

bug ♥ match



Name: A. aegypti
Height: 0.3 inches
Hometown: Oxitec labs

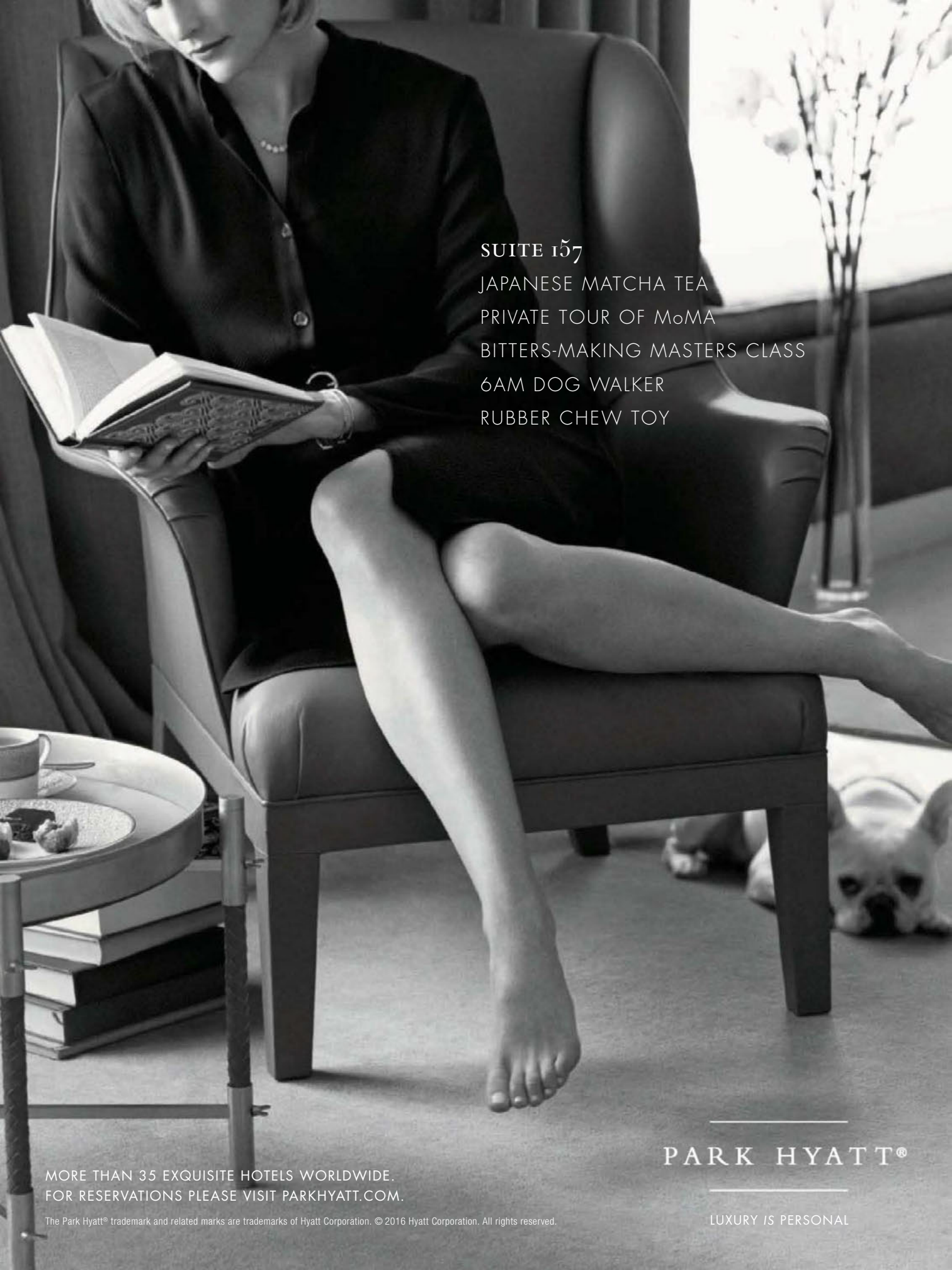
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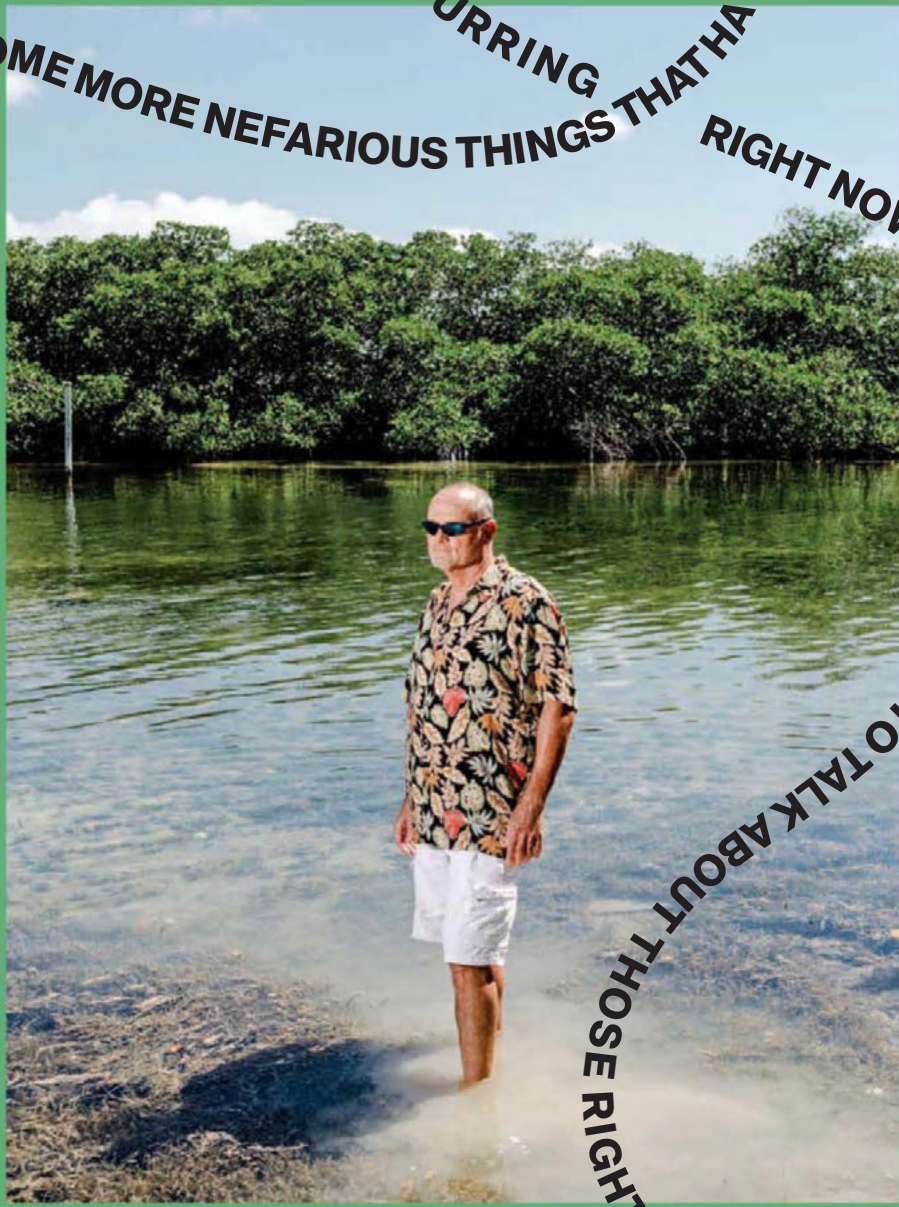
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LUXURY IS PERSONAL

**Bloomberg
Businessweek**
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Cover Trail

How the cover gets made

Domestic Cover

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"The story is about a controversial way to control Zika-carrying mosquitoes that may be tested in Florida."

"How does it work?"

"Male mosquitoes have been genetically modified so their offspring die before they mature. The process simply involves releasing them into Zika zones so they mate with infected females, therefore rendering them essentially unable to reproduce."

"Except for praying mantises, this sounds like the insect world's worst sexual encounter."



International cover

1

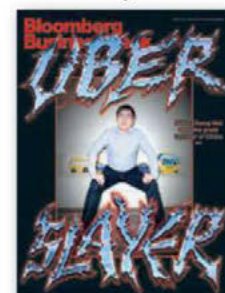
"We interviewed Cheng Wei, CEO of Didi. It's a wildly successful ride-hailing app in China. So much so that it overtook Uber there."

"Let's photograph him."



2

"That's certainly the pose of a man who just beat Uber at its own game."



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Trump fans in Ohio



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Corrections & Clarifications

The date of the Bloomberg Politics poll cited in "Hillary Clinton" (Politics/Policy, Oct. 3-Oct. 9, 2016) was Sept. 14. Clinton narrowly maintained her lead among millennials in that poll when third-party candidates were included. "In Crappy, Buggy, Obsolete Voting Technology We Trust" (Features, Oct. 3-Oct. 9), which ascribed the allegation of voter fraud to "the defendants," should have read, "Following every major election since introducing computerized voting six years ago, Shelby County has been sued, often with the plaintiffs alleging some version of election fraud."

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Legendary Performance Born of Potential

In The Ryder Cup at Hazeltine, players on both sides achieved new levels of competitive greatness

Some of the most lively days for investors occur when markets start to drop precipitously while the day's first coffee has only barely been sipped. By lunchtime, the first hints of a rally appear. By day's end, what seemed lost has, for the most part, been recovered.

In The Ryder Cup competition that came to a close on Sunday, European Team Captain Darren Clarke and his counterpart on the U.S. side, Davis Love III, experienced those same emotions for three long and grueling days of world-class performances. They built their teams based on analysis and potential—and then unleashed their talented players onto the stage in front of energetic and vocal spectators who seemed to cover every inch of Hazeltine National Golf Club, in Chaska, Minnesota.

The U.S. Team won the first four points on offer, pulling off a clean sweep of Friday morning's foursomes. U.S. players had not managed that feat in more than 40 years, and it was the worst of all possible starts

for Clarke and his team. Undaunted, the European Team went out and took three of four four-ball matches in the afternoon, establishing momentum heading into Saturday and trailing by just two points.

"What went on today is why so many millions of people watch this event all over the world," Clarke said Friday evening. "It's match-play golf with 24 of the best players in the world, and anything can happen. That's the beauty of The Ryder Cup. We came out this afternoon way behind and put in a great performance. Our players showed a massive amount of desire and the fight in them to get themselves right back into it again. I couldn't be more proud of them."

Faith in potential

To survive their emotional ride on Friday, Clarke and his players had to believe in their own potential—faith that they could and would play better, and that in turn would create opportunities for points. The same mind-set is required when investing in

today's global markets, and by embracing painstaking research and bottom-up analysis, Standard Life Investments, Worldwide Partner of The Ryder Cup, provides a steady hand on the wheel.

"For investors, potential is everywhere," says Jeremy Lawson, Chief Economist, Standard Life Investments. "From identifying an investment to understanding its rewards and risks, our philosophy seeks to identify and exploit the potential for change in an investment before the market view moves into line with our own. To underpin this, we employ a robust and repeatable investment process that strives to consistently realize potential."

By the start of play on Saturday afternoon, the European Team had reduced its deficit to a single point behind inspired play by Rory McIlroy and Sergio Garcia, both of whom seemed supercharged by the electric atmosphere on the course.

Europe seemed on the brink of fully seizing all momentum early on Saturday afternoon, until Patrick Reed holed out from



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“What went on today is why so many millions of people watch this event. It’s match-play golf with 24 of the best players in the world, and anything can happen.”

— Darren Clarke, captain of the European Ryder Cup Team

the fairway on the sixth hole in a match that pitted him and Jordan Spieth versus Henrik Stenson and Justin Rose. In the short time it took for the reaction to that shot to ripple across Hazeltine, the U.S. Team seemed to reawaken to its own potential. Playing his third match in four days, 46-year-old Phil Mickelson seemed particularly invigorated, turning in vintage Phil the Thrill moments.

The to and fro was endless—players grinding away until they hit the sweet spot where preparation and potential evolve into “the zone.” By end of play on Saturday, the U.S. held a three-point lead—but it was only four years ago that the U.S. surrendered a four-point lead. The game was far from over.

Potential delivered

Sunday at The Ryder Cup—12 individual showdowns in golf’s ultimate competitive theater. Captains Clarke and Love were fully aware that the first match out would likely set the tone for the day. Each tapped their hottest player to carry the banner for all behind to see—McIlroy for Europe, Reed for the U.S.

Had this been the Open Championship or The Masters, McIlroy would have been the heavy favorite. But this was The Ryder Cup, where every hole presents a new opportunity to change the standing of the match and tenor of the day. It was a nail-biter on every swing and stroke.

In the end, Reed’s gimlet-eyed play

provided a 1-up margin over McIlroy, and made believers of his U.S. teammates. Despite tight matches across the board, the Americans held their lead and won The Ryder Cup for just the fifth time in the last 13 tries. Reed’s play drew comparisons to perhaps the most feared U.S. competitor of all time, Lanny Wadkins, who won 21.5 Ryder Cup points during his career.

“I knew today was going to be tough going against Rory, especially how he was playing earlier this week,” said Reed. “It was definitely something fun to be a part of, and pretty sure it was fun to watch, too.” ●

Find out more at
www.standardlifeinvestments.com/rydercup

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Opening Remarks

The Smart Person's Guide To Paying Taxes

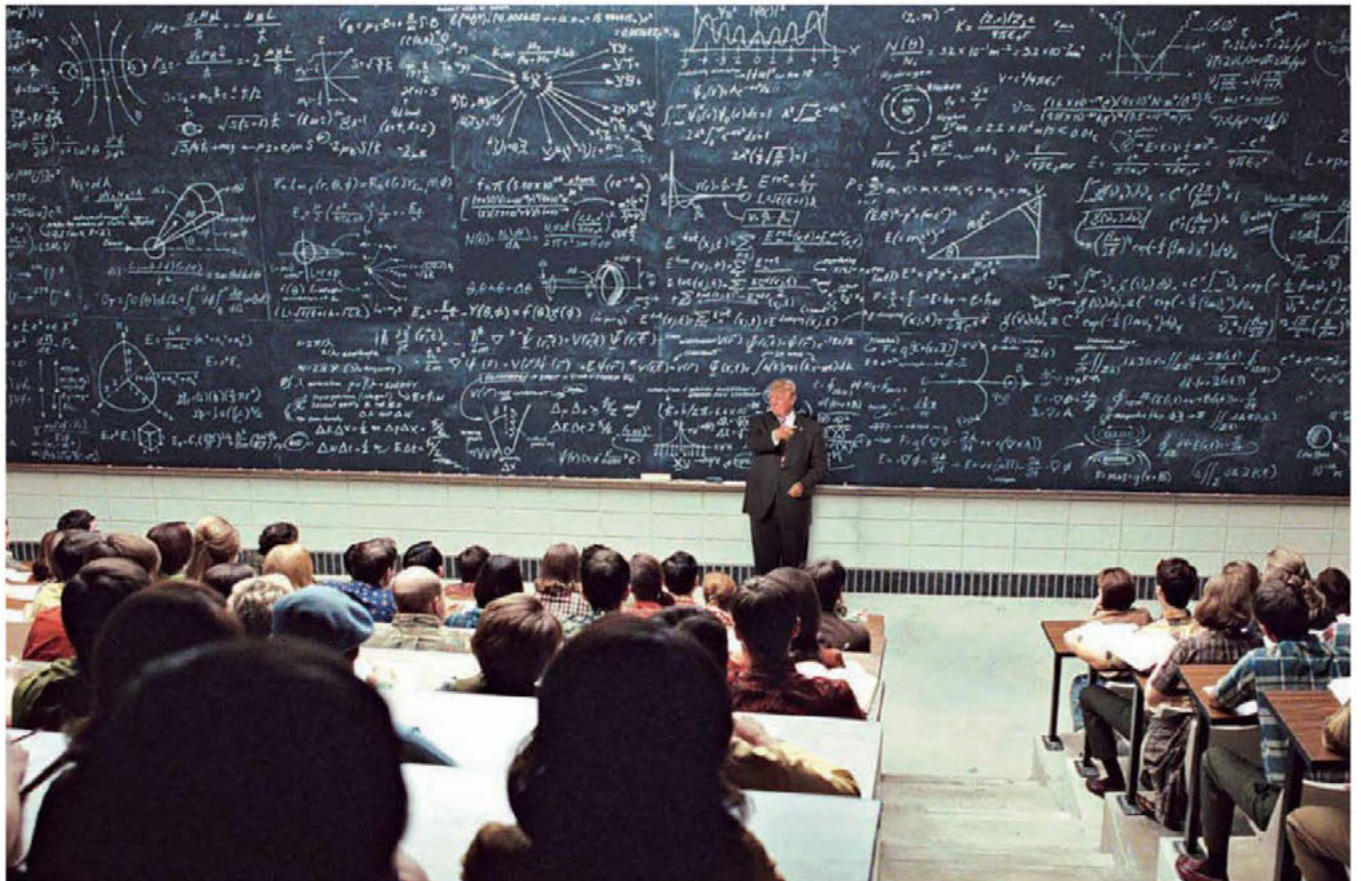
By Jesse Drucker

Snippets from candidate tax returns offer lessons in obscure tax planning strategies

Three years after he resigned from the White House, Richard Nixon offered this advice: “Make sure you pay your taxes.” He had refused to make his tax returns public during his two successful presidential runs. Then, in his second term, Congress looked into his filings amid suspicions raised about his deductions. “I am not a crook,” he declared, but the inquiry concluded he owed almost half a million dollars. Ultimately, the Watergate scandal, which broke just before the tax controversy, forced him to quit in 1974.

Since then, every major party presidential nominee—except Gerald Ford—has volunteered at least one tax return to buttress claims of civic responsibility and rectitude. The disclosures have become stingier in recent years—culminating in Donald Trump’s complete refusal to release his (he says he’s being audited and will do so once the IRS is done). But the snippets we’ve gleaned from the most recent Republican nominees—including Trump—offer lessons in how obscure tax planning strategies benefit the well-to-do, yet are mostly out of ordinary Americans’ reach.

In 2012, Mitt Romney had to be pressured to release his. His opponent Barack Obama had made more than a decade of returns public. However, Romney



released only two years of tax returns for himself and his various trusts. He kept earlier years out of public view.

At that time, I wrote two articles about a variety of tax avoidance techniques used by Romney. They were transactions the average American likely didn't even know existed. He used one type of trust that permitted him to take advantage of the tax-exempt status of the Mormon church without actually giving away much money. (Congress cracked down on the shelter the year after Romney set his up.) Another type of trust, known as "I Dig It"—short for "intentionally defective grantor trust"—allowed him to avoid estate and gift taxes on a pile of shares left for his children and grandchildren. By the time he made his remark about how 47 percent of Americans don't pay income taxes yet benefit from government programs, Romney had cornered himself into the elite 1 Percent, out of touch with the rest of the country.

Now come Trump's taxes—or the lack of them. The *New York Times* on Oct. 1 published portions of his 1995 returns, leaked to the paper from an unknown source. (Trump's campaign hasn't questioned the documents' authenticity, and his accountant at the time, now retired, said they appeared to be genuine, the *Times* reported.) On the line where most people report income, Trump indicated losses of roughly \$916 million. It's a huge amount and a pattern of losses consistent with previous reports from New Jersey state gambling regulators. Those reports, which were based on Trump's tax information, suggested he'd had enough losses to be able to avoid any federal tax liability for four years in the late 1970s and early 1990s, according to accounts by the *Washington Post* and *Politico*.

Trump hasn't offered any explanation for the whopping loss reported on the 1995 forms. But here's what probably happened: In the early 1990s, his real estate and casino empire was awash in debt he and his companies couldn't repay, and two of those companies filed for bankruptcy in 1991 and 1992. Trump generated what are known as net operating losses. If you own a business and lose money one year, you're generally able to use some portion of that loss as a deduction to offset your tax bills on income in future years. Back in the early '90s, Congress limited the use of those losses to 15 years going forward and three years going back. The 1995 documents show Trump had enough losses to ensure he wouldn't have to pay taxes

at all on \$916 million of income over as many as 18 years.

Although he may have legitimately deducted the \$916 million in losses, there's something more troubling: The really big tax benefit available to Trump isn't that he could take massive deductions after losing a ton of money. It's that he could lose other people's money—but claim the deductions for himself.

Based on what we know from bankruptcy filing disclosures about his borrowing and the well-documented collapse of his real estate empire in the early '90s, this is probably what happened, says Edward Kleinbard, a professor of tax law at the University of Southern California and former chief of staff for the congressional Joint Committee on Taxation.

Trump's almost \$1 billion loss reported on the tax documents was likely the result of "straightforward bad real estate investing cushioned by extremely generous tax rules," says Kleinbard. "Yes, there was a real economic loss, but it was other people's money that got lost. And by virtue of these complex rules, he got to use the tax loss attributable to losing other people's money." At a September rally, Trump bragged about his practice of using "other people's money," or "OPM." (Of course, without access to Trump's federal tax returns, it's impossible to know what deductions he claimed. A spokeswoman for the campaign didn't respond to requests for comment.)

As Trump negotiated with his creditors, some of them forgave substantial loans they'd made to him and his businesses. Normally, canceled debts should translate into taxable income. Think of it this way: When you take out a \$500,000 mortgage, you don't owe any income tax, because you're repaying borrowed money. But if the bank forgives the debt, in the eyes of the IRS, that's like your employer simply giving you \$500,000 in compensation. There are exceptions—if you're insolvent; or, beginning in 1993, by virtue of a tax code change, if your canceled debts were loans related to real estate. The new law came after lobbying by the real estate industry, which was in the depths of a crisis.

While Trump's losses may have been built on borrowed money, average wage earners generally aren't able to use such tax benefits for their regular income. Until the mid-'80s, most taxpayers could average out their good and bad years and use the bad times to offset taxes owed in the good. But since the Tax Reform Act of 1986, that averaging benefit exists pretty

Most methods for dramatic reductions are out of reach for ordinary Americans

much only for business owners—small ones, too, not just Trump—but not for typical workers.

This particularly hurts low-income people, who are more likely to have big yearly fluctuations in their earnings, says Lily Batchelder, a tax law professor at New York University and former majority chief tax counsel for the Senate Finance Committee. For example, she found that the after-tax income of a single mother with two children who earned \$35,000 in one year and none in the next would be \$8,980 higher if she'd been permitted to average her income over two years.

"We are burdening people with higher tax payments if they have volatile income, and lower- and middle-income people tend to have bigger swings," says Batchelder. In the 1980s, the restrictions made some sense, because letting people average their income over several years was an administrative nightmare for an already overburdened IRS. Now, in the age of TurboTax and other software, there's much less justification to disallow income averaging.

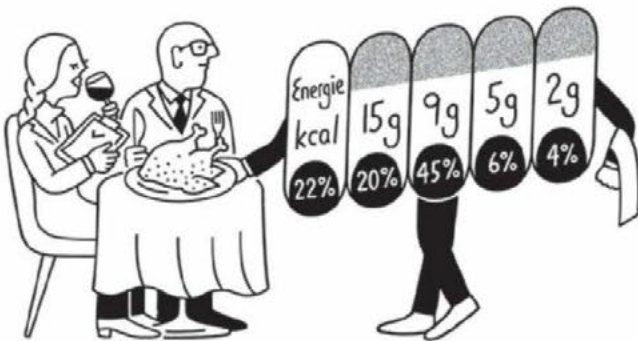
(For their part, Bill and Hillary Clinton reported an effective tax rate of about 34 percent of their \$10.6 million adjusted gross income in 2015; most of that income came from speaking fees, which is taxed like ordinary income.)

Trump bragged in his first debate with Clinton that not paying taxes made him "smart." Even as his campaign scrambled to counteract the *Times* story, the candidate crowed on Oct. 3: "I was able to use the tax laws in this country and my business acumen to dig out of the real estate mess. Few others were able to do what I did."

The next few weeks will show if that strategy works electorally. "From a policy perspective, this is a guy who is definitely trying to get the maximum benefit the tax code offers," says Bryan Skarlatos, a tax litigation attorney at Kostelanetz & Fink. "Maybe if you are going to use the tax system to squeeze out the maximum benefits possible that are available to only a small class of people, you shouldn't be president. Or you should say you will change the system to make it more fair. Or you should explain why you think it is appropriate for that system to be there." **E**

Voilà! France's Next Culinary Advance

Better food labels—but it's still an experiment, and the four candidates need more testing



If people could tell at a glance the nutritional content of the food they buy and eat, they could easily improve their diets. Obesity and diet-related health problems of all kinds would fall significantly. Or they would, public-health officials believe, if a perfectly clear and simple food label could be devised.

The U.S. Food and Drug Administration has recently updated its label to highlight calorie counts and number of servings and to provide a daily value for added sugar. It's now looking into regulations governing which foods can be promoted as "healthy." The U.K. since 2013 has had prominent red-amber-green traffic-light labels showing whether a food is low, medium, or high in calories, fats, sugar, and salt. Early data suggest that, as a result of the voluntary program, British shoppers are buying fewer salty and fatty products such as prosciutto di Parma and Brie.

But is there a better way? France aims to find out by experimenting with four designs of color-coded labels. This is a promising approach, and it would work even better if the country would extend the study beyond its intended 10-week run, which isn't enough time to see the labels' effect on dietary habits.

The experiment is part of a broad effort to reverse France's rising obesity rate, which stands at 24 percent. While not as high as America's 36 percent, it's a burden on the health-care system. The government has banned free refills of sugary drinks at restaurants. And 2 million labels will appear at major supermarkets, including giant chains Carrefour and Casino.

The four labels include the "Nutri-score" design, which rates a product's overall nutrition from A for best to E for worst. The "Sens" format conveys how much of a product can healthfully be eaten, from a green for "very often" to purple for "occasionally in small quantities." The "Nutri-repère" design uses a bar chart to illustrate a product's percentages of daily recommended allowances. And the "RNJ" scheme uses color-coded symbols along with numbered amounts and daily percentages for calories, fat, saturated fat, sugar, and salt.

Even before the trial begins, there's reason to suspect that the first two label designs paint with too broad a brush by attempting to encapsulate complicated (and sometimes debatable) information into a single grade. The last two have more promise, presenting information that in the U.S., for example, is available only in small print on the back of a package.

Politicians and food companies make a reasonable case that the labeling systems are biased against products with healthful fats such as olive oil, nuts, and fish. And some watchdog groups complain that industry representatives were too much involved in designing the labels. But France should be applauded for trying to find the best possible way to inform consumers about what they eat. It will become a European Union lab for innovation on nutrition, at least for a couple of months.

India's Cautious Kashmir Solution

New Delhi limits fallout from a militant attack, but more must be done for Kashmiris

With a strike across the de facto border in Kashmir, India appears to have found a new way to respond to attacks by Pakistan-linked militants. Its government should be wary of overestimating the scale of its victory, though, or underestimating the scope of the challenges that remain.

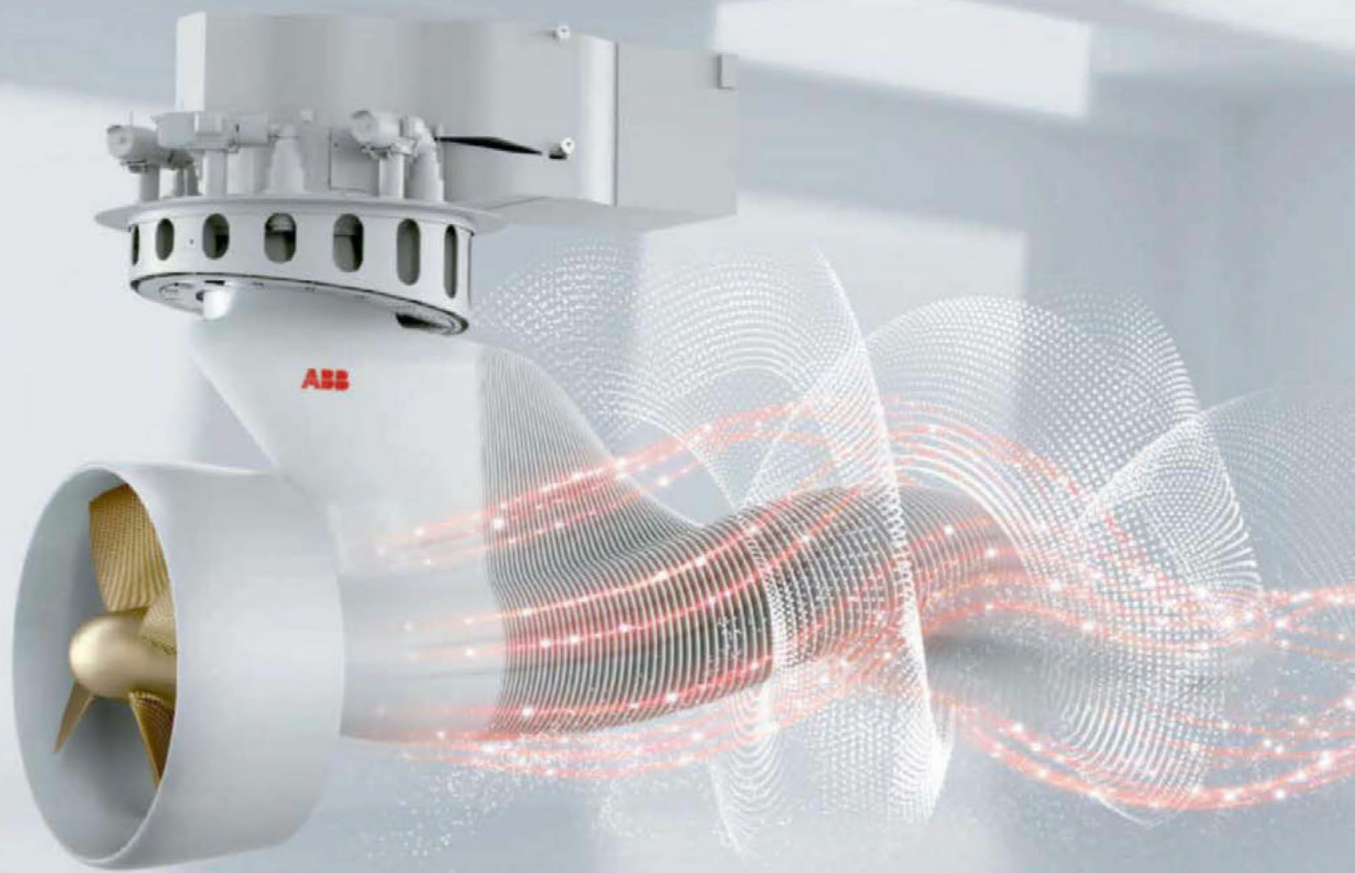
That's not to say India doesn't deserve credit for its deft handling of the latest confrontation between South Asia's nuclear-armed neighbors. After Pakistan-linked militants killed 19 Indian soldiers in Kashmir in mid-September, Prime Minister Narendra Modi faced massive pressure at home to retaliate. Instead, Indian diplomats launched a wide-ranging campaign to isolate Pakistan within the region and internationally. When the Indian military finally made its move, it limited the scope of its operations to the border area and to terrorist targets.

India is smart to be cautious. It's impossible to predict how Pakistan might react to another such strike or how much further Indian forces could go without provoking an escalation.

The tasks India faces remain the same. First, the country has to do a better job of building up its defenses against assaults. The next attack could well focus on targets inside India itself, putting a premium on developing better intelligence and surveillance capabilities.

India has to draw a sharp distinction between Pakistan-sponsored militancy and the legitimate grievances of Kashmiris themselves. Countless commissions have laid out what needs to be done: Provide economic development and opportunity for Kashmiris, as well as a greater degree of autonomy. Make a credible case for why they should see a future for themselves within India to counteract the jingoistic rants on Indian television that portray young Kashmiris as ungrateful jihadists. Above all, ease the heavy police and paramilitary presence in Srinagar and other towns, so Kashmiris can go about their lives in peace. **B**

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Movers

By Kyle Stock



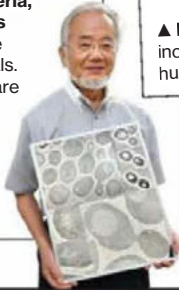
"History may well judge [today] as a turning point for our planet."

▲ **President Obama** on Oct. 5 announcing that the Paris climate accord negotiated last year has been ratified by enough countries—55, accounting for 55 percent of global carbon emissions—to go into force.

▲ **Google unveiled its first smartphone** (\$649) and a talking speaker (\$129), taking the gadget fight to Apple and Amazon. More ▷ p.33

▲ **Toyota introduced a tiny, \$400 robot designed to sit in a cupholder and chat with drivers to keep them awake.**

▲ **Nobel Prize winner for medicine Yoshinori Ohsumi** figured out more precisely **how cells break down other cells, bacteria, and viruses** and recycle the materials. Scientists are using his findings to battle cancer and other diseases.



\$5.5b

▲ **Bass Pro Shops bagged Cabela's**, a rival outdoor retailer. The deal includes 180 stores, giving Bass more than 20 percent of the U.S. market for hunting, fishing, and camping gear.

▲ **Netflix is going to the movies.** The company signed a deal with luxury cinema chain iPic Entertainment to **screen its original films the same day they hit TV.** iPic has 15 U.S. locations and more in development.

▲ **Bob Bradley became the first American to manage a team in soccer's English Premier League.** Bradley, a Princeton University graduate and former Procter & Gamble employee, has coached both the U.S. and Egyptian men's national teams.

Sompo, a Japanese underwriter, purchased U.S. life insurer Endurance Specialty **\$6.3b**

U.K. asset manager Henderson Group acquired rival Janus Capital **\$2.6b**

LVMH bought 80 percent of German luggage company Rimowa **\$719m**

Number of people in China who took trips during the annual Golden Week holiday **589m**

Tesla vehicles delivered in the third quarter, sending its stock up 7 percent **24.5k**

Ups

Downs

▼ **The FBI arrested a National Security Agency contractor** who worked at Booz Allen Hamilton and is investigating whether he stole classified computer codes the agency used to hack into the networks of foreign adversaries.

▼ **Colombian voters narrowly rejected a peace deal** to end a 52-year war with the rebel Revolutionary Armed Forces of Colombia. More ▷ p.17

▼ **U.S. auto sales slipped 0.5%** from a year earlier. Of the Big Three U.S. automakers, **Ford posted the largest drop** at 8.1 percent.

▼ **The U.S. Supreme Court refused to hear an appeal** by the Washington Redskins over the loss of trademark rights.



Its registration for the controversial logo was revoked in 2014 at the request of Native American groups. In its appeal, the team called out a list of iffy trademarks, including Dumb Blonde beer.

New York City's homeless population reached a high **60k**

Jobs shed at ING, 7 percent of the Dutch bank's workforce **7k**

Days the ski season in the Swiss Alps has lost since 1970 due to less snowfall **37**

Manhattan apartment sales plunged in the third quarter **-20%**

The British pound hit a 31-year low against the dollar **\$1.27**

▼ **Hurricane Matthew ravaged Haiti, the Dominican Republic, and Cuba** (pictured) with 145-mph winds, killing at least 11 people. Residents on the coasts of Florida and South Carolina fled inland.

October 10 – October 16, 2016

Wind Is the New Corn

▶ In some of the poorest rural areas in the U.S., turbines are a fresh source of wealth

▶ “Before, I raised corn and soybeans and cattle. Now I don’t. I’m a wind farmer”

Wind energy, the fastest-growing source of electricity in the U.S., is transforming low-income rural areas in ways not seen since the federal government gave land to homesteaders 150 years ago. As commodity prices threaten to reach decade lows and farmers struggle to meet debt payments, wind has become the newest cash crop, saving family farms across a wide swath of the heartland.

The money Richard Wilson earns from leasing his land for about 35 turbines run by the Golden West Wind Energy Center outside Colorado Springs has kept him from having to sell off pieces of the 6,000-acre cattle and wheat ranch his family has owned since 1948. “We weren’t making enough money to sustain ourselves,” he says. “Now we’re in a position where we can operate our farm for another generation at least.”

For others, turbines spin off six-figure incomes that have allowed them to retire from farming altogether. “One turbine has changed my life,” says Ed Woolsey, a fifth-generation Iowa farmer and a principal with Crosswinds Energy Project, a community collective that

manages 10 turbines and sells the power they generate to rural electric cooperatives. “Before, I raised corn and soybeans and cattle. Now I don’t. I’m a wind farmer.” Woolsey leases his farm to others to cultivate. Neither he nor Wilson would disclose how much he earns, but landowners who sign lease agreements with wind companies typically get between \$7,000 and \$10,000 per turbine each year.

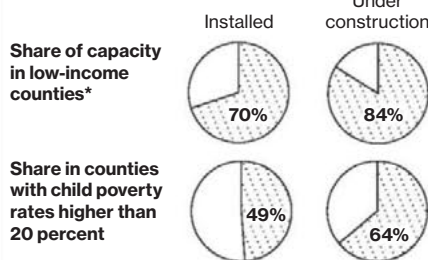
The more than \$100 billion that companies have invested in wind power in

low-income counties—where about 70 percent of wind farms are located—has helped double assessed land values in some of the poorest parts of rural America. That’s provided a much-needed infusion of local tax revenue that’s being used to rebuild schools and pay down debt.

A five-year extension of a federal tax credit on wind production, passed at the end of last year, should accelerate the construction of turbines. The credit pays wind power producers 2.3¢ for every kilowatt-hour of electricity generated for a 10-year period. That incentive should help double U.S. wind power capacity to 167 gigawatts—enough to power 50 million homes—by 2030, according to Bloomberg New Energy Finance. By 2030 rural

Wind Power in Rural Counties

As of 2015



*COUNTIES IN WHICH THE MEDIAN INCOME IS BELOW THE NATIONAL MEDIAN; DATA: AMERICAN WIND ENERGY ASSOCIATION

16





landowners are projected to reap as much as \$900 million a year by leasing land to wind developers, says Alex Morgan, North American wind energy analyst at BNEF.

In Oklahoma, wind farms are projected to return \$1 billion in property taxes to counties and school districts over a 40-year period. Increased tax revenue has already helped the state weather the decline in the oil sector and allowed some school districts to forgo state funding.

In Colorado, annual payouts totaling as much as \$10,000 per turbine reversed the trend of farmers selling land to make up for falling crop prices. For some towns in Illinois, where localities levy the nation's highest property taxes on wind turbines, getting a wind farm is like landing a luxury home development. "A two-megawatt turbine is valued at \$720,000, and often 150 are built at once," says Kevin Borgia, a public policy manager at Wind on the Wires, a renewable energy advocacy group. "Suddenly little communities have 150 \$720,000 homes."

In Iowa, which got 31 percent of its power from wind in 2015, more than any other state, money from turbines has protected farmers from falling corn prices. Annual lease payments of about \$17 million helped some avoid foreclosure as they prepared for a record corn harvest that could drive receipts to a 10-year low. Tim Hemphill, a corn and soybean farmer outside Milford, gets about \$20,000 a year for leasing land for turbines. "A few years ago corn was \$7 a bushel," he says. "Now my cost to raise it is \$4.20 and [the price] could fall to \$2.70. It's going to break a lot of people."

Wind is also keeping power prices low across much of rural America. In the 11 states that produce more than 7 percent of their power from wind, electricity prices fell 0.37 percent from 2008 to 2013; nationwide, power prices were up 7.7 percent during that period.

Warren Buffett's **MidAmerican Energy** is negotiating with landowners

for leases to build a \$3.58 billion series of wind farms across Iowa, the largest economic development in state history. Land agents are also in discussions with hundreds of farmers who stand to profit from \$1 billion in new projects planned by **Alliant Energy**.

"This is our financial future," says Michael Nolte, a farmer who sits on the Franklin County Board of Supervisors in Iowa. This year the board voted to lower property taxes after it paid off a bond used to fund \$18 million in road and bridge improvements. Surrounding counties had recently been forced to close bridges that could no longer support heavy farm machinery, and they lacked the money to fix them. "It's helping us survive and maintain services," Nolte says, "whereas other counties have had to make cuts." —*Jennifer Oldham*

The bottom line With 70 percent of turbines in low-income areas, the wind power industry is providing new income for struggling farmers.

Conflict

A Failed Peace Process Could Mean More Pain

- ▶ **Colombia may pay an economic price for rejecting the FARC deal**
- ▶ **"This will significantly increase the probability of a...downgrade"**

Colombians shocked the world when they voted by the narrowest of margins to reject a peace accord with the Revolutionary Armed Forces of Colombia, or FARC. If it had gone the other way, the Oct. 2 vote would have ended the 52-year-old conflict. Instead, Colombians are now wondering what will happen to the fragile ruling coalition of President Juan Manuel Santos and the cease-fire he engineered as part of the agreement.

The consensus seems to be that the Santos administration has been severely weakened and will achieve little through the end of its term in 2018. For investors worried about ▶

Supporters of the treaty with FARC in Bogotá on Oct. 3. The sign reads: "For a Colombia in peace, sit here"



◀ how the country will scrape together the funds to close its fiscal deficit and avoid a credit-rating downgrade, the prospect of a do-nothing government is a big worry. As soon as markets opened on Oct. 3, currency traders dumped the peso, driving it down as much as 3 percent, the world's biggest drop in that day's trading.

The vote on FARC will strengthen the hand of former President Alvaro Uribe's Democratic Center Party, which opposed the deal. At the same time, the defeat of the Santos administration's main initiative will prompt allies in Congress to desert him, says Sandra Borda Guzmán, a political scientist and dean of the social sciences department at Bogotá's Jorge Tadeo Lozano University.

"What we saw in terms of opposition up to now is nothing to what we're going to see in the next two years," Borda says. Legislators from Uribe's party "aren't going to let anything pass in Congress. The government's

ruling coalition is going to fall apart."

The upheaval is likely to hamper a tax reform the government must pass to plug a growing hole in its finances. The budget deficit has widened from 3 percent of gross domestic product in 2015 to a probable 3.9 percent this year as a result of the steep drop in oil prices, Colombia's chief export. Coal, its other big export, has lost much of its value as well.

Santos has kept mum about his tax legislation, but his ministers haven't ruled out a tax on dividends. His diminished position increases the chance of a watered-down tax reform that raises less revenue and reduces the government's ability to manage the debt. "This will significantly increase the probability of a credit rating downgrade by Standard & Poor's or Fitch, both of which have Colombia on negative watch," Bank of America strategist Ezequiel Aguirre wrote in a note to clients.

The Radical Change Party, a small but important part of Santos's coalition whose chief, Germán Vargas Lleras, is vice president, has only been a luke-warm supporter of the peace process. It could jump ship to be better placed

for the presidential and congressional elections in 2018, Borda says. The party has 9 of 102 senators and 16 of 166 representatives in the lower house. At the same time, some left-wing politicians may refuse to work with the government, because they were on board with the peace process but not with other initiatives, Borda says.

Green Party Senator Claudia Lopez, who supported the peace accord but otherwise opposes the government, says, "The peace process and the tax reform are linked. This government has no chance of passing a tax reform. It has neither the political support nor the legitimacy."

Jorge Restrepo, director of the Cerac research institution, which monitors the conflict with FARC, says the result was a "heavy blow" to Santos that will severely affect his ability to govern, but he should be able to hold the ruling coalition together until he leaves office.

The peace agreement would have compensated people FARC drove off their land and increased spending on infrastructure and development in affected areas. But it would also have granted the largest guerrilla army (about 6,000) in the Americas seats



in Colombia's Congress and reduced sentences for crimes in return for handing in weapons. Many Colombians objected to such generous terms for a group known for bomb attacks and kidnapping. Uribe, who led the opposition to the deal, wants tougher penalties for FARC.

For now, FARC is honoring the cease-fire its negotiators had worked out with the government, but that could change if divisions form within FARC itself and splinter groups take up arms again. More than 200,000 Colombians have lost their life in the conflict, which began in 1964. —*Matthew Bristow*

The bottom line President Santos expected the peace agreement with FARC to be a lock. What he got instead is a political and economic mess.

Commodities

California's Recycling Industry Is in the Dumps

▶ **Low prices for scrap drive recyclers out of business**

▶ **"There's been a massive crisis and a massive failure to respond"**

About 90 percent of the 8 billion soda cans sold in California every year get turned in for recycling and a 5¢ refund. But cheaper commodity prices, plus lower Chinese demand for America's used bottles and cans, have upended the economics of the state's recycling industry. Over the past two years, California's recycling rate has fallen enough to relegate more than 2 billion containers a year to landfills.

About 700 of the 2,400 redemption centers California had in 2011 have closed, according to CalRecycle, the state's recycling agency, the majority in the past year. The mostly small companies that run the shed-like centers in parking lots outside grocery stores are being squeezed by a commodity bust that's lowered the price they receive for recycled glass, plastic, and aluminum. The price they have to pay consumers for this detritus has stayed fairly high. A state subsidy program that was supposed to help make up the difference hasn't kept up.

In most of the 10 states with bottle redemption laws, beverage companies such as **PepsiCo** pay recycling centers a fixed amount per bottle, which means the centers don't need to rely on the market value of the scrap. In California, the state pays redemption centers for processing and handling recycled material. The centers also make money by reselling bottles and cans on the scrap market. Twice a year, California sets a minimum price that redemption centers have to pay consumers for their bottles and cans; it's supposed to equal the deposit customers paid when they bought the drinks. This year, that's \$1.57 per pound for aluminum cans, down 2¢ from last year, and \$1.19 a pound for plastic bottles, up 3¢.

Scrap prices have fallen much more. As of September, a ton of sorted aluminum cans went for \$11.88, down 28 percent from two years prior, according to Resources Recycling Systems, a consulting company in Ann Arbor, Mich. A ton of plastic bottles went for \$4.25, down 44 percent since 2014. Lower oil prices have also cut the value of recycled plastic, by making it cheaper than it was before to manufacture new plastics, and in some cases it's cheaper than buying recycled materials.

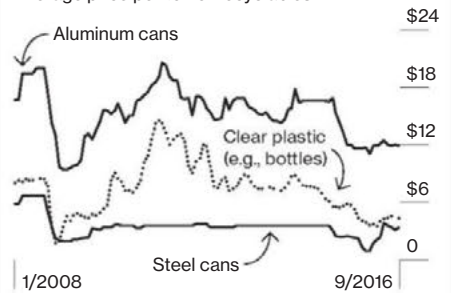
The decline in the value of scrap is draining California's Beverage Container Recycling Fund, which relies on the proceeds from bottle deposits consumers pay upfront to reimburse redemption centers. As of June 30, it had \$195 million, down from \$246 million a year earlier. At this rate, it's expected to run out of money in the first half of 2018.

"There's been a massive crisis and a massive failure to respond to that crisis," says Susan Collins, president of the Container Recycling Institute, an advocacy group in Southern California. Collins says the state needs to boost its "outdated" payment formula by as much as \$1 million a month or follow other states, where bottling companies pay recycling centers a fixed amount per container. A spokesman for CalRecycle says the state is looking at all options.

China is the largest destination for U.S.

Treasure to Trash

Average price per ton of recyclables

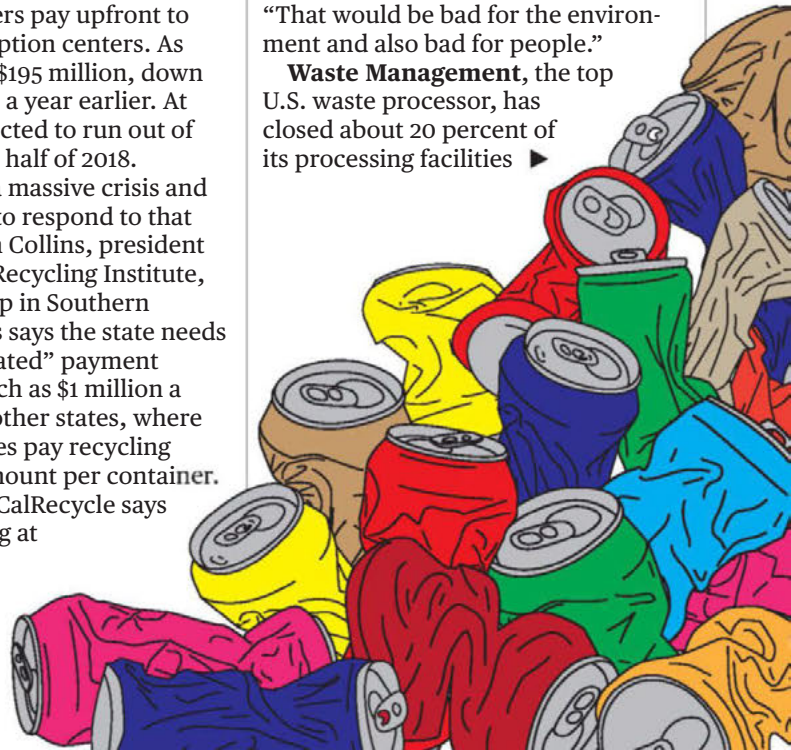


DATA: RESOURCE RECYCLING SYSTEMS

scrap exports, taking about 11 percent by volume in 2015. Since 2013, under a government program called Operation Green Fence, China has been aggressively inspecting and in some cases turning away bottles and cans that are mixed in with food waste or other nonrecyclable scrap. The policy has forced waste processors in the U.S. to screen discarded containers more carefully, driving up costs and diminishing the value of some waste.

Since his local recycling center closed last year, Hiro Tani, a cook who lives in Santa Cruz, has had to take his used bottles and cans to a facility about 15 miles away. "It kind of defeats the purpose if you have to drive that far," he says. Jose Ponce, who operates six centers in the Los Angeles area, says he's struggling to keep his business open amid lower scrap prices. "If it keeps going the way it is, I don't know if I'm going to make it," he says. "That would be bad for the environment and also bad for people."

Waste Management, the top U.S. waste processor, has closed about 20 percent of its processing facilities ▶



◀ nationwide in the past two years, says Brent Bell, vice president for recycling operations. “If you told me today that China’s GDP growth rate was going to go back to 14 or 15 percent and the price of oil would go back to \$100 a barrel, I would say we would go back to where we were. I don’t see those two things happening.” —*James Nash*

The bottom line About 30 percent of California’s recycling centers have gone out of business amid falling prices for scrap aluminum, glass, and plastic.

Currency

Trump Hurts the Peso. That Helps Mexicans

▶ **Migrant workers in the U.S. are wiring record sums back home**

▶ **“With the exchange rate moving so much, I try to send a bit more”**

Mention the name Donald Trump to Gerardo Lozano, and it doesn’t take long for him to explode. “That man,” he says, the anger building in his voice, “has racist views.”

Lozano, short and wiry with thick glasses and a black-and-gray “Texas” ball cap, is an undocumented Mexican immigrant. He’s worked in the U.S. for 15 years, the last two as a day laborer in Plano, a wealthy suburb north of Dallas. He does a little roofing, some landscaping, plumbing—whatever comes his way. On a good day he can pocket as much as \$150.

Trump’s candidacy has benefited Lozano greatly. The value of his paychecks, when converted into pesos and wired home to his family in Mexico, is soaring. That’s because Trump’s campaign promises about Mexico—build a huge wall between the U.S. and its southern neighbor, throw out all the undocumented workers, renegotiate Nafta—have rattled markets and pushed the peso down against the dollar month after month. The Trump campaign didn’t return requests for comment.

Each dollar Lozano ships across the border today provides his wife, María, with almost 20 pesos. In mid-2015, before Trump entered the race,

each dollar fetched a little more than 15 pesos. The extra cash has helped María pay for blue jeans and skater-style sneakers for their 16-year-old son, and a month’s worth of beef, chicken, and soap. She’s even looking to salt away a bit of the money so she can build a proper staircase to the second floor of their home in northern Mexico. “If you’re saving to buy a house or have a big expense coming up,” says Carlos Vargas-Silva, an economist with the University of Oxford’s Migration Observatory, “this is the moment” to ship money home.

Mexicans are sending more dollars home than they have in seven years, an upswing explained in part by the rush to take advantage of the exchange rate. Some experts say that, if the peso remains at these levels for months to come, more Mexicans could eventually be tempted to cross into the U.S. in search of work.

Like most Mexicans in the U.S., Lozano follows the peso’s fluctuations closely and has been scrambling of late to repatriate every dollar he can. Some weeks, he sends as much as \$200, up from his regular \$100.

What Lozano hadn’t realized was that Trump was behind much of the peso’s decline. The currency touched a record low of 19.93 per dollar at the end of September after polls showed he was continuing to cut into Hillary Clinton’s lead. Investors worry that Trump, if elected, would try to curb remittances; or force U.S. manufacturers to close plants in Mexico and reopen them at home (he’s called out **Ford Motor** and **Carrier** on this point); or that his policies will wind up weakening the U.S. economy, the buyer of 80 percent of Mexican

exports. Other factors are making the currency weaker as well, but Trump’s ascendancy has been the main driver in recent months, says Andrés Jaime, a strategist at Barclays. “Once he gained momentum, that’s when we really saw the peso underperforming.”

For Mexico, the jump in remittances is a rare bright spot in a sluggish economy.

The \$17.6 billion that flowed over the border to Mexico in the first eight months of this year marks a 6.6 percent increase from last year and an 18 percent gain from three years ago.

Much of the money supports consumption. Israel González, an immigrant who works as a welder in Dallas, says he’s been wiring more cash to mechanics fixing up a classic VW Beetle he owns in his hometown in central Mexico. And Iris—she won’t give her full name, fearing deportation—says she and her husband have increased what they send to help their parents in northwestern Mexico to renovate their home and build an extension. “With the exchange rate moving so much, I try to send a bit more,” she says. “Because I know for them, it’s going to be a lot more.”

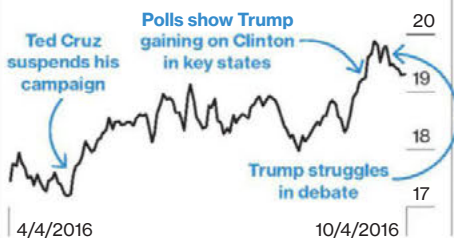
Trump’s rise obviously hasn’t been all positive for the immigrant community here. It’s caused plenty of angst and pain. Iris says she was heartbroken to find so many people supported a candidate with such extreme anti-immigrant views. “These are values Americans had and were hidden,” she says. “And this man brought them out.” After watching the Republican National Convention, she decided she needed an emergency plan. She instructed her mother to set up a savings account for her. It’s a little contingency fund, so she and her husband, a construction worker in Dallas, and their 4-year-old daughter have something to fall back on if they get deported. —*Isabella Cota*

The bottom line Donald Trump has helped force down the value of the peso, giving Mexicans in the U.S. more bang for every buck they remit.



Mr. Trump, Talk Up That Wall

Pesos per U.S. dollar



B Edited by Matthew Philips and Christopher Power
Bloomberg.com



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2001



STILL UGLY, AFTER ALL THESE YEARS



2016

22

▶ **Toyota has saddled the Prius, already caught in a sales decline, with a polarizing redesign**

▶ **“One can argue Toyota has squandered its lead in the green vehicle market”**

The Toyota Prius that Kendall Greuel bought in August does what he wanted, which is save money on his daily 100-mile round-trip commute. Just one thing nags at the 31-year-old IT worker from Muskogee, Okla.: “Sometimes I catch a glimpse of the car,” he says, “and think it’s kind of ugly.”

Greuel has his finger on the latest vexation for Prius, the gas-electric hybrid that established **Toyota** as an environmental leader two decades ago. At a time when American customers were already defecting from Prius because of cheap gasoline and a continuing shift to SUVs, the automaker in 2015 pushed through a polarizing redesign—one that’s been a hit at home in Japan but has failed to stem a sales slump in the U.S.

“The Prius design is busy and overwrought,” says Eric Noble, who runs a product development consulting firm called Carlab. “It never should have been allowed to happen.” In his view, the new Prius comes close to rivaling the Pontiac Aztek, a 2005-era sport-utility vehicle often mentioned as one of the worst auto designs ever.

The 105,558 Priuses sold this year in the U.S. through September represented a 25.6 percent drop from the year-earlier period and put the line on pace for its worst annual deliveries in five years. The Prius’s rate of sales decline through September is almost double that of all hybrids lacking a plug, according to HybridCars.com. Demand has dropped even though Toyota updated the Prius late last year with a double-wishbone suspension for better handling and added tech features such as lane-keeping assist. Only 42 percent of owners are opting for another Prius when they trade in their car, down from 64 percent in 2005, says Edmunds.com.

In surveys, customers complain about a cramped interior and a paucity of storage space, says Alexander Edwards, president of Strategic Vision, a consumer research firm. In his firm’s overall measure of customer satisfaction, Prius ranks below the slow-selling, now-discontinued Chrysler 200. Among customers who shopped and rejected the Prius, 12 percent did so because of exterior styling, up from 8 percent with the prior model.

Those figures may help explain why Toyota has had to keep relatively high rebates on Prius even after the redesign. The company offers rebates of \$3,039 on each Prius, down only about \$200 from a year earlier, says

The new model’s aggressive styling has drawn different reactions in Japan and the U.S.

Jessica Caldwell, an Edmunds.com analyst.

Bill Fay, Toyota’s head of U.S. sales, says the automaker chose the new design to attract mainstream customers as well as environmentally conscious buyers, and that plenty of people like the updated look. The vehicle’s greatest challenge is fighting the booming popularity of truck and SUV models spurred by cheap gasoline, he says.

The situation is far different in Japan, where gas costs the equivalent of about \$4.50 a gallon and Prius in January regained its position as the top-selling model. The varying reactions to the design may reflect cultural differences. “Toyota opted for an ‘entertainment’ or ‘anime’ design that appeals to the Japanese market more than the U.S.,” says Geoff

Wardle, executive director of graduate transportation systems and design at the ArtCenter College of Design in Pasadena, Calif. Several design elements don't support a common theme, he says, such as the neon-red lights zig-zagging through 20-inch taillamps that protrude from the side of the car like "flying buttresses."

Fay was among the executives consulted on the design and says he's confident the updated line will do well. "All we can do is continue to reinvest and make the car as compelling as we can, because the market is going to change again," he says. Two models, the Prius c compact and Prius v wagon, haven't been updated.

The brand will soon get a refreshed plug-in model, newly dubbed the Prius Prime. With a 25-mile all-electric range that allows 640 miles between gas refuelings, the Prius Prime has a starting price of \$27,100, \$6,000 less than the plug-in hybrid Chevrolet Volt.

Yet even Prius Prime's green credentials disappoint some environmentalists. Roland Hwang, transportation program director with the Natural Resources Defense Council, says Toyota is being too conservative. The plug-in's electric range is less than half the Volt's 53 miles. And while **General Motors'** all-electric Chevrolet Bolt will hit showrooms this year, Toyota doesn't offer a battery-only car in the U.S. "One can argue Toyota has squandered its lead in the green vehicle market," Hwang says.

Soon, environment-minded car buyers will have unprecedented choices as the number of battery-only and hybrid plug-ins grows to 33 next

year from three in 2011, according to the Consumer Federation of America. The Prius today even has gas-electric challengers in Toyota's own lineup: The company has sold 32,989 RAV4 hybrids in the U.S. so far this year.

For now, Prius owner Greuel is satisfied that his ride averages 56.1 miles per gallon, enough to save the equivalent of a second monthly car payment. But as for that design—with curves in the hood converging into a small snout above an exaggerated grille opening—his attitude toward it, he says, "depends on what mood I'm in." —*John Lippert*

The bottom line Prius sales in the U.S. fell 25.6 percent in the first nine months of 2016. So far its new design hasn't stemmed that decline.

Pharmaceuticals

Your Prescription Gets A Rebate—for Insurers

▶ Drug rebates go to health plans, even when patients pay the bills

▶ "Every penny until \$2,600 we pay. It's outrageous"

Robyn Curtis, a staff adviser at the University of Southern Mississippi in Hattiesburg, has a 13-year-old daughter with diabetes. Each month, the girl's insulin pump requires three vials of NovoLog-brand insulin, which together cost \$890 under her plan, Curtis says. Her daughter's insurance has a \$2,600 deductible. So Curtis was beside herself when she learned that NovoLog offers rebates—almost always paid to insurance companies and drug benefit managers, not patients—that might have cut the out-of-pocket cost in half earlier this year. "Every penny until \$2,600 we pay," she says. "It's outrageous."

Millions of U.S. patients with high-deductible insurance find themselves in that situation—and don't know it. Behind the scenes, drugmakers for years have given insurers and benefit managers rebates and other discounts—more than \$100 billion in 2015—to lower

the soaring cost of drugs for diabetes, asthma, arthritis, and allergies.

No one balks when insurers get rebate checks if they actually paid for a drug. But, increasingly, Americans are forced to pay for medication out of their own pockets—at least for part of the year. That's because more are enrolling in insurance plans with deductibles as high as \$4,000 for a family. The Kaiser Family Foundation says a quarter of workers in employer plans must pay the full cost of drugs before their coverage kicks in. That's up from 17 percent in 2011. In such cases, insurers receive the rebates even though they haven't paid a dime.

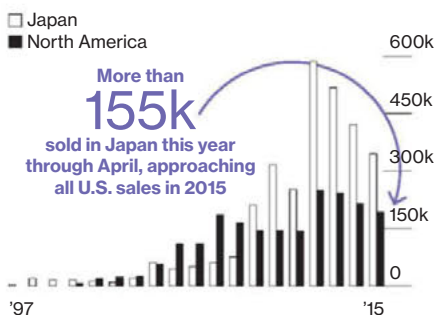
As Congress excoriates drugmakers for increasing the price of even old drugs by as much as 5,000 percent, this rebate practice undercuts the industry's argument that its discounts shield consumers from high list prices. Eight pharmaceutical companies contacted by Bloomberg, including **Novo Nordisk**, which makes NovoLog, **Merck**, **Pfizer**, and EpiPen maker **Mylan**, said their contracts with benefit managers and insurers generally require rebates be paid to them on all prescriptions, even when the patients pay the full cost because of high deductibles. On a \$600 prescription, "if the patient has a high-deductible plan, then the insurer could pocket the \$300 rebate and not share it with the patient," says Adam Fein, president of **Pembroke Consulting**, which advises drugmakers on sales and distribution.

Pharmaceutical companies such as Mylan say the situation reflects a changing insurance market outside their control. Over the last decade, the average deductible for an employee has quadrupled, to \$1,221, according to the Kaiser Family Foundation. Americans insured under the Patient Protection and Affordable Care Act, or Obamacare, often must pay \$3,000 or more before their insurance kicks in.

"We regret that our programs did not keep pace with the evolving health-care system, and, as a result, some patients are facing out-of-pocket

On a \$600 prescription, "if the patient has a high-deductible plan, then the insurer could pocket the \$300 rebate and not share it."
—Adam Fein, Pembroke Consulting

Prius sales



◀ costs that were never intended, potentially leading to stress upon them and their families,” Mylan said in a letter to Congress in September.

Mylan has said it discounts EpiPen, on average, by more than 50 percent. Novo Nordisk said it offers a similar price cut on its U.S. medicines. While the majority of patients don't pay the full cost, “a small but growing” number now must do so because of rising deductibles, according to spokesman Ken Inchausti.

Typically, rebate money from drug companies is bundled together into quarterly payments that can amount to hundreds of thousands of dollars. These rebate checks can result in lower premiums, says Glen Perry, who directs pharmacy services for **Blue Cross Blue Shield of Michigan**, a not-for-profit insurer. **CVS Health**, which administers drug plans for employers and insurers, gives “the vast majority of rebates” back to those clients, says spokeswoman Christine Cramer. **Express Scripts**, which plays the same role, says it returns about 90 percent of rebates to its customers, generally keeping about 10 percent as its compensation.

Many employers and insurers have come up with a simple way to avoid the problem for many of their clients: Exempt medicine for diabetes and other chronic conditions from deductibles in the first place. But why not

break up the rebate checks and refund the cash to the patients who paid for the drugs? Representatives of corporate health plans say that would be impractical because they get the money months after employees bought the drugs. Says Laurel Pickering, chief executive of the Northeast Business Group on Health, a coalition of large employers: “It would be very difficult to figure out how to administer that.” —*Robert Langreth*

The bottom line Drugmakers pay insurers more than \$100 billion a year in rebates—including for some drugs paid in full by patients.



Trends

Halal's Rise From Street Carts to Whole Foods

▶ Americans can't get enough chicken gyro with white sauce

▶ It could “be like kosher food, which is... fresher, more virtuous”

They came for the chicken platter with rice and the beef gyro with white and hot sauce. Almost 800 hungry customers waited at a shopping mall in King of Prussia, Pa., for as long as three hours on Oct. 1 for the grand opening of the newest outpost of **Halal Guys**, a

fast-food chain serving Middle Eastern- and Mediterranean-style fare.

“I saw pretty much every demographic there is, from college students to families, and every race,” says Naveen Mohiuddin, the new franchise owner. The King of Prussia store is the 22nd Halal Guys to open in the U.S. over the past two years. The business started as a hot-dog cart on 53rd Street and Avenue of the Americas in Manhattan in the 1990s, before its three owners switched to halal food, prepared according to Muslim traditions that dictate the kind of meat used and how animals are slaughtered.

Mohiuddin's franchise is a sign of the growing appetite for halal food in the U.S. In 1998 there were about 200 halal restaurants and grocery stores, according to Shahed Amanullah, who's run an online list since then. Today there are about 7,600, he says. “Food is a great medium for cultural sharing,” he says.

At every level of the U.S. food chain, halal foods occupy a small but rapidly expanding niche. Sales in grocery and convenience stores and similar outlets reached \$1.9 billion in the 12 months through August, a 15 percent increase from 2012, according to Nielsen research. Total halal sales are projected to reach \$20 billion this year, a third more than in 2010, according to the

Halal Time



Halal Guys, started as a food cart in New York, plans to open 300 restaurants nationwide in three years

8.1m

Projected U.S. Muslim population by 2050

Saffron Road is a top-selling halal brand at Whole Foods

\$20b

Projected 2016 U.S. sales of halal foods

Islamic Food and Nutrition Council of America, an industry group.

Whole Foods Market, which started selling halal food in 2010, promotes the items during such holidays as Ramadan, the monthlong period of fasting and prayer. It has seen double-digit sales growth of halal in each of the last five years, according to Rick Findlay, vice president for purchasing and marketing. “People look to Whole Foods to be that trendsetter,” he says, noting that halal entrees from Saffron Road are among the company’s best-selling frozen products. The brand is made by food company **American Halal**, founded in 2010, and is sold in 12,000 stores, including Whole Foods, **Kroger**, **Safeway**, and **Giant Foods**.

“Halal really resonates to a much larger umbrella than just Muslims,” says Adnan Durrani, the founder and chief executive officer of American Halal. He estimates that as many as 80 percent of Saffron Road consumers are food lovers who don’t follow Islamic law. The proportion of Americans who do is growing—the number of U.S. Muslims is projected to reach 8.1 million by 2050, up from 3.3 million in 2015.

Some of the biggest food companies and grocery chains aren’t as committed to the U.S. market for halal. **Mondelēz International**, which operates in predominantly Muslim countries such as Indonesia and Saudi Arabia, where halal is standard, sells only a handful of such products in the U.S. **Nestlé**, the world’s largest food company, has 151 factories around the world, from Malaysia to Pakistan, making hundreds of halal products. In the U.S., the company sells the food mainly through its health-care unit, which supplies hospitals. **Walmart** sells halal products in 400 of its 4,600 stores.

At a time when Islam has stoked political debate, the cuisine could carry a stigma, says Krishnendu Ray, associate professor of food studies at New York University. But based on Americans’ history with ethnic food, halal “could eventually be like kosher food, which is identified as fresher, more virtuous,” says Ray, who has studied and written about immigrant influences on American cuisine. A parallel to halal is Americans’ perception of German food during the first and second World Wars. Sauerkraut was renamed liberty cabbage, and the

hamburger, an American staple today, was suspect, he says.

The King of Prussia Halal Guys is one of six to open across the U.S. in recent weeks. The company, which established its first franchise in 2015, plans 300 sit-down locations over the next three years, far from the busy New York street corner where it started. It’s popular because it tastes good, Mohiuddin says, and “people care about how their food is prepared.” —*Jeff Green and Craig Giammona, with Leslie Patton and Corinne Gretler*

The bottom line Sales of halal food in grocery and convenience stores in the U.S. have increased 15 percent since 2012.

Airlines

The Short Flight From Clerk to Cockpit

▶ **JetBlue welcomes its first pilot trainees without past experience**

▶ **“I’m literally blown away by the enthusiasm and raw aptitude”**

What do a supermarket clerk, an airline baggage handler, and a heavy-equipment operator have in common? They’re among the first participants in **JetBlue Airways’** program to turn people with little or no flight experience into pilots. The initial six recruits began the second phase of training on Oct. 3, after three weeks studying meteorology, aerodynamics, aircraft systems, and the like. They’ll spend about seven months in Arizona to begin flight training at CAE Oxford Aviation Academy. If successful—and if they can foot the training program’s \$125,000 price tag—they will become first officers at JetBlue in 2020.

U.S. carriers are seeking new ways to recruit as the country faces what the University of North Dakota projects to be a shortage of 15,000 aviators in the U.S. by 2026. JetBlue’s Gateway Select program is the first of its kind in the U.S., although similar efforts have successfully been used in Europe and Asia. “I’ve been a pilot coming up on 30 years now, and I’m literally blown away by the enthusiasm and raw aptitude

these six individuals have,” says David Freiwald, a JetBlue flight instructor. One had 100 hours of flight time as a private aviator, another had about 35 hours, and the rest had never flown a plane. The airline declined to make any student available for interviews.

JetBlue’s pilots’ union doesn’t support the program. “We don’t see a need for it,” says Patrick Walsh, chairman of the Air Line Pilots Association International group at the carrier. “There are thousands of qualified pilots applying with JetBlue currently.”

The airline is working with lenders to assist recruits, says Warren Christie, senior vice president for safety, security, and training. Costs of training cover lodging and food during certain phases. “A lot of programs you pay for flight training, but there isn’t a job offer at the end,” he says. Completing a major in commercial aviation at the University of North Dakota, the largest public aviation program in the U.S., can cost more than \$150,000 for an out-of-state student when flight training fees are included.

JetBlue, which says it doesn’t have a pilot shortage, received 1,480 applications after the program was announced late last year. It narrowed down the group through assessments and tests before inviting 120 people for interviews. The carrier selected 24 who, divided into groups of six, will all be in training by next year’s third quarter.

Major U.S. carriers have long relied on hiring pilots who already have the required minimum 1,500 flight hours, typically amassed in military aircraft or by working as a civilian instructor before joining a regional airline. Gateway Select provides more time in simulators than traditional training to force students to contend with challenging situations such as bad weather and mechanical failures.

“These six candidates are going to learn how to fly from the very beginning using the same training... and operating philosophy our current pilots use,” Christie says. “What you learn first is what you remember the longest.” —*Mary Schlangenstern*

The bottom line With a forecast of a shortage of 15,000 pilots in the U.S. by 2026, JetBlue has started turning fledglings into aviators.

B Edited by James E. Ellis and Dimitra Kessenides
Bloomberg.com

In Ohio, the Ground War Goes Door-to-Door

► The Republican Party steps in to help Trump battle Clinton's army of field organizers

► "It's our job to make people feel a little more comfortable about him"

Donna Walker-Brown describes herself as a lifelong Republican and political activist. Originally from Arkansas, she moved as a teenager to Cleveland, where she's a bail bondsman. In 2013 she ran and lost in the Republican City Council primary, after failing to collect enough signatures to make the mayoral ballot. Now she chairs the Inner-City Republican Movement, an Ohio group formed in 2009 to lobby for changes in health policy and urban education. On Oct. 1, Walker-Brown hosted the opening of the group's Trump Victory Center in East Cleveland, a poor city

next door to its much larger namesake. About 30 people showed up, including the president of the Akron chapter, Cynthia Blake, who arrived decked out in color-coordinated red, white, and blue Trump gear.

For two hours, Walker-Brown and other participants talked up local Republican candidates and the importance of getting friends and family out to vote on Nov. 8—exactly the kind of thing campaigns have traditionally focused on in the weeks leading up to the November general election. But Walker-Brown's group hasn't received

any funding from Donald Trump's campaign. "I'm not surprised. They haven't put much money out, period," Walker-Brown says. Her group has received some money from the Republican Party for Cuyahoga County, which includes Cleveland, and suburban GOP offices. That hasn't stopped her from doing as much as she can on her own. "The bottom line is, we want a Republican president," she says. "We're not gonna be waiting for the Trump campaign to come and say, 'Here's \$50,000, or \$20,000.' God uses a few to get a big message out."

The Republican nominee has been slow to organize in

Ohio, which backed its governor, John Kasich, in the March GOP primary. Hillary Clinton won decisively over her primary rival Bernie Sanders and has opened 64 offices across the state—more than twice as many as the 31 combined opened by the Trump campaign and the Republican National Committee. Yet Trump has been competitive, thanks in part to the large numbers of white, working-class Democrats who have defected to back him. In a Quinnipiac University poll released on Oct. 3, Trump came in 5 percentage points ahead of Clinton among likely voters, at 47 percent to her 42 percent.

In recent weeks the GOP has activated its party infrastructure in the state, supplementing the ad hoc activities of supporters like Walker-Brown. "They've been late to the game, but they've picked up the slack quickly," says Mark Weaver, a longtime GOP political consultant in Ohio who's not aligned with the Trump campaign.

Trump's Ohio operation is headed by Bob Paduchik, who ran George W. Bush's successful campaigns in the state in 2000 and 2004, as well as Republican Rob Portman's 2010 campaign for U.S. Senate. The work of recruiting volunteers and knocking on the doors of prospective voters has been largely outsourced to county and state Republican officials, the political establishment that Trump has often dismissed as part of a "rigged system."

Party regulars are in charge of phone bank operations in Hamilton County, which includes Cincinnati—a vote-rich area where Trump was creamed in the primary. "It's all sort of coming together. There's a sense



A newly placed sign outside the Trump Victory Center in East Cleveland



Blake, the Akron chapter president of the Inner-City Republican Movement

◀ that we can win,” says Hamilton County Republican Chairman Alex Triantafilou, who’s overseeing more than 120 hours of weekly phone bank operations in two separate locations, six days a week. “There are a lot of couch potatoes, probably just watching Fox News, who got up and are getting involved. We’re seeing some of the excitement that Obama got in ’08.”

In Youngstown, Trump’s operation ran into trouble in late September, when Chairwoman Kathy Miller was replaced after giving an interview to the *Guardian* in which she said, “If you’re black and you haven’t been successful in the last 50 years, it’s your own fault.” To help out, Mahoning County Republican Party Chairman Mark Munroe has mobilized his office on Trump’s behalf. Munroe, a retired TV and video production specialist, keeps a thick book of volunteer names on his desk and manages the work of scheduling phone banks and weekend door-knocking expeditions.

He’s also trying to offer a retail experience for people who are curious about Trump: a stack of “bricks” made from painted pieces of wood two-by-fours sits by the front desk next to a sign explaining that they’re for sale, starting at \$5 apiece, “to help us build the wall.” Says Munroe: “He’s been a little bit controversial at times. It’s our job to make people feel a little more comfortable about him.”

Clinton started out with an advantage. She replicated the organization President Obama built in 2012, when he beat Mitt Romney by fewer than 167,000 votes. Her campaign is focusing on voter registration before Ohio’s Oct. 11 deadline, trying to capture new and infrequent voters or people who’ve moved recently, and encouraging Democrats to cast their ballots during Ohio’s early voting period, which begins on Oct. 12. Volunteers ranged up High Street in Columbus, stopping people after the Oct. 1 Ohio State game and asking if they were registered to their current addresses.

The next day, the campaign took over the home of Enas Yunis, a Clinton supporter in Powell, a Columbus suburb in heavily Republican Delaware County, and turned it into a base for sending volunteers to knock on doors. Romney won 61 percent of the vote in the county in 2012, but Clinton’s campaign

is trying to lure suburban women and people with college degrees.

Cordell Clealand was on her fifth Sunday canvassing and registering voters. She had a list of 31 addresses where residents had voted in Democratic primaries. Deborah Charney’s was one. Clealand encouraged Charney to vote early and whipped out a card labeled “Join the Team.” Charney, an attorney, told Clealand to check off boxes indicating she’d be willing to volunteer during phone banks and register voters herself. “I’m not sure how females can vote for Trump,” Charney said, referring to Trump’s derogatory comments about women.

The Clinton campaign is counting on people like Clealand to deliver enough votes to carry the state despite the tight polls. “We certainly look at the dynamics of the state and have built our campaign from the very beginning with the expectation that our team, the ground game that we’re building, is going to be the difference,” says Ohio director Chris Wyant, who worked on Obama’s 2008 and 2012 campaigns in the state. “You can’t discount the value of that advantage.”

Back in Cuyahoga County, Democratic Party Chairman Stuart Garson acknowledges Clinton faces challenges to generating the turnout Obama enjoyed among black voters and millennials. The county is the most populous in Ohio and is crucial to winning the state. Clinton has 11 field offices there, the same as Obama had in 2012. “There’s work to do, clearly,” Garson says.

Clinton is also leaning on black churches, traditionally bastions of Democratic voters, to help give her a lift. The Greater Cleveland Congregations, a nonpartisan group that includes more than 40 churches, plans to register 10,000 people and knock on 35,000 doors in Cleveland, particularly in low-income neighborhoods. The Reverend Jawanza Karriem Colvin, a co-founder of the congregational group and pastor of the Olivet Institutional Baptist Church in Cleveland, says the excitement gap Clinton is suffering relative to Obama among black voters will make church efforts even more important this year. “I don’t think we should anticipate the same level of enthusiasm, but that

doesn’t mean that we can’t have the same level of turnout,” he says. “It just means that we’re going to have to do a lot more work to convince, to converse, to cajole, for lack of a better word, people to the polls.” —*Tim Jones and Mark Niquette*

The bottom line Trump has half as many field offices in Ohio as Clinton, but he’s counting on enthusiasm to push him to victory in the state.

Drugs

Seattle Breaks New Ground on Opioids

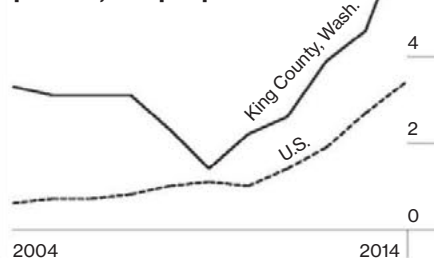
▶ **Officials sanction public spaces for shooting heroin**

▶ **“We need to do what the science tells us to do”**

Almost 30 years ago, at the height of the AIDS crisis, Seattle established one of the first public needle exchanges in the U.S. to contain the spread of the disease. With opioid use reaching epidemic levels, the city has again put itself at the vanguard of treatment with a plan to open facilities where users can take heroin or other opiates under medical supervision. They’ll offer users clean needles and cookers, access to care in case of overdoses, and information about addiction treatment and other public health services.

The centers were proposed in mid-September by King County’s Heroin and Prescription Opiate Addiction Task Force, established in March after Seattle declared a state of emergency because of the rise in homelessness. The goal is to reduce the number of overdoses in the county as well as help users find treatment if

Heroin-related deaths per 100,000 people



Abortion Protests



Poland's Law & Justice Party took power with 38 percent of the vote in October 2015. Only

29%

of voters support it now.

In Eastern Europe, the abortion rate fell to

42

per 1,000 women age 15 to 44 in 2014, down from 88 two decades earlier—the steepest decline of any region in the world.

Warsaw Thousands of women skipped work on Oct. 3 to march against draft legislation that would have banned abortions and criminalized the procedure. After the protest, Prime Minister Beata Szydlo distanced herself from the proposal. Two days later, lawmakers voted it down in Parliament. —*Dorota Bartyzel, Laura Colby, and Marta Waldoch*

they want it. “Our current strategy, the status quo, wasn’t working,” says Dr. Jeff Duchin, Seattle and King County’s top public health officer, who co-chaired the task force. “From our perspective, substance abuse is a medical condition, and it should be viewed the way we view other chronic treatable medical conditions, like diabetes.”

New York is also exploring whether to open an opioid-injection facility. The only such drug center in North America is Vancouver’s Insite, where staffers have overseen more than 3 million injections since 2003. Clients inject their own drugs and then go to a “chill out” room, where they get coffee and juice. “We all would wish that people would not take intravenous drugs and would not end up with serious, long-term drug habits, but you have to deal with that,” says Anna Marie D’Angelo, senior media officer for Vancouver Coastal Health, which operates Insite. “There’s a cost to doing nothing.”

About 60 to 100 people overdose monthly at Insite, D’Angelo says, but none have died because staffers are armed with naloxone, a drug that reverses the effects of opioids. “If you look at somebody using drugs in an alley or in a rooming house, and they

overdose, then it’s 911, ambulance, police, fire,” D’Angelo says. “It’s a huge draw on your first responders.”

The number of people admitted to heroin treatment programs doubled from 2010 to 2014 in King County, and in 2015 heroin users outnumbered alcoholics in treatment admissions for the first time. The King County Medical Examiner’s Office says 132 people overdosed last year in the county, which includes Bellevue and Redmond. “We need to do what the science tells us to do,” Seattle Mayor Ed Murray said during a Sept. 15 news conference.

The King County task force will now begin exploring where to put them and how to pay for them. The goal is to open at least one in the next year. “We don’t believe people will come to the areas specifically to use these,” says Duchin, the co-chair. “We put them in areas where people are already using.”

The task force included the U.S. attorney for Seattle, Annette Hayes. Washington state, which has legalized marijuana for both medical and recreational use, is already operating in a legal gray area with regard to federal drug laws. Local law enforcement officials have pledged not to arrest people who use the centers. Says King County

Prosecuting Attorney Dan Satterberg, whose office participated in the task force: “This drug crisis should be handled by the public health experts and not the criminal justice system.” —*Alexandria Arnold*

The bottom line Seattle plans to open a facility for drug users to take opioids with medical supervision, the first of its kind in the U.S.

Congress

Scott Garrett Turns to Extremists for Votes

▶ **The Republican tries to keep his seat after losing Wall Street**

▶ **“What I need from you is your blood, sweat, and tears”**

Republican Representative Scott Garrett of New Jersey, a seven-term incumbent locked in a close reelection race, headlined an Oct. 1 breakfast organized by an official for an antigovernment group that New Jersey’s Office of Homeland Security and Preparedness considers a “domestic terrorist threat.” At the ▶

◀ breakfast, Garrett hailed the official, Edward Durfee, as an “unsung hero.” Durfee is regional coordinator for New Jersey Oath Keepers, a group state officials list as “militia extremists” who “pose a moderate threat to New Jersey.”

Durfee also co-founded the American Bedrock Foundation, which co-sponsored and collected payments for the Garrett breakfast. “The American Bedrock Foundation is basically the fundraising arm for the Oath Keepers and other pro-Constitution groups,” Durfee says. “That’s what our purpose is.”

Garrett didn’t respond to interview requests. In a statement, his campaign manager, Sarah Neibart, said, “Congressman Garrett has no affiliation—personal or political—with any of the organizations mentioned. Any suggestion otherwise is absurd.”

Garrett is casting a wide net in his reelection bid because he suddenly needs all the friends he can find. He ran into trouble last year when *Politico* reported that he made disparaging remarks about gays in a meeting with Republican colleagues and refused to pay his party dues to protest Republicans’ recruitment and support of gay candidates. Afterward, many banks and hedge funds that had supported Garrett—including **Goldman Sachs, JPMorgan Chase, and Elliott Management**—stopped giving him money.

Since then, he’s had to rely on individual donors, including Donald Trump’s campaign manager, Kellyanne Conway, who lives in Garrett’s district and has given him more than \$5,000 this year, according to Federal Election Commission filings. Even so, Garrett has struggled to raise money, and polls

show his Democratic challenger, Josh Gottheimer, within striking distance.

Garrett is a founding member of the right-wing House Freedom Caucus and one of the most conservative members of Congress—a profile that’s endeared him to Oath Keepers like Durfee. “He sticks to the Constitution,” Durfee says. “We organized the breakfast meet-and-greet to bring some credence to our organization, as well as to inform the people” who attended.

Dennis LaGrua, state president of New Jersey Oath Keepers, says many politicians refuse to associate with his group for fear it will damage their political standing. Earlier this year, Oath Keepers members were among the antigovernment activists who occupied the Malheur National Wildlife Refuge in Oregon during a 41-day armed standoff with federal agents. One of the activists, LaVoy Finicum, was shot and killed by Oregon state troopers. Last year Oath Keepers founder Stewart Rhodes declared in a speech that Arizona Senator John McCain should be “hung by the neck until dead” for treason.

LaGrua dismissed these episodes as unsanctioned and unrepresentative of what Oath Keepers seeks to achieve. His organization’s goal, he says, is to “reach, teach, and inspire” people to defend the Constitution, even if it requires military and law enforcement officers to disobey orders. “There are people like Scott Garrett,” LaGrua says, “who realize that we’re good guys working for a good cause.”

New Jersey officials disagree. Under Governor Chris Christie, state authorities have made a concerted effort to track militia groups and other threats. “In 2014 we became concerned that a lot of domestic terrorism threats were not being looked at closely

enough,” says Dean Baratta, analysis bureau chief for New Jersey’s Office of Homeland Security. “Oath Keepers are one of the domestic terrorist threats we’ve become concerned with.” He says his office based its finding on evidence of “increased activity, increased violent rhetoric, and the capability, intent, and presence in New Jersey.” Although there hasn’t been criminal activity like the seizure of the federal building in Oregon, “state boundaries are not a significant barrier to [Oath Keepers] moving or conducting criminal activity,” Baratta says.

Durfee says he’s determined to pressure state officials to rescind the “terrorist” designation for Oath Keepers. “I’m on it like white on rice,” he says. “We’ve been aggressively pursuing trying to get some pressure onto the Office of Homeland Security to not go along with this.” LaGrua says he may sue the state for slander.

Although many politicians are wary of associating with extremist groups, for some this disinclination has begun to erode. “Politicians are increasingly endorsing or embracing fringe conspiracy theories and the groups that support them,” says Ryan Lenz, who tracks antigovernment extremist groups for the Southern Poverty Law Center. “It’s no longer necessarily fatal to your political future and may actually be just enough to get the votes that you need. Look at Donald Trump, who refused to disavow David Duke.”

With Trump expected to lose New Jersey—a RealClearPolitics polling average shows Hillary Clinton leading by 11 points—Garrett’s hopes for reelection lie in activating conservatives such as the several dozen who attended the breakfast at the River Edge Diner in River Edge, N.J. “I blasted out tons of e-mails to everyone I know,” Durfee says. “We drew local Republicans, Tea Partiers, and lots of liberty folks.” For his part, Garrett seemed to have no reservations about his host or the crowd. “What I need from you is your blood, sweat, and tears,” he told his audience. “We need the grass roots to come on out.” —*Joshua Green*

The bottom line Republican Representative Scott Garrett appeared at a breakfast hosted by a member of Oath Keepers, an extremist militia.

B Edited by Allison Hoffman
Bloomberg.com

“Whatever abuse she throws at you, ignore her. Don’t defend yourself. There’s no point.”

Advice to Donald Trump from **Nigel Farage** in an Oct. 2 CNN interview on how the Republican should respond to Hillary Clinton at their Oct. 9 debate, where the former U.K. Independence Party leader was invited to be a guest of Trump’s



Quoted



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October 10 — October 16, 2016



Look familiar?

► Google's Pixels will go up against Apple and other Androids

► "This is... what we think is the ideal Google user experience"

Google's first pitch to phone makers was simple: You make the hardware, we'll make the software. Our play is services, ad revenue, eyeballs. The more phones you sell, the better we do. It was a good pitch. More than 3 in 4 smartphones shipped around the world run Android, and when it's not Christmastime, that figure rises closer to 9 in 10.

For years, though, Android alliances have been uneasy. Hardware partners from **Samsung** to **Xiaomi** have built their own Android apps and app stores, promoted on their phones alongside or instead of those made by Google. Samsung is also developing its own operating system, as is China market leader **Huawei**, according to tech news site The Information. Google had

been pushing a line of Nexus phones, typically built and co-branded with Samsung or LG but meant to showcase Google's idea of what an Android phone should look like. The awkward question has been what would happen when one side of the hardware-software equation decided to compete more directly against the other.

Google made the first move on Oct. 4, unveiling two smartphones created fully in-house. The Pixel and larger Pixel XL incorporate Siri-like voice commands, flashy camera features, and other bells and whistles from the latest Android operating system. While Android will still run on other companies' products, the Pixels mark the end of Google's Nexus phones and signal the company's firm push into the high end of the \$400 billion smartphone hardware business. (As with the iPhone, the cheapest Pixel costs \$649.) "This is kind of what we think is the ideal Google user experience," says Rick Osterloh, head of the company's new hardware division. "It's ours."

LG, Huawei, and Xiaomi declined to comment. Samsung didn't respond to requests for comment.

The metal-framed Pixels, which come in black, silver, and limited-edition blue, are more elegant and finely crafted than some of Google's earlier forays into hardware, like the flimsy-at-\$1,500 Google Glass headset. The phones run apps at speeds once reserved for laptops, with solid battery life and fingerprint scanners that double as trackpads. The Google Assistant feature offers suggestions based on previous questions: Ask about the weather in San Francisco, and it'll guess you also want to hear about local sights.

During a demo at Google's headquarters in Mountain View, Calif., Osterloh showed off the Pixel's cameras. A flick of the wrist toggles between the standard and selfie cameras, and software-enhanced gyroscopes cut down on shakiness in recorded videos. "We spent an enormous amount of time working on performance metrics, like start times," he says. Dave Burke, who runs Android engineering, says the company tweaked its hardware to make sure the Pixels



Osterloh

◀ could take quicker photos and had better touchscreen response times than any other Android device.

Most of the components are standard-issue, from the likes of Samsung and **Qualcomm**, and Taiwanese phone maker **HTC** is assembling them—a process that Osterloh likens to Apple’s relationship with **Foxconn**. Among the things his team is handling for the first time: sourcing components, doing supply chain deals, building relationships with carriers, managing inventory and distribution, and making accessories such as cases and cables.

It’s not the first time for Osterloh, though, who ran Motorola Mobility until March and was a hardware executive there when Google owned it. So how is the Pixel team different from the search giant’s ill-fated 2012 purchase of Motorola? “While we were part of Google, we were very arm’s-length,” Osterloh says. An asset, not a strategy. Now, phones with the words “Made by Google” stenciled on the back are a centerpiece of the company’s emerging hardware strategy, so he gets the earliest crack at a bunch of projects from the software divisions, including Google Assistant and other AI work. He also has a mandate from Chief Executive Officer Sundar Pichai to sell phones.

While that may sound obvious, it hasn’t always been the case. Nexus phones were basically concept cars, and the designs were often 90 percent finished by the time Google had anything to do with them, according to Burke. Only last year did Google executives start to conclude that they needed to shift more toward an Apple-style closed system, with a portfolio

of consumer electronics designed to lock users into their services. Pichai approved the Pixel project in the summer of 2015, and development began last fall.

Since Osterloh arrived in mid-April, he’s unified the engineering and design teams working on Google’s hardware projects, including Pixel, Glass (yes, it’s still around), and the digital media player Chromecast, and shuttered projects he saw as dead ends, like a modular phone called Project Ara, which made it relatively easy to swap different components into its slots. Expertise from Google’s Nest smart-home division helped him build a procurement team, the first link in the company’s plans for an Apple-style supply chain. Burke says the company will eventually be able to use its own chip designs for features like cameras.

As for the other Android phone makers, Osterloh says, “It’s not my role to talk to them.” That job falls to Android chief Hiroshi Lockheimer, a longtime friend, who stresses that his division is kept separate from the hardware unit and says the Pixel team doesn’t get special treatment or inside intel. “Samsung is a very important partner, as is LG, Huawei, and so on. Rick is an important partner,” Lockheimer says. “Samsung tells us confidential information about their product lineup, their plans. We won’t tell LG that, and vice versa. That continues. Everyone is treated the same, including Rick’s team.”

Nonetheless, the Pixels will be the first phones to run the next version of Android, which includes Google tie-ins such as instant messaging with tech support, a set of photo-editing effects, and a service that can automatically shift files from a person’s phone to the cloud to free up storage. Lockheimer says he expects people to look back on Oct. 4 and think, “‘Yeah, that’s when it started’—‘it’ meaning Google leaning very seriously and very publicly into hardware.” Osterloh unveiled the phones alongside a Google-engineered virtual-reality headset, a wireless router, an Amazon Echo-like speaker, and a Chromecast media player

compatible with the latest 4K TVs. The hardware push is a gamble. “Google makes incredible software and has the best software engineers in the world, but it hasn’t done much good hardware,” says James Kuffner, the chief technology officer of Toyota Research Institute, who previously led Google’s robotics efforts and worked on the Google self-driving car project. Even if the Pixel line takes off, sapping business from other Android makers doesn’t particularly help the company’s core software and services businesses, says Brian Blau, an analyst at researcher Gartner. “Google can’t be in extreme competition with their partners,” he says. “They have to have a healthy relationship.”

Lockheimer says Google needs to make its own phones because “the intersection of hardware and software is more important than before.” The other Android makers have questioned but accepted the existence of the Pixels, he says, as they did with the Nexus phones and Google’s purchase of Motorola: “They’re still with us four, five years later. That gave us the confidence that we can do this.” —*Mark Gurman*

The bottom line Google’s shiny, homemade iPhone challengers are part of a new consumer hardware focus that complicates its Android partnerships.

The specs

Google Pixel
\$649

- Android 7.1 Nougat
- Snapdragon 821 quad-core processor (2x 2.2GHz, 2x 1.6GHz)
- 4GB of RAM
- 32GB internal storage
- 12.3-megapixel main camera, 8MP selfie cam
- 5-inch HD screen with 441 pixels per inch

Apple iPhone 7
\$649

- iOS 10
- 2.3GHz quad-core Apple A10 processor with 6-core graphics
- 2GB of RAM
- 32GB internal storage
- 12MP main camera, 7MP selfie cam
- 4.7-inch HD screen with 326 pixels per inch

→ **The Pixel’s main camera scored a record high on the industry image-quality benchmark DxOMark Mobile**

Venture Capital
Do as I Say, Not What I’m Accused Of

- ▶ **Mike Lynch is running a hands-on fund while he battles HP in court**
- ▶ **“The internal saying is, always take a gun to a knife fight”**

When a hot tech company gets acquired by a Silicon Valley giant, it’s standard practice for employees to use their experience and windfall to go build startups elsewhere. When that acquisition becomes a spectacular embarrassment and ignites a years-long court battle, things get more complicated. Just ask Mike Lynch.

Lynch co-founded Autonomy, a software company that specialized in the sorting and analysis of big data sets for

\$4b

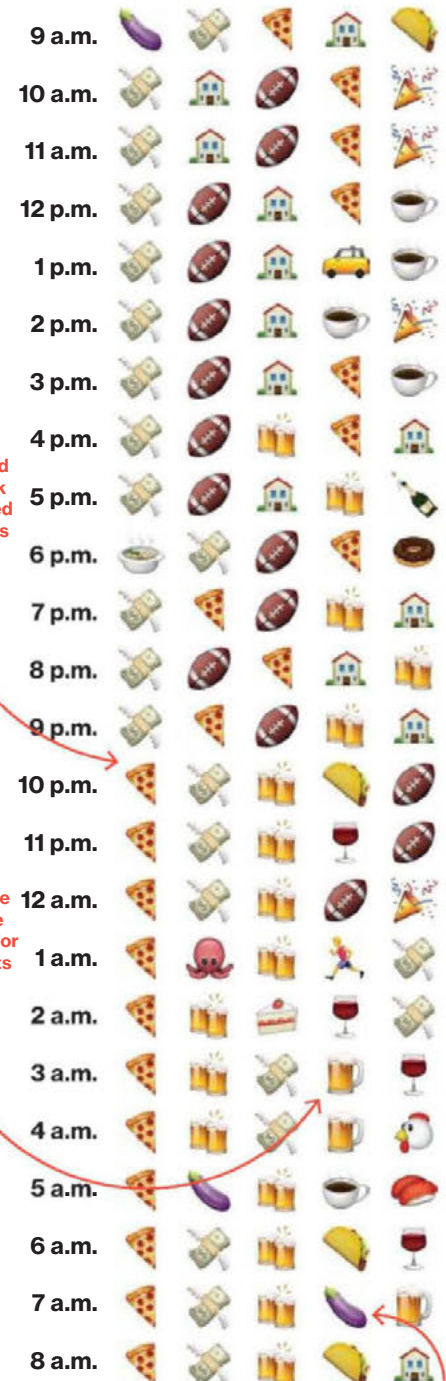
processed by Venmo in the second quarter of 2016

E-Commerce A Day Well Spent, in Emojis

Studying 500,000 public transactions on payment app Venmo, researchers at student loan market LendEDU noticed some trends in the emojis in payers' comments. —Polly Mosendz

Top Emojis Used by Hour

The taco refers to drunk food



Pizza took the top spot overall, followed by the broader stack of cash, typically used to denote rent or bills

Slowly, beer and wine become more common than the football, a symbol for fantasy sports bets

The eggplant in the morning hours generally refers to bedroom activity

businesses. As chief executive officer, he sold the company to Hewlett-Packard in 2011 for \$10.3 billion. A year later, HP wrote down \$8.8 billion of that, alleging that Autonomy inflated years' worth of its finances. Lynch became a symbol of dealmaking gone awry. Yet even as he continues a ferocious legal fight with what's now called **Hewlett Packard Enterprise**, he's become an important part of London's venture capital scene.

His \$1 billion Europe-focused firm, **Invoke Capital**, looks like a cross between the Carlyle Group and Y Combinator. Invoke doesn't just invest in tech startups; it helps set up and manage them, particularly by matching scientist founders with corporate types, many of them Lynch's former Autonomy colleagues. The idea is to use Lynch's connections, and fluency with data analysis and artificial intelligence, to get in early on promising projects from the academic community—especially British universities such as Cambridge, where he got a Ph.D. in digital signal processing in 1990.

When screening technologies, Invoke looks for startups that are far ahead of any rivals. "We want an unfair advantage. The internal saying is, always take a gun to a knife fight," Lynch says. As for Invoke's pitch to startups: "There's a little bit of an element of the Spice Girls. We can bring people together."

The firm has about 60 employees, a lot for VC. So far, though, its portfolio comprises just four companies. Lynch says that's because he wades deep into each startup's operations. About half his staffers do in-house research and development, helping existing portfolio companies improve their offerings and assessing potential additions.

Advances in AI and large-scale data processing are within the reach of existing hardware, says Laurence Garrett, partner at tech investment firm Highland Europe. "But you've got to be able to package that hardware in a very sophisticated, slick manner, and turn it into a business that can win clients," he says. "Mike's been thinking about and doing this for some time."

Lynch is asking academics to make the same leap from the ivory tower he did. His Ph.D.

thesis focused on pattern recognition, drawing on the work of Thomas Bayes, an 18th century English clergyman and leader in the study of probability. Shortly after getting his doctorate, Lynch founded Cambridge Neurodynamics, which developed fingerprint recognition software, before starting Autonomy.

His most recent—and ironic—investment is **Luminance**, which makes software designed to process legal documents and check for dicey numbers in acquisitions. (Announcing the deal, he dryly said an overhaul of due diligence procedures was "perhaps long overdue.") Last summer, Lynch heard about Cambridge mathematicians working on algorithms that could better understand written language. After putting its own staff to work with the mathematicians to test the concept, Invoke set up Luminance as a company, provided R&D and legal experts, and hired an experienced executive as CEO.

Invoke is the only investor in Luminance, which is working with law firm Slaughter & May to refine its software in advance of a commercial launch. Lynch's firm is also the sole investor in **Neurence**, a Cambridge company making cloud-based AI software designed to help wearable gadgets recognize specific objects.

Invoke's biggest investment, cybersecurity company **Darktrace**, offers a more developed example of its approach. Invoke committed \$10 million after helping a group of Cambridge AI specialists turn an embryonic technology—can an electronic immune system repel attacks better than humans?—into a viable business. Darktrace shares office space with Invoke, and its CEO, chief financial officer, chief technology officer, and head of marketing are all Autonomy alumni.

That so many Autonomy veterans are available to be hired, of course, is a function of the disastrous outcome of its acquisition. Initially, HP's then-CEO, Léo Apotheker, championed the deal as the linchpin of his strategy to reorient HP around high-margin software. It was at the time the biggest-ever sale of a U.K. tech

"It's like turning up in a country and finding out it has vast oil reserves. What we haven't been doing is drilling."
—Lynch on the promise of the U.K.'s technology researchers



Lynch

◀ company, and it made Lynch about \$800 million, turning him into one of the country's richest entrepreneurs.

But HP ousted Apotheker soon after, putting Meg Whitman in charge. She pushed out Lynch and took the writedown, then diced Autonomy's products among various HP units, which were themselves divvied up when the company split into HP Inc. and software-focused HP Enterprise last year. HPE is preparing to sell off its Autonomy portfolio.

HP's claims against Lynch are nowhere near finished. While the U.K.'s Serious Fraud Office has said there was insufficient evidence for a prosecution, a U.S. Department of Justice probe is still under way, and HP last year sued Lynch and Autonomy ex-CFO Sushovan Hussain—also now at Invoke—for \$5.1 billion. Hussain declined to comment.

Lynch has countersued for at least \$160 million, claiming he's "suffered

\$400
million-plus

Valuation of Invoke-backed startup Darktrace

significant reputational damage and been unable to pursue business opportunities." In particular, his claim alleges, he "had advanced discussions with various financial backers, including private equity

firms," for investments in Invoke that fell through because of HP's suit.

Lynch says he's "desperate" to drag Whitman into court and has no interest in a settlement. In a statement, HPE said it continues to believe Lynch and Hussain "conducted a systematic and sustained scheme to mislead investors and potential buyers" about Autonomy's performance.

Making a success of Invoke could help Lynch in court, says Tim Brown, a litigation expert at London law firm Reynolds Porter Chamberlain. "If he can show that it's relatively successful with limited backing, he can argue he would have made even more money" absent the HP fallout, Brown says.

Invoke is starting to attract big-name allies. In July, Darktrace raised \$65 million from investors including KKR and SoftBank, valuing it at more than \$400 million.

Although the Autonomy fracas has

been bad for U.K. tech, Lynch says, the country has huge untapped potential—a broad scientific base but few world-beating companies. "It's like turning up in a country and finding out it has vast oil reserves," he says. "What we haven't been doing is drilling."

—Matthew Campbell

The bottom line While fighting a \$5 billion lawsuit from HP, Mike Lynch has set up a \$1 billion venture firm that runs a lot like an incubator.

Transportation

Baby, You Can Rent My Car

▶ **Airbnb-like services for car owners are expanding in Europe**

▶ **"Private vehicles sit unused 95 percent of the time"**

When carpooling service Amovens added a peer-to-peer car rental option in 2015, David Jurado didn't hesitate to try it. The Seville native who lives in Madrid had frequently used Amovens and **BlaBlaCar** to find passengers who could split the costs of fuel and tolls on longer trips. And since he owns two cars, any money he could make from renting out the one, a 2006 Skoda sedan, would help cover the costs of owning and maintaining it.

Today, Jurado, a workplace safety manager, uses three services to rent his Skoda several times a month. He charges a minimum of €27 (\$30) per day and pockets about 70 percent after the

site takes its cut for matchmaking and insurance. "It's a way to reduce the car's overhead and collaborate with society," he says.

Jurado is one of thousands of car owners across Europe who rely on peer-to-peer rental sites to make car ownership more affordable. The services, including Paris-based **Drivy** and Copenhagen-based **GoMore**, are getting popular. The business model is similar to Airbnb's: Car owners post their vehicles on a website, and users, after their driver's licenses are verified, ask to rent them. The sites take a cut of each transaction. They work with such partners as **Allianz** to provide roadside assistance and insurance for damage, theft, and liability. Owners set rates, from about €15 to €100 a day, depending on the type of vehicle. Fares are discounted for longer-term rentals. Renters pay for fuel.

"I see a lot of potential for this model, particularly as we evolve into more automated, connected vehicle systems," says Susan Shaheen, co-director of the Transportation Sustainability Research Center at the University of California at Berkeley. "Private vehicles sit unused 95 percent of the time."

Drivy launched in France in late 2010 and now also operates in Austria, Belgium, Germany, and Spain. It lists about 38,000 cars for rent and has 1 million registered users, says founder and Chief Executive Officer Paulin Dementhon. GoMore is in Denmark, France, Norway, Sweden, and Spain—it bought Amovens last year—and lists about 11,000 cars, according to co-founder and CEO Matias Dalsgaard. The services say their rates average

Car Rental Markets

Drivy	Getaround	GoMore	Turo
Paris	San Francisco	Copenhagen	San Francisco
Launched in 2010	Launched in 2011	Began rentals in 2014	Launched in 2009
83 employees	120 employees	50 employees	150 employees
38k cars	2.5k cars	11k cars	N/A*
1m users	350k users	1.3m users**	N/A*
In 5 European countries	U.S.	In 5 European countries	U.S. and Canada
\$53m	\$40m	N/A*	\$101m
in funding	in funding	in funding	in funding

Innovation

Needle-Free Injections

Form and function

Designed for patients to use on themselves, the needle-free injector delivers drugs through the skin using a small piston that the company says is less painful than a conventional hypodermic needle.

Innovator Patrick Anquetil

Age 42

Title Chief executive officer of Portal Instruments, a 30-employee company in Cambridge, Mass.



significantly less than what conventional car rental agencies charge.

Similar operations are gaining traction in North America. Five-year-old, San Francisco-based **Getaround** says it has 350,000 users sharing 2,500 cars in five states and Washington, D.C. It has raised about \$40 million from investors, including Cox Automotive and Menlo Ventures, and has received two Federal Highway Administration grants to conduct pilot programs. But the spread of on-demand transportation options, from **Uber** to car-sharing programs such as **Car2Go** and **Zipcar**, makes the practice a tougher sell in the U.S., says Lisa Jerram, a principal research analyst at Navigant Research.

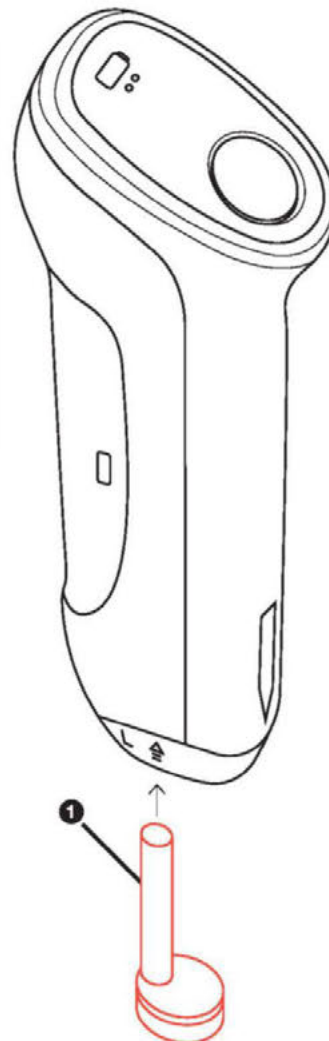
Navigant estimates global car-sharing revenue will climb to \$6.5 billion by 2024, up from \$1.1 billion in 2015. Peer-to-peer operators' share will be small, says Jerram. Still, industry experts see room for startups serving different needs. "Everyone is driven by economics and convenience," says Robin Chase, co-founder and ex-CEO of Zipcar, which **Avis Budget Group** acquired in 2013, and co-founder and ex-CEO of French peer-to-peer startup **Buzzcar**, which Drivy bought last year. "I would never take a Car2Go or Uber to go out to the beach for the day," she says.

One way startups try to appeal to more customers is to make renting faster and smoother. Getaround requires users to equip their vehicles with hardware that lets renters unlock them with their smartphones. (Car owners pay a one-time \$99 installation fee plus \$20 a month for the device.) Drivy has a similar system in 600 cars and expects to add it to 400 more by yearend. It plans to expand its service to the U.K. in coming months and a few more nations next year, thanks to a €31 million investment from Cathay Innovation, Nokia Growth Partners, and others in April. "We're not talking about taking market share from an existing industry," says CEO Dementhon. "We're talking about creating something that didn't really exist before." —*Nick Leiber*

The bottom line Global car-sharing revenue will reach \$6.5 billion in 2024, according to Navigant Research, up from \$1.1 billion in 2015.



Use The 7-inch, 10-oz. injector comes loaded with a disposable cartridge containing multiple doses (about 1 milliliter each) of a given drug. Patients press the tip of the injector against their thighs or abs and push the button.



Funding Portal has received \$36 million from investors including drugmaker Sanofi.

Rivals Other needle-free delivery devices depend on compressed air, springs, or chemical explosions to inject drugs in a sustained blast.

Origin Anquetil co-founded Portal in 2012 with Ian Hunter, the head of MIT's Bioinstrumentation Lab, who helped develop the first prototype.

Treatments Portal says it plans to pitch its injector to drugmakers for self-treatment of chronic diseases such as multiple sclerosis, rheumatoid arthritis, and hemophilia.



Delivery A piston driven by a computer-controlled electric motor delivers a 150-micron-thick jet of drugs through the patient's skin in about half a second. It reduces painful pressure after penetrating the skin.

Next Steps

Dan Luo, a professor of biological and environmental engineering at Cornell, says that besides appearing safer than a hypodermic needle, the piston injector, with its reduced pain, may make patients less likely to skip doses. Anquetil says clinical trials are under way and that the injector's design should be final, and smaller, next year. He's aiming for U.S. Food and Drug Administration approval in 2019 and hasn't settled on a price.

—*Michael Belfiore*

Some Things Not Doing So Well



▶ A scare over a possible multibillion-dollar penalty has people worried about Deutsche Bank

▶ “I don’t know whether to laugh or be angry”

It’s been more than eight years since the financial crisis. Shouldn’t the No. 1 bank in Europe’s biggest economy have found its footing by now?

Germany’s **Deutsche Bank** has investors rattled, policymakers muddled, and anyone else who’s paying attention feeling a little queasy. The trigger was news in September that the bank could be hit with a \$14 billion penalty for alleged misdeeds during the U.S. mortgage boom. Fearing Deutsche Bank would have to raise capital—selling stock and diluting per-share value—or even find itself in need of a state bailout, investors sent its shares tumbling to a record low on Sept. 26.

While Deutsche Bank’s shares have since stabilized amid hopes it can negotiate a smaller bill with the U.S. Department of Justice, they’re still down 43 percent this year. It’s clear that one of Europe’s too-big-to-fail institutions is struggling to adapt to a post-crisis world defined by more aggressive regulation and fewer ways for banks to make money.

“The European banking model may be broken,” says Peter Hahn, a professor at the London Institute of Banking

& Finance. “The existing system isn’t working with low growth and zero-to-negative interest rates.” Rock-bottom rates have lowered banks’ cost of borrowing but also mean they are paid less on loans and investments.

The health of Deutsche Bank has implications far beyond Europe. With €1.8 trillion (\$2 trillion) in assets, it raises capital and trades securities for clients in dozens of nations, including the U.S. In June the International Monetary Fund flagged Deutsche Bank as the biggest contributor to systemic risk among global banks.

For the past three weeks, Chief Executive Officer John Cryan, a Briton who speaks fluent German, has been reassuring the market. He told the German press that seeking state aid was “out of the question.” In a memo to the bank’s 101,000 employees, he said the bank was stronger than it was before the 2008 crash. Its Tier 1 capital ratio—one measure of financial strength—will improve to 11.2 percent from 10.8 percent following the sale of its stake in a Chinese bank.

Cryan cited “heavy speculation” for the falling share price. That drew the

ire of German Vice Chancellor Sigmar Gabriel, who told reporters on Oct. 2, “I don’t know whether to laugh or be angry that the bank that declared speculation to be its business model now declares itself the victim of speculators.”

Once a sleepy adjunct of German industry, Deutsche Bank spent the first decade of the 2000s expanding its investment banking operations in a bid for growth. In the years following the financial crisis, it chose to largely preserve its investment banking franchise even though regulators were forcing the industry to curtail risk-taking. Deutsche Bank had fewer options to fall back on than its rivals—**UBS** and **Credit Suisse** possessed asset management businesses that generated lucrative fees, and American giants such as **Citigroup** could rely on deep reservoirs of retail deposits.

Even as its rivals shuttered underperforming units and eliminated tens of thousands of jobs, Deutsche Bank’s head count has actually climbed 29 percent since 2007. When Cryan took charge in October 2015, he vowed to make the bank simpler, less risky, and more efficient. The five-year plan

at the Moment



included cutting 9,000 jobs and slashing €3.8 billion in costs.

But Deutsche Bank is still dealing with an overhang of legal issues. In 2015 it paid \$2.5 billion to settle claims over its role in rigging the bellwether London interbank offered rate. The bank has set aside €5.5 billion to cover litigation costs, which it may have to

drain even if it reaches a lighter settlement with the U.S. on mortgages. Meanwhile, authorities in the U.S. and the U.K. are investigating whether Deutsche Bank helped clients move money out of Russia in violation

of money laundering rules.

Cutting costs and settling legal bills won't solve Deutsche Bank's most pressing problem. It needs to generate ample profits to reinvest in the business and to continue to shore up capital. In the second quarter of 2016, Deutsche Bank's net income dropped to €18 million from €796 million a year earlier as it absorbed restructuring costs. Last year it lost €6.8 billion, which was worse than the €3.9 billion loss it recorded in 2008.

"Deutsche Bank has to restore confidence in itself, and to do that you have to produce sustainable profitability," says Gary Jenkins, the head of Swordfish Research, a credit analysis firm. "That's really tough to do when you need an industrywide restructuring."

This drama couldn't come at a worse time for German Chancellor Angela Merkel, who's girding for a general election in the second half of 2017. The last thing she wants to deal with is saving Deutsche Bank, especially after her government led the push in recent years to largely bar taxpayer-funded bailouts in the European Union. In a process dubbed a "bail-in," troubled lenders must force losses on their shareholders and some creditors before state aid can be considered.

Cryan's allies are pushing back on the idea that the bank needs such a radical remedy. On Oct. 4, Jamie Dimon, the CEO and chairman of **JPMorgan Chase**, told CNBC that Deutsche Bank had plenty of capital and would overcome its challenges. The chieftains of German companies such as **Allianz**, **Siemens**, and **Munich RE** have been rallying around the bank in statements to German media. But it will take more than supportive comments to nurse this

146-year-old institution back to health. Whether its raising capital, merging with another lender like the struggling **Commerzbank**, or in the worst-case scenario turning to a reluctant Berlin for help, the most obvious options are painful. —*Edward Robinson*

The bottom line Even if Deutsche Bank doesn't end up having to pay \$14 billion for its alleged role in the mortgage mess, it still has big problems.

43%

Decline in Deutsche Bank's share price since Dec. 31

Investing

Schwab's Cut-Rate ETFs Are Catching On

► Generic funds can do well when you run a financial supermarket

► "Cost is the holy grail.... We are not focused on niche products"

In the crowded race for a piece of the \$2.4 trillion exchange-traded fund market, one contender is coming up rapidly from behind. **Charles Schwab**, better known for its low-cost brokerage, has attracted more than \$10 billion to its ETFs this year. Only the three giants of the business—**BlackRock**, **Vanguard**, and **State Street**—added ►

◀ more money. Five years ago, Schwab wasn't even in the top 10 of ETF managers by assets. Now it's ranked fifth, with \$54 billion in its 21 ETFs.

Surprisingly, Schwab has done this while focusing on plain-vanilla investment options, where there's stiff competition. ETFs are funds that trade like stocks, and the most popular ones, such as State Street's \$197 billion SPDR S&P 500 Trust, mimic broadly diversified market indexes, just like Schwab's biggest funds do.

It's tough to take on the established ETF brands—who needs another generic blue-chip index fund?—but Schwab's products have had two advantages. First, “they are the cheapest of the cheap,” says Eric Balchunas, an analyst with Bloomberg Intelligence. Some of Schwab's ETFs, including the one tracking large-cap stocks, charge investors annual fees of as little as 3¢ per \$100 invested.

Schwab's least-expensive ETFs are even cheaper than those sold by Vanguard, a company known for low prices, though in most cases the gap is as small as 1¢ or 2¢ per \$100 invested.

Schwab also benefits from being a financial supermarket that already reaches millions of customers. “It's a large, captive audience,” says Ben Johnson, director of global ETF research at Chicago-based Morningstar. In addition to having 10 million brokerage customers, Schwab manages retirement plans for 1.6 million participants. About 7,000 financial

advisers use it for trading and other back-office services.

Schwab says it sells a majority of its ETFs to existing customers, with roughly 30 percent of money coming in from new clients. In 2015 the company launched a robo-adviser, a web-based service that automatically builds clients a diversified portfolio; the service invests mainly through Schwab's ETFs. Schwab's new mutual funds for retirement investors also invest in its ETFs.

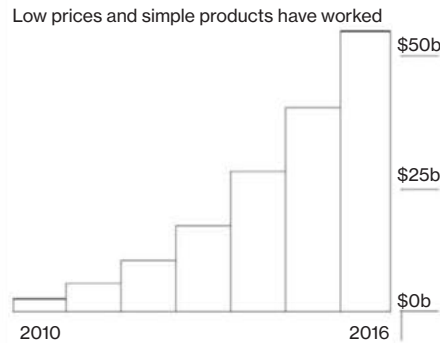
Schwab launched its ETFs in 2009, relatively late. Other newer entrants have chosen to bypass basic index funds to offer more novel strategies. For example, one ETF tracks companies that supposedly fight obesity, and another holds video-game makers. Except for a real estate fund, Schwab has no industry-specific ETFs. “Cost is the holy grail for the future of this industry,” says Marie Chandoha, head of Schwab's asset management subsidiary. “We are not focused on niche products.”

Another popular strategy, called smart beta, is to build specialized indexes that weight stocks based on factors such as low valuation or dividends in an attempt to beat the market. No. 4 player **Invesco** has heavily embraced smart beta with its PowerShares funds. Schwab has a few such offerings, too, dubbed Fundamental Index funds, but so far they represent only 10 percent of its ETF assets. Smart beta charges more than the basic index funds—

Schwab's cost 32¢ or more per \$100 invested.

Even with its growth,

Schwab's ETF assets



Schwab is far smaller than the biggest names in the industry. No. 1 BlackRock has more than \$900 billion in assets in its U.S. iShares ETFs. Even Invesco has twice as much in ETF assets as Schwab with \$106 billion. “Schwab will continue to pull in assets, but I don't think you are going to see them reach a couple of hundred billion dollars overnight,” says Dave Nadig, director of ETFs at FactSet. The captive-audience model has its limits. “It's a bit difficult to imagine Vanguard brokerage customers buying Schwab ETFs,” says Nadig.

And the price war is getting more intense. **Goldman Sachs** in 2015 launched a line of smart-beta ETFs with expenses of just 9¢ per \$100 invested. That's far cheaper than Schwab's smart-beta offerings. On Oct. 5, BlackRock announced it would cut expenses on 15 stock-and-bond ETFs, matching Schwab in a number of fund categories.

Schwab's Chandoha thinks price is going to become even more important. A new U.S. Department of Labor rule, which will go into effect next year, requires advisers dealing with retirement investments to put their clients'

Real Estate

Trying to Let the Air Out... Gently

In an effort to address rapidly rising home prices, Canada has tightened mortgage rules again. It also ended a tax break used by some foreign buyers.

Vancouver's market, where prices were up **31%** in August from a year earlier, is ranked by analysts at UBS as the world's most bubbly. Home prices in the city are almost **40x** annual rents, compared with about 20 times in San Francisco. Since British Columbia put a **15%** levy on foreign buyers in August, Vancouver sales have slowed. —Katia Dmitrieva



Nationally, home prices rose 15%

33%
Drop in the number of Vancouver homes sold in September, vs. from a year ago

interests first. One way to show you've done that is to put them in low-cost funds. "There will be a shakeout in this business," says Chandoha, "and cost will be the driving force bringing in assets." —*Charles Stein*

The bottom line Many ETF challengers avoid competing directly with the big brands. Schwab has the marketing muscle to do it.

After Wall Street

Mindfulness for the Hedge Fund Set

► **A former BlackRock exec blogs about being your best self**

► **"In the journey of life, don't we want to be long-call options?"**

A day in the life of Khemaridh Hy, formerly of Wall Street: He starts at 5:15 a.m. with a Snapchat selfie and a caption that says, "Time for daily practice. Be present in the now!" After 20 minutes of meditation, he heads for the elevator of his Brooklyn apartment building and posts a quote on Twitter by Lao Tzu that begins: "Stop leaving and you will arrive." Then he strolls to a coffee shop for some blogging.

Hy writes about a mashup of topics, such as taking cold showers for mental resilience, limiting desserts to four per week, and why skateboarders make good employees. One recent post dwells on "the number"—the amount of money you need to amass to quit working. "If the number enables you to live off a bond-like profile, remember that you're also short a put," Hy writes. "In the journey of life, don't we want to be long-call options?"

That kind of finance jargon—indecipherable to most—mixed with self-improvement has brought Hy a small but high-powered audience. About 2,000 people read his e-mail newsletter or follow him on social media. That includes at least one person at each of the 60 largest hedge funds. Hy has serious finance credentials: He left **BlackRock** 17 months ago when he was 35 and head of New York research for its \$22 billion fund-of-hedge-funds. Now he's a preacher of sorts for "being your best authentic self."

Among those who track Hy are Ross Garon, who heads the quant business for Point72 Asset Management, and Mark Godvin, a partner at HBK Capital Management. Brad Katsuyama, founder of equities exchange operator IEX Group, urges his employees to read Hy's website, RadReads. "Self-reflection or self-knowledge is extremely important," he says.

Hy is living mainly off savings—he says he quit when he had enough to go three years without a major lifestyle change. He recently generated a bit of income when a handful of hedge funds brought him in to speak to their staffs. In September he became the inaugural entrepreneur-in-residence at the website Quartz, an unpaid gig.

Hy's fans "are real people who follow and interact," says Rich Rosenblum, former global head of oil derivatives trading at Goldman Sachs. "He puts a lot of sweat into his position as a hub of information, with no clear avenue for self-profit."

Among Hy's products is an e-mail he sends out every Saturday in which he shares links to five articles that captured his attention. Rishi Ganti, founding partner of Orthogon Partners, says he forwards at least one article a week to friends and colleagues. Some, though, say they tune in just because they find Hy's posts, such as his Facebook Live meditation video, so bizarre. Hy says he's used to "passive-aggressive patronizing" from a crowd that takes a dim view because "what I'm doing is a mix of blogging and writing and not a company that's making money."

Hy says he left BlackRock out of a desire to "maximize productivity at life." Also, he might have been bored. "After 12 years, I'm like, hey, fixed-income strategies or statistical arbitrage don't change that much," he says. "Once the money hit a certain point, I just wanted to do something different." Raised in New York City, Hy earned



a computer science degree from Yale and started his career in 2002 with a stint in investment banking. He began at BlackRock in 2007, just before the financial crisis, and made managing director at 31. He honed productivity tricks, such as researching the most-used words with more than four letters to create a BlackBerry shorthand for faster typing. For networking, Hy devised a way to catalog thousands of people he met. He says 42 percent of the names in his database are "non-bros," meaning women or racial or ethnic minorities underrepresented in finance and tech.

Each day, Hy spends at least four uninterrupted hours with his wife and 2-year-old daughter and meditates twice. Among his favorite authors are Soren Kierkegaard and Abraham Lincoln, and he listens to audiobooks at 2.5-times speed. He's slightly obsessed with a dread of death and what a person can learn from that.

Hy acknowledges that at some point he'll have to make money again, perhaps by somehow monetizing RadReads, starting a business, or getting a job. He's still trying to reckon with "the number." —*Sangwon Yoon*

The bottom line Khemaridh Hy found online self-improvement more interesting than arbitrage. But how do you turn a following into a career?

B Edited by Pat Regnier
Bloomberg.com

October 10 — October 16, 2016

To Talk About Sex to Teens In Zambia, Play the Diva

► An NGO and a design firm team up to combat teen pregnancy

► “The centers are really about as far from a medical clinic as possible”

Sandwiched between a bakery and a grocery store in a bustling neighborhood of Lusaka, Zambia’s capital, the Diva Centre is nothing fancy: a sparse room with some chairs and tables cluttered with magazines and bottles of nail polish. With teenage girls and young women coming and going, it could easily be mistaken for a nail salon.

The Diva Centre is actually a health clinic in disguise—the product of a collaboration between Marie Stopes International, a London-based family-planning organization, and Ideo.org, a nonprofit that specializes in applying design thinking to social problems.

Marie Stopes has a well-established presence in Zambia, providing services, including dispensing contraceptives, mostly in rural areas and largely to older, married women. But according to Zambia manager Nikile Njovu, the organization has struggled to reach adolescents, which make up only 17 percent of its clients. That’s a critical gap in a country where almost 30 percent of girls become pregnant before their 18th birthday, according to the Zambian government’s 2013-14 demographic and health survey. “They are a disenfranchised population that have to overcome barriers—cultural, religious, social, and economic—in order to make independent decisions about their reproductive health,” says Njovu.

In 2014, the William & Flora Hewlett Foundation, one of Marie Stopes’s funders, connected the organization with Ideo.org’s creative director, Patrice Martin. Part of the problem, her design team found, was semantic. Zambian teens didn’t think they

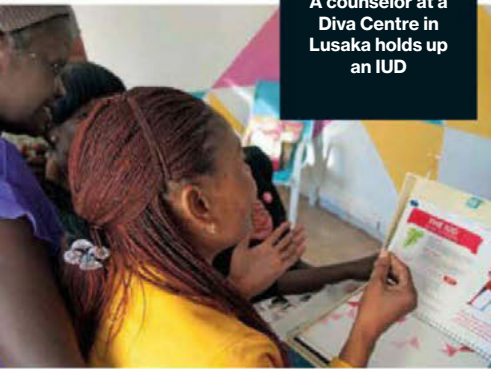


Visitors can sample nail polish, browse magazines, and get information on different forms of birth control



“Teen connectors” facilitate conversations with adolescent girls

A counselor at a Diva Centre in Lusaka holds up an IUD



as observers, listening as more than 100 teens talked about their understanding (or often misunderstanding) of sex and reproduction. On their second trip, the designers began testing environments in which girls would feel more comfortable talking about these issues. They rented a space and got teens to pass out invitations to a “speak-easy” club to young women; another time they set out bottles of nail polish in an attempt to create a more relaxed, spa-like atmosphere. The last idea worked so well that they ran with it.

“It was about creating a friendly space, one that is youth-centered,” says Martin. “The centers are really about as far from a medical clinic as possible.”

The project also involved branding: The Ideo.org team created a set of four aspirational characters called the Divine Divas, each with a personality and lifestyle suited to a particular type of contraception. The Perfectionist “never misses a party or an exam” and she “never forgets to take her birth control pill.” The Supergirl’s IUD “makes her invincible and protected from pregnancy for a super long time.”

The Diva Centres each see an average of 14 girls a day, a small but steady trickle that’s added up to more than 11,000 teens, 75 percent of whom are now using contraception, according to Marie Stopes. “Initially, it wasn’t easy to convince my fellow young girls to access information and services on sexual and reproductive health,” says Catherine, a 22-year-old who works at the Diva Centres in Lusaka as a “teen connector,” handing out pamphlets to teens on the street and talking to them about their contraception options. Catherine, who did not want her last name used, became pregnant during her senior year in high school. When she visited an abortion clinic, she was turned away by a nurse who told her that she had been careless and needed to learn her lesson. She says that some girls toss the pamphlets away and sometimes a parent or teacher will approach as she’s talking with a teen and accuse her of promoting prostitution.

There are three Diva Centres in Zambia, two in the capital and one in

the process of moving to the smaller city of Ndoka. Marie Stopes doesn’t plan to open new ones, because it views them as most effective in urban settings. “The insights from the Diva model are still of great value,” says program manager Njovu—one of them being that information on contraceptive services for teen girls “has to be packaged in a way that is attractive to them.” Her group is working with Zambia’s Ministry of Health to adapt those findings to rural areas. Meanwhile, Martin’s team is in conversation with Marie Stopes’s Kenya affiliate to figure out how the lessons from Zambia can be applied there. —*Jessie Scanlon, with Taonga Clifford Mitimingi*

The bottom line Ideo.org created centers where Zambian girls can get information about birth control in a fun and relaxed setting.

Industrial Design Sketching a High-Voltage Future

► Mercedes unveils a dedicated subbrand for electric cars

► Plug-ins “started out with a bit of an eco-friendly, responsible tag”

When Karl Benz built the first gasoline-powered automobile in 1885, it looked like a horse-drawn carriage without the horses. It would take more than three decades for the shape of vehicles to catch up to the new way of propelling them forward. **Mercedes-Benz** design chief Gorden Wagener says electric motors could similarly reshape the way cars look. “The architecture is going to change fundamentally,” he says.

At the Paris Motor Show on Sept. 29, Wagener unveiled the Generation EQ, an electric sport utility/coupe crossover with a range of roughly 300 miles—part of a lineup Mercedes will market under a new subbrand, EQ. The first model—which Mercedes says will be priced to compete with similar cars with traditional engines—will hit in 2019, and a total of 10 SUVs, sedans, and

needed family planning services. They just didn’t want to get pregnant. “We had to flip the question,” Martin says. “Instead of asking, ‘How do we get girls to reproductive health services?’ we asked, ‘How do we get the reproductive health services to the girls?’”

Founded in Palo Alto in 1991, Ideo, the nonprofit’s parent, has extensive experience in designing products and services, with a client list that includes **Apple, Ford, and Coca-Cola**. For the Zambia project, which spanned a period of eight months, teams of three or four Ideo.org designers took three trips to Zambia. Initially they acted

Focus On/Design

1 The dashboard features an elongated touchscreen and is free of knobs.

2 The lack of a transmission means the middle console isn't attached to the dashboard.

3 Electric motors need little cooling, so the Generation EQ's designers were able to render the trademark Mercedes grille in glass.



4 The body's seamless look is reinforced by the absence of door handles. To open, the owner waves a hand over a sensor.

5 Sideview mirrors are replaced with rear-facing cameras that transmit images to small displays on the doors.



◀ compacts are planned by 2025.

Wagener's job is to develop a design vocabulary for EQ that draws from Mercedes's lexicon—think three-pointed star and trapezoidal grille—but is distinctive enough for buyers to feel they're trumpeting their green credentials. The body of the Generation EQ forms a gentle arc from the front end (with an illuminated Mercedes star) to the hood, windshield, and roof before dropping sharply to the rear tailgate, which sports a red light bar across the car's entire width. The vehicle has no door handles—the doors open automatically when you wave your hand over a sensor. Instead of sideview mirrors, it's got small displays that show images from rear-facing cameras. The dashboard is dominated by a rectangular screen, which appears to float behind the steering wheel, and is otherwise devoid of dials and buttons. Electric cars "started out with a bit of an eco-friendly, responsible tag," Wagener said as crowds clustered around the Generation EQ during the Paris show. "They weren't sexy, they weren't luxury cars, and they didn't sell."

Some automakers have treated electric cars as an afterthought. Mercedes's current offerings in the segment simply swap batteries and electric motors into existing models such as the van-like B-Class. Similarly, **Ford's** electric Focus is hard to distinguish from the original. And stabs at standout styling haven't always succeeded. **BMW** created a new look for its i3 electric city car in 2013, but the quirky, stubby design was a factor in the tepid response from buyers. The Model S from **Tesla Motors**—with a price tag that can top \$110,000—has been more successful, last

year outselling the \$96,600 Mercedes S-Class in the U.S. But it looks pretty much like other luxury sedans. "Soon, somebody may take the 'bold pill,' and something completely unique and fabulous will come out," says Howard Guy of Design Q, an automotive design studio that's worked with Jaguar, Aston Martin, and Ferrari. "The challenge is to make an electric car do something that petrol proportions and design can never do."

Wagener says his goal for EQ is to explore new options in layout and styling permitted by electric technology, like the stretched-out wheelbase. "The wheels can be further apart," he says, holding his arms out wide. "They have to be, because in a crash the only safe place for the batteries is between the wheels." But he acknowledges that for now, he can only go so far. With no gasoline exploding in the pistons, there's no need for air vents, but the Generation EQ still has something that looks like a grille: a black glass panel at the front that incorporates the star and familiar horizontal bars, glowing white and blue. And while there's no transmission creating a bulge between the seats, there's a center console, though it floats up from the floor rather than being attached to the dashboard.

In the shift to self-driving cars, designers will have more latitude—for instance, possibly eliminating air bags and seat belts as driving gets safer, says Adrian van Hooydonk, the design boss at BMW. "We'll be able to do different things," he says. "I expect that to become visible in one form or another in almost all our products." Wagener says that as electronics improve, cars

will more closely resemble living spaces, with wooden flooring and seats that swivel for easy conversation. But there's one feature he's not ready to ditch: The steering wheel (though he allows that it may be retractable). "We're moving toward designing lounges on wheels," Wagener says. "But one that I can still drive when I want to." —*Elisabeth Behrmann*

The bottom line Mercedes is seeking to create a design vocabulary that's familiar yet distinctive for its new EQ range of electric SUVs and sedans.

Field Studies

Postcards From The Edge



▶ **Studio D Radiodurans specializes in challenging environments**

▶ **"I've not met another agency specializing in this kind of work"**

Jan Chipchase travels light. But after touching down in Myanmar in late 2015, Chipchase—whose design consulting company was doing field research on how rice farmers use their smartphones—decided he was still overburdened. So he headed to a local

Chipchase observations: Touch ID doesn't work at high altitudes; finger-prints are too dry / Tibetan monks prefer iOS over Android /

Accelerating time to value

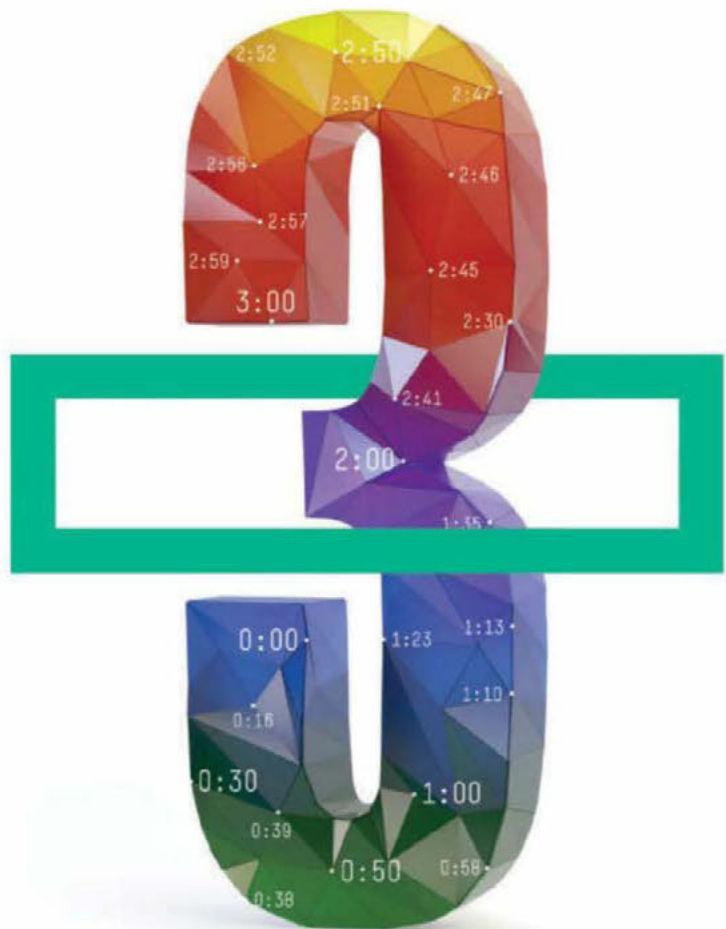
market and had his head shaved. “I believe I can do the best research by stripping myself down,” he says.

Everything about **Studio D Radiodurans**, which Chipchase founded in 2014, is stripped-down. It has no permanent offices and no full-time staff. Its website mentions few clients or specific services, but case studies and social media posts hint at the scope of its practice: dispatches from monthslong expeditions to places such as Somalia and Tajikistan; photographs of dirt roads and remote airstrips; references to unnamed global clients who demand “keeping relationships discreet.” If Chipchase weren’t design world royalty, the whole thing might come off like viral marketing for a Jason Bourne movie.

Before starting Studio D, Chipchase was executive director of global insights at **Frog Design**, the San Francisco consulting company famed for its work with **Apple** founder Steve Jobs. Frog hired Chipchase in 2010 from **Nokia**, where he spent a decade as a globe-trotting usability researcher. Chipchase, who was born in the U.K., was initially stationed at a Nokia research center in Tokyo. He soon realized, he says, “that the kinds of questions they were asking”—about how culture and context affect where, when, and why people use their mobile phones—“couldn’t be answered in a lab.”

Over coffee during a rare extended stint in his home base of San Francisco, Chipchase describes Studio D’s approach. “The art form,” he says, “is being able to look at this street scene”—he gestures toward Divisadero Street—“and pinpoint the three things that matter to your business and create an argument, with all the supporting evidence, for why those three things may grow or kill your business in the next 5 to 10 years.”

To gather that evidence, Studio D conducts field research, often in the form of pop-up studios where small teams of designers and fixers spend weeks or months interacting with locals and documenting their behavior. This ethnographic approach has become an important concept in corporate strategy over the past decade. **Xerox** employed an ethnographer as early as 1979 to document the habits of accounting clerks and now uses them to study why office workers



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Accelerating next



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Reinventions

Scrip

NewDealDesign, the San Francisco studio best known for the look of the Fitbit activity tracker, has released a conceptual design for Scrip, a device for making digital payments. Its surface, which is made up of tiny, diamond-shaped sections, changes with each transaction. The goal: to restore a physical dimension—and perhaps a measure of restraint—to the act of purchasing. —*Joshua Brustein*



The Essentials

1 Scrip weighs an ounce and is designed to fit comfortably in the change pocket of a pair of jeans.

2 Users would load funds from their checking accounts onto the device through a cell phone. To pay, they'd make a swiping gesture, as if they were handing somebody cash.

3 The surface of the Scrip would change to show the new account balance. The amount also appears on an illuminated display.

The personal

NewDeal founder Gadi Amit noticed his daughters had been better at managing their money back when it consisted only of bills and coins. Today, his debit card-toting teenagers are always broke, he says.

The theoretical

Paying with cash causes physical discomfort, according to a study published in the *Journal of Consumer Research*, but it also makes people feel a closer connection to whatever they've purchased. Researchers told subjects that a coffee mug was worth \$6.95, then sold it to them for \$2. When the researchers asked to buy back the mug, people who had paid by credit card asked for an average of \$3.83, while those who had used cash demanded \$6.71.

The future

Given the obsession with making payment frictionless, Amit says, Scrip may never reach the market. But he says the exercise is worth it: "It's about introducing off-mainstream ideas back into the discussion."

◀ still print out things. In 2014, **Adobe Systems** hired anthropologist Charles Pearson to observe how customers use Photoshop; his findings inspired a pared-down version of the software for mobile app designers.



Chipchase's studio, named after a hardy species of bacteria, caters to businesses that want to understand markets whose geography or culture make them inhospitable to standard research. In 2015 a Studio D crew embedded in Riyadh gathered intel for **Saudi Telecom (STC)** on "what it means to be a 'Saudi youth.'" STC used the findings to develop Jawwy, a youth-targeted mobile brand that lets millennials in the kingdom assemble a la carte data plans. That same year, the Bill & Melinda Gates Foundation sent Studio D to Somaliland to investigate adoption of mobile money services, which allow people without bank accounts to send and receive funds. That followed the Myanmar job, for which Studio D produced a report on the nation's rice-production pipeline for the University of California at Irvine's Institute for Money, Technology & Financial Inclusion. "I've not met another agency specializing in this kind of work," says Mark Rolston, Chipchase's boss at Frog, who now runs Argodesign in Austin. "I think he has a lock on it."

Chipchase says he started Studio D after becoming frustrated with the bloated cost structures and distorted priorities at big-name design studios. He describes his alternative as "a laptop, connectivity, a pool of relationships, and some bare walls to stick stuff up on." Studio D's minimal overhead is a selling point, says Lauren Serota, who works as Studio D's design director on a per-project basis. "We're never in a position where we're charging a significant percentage on top of our fees to cover administrative costs," she says. "Our relationships are really strong, because our clients feel like they're getting a tremendous value." Which isn't to say Studio D tries to undercut its competitors on price: "We charge similar amounts" as firms such as Frog and IDEO, Chipchase says.

Even though the destinations are



exotic, the work isn't glamorous. "There are bugs everywhere, the power keeps going out, and you're covered in sweat," says Craig Mod, a designer who worked with Studio D in Myanmar. Chipchase

requires team members to hew to "a very strict rubric of do's and don'ts," Mod says, especially regarding photography. When concluding a session of fieldwork, researchers hand over their cameras and tell their subjects they may delete whatever material they wish. "That emphasis on respect and gratitude results in better insights," he says.

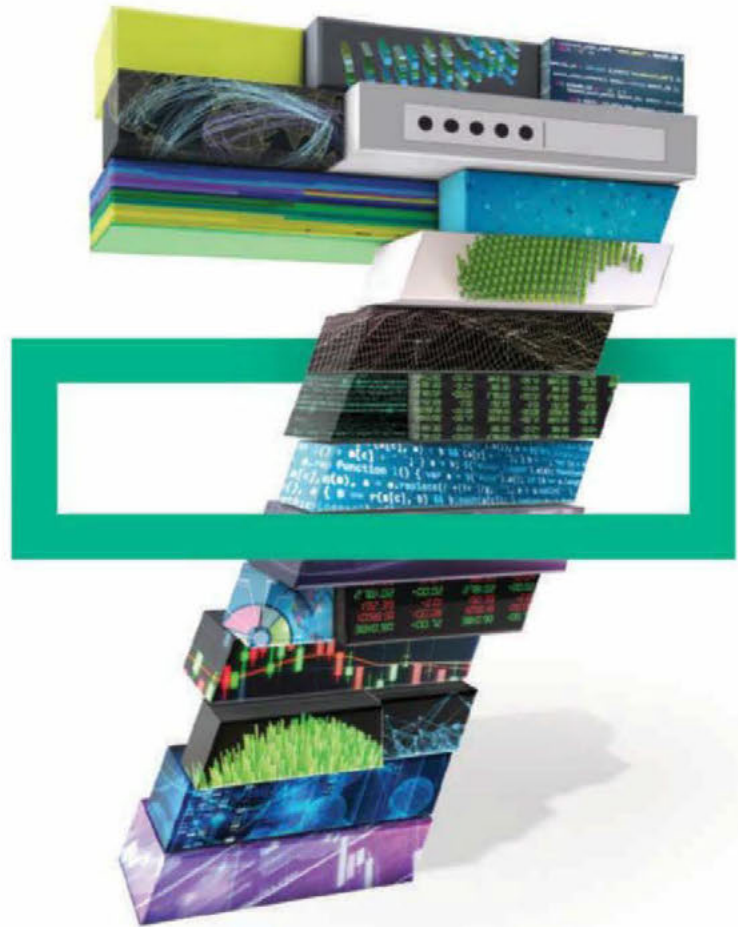
Studio D's method has also led to a line of rugged duffels and pouches. The \$720 1M Hauly Heist is ideal for toting around "\$1 million in used bank notes while minimising the risk of radio frequency tracking," according to the description on the website of SDR Traveller, Studio's D's sister company. "We just design stuff for dealing with our world," Chipchase says. "We have to pay people, and there often aren't ATMs."

Nondisclosure agreements are standard in design consulting, but Chipchase says he has other reasons for guarding his privacy (he wouldn't consent to being photographed for this story) and that of his clients. "If I told you that I work for Company X, I could be at a border crossing three years from now and someone will say, 'Oh, you work for X,'" he says—a preconception that could hamper his team's ability to establish trust in the field.

When Jawwy won a Middle Eastern branding award in 2016, a press release touted the carrier's collaboration with Frog and **Lippincott**, another leading global design firm. Studio D wasn't mentioned, but that's how Chipchase prefers it. "Of course, maybe five people on the planet will ever have to carry a million dollars around in a bag," he says. "But there is a world where that is important. And if people do a bit of digging, they realize that actually, there is a company that does this shit—and that's us." —*John Pavlus*

The bottom line After honing his ethnographic method at Nokia and Frog, Jan Chipchase is running his own small, itinerant design studio.

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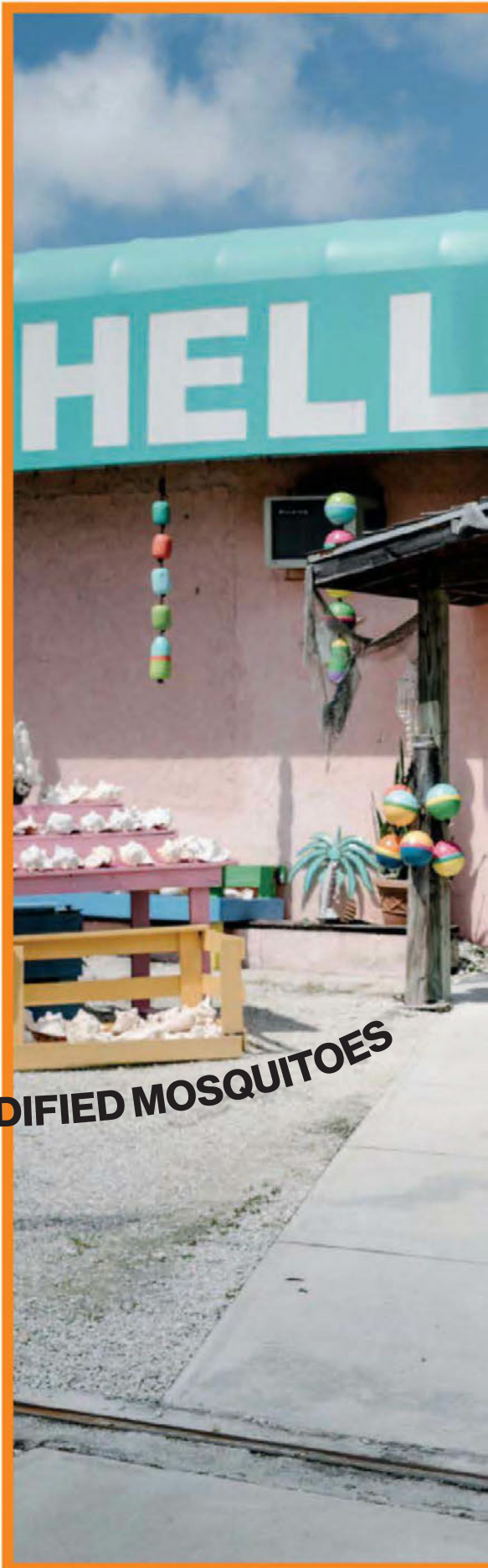
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DATA

EVEN IN THE AGE OF ZIKA, THE PEOPLE OF KEY WEST WANT NOTHING TO DO WITH OXITEC'S GENETICALLY MODIFIED MOSQUITOES





BY ROBERT KOLKER

PHOTOS BY JASON HENRY

ST

In a Tuesday morning in September, under a sweltering tropical sun on the island of Grand Cayman, 140,000 mosquitoes flit around in four large coolers in the back of a gray Toyota minivan. Behind the wheel is Renaud Lacroix, a Ph.D. in biology and medical entomology who works for the British biotechnology company Oxitec. A colleague, Isavella Evangelou, crouches behind him in a tight space next to the coolers. The minivan is idling on the side of a dirt road in West Bay, a quiet neighborhood where iguanas and roosters dart in and out of the yards of small homes painted in Caribbean pastels. The time has come for the mosquitoes to fulfill the purpose for which they were genetically engineered: a kamikaze mission to eliminate their own species.

As the minivan's air conditioning struggles against the humidity, the two Oxitec scientists prepare for the release—a process that, given the *Island of Dr. Moreau*-level hysteria that sometimes greets Oxitec's efforts in test sites around the world, is surprisingly low-tech. First, Evangelou pulls out a piece of light sheet metal that's been shaped into a foot-wide tube. She sticks one end of the tube through a circular hole cut out of the van's rear window, then fastens the other end in place with Velcro a few inches from the mouth of a small Dyson fan. Next, she takes her seat in the back, next to the fan, opens one of the coolers, and pulls out one of the 30 plastic containers in which the mosquitoes are waiting. Lacroix puts the van in gear, and off they go.

"Do I need to make a left here, Isavella?" Lacroix asks. Consulting a GPS-equipped tablet, she says yes. As the van slowly winds through the neighborhood, the tablet lets out a beep about every 30 meters. Each time she hears a beep, Evangelou—using little, if any, of the training that earned her a master's in biology—gently lifts the lid of a plastic container, as close to the fan as she can, and several thousand mosquitoes are blown out through the metal tube and into the neighborhood.

It takes over two and half hours, emptying container after container, to release all the mosquitoes into West Bay. They've been doing this three times a week since July; residents used to grimace when they drove by, but now they barely glance over. The procedure seems more disruptive to those of us in the van. Each time Evangelou opens a container, a fair number of mosquitoes escape the wind tunnel and start buzzing around our heads. "There will be a few fliers, yeah," Lacroix says with a smirk.

"A few" isn't quite right. Before long, we're overrun. Being in this van is like being in a Cheech and Chong movie, only with mosquitoes instead of smoke.

"Aren't we going to get eaten alive?" I ask, trying not to sound too concerned.

"No," Lacroix says. "They're males."

Male mosquitoes, he reminds me, aren't the ones that bite. Just about the only thing male mosquitoes do, he says, is seek out females, which do the biting. Oxitec is trying to leverage this mating instinct to help wipe out one particular species of mosquito: *Aedes aegypti*, carrier and spreader of some of the worst insect-borne diseases known to medicine—dengue, malaria, and Zika. The *A. aegypti* mosquito has evolved to survive even the most effective pesticides. It can lay 500 eggs in just a bottle cap's worth of water, and it prefers to bite humans over animals, so it lives in places where no one thinks to spray, like under the couch.

The idea behind Oxitec's experiment is that if enough genetically modified male *A. aegypti* mosquitoes are released into the wild, they'll track down large numbers of females in those hard-to-find places and mate with them. The eggs that result from any union with an Oxitec mosquito will carry a fatal genetic

trait engineered into the father—a "kill switch," geneticists call it. The next generation of *A. aegypti* mosquitoes will never survive past the larval stage, never fly, never bite, and never spread disease. No mosquitoes, no Zika.

Oxitec is far from the first company or research team that's tried to sterilize an entire insect population. Scientists have been going after *A. aegypti* in this way since the 1970s, usually by irradiating them. The problem with radiation is that it makes the mosquitoes too weak to get out and breed. The great innovation of the Oxitec method is that it cleverly achieves the same result as sterilization, while leaving mosquitoes able to do what mosquitoes do.

The approach was developed by founder Luke Alphey, a British geneticist specializing in vector control, or the elimination of disease-bearing creatures. Oxitec has applied the method in Brazil, Malaysia, and Panama, often with partial support from the Bill & Melinda Gates Foundation, and claims to have reduced the *A. aegypti* population in tiny test areas by at least 90 percent. That's a far better percentage than spraying, which usually hits about 50 percent and has a tendency to breed resistance, requiring more and more spraying to get the same low result.

"It takes one or two generations at least to be noticeable," Lacroix says as he grabs a green fly swatter the size of a tennis racket and starts thwacking away at some of the mosquitoes flying around his head. *A. aegypti*'s life span ranges from two weeks to a month, so the company will know in a few months if the population is starting to decrease. If it is, Lacroix says, "we can roll out to the rest of the island, drawing down south through the peninsula." Oxitec charges about \$7.50 per person per year in each area it treats. While the price gets cheaper as the *A. aegypti* population decreases and fewer Oxitec mosquitoes need to be released, the treatments aren't a short-term prospect: To ensure *A. aegypti* doesn't come back, the company continues releasing its mosquitoes on an open-ended basis.

Chief Executive Officer Haydn Parry has called Oxitec's method "a dead end" for the *A. aegypti* species. And, of course, in the age of Zika, such a dead end couldn't be more desirable. Since the news emerged last spring that a spike in cases of microcephaly in Brazil appeared to have been caused by Zika, politicians and public-health officials from around the world have been beating a path to Oxitec's door. U.S. officials were among them, even as Congress dithered all summer before finally, in late September, approving the funding of countermeasures to prevent large outbreaks. "I don't think time is on our side," Parry told a congressional committee in May. "I think the utmost urgency is required. I've just come from Puerto Rico, and we could have a catastrophe on our hands if we are not careful." The big winner if Oxitec ends up enlisted to fight Zika in the U.S. would be Intrexon, a biotech company run by billionaire Randal Kirk, which acquired Oxitec for \$160 million in the summer of 2015.

This August, the U.S. Food and Drug Administration approved Oxitec's first stateside experiment, in Key Haven, Fla., an unincorporated area separated by a narrow stretch of water from Key West. In many respects, you couldn't ask for a better test site in America. It's secluded, tropical, and surrounded by water, which prevents new mosquitoes from entering the area. If the Oxitec method works in Key Haven, then Florida, and the country, could have a powerful tool to help stop an incipient public-health crisis.

There is, however, an obstacle. Oxitec has been trying to conduct a trial in the Keys for seven years, ever since a dengue



outbreak there. Local opponents have thwarted those attempts for years, and now they've forced a pair of referendums, set for November, on the Key Haven test. Officials from the local Mosquito Control District have pledged to be guided by that vote—even if it means saying no to the FDA's approved experiment, with a major Zika crisis looming over Florida. In public meetings, on local radio, and, of course, online, opponents have all but commandeered the conversation about mosquitoes and Zika in the Keys. They call Oxitec's tactics unethical and underhanded. They call the company's science untested, unproven, and unsafe. Above all, they're worried about unintended consequences. Their not-so-affectionate name for the Oxitec mosquitoes: Frankenflies.

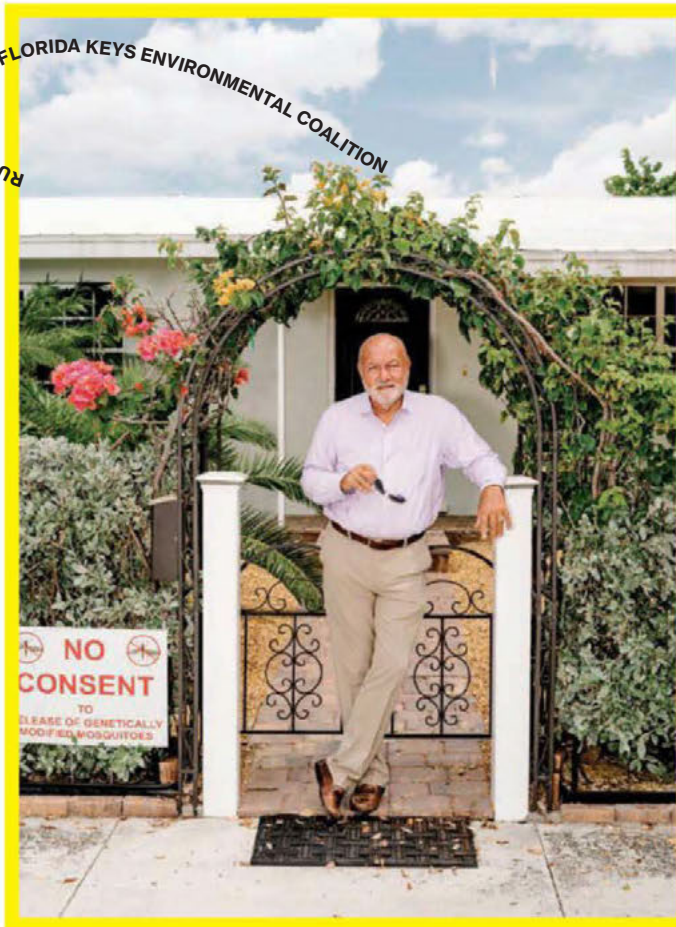
The Florida Keys Mosquito Control District (MCD) is run by a board of five commissioners—elected officials, not bureaucrats—and commands a \$10 million annual operating budget and 69 full-time employees. When there's trouble, the board can decide more or less unilaterally how to deal with it. In 2009, when *A. aegypti* brought dengue to the Keys for the first time in nearly eight decades, the board responded with an aggressive approach that saw workers go door to door to persuade residents to eliminate standing water and take other preventive measures. The disease subsided, but only after 88 people were infected. That was when the Mosquito Control District went searching for something that might be capable of wiping out *A. aegypti* completely. Enter Oxitec.

In 2011 the MCD announced that all of the city of Key West—its 25,000 citizens, its millions of visitors—would be subject to a trial of Oxitec's technology, overseen by the FDA. The MCD said the price tag would be less than \$10 per resident, and it expected to break even on the investment by requiring less aerial spraying against the mosquito. The Keys, however, have no shortage

of activists who know how to push back against government. Ed Russo is chairman of the Florida Keys Environmental Coalition, a group formed after the 2010 *Deepwater Horizon* oil spill. He's also worked as a business consultant to Donald Trump, and recently wrote a short e-book titled *Donald J. Trump: An Environmental Hero*. (Trump was the first donor to the coalition.) Russo's group was among those incensed that the MCD appeared to be fast-tracking the Oxitec experiment by having it overseen by the FDA, which would treat the GMO technology as an animal drug, rather than as a biopesticide, which might have required a complete environmental impact statement from the U.S. Environmental Protection Agency. "If you even want to take down one tree in a wetland, you need an EIS," Russo says. "And these clowns don't want to do an EIS? And we're considered anti-science?"

At a particularly heated community meeting with the MCD board in 2012, Russo asked a series of questions about Oxitec's protocols and whether the MCD was prepared for problems. Russo says the board had no answers for him that day, and no answers over the next two months. Then the MCD announced that, after consulting with the FDA, it had decided to move the venue for the experiment. Instead of Key West, the proposed trial would be conducted in Key Haven, a small community of 144 homes on a neighboring island. "That's when all the flags went up and the sirens wailed," Russo says. "Would you let your family take part in a scientific experiment without your informed consent in writing? If you're a prisoner in an institution in the United States, you are given that right."

Mila de Mier, a real estate agent in the Keys, started a Change.org petition to "say no to genetically modified mosquitoes in the Florida Keys," which eventually got 170,000 signatures from around the country. Activists worldwide offered support and expertise. It took de Mier years, and the threat of a lawsuit, to





THE RESISTANCE IN KEY HAVEN

get the MCD to say how many *A. aegypti* mosquitoes it estimated were in Key Haven. When she secured the data, earlier this year, it indicated that there were practically none—or at least not enough to call for traditional spraying methods. De Mier, who's emerged as a grass-roots leader of the resistance, says she realized that as successful as Oxitec's method was said to be, it had never faced serious public scrutiny before coming to the U.S. "I saw what they did in Brazil," she says. "They brought a truck around with a loudspeaker, and they made a song. 'God sent you the mosquito to heal you.' That was the public engagement." (Oxitec does use vehicles with loudspeakers in Brazil, but it also distributes more scientifically based information.)

As Oxitec prepared its full proposal to the FDA, the company released more details, and others started asking questions. Meagan Hull, a longtime resident, wondered why, if Oxitec's method was all about male GMO mosquitoes, did the company's data say it also let loose some females in its test—about 1 per 1,000 males? Did those females mate, and breed, and bite? Had anyone studied the long-term effects of that? Wouldn't some Keys residents almost certainly be bitten by a GMO mosquito? Even the males, some said, might create antibiotic resistance in the community, because all the mosquitoes Oxitec grows in its lab are doused during the larval stage with tetracycline, to bypass their kill switches and allow them to grow to adulthood. "The tetracycline's going to cause resistance," says John Norris, a local physician. "They care nothing about the fact that they are breeding resistant germs of no purpose." He's gotten more than a dozen local doctors to sign a letter objecting to the plan.

David Bethune, a computer programmer and artist, wondered why Oxitec seemed so sanguine about long-term effects. "We don't understand how the science works, but we do understand that when you put a genetically modified organism into the wild, there are going to be other consequences than just reducing the population," he says. Chief among them: What might take *A. aegypti*'s place in the ecosystem? Something stronger? "Just to say, 'We've got it all worked out' is really unnecessarily arrogant," Bethune says. "We're the little guinea pigs on an island that they thought of as Margaritaville. They thought that we would all be out having a cocktail and just not care?"

Then the Zika crisis emerged late last year, and the debate went off the rails. In January a Reddit thread, posted in a forum known for floating conspiracies, raised the possibility that it was Oxitec's testing in Brazil that had caused the birth defects public health officials were attributing to Zika. The anonymous author posited that some of Oxitec's GMO offspring do, in fact, survive and pass on their genes, blending with Zika to create a

megavirus that brought about microcephaly. The entire notion has been disproved—chiefly because the concentration of birth defects in Brazil is located 400 miles from Oxitec's test site, and the *A. aegypti* mosquito travels only a few hundred yards in its lifetime. But that hasn't kept some opponents in the Keys from revisiting the question, even now.

"It's these chemicals you're spraying that are causing microcephaly," one local environmental activist, Doug Hattendorf, said in September at a meeting in Key West, where town commissioners were deliberating over a proposed resolution supporting the Key Haven project. "There's no proof of Zika causing microcephaly, except what Oxitec says," he added.

"I have nothing against spraying whatsoever," said Judy Martinez, another neighbor, at the same meeting. "But I am against monkeying around with Mother Nature. They're going to kill us off, that's what's going to happen." The resolution was ultimately voted down.

The Florida Keys Environmental Coalition takes no official position on the Oxitec-Zika conspiracy theory. But Barry Wray, the group's executive director, is willing to keep the conversation going. "We're witnessing the results of the microcephaly question gradually evolve," he says. Wray is also happy to give oxygen to another roundly denied conspiracy theory—that the local government was won over by Oxitec in a less-than-above-board way. "There's some more nefarious things that have occurred and are occurring right now, and I'm not at liberty to talk about those right at the moment," he says.

Then he smiles. "I would say that if you don't consider all the spectrum of things you've experienced over your life, then you're not thinking broadly enough."

Derric Nimmo, Oxitec's head of public-health research, remains slightly baffled by the dissidents' claims. "I've done town hall meetings, done board meetings, gone door to door," he says; the exchanges are mostly cordial, but strained. "I've kind of turned into, rather by accident, a communication person for Oxitec in the Keys." It's not a natural fit for him. "I'm a scientist at heart. It's my background, you know, a Ph.D. My postdoc was all about molecular biology in insects. And so I've had to learn to try and—not dumb that down, that's the wrong word—to try to communicate that in a simple way that people can understand."

He moves through the criticisms as quickly as he can. Even if some females are released, he says, they will have the same kill switch gene the males have, and their offspring will die in the larval stage. If the females do end up biting anyone, it

would have the same impact as any ordinary mosquito bite; all the lab-bred mosquitoes are screened for disease before being released. The amount of tetracycline used on the mosquitoes is “extremely low,” he says, trivial next to what you’d find in, say, a typical pig farm. As for long-term impacts, the GMO mosquitoes never effectively reproduce, which means the entire system is closed. “Within six to eight weeks there’s no evidence of [Oxitec mosquitoes] in the wild at all,” he says.

During the 60-day public-comment period for the FDA’s review of Oxitec’s proposal, he says, “there were 2,700 comments, and the FDA, the CDC, and the EPA have looked at all of those, and they’ve said there’s nothing here scientifically valid that changes our minds.” Yet for years now he’s been forced into a rear-guard action.

The whole Reddit conspiracy theory drives Nimmo to distraction. “We’ve also had several articles from independent people, saying this is not true, but it does keep coming up, all the time. So we just have to keep answering it.”

The age of engineered biology is actually well under way,” declares Randal Kirk. The Intrexon CEO speaks a mile a minute, with a proselytizer’s zeal. “We’re not pure altruists,” he says. “We are running a business here. But believe it or not, we do a lot of thinking at Intrexon about how we might improve the world.”

Kirk, who has homes in San Francisco and Virginia but spends most of his time in West Palm Beach, Fla., sold his drug distribution company, General Injectables & Vaccines, in 1998 for \$65 million. He then started New River Pharmaceuticals, which was acquired by Shire for \$2.6 billion in 2007, and followed with Clinical Data, a genetic-testing company acquired by Forest Laboratories for \$1.2 billion in 2011. Around 2004, he invested \$300 million in Intrexon, which a molecular geneticist named Thomas Reed founded in 1998 as the human genome was being sequenced, to assemble a library of standardized DNA components—“hot rod parts,” as Kirk calls them—that could be used to make designer genes. Kirk took the company public in 2013. Before acquiring Oxitec last summer, Intrexon bought AquaBounty Technologies, which genetically modifies salmon to make them grow faster, and Okanagan Specialty Fruits, which makes apples that don’t turn brown.

No Intrexon company has successfully brought a product to market yet. And Intrexon’s gene-designing system, a technology known as UltraVector, has never been submitted to any peer-reviewed journal. One vocal critic of Intrexon, TheStreet’s Adam Feuerstein, has compared the company to Theranos in its lack of transparency and has called Kirk a “wheeler-dealer.” An industry analysis published in May by Spotlight Research characterized Kirk’s holdings as “an intricate web of micro cap, zero revenue, free cash flow negative companies that seem to exist for the sole purpose of inflating [Intrexon’s] revenue and profitability.” Kirk waves off all that. “Competitors and people who for whatever reason may not like us, they’re free to say whatever they wish,” he says. “I’ve always focused throughout my entire career on the creation of intrinsic value, and in order to do that, it’s not always possible for us to talk publicly about everything we’re doing.”

Instead, Kirk speaks more broadly and loftily about genetic modification—how it existed in the ecosystem long before Oxitec came along, most likely starting with the breeding of cereal grain in Mesopotamia, which led to the creation of seed and the portability of food. “Almost none of the things that we think of as natural are actually natural,” he says. “Cows, pigs, chickens, horses, strawberries, corn. We have been genetically engineering things both deliberately and accidentally for thousands of years, and we’ve been creating millions upon millions of mutations without any ability to document what they were.”

As for *A. aegypti*, Kirk argues, that particular species has prospered around the world only because “we have genetically modified it for decades through the use of pesticides. This is the most anthropophilic mosquito. In other words, it loves us. We’ve genetically evolved it to love us.” The Oxitec method, Kirk says, is an elegant way of undoing that work.

Kirk is on the opposite end of the political spectrum from some wealthy Keys activists like Russo. He’s raised \$785,000 over the years for Hillary Clinton’s running mate, Tim Kaine. (“He’s just a tremendous intellect,” Kirk says, recalling one dinner during which Kaine recited lines from Nabokov’s *Pale Fire*.) What he shares with Russo, however, is a certain doubt about the government’s ability to deal with Zika. “It’s a deplorable state of affairs I think today in Washington,” Kirk says. “I’m not talking about corruption. I’m talking about laziness.” He mentions the glacial efforts by politicians to form a common framework among agencies like the USDA, EPA, and FDA for addressing Zika.

That said, Kirk thinks Congress’s delay in addressing the \$1.9 billion Zika bill put forth by the White House may accidentally have served the public well. “When the president first proposed his spending, they didn’t talk about disease vector control at all,” he says. “Now even the president knows that disease vector control is very, very important.”

To which Russo answers: Anything that helps Oxitec test humans without their consent is part of the problem. “I didn’t know there was any connection between Oxitec and the Democratic Party,” he says. “But this never should have gotten this far. Government is failing at all levels.”

The swelling controversy in the Keys was enough to force two separate referendums on Nov. 8—one for Key Haven residents and one for all of Monroe County, which contains the Keys and a portion of the Everglades. The results won’t be binding, but three of the five Mosquito Control District commissioners have promised to honor the will of the people.

If the Keys scuttle the project, it may go against broader public opinion. A national survey released in February by Purdue University found that 78 percent of those surveyed supported using GMO mosquitoes to fight Zika. Last month a bipartisan group of 61 Florida state legislators issued a statement asking the FDA to use emergency powers to give them Oxitec right now. “What’s happened now is you have various mosquito districts saying, ‘Why can’t we use this technology?’” says Parry, Oxitec’s CEO. If the vote goes against Oxitec, “we would move the trial somewhere else,” he muses. “But obviously it would be more preferable and more convenient to do it where we planned to do it.”

Even if Oxitec is chased away, the idea of undermining *A. aegypti* at a genetic level will persist. More-sophisticated gene-editing techniques, such as Crispr/Cas9, have been developed, and new businesses will emerge to take advantage of them. The scientific community is largely unperturbed by the idea of removing the *A. aegypti* mosquito from the face of the earth. “The disappearance of a few species, while a pity, does not bring a whole ecosystem crashing down,” evolutionary biologist Olivia Judson has written. “Our current methods of mosquito control are crude and kill more than just mosquitoes. An extinction gene at least has the benefit of being precise and clean.”

In Grand Cayman, the government is moving forward. In a few years, *A. aegypti* might be eliminated from an entire island, the first time such a thing has happened. Maybe that will lead to something unexpected, or maybe it won’t. In the Keys, some would rather take their chances with Zika than risk the unknown. “We are setting a standard for the rest of the world,” de Mier says. “Today it’s a mosquito, tomorrow God only knows what is going to happen.” **E**

Patagonia: For climbing diving the Great Barrier saving the planet on a

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**THE OUTDOOR
APPAREL COMPANY
HAS STARTED SELLING
FOOD THAT'S HEALTHY
FOR THE ENVIRONMENT**

By Brad Wieners

g Everest, r Reef, and beer run



Yvon Chouinard, the short, bluff, fatalistic founder of Patagonia, the company renowned for its pricey parkas, fuzzy fleeces, and exhortations to buy fewer of them, sits in a cafeteria-style Chinese restaurant in Jackson, Wyo. He scratches a clam from its shell, forks it into his mouth, chews, checks the time. “Oh, we’re fine,” he says. Birgit Cameron, seated on his right, does her best to look reassured. A fairly recent addition to the Patagonia family, Cameron seems as eager to make a good impression this evening as Chouinard is indifferent to how he’s perceived. The two are expected in 10 minutes at the Center for the Arts in Jackson, where they’ll appear on stage together and introduce *Unbroken Ground*, a 26-minute film produced by Patagonia that highlights the suppliers of Patagonia Provisions, the three-year-old sister food company that Cameron heads. Depending on your level of cynicism, *Unbroken Ground* may strike you as a well-turned documentary about the ecologically enlightened suppliers behind the foods she sells, or perhaps as a slick marketing piece. Naturally, it’s both.

“It’s hard to get people fired up about how cotton is grown in Turkey,” Chouinard says, “but we’ve got to, because the way 99 percent of cotton is grown, it’s a disaster. And it’s the same with where most of our food comes from. So we use film, because a lot of these little guys we’re working with don’t have the resources to make a movie. We do.”

At 77, Chouinard long ago stepped back from Patagonia’s day-to-day operations, but he and his wife, Malinda (also present, but not to be quoted), remain the owners and stewards of the brand. They mostly split their time between here, where their home faces the Teton Range, and Ventura, Calif., where Patagonia’s headquarters and their children and grandkids are. Both published books in the last two months: Yvon, an updated edition of his memoir-cum-management treatise, *Let My People Go Surfing*; Malinda, with co-author Jennifer Ridgeway, *Family Business: Innovative On-Site Child Care Since 1983*, a monograph promoting kindergartens at corporate offices.

They’d explored selling food for years. The impulse wasn’t toward brand extension so much as applying to cuisine the things they’d learned from making the switch to organic cotton and torture-free goose down at Patagonia. Yvon, especially, always wanted to do something with tsampa, a roasted barley he’d found to be the perfect fuel on treks in Nepal and Tibet. But the food business didn’t get off the ground until their chief executive officer, Rose Marcario, recruited Cameron. The two established a startup in Sausalito, Calif., in 2012. A year later, smoked Alaskan salmon became Patagonia Provisions’ first product (\$12 for a 6-ounce portion). Since then, it’s added freeze-dried tsampa soups (\$6.50 each), fruit and nut bars (12 for \$24), buffalo jerky (\$10 for 2 ounces), and, in September, three low-sugar hot cereals (\$6.50 per serving). Mostly, they’ve sold these online, at Patagonia’s stores, and at REI, the outdoor retailer, but they’ve begun working with independent natural foods stores, too.

While the line seems intended for hikers and campers—haute trail food—the products were selected, Cameron says, because, as dry goods, they’re “shelf-stable,” and because each comes from a subcontractor that met Patagonia Provisions’ environmental and labor standards. “The first product was about saving wild salmon species—catching the salmon in the correct way so you can count how many are coming upriver, how many you can safely take,” she says. “So what we want to do in each case is make sure that we’re armed with enough information to make the right



decisions, and when we are, that really determines when we bring it out.”

Cameron, 52, has straight, blond hair and bright, alert eyes. She could pass for Swedish, but is in fact a German-Canadian émigré to Marin County. She’s dressed casually but nicely, with a new Patagonia down shirt over an organic cotton tee. Earlier, she caught three fish on a branch of the Snake River after Chouinard coached her on her fly cast. She’s clearly soaking up all she can during her time with the founders, but now, with a reporter along, she’s wary, too: What will Yvon blurt out next?

Chouinard, dressed in an old sweater, jeans, and Converse sneakers, has begun to resemble the raptors he trained as a teenager—fewer feathers at the temple, perhaps a little beakier in profile. A celebrated big-wall climber, mountaineer, and surfer, he has a laugh that evokes the sound one intends when responding “HA!” in a text. He can come off as a crank. He avoids computers, doesn’t do e-mail, and told the *New Yorker*’s Nick Paumgarten this summer that Apple, the most valuable public company going, makes toys. “The American empire, and globalization, which is a form of empire, is finished,” he says. “And, really, who cares? HA!”

On stage in Jackson, his despondency is less devil-may-care, more personal. “You know, I really thought that if we led by example, if we showed as a company that with a little more effort you could make a product that’s just as good but also takes better care of the environment, that others would follow. But it’s not happening.” He sighs. “I was naive, I guess.”

If there’s one stay against his pessimism, it’s “regenerative agriculture.” Like all buzzphrases, it’s subject to debate, frequently misapplied, and often uttered in an all-is-revealed tone, like “plastics” in *The Graduate*. A paradigm. Even so, what it refers to is profound. Conventional farming practices tend to entail reaping one annual crop, tilling the soil for next season’s harvest, and making extensive use of inputs—fertilizer, herbicides, pesticides—to boost yield. Regenerative agriculture emphasizes a diverse variety of crops, whether throughout the farm, in rotation, or even in the same field. It entails placing seeds amid the residue of previous plantings rather than tilling the soil, often

regenerative protocols. And those protocols return the soil to sufficient health that it pulls carbon out of the air and returns it to the ground. Well, now your sweater is part of the climate change solution. Not less bad, more good.”

“If we’re in a situation where there’s drought in a ton of places, and there’s a method that uses a ton less water, why wouldn’t you try that?” Cameron says. Because of drought, wind, and other erosion, the U.S. loses 1.7 billion tons of topsoil—valued at \$44 billion—annually, according to the federal Natural Resources Conservation Service. One study, from David Johnson, a molecular biologist at New Mexico State University’s Institute for Sustainable Agriculture Research, goes so far as to suggest that rehabilitated soil and undisturbed prairie alone can absorb enough carbon to neutralize the risks posed by global warming. That strikes many researchers as absurdly, even recklessly, optimistic. Others, such as Chris Field and Katharine Mach, at Stanford, insist that regenerative agriculture is nevertheless a valuable opportunity, because it’s a “win-win”—better soil, less carbon.

“This is why we’re working with Kernza,” Cameron says. “It’s a new food crop that acts like a sponge for carbon.” Kernza is a wild grain; it’s also a relatively recent registered trademark held by the Land Institute, a sustainable agriculture nonprofit in Salina, Kan. An intermediate wheatgrass, it has dense, deep roots—ideal for keeping soil in place and sending down nutrients and carbon. A perennial, it’s suited to organic, regenerative agriculture. But it still has a ways to go before it’s a viable competitor to annual wheat. Chouinard and Cameron figure that if Patagonia Provisions can create some demand for it, the crew of Ph.D.s at the Land Institute might eventually get it there.

Chouinard says he’s been giving money over the years to farmers to grow the stuff. “Last year we got about 80,000 pounds of usable grain,” he says. Patagonia Provisions had to determine that Kernza was generally recognized as safe (GRAS) under U.S. Food and Drug Administration regulations, so it kicked in the \$50,000 needed for research and testing to gain that designation. Kernza is tricky to store for milling, though. “So,” Chouinard says, “we made most of it into a beer.”

Another partner, Hopworks Urban Brewery in Portland, Ore.,

The label asks before you do: “What’s

adding perennials to the mix as buffers (which protect primary crops from erosion, contaminants, and other hazards) and cover crops (which are typically planted at the end of the season to suppress weeds and provide natural fertilizer). In turn, these techniques allow farmers to limit the use of inputs.

It’s even harder than it sounds, but a growing body of soil science and on-farm research shows that these techniques—especially not tilling the soil (hence, *Unbroken Ground*)—can generate competitive harvests while saving water and restoring topsoil. Restored soil is able to fix more nitrogen in place, so farmers can cut down on expensive nitrogen fertilizers and excess nitrogen doesn’t run off into rivers and create dead zones in bays. This soil retains higher concentrations of carbon, too, so CO₂ doesn’t rise in the atmosphere and trap heat there, frying the planet.

“Our mission statement includes that line ‘Cause no unnecessary harm,’ but there’s a limit to that,” says Rick Ridgeway, one of Chouinard’s oldest friends, who’s been with the company since the beginning. “You can reduce the footprint, but it is still a footprint. Making our jackets is harmful to the planet. There’s no way around it. But imagine if the product, that jacket or, more likely, a sweater, was made from a natural fiber—cotton or wool—that had been grown from animals that were grazed using

did the brewing, well enough that on Oct. 3, Patagonia Provisions Long Root Ale went on sale in 101 Whole Foods Market stores in California, Oregon, and Washington. As a note on the 16-ounce cans explains, it’s made with 15 percent “Kernza perennial grain”—the first large-scale product to include it. The self-aware label asks before you do: “What’s a clothing company know about beer?”

“I offer two versions of the tour, one that’s intended to generate more interest, and one that’s more to impress. Which’ll it be?” asks Wes Jackson as we navigate the main building of the Land Institute, which he co-founded in 1976. Before I can answer, he puts his hand on a door handle, and, just before turning it, says, “This really is the road to Damascus.”

The door opens on a set of descending stairs. On the opposite wall, from the rafters to the bottom of the stairwell, is a banner with a blown-up, laminated photo of two plants on a black background. On the left is a conventional red wheat plant; on the right, Kernza. The wheat’s roots run roughly a quarter to a third of the banner. The Kernza root ball extends three times as long, like a giant beard, to the bottom. “All the microbial life that’s vital to soil you can’t see, so it’s too abstract,” Jackson explains. “But when people see this—it’s immediate.” It’s also a lot less messy



Wild Sockeye Salmon, Original, 5 stars, patagoniaprovisions.com: "I had the pleasure of enjoying this salmon on the top of Upper Yosemite Falls with my girlfriend and an avocado."

than carrying around the root ball in his backpack, as he did for years when giving talks and raising money for his research. He even unspooled the mass of fine tendrils in a few airports and at least once in the aisle of an airplane. "Who told you about that?" he asks, laughing at the memory. "Well, it's true. It's not easy being an eccentric."

Jackson is a big fellow, but gets around well for 80, and he doesn't look like a radical. He wears a plaid button-down and reading glasses. His haircut is from 1966. His broad shoulders made him an effective guard for his championship college football team, "back when there were two coaches and we all played 60 minutes." He later coached track and field and football while finishing his graduate studies in botany and genetics. He secured tenure at California State at Sacramento in the early 1970s but took a year off to come back to Kansas. Then two events, one right after the other, changed the course of his life, leading him to stay on the prairie and co-found the Land Institute.

The first was a report from the U.S. Department of Agriculture showing that soils in the American heartland weren't substan-

"We have made a lot of progress, but there's a ways to go," says Lee DeHaan, the institute's chief Kernza breeder, when we're back inside. He lives on the property in a solar- and wood-heated home that he built. Through selective breeding, he's managed to triple the size of Kernza seeds, which are more slender and a fraction the size of typical wheat berries. He shows me to a table where a grad student tweezes the seeds into cartons for germination. Then DeHaan digs a hand into a bin of Kernza. "The nutritional profile is quite good. It's higher in protein than most wheat and lower in gluten strength," he says. The smaller size of Kernza and its cylindrical shape remain a problem. It doesn't work well with existing combines, for example, and it wasn't clear at first if it would gum up the machines used for Long Root Ale.

"We had a lot of questions going in about how it'd perform, like if it would clog our sieves," says Christian Ettinger, the founder and brewmaster of Hopworks. "Barley is more like a kernel, and wheat is elliptical, like a pellet," he says. "Kernza is more like wild rice." Happily for Long Root Ale, the Kernza became suspended in the barley mash and added a nutty spiciness to the hopped-up ale Hopworks wanted to create.

Most of the Kernza in the Long Root Ale is grown in a second location, at the University of Minnesota's campus in St. Paul, where Patagonia Provisions paid for 54 acres of production in 2014. Now about 125 acres are planted. It will be up to DeHaan and his peers in Minnesota to determine if Kernza is a novelty additive to products like Long Root Ale or something more. General Mills has begun testing it, too.

Even those skeptical of Kernza are interested to see what might come of it. "I welcome it, of course," says Miriam Horn, of the Environmental Defense Fund and author of *Rancher, Farmer, Fisherman: Conservation Heroes of the American Heartland*. Her one caution: "It's misleading to think that these smaller, experimental efforts are the only path." Horn mentions a farmer, Justin Knopf, whom she profiles in her book. He employs regenerative, no-till practices, working not far from the Land Institute. But

a clothing company know about beer?"

tially better than they'd been during the Dust Bowl. The second was a visit to native prairie in Salina—natural grassland that had suffered none of the degradation and erosion that nearby cropland had. That undisturbed prairie, he later wrote, ought to serve as our standard for future agricultural practices. Or, as he has also put it, "Most analysis of the problems in agriculture do not deal with problem of agriculture."

Jackson readily acknowledges that conventional agriculture, which has allowed us to feed billions more people in the last century, remains a remarkable achievement. The trouble, he says, is that it's not sustainable. "Soil is more valuable than oil—and just as nonrenewable."

We drive in an old pickup to a plot that has neat rows of Kernza. It's blistering hot, the first official day of autumn—the mercury will hit 97F, a record—and the monarch butterflies in the milkweed are about the only things that don't seem stunned by the heat. The Kernza plants look like they belong on a dune—short, dry shafts and a spray of pointy grass about 2 feet high. The institute also studies sorghum, sunflowers, and wheat, growing each in monoculture fields, in polycultures (with legumes), and in rotation—all in an effort to discover how to yield not only edible grain, but also richer soil.

his is no boutique operation. He cranks out massive amounts of hard red winter wheat on 4,500 acres. "Sustainability really can scale," Horn says.

"No one wants to be told what to do, and there certainly isn't only one right way forward," says Stephen Jones, a geneticist and director of the Bread Lab at Washington State University. At the lab, Jones has overseen the cultivation of a buckwheat that Patagonia Provisions uses in its soups. "In some ways we come at this in reverse to the Land Institute," he says. "They're domesticating a wild wheat, while we're trying to un-domesticate wheat." At the core, though, the goal is the same, he says: "More diversity, because our best defense against change is to have variation, and the best thing for growers is to have more options."

The offices for Patagonia Provisions are within a duplex on the Bridgeway, the two-lane road that winds along the shore of the San Francisco Bay in the tourist town of Sausalito, just over the Golden Gate Bridge from the city. Ventura, where Patagonia began and remains, is great for surfing, but it's a bit cut off from everything. Marcario and Cameron felt it was critical that Provisions be near the food-obsessed Bay Area. Chad Robertson, a celebrated baker and founder of Tartine, has baked with Kernza.



Karen Leibowitz and Anthony Myint, the owners of The Perennial restaurant, also in San Francisco, use Kernza in one of their most popular dishes, not to mention in their ice cream.

On a recent Wednesday, about a dozen people were in the office, and a spread of Provisions breakfast cereals was laid out on a table with fresh berries, Greek yogurt, nuts, seeds, and almonds. No one appeared to be older than 27, hung over, or unable to run straight up the steepest trail on nearby Mt. Tamalpais.

Listening to Cameron can be like reading a heavily footnoted mom blog crossed with a green-market flyer. Her desire to avoid extra sugar and salt in Provisions products stems from her search for healthier snacks for her kids. "And really," she asks, sounding for a moment as exasperated as Chouinard, "how hard is it to add a little honey or sugar yourself?"

Cameron's grandfather owned a coffee import company and dazzled her as a kid with his travels. Her father started a global import-export commodity food business in Toronto, which her brother now runs. She broke away from food initially, training as an architect and working as a designer for years, but she's relieved now to discover how much she learned about the food business listening to her parents at the dinner table.

Cameron appreciates that most attempts by companies to jump categories end badly. She doesn't let that bother her too much. Provisions has been set up as a separate company, but she says the parent brand and what it stands for give her a distinct advantage. Carl Jorgensen, director for global consumer strategy at retail consulting firm Daymon Worldwide, agrees. "It may be niche, but it has cred," says Jorgensen, who tracks grocery and organic food companies. "Energy bars and craft beers are incredibly crowded categories, but that's where the brand should help them." Annual sales of natural and organic foods are growing faster than those of the general food market by 20 percentage points, he adds, and other upscale brands such as Restoration Hardware are experimenting with food, too.

Because both Patagonia companies are private, Cameron doesn't have investors breathing down her neck. "We're not dealing with that kind of pressure," she says. "We can afford to be patient." Also because it's private, Patagonia Provisions doesn't publish financial data. Cameron says sales are meeting expectations, which is confirmed by Marcario, the parent brand's CEO. This summer, Provisions launched in Japan, its first market outside the U.S., and, Cameron says, the line has done so well that she's had to restock sooner than expected.

Having Marcario's support is arguably Cameron's greatest advantage. A gay, Buddhist alumna of General Magic, a legendary 1990s Silicon Valley company, Marcario is often sought for

"Soil is more valuable"

speeches and panels, though she professes to prefer doing the work of a chief executive to being on the conference circuit. She's gone native, wearing flip-flops to work in Ventura's open-plan executive suite. Inside Patagonia, she's renowned for her fiscal discipline—she was initially hired as chief financial officer in 2008.

"You really get behind the berm when you're the CFO. You see everything," Marcario says. She was surprised to find that, for such a beloved brand, Patagonia wasn't bigger. "Your company seems so small," she recalls telling Chouinard and the company's then-CEO, Casey Sheahan. It's less small now. Marcario and Doug Freeman, the chief operating officer, led a streamlining of the company's suppliers, processes, and inventory system, reducing 150 partners to 80 in 17 countries. Although Chouinard regularly blames growth for the planet's troubles, revenue has doubled since 2010, to \$800 million. Barring unforeseen catastrophes, Patagonia will become a billion-dollar company

Fruit + Almond Bars, 5 stars: "Happy tummy & conscious."



on Marcario's watch. "It's early yet," she says, "but I do think food could one day be even bigger than clothing for us."

One question that comes up frequently for Cameron: Who is Patagonia Provisions for? Are they making healthy food only for their apparel customers, those who can afford to drop \$299 on a "Patagucci" hoodie? "It's something we're thinking a lot about," Cameron says. She has no illusions that they're going to feed the world, "but our intention is to stimulate regional economies and to highlight practices that others can run with. Like with breadfruit." Breadfruit, she explains, is a staple food native to Hawaii (it tastes, as the name suggests, not unlike freshly baked bread). It was cleared out from the islands to make room for pineapple

more than the cattle ranch. The difference, Chouinard explains, is the way they graze. "Cattle stay in one place. They stomp the earth down, harden the hardpan so when it rains, it just runs off," he says. "The buffalo have got little sharp hoofs like deer do, and elk do, and animals that belong in those places. And they make little divots, and every time it rains, it holds in the divots and also it presses the grass down into those divots and makes compost. And you know, [the farmer] doesn't touch those animals. Doesn't have to go out and feed them during the winter, doesn't have to be there at birthing, sticking his arm in some cow's uterus to pull this thing out. Doesn't do any of that stuff."

Chouinard's passion for regenerative agriculture and

than oil—and just as nonrenewable"

and sugar cane—export cash crops. Hawaiians, Cameron says, only have from three days to two weeks of food if they were suddenly cut off. She's working on a project that could create a market for breadfruit. "So you help to bring back infrastructure that was there before," she says, "and promote self-sufficiency and potentially give a lot of young farmers a way to make a living." Just as Patagonia's main brand has sought out and supported environmental causes, she's hoping to fund activism around food insecurity. She touts the work of Oran Hesterman of the Fair Food Network, creator of the Double Up Food Bucks, a program active in several states that doubles the purchase power of food stamps at farmers markets.

Michael Besancon, a former global vice president for Whole Foods, is consulting with Patagonia Provisions. Over lunch at Fish, a sustainable seafood restaurant in Sausalito that's a magnet for foreign tourists, he listens carefully to Cameron's virtuous vision. It's not that he doesn't believe it. He does. But, he says, even if Cameron gets the science and the often maddening politics of food right, she has a more fundamental challenge: "Does it eat?"

During the Q&A following the screening of *Unbroken Ground*, Chouinard tells the crowd he doesn't think anything short of major social and political upheaval will keep the earth habitable. "It's going to take a revolution," he says. "And I want to be in my blacksmith shop sharpening the guillotines." At breakfast with Cameron the next morning, he's less hyperbolic but no less emphatic.

"The thing we're gonna run out of first is water," he says. "And the second one is topsoil." He cites John Jeavons, co-founder of Ecology Action, who warns we have maybe 30 more years of topsoil. "Let's say you just don't believe it. Double it to 60. It's still a scary fact."

We're seated in the Silver Dollar bar at The Wort, an Old West hotel in the center of Jackson that features framed photos of the gambling and other vices that once took place there. The bar closed eight hours ago, the tables are all cleared, and the only light is from the windows. The concierge offered us seating here, away from the dining room, so we could record our conversation. The bar is usually packed, so the quiet is striking. There are worse places, it must be said, to contemplate the end of the world. The mounted buffalo head in the lobby is a reminder, too, that much of what Patagonia Provisions proposes is meant to recapture the benefit of what was already here.

"We did a carbon sequestration study on the [O'Brian] buffalo ranch where we get our jerky, and he's got a fence. On one side are the bison, and on the other side they're raising cattle," Cameron says. The bison side, they found, sequesters nine tons per hectare

grazing was something he shared with his best friend, Doug Tompkins, who died on Dec. 8, 2015, after getting caught in a storm on Lago General Carrera, on the Chilean-Argentine border. Chouinard and Rick Ridgeway were on the water, too, but survived. Yvon still speaks of Doug in the present tense. "We're both doombats," he says. He allows that Tompkins, the founder of North Face, who sold his interest in his second company, Esprit Holdings, in 1990 to commit himself full time to wilderness conservation in South America, tried to persuade him to do the same. (On Sept. 25, Tompkins's widow, Kris McDivitt Tompkins, donated 2.2 million acres for a new national park in Argentina.) "Yeah, Doug would rag on me a lot about staying. He kept saying I should sell the business and do what he's doing. And I would argue, 'Look, what I'm trying to do is change the way people do business. I can do far more by showing by example.' Of course, that's when I was an idealist."

For a while, he was proud of the work his sustainability teams did with companies like Walmart. But, he says, "they took the low-hanging fruit, recycling plastic, converting their fleet over to natural gas. Things like that. They did everything that ends up making 'em more money. But when it comes down to doing the hard things, anything with a long-term payoff, they backed out." He stresses that it's not just Walmart. "All of these companies, whether it's Dannon or Unilever, they're all greenwashing. They start out making a big deal out of something and they back down. It's like Nike started out doing a little bit of organic cotton, like 1 percent. Now I don't know if they do any at all. The fashion industry, same thing."

All the same, he has high hopes for Provisions. It's considering shipping frozen portions of salmon. While there are no plans for Patagonia Pot, they're looking into hemp seeds. Chouinard has been urging Cameron to look into canned fish, and shellfish most of all. "That's my next thing," he says. "Eating the type of fish we should be eating, rather than sitting down to a tuna steak. Eating sea snails and squid, and sardines, anchovies, rather than making fish meal out of them and feeding 'em to pigs and chickens. Shellfish is the most responsible form of animal protein, because mussels and clams are just filter feeders. Put 'em in Chesapeake Bay, and they clean the bay and provide protein." Shellfish, he says, are a way we really can feed the world.

Before the plates can be cleared at The Wort, Chouinard says, to Cameron's horror, that Long Root Ale isn't for him. "All these India pale ales, they're all too overhopped," he grouses. For a moment, the West Coast style of IPA seems like the most ridiculous thing he's ever heard of. He'd prefer a hefeweizen—a wheat beer that uses more of the wheat-like Kernza. He'll have to wait. When saving mankind, it's sometimes necessary to first make a concession to popular taste. **B**

Tsampa Soup with Garden Veggies, 1 star: "The Nepalis don't load up their tsampa with salt."

OUT-UBERING

Uber





How **CHENG WEI,** *founder of China's*
DIDI, *drove the Americans* **OFF THE**

ROAD *in* **CHINA** *and* **LULU YILUN CHEN**

By

BRAD STONE

Photographs by

KA XIAOXI

At the BEIJING

offices of the ride-hailing startup Didi, many employees refer to Cheng Wei, the founder and chief executive officer, as *laoda*, or “big boss.” Others use his English nickname, Will. This summer the world came to know him by another designation: the Uber Slayer, the one entrepreneur who managed to beat back the relentless advance of the richest, most rapacious startup since Bill Gates ran Microsoft. In August, after a multibillion-dollar, year-and-a-half-long battle, Uber agreed to sell its business in China and depart the country.

It was a face-saving retreat for Uber, which got a 17.7 percent ownership stake in Didi and \$1 billion in cash. But it was a huge victory for Cheng. Eight weeks after the deal, on the fifth floor of the company’s headquarters, he’s careful to sound magnanimous toward his vanquished rival. “Uber is a great company,” he says. “They have the best strategy in China among all the Silicon Valley companies. They are more agile than Google. They aren’t like this in other parts of the world, but in China they’ve learned to show goodwill. They are not like a usual foreign company in China, but more like a startup, full of passion, feeling like they are fighting for themselves.”

The world is plenty familiar with Uber and the fighting spirit of its CEO, Travis Kalanick. But until August, Cheng was little known outside China, preferring to let the company’s English-speaking president, Jean Liu, a former Goldman Sachs managing director, serve as its public face. Under Cheng, Didi has expanded in just four years to 400 Chinese cities. The service lets users digitally hail and pay for taxis, private cars, limousines, and commuter buses. Cheng says 80 percent

of all taxi drivers in China now use Didi to find passengers. So many people use the app, it can be difficult to get a cab during rush hour without it. Investors recently valued Didi at \$35 billion, making it one of the most valuable private companies in the world. Uber, with operations in almost 500 cities on six continents, is worth \$68 billion.

In late September, during a rare interview, Cheng spoke to *Bloomberg Businessweek* about his journey from obscurity to China business hero. At 33, he’s cherubic and bespectacled—he wouldn’t look out of place in a video game parlor at 2 a.m. His spacious office in the north part of the city is furnished with business books and a desktop goldfish tank. On clear days, which are rare in Beijing, he can see the mountains in the northwest where the Chinese strengthened the Great Wall in the 15th century to protect against invasion from the Mongols. This seems apt.

“By the time we were actually about to launch the service, about 30 companies emerged at the same time,” he says. “There were different models. Some companies were much more powerful than us.

“It’s a long story,” he continues. “It had unexpected twists.”

Cheng was born in Jiangxi province, a landlocked region in eastern China famous for being the cradle of Mao Zedong’s Communist revolution. His father was a civil servant, his mother a mathematics teacher. He says he excelled at math in high school but during his college entrance exams neglected to turn over the last page of the test, leaving three questions blank. He got into the Beijing University of Chemical Technology, less prestigious than the upper-echelon schools. Cheng planned to major in information technology but was instead assigned by his university to business management. He worked during his senior year, as

Chinese students often do. His job: selling life insurance. He didn’t sell a single policy—not even to one of his teachers, who told him that “even my dog has insurance,” Cheng says. At a job fair, he applied for an opening as a manager’s assistant at a company billing itself as a “famous Chinese health-care company.” But when he showed up for work in Shanghai, luggage in hand, he discovered it was actually a chain of foot massage parlors. “That’s why we seldom advertise at Didi,” he says. “Because I think it’s all scams.” He’s not a fan of foot massages.

In 2005, out of school at 22, he got an entry-level job at Alibaba, the huge e-commerce company, by showing up at the front desk of its Shanghai office and asking for work. He landed in sales, earning 1,500 yuan, or \$225, a month. “I am very thankful toward Alibaba,” Cheng says. “Because someone stepped forward, didn’t shoo me away, and said, ‘Young people like you are what we want.’”

Despite his earlier insurance fiasco, Cheng proved to be good at selling online ads to merchants. He moved up the ranks and eventually reported to an outspoken executive named Wang Gang. When he first met Cheng, Wang says, his sales numbers were strong, but his real talent was emceeing customer events.

In 2011, Wang, unhappy about being passed over for a promotion, gathered Cheng and other underlings to brainstorm about startups. After they tossed around ideas about companies in education, restaurant reviews, even interior decorating, a foreign ride-hailing startup that was rapidly raising money and planning to spread around the world captured their attention. It wasn’t Uber; it was Hailo—a U.K. company that worked with London’s famous black cabs, driven by licensed hackney drivers. Cheng figured the Hailo model could be replicated in China, with its 2 million yellow-striped taxis. He left Alibaba in 2012;

“We felt like the People’s Liberation Army, with basic rifles, and we were bombed by airplanes and missiles.

They had some really advanced weapons”

so did Wang, who became Cheng's primary financial supporter, investing 800,000 yuan. (Wang's Didi shares are now worth \$1 billion, he estimates.) Aiming for a memorable name, Cheng came up with Didi Dache, or "honk honk taxi." The company recently rebranded itself as Didi Chuxing, or "honk honk commute."

Cheng and several ex-Alibaba colleagues initially set up shop in a shabby 100-square-meter warehouse space with a single conference room, in the northern part of the city. The team—they called each other classmates, just as they did at Alibaba—spent its first months trying to outmaneuver the dozens of other ride-hailing companies that had gotten the same idea at the same time. Cheng says he dispatched two of his first 10 employees to launch the service in Shenzhen, home to Foxconn's iPhone factories, because he thought the city had the most liberal regulatory attitude in China. Didi's service was promptly halted by local authorities.

But it turned out that Didi had a few advantages over the competition. Some were copying Uber's U.S. strategy of working with limousine and town car chauffeurs. But there are far fewer black cars than yellow cabs in China. When Yaoyao Taxi, a rival backed by Silicon Valley's Sequoia Capital, won an exclusive contract to recruit drivers at the Beijing airport, Didi classmates descended on the city's biggest railway station to promote their app. Instead of imitating competitors and giving away smartphones to drivers, an expensive proposition for a capital-strapped startup, they focused on providing their free app to younger drivers who already had phones and were likely to spread the word about Didi.

During an epic Beijing snowstorm late in 2012, when it was impossible to hail a cab on the street, residents turned to the app and the company surpassed 1,000 orders in a single day for the first time. That got the attention of a Beijing venture capital firm, which put in \$2 million, valuing Didi at \$10 million. "If it didn't snow that year, maybe Didi wouldn't be here today," Cheng says.

Then, some bad news: Alibaba invested in a rival ride-hailing company, Kuaidi Dache ("fast taxi"). Success for internet startups in China often depends on the strength of a company's connection to one of the Big Three—Alibaba, Tencent, or Baidu. Wang and Cheng turned to Tencent, the social network and video game maker based in Shenzhen.

With the backing of two rival Chinese internet giants, Didi and Kuaidi trained their sights on each other. During one notoriously difficult week, reverently known at Didi as "Seven Days, Seven Nights," both companies had intermittent technical problems, sending drivers and riders scurrying from one service to the other and back again. Cheng says engineers were holed up in Didi's cramped offices for so long and worked so hard to resolve their issues that a classmate had to have his contact lenses surgically removed.

Finally, Cheng called Pony Ma, the founder of Tencent, for help. Ma agreed to lend 50 engineers and a thousand servers, and invited Didi's team to work temporarily out of Tencent's more comfortable offices. But Didi wasn't making any money, and Cheng needed to raise capital. He visited the U.S. for the first time in November 2013, only to be rejected by multiple investors. "We had burned a lot of money," he says. "Investors were like, 'Whoa.'"

In early 2014, during the Lunar New Year, everything changed. Tencent ran a successful promotion over the holiday called Red Packet, which allowed WeChat users to send small financial gifts to friends and families, a Chinese custom, using their smartphone. It was a big success and led Tencent to an epiphany: Mobile payments were the future.

Tencent recognized that Didi could help increase mobile transactions and started to funnel capital into the company, which by then was allowing riders to pay drivers using WeChat's cashless payment service. Alibaba responded by pumping money into Kuaidi, which was integrated with its mobile payment service, AliPay. Together the companies spent about 2 billion yuan in discounts and subsidies to customers on the taxi-hailing apps over the first few months of 2014, according to Chinese media reports. Ridership soared. Li Hairu, an early Didi employee, recalls checking daily orders each night during those months—3 million! 3.1 million!—and yelling them across the office to her colleagues.

With Kalanick eyeing China as Uber's next big opportunity, Didi's and Kuaidi's investors eventually realized the two companies were going to bludgeon each other into oblivion. The Russian venture capitalist Yuri Milner, a Didi backer, shuttled between the headquarters of Alibaba and Tencent to help broker a deal. In February 2015 the companies merged. Didi, which had

DIDI *is*

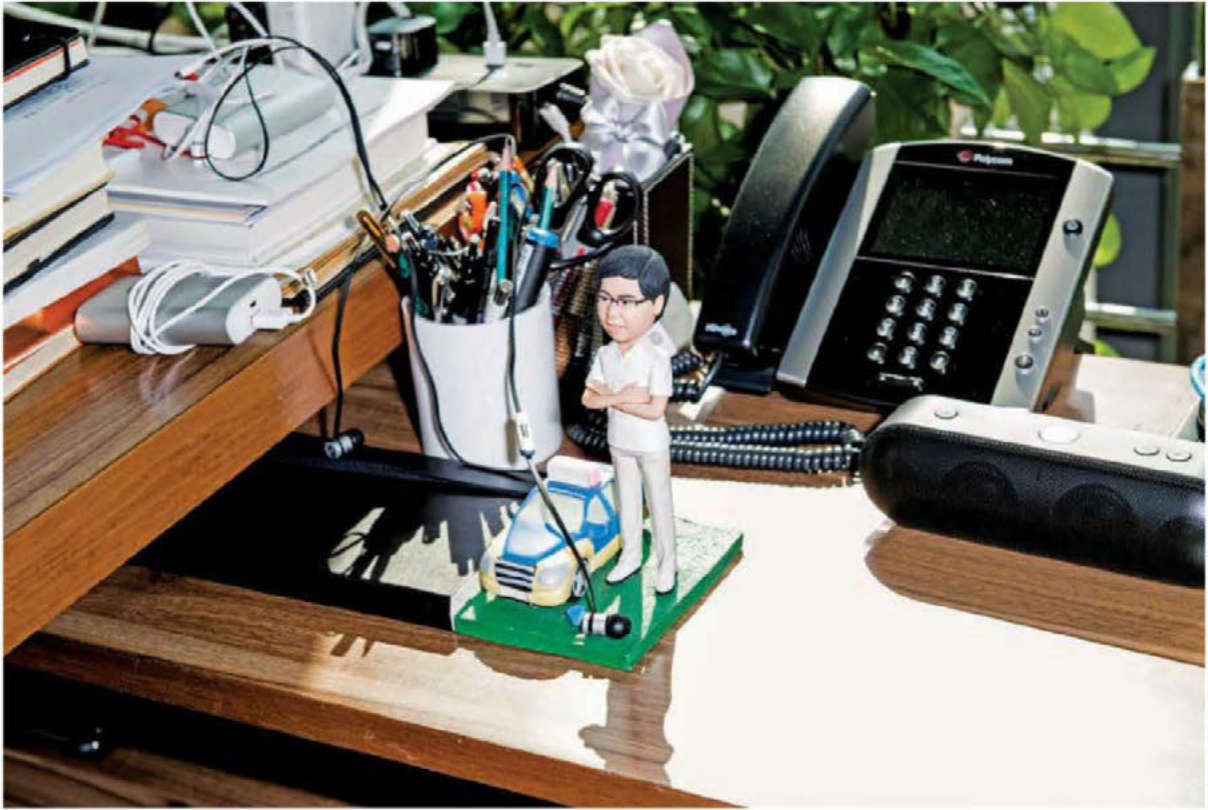
4 *years old,*

active in **400**

Chinese cities,

and worth

\$35 *billion*



Cheng's desk at Didi headquarters in Beijing

more ride volume than Kuaidi, ended up controlling 60 percent of the combined company. Cheng insisted on running it as a condition of the deal.

In late 2013, Kalanick and a team of Uber executives toured China to size up prospective partners and rivals. They visited Didi's offices. Cheng kicked things off by telling Kalanick, "You are my inspiration," after which the mood became tense. Emil Michael, Uber's senior vice president for business, remembers what may have been some psychological warfare: "They served us maybe the worst lunch I've ever eaten," he says. "We were all just poking at our food, wondering, Is this some kind of competitive tactic?" (It wasn't. Liu, Didi's president, later apologized to Michael for the food.)

At one point during the meeting, Cheng walked over to a whiteboard and drew two lines. Uber's line started in 2010 and went up sharply and to the right, depicting its rapidly rising ride volume. Didi's started two years later, in 2012, but had a steeper curve and

intersected Uber's line. Cheng said Didi would one day overtake Uber, because China's market was so much larger and many of its cities restrict the use and ownership of private cars as a way to manage traffic and pollution. "Travis just smiled," Cheng recalls.

Kalanick raised the possibility of Uber investing in Didi, but he demanded a 40 percent stake, Cheng says. "Why would I take it?" he replies, when asked if he considered the offer. Uber's executives were impressed. Kalanick, Michael says, "told me that among all the ride sharing founders, Cheng Wei was special. He was just a massive cut above anyone else in the industry." Uber and Didi were going to have to settle the matter in the market.

By the beginning of 2015 it seemed that Uber had an insurmountable advantage. It had a better app, powered by more stable technology. Investors valued it at \$42 billion, about 10 times Didi's valuation at the time. While Didi was consumed with its merger with Kuaidi, Uber was catching up: It controlled almost a third of the private car-hailing

market in China within a few months. "At that time we felt like the People's Liberation Army, with basic rifles, and we were bombed by airplanes and missiles," Cheng says. "They had some really advanced weapons."

Cheng is a student of military history, particularly such heroic events as the battle of Song Shan during World War II, when Chinese nationalist troops tunneled under a mountain to surround the invading Japanese army. Cheng held morning meetings with his senior staff, which he called the Wolf Totem. The name, based on a popular novel set during the Cultural Revolution about urban students sent to live in Inner Mongolia, connotes aggression. The Wolf Totem studied Didi's daily results and adjusted the amount of subsidies given to drivers and riders. Cheng would regularly warn employees, "If we fail we will die."

In May 2015, Cheng went on the offensive. Didi said it would give away 1 billion yuan in rides. Uber matched it. Cheng and his advisers searched for ways to fight the American company

“On the global market, we will also have competition.

We hope that this competition won't be as malicious”

on its home turf. Uber, they reasoned, was like an octopus—its tentacles were everywhere in the world, but its mantle was in the U.S. Wang, the early investor and former board member, suggested at a meeting that Didi “stab Uber right in its belly.”

Wang says Didi contemplated expanding into the U.S. Instead, in September 2015, it invested \$100 million in Uber's American rival, Lyft. According to Wang, it was less about undermining Uber than about gaining negotiating leverage. “The purpose of them grabbing a lock of our hair and us grabbing their beard isn't really to kill the other person,” he says. “Everyone is just trying to win a right to negotiate in the future.”

It was widely suggested in press accounts that the Chinese government helped Didi in its battle against Uber. Cheng rejects that, noting that as the largest ride-hailing company, Didi had to shoulder most of the regulatory burden and paid tens of millions of yuan to cover driver traffic citations and other fines. He also points out that state-connected companies such as Guangzhou Automobile Industry Group and China Life invested in either Uber or its China operations.

At the peak of hostilities, Didi and Uber were each burning through more than a billion dollars a year, giving unprofitable subsidies to drivers and riders. Both companies were desperate for new capital. Apple invested \$1 billion in Didi in May 2016. A month later, Uber raised \$3.5 billion from Saudi Arabia's Public Investment Fund. The message to both sides became clear: They were going to have to wage this destructive money-losing battle for a very long time.

Cheng says the initial call for peace came from Uber; Michael from Uber contends that the Saudi money forced Didi to the table—the investment suggested there was simply no end to the capital Uber could tap. Regardless, both sides agreed it was time to stop the blood-letting and focus on building their businesses. “It was like an arms race,” Cheng says. “Uber was fundraising, we were also fundraising. But in my heart I knew

our money needed to be put into a more valuable field. This was why we were able to join hands with Uber in the end.”

Michael and Liu hammered out the deal terms in two weeks and then met Kalanick and Cheng at a hotel bar in Beijing to raise glasses of *baijiu*, a traditional Chinese spirit made from sorghum. Over drinks, the CEOs spoke of mutual respect and their admiration at how hard both sides had competed. “We are the craziest companies of our times,” Cheng says. “But deep in our heart we are logical. We know this revolution is a technology revolution, and we are just witnessing the very beginning.” He genuinely seems to admire Kalanick—to a point. “His alcohol tolerance is just so-so,” Cheng says, smiling.

Didi now has about 5,000 employees, about a quarter of them in a collection of prefabricated five-story buildings on the periphery of Beijing's Zhongguancun technology district. IBM and Lenovo have campuses nearby. Adorning the walls are pictures of a smiling cartoon taxicab, the company's mascot. In the main building, a slide no one seems to use connects the fourth and fifth floors. Legions of young engineers hunker over their PC screens. One engineer wears an Uber T-shirt. “Surreal,” says a PR person, who still can't get over seeing the former enemy's logo on Didi property.

Uber and Didi each have one seat on each other's board—without voting rights—and, Cheng says, “will also learn from each other.” The deal hasn't closed yet; China's Commerce Ministry is still examining the merger. But Chinese legal experts say the odds are slim that the antitrust agency will nix such a high-profile deal involving a well-connected national corporate champion. There are no restrictions on the two companies competing with each other in other countries. “On the global market, we will also have competition,” Cheng says. “We hope that this competition won't be as malicious.”


The steep discounts of the past two years have come to an end, which means

fares are going up and payouts to drivers are going down as the company attempts to become profitable and establish favorable numbers for an initial public offering. “The industry is slowly getting into a more rational state,” Cheng says.

Drivers and riders in Beijing have noticed, and their complaints mirror the grumbling about ride hailing in other parts of the world. The private cars “are more expensive to use than a taxi now,” says Christina Chen, an internet company employee who was taking a crowded Uber carpool in Beijing, with three other passengers, in late September.

Her driver, Sun Can, worked in construction before driving but says these days, with fewer special bonuses and incentives for drivers, he often prefers to just stay at home. “Who wants to be on the road when you are not making money?” he asks.

Cheng is already thinking about replacing his drivers. Didi is hunting in Silicon Valley for data scientists to develop a self-driving car, which will put it in competition with companies such as Google, Baidu, Tesla, General Motors, and, of course, Uber. He's also held conversations with Gansha Wu, the former director of Intel Labs in China and founder of a Beijing-based driverless car startup called UiSee Technology, which is developing road-scanning systems for autonomous cars. “We share the same vision that driverless cars can do wonderful things for society,” Wu says.

For Cheng, this is what constitutes peacetime. The Wolf Totem is no more. He and his wife of four years are expecting a baby, their first. And that chart he drew a few years ago for Kalanick? Cheng says that when the total amount of money spent on rides on Didi and Uber China is combined, it will exceed the total spent on Uber rides around the world. The prediction he made to Kalanick has come true, and he believes it's a turning point for his country: “This means China will become the leading country in the world for the sharing economy.” 

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THE ART OF KILLING
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8 HOT COFFEE MAKERS

SEXUAL
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ENTERTAINMENT WEEKLY

TODD SNYDER
WANTS TO REMIND
YOU THAT FASHION
DOESN'T HAVE
TO BE SO FICKLE

BY
MAX BERLINGER
PHOTOS BY
LAUREL GOLIO

MODERN
CLASSIC



This is the most nerve-wracking part,” Todd Snyder whispers. The menswear designer is at his showroom in New York’s Garment District—a handsome space with dove-gray walls, an industrial wood table, and shelves stacked with hefty art books—while a buyer from Barneys Japan looks at Snyder’s upcoming collection, deciding what, if anything, his store will carry next season. So far, only a few pieces hang on the “yes” rack.

Although he’s trying to look relaxed, Snyder is keeping a close eye on the proceedings. Typically, designers don’t help sell their collection; they’re too emotionally invested, too busy, or too concerned with appearing either way. But Barneys is an important store, and he’d like it to have a more robust offering than the graphic tees the buyer, a hip-looking man named Mitsuo Nakahashi, has shown interest in so far. Two employees are there guiding Nakahashi through the collection, but Snyder interrupts with suggestions, pulling a button-up shirt and a

pair of utility shorts and placing them on the rack himself. “Is this everything? It feels like we’re really short,” he says, looking for a white polo shirt with blue-tipped sleeves that appears to have gone missing. Slowly, the rack begins to fill up. “You have to slow them down and show them things,” the designer explains later. “It’s easy for everyone to skim, but you have to be a merchant.”

Lately, Snyder has been very good at selling himself and his eponymous brand, becoming one of American retail’s few promising stories. American Eagle Outfitters acquired the label last year for \$11 million in cash and stock, which Snyder has already used, in part, to hire a director of merchandising for his first permanent brick-and-mortar location in the U.S., a 4,500-square-foot store near Manhattan’s Flatiron District, which is set to open this month. It’s a flag in the ground at a time when older companies are struggling to keep their flying high. Sales are faltering at Ralph Lauren; Calvin Klein dismissed its design team earlier this year to make way for a new creative director, Raf Simons; and Donna Karan stepped down as chief executive officer of her label last year. “It’s a new generation,” Snyder acknowledges. “It’s shifted.”

Snyder’s generation has different ideas about what it means to run a fashion label. Gone are the days of personality-driven megabrands with a core fashion business and spinoffs into a million licenses for products such as sunglasses, perfumes, and underwear. In 2016 you need a less hubristic mission, and it seems as if Snyder’s is to sell you a perfectly proportioned field jacket. In a fashion universe where drop-crotch pants and \$400 sneakers are everywhere, something as simple as that might just cut through the noise.

Snyder, 48, has wanted to be a designer for as long as he’s known it’s a thing you

Snyder in his Manhattan showroom



“THERE’S A SEGMENT OF THE POPULATION THAT DOESN’T WANT TO BUY FROM MEN’S WEARHOUSE BUT DOESN’T WANT TO PAY \$400 FOR A SHIRT—THAT’S INSANE”

WHAT A 'REAL' GUY WEARS

Todd Snyder's namesake collection is full of pieces that look good, simply



Infantry cargo pants
\$245

Button-down collar shirt
\$158



Suede snap-front Dylan jacket
\$995



Double-breasted officer coat
\$898



could be. "I read Ralph [Lauren]'s book in the '80s," he says. "When I discovered that you could be a fashion designer, I thought, Holy shit, that's cool!" By the time he started his namesake label in 2011, Snyder had 20 years of experience working for big brands such as Ralph Lauren, the Gap, and J.Crew, where he was director of menswear. It was his sensibility behind the Ludlow suit, which brought tailoring to the masses, and along with J.Crew CEO Mickey Drexler, he opened the Liquor Store, a concept-driven, multibrand boutique in Tribeca, which has cast a long shadow over the men's retail landscape. Anytime you enter a clothing shop filled with dark wood furniture, antiqued accents, and filament lightbulbs, you have Snyder to thank.

Whereas some designers produce a pair of ironically pleated, wide-legged trousers to channel the zeitgeist, Snyder's aesthetic begins with the slim-cut suit: its classic style, its precise tailoring, its easy elegance. He likes designing suits and outerwear most because they're technically difficult but so rewarding when done right. He's less trend-driven than Club Monaco or J.Crew but more approachable than, say, Ermenegildo Zegna. A native Iowan, Snyder approaches design with some humility, characterized by sophisticated basics such as slimmed-down cargo pants in dark wool (\$278) and an officer coat made from double-faced camel hair, with big black buttons (\$898). Save for a few shearling pieces, outerwear mostly comes in at less than \$1,000, and he's introducing a \$595 suit this fall. "I want to sell product," he says. "I don't want to be boring, but at the same time I don't want to shock the customer. There's a segment of the population that doesn't want to buy from Men's Wearhouse but doesn't want to pay \$400 for a shirt—that's insane."

Snyder's label found immediate support in the fashion industry. He's been named one of *GQ*'s Best New Menswear Designers in America, nominated for Menswear Designer of the Year by the Council of Fashion Designers of America, and a finalist in the prestigious CFDA/*Vogue* Fashion Fund competition. More important, stores wanted to carry the line. "It resonated with me from the very start," says Kevin Harter, vice president for men's fashion direction at Bloomingdale's. "I actually thought there was a need for those basics and something designed for... I don't want to say the 'real' guy. For the guy that appreciated fashion but doesn't need to make a

huge statement about it. He has his pulse on how guys want to look. He's definitely the Next Big Thing." Snyder's line also resonated for Chad Kessler, American Eagle's global brand president. "I was immediately struck by his taste level and his updated, modern take of American style," he says. "He launched at a time when there was a renewed interest in American sportswear, and Todd was a real standout."

In addition to the Todd Snyder label, American Eagle acquired Tailgate, a casual T-shirt line Snyder began with his brother in 1997. "We literally started it in my dad's basement," Snyder recalls. The idea was to do a brand oriented to high school and college students—American Eagle's core constituency—that made use of the fine fabrics and construction techniques he was then learning at Ralph Lauren. Although the line did well, it didn't do well enough for Snyder to support himself, so he left the business for his brother to manage at home. For American Eagle, though, it was a huge boon. "We wanted to see if we could leverage jeans and T-shirts with the AE customer, and leverage not only his own line but his design expertise across the AE business," Kessler says. Snyder himself has been advising the company and acting as a sounding board, helping with merchandising and marketing. He introduced American Eagle to the agency that released the brand's latest ad, which featured social media influencers and the inspirational hashtag #WeAllCan. ("I can create my future... #WeAllCan.")

Snyder's next big push is the Manhattan flagship. "You can't open up a store in New York City just to open one up," he says. "It's going to be a different experience. I want to make it so that guys will want to come and hang out." He's going for a slightly cleaner aesthetic than that of the Liquor Store, whose once trend-defining richness now feels passé. That said, there will be an in-house tailor, a barbershop, and a bar. The space will house Snyder's line, plus items from his collaborations with Champion, Cole Haan, and Timex, to name a few, and complementary brands such as Red Wing boots and Drake's ties.

So far, he's managed to retain a certain Midwestern charm—"I'm still kinda the same guy from Iowa. I'm still just working hard"—but a bit of the weary city boy peeks through from time to time. "You have a gut feeling about something selling, and it's just a guess," he says. "You do your best work, and then you hope it sells. When it does, it's exciting. It makes you feel OK." **B**

“We have a fairly large space, and the Razor kick scooter is a great way to travel to and from the bathroom and other places.

When I get bored, I’ll race down the hallway. I’ll sometimes ask my employees to time me. I can usually go the length of the hallway in under five seconds.”

Sébastien Dupéré

co-founder and chief executive officer, Dupray steam cleaners

How Do You Waste Time at Work?

Six people perfecting the art of procrastination

By Katie Morell



“I found a cool app that allows me to play Risk.

A few team members were intrigued, so I loaded up a replay of my most recent game on our big screen, and we all watched, turn by turn. Everyone was so into it that we started commenting on each move, like at a sporting event. We did this for 90 minutes before we felt inspired to work.”

Terence Channon

managing director, startup studio SaltMines Group

“I start my day feeling anxious that I haven’t completed, or even started, my clients’ work.

I make a list. After that, I make a sublist. Finally, I start doing research for my first list and add more items to it. At that point, I usually have an ‘Oh, crap’ moment when I realize that I’ve done nothing other than make lists.”

Sia Mohajer

founder, brand consulting firm Market Monkey

“I search for luxury pillows on Amazon. I have been searching for the perfect pillow for five years. My cart has over 200 in there, but I haven’t purchased one yet.”

Brian Cherhoniak

co-founder, personal-finance blog Beating Break-Even

“It’s not uncommon for me to take baths.

I will take a procrastination bath at least twice per week and up to three per day if I feel overwhelmed. I’ll spend a minimum of 20 minutes in the bath and a max of over an hour. Baths feel like a free spa retreat for my body and an energy drink for my mind. Afterward I always feel rejuvenated.”

Misti Cain

founder, online advice platform Whyzze

“I work from home, so I sing. I’m a classically trained soprano, and I’ll belt out arias from Puccini or Mozart. One day I was singing the intro to *Beauty and the Beast* and heard a male voice join in. I lived alone, so it startled me. Turns out a worker was cleaning my building’s windows. He knew the tune.”

Natalie Bidnick Andreas

digital marketing consultant

SEX ON TAP

Emily Witt went to San Francisco to see if internet culture had ruined love. By Miranda Purves

In a world of too much stuff, too many images, and too many opinions, it's a compliment to call *Future Sex* (Farrar, Straus and Giroux, \$25), culture reporter Emily Witt's first book, useful. Because Witt is beautiful and writing about sex in the internet age, she's gotten media attention. But she's bristled at calling her work a memoir. Although being single at 30 led her to her topic, Witt travels beyond her own psychic distress and into a journalistic tour of 21st century mating. The result serves as a new economics of sex or, equally, an economics of new sex.

Witt, now 35, is at the tail end of Generation X, which believes its role is to reject what the boomers stood for—including post-pill free love—because that ended in divorce and neglected children. However, instead of the loyalty, procreation, and helicopter parenting she thought would be her demographic destiny, “another kind of freedom had arrived: a blinking cursor in empty space.”

She's referring, of course, to the screens that mediate our interactions and the freedom our devices give us to load porn in .001 seconds or tell us if someone within 5 miles is available for a one-night stand. We're assured “of the presence of the like-minded: No one need be alone with her aberrant desires and no desires were aberrant.”

This is new territory. Suspecting that it has to do with her purgatorial state—rejecting and being rejected on aimless dates arranged online, for example—she heads to San Francisco, home to the inventors of the modern internet and social media, to try to give shape to the murky sense that the rules guiding men, women, and society are in flux.

There she navigates the intersection of the tech revolution and experimental

California living. She talks to women who've learned to like sex in a way they hadn't expected via apps such as Tinder. She gets to know gender-fluid Googlers in open marriages that are sustained by complex “OK/not OK” agreements and orgies. She accepts an invitation to Thunderwear IV, a nitrous-oxide-powered event that a polyamorous programmer couple throw. At Burning Man—“rich people on vacation breaking rules that everyone else would suffer for if they didn't obey”—she sleeps with a guy in leather shorts she calls Lunar Fox. She attends seminars at One Touch, a business/cult that teaches orgasmic meditation;

investigates alt-porn studio Kink .com, where female directors experiment with harrowing levels of abjection; and meets Max and Harper, webcam stars who stepped off the corporate treadmill to film themselves having sex in 50 states. Their fans bailed them out when they wound up broke in Mexico.

Witt's survey isn't systematic or scientific. But read together, the chapters form an interpretive crazy quilt over the bed that floats between the virtual and real worlds. She doesn't finish her trip cured of a desire for monogamy, but her faith in its assumed superiority is shaken. The next generation, she hopes, will “meld their bodies seamlessly with their machines without our embarrassment, without our notions of authenticity.”

She ends on a smart swerve, lamenting that contraception is stalled miles behind current sexual mores while fertility treatments have progressed miles ahead of civic safety nets: “The futuristic, at this point in history, is thinking about how best to make babies and support children without marriage and the nuclear family.” We await a phone that can also breast-feed. **B**

TINDER, ORGIES, ALT-PORN, AND ORGASMIC MEDITATION

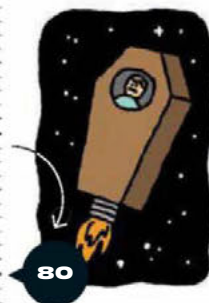
Critical Mass

A random ranking of recent bad behavior

Most Worst

SUICIDE MISSION TO MARS

Elon Musk, who plans to launch an unmanned craft to Mars in 2018 and transport people after that (at \$200,000 a head), says, “The probability of death is quite high on the first mission,” though that likely won't wind up in the brochure.



SNEAK PEEK

Snapchat will sell “surveillance specs,” glasses that record video and automatically upload it to the app. Execs must have seen how successful Google Glass was and thought, Clearly, this is a good idea.



THE BEST PART OF WAKING UP

Laboratory testing by the U.S. Food and Drug Administration discovered that an ingredient in Stiff Bull herbal coffee is close to what's in Viagra. Seek immediate medical help if you experience a caffeine buzz lasting more than four hours.



SCARY RESEMBLANCE

Home Depot removed the Scary Peeper Creeper Halloween window decoration from Canadian stores, in part because of complaints it promoted voyeurism. It was still selling in the U.S. as of late September, perhaps because Americans are used to being spied on.



Least Worst

Morning Glory

These coffee makers brew a great cup and look good doing it
By Monica Khemsurov

French press

The typical French press uses a glass beaker, which loses heat quickly. Stoneware and ceramic help keep your coffee at a cozy temperature.

72

MANUAL COFFEE MAKER NO. 1 BY CREIGHTON BERMAN

\$99; manual.is

A coffee maker for Luddites that's less machinelike than sculptural. Go ahead, leave it out on the counter.

BREWER STAND SET BY KINTO

\$188; trnk-nyc.com

The stand is made of walnut and brass, and it adjusts so you can brew into the glass carafe or any mug.

PUSH COFFEE MAKER BY MEETE DUEDAHL FOR MUUTO

\$149; lumens.com

All the plunger action—which includes the sludgy, mucky-looking grounds—are concealed behind a creamy stoneware facade.

ROK MANUAL ESPRESSO MAKER

\$199; trnk-nyc.com

Learning to operate the die-cast aluminum levers takes a little practice, but once you get it right, it's an impressive trick.

OTTOMATIC COFFEE MAKER BY CHEMEX

\$350; chemexcoffeemaker.com

The classic Chemex is part of the Museum of Modern Art's permanent design collection, so you don't want to mess it up with ugly accessories. This simple drip arm gets the job done with maximum precision and minimum fuss.

Pour-over

The manual method gives you the most control over brew time and temperature, but it's labor-intensive. If you love the taste but hate the work, specially calibrated automatic drippers can make a convincing approximation.

BREW CAFETIERE BY TOM DIXON

\$210; aplusrstore.com

Part of a matching set (tray, milk carafe, sugar bowl, espresso cups) in the same copper finish and art deco styling.

COLD BRUER BY BRUER

\$80; aplusrstore.com

An appealingly neat contraption, with its brightly colored valves and floating grounds chamber. The whole top section lifts out, leaving behind a sleek, modern pitcher for serving.

Cold brew

Ice and water drip slowly from the top chamber through the grounds and into the vessel below. This one features an adjustable valve so you can experiment with brew time, though Bruer recommends one drip per second, or six hours total.

850ML CERAMIC FRENCH PRESS BY YIELD

\$120; yielddesign.com

Made of food-safe ceramic, with a trendy copper pull, this stylish coffee maker is for sleep-deprived workers at hip startups.

CHUCK'S NEW CHEDDAR

A card payment system at Chuck E. Cheese's might cause fluctuation in the token-collector market

By Mary Pilon

Chuck E. Cheese's—the pizzeria-slash-video-game-arcade that bills itself as the place “where a kid can be a kid”—has been making some changes of late aimed at appealing to millennial moms and dads. Thin-crust and gluten-free pizza have been added to the menu, along with wraps and an expanded beer and wine selection. Some locations have free Wi-Fi. Chuck himself, the chain's guitar-playing mascot, has even grown up a little, exchanging his skater look for a pair of well-fitted jeans.

Its most sweeping change is yet on the horizon: After 39 years, it's phasing out tokens in favor of rewards cards. Christelle Dupont, a

spokeswoman for the restaurant's parent company, CEC Entertainment, says the cards “will be easier for everyone.” Easier, of course, for Chuck E. Cheese's to collect data on customers' gaming habits and easier for gamers to track their scores and recover points if they lose their cards. Don't worry: Dupont says the raffle-style tickets the basketball arcade games spit out—the ones you need to claim stuffed animals and other prizes—aren't going anywhere.

The company's decision could roil the Chuck E. Cheese's currency market—which, yes, is a thing. Collecting arcade tokens is a “relatively new phenomenon,” says Rich Hartzog, who runs World Exonumia, an online marketplace and information resource

for collectors of exonumia, or nonmoney money such as casino chips. A wave of nostalgia has powered pop culture in recent years, and because Chuck E. Cheese's is one of the biggest and oldest arcade chains operating in the U.S., its tokens dominate the ersatz coin trade.

For collectors, the influx of new tokens could cause the low end of the market to collapse. Billions of Chuck E. Cheese's tokens have been distributed over the years. At least 75 million more are about to become collectors' items, estimating conservatively, as the company says each of its 598 stores has about 125,000 on hand, with some of the larger locations carrying as many as 160,000. “The common bulk tokens will decrease greatly in value,” Hartzog says. “It isn't the normal supply-vs.-demand situation, as the collectible Chuck E. Cheese tokens are already the obsolete ones,” and now there will just be more obsolete tokens. (For dedicated Skee ballers who buy bulk tokens to shave a few cents off the price per game, doing so is still a value proposition; each token will be transferable to the cards at face value, 25¢.)

Rarer tokens such as the ones imprinted with the location of the restaurant they were destined for—standard practice until 1982—or with an image of Chuck or the tokens' original motto, “In Pizza We Trust,” can go for about \$25 and are unlikely to diminish in value. Those printed with the chain's original name, Pizza Time Theatre, are

even more valuable. There's also the famous set of tokens created for a store in Santa Ana, Calif., in the late 1970s that arrived defective and had to be sent back to the company mint in Cincinnati: The location never opened, and only nine coins were spared from the melting pot. Hartzog says those can go for \$1,000 each.

Matt Rivera, the in-house currency historian at CEC Entertainment, has a personal collection of 4,000 tokens that's worth about \$1,000—essentially face value. “I'm a huge Chuck E. Cheese fan,” he says. “It's like baseball cards; it's a hobby.” Fortunately for Rivera, he also works in customer service, so it's not just a hobby—it's still a job. **E**



These tokens will soon be collectors' items

His latest book, *Guy Fieri Family Food* (HarperCollins, \$29.99), comes out on Oct. 11

What I Wear to Work

Etc.

GUY FIERI

48, TV host, restaurateur, chef, Santa Rosa, Calif.

JOHN HARDY

ROOM 101

KNUCKLE SANDWICH

DLC JEWELRY

What's Knuckle Sandwich?

When I started at Food Network, I formed an LLC to handle my business affairs. I was hanging out with buddies, trying to come up with a name. There were one too many jokes made, and someone said, "Say that again, and you get a knuckle sandwich." That was it.

You're dressed differently than you are on TV! I've got nice dress shirts that I'll wear for my shows or if I'm going out with my wife, but otherwise it's a T-shirt and jeans.

Are those collard greens? That's the chard. The garden is all organic. We have herbs, kale, peppers, carrots, onions, and artichokes.

SURVIVAL STRAP

DLC JEWELRY

Why aren't these sunglasses on the back of your head? That's your trademark. People think I was trying to make this fashion statement. That's purely fashion as function: If I hook them on my shirt, they'll bang the mic when I'm filming. If I set them down, I'll lose them.

I have to ask about the hair. One day, I said to the girl who did my hair, "You do what you want to do," and that's what she did. It wasn't made for TV.

BULLBOXER

Is that a championship ring on your pinky finger? No, but my littlest guy says it looks like that. It's a ring a buddy of mine made for me, modeled off one I saw Hank Williams Jr. wear.

DIESEL

You bleach a bit of your goatee, too. No, I happen to have a naturally blond goatee. I'm kidding!

That looks like a fabric bracelet. In an emergency, it can be unwound, and you can make a tourniquet out of it.

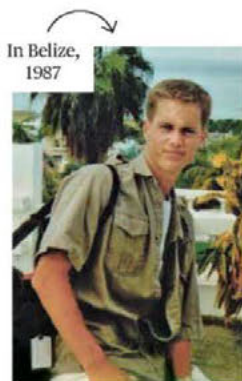


KEVIN HARTZ

Partner, Founders Fund



“Senior year I forged a letter from the principal saying that the school would be closed because of asbestos. I got suspended the last five days, which was one of the most wonderful things to ever happen. People said the letter was too well-written to be from the administration.”



“I worked in a neurology research lab where I got exposed to the internet and programming. It was love at first sight.”

Education

- Miramonte High School, Orinda, Calif., class of 1988
- Stanford, class of 1992
- University of Oxford, class of 1993

“I got to know the PayPal mafia: Peter Thiel, Keith Rabois, David Sacks. I was their token liberal friend.”



With YouTube co-founder Jawed Karim (center) and Rabois, 2009

Work Experience

- 1994–95**
Research assistant, Smith-Kettlewell Eye Research Institute
- 1995–97**
Product manager, Silicon Graphics
- 1998–99**
Co-founder, Connect Group
- 1998–Present**
Angel investor
- 1999–2001**
Principal, Outlook Ventures
- 2001–05**
Co-founder and chief executive officer, Xoom
- 2005–16**
Co-founder and CEO, Eventbrite
- 2016–Present**
Partner, Founders Fund

“I was product manager for a 3D web browser—you would surf through immersive spaces. It was way ahead of its time. Alan Braverman, who I started Xoom with in 2001, was an engineer there.”

“I invested in Fieldlink, which became PayPal and took off just when everything was melting down in 2001.”



“Ticketing was the last bastion of commerce characterized by high fees, poor customer service, and a lack of innovation. My wife is a co-founder—we had our first child at the same time we hired our first employee. She’s now the CEO.”

“I reunited with Alan and started an international money transfer company, but I was asked to step down [as CEO]. I was crushed by that. People I trusted advised me to move on to something new. I sat on the board until 2015: We sent \$6.5 billion to 30 countries in 2014.”



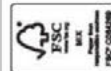
Hartz with his wife, Julia, his daughter, and Eventbrite staff, 2010



Life Lessons

“I’m excited to focus full time on an old and growing passion of mine: investing in people and transformational technologies.”

PayPal acquired Xoom in 2015 for \$890 million



SAMSUNG

See inside from anywhere.

The new Family Hub™ refrigerator

It has built-in cameras that take a photo every time the doors close, so you always know what you have and what you're missing.



IN THE
APPLICATION
ECONOMY,
YOUR
BOTTOM LINE
IS A LINE
OF CODE.



From mobile shopping to product development, applications are at the core of everything your business does. Only CA Technologies provides the end-to-end set of tools and services to help you fuel innovation and drive success in the Application Economy.

Explore how at ca.com/appeconomy

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