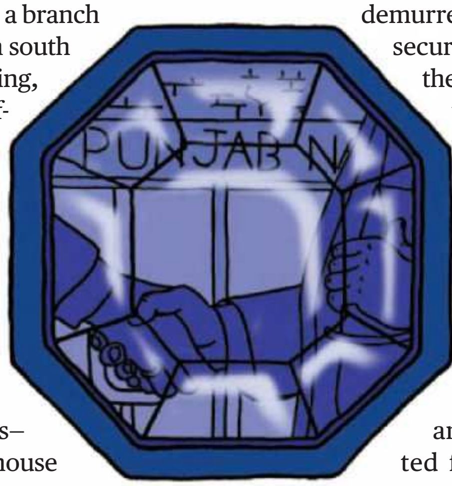
Two former employees recount the care with which he fashioned his image. The Nirav Modi marketing team was given meticulous notes on the kind of person he was, or wished to be built into. A member of the team kept her notes, three pages of the Modi aesthetic condensed into bullet points: He read Robert Frost and John Keats, Plato and Aristotle; he loved the clean lines of Art Deco, and the music of Nina Simone, and Raphael's *Three Graces*, and "butterflies and ladybugs but not necessarily for jewellery." He went to the ballet and liked any dance, really, that "exudes grace and highlights femininity." He was "not fond of geometric shapes" and hated "bad craftsmanship in anything—whether furniture or jewellery."

This employee describes her stint as a strange time and Modi as a polite, persnickety man. During her job interview in his art-filled office, she recalls, he pointed to a poster on the wall—one of the tiny-lettered kind that compress a book's full text into an image—and asked her if she knew what it was. "He made me get up to go look at it," she says. When she recognized it as *The Count of Monte Cristo*, he seemed inordinately impressed. Her workplace held hundreds of people, but she remembers that it was always hushed. Cameras were everywhere—a routine measure, given all the jewelry on the premises, except supervisors used them "to spy on people," she says. "If you spent too long talking to a colleague, they'd email you a photo of it and tell you off." Modi wasn't always in, but when he was, he seemed to follow a finicky schedule: "At a certain time he'd have fruit, and then at a certain time he'd have his



"I COULDN'T UNDERSTAND HOW THIS COULD HAVE green tea in his special flask and cup, and then he'd have lunch even if we were waiting for a meeting with him. He took his own crockery between this office and the other."

This fastidiousness contrasted with Modi's verve as a businessman. The other former employee, once a Firestar executive, calls Modi "reckless, a risk-taker." On the face of it, the gambles paid off. By 2017, Firestar's revenue had reached $2.3 billion, according to figures filed with India's Registrar of Companies. Modi's name was everywhere. He mingled with models and actresses, becoming the kind of lavish sophisticate who flies the Italian chef Massimo Bottura to Mumbai for an invitation-only dinner attended by celebrities. Even so, the fraud accusations came as a shock, the former executive says. "If you've taken the country's money to this extent—well, I can't digest that at all."



The stage for the giant swindle was a branch of PNB, set into a jammed road in south Mumbai. On a recent visit, the building, Brady House, was trussed up in scaffolding and green tarpaulin. A lone security guard loitered in the dark corridor leading to the lobby. There were no counters or tellers and probably no cash; Brady House is, as the gilt lettering on a wall proclaimed, a "mid corporate bank," serving mid-size companies. A red sofa, a golden Buddha, cramped plywood cubicles, tacky red linoleum on a flight of steps—the type of lackluster premises that house every state bank branch in the land.

The way Avneesh Nepalia described it, it was sheer carelessness that brought the cat tumbling from the bag. A deputy general manager with PNB in Mumbai, Nepalia registered the first complaint about Modi and Choksi in a two-page letter to India's Central Bureau of Investigation (CBI) in January. Two weeks prior, Nepalia wrote, representatives from three smaller diamond-importing companies owned by Modi had come to Brady House and asked for new letters of undertaking.

A letter of undertaking was a uniquely Indian financial instrument—a relic from the economy's statist years, when the government controlled the flow of foreign exchange and importers could use only state-owned banks to pay suppliers abroad. India's central bank recently eliminated them, but they were once a bank's guarantee for a sum of money in an exchange transaction.

Ordinarily, PNB might have sent a letter in the name of one of Modi's import companies to the New York branch of another Indian bank, from which Modi's company was borrowing U.S. dollars to fund American diamond purchases. The second bank would then deposit the money into PNB's nostro account (a dollar account in a U.S. institution), and PNB would in turn release the money to Modi's company. PNB repaid the lending bank with interest, in U.S. dollars, while the company repaid the amount to PNB at home, in rupees, adding a low fee for the service. It was a circuitous way to buy and import diamonds, but it would have been more expensive to take out a loan in rupees, convert them into dollars, send them to New York, and pay interest on the principal at home.

On the mid-January day when Modi's companies applied for new letters, the official in charge asked for collateral, in cash, on the requested amount of foreign currency, usually the standard practice. Modi's executives demurred—for them, a big mistake. They'd secured many similar letters in the past, they told the bank, without being asked to provide collateral.

Puzzled, bank officials consulted their database. "The branch records did not reveal details of any such facility having been granted," Nepalia wrote. Then they checked the logs for the Society for Worldwide Interbank Financial Telecommunications (Swift) system, which held all the transfer and payment instructions transmitted from Brady House to institutions overseas. Nepalia's complaint is a sober document, betraying no shock at what the bank found—that unapproved letters of undertaking, backing Modi's and Choksi's companies in return for little or no collateral, had been issued for years. PNB had been guaranteeing loans without its officers' knowledge. The first complaint counted about $44 million of credit, issued across eight letters of undertaking.

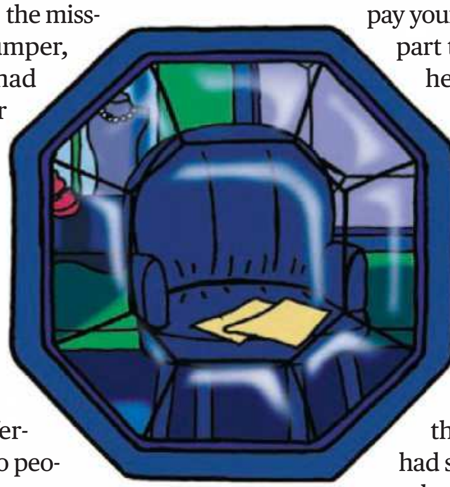
As its investigation deepened, PNB found more and more letters promising to pay more and more money. It filed another complaint, then another. The smoking hole in the bank's balance sheet expanded to $2 billion. In the second complaint, Nepalia wrote that when the loans had come due, Modi and Choksi had used some of the money guaranteed by newer letters to pay debts incurred by earlier ones. Arun Jaitley, India's finance minister, told Parliament in March that at least 1,213 fraudulent letters of undertaking had been issued to Modi's ▶

HAPPENED. THIS WAS ALL RISK MANAGEMENT 101"

◀ and Choksi's companies over the previous seven years. (Modi's lawyer told Bloomberg News at the time that the allegations were without merit. A PNB communications officer didn't return phone calls and emails.)

The bank claimed that two rogue Brady House employees, a deputy manager in the foreign exchange department named Gokulnath Shetty and a clerk named Manoj Kharat, had connived with Modi, issuing the letters without asking for collateral or documentation. Then, the bank said, they'd refrained from updating the bank's database, which would have flagged the credit as unapproved and unsecured. Shetty and Kharat would likely have known—as employees at every state-run bank would have known—that the Swift messaging platform in these institutions wasn't integrated with customer records and that, as a result, the transfers wouldn't trigger any warnings. This was the vulnerability that invited the attack.

The caper might have continued, the missing sum growing plumper and plumper, like a snowball rolling downhill, had Shetty not retired in the summer of 2017. When Modi's companies approached PNB this January for that last batch of letters, Shetty was no longer behind the counter. It was an error, but Modi had loan payments due within weeks, so he might have needed the money.



The CBI hasn't suggested what Modi and Choksi did with all the money they were accused of pilfering. But Modi had big ambitions. Two people with close knowledge of the process say that, for the better part of last year, he was preparing to take Firestar public. His company had hired two Big Four auditors and a trio of investment banks, and its staff had worked to iron out the various audit irregularities, unrelated to the alleged bank fraud, that had wrinkled its books over the years. "He wanted to grow his business, and to do in five years what might otherwise have taken 20 years," one of the men says. "If he'd gone public, maybe he could have pledged his equity, raised some money, and finally paid the bank back. Perhaps he would have done that."

Or perhaps not. Once a man has gotten used to easy money, he often feels entitled to more.

Even as his companies were applying for new letters of undertaking from PNB, Modi may have sensed the end was imminent. According to the *Mumbai Mirror*, his wife, a U.S. citizen, had pulled their three children out of school the previous year and moved them to New York, telling friends her father was unwell. And the CBI revealed that Modi and Choksi had left India in early January. (Modi's lawyer said his client had departed for business reasons.)

Once the scandal flared, whispers of their whereabouts began filtering in like rare-bird sightings. They'd flown to Hong Kong, or had winged it to New York, or were roosting in London, the metropolis of choice for absconding Indian billionaires. By the time the government began seizing Modi's properties—his diamonds, his Porsche Panamera, his Mumbai penthouse, his coastal farmhouse—he'd melted from view.

In early February, his offices were raided by investigating agencies. A few days later, he sent an email from parts unknown to his staff. "The near future seems a little uncertain," he wrote. His bank accounts all over the world had been frozen. "We shall not be in a position to pay your [salaries], and it would be right on your part to look for other career opportunities," he wrote. "I hope that we will be able to re-associate ourselves in better days."

Modi wrote to PNB as well, and the letter leaked into the media. He urged the bank "to be fair" and argued that he ran "a legitimate luxury brand business." He owed the bank "substantially less" than $2 billion, he claimed, adding that after PNB had filed its first complaint, he'd offered to sell his company to settle up. But the frenzy of publicity and investigation had sparked panic, he scolded the bank, and now he wouldn't have the necessary capital. "In the anxiety to recover your dues immediately, despite my offer, your actions have destroyed my brand and the business." (No evidence of such an offer has emerged.)

Early in the investigation, the CBI arrested three men: Shetty, Kharat, and Hemant Bhat, an authorized signatory for Modi's companies who'd applied for the January letters of undertaking. In its three official complaints, PNB had claimed that Shetty and Kharat were the only bank officers involved, but everyone presumed more would be fingered. Shetty and Kharat weren't especially influential.

Anil Prabhu, a senior official of PNB's employee union who knows Kharat well, describes him as "a good boy, a very soft-spoken boy." Kharat had joined the bank in 2014, starting on a salary of $250 a month. He came from a poor family in Karjat, a town near the city of Pune. "He was always talking about how he wanted to

be transferred to Pune," Prabhu says. "I'd ask him: 'Stay here a while. Why are you in such a hurry?' " Kharat couldn't have known about the convolutions of the purported scam, Prabhu adds. "His work was like data-entry work. He would have had to type in so many entries, day in and day out," he says. "It wouldn't have been easy for anyone to tell which were fraudulent and which weren't. And Kharat—I can vouch for him. He wouldn't even recognize what a letter of undertaking is."

Prabhu was less familiar with Shetty, a clean-shaven man with graying temples. "He wasn't the type who'd sit and chat with you," Prabhu says. "He wouldn't converse at all." In May the CBI said Shetty had "obtained illegal gratification"—bribes, in other words—from Modi's and Choksi's companies in return for his assistance. Press reports claimed Shetty had confessed to the CBI after his arrest, but his lawyer issued a statement denying that he was guilty. Kharat's lawyer said in a statement that his client had only typed out such letters "under pressure from Gokulnath Shetty. He has no role in the case." Bhat's attorney said his client was only a signatory and didn't understand the terms of the documents.

A former PNB executive, speaking on condition of anonymity, says there was little reason to believe Shetty and Kharat were the only two employees involved. "There is a concurrent auditor sitting there all day, for instance. He's supposed to validate the daily transactions. It isn't as if he slipped up on one day, or two days. This went on for years. How did that happen?" The funds moving in and out of PNB's nostro account overseas should, similarly, have triggered an alarm when they failed to match up with the actual sums the bank had approved.

It's also possible that Modi's credit lines simply drowned within PNB's oceanic volume of business; by 2017 its total assets stood at $106 billion. "At the corporate level, these transactions aren't noticeable," the former executive says. "But the branch manager should have noticed." The governance of India's state-run banks needs to improve, the former executive acknowledges. Political nudges and corrupt officials are familiar itches in the banking body, so a loose system of accountability is an invitation to fraud.

Harsh Vardhan, the head of Bain & Co.'s financial-services practice in India and a trenchant critic of how state banks are run, says he was stunned when news of the PNB fraud emerged. "I couldn't understand how this could have happened. This was all Risk Management 101." State-run banks undergo multiple audits, he says, "all of which seem to have been compromised."

Cronyism and corruption are endemic to the system, Vardhan adds. Standards change when the borrowers are connected to politicians or bank directors, with loans too liberally advanced and too lethargically pursued. "If you line up a list of the top 20 defaulters, they're all seen to be politically very powerful," he says. That's partly why stressed assets, which include nonperforming assets and restructured loans, make up 16.2 percent of state banks' loans; the figure for privately owned banks is 4.7 percent. Modi does have powerful friends—he appeared in an official group photo with Indian Prime Minister Narendra Modi (no relation) at the World Economic Forum in Davos in January—but there's been no suggestion that political influence helped him and Choksi obtain letters of undertaking.

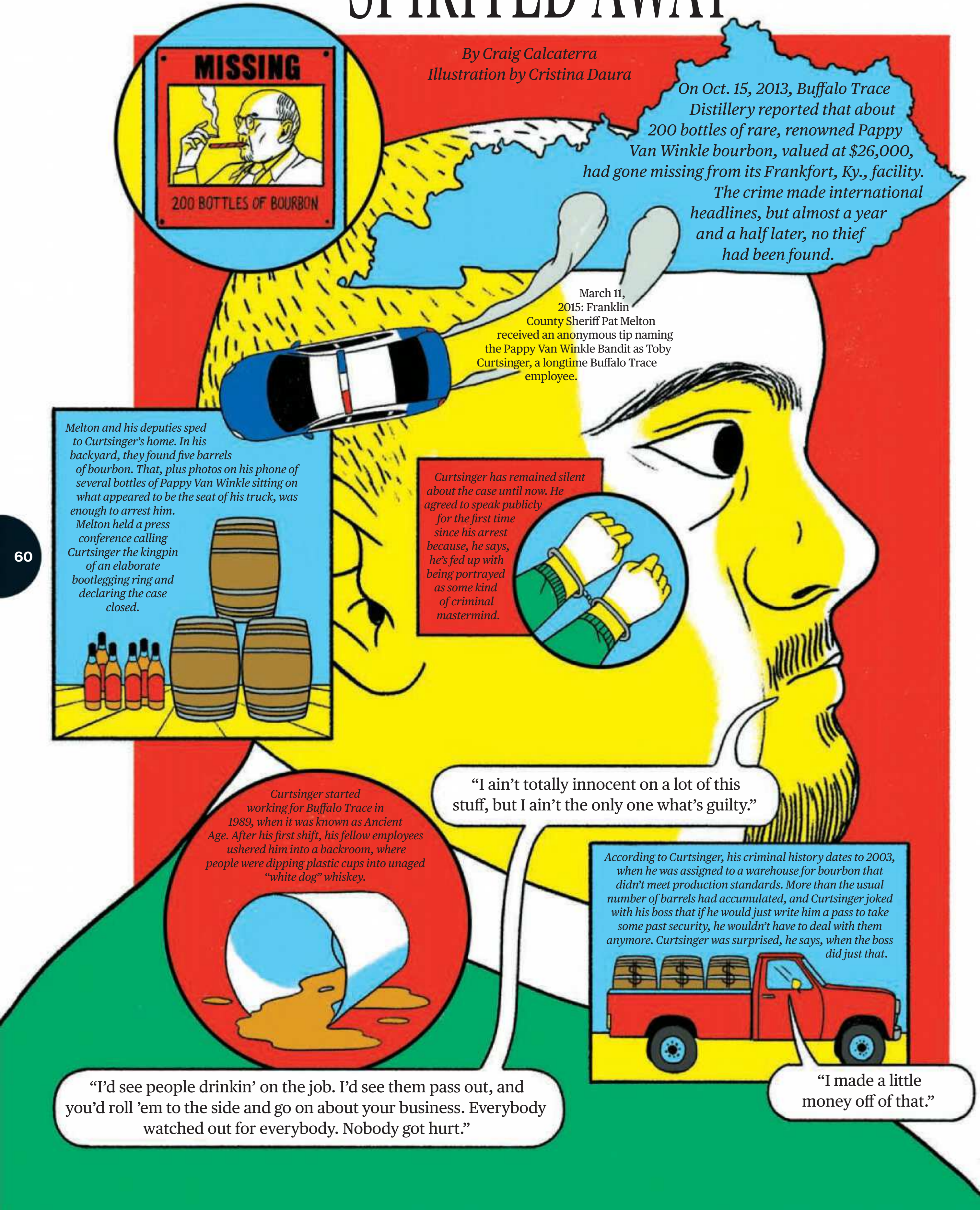
The notion that they could have pulled off such a swindle with the collusion of just two bank employees was abandoned in mid-May, when the CBI filed charge sheets, running into thousands of pages, against Modi, Choksi, and several past and present PNB employees. The highest official to be named was Usha Ananthasubramanian, the bank's chief executive officer from 2015 to 2017. Ananthasubramanian and other executives were accused of failing to implement a 2016 order from India's central bank to seal the gap between PNB's Swift platform and its main database. Further, the CBI alleged, these officials had misled the central bank, assuring it these systems were secure. (In a text message, Ananthasubramanian denied she was guilty.)

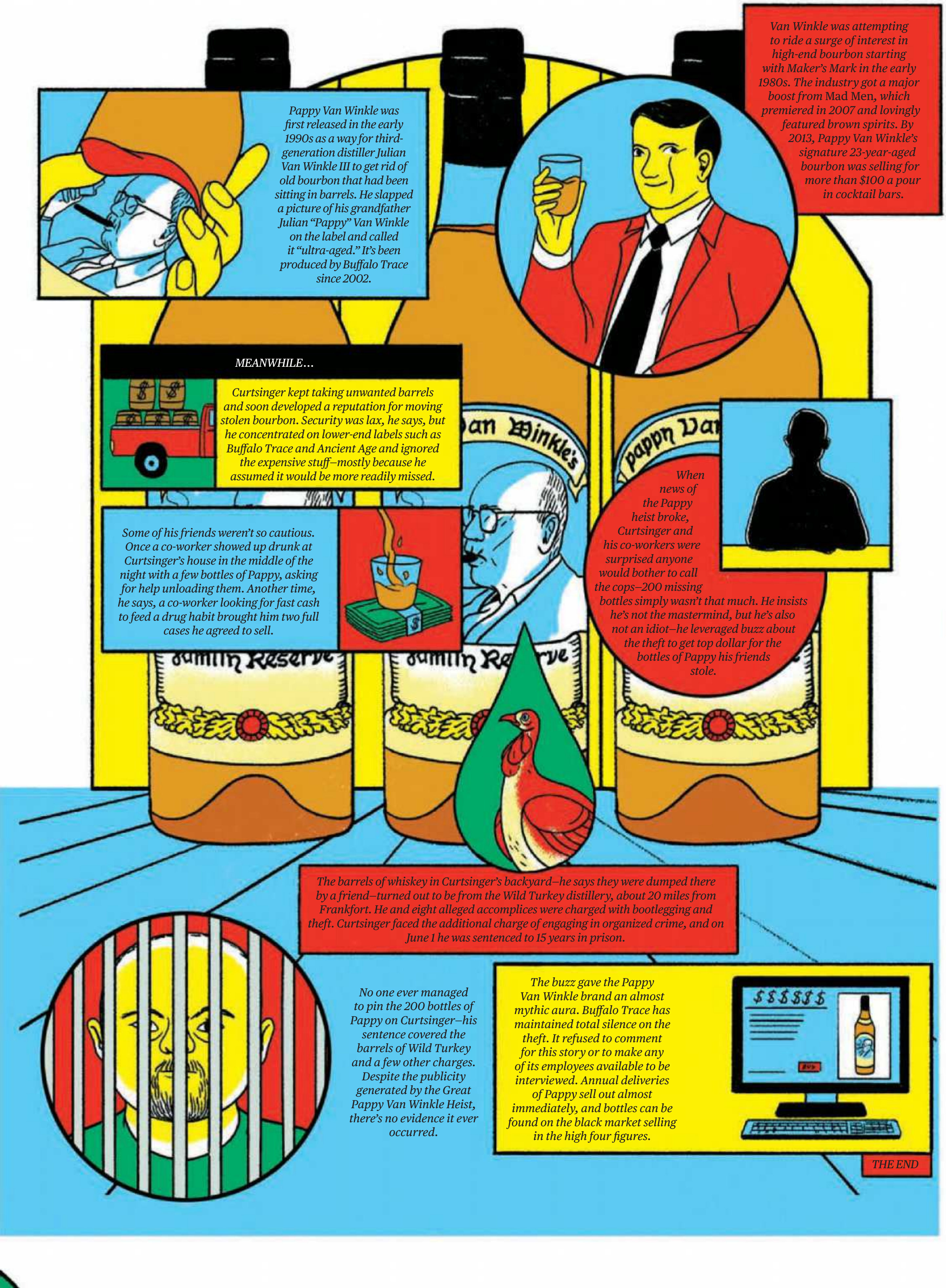
The charge sheets are merely precursors to a trial, but the wheels of the judiciary in India grind with exasperating sloth. Lalit Modi, another tycoon (again, no relation to Nirav) who nipped out of the country just as law enforcement agencies began cracking their fingers, reached London in 2010; the government has yet to submit an extradition request to bring him home for trial.

If Nirav Modi ever makes it back to India, he'll face multiple charges, including conspiring to defraud PNB and money laundering—accusations his lawyer called "half-baked" in a statement released in May. In a way, the fraud has cost the state-run banking system not only PNB's immediate $2 billion but also future funds. At least two banks have deferred their plans to raise fresh capital in the first half of this year. "There has been a real shaking of investors' faith in governance, and that faith was never strong to begin with," Vardhan says. "That's where the real damage has been." The banks can try to convince their shareholders and investors—and perhaps even themselves—that the scam was an anomaly, an aberration, the product of a stray loophole that someone had hoovered money through. Only, there's nothing as yet to indicate that this is the truth. Ⓑ

SPIRITED AWAY

By Craig Calcaterra
Illustration by Cristina Daura




Pappy Van Winkle was first released in the early 1990s as a way for third-generation distiller Julian Van Winkle III to get rid of old bourbon that had been sitting in barrels. He slapped a picture of his grandfather Julian "Pappy" Van Winkle on the label and called it "ultra-aged." It's been produced by Buffalo Trace since 2002.
Van Winkle was attempting to ride a surge of interest in high-end bourbon starting with Maker's Mark in the early 1980s. The industry got a major boost from Mad Men, which premiered in 2007 and lovingly featured brown spirits. By 2013, Pappy Van Winkle's signature 23-year-aged bourbon was selling for more than $100 a pour in cocktail bars.
MEANWHILE...
Curtsinger kept taking unwanted barrels and soon developed a reputation for moving stolen bourbon. Security was lax, he says, but he concentrated on lower-end labels such as Buffalo Trace and Ancient Age and ignored the expensive stuff—mostly because he assumed it would be more readily missed.
Some of his friends weren't so cautious. Once a co-worker showed up drunk at Curtsinger's house in the middle of the night with a few bottles of Pappy, asking for help unloading them. Another time, he says, a co-worker looking for fast cash to feed a drug habit brought him two full cases he agreed to sell.
When news of the Pappy heist broke, Curtsinger and his co-workers were surprised anyone would bother to call the cops—200 missing bottles simply wasn't that much. He insists he's not the mastermind, but he's also not an idiot—he leveraged buzz about the theft to get top dollar for the bottles of Pappy his friends stole.
The barrels of whiskey in Curtsinger's backyard—he says they were dumped there by a friend—turned out to be from the Wild Turkey distillery, about 20 miles from Frankfort. He and eight alleged accomplices were charged with bootlegging and theft. Curtsinger faced the additional charge of engaging in organized crime, and on June 1 he was sentenced to 15 years in prison.
No one ever managed to pin the 200 bottles of Pappy on Curtsinger—his sentence covered the barrels of Wild Turkey and a few other charges. Despite the publicity generated by the Great Pappy Van Winkle Heist, there's no evidence it ever occurred.
The buzz gave the Pappy Van Winkle brand an almost mythic aura. Buffalo Trace has maintained total silence on the theft. It refused to comment for this story or to make any of its employees available to be interviewed. Annual deliveries of Pappy sell out almost immediately, and bottles can be found on the black market selling in the high four figures.
$$$$$$
THE END

THE ART VIGILANTE AND THE CASE OF THE EROTIC VASE

Christos Tsirogiannis has collected tens of thousands of images from the artifact underground with a singular goal: Stop auction houses from selling looted ancient art

By Vernon Silver
Photograph by Kate Peters

For days, Christos Tsirogiannis had been hitting refresh on his laptop, waiting for a chance to snatch ancient artifacts from one of the world's biggest auctioneers. At the dining room table of his tidy house on a quiet street in Cambridge, England, the 45-year-old archaeologist was stalking Christie's website, where the catalog for an upcoming antiquities auction in New York would soon be posted. It was important to his vigilante mission that he see the lots quickly. Tsirogiannis had work to do to repeat previous exploits in which he'd cost Christie's and rivals Sotheby's and Bonhams millions of dollars in sales—and the sale was in less than a month.

Then, on a sunny March morning, after dropping off his 2-year-old daughter at school and bicycling home, he returned to his laptop and tried again. The catalog appeared. He clicked through the pages, eyeballing the marble statues and clay vases as they flashed by. At Lot 26, he stopped. "That…is…an interesting one," he said. He moved his cursor toward the image of an amphora listed as "Property from a Manhattan Private Collection" that was expected to sell for as much as $50,000.

More than a decade ago, Tsirogiannis started building a secret archive of tens of thousands of Polaroids and other photos from the artifact underground, where illicitly dug pots and statues are laundered as they pass from tomb raiders to smugglers to dealers and then on to museums, collectors, and auction houses. Most of his images were seized in police raids and given to him by prosecutors in Greece and Italy. Working independently, Tsirogiannis matches the photos with objects that surface at auctions or museums and then works to repatriate the pieces. It was easy to see why the 2,500-year-old vase jogged his memory, decorated as it was with an erotic daisy chain of men, dogs, and one woman. He thought he'd seen the amphora in the section of his archive dedicated to convicted Italian trafficker Giacomo Medici. "There is a similar one in Medici, definitely, but maybe not that particular one," he said. "We will see."

Tsirogiannis takes great caution to keep the images from prying eyes. The archive itself—30,000-plus pictures depicting more than 100,000 objects—is a digital one, taking up a half-terabyte on a server in an undisclosed country in the South Pacific, accessed with passwords he changes twice a week. "There is no actual copy with me or in my house or in my working space," he said.

Although he invited me to watch him work, something he hasn't allowed a journalist to do before, Tsirogiannis refused to let me in his house when he accessed the archive. He'd even downloaded part of it to his laptop before my arrival to avoid being connected to the ▶

"I CANNOT STAND TH

◀ database while being observed. He's afraid of driving objects underground: If dealers learn that an ancient pot is in Tsirogiannis's Polaroid trove, it might never again see the light of day because it risks being seized.

When he finished clicking through the last of Christie's 109 lots, Tsirogiannis was ready to dive into his archive. It's meticulously organized so he can fetch images from one of three major dealers, including Medici, and from galleries and smaller dealers whose photos help him reconstruct who owned what and when. Within each of these libraries, he has folders for about 10 object types, amphorae in one, kylix drinking cups in another. Those in turn are categorized by shape and color. Figurines are sorted by animal type–horses are with horses, boars with boars.

To vet the catalog, he'd made a list of about 15 suspect lots. Then, one at a time, he looked for matches. The laptop screen was filled 14 across with thumbnails from the Medici folder, and Tsirogiannis's eyes darted left to right as he scrolled through in an intricate game of Memory, where players turn over two cards at a time looking for a pair.

He'd barely begun when he needed to run to a lunch meeting. He would continue the search that evening; we could meet the next day, he said. As we prepared to leave, he deleted the downloaded portion of the archive. Tsirogiannis's curiosity proved overwhelming. As soon as I left, he logged back in. "These are things that always have priority for me," he told me later. What he found made him late for his appointment. By midnight, he'd alerted law enforcement on two continents.

The foundation for Tsirogiannis's work began on the night of April 3, 1986. In the seaside town of San Felice Circeo, south of Rome, intruders sawed through the padlock on the massive front doors of a noblewoman's stone fortress while she was away. They used axes to smash a set of inner doors and set about stripping the furnishings. On a patio, they found a 2,000-year-old Roman child's sarcophagus carved from a solid block of white marble. They took that and the top of an ancient marble column they spotted near the kitchen. Using a pickax, they also detached a white marble fireplace fashioned from another sarcophagus. It bore a carved bas-relief of a scene depicting sea horses and the head of Neptune, god of the seas, according to the police report. Such ancient fixtures had legally made their way into private collections through the centuries, long before Italy passed its cultural heritage laws in the early 1900s.

The break-in set off a chain reaction that rocked the biggest auction houses and museums and, ultimately, led to Tsirogiannis's career. When Sotheby's published the catalog for its May 1987 London antiquities sale, investigators from the Italian Carabinieri art squad noticed that three lots appeared to match objects from the burglary. The Carabinieri contacted Interpol, which relayed a request to the British police to block their sale. Sotheby's pulled them from auction. More important, the operation yielded the name of the company that had consigned the three antiquities for sale: Editions Services SA, based in Geneva and registered in Panama. Medici owned the shell company, which rented storage space at a gated warehouse complex where foreign goods in transit are exempt from Swiss taxes.

In September 1995, after a lengthy standoff with the shell company's Swiss administrator, Swiss and Italian police searched the warehouse. Alongside thousands of artifacts, they found Polaroids and rolls of film–more than 80 albums with about 4,000 photos. Some depicted objects in fragments, encrusted with dirt. Others showed the same objects undergoing restoration, and yet more depicted them fully restored. In a few photos, Medici posed with the same works in American museums.

Sorting out the pictures for Italian prosecutors was a task that fell to Maurizio Pellegrini, a technician from the Villa Giulia Etruscan museum in Rome, and Daniela Rizzo, an archaeologist there. They sought to match each of the thousands of photos to known pieces in museums and collections around the world. The evidence they compiled helped lead to the return of more than 100 objects from museums globally, including New York's Metropolitan Museum of Art, the J. Paul Getty Museum in Los Angeles, and Boston's Museum of Fine Arts. Italy seized the objects of apparent Italian origin at the warehouse, but many of them stayed in Geneva under Medici's control.

In 1998, Tsirogiannis graduated from the University of Athens, where he'd been studying archaeology and art history. His career path had been set in 1977. When he was a 4-year-old growing up in Komotini, a small town in northeast Greece, his parents had showed him newspaper photos from the newly excavated royal Macedonian tombs, which included the undisturbed, gold-filled burial place of Philip II, the father of Alexander the Great. "They showed me how these objects can be discovered," he said. "I found my cause."

At university he largely skipped lectures to work on

Lot 26, the erotic amphora Christie's pulled from auction government excavations for fieldwork experience, and he passed exams by studying friends' class notes. After a handful of short-term archaeology jobs, he began his mandatory military service in 2002, turning his remote postings into expeditions. On Crete he discovered an ancient fortification and gathered pottery for a local museum. As an army officer in 2003, Tsirogiannis discovered an ancient settlement and cemetery on the Greek-Albanian border. It helped him win his first of several contracts as a government archaeologist in 2004.

That same year, a judge in Rome convicted Medici on trafficking charges. About the same time, related investigations had netted other photo caches. One raid on the Swiss vaults of Sicilian dealer Gianfranco Becchina yielded a huge trove. Another police mission, on a remote Greek island, brought Tsirogiannis into the hunt.

His work for the government had introduced him to the Greek police art squad, which needed archaeologists to identify looted artifacts on raids. In April 2006, Tsirogiannis went to a villa that housed the belongings of British antiquities dealer Robin Symes and his late partner, Christo Michaelides, on the island of Schoinoussa. While Symes was away, Tsirogiannis and the police spent four days searching the property for artifacts. They were successful but didn't find the documentation they suspected might be there. They returned to Athens only to be sent back after the head of the art squad got new information. On the penultimate day of the second trip, the team combed through a storage room next to one of the complex's many kitchens. There they stumbled upon 17 albums bound in dark green leather and embossed with gold lettering, containing, Tsirogiannis said, "photographs of unique masterpieces from nearly all ancient civilizations." (Symes was investigated, but never indicted, in the broader Medici probe. Symes, who couldn't be reached for comment, denied in a 2005 interview with the *Los Angeles Times* that he knowingly sold looted goods.)

In July 2006, at a two-day meeting at police headquarters in Athens, the Italians gave the Greek team digital copies of the Medici and Becchina archives. Tsirogiannis now had the core of his collection. By 2008 his investigative work with the photos had become well known in antiquities circles. Professor Colin Renfrew, a member of the House of Lords and the godfather of academics who advocate for repatriating ancient objects, invited Tsirogiannis to the University of Cambridge to turn his archival work into a doctoral thesis.

From that perch, Tsirogiannis claimed his first auction house scalp, in 2010 at Bonhams in London. "I identified three busts depicted in fragmentary condition in the Symes-Michaelides archive that, at Bonhams, were restored in such a way that gave the impression they had never been broken," he said. The same catalog also had a marble statue he matched to a Polaroid from the Medici archive in which the piece sat uncleaned on a table. Bonhams removed the objects from sale.

Tsirogiannis had changed the rules of the game. Others had called out the houses for their practices, but no one had done so with such a powerful trove of visuals. "His approach has made auction houses and other dealers take due diligence much more seriously," said David Gill, a professor at the University of Suffolk who specializes in cultural heritage issues and helped supervise Tsirogiannis's grad work. Sotheby's contends that the industry's due diligence would benefit if the archives were made public. "Regrettably, those materials have been and remain at present completely inaccessible—except to one private individual," it said in a statement. Bonhams has asked for access to the archive, "to assist the rigorous due diligence that we do for each object in our sales," said spokeswoman Lucinda Bredin.

To date, Tsirogiannis said, he's matched more than 50 objects at auction and disrupted at least $10 million in sales. One of the biggest was a Sardinian marble female idol put up for sale at Christie's in December 2014 for an estimate as high as $1.2 million. Tsirogiannis linked the gleaming figure in the catalog to an image of a yellowed and cracked object in the Medici archive. Christie's pulled the idol from the auction.

The move to Cambridge changed his life. Tsirogiannis got his doctorate and married an Englishwoman on the classics faculty, Helen Van Noorden, who specializes in Greek epic poetry. They named their daughter and son after figures from Greek mythology.

To his frustration, Tsirogiannis doesn't make a cent as a Robin Hood—though he does have a book contract from an academic press to publish his dissertation. Since completing his doctorate, he's worked as a researcher for the Trafficking Culture project at the University of Glasgow and for a commercial archaeology unit in Cambridge ▶

Medici, pictured in July 1980 at a Christie's auction in London

◀ that provides services for construction projects. He’s also advised law firms on provenance research. In June, Denmark’s Aarhus University awarded him a fellowship to study material confiscated from Symes.

Tsirogiannis persists because the auction houses won’t submit photos from their prospective sales for vetting by authorities in countries such as Greece. The houses consider such vetting to be unfairly time-consuming. Someone has to do the work, he said, because the market is failing in its responsibility to prove that ancient objects haven’t been illegally removed from tombs, temples, and sanctuaries where people dedicated them to memorialize ancestors: “I cannot stand that there is such disrespect to the most sacred things and beliefs we have as human beings.”

After I left his home on that March day, Tsirogiannis told me later, he found a match for a bronze Roman figurine of a boar among the 15 suspect lots in the Christie’s catalog. It was in the Symes files. That evening, after putting his daughter to bed, he returned to his list. By 11 p.m., he’d vetted 13 more objects without a match. Tiring, he checked Lot 26, the erotic amphora. The pot was Etruscan, made by the pre-Roman civilization from which Tuscany gets its name. He knew it wasn’t in the Symes archive, which he’s practically memorized. He opened the Medici files, turning to a folder of Italian vases, which held a subfolder of Etruscan material and a sub-subfolder of amphorae. Although he initially suspected he’d find it here, there was no match.

Tsirogiannis had arranged the photos from the Becchina seizure in Switzerland in the same configuration as the Medici trove. He clicked through. What appeared on his screen was a picture of a piece of paper to which two Polaroids were affixed. It was the erotic scene in fragments and covered with encrustations, sitting on a wicker table or chair. On the paper were dates from 1993 and a handwritten code that he deciphered as price information—it appeared that Becchina bought it for 30,000 Swiss francs (about $20,400 at the time) and sold it for 47,000. (Becchina was convicted of trafficking in 2011, but he appealed, and the case ended when the statute of limitations expired. He didn’t reply to requests for comment for this story.)

Tsirogiannis activated his network, an informal team of police, prosecutors, journalists, and bloggers who work together to get suspect antiquities pulled from auction and repatriated. He emailed the photos of the vase to the chief of Interpol’s art squad, French policewoman Françoise Bortolotti. “I have just made two new identifications at the antiquities catalogue of the forthcoming Christie’s auction on 18 April 2018 in New York,” he wrote, describing the boar and the pot. “Please, for both cases, forward the information and the relevant evidence to the U.S. authorities.”

He also sent that email to Matthew Bogdanos, a prosecutor in the Manhattan District Attorney’s office who runs a new unit dedicated to antiquities investigations. A colonel in the Marine reserves, Bogdanos handled the U.S. investigation of the 2003 looting of the Iraqi National Museum in Baghdad. In New York he’s repeatedly used research that Tsirogiannis has offered as investigative leads, including, last year, in the confiscation of a 2,300-year-old vase at the Metropolitan Museum of Art that matched a photo in the Medici archive.

The next morning, Tsirogiannis was indignant and thrilled at having paired Lot 26. “It’s profoundly illicit,” he said. “It’s all incriminating. It’s pure proof. It’s quite straightforward, and the Italians should get it back today. Not even tomorrow.” The boar was a different story. There was nothing about the photo that indicated recent excavation. The boar sparkled in what appeared to be a showroom. Although Tsirogiannis sees his work in black-and-white terms, the boar was more gray, raising the question of whether an ancient object is loot just because it shows up in a disgraced dealer’s archive.

The family that Giacomo Medici comes from could hardly be confused with its Renaissance namesake. Born in Rome, he grew up poor, almost starved in World War II, and then followed his father into the artifact trade, climbing from the family street stall to supply museums. After his 2004 conviction, he served two years under house arrest at his seaside villa. He paid a €10 million ($11.6 million) fine by renouncing titles to antiquities the Italian police seized from the Geneva warehouse that weren’t part of his conviction.

On a recent afternoon in Rome he sat down, smiling and tanned, for an *aperitivo*, a gold Cartier Tank watch on his wrist. After ordering a nonalcoholic Crodino, Medici, who turns 80 in July, ripped into the man he refers to only

A Sardinian idol that was to be sold at Christie’s until Tsirogiannis published this photo from a smuggler as "the archaeologist." "He's doing terrorism toward the auction houses and the museums!" he said.

Medici stressed that, despite his conviction for illegally trafficking in hundreds of objects, the judge absolved him of smuggling thousands of others, even objects that were photographed broken and dirty. "Archaeologists seize on the fact that an object is encrusted, but that's hugely stupid," Medici said, pointing out that many Italian museums display works that are purposely left in their natural states. That's true to a limited extent.

I showed him a photo of the prerestoration Sardinian figurine from his archive. He remembered it well. "Absolved!" he said, triumphant because the picture, and the figurine depicted in it, wasn't among those for which he was convicted. Then I showed him images of the erotic amphora. Even though it wasn't from his archive, I thought he might recognize it. He said it could have come from "an old collection," not an illicit excavation. But looking closely at the pictures, Medici conceded that Tsirogiannis had a point. "Unfortunately," he said, "on this, he, the archaeologist, is right."

As Christie's April auction approached, Tsirogiannis saw few signs that others agreed. Interpol told him it had forwarded the information to the relevant authorities, and Bogdanos told him only that he'd look into the matter. To apply pressure, about two weeks before the sale, Tsirogiannis sent his findings, including copies of the photos, to antiquities bloggers. Some of those posts were picked up in the art press.

On April 11, a week before the auction, a notation appeared on the catalog entry for Lot 26: "This Lot is Withdrawn." The boar was still for sale. Other lots that Tsirogiannis hadn't flagged were in flux, too: An Egyptian statuette of the god Bes, Lot 55, was withdrawn, and another vase went from withdrawn to back on sale with a note that it wouldn't be delivered to a buyer until the seller established clear title. Tsirogiannis said the withdrawals were evidence that the antiquities trade reeked. He held out hope that the boar would be withdrawn.

A week later, Tsirogiannis tuned in to a webcast of the sale from his dining room, fingers crossed. He watched as an auctioneer wearing a pink tie made announcements preceding the bidding. "We have two withdrawn lots," he said. "Those are Lots 26 and 55." The boar was still for sale. Someone bought it for $15,000. Christie's spokeswoman Cat Manson said the vase was withdrawn because information not previously available had come to light and the auction house would never sell anything that might be stolen. In this and other cases, she said, "without access to the archives, we are not able to do our best by the object."

Tsirogiannis sounded resigned afterward. Nobody heeded his warnings about the boar, and he didn't yet know the fate of the amphora. "Usually, I have to wait years to see," he said. And even then, he's never been invited to a ceremony where, say, Italians take possession of an item being returned. At best, he gets kind emails from members of the public after his rescues hit the news. "If it turns out to be the same thing with the Etruscan amphora," he added, "I will be more than happy."

In early June, Bogdanos told Tsirogiannis that a warrant had been executed for the vase. The prosecutor in the case said in an email to *Bloomberg Businessweek* that it doesn't comment on ongoing investigations but cited press releases that commended Tsirogiannis for his "conscientious dedication to helping stop the illegal trade in antiquities."

Yet there was no time to celebrate. Less than a month after the Christie's auction, Sotheby's would have an antiquities sale in New York, and the catalog was expected any day. When it came out in early May, Tsirogiannis found a match: Lot 4, a bronze Greek figure of a horse in the Symes trove, was estimated to sell for as much as $250,000. The day before the auction, the Greek culture ministry wrote to Sotheby's demanding the horse be withdrawn, and it was.

After years of lost sales and accusations of aiding smugglers, Sotheby's went on the offensive in June. It sued the Greek culture ministry over the bronze horse in Manhattan federal court, saying Greece had no proof that it was exported illicitly and that the client who consigned the horse for sale was its rightful owner. Tsirogiannis's work had triggered the ministry's demand. What happens next will test how much sway his secret archive has in court and whether collectors will feel more emboldened to buy a piece of history regardless of whether it should even be for sale. Ⓑ *—With Katya Kazakina*

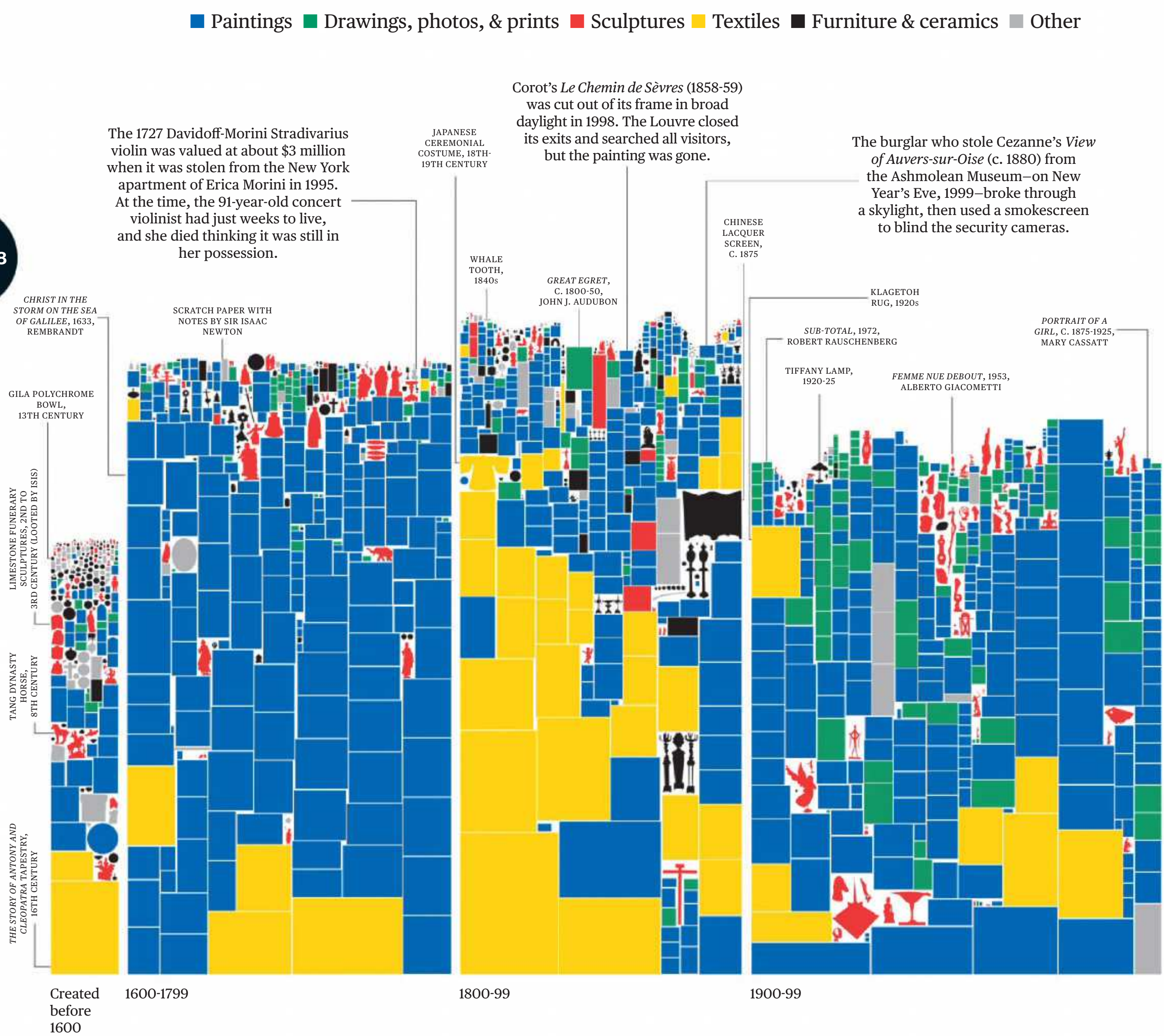
Polaroids of a fragmented vase from Tsirogiannis's archive matched Lot 26 from Christie's April sale

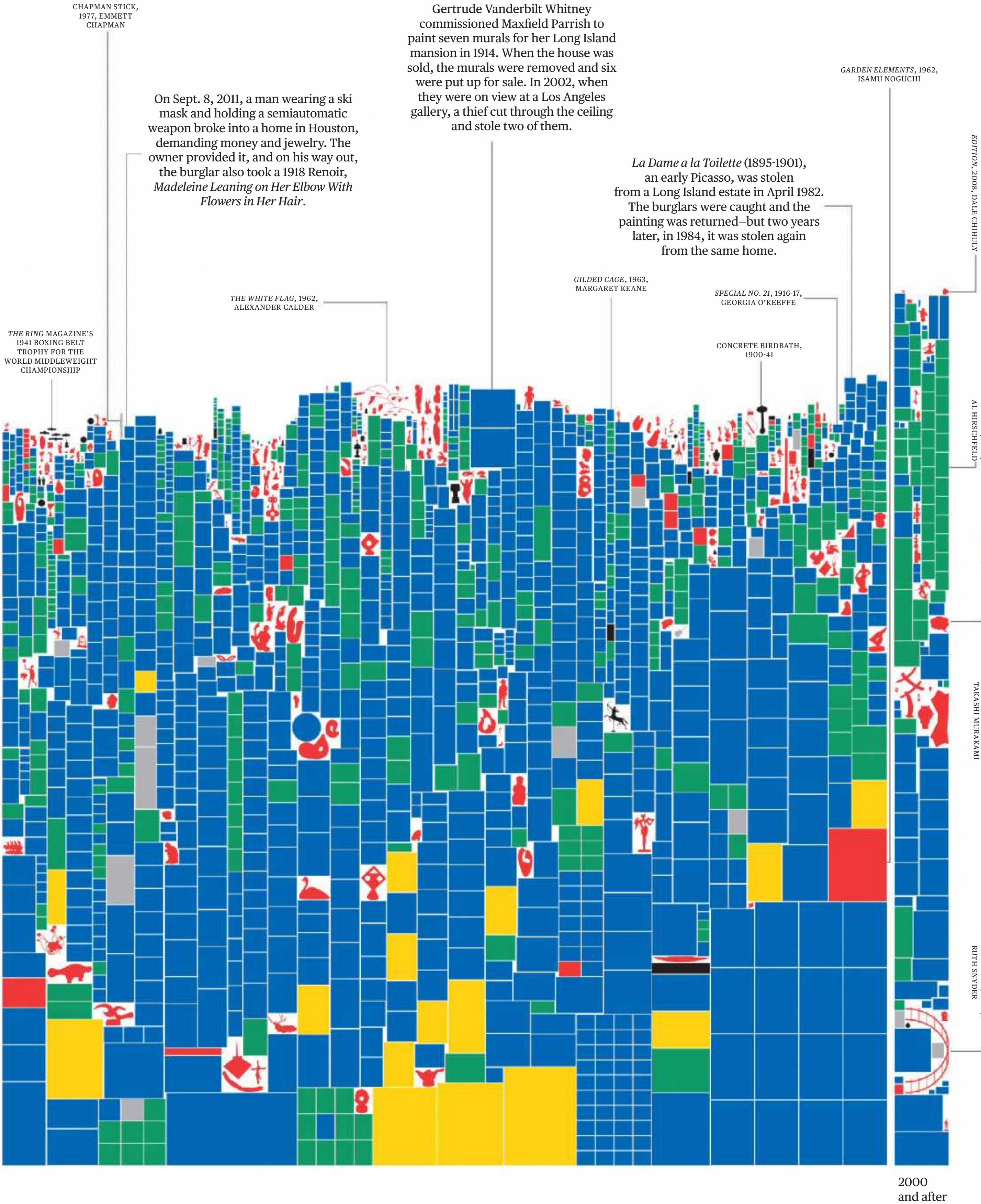
COURTESY CHRISTOS TSIROGIANNIS (2)

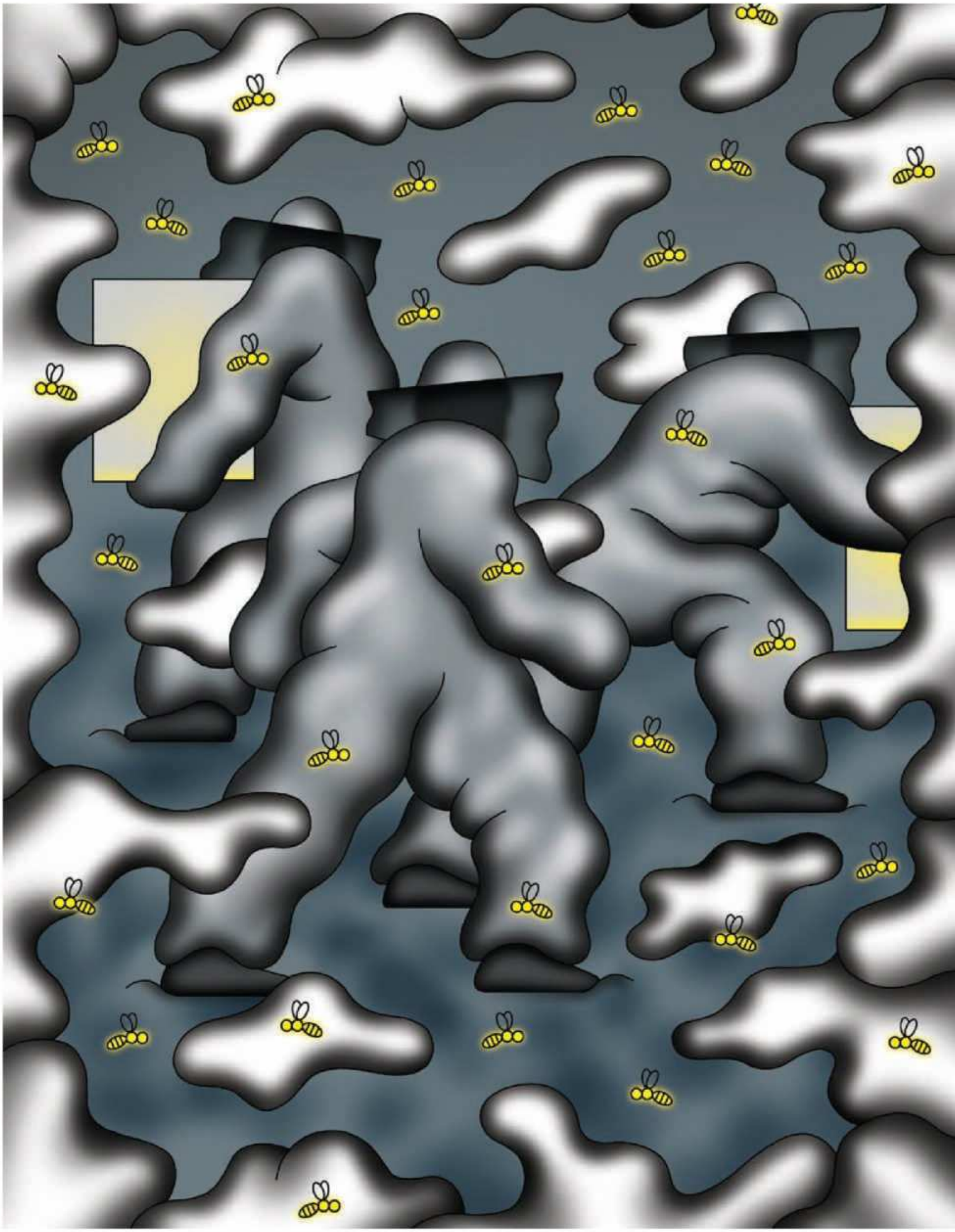
YOU COULD FILL A MUSEUM

Missing masterpieces draw headlines, but most stolen art is crushingly quotidian—a family portrait "lost" by a moving company, a landscape snatched with the jewelry during a break-in. The FBI's global database has more than 7,200 items. Below are the 3,362 for which the bureau provides information about size and when the object was made. Each shape is drawn to scale (1:218, where 1 inch equals about 18 feet) and grouped, left to right, according to the century (or centuries) in which it was created. If there's one conclusion to draw, it's that thieves like 20th century paintings.

By Dorothy Gambrell and James Tarmy




CHAPMAN STICK, 1977, EMMETT CHAPMAN
On Sept. 8, 2011, a man wearing a ski mask and holding a semiautomatic weapon broke into a home in Houston, demanding money and jewelry. The owner provided it, and on his way out, the burglar also took a 1918 Renoir, *Madeleine Leaning on Her Elbow With Flowers in Her Hair*.
Gertrude Vanderbilt Whitney commissioned Maxfield Parrish to paint seven murals for her Long Island mansion in 1914. When the house was sold, the murals were removed and six were put up for sale. In 2002, when they were on view at a Los Angeles gallery, a thief cut through the ceiling and stole two of them.
GARDEN ELEMENTS, 1962, ISAMU NOGUCHI
DAKOTA MACCHIA STUDIO EDITION, 2008, DALE CHIHULY
La Dame a la Toilette (1895-1901), an early Picasso, was stolen from a Long Island estate in April 1982. The burglars were caught and the painting was returned—but two years later, in 1984, it was stolen again from the same home.
GILDED CAGE, 1963, MARGARET KEANE
THE WHITE FLAG, 1962, ALEXANDER CALDER
SPECIAL NO. 21, 1916-17, GEORGIA O'KEEFFE
THE RING MAGAZINE'S 1941 BOXING BELT TROPHY FOR THE WORLD MIDDLEWEIGHT CHAMPIONSHIP
CONCRETE BIRDBATH, 1900-41
THE END, 2003, AL HIRSCHFELD
MR. CLOUD, 2004, TAKASHI MURAKAMI
BONE RAINBOW, 2005, RUTH SNYDER
2000
and after



HOW TO STEAL 50 MILLION BEES

Apiarists from all over America rent their hives to farmers in California, attracting a particular breed of thief

By Josh Dean
Illustrations by Alexis Beauclair

Lloyd Cunniff felt terrible, literally sick to his stomach, about trucking his bees to California, but fate had painted him into a corner. Bad weather, bad luck, scrawny, needy bees—a whole mess of headaches had upset the economics at Beeline Honey, his third-generation apiary in Montana. It was colony collapse in 2015 that had really tipped things sideways. The mysterious affliction, which causes worker bees to vacate a hive en masse, had destroyed half of the Beeline colonies. Cunniff and his wife, Brenda, were down to 489 hives, when he bit the bullet and did the thing he really didn't want to do.

In January 2017, Cunniff piled 488 of his 489 bee boxes—24 to a pallet—onto a semitruck trailer, strapped them down, and headed west to chase the sweet, sweet almond dollars that were drawing so many of his beekeeping brethren to California's Central Valley. Loaning his bees out for a season, 1,000 miles away, made him very uncomfortable. But if your business is bees, California is where the big money is. Or it is at least in February, when 1.2 million acres of almond trees don't get pollinated without the help of honeybees, which love almond flowers. California produces 80 percent of the world's almonds, and over the past 15 years the trees have come to dominate the valley, pushing out all kinds of row crops. There aren't enough California bees to pollinate them, so every year the call goes out to keepers: Bring your boxes west. An acre of almond trees needs at least two hives, meaning that every February, 2.5 million colonies—two-thirds of the commercial honeybee colonies in the U.S.—are clustered in a few California counties. Beekeepers command as much as $200 per hive for the season, which runs a few weeks.

Cunniff has a long-standing relationship with Strachan Apiaries, a Yuba City-based business that's one of the most famous names in American bees. Don Strachan, the founder, helped Cunniff's grandfather get his apiary up and running. For years now, Valeri Strachan, Don's granddaughter, has sent a few trucks of California bees to Montana to make clover honey in the summer, when there's little for those bees to eat or do in the Central Valley. So when Cunniff decided to participate in the 2017 almond season, the Strachans were happy to help out an old friend. They arranged for farmers to hire his bees and offered to keep them for a few weeks until it was time to head south from Sutter County toward Fresno and the trees.

When Cunniff arrived in Yuba City, the Strachans directed him and his truck to a dike running along some sunflower fields southwest of town, between the Sacramento River and the Sutter National Wildlife Refuge, and that's where he unloaded his bees on Jan. 17, arranging the boxes in tidy rows. Leaving them that evening, Cunniff felt better about things. The bees seemed happy; that's what he told Brenda when he called her from his hotel.

The next morning he rose early and drove back to the site. The fog had rolled in overnight, and Cunniff ▶

◀ couldn't see 100 feet past his nose, so he wandered around to make certain he wasn't fog-blind. Then he double-checked to be sure he was in the right place, because goddamn if something weird hadn't happened: The hives were gone.

Almost 50 million bees, in 488 white boxes with cedar lids, every one of them hand-crafted by Cunniff, had vanished into the fog.

The first thing Philip Strachan, Valeri's son, thought when Cunniff called him in a fugue state, muttering about stolen bees, was that this was the work of professionals. No normal criminal would think to steal bees or have the equipment or know-how to pull it off. Cunniff was thinking the same way, and the evidence was right there in the dirt. He could tell by the thieves' tracks that they'd used single-axle, dual-wheeled straight trucks, and not semis, probably because they knew there wasn't room to turn a semi around in a hurry. He also saw signs of a forklift, so they'd come prepared to lift pallets.

Hives go missing; that's no surprise. But historically, Strachan says, it's been "one here, two there." Just some drunk opportunists in a pickup. But this was a methodical operation. Cunniff's weren't the only hives taken. In total, more than 700 of them, valued at as much as a million dollars, went missing in a single night. In addition to the heavy equipment, the burglars needed the gear required to subdue and corral the boxes—namely, full keeper suits and hand-held smokers. Whoever did this knew how to handle bees.

And this wasn't the first time, either. What sounds to novice ears like the plot of *Fargo* Season 4—a crew of guys in white suits and beekeeper hoods boosting hives in the fog—is a small but growing niche of agricultural crime. Two years prior, someone stole a bunch of hives in a neighboring county, and the next year more were taken, Strachan says. Counting the loss of Cunniff's bees in 2017, then, "it was three years in a row that we had large thefts in this area."

Meanwhile, in New Zealand, hive heists are an epidemic. There the motive is manuka honey, a highly prized variety that goes for $150 a kilogram (or 2.2 pounds), and authorities suspect an organized crime syndicate may be to blame. "It doesn't matter if it's beekeeping or meth; this is just the new gold rush," one apiary manager told Reuters.

The culprits in California were almost certainly not local. Beekeepers are a close-knit community. They share wisdom and are aware of one another's operations and equipment, particularly within a given area. Anyone new showing up with a bunch of hives for hire is going to stand out. "I wouldn't steal my neighbor's car and park it right next door," Strachan says. "And it was pretty obvious that if you were going to take them from this area, they're probably going to take them straight down to the almonds."

Cunniff grew up around bees and hears their buzz in his sleep. His grandfather tended hives on the high plains of Montana, so did his father, and so did he, as soon as he was old enough to participate, at age 13. The morning of the theft, Cunniff drove around in a daze, his hope dwindling. He stopped every time he saw a beekeeper tending to boxes, but their reactions sunk his spirits further. The bees, folks said, were almost certainly gone forever. Stolen bees just aren't found. "One kid said that he'd lost 300 colonies the year before and never saw anything of them," Cunniff recalls.

He'd hated the idea of moving his bees in the first place, but this was far worse than anything he imagined. He'd lost so much more than the $100,000 in pollination fees. His entire livelihood was gone. One day, he had almost 500 hives. The next, he had one. "I was 57 years old, and I had to start over from scratch," he says. "Where I had been thinking about retiring, now I got to … there's no way I can retire now."

Valeri Strachan, a former president of the California State Beekeepers Association, mobilized that organization. The CSBA has a fund for rewards, and it put up $10,000 for information that could lead to an arrest and conviction for the hive thefts. More important, law enforcement took notice. Agriculture crime detectives in Madera, Sutter, and Fresno counties were all put on the case, and the FBI even offered assistance.

Around the state, bee people were on the lookout for boxes that fit the description of those stolen from Cunniff and several others, but with 2.5 million hives in a concentrated area, the task was daunting. California law requires commercial keepers to brand their boxes by burning or cutting a state-assigned number into the wood. But the law isn't strictly followed. Some beekeepers can't be bothered, whereas others, such as Cunniff, are from out of state.

Market forces wouldn't help, either. Demand in almond season is often desperate, something thieves can exploit. "You're going to come across somebody who may not have bees on his almonds yet, and you're like, 'Do you want bees?' And that guy is not going to

"I WOULDN'T STEAL

ask questions," Philip Strachan says, "because without those bees, he's not going to have a crop."

Cunniff's main business is honey. That's how it used to be for most apiaries, especially those on the high plains of the western U.S., where the air is clear, the water is clean, and the forage, as keepers call the many plants bees plunder for pollen and nectar, is plentiful. Bees in Montana and the Dakotas produce more honey per hive than any other bees in America, and that's been good enough to keep three generations of Cunniffs housed and fed, with money left over to vacation in Hawaii and send the kids to good colleges.

But the business isn't what it used to be, for them or anyone else who raises bees commercially. Today's commercial beekeeper can never relax. He can expect to lose 30 percent of his bee stock every year, from bad flower years, pesticides, disease, and bears, which really do love honey, just like the cartoons say. Climate change is a problem, especially as it pertains to drought, because bees need lots of water. They both drink it and collect it to take back to the hives for the queen and her nurses, which is why you always find bees floating in pools and buzzing around leaky sinks.

"We spend so much money to keep them alive," Cunniff says. "We feed them pollen substitutes that we never, ever dreamed of." Those are $2.50 a pop for each hive. "They used to make enough honey to make it through the winter. Now they won't make it. You got to feed them corn syrup at 40¢ a gallon." Twice a year, he treats for varroa mites, a scourge his father never had to deal with. The treatment used to cost $1 a hive. It's now $4.

"It's probably twice the labor it used to be to maintain the beehives," says Valeri Strachan, who took over the Strachan Apiaries business when her father passed away and will soon hand it over to Philip. Honey is third on the list of revenue streams for the Strachans. Above that is queen bee breeding. If an apiary in America is using Carniolan queens, they've almost certainly been bred by the Strachans, who've perfected the art. Valeri's specialty, and it's a rare one, is instrumental insemination. She's one of a handful of Americans who can extract semen from drone bees and use it to inseminate virgin queens, a delicate skill requiring a steady hand, tiny tools, and a microscope. The Strachans produce close to 50,000 queen bees a year. "We use some, some die, and then the rest are shipped," Philip says. A healthy Carniolan queen costs $31 (or $28 if you buy bulk); she'll be sent overnight by UPS in a tiny box with screened sides along with six bodyguard bees that tend to her needs in transit.

At the top of the pyramid for the Strachans is pollination. The company maintains an average of 10,000 hives in a given year, an exponential leap from the 600 Valeri's father started with and the most it has the space for. Bees move from almonds to prunes to any one of many other crops: apples, cherries, melons, sunflowers. This summer there are eight Strachan hives in a cilantro field; others will soon be sent to farmers of alfalfa seed.

Back in 2013, a Whole Foods in Rhode Island wanted people to recognize how important bees are to their daily diet. For a few days, the market removed all produce that grew on plants that depend on pollinators. More than half of the section was empty: 237 of 453 products in the section, or 52 percent of the store's produce, were gone.

In late May 2017, four months after Cunniff's hives vanished in the fog, someone who knew enough about bees to recognize an odd sight called the Fresno County Sheriff's Office to report something suspicious: A vacant lot at the intersection of two roads about 20 minutes east of downtown Fresno was filled with bee boxes—many more than any reputable beekeeper would store at a single location. And it wasn't just too many boxes. These were scattered all over the one-acre lot, stacked haphazardly, and in various shapes, sizes, and colors.

When a Fresno County Sheriff's deputy arrived at midday to inspect the site, bees impeded his investigation. They're most active in warm temperatures, and these bees were agitated—too agitated for him to get anywhere near the boxes without getting stung.

Cops returned later, this time after dark, and found what Fresno Detective Andres Solis called a "chop shop" for hives. A man in full beekeeper regalia—veil and all—was sitting in a passage between some stacked boxes that seemed to be his workspace. He appeared to be in the process of splitting each colony into two, so he'd have twice as many hives to market. (Half the hives would then be without a queen, of course, but healthy hives often split anyway, when they get overpopulated. The bees make a new queen from a fertilized egg.) Nearby was a station where someone had been sanding and repainting, as well as a stencil for the name that had been sloppily spray-painted on many of the boxes: Allstate Apiaries Inc.

That was the name of the apiary operated by the man detectives arrested there, a 51-year-old Ukrainian immigrant named Pavel Tveretinov, who'd been renting hives to local almond growers and selling them to buyers around the U.S. ▶

MY NEIGHBOR'S CAR AND PARK IT RIGHT NEXT DOOR"

◀ Detectives asked a local beekeeper named Ryan Cousins to come down to the lot and help them ID the hives so they could begin the process of getting the very angry insects back to their rightful owners. Cunniff's boxes weren't marked, but they were handmade and had a unique configuration of frames inside. Cousins recognized them from photos Valeri Strachan had posted on Facebook.

The police called the Cunniffs in Montana, and Lloyd and Brenda drove immediately to Great Falls to catch a flight to Fresno. They were on a stopover in Salt Lake City when a detective called with an update. "He said, 'You're not going to believe this, but we found two more locations with your bees since you got on the plane this morning!' " Cunniff recalls.

In California he went immediately to one of the lots and wandered through the rows of tipped and broken boxes, angry bees buzzing around his head. "Hives were tipped over and mixed together," Cunniff says. "Oh God, it was like a nightmare." Many had been split from their normal two-story configuration into single hives, not to mention painted over and affixed with the new stencil. He spotted some hives that looked familiar. He pulled out his phone and called the young man he'd met near Yuba City the day his own hives were taken, the one who said he'd lost 300 hives and was sure they were gone forever. He thought he ought to tell him he was right: None of his bees were left. "It was just empty equipment," Cunniff says.

The authorities recovered more than 600 hives at the three locations, stolen over the course of at least three years. They charged Tveretinov, along with another Ukrainian immigrant, Vitaliy Yeroshenko, with 10 felony counts of possession of stolen property, and estimated that the value of the stolen equipment and bees was at least $875,000, making it "the largest bee-theft investigation we've ever had," says Arley Terrence, a sergeant in the Fresno County Sheriff's Office.

Beekeepers from three states flew in to assess the damage and salvage what they could. "We had no intention of bringing anything home," Cunniff says. The insurance company had told him not to. "But once we got down there, there was so much equipment, we just couldn't leave it."

Cousins called some friends, who brought a truck and a forklift and helped Cunniff load his gear and the remaining bees. The truck wasn't big enough to carry it all, so they left some overnight, and when they went back in the morning it was gone. "They had come in and stolen some of the stuff, again," Cunniff says. It was later recovered, again.

In beekeeper circles, it's widely believed the arrested men are part of a larger criminal enterprise. But neither the Fresno County Sheriff's Office nor the district attorney assigned to the case is pursuing that angle. The trial has yet to be scheduled, and the defendants have pleaded not guilty. Detectives initially feared the men would be a flight risk, but they've appeared at every hearing. "I'm a little surprised that they keep showing up," Sheriff's office spokesman Tony Botti says. "But they're still insisting they've done nothing wrong. I don't understand it."

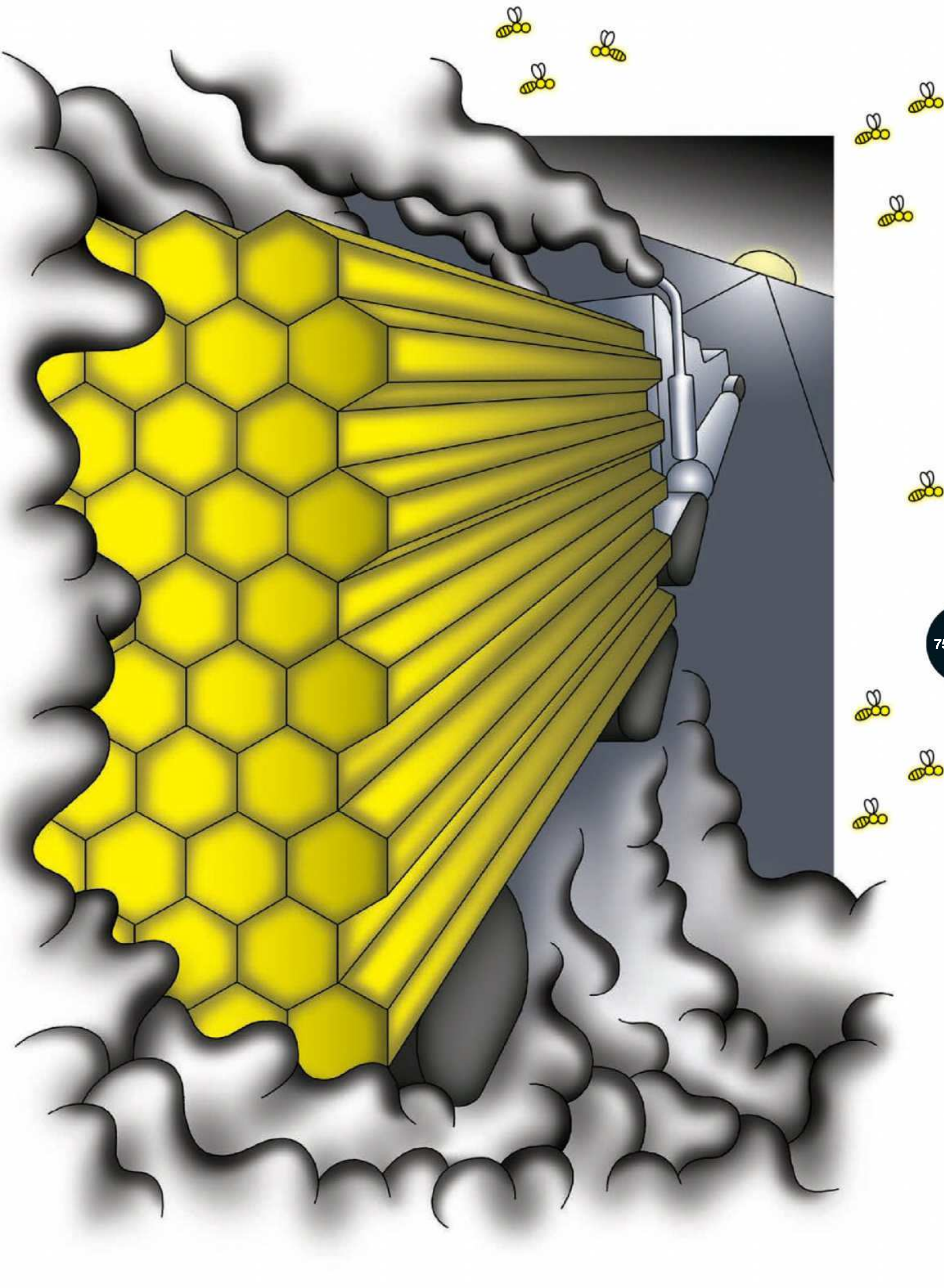
Sometime this fall, Kelsey Peterson, a deputy district attorney and agriculture crimes prosecutor, will open the state's case against the two defendants in a courtroom at the Fresno County Courthouse, which itself looks very much like a honeycomb. As of late May, her investigator, Doug Bolton, was still pursuing leads in the hope that she might be able to add theft charges on top of possession. "I'd like to do that for the victims," Peterson says.

Cunniff trucked his bees home last summer, but he and Brenda had already started over with all new hives, most of them started with Carniolan queens either given to him or sold at an extreme discount by the Strachans. "We were starting over, and then all of a sudden these other bees show up," he says. He had to quarantine the old bees, to make sure they hadn't picked up any diseases. "That's like a whole different operation. You can't go work on those colonies and then come work on the new colonies unless you sterilize all your equipment and change gloves," he says. "I had to hire three or four guys just to try to keep up with all these different things that we were doing at the same time."

Insurance covered a chunk of his losses, but not the loss of income from the missed almond season or all the honey he couldn't make last year. This year his policy premiums jumped $8,000. The insurance company also decided it would no longer cover lost bees, only equipment.

That's why, when January 2018 rolled around, Cunniff was once more doing the thing he'd hated to do in the first place, the thing he'd thought he'd never do again. He stacked his hives—456 of them—on a truck, strapped them down, and headed for California. This time he took precautions. Instead of bringing in the hives early to settle in and acclimate—but also give "everybody that's crooked a chance to scope everything out and drive around and find stuff that's easy to get to"—Cunniff waited until the last possible minute to take them west.

Unlike last year, the bees all came home. "They made some money, and we got them back in pretty good shape," he says. Ⓑ



SAY BYE TO YOUR BITCOIN

There are lots of opportunities for cryptocurrency to go missing–some inherent to buying internet money, some involving crime. Below, a few common ways of going virtually broke

By Lily Katz and Andre Tartar
Illustrations by Nichole Shinn

NOT REALLY YOUR FAULT

Phone Porting

Pretty basic: Scammers hijack people's mobile accounts by calling their carriers and impersonating them. The thieves get their victims' numbers transferred to new devices and ultimately gain access to crypto accounts.

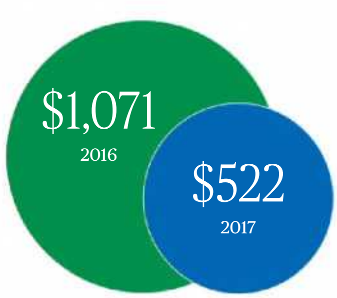
51 Percent Attack

This hasn't happened yet, but it's every crypto enthusiast's greatest fear. If a nefarious syndicate were to gain control of more than half of the Bitcoin network's computing power, it could tamper with the process of verifying transactions and potentially spend the same Bitcoins twice.

Ransom Demands

Everyone from local officials to large corporations has fallen victim to ransomware attacks, which often involve hackers holding computer files hostage until the victim pays a fee in crypto. In June 2017 a South Korean web provider paid hackers $1 million in Bitcoin. Although many payments aren't publicized, it's the largest ransomware demand known to have been paid.

Average ransomware demand

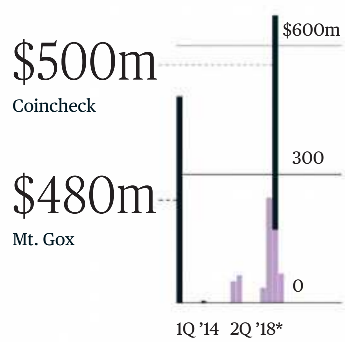


SORTA YOUR FAULT

Exchange Issues

It seems as if every week another cryptocurrency exchange says it's been breached by hackers who've run off with customer funds. Investors can also lose money on exchanges because of technology glitches or account holds that freeze funds and prevent buying or selling during significant market movements.

Losses from exchange hacks



Fraudulent ICOs

Investors have poured billions of dollars into initial coin offerings, only to find their savings drained. In April two founders of an ICO promoted by boxer Floyd Mayweather were brought up on federal charges of raising more than $25 million for a planned digital currency without registering the offering. (Mayweather wasn't accused of wrongdoing.)

Overhyped Stocks

Dozens of struggling businesses used the buzz around crypto to boost their stock market value in late 2017 and early 2018. (Long Island Iced Tea Corp. changed its name to Long Blockchain Corp., but it couldn't raise the capital to mine crypto.) Traditional investors looking for exposure to the nascent industry bought in, but the gains didn't last, and some companies got in trouble with regulators.

TOTALLY YOUR FAULT

Wrong Addresses

Unlike credit card transactions, Bitcoin payments are irreversible. If you send digital tokens somewhere you didn't mean to, you're out of luck unless the other party agrees to return your funds.

Twitter Scams

Fraudsters on social media have devised a new twist on an age-old con: If you send them one Ether coin, they'll send you 100 back! Sound too good to be true? It is. Still, scammers have tried to fool people's followers by making fake accounts (with real names and photos) to lure victims into thinking that they were being offered a great deal from a reputable source.

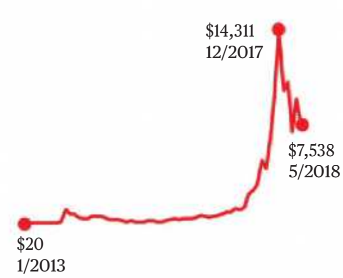
$225m Losses from Ether-related cybercrimes through August 2017

51% Share of those losses from phishing attacks

Lost Keys

There might be no worse self-inflicted crypto wound than buying Bitcoin low (say, in 2013) and trying to sell high (say, at the end of 2017), then realizing that you lost your private key. D'oh!

Price of Bitcoin at month's end



There were more than 4,000 victims of virtual-currency-related crimes worldwide in 2017, with losses of more than $58 million, according to the FBI, up from 392 victims and less than $2 million in 2014.

*THROUGH JUNE 26. DATA: CHAINALYSIS, COINDESK, TECHCRUNCH, SYMNATEC, BLOOMBERG