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THE WALL STREET JOURNAL.

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What's News

Business & Finance

Sprint and T-Mobile struck a \$26 billion deal to combine that, if passed by antitrust enforcers, would leave the U.S. wireless market dominated by three national players. **A1**

◆ **Marathon** plans to buy pipeline and refining company Andeavor for more than \$20 billion. **B1**

◆ **The Justice Department's case against AT&T's planned acquisition of Time Warner** is showing signs of strain. **B1**

◆ **The dollar is rallying** in a sign that global growth momentum may be shifting back to the U.S. from other big economies. **A1**

◆ **Main Street banks** are finding it harder to retain deposits as higher interest rates elsewhere siphon off balances. **B1**

◆ **Walmart is in talks** to give up control over hundreds of stores in the U.K. and Brazil even as it takes more interest in India. **B1**

◆ **Saudi oil giant Aramco** shuffled its board, adding five members, including its first female director, as it readies an IPO. **B5**

◆ **Demand for refrigerated-food shipping** is growing twice as fast as it is for other ocean transport as affluence spreads. **B3**

World-Wide

◆ **U.S. officials** were cautious about Kim's pledge to shut North Korea's nuclear-test site, saying the dismantling of Pyongyang's arms program must be irreversible and verifiable. **A1**

◆ **China is looking** to dazzle a visiting U.S. trade delegation with planned pledges to cut tariffs and ease regulations. **A7**

◆ **Secretary of State Mike Pompeo** visited four countries on his first ports of call since becoming the top U.S. diplomat. **A18**

◆ **Investigators' use** of a public genealogy website to identify a suspected serial killer by DNA is raising privacy concerns. **A6**

◆ **Hundreds** of Central Americans in a migrant caravan neared the border with Mexico, expecting to ask for refuge in the U.S. **A3**

◆ **Private colleges** are discounting tuition to boost enrollment, but students aren't signing up in droves, even at sale prices. **A3**

◆ **Trump skipped** a White House press corps dinner in Washington, instead speaking at a rally in Michigan on trade and immigration. **A4**

◆ **The new NASA administrator** is juggling private and public options for moon exploration. **A4**

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Thousands Rally in Support of Pakistani Opposition Candidate



GETTING OUT THE VOTE: Supporters of an opposition lawmaker who hopes to become Pakistan's prime minister gathered in Lahore as his party launched its campaign for July elections. Backers of Imran Khan, a former cricket star, filled a park and surroundings. **A9**

U.S. Wary on North Korea Moves

BY JULIAN E. BARNES AND JONATHAN CHENG

Top U.S. officials expressed caution about North Korean leader Kim Jong Un's pledge over the weekend to shut down Pyongyang's nuclear-test site, saying a dismantling of the North's weapons program must be "irreversible" and verifiable.

North Korea said it would shut down the site by May and take steps to demonstrate the closure to the world, South Korea officials said.

U.S. NEWS

THE OUTLOOK | Richard Rubin

Tax Revamp Targets Shifting Profits



The U.S. tax law passed in December aimed to remove the features of the old tax system that gave companies a strong incentive to put profits, factories and headquarters overseas.

Under the old system, a 35% domestic corporate tax rate, highest among major countries, coupled with a tax on repatriated profits, drove corporate decisions. Microsoft Inc. accumulated \$142 billion in profits abroad. Apple Inc. sought low tax rates in Ireland for its non-U.S. profits and Johnson Controls International PLC took a foreign address through a merger.

The new tax law's 21% corporate rate and revised system of rules for money earned at home and abroad were a message to American companies: Come invest at home.

Will it work? Yes, tax experts say—but with limitations and caveats.

The lower corporate tax rate reduces the advantage from earning profits abroad and companies don't face additional U.S. taxes when they bring foreign profits back to shareholders. The playing

field is more even, but it isn't fully level. Tax rates still differ around the world and the revamped system has a few new quirks creating narrow incentives at the margins—where corporate decisions are made—to hold foreign assets.

Before the overhaul, U.S. companies shifted \$300 billion in profits abroad each year, according to a Congressional Budget Office estimate; the new law should reduce that by \$65 billion annually.

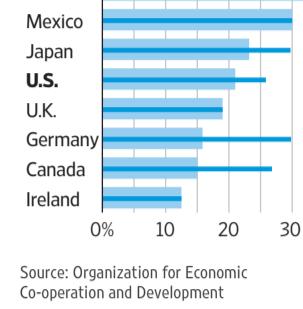
The old system incentivized corporations to move intangible assets such as patents and trademarks to low-tax countries to concentrate reported income there. Technology and pharmaceutical companies enjoyed single-digit foreign tax rates and others engaged in inversion transactions—often buying competitors in low-tax countries—to get their tax addresses outside the U.S.

The U.S. corporate rate cut made the largest dent in that foreign advantage, and it will stick because few in Congress want to go back to 35%. Tax savings from each dollar of income shifted abroad just aren't as large as they had been, said Tom Neubig, a cor-

Middle of the Pack

The U.S. tax rate cut last year followed other countries' actions over the past few decades.

- Corporate tax rate
- Rate adjusted for state and local taxes



Source: Organization for Economic Co-operation and Development

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porate tax specialist who has worked at the Treasury Department and the Organization for Economic Cooperation and Development.

"You're never going to eliminate this until we have exactly the same tax rates and tax rules across all the countries," Mr. Neubig said. "But you can certainly not have the U.S. be a chump."

As part of the overhaul, Congress created a so-called territorial tax system, mean-

ing U.S. companies can earn profits abroad, pay foreign taxes and distribute the money to shareholders without paying additional U.S. taxes. That means there's still an incentive to book profits in countries with rates lower than 21%.

Knowing that, Congress created restrictions on the territorial system to curb profit shifting. Those limits are aimed at sectors—like tech and pharmaceuticals—with intangible assets that are easy to shift and tough for the Internal Revenue Service to challenge, though they could hit others.

The Global Intangible Low-Taxed Income tax, or GILTI, is a minimum tax, roughly between 10.5% and 13.125%, on U.S. companies' foreign earnings. GILTI crudely attempts to isolate and tax mobile profits. It doesn't define "intangible income." Instead, it exempts a risk-free return, calculated at 10% of tangible foreign assets, such as factories and buildings. A company with \$1 million in tangible assets abroad can escape about \$13,000 in taxes on foreign income. The reverse applies domestically, with companies getting larger deductions for

exports if they have less tangible investment in the U.S.

That's a new reason, at the margin, for manufacturers to put factories outside the U.S.

The law could have been more carefully targeted, said Rebecca Kysar, a Brooklyn Law School professor.

"The more assets you have abroad, the more income that's exempt from the minimum tax," she said.

Under the old law, she said, the greatest incentive was for shifting profits, often accomplished with paper transactions—a Bermuda address here, an Irish subsidiary there. The new incentives are smaller but they are about hard assets that bring jobs with them.

For now, few companies are making tax-driven decisions about locating investments. They're waiting for Treasury Department rules, gauging how Congress might alter the tax law and calculating its impact.

"I haven't seen anything that looks like it's being done just for this kind of benefit," said Corey Goodman, a tax partner at the law firm Cleary Gottlieb Steen & Hamilton LLP in New York.

ECONOMIC CALENDAR

MONDAY: The U.S. Commerce Department releases figures on March personal income and outlays. **Personal-consumption expenditures**, a measure of household spending on everything from dishwashers to books, increased at a slower pace in February, at a seasonally adjusted 0.2% from the prior month. Economists will look to see whether spending rose in March given bigger worker paychecks. Economists surveyed expect spending rose 0.4% in March.

THURSDAY: Eurozone inflation has been weaker than the European Central Bank hoped for in the early months of the year, but figures are expected to show a second straight month of increases in the headline rate, to 1.4% in April from 1.3% in March. However, economists also expect to see a weakening of the core inflation rate, which would reinforce policy makers' caution as they decide when and how to end a bond-buying stimulus program.

FRIDAY: The U.S. Labor Department releases the April jobs report. **Nonfarm payrolls** rose a seasonally adjusted 103,000 in March after February's outsized increase of 326,000. Economists will watch to see whether the **unemployment rate** continues its six-month streak at 4.1%. Economists surveyed forecast the unemployment rate will show a drop to 4% while the economy added 197,000 jobs in April.

Inflation Puts Scrutiny on Fed's Rate-Rise Plans

BY NICK TIMIRASOS

enough to keep price pressures under control.

The Fed is closer than it has been in years to meeting its mandates to foster the best labor market possible without fueling too much inflation. Officials want to keep gradually raising rates to keep the economy on an even keel, which could become more challenging as the economy absorbs a boost from recent tax cuts and federal spending increases.

Unemployment, at 4.1% since fall, is below the level officials regard as sustainable over the long run while keeping price pressures contained.

The Commerce Department is likely to report Monday an upturn in inflation because weak March 2017 figures will fall out of the 12-month measure.

Fed officials say this increase alone won't change their interest-rate plans. A recent rise in the cost of hospi-

tal services has also been giving the inflation reading an extra pop.

Economists estimate so-called core prices, which exclude volatile food and energy categories, rose 1.9% for the year ended in March, up from 1.6% in February.

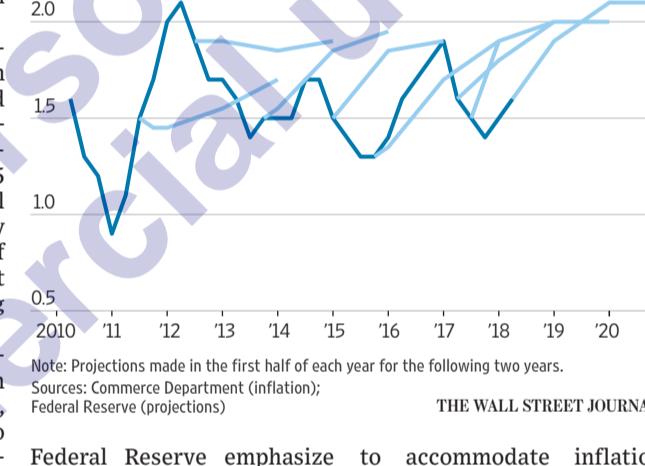
Fed officials see 2% inflation as consistent with an economy with healthy demand for goods and services. Projections released at their meeting last month show all 15 participants expected annual core inflation of at least 2% by 2020, and more than half of them see it rising to at least 2.1% next year and staying there through 2020.

This was the first time officials have projected inflation exceeding the Fed's 2% target, signaling they don't expect to pick up the pace of rate increases in the case of a modest and temporary overshoot.

"We're going to see the

Tracking Projections

How Fed inflation forecasts compare with actual core inflation



Note: Projections made in the first half of each year for the following two years.

Sources: Commerce Department (inflation); Federal Reserve (projections)

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Federal Reserve emphasize that we missed the target on the downside for a while and for that reason we're willing

to accommodate inflation somewhat above target for a while," said Nathan Sheets, chief economist at PGIM Fixed

Income and a former Fed economist.

Still, officials haven't said how much or for how long they would let inflation go above 2% before moving to raise rates more aggressively to bring it down.

"We haven't agreed on that," said Fed Chairman Jerome Powell at a news conference last month.

Officials are also likely to keep a close eye on inflation expectations. If they remain anchored even as core inflation rises to 2.5%, "I'm not going to be worried about it," said Minneapolis Fed President Neel Kashkari in a recent interview. If expectations start to rise, however, the Fed might need "to send some kind of signal that we are not going to let that get out of control," he said.

Fed officials have made few changes to their interest-rate forecasts over the past two years.

Even T-Mobile, which adds millions of customers each year mostly at its rivals' expense, has showed signs that growth is cooling.

The company predicted it would add 2 million to 3 million subscribers with monthly contracts this year, fewer than in 2017.

Meanwhile, network engineers say the next-generation 5G standards could allow wireless companies to serve huge new markets, from home internet service still dominated by cable companies to autonomous cars just now being developed.

But rolling out 5G services will require heavy investment in cellular spectrum and installing hundreds of thousands of antennas around the country, which gave new impetus to Sprint and T-Mobile executives to join forces.

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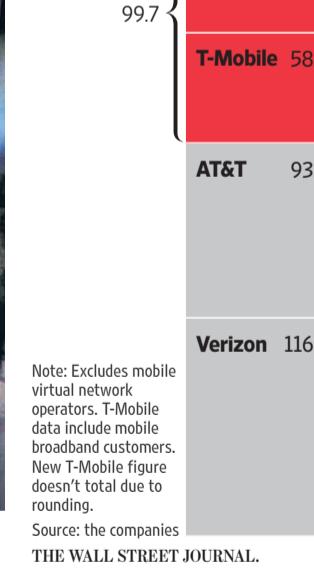


T-Mobile President and CEO John Legere is expected to run the combined entity, to be known as T-Mobile.

BRENDAN McDERMID/REUTERS

Catching Up

Wireless customers, in millions



Source: the companies

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Verizon's network.

"This isn't a case of going from 4 to 3 wireless companies—there are now at least 7 or 8 big competitors in this converging market," Mr. Legere said on Sunday. The companies also vowed to boost hiring and spending in the U.S. after the transaction.

The companies said they plan to add to their combined headcount of roughly 80,000 full-time U.S. employees once the deal closes.

"This is one of those few mergers that are actually going to be net job positive from the get-go," Sprint CEO Marcelo Claure said. "We're going to go build an amazing network that is good for the economy."

Teaming up would allow the companies to decommission about 35,000 cellular transmission sites, cutting the cost of rent and maintenance.

The two companies have already signed a wireless roaming

agreement to set themselves up to merge infrastructure. T-Mobile technology chief Neville Ray said it could take two or three years to move all customers onto the new system.

Last year, Sprint and T-Mobile discussed a deal but the talks collapsed in November after they failed to agree on who would control the combined company, people familiar with the matter said. Japanese technology giant SoftBank controls 83% of Sprint. Germany's Deutsche Telekom owns 62% of T-Mobile.

SoftBank founder Masayoshi Son, whose firm took control of Sprint for \$22 billion in 2013 with an eye toward combining it with T-Mobile, was reluctant to give up control of Sprint last year. One person close to Mr. Son said the pressure on Sprint to roll out 5G technology made him more amenable to relinquishing some control.

Wireless executives have long complained there are fewer ways to grow profits now that nearly every American adult—and many of their children—owns a smartphone.

They hold onto those devices for longer, cutting into equipment sales.

All four top carriers now offer plans that promise unlimited data, making it harder for them to show they're different from their rivals.

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U.S. NEWS

Summer Jobs Stir Anxiety

Risk of harassment working in restaurants gets families' scrutiny; industry adds training

BY JULIE JARGON

When Charlotte Crumm's teenage daughters began thinking about applying for summer jobs, the mother made one stipulation: No restaurants.

Ms. Crumm, now 41 years old, hasn't forgotten what it was like to be sexually harassed when she was a 16-year-old server at an Italian restaurant. She says customers would proposition her, scribbling their phone numbers and hotel rooms on the butcher block paper that covered the tables.

She says one of her supervisors, who was much older, frequently hit on her and invited her to parties at his apartment, which she declined. Six months into the job, she quit. Last summer, she likewise put her foot down when her older daughter wanted to pursue a restaurant job.

"She said, 'C'mon, mom, it wasn't that bad,'" Ms. Crumm recalled. "I said, 'Yes, it was.'"

Her older daughter found work at a veterinarian's office, a job the 17-year-old will resume this summer. Her younger daughter has lined up a job as a camp counselor.

"I know it can happen in any environment," said Ms. Crumm, who runs an insurance claims processing business in Overland Park, Kan. "But I feel safer with them working in a vet's office, or at a children's camp."

As the first summer of the #MeToo era approaches, many teenagers and their parents are

increasingly mindful of the possibility of sexual harassment in the workplace. Restaurants are the nation's largest employer of teenagers, and, for one in three Americans, their first job.

The industry, too, is paying more attention to the issue. Many large restaurant chains have updated their sexual-harassment awareness training in recent months, and small chains and independents that previously didn't offer such training have been reaching out to the Council of Hotel and Restaurant Trainers for guidance, according to Gabe Hosler, its president-elect.

"It went from such a low-priority topic to something everyone is talking about," said Mr. Hosler.

"Sexual harassment, or harassment of any type, is wrong and will not be tolerated," Dawn Sweeney, chief executive of the National Restaurant Association, said. "As the industry of hospitality, we are strongly committed to promoting positive workplaces where every person is safe and has the opportunity to thrive."

The industry employs a particularly vulnerable population.

Teens make up 18% of restaurant workers and have been involved in dozens of sexual-harassment suits filed by the Equal Employment Opportunity Commission against national fast-food chains, mom-and-pop restaurants, bagel shops and ice-cream parlors, according to agency data. Successful suits typically end in monetary settlements to claimants.

In March, the EEOC filed suit against a Florida-based Arby's franchisee, claiming it subjected several teenage female employees at an Alabama Arby's to



Charlotte Crumm is concerned about sexual harassment her daughter, Hannah Warren, may face working in the restaurant industry.

sexual harassment. The franchisee declined to comment. An Arby's corporate spokesman said the franchisee is conducting an investigation and that "as a restaurant brand that highly values respect among employees, we take this issue with one of our franchisees very seriously."

Katy Yang-Page and Antony Page recently decided to talk about the issue with their 14-year-old daughter, Katriona, who plans to babysit this summer but says she wants to work in a restaurant next year.

Mr. Page, vice dean and professor at the Robert H. McKinney School of Law at Indiana University, has reservations. He worked at fast-food chains as a teenager and remembers male managers in their 20s hitting on teenage girls. "I might naively hope that kind of behavior is now understood to be unacceptable," he said.

able, but obviously it is going on still," he said.

"We wanted her to understand that she is not to blame if something happens and that she has the backing of her parents," said Ms. Yang-Page, legal counsel for Rolls-Royce North America.

EEOC data show that both the total number of sexual-harassment complaints filed with the agency by all employees and the number filed by teenagers has fallen since the 1990s. It is optional for people to list their age when they file complaints, and many don't, making age data unreliable, the agency said.

Filing a complaint with the EEOC is a required precursor to filing a federal lawsuit under Title VII of the Civil Rights Act of 1964, which prohibits employers from discriminating against employees.

Steve Thomas, a manage-

ment professor at Missouri State University, noticed a theme when he studied 30 EEOC sexual-harassment cases involving teens over roughly the past decade: Two-thirds of them were filed against restaurants and all involved allegations of management not taking the teens' reports seriously, retaliating against the teens, or both.

Teen workplace sexual harassment is a badly underreported problem, experts say, because teens typically don't hold down jobs long enough to bother reporting such behavior, or lack the confidence to stand up for themselves. "I've had girls tell me this is their first job, and they think maybe this is how people act at work," said Paige Fiedler, an employment attorney in Des Moines, Iowa.

—Jim Oberman contributed to this article.

Starting Out

Employment type by percentage among 16- to 19-year-olds, July 2016



Source: Labor Department
THE WALL STREET JOURNAL.



Central American migrants who plan to seek asylum in the U.S. were in Tijuana, Mexico, on Sunday.

'Caravan' Migrants Make Way to Border With U.S.

BY ALICIA A. CALDWELL

TIJUANA, Mexico—When the caravan of nearly 200 migrants from Central America reached the U.S. border crossing here Sunday, U.S. Customs and Border Protection said the crossing was full and couldn't process asylum-seekers.

The migrants are part of a caravan that has drawn the attention, and ire, of President Donald Trump. The president has said the group's plan to ask for asylum is evidence that there is a crisis at the U.S. border with Mexico.

The first 50 people who went through the gates and into the port were told they would have to wait until there is more capacity, said Alex Mensing, a caravan organizer.

Half the group of children and adults waited on a pedestrian bridge connecting the U.S. and Mexican ports. The others were corralled just outside the gates into the U.S. Customs building. Volunteer lawyers and immigrant-rights activists sat with them, waiting.

The remaining migrants—more than 100 people—planned to spend the night in the plaza on the Mexican side of the border, Mr. Mensing said.

"We will stay here until every single asylum seeker is taken," he said.

U.S. Customs and Border Protection said Sunday evening, "At this time, we have reached capacity at the San Ysidro port of entry." It added,

"Depending upon port circumstances at the time of arrival, those individuals may need to wait in Mexico as CBP officers work to process those already within our facilities."

The group left downtown Tijuana about 3:30 p.m. to make the final walk to the border. Some of the migrants were crying.

Chanting "we are migrants, we are not criminals," the caravan made its way to the Mexican side of the port and were greeted by Mexican immigration officials who told them they would have to separate into smaller groups before heading into the port to ask for asylum on the American side.

The march to the border ends a nearly monthlong trip from Central America.

Rudolfo Figueroa, a Mexican immigration official, said only U.S. officials could decide if the migrants would be allowed to make asylum requests Sunday night.

When the group arrived at Friendship Park on the border with the U.S. Sunday, they were greeted by supporters standing on the beach on the other side of a 20-foot fence that marks the border where it meets the Pacific Ocean.

Their march to the border brings to an end a nearly monthlong trip from Central America and across Mexico.

The migrants arrived by bus in various groups starting last week and took up residence in shelters around Tijuana, not far from the border.

At the Movimiento Juventud 2000 shelter, more than 130 Central Americans stayed in tents inside the tin-roofed building within view of the border. Ana Suaso, a Honduran woman who was traveling with three of her children, said Thursday she was ready to make the final push to the U.S.

"I'm ready to go," she said, standing outside the shelter.

It is possible that the parents, if detained, may be separated from their children. The government is prohibited from jailing children, and the Department of Homeland Security doesn't have a blanket policy about separating asylum seekers from their children, though officials have said it is being considered.

Mr. Trump has urged Mexico to stop the caravan and has deployed the National Guard to the border to help the U.S. Customs and Border Protection secure the area.

In a fundraising email sent to supporters recently, Mr. Trump said he has directed the Department of Homeland Security to "STOP the caravan of illegal immigrants trying to cross our WIDE-OPEN BORDER" and calling again for an "impenetrable WALL."

College Price Cuts Risk Backfiring

BY MELISSA KORN

Private colleges have been aggressively discounting tuition in an effort to boost enrollment, a risky strategy that now may be backfiring as students aren't signing up in droves, even at sale prices.

Tuition discount rates, or the share of gross tuition and fee revenue that schools shell out as grants and scholarships, increased to a record 49.9% for full-time freshmen at private colleges this academic year, according to a preliminary report by the National Association of College and University Business Officers. That is up from a then-record 48.2% in the 2016-17 school year.

Overall tuition discount rates for undergraduates hit a record 44.8%, up from 43.2% last year, based on survey responses from 404 private schools.

That figure is generally lower than it is for freshmen, as some schools front-load scholarship offers and others set flat per-year awards even as sticker prices increase.

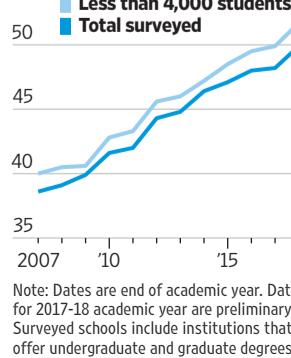
Discount rates for schools with fewer than 4,000 students—stitutions that are generally reliant on tuition dollars and for whom a small enrollment shift can hit hard—reached 51.7% this year for freshmen, and 46.1% overall.

Schools often use tuition discounts with the aim of boosting their academic profiles or luring more families to enroll. Even at a lower per-student price, if enrollment increases enough, the school's net tuition revenue can grow.

That has been the case at Albion College in Albion, Mich.

On Sale

Average tuition discount rate for surveyed schools for first-time, full-time freshmen, by school type



Note: Dates are end of academic year. Data for 2017-18 academic year are preliminary. Surveyed schools include institutions that offer undergraduate and graduate degrees as well as research universities.

Source: NACUBO Tuition Discounting Study

The school has a discount rate of around 70%—and slightly higher for freshmen—and just a handful of students pay full sticker price, says President Mauri Ditzler.

But with enrollment growing by 24% since 2014, to 1,568 total this year, the school is increasing its net tuition revenue. Dr. Ditzler also noted that even when students pay relatively little for tuition, the school still makes money on dorm rooms.

Albion may be an outlier, as enrollments at private, nonprofit schools nationwide have fallen for each of the last three years.

The financial impact of declining enrollment is being compounded now by the fact that schools are earning less from each student who does come to campus. On a per-stu-

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U.S. NEWS

Worker Wins Ruling in Spy Case

By KATE O'KEEFFE

A U.S. judge ordered the Commerce Department to reinstate a Chinese-American hydrologist it had fired over many of the same allegations in a failed spy case.

Sherry Chen was correct to assert she had been the "victim of a gross injustice" when the department fired her in 2016, according to a ruling last week by the Merit Systems Protection Board.

Michele Szary Schroeder, a judge for the MSPB, which is an independent body that hears appeals from federal employees over personnel decisions, wrote that the officials involved in deciding Ms. Chen's fate were "more concerned about being right than doing the right thing." She added: "Based on the unyielding nature of their testimony, I would not have been surprised if they rejected that 2 + 2 = 4."

Following a hearing and examination of evidence, Judge Schroeder ordered the Commerce Department to give Ms. Chen her job back and to make up for lost wages after finding that nearly every reason it had given for firing her wasn't supported by the facts.

A spokesman for the Commerce Department said it would appeal the decision. The department is the parent agency of the National Weather Service's Ohio River Forecast Center, where Ms. Chen worked to predict floods.

Ms. Chen's lawyer, Steve Simon of Tobias, Torchia & Simon, said in a statement that his client "looks forward to re-



SAUL LOEB/AGENCE FRANCE PRESSE/GTY IMAGES

Sherry Chen, a government hydrologist, was the target of an indictment that was dropped in 2015.

turning to the job she loves." He said that based on the terms of the ruling, and regardless of any appeal, the Commerce Department has to let Ms. Chen return to work by July unless it can prove it would be "unduly disruptive" to the agency.

Members of the Congressional Asian Pacific American Caucus commended the decision in statements and said they would call on the Commerce Department's Inspector General to investigate the handling of Ms. Chen's case.

The judge's ruling comes amid concerns from Chinese-American leaders and others that the U.S. government is engaging in racial profiling as it pursues Chinese spies and hackers. In recent years, the Justice Department has dropped multiple Chinese espionage-related

cases, among them Ms. Chen's case, one against a Temple University professor, and one against two ex-Eli Lilly scientists. The Justice Department has denied that race, ethnicity or national origin was a factor in those cases.

Ms. Chen's troubles began in 2012 when she contacted a colleague in another U.S. government department asking for public information about dams, in an attempt to answer questions from a water-resources official in China, according to the documents in the case.

Ms. Chen had met with the official, who was a former classmate, on a family trip to China, and he had asked about the total water volume in the U.S. and about how the U.S. federal and local governments share costs to repair

dams, the documents said.

Ms. Chen, who was born in China and became a U.S. citizen in 1997, sent the Chinese official some public information and told him he should contact her colleague directly if he had further questions, according to the documents.

Unbeknown to Ms. Chen, that colleague reported her as a potential national security threat.

"I'm concerned that an effort is being made to collect a comprehensive collection of...water control manuals by a foreign interest," the colleague wrote, according to the ruling.

That prompted an investigation by law-enforcement agencies and an indictment that prosecutors dropped in 2015, court records show. The U.S. attorney in charge of the case said in a later interview with

The Wall Street Journal that he didn't believe Ms. Chen's conduct merited prosecution.

Regardless, the Commerce Department decided to dismiss Ms. Chen in 2016, citing her interactions with the Chinese official, among other allegations.

In her ruling, the judge found that Ms. Chen hadn't done anything improper when communicating with the Chinese official. At the same time, the judge said she didn't find proof that Commerce Department officials had acted with "discriminatory animus" toward Ms. Chen, as she had alleged in her appeal.

The judge wrote that the fact the Commerce investigators on Ms. Chen's case lacked hydrology expertise, as well as the fact that English is Ms. Chen's second language, may have contributed to some confusion.

The judge ruled that the Commerce Department had proven Ms. Chen acted in an untrustworthy manner in one instance—a characterization Ms. Chen rejected. The judge said the department was justified in suspending her for 15 days over that claim, which was unconnected to the China-related allegations.

In that incident, Ms. Chen agreed to a former colleague's request to not tell her supervisor that she planned to help him with an academic project by providing nonproprietary information, according to the documents.

Trump Highlights Trade, Security At Rally

By SIOBHAN HUGHES

WASHINGTON—Skipping an annual black-tie dinner hosted by the White House press corps, President Donald Trump flew to Michigan on Saturday to suggest he would use brinkmanship to get his way on trade and border-security policies, criticize the media and take a shot at a Democrat he blames for blocking a Veterans Affairs nominee.

"I was invited to another event tonight—the White House Correspondents' Dinner," Mr. Trump told a crowd at the Total Sports Park in Washington Township. "I'd much rather be in Washington, Mich., than in Washington, D.C., right now."

A large part of the speech was devoted to trade and immigration policy. Mr. Trump suggested farmers may need to accept short-term pain so the U.S. can achieve better trade deals.

The Trump administration is in the midst of renegotiating the North American Free Trade Agreement with Mexico and Canada. Some Republican and Democratic lawmakers worry that he will force U.S. trading partners—and Congress itself—to choose between exiting the deal or accepting an alternative that they dislike.

The president also lobbed a broadside at Democratic Sen. Jon Tester of Montana, who this week circulated allegations from what he said were current and former colleagues of Rear Adm. Ronny Jackson, the White House doctor, who was Mr. Trump's nominee to serve as secretary of the Department of Veterans Affairs.

The White House said its own review of documents turned up no records to support that or other allegations.

NASA Considers Shifting Strategy

By ANDY PASZTOR

After his first week as NASA administrator, Jim Bridenstine already is juggling starkly different visions of government versus commercial endeavors to explore the moon.

The agency sparked strong criticism from planetary scientists in recent days for canceling the most advanced publicly-financed plan for a robotic lander, dubbed Resource Prospector, intended to search for water and ice on the lunar surface.

One letter from disgruntled researchers on a NASA-sponsored panel said the action was "viewed with both incredulity and dismay by our community." Scientists working on the project, which has experienced repeated cost estimate increases, nevertheless argue that replacing it with an industry-NASA partnership would disrupt research and delay mission schedules.

Citing budget constraints for the decision, NASA simultaneously is stepping up efforts to solicit proposals from private enterprise to build and operate alternate spacecraft for similar missions during roughly the next decade. The follow-on projects are designed to build on progress by NASA so far.

Such tensions between traditional big-ticket NASA programs and a surge in government-industry partnerships, projected to be less expensive

and more nimble, likely will be hallmarks of Mr. Bridenstine's tenure, according to federal and industry experts.

Long before the former Republican Congressman from Oklahoma narrowly won confirmation, the Trump administration staked out its commitment to rely on entrepreneurs and commercial-space companies to spearhead U.S. efforts to return to the moon.

Now, the new team at the helm of NASA is searching for effective ways to meet that goal. Last week, the agency issued a draft request for proposals covering "end-to-end commercial payload services between" earth and the moon, utilizing private launch vehicles, landers and re-entry vehicles.

The document, among other things, described the move as "the latest step in a long-running effort by NASA to support the development of commercial lunar capabilities."

In a statement, a NASA spokeswoman said plans are under way for "a series of progressive robotic missions to the lunar surface," envisioning increasingly larger spacecraft "leading to an eventual human lander capability."

Elon Musk's Space Exploration Technologies Corp. and Blue Origin LLC, the space-transportation startup founded and run by Amazon.com Inc. CEO Jeff Bezos, are among the companies maneuvering to benefit from that trend.

Comedian Is Criticized For Routine

By LOUISE RADNOFSKY

WASHINGTON—A comedian who performed Saturday at an annual Washington press corps dinner drew criticism from supporters of the Trump administration and some journalists for a routine that they said had crossed the line from humor into personal attacks.

The black-tie White House Correspondents' Association dinner, at which journalists mix with administration officials and politicians, has often featured scorching comments about Washington figures.

This year's event raised a debate about whether comedian Michelle Wolf had gone too far with pointed jokes about White House press secretary Sarah Sanders, the president's daughter Ivanka Trump, senior counselor Kellyanne Conway and Vice President Mike Pence, among others.

"I actually really like Sarah," Ms. Wolf said of Ms. Sanders. "I think she's very resourceful. Like, she burns facts, and then she uses the ash to create a perfect smoky eye."

Some took the comment as an attack on Ms. Sanders' appearance.

Critics, including many Republicans and allies of President Donald Trump, said they were horrified by the jokes.

The head of the White House Correspondents' Association, reporter Margaret Talev, said on CNN Sunday that comedians invited as entertainers over the past 30 years had often been controversial.

"It's a night about free speech, and so, by tradition, we do not vet their monologue," Ms. Talev said.

In a note to association members, Ms. Talev said Sunday that some in the press group had expressed "dismay" at Ms. Wolf's comments and concerns about how it reflected on the group's mission.



NASA's new chief Jim Bridenstine has emphasized the agency's renewed focus on lunar exploration.

DOLLAR

Continued from Page One

ening, analysts were puzzled why the interest rate differential between Treasurys and foreign bonds didn't support a stronger U.S. currency. But now that dynamic may be playing out. The gap between U.S. 10-year Treasury yields and those on German bonds is at its widest since 1989, according to DWS.

With investors increasingly believing the Federal Reserve may raise interest rates four times this year, that spread could continue widening and offer additional dollar support.

The WSJ Dollar Index rose 1.1% last week, its best weekly performance since 2016, and the dollar ranks as one of the currency market's top performers in April. Last year, the dollar fell 7.5% as investors came to believe that growth would accelerate faster abroad as the U.S. economy reaches the end of its cycle.

Dollar bulls have another reason for hope. The futures market is still highly skewed against the U.S. currency, with the largest bearish dollar position since 2011 earlier this month, according to data from the Commodity Futures Trading Commission. Further dollar gains could force some of those investors to cover their bets and buy back the dollar, pushing it higher, analysts said.

Rising yields are making it expensive to remain short the dollar, as investors have to borrow in the U.S. currency to bet against it, said Ugo Lancioni, head of global currency at Neuberger Berman.

A rising dollar has broad implications for markets and the economy. While it can attract more foreign capital to U.S. bond markets, it can bruise the earnings of U.S. multinationals by making their products less competitive abroad. Around 60% of companies reporting first-quarter results said that dollar weakness had helped boost their earnings, according to FactSet data

gathered in mid-April.

Facebook Inc. said last week that "foreign exchange tailwinds" contributed \$536 million to its first quarter revenue, while pharmaceutical company Bristol-Myers Squibb Co. also indicated favorable foreign exchange dynamics provided a 4-percentage-point boost to revenue.

Looking Up

The spread between U.S. and German bonds has widened, which could support the dollar. Continued dollar gains could also force some to cover bearish futures bets.

2.4 percentage points



Sources: Ryan ALM (spread); CFTC (futures)

Some investors believe the dollar rebound could prove temporary. For one, the U.S. economy is later in the economic cycle, and the European Central Bank has barely begun tightening its monetary policy. Analysts expect the ECB to make a decision in June or July to phase out its bond-buying program by December—four

years after the Federal Reserve halted its own quantitative-easing program.

Moreover, many analysts also believe the dollar's bullish and bearish cycles tend to last between five and seven years, on average. That would mean the U.S. currency is in the early stages of an extended period of decline, after a bull market that began in 2011 and peaked in early 2017.

But a temporary dollar rally can last months, even in the midst of a bear-market period. That is what happened during a seven-year dollar slump during the previous decade: In 2005, the dollar rose 13% over 11 months, before returning to a downward trend the next year.

Some think growth momentum will likely shift back to Europe in the coming months, spurring the ECB and other central banks to continue normalizing monetary policy.

The dollar's move "is a bear market rally," said Jason Draho, head of tactical asset allocation Americas at UBS Wealth Management.

U.S. NEWS

American Airlines 

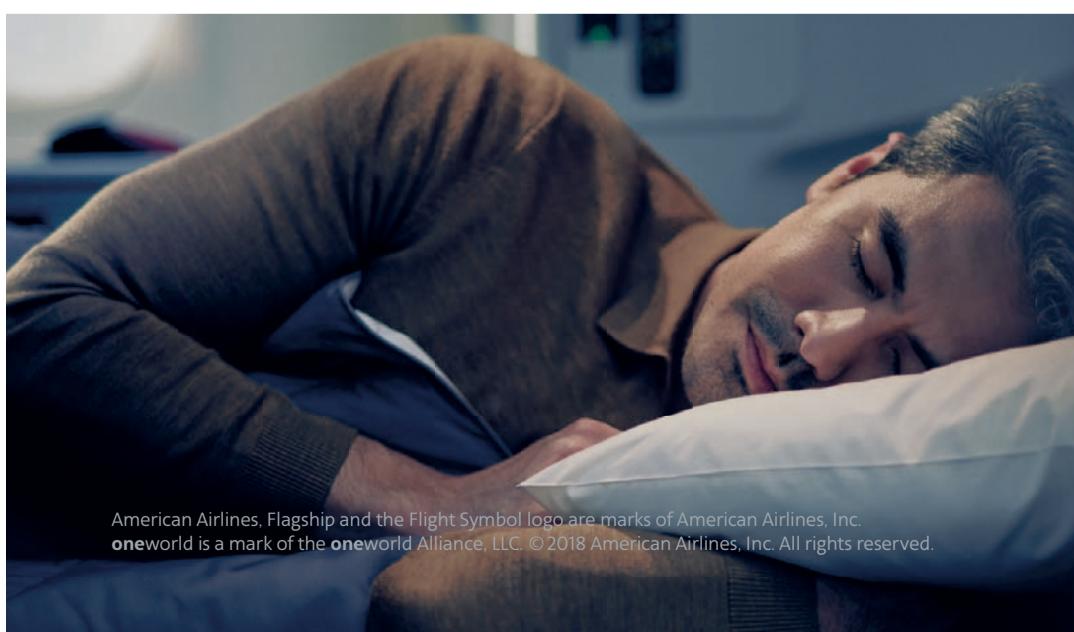
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U.S. NEWS

Training Blasts Linked To Troops' Brain Injury

By BEN KESLING

WASHINGTON—Thousands of U.S. troops are likely suffering traumatic brain injury not just from battlefield explosions but from repeated exposure to trauma while training on their own weapons, according to a new study.

Service members, even those who may not have seen combat but specialize in using high explosives or weapons such as rocket launchers, could have lasting brain damage from the pounding on their necks and heads, researchers at the Center for a New American Security said in a report released Monday. The defense think tank is a nonprofit funded by the federal government and public- and private-sector donors.

"It's analogous to people getting hits to the head in sports, playing football or boxing," said Paul Scharre, a senior fellow at the center. "Exactly how it affects the brain is unclear, but the fact that it is having some kind of negative effect is now being shown."

Shoulder-fired rockets and rocket-propelled grenades don't shoot away with a "whoosh" as they are sometimes portrayed in movies. They go off with an ear-ringing boom that troops sometimes liken to getting punched in the side of the head. The Defense Department has long acknowledged this and has limits on the number of rounds troops can fire at any given

time. But the Pentagon didn't take a hard look at the harm these blasts could cause until recently.

The Defense Department started diagnosing and tracking traumatic brain injury just before the wars in Iraq and Afghanistan began. TBI has become one of the signature injuries of the current generation of troops, with some 380,000 personnel affected by it, according to the Defense Department.

The military sporadically has used blast gauges, small devices worn on troops' helmets or body armor, to better understand the effects of explosions in combat. Researchers began to notice that these gauges weren't just registering substantial blasts in combat, but in training, too.

Researchers drew on Defense Department data, blast-effect research on animal subjects and computer modeling to reach their conclusions, noting that military officials have expressed concern about the issue and say it needs further examination. Researchers and officials say available data is insufficient.

VA spokesman Curt Cashour said the department hasn't undertaken the time-consuming process of reviewing individual cases to determine whether veterans are claiming harm from repeated exposure in training.

The Defense Department didn't respond to requests for comment.

Use of Database Raises Questions

Reports that investigators homed in on the alleged Golden State Killer using a public genealogy website raises new questions about privacy and how law enforcement uses DNA information.

By Daniela Hernandez, Zolan Kanno-Youngs and Zusha Elinson

Investigators used DNA from crime-scene samples and compared it with genetic profiles on a site called GEDmatch, according to GEDmatch and law-enforcement officials. The site allows people to upload their genetic information to an online database that is searchable by other users. The practice helps people find family members because blood relatives share closely related genetic traits.

That feature is also what officials leveraged to find the alleged serial killer, Joseph James DeAngelo, a 72-year-old former police officer. Investigators found a relative of the suspect online, then looked at online family trees to narrow down the search, according to the Sacramento County district attorney's office.

The use of DNA information in criminal investigations isn't new, but what makes the case noteworthy, according to legal experts and bioethicists, is the use of a nonstate-owned DNA database, where individuals who share their genetic code are essentially sharing information about family members



FRED GREENBERG/REUTERS

Alleged serial killer Joseph James DeAngelo appeared at his arraignment in Sacramento, Calif., on Friday.

who may not have consented to reveal such data.

State-owned databases contain DNA data of convicted criminals and, in some instances, people arrested. Sites like GEDmatch contain data of people who may not have had run-ins with law enforcement.

Michael Bock, a former New York Police Department Special Victims Division investigator for 10 years, described searching in a genealogy website as "uncharted territory."

The process, known as familial DNA searching, usually uses specialized software to generate a ranked list of po-

tential relatives, according to legal experts who study use of DNA data in law enforcement. Familial searches are useful, but also controversial, because they help authorities identify people who wouldn't have been suspects otherwise.

"The number of people who become subject to genetic surveillance is much broader," said Natalie Ram, an assistant professor at the University of Baltimore's School of Law.

The utilization of DNA databases—and familial searches—has expanded in recent years, including in New York. In June 2017, the Commission on Fo-

rensic Science, a state panel of medical examiners, district attorneys and others, voted 9-2 approving a familial-search policy. The method allows officials to search a state database with some 600,000 profiles, for people who may be related to someone convicted of a crime.

Critics say familial DNA searching could invade the privacy of innocent people and target minorities, who are disproportionately represented in state databases.

Lawyers from the Legal Aid Society and Gibson, Dunn & Crutcher LLP filed a lawsuit in February in Manhattan Supreme Court against New York's Division of Criminal Justice and the Commission on Forensic Science seeking to block the searches.

GEDmatch's purpose is genealogy research, according to its terms and policy statement.

"Although we were not approached by law enforcement or anyone else about his case...it has always been GEDmatch's policy to inform users that the database could be used for other uses," said Curtis Rogers of GEDmatch. "It is important that GEDmatch participants understand the possible uses of their DNA, including identification of relatives that have committed crimes or were victims of crimes."

Users have the option to delete their uploaded data, he added.

The reality, according to bioethicists, is that most people don't understand those risks.

Volunteers Prepare Meals for South Florida Senior Citizens



HELPING HANDS: Volunteers packaged red lentil jambalaya for the 5th Annual Million Meal Pack on Sunday at Nova Southeastern University in Fort Lauderdale. The food will be delivered to older adults in Miami-Dade, Broward and Palm Beach counties.

C.M. GUERRERO/MIAMI HERALD/ASSOCIATED PRESS

U.S. WATCH

MAINE

Suspect in Deputy's Killing Is Behind Bars

A man accused of killing a sheriff's deputy was being held in the state's maximum-security prison on Sunday, officials said.

John Williams was transferred to the Maine State Prison after his arrest on Saturday, the fourth day of a massive manhunt.

Mr. Williams, who is expected in court early this week, is accused of killing Somerset County Cpl. Eugene Cole, 61 years old, on Wednesday after the two had an encounter on a darkened road in Norridgewock.

Mr. Williams, 29, was shirtless and shoeless when captured outside a remote cabin in the woods.

Mr. Cole's brother, Tom Cole, said people were honking their car horns as they drove by his house. "The whole town was celebrating with me," he told WMTW-TV.

Mr. Cole said the grieving for his brother can start now that Mr. Williams is in custody. Eugene Cole's funeral will be May 7.

Neither Mr. Williams nor a family member could be reached for comment, and it was unknown whether he had a lawyer.

—Associated Press

CALIFORNIA

Burning Man Festival Co-Founder Dies

Larry Harvey, whose whimsical decision to erect a giant wooden figure and then burn it to the ground led to the popular, long-running counterculture celebration known as "Burning Man," has died.

Mr. Harvey, who was 70 years old, died Saturday at a San Francisco hospital, surrounded by family, said Burning Man Project CEO Marian Goodell. The cause wasn't immediately known, but Mr. Harvey suffered a stroke earlier this month.

Burning Man takes place annually the week before Labor Day in northern Nevada's Black Rock Desert. The weeklong festival attracts some 70,000 people who pay anywhere from \$425 to \$1,200 a ticket to travel to a dry lake bed 100 miles east of Reno.

There they must carry in their own food, build a makeshift community and engage in whatever interests them. On the gathering's penultimate day, the giant effigy—or Man as it is known—is set ablaze during a raucous, joyful celebration.

—Associated Press

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WORLD NEWS

China Plans Trade Offers for U.S. Envoys

Chances of a quick resolution of tensions are slim as Beijing hosts high-stakes talks

China is looking to dazzle a visiting U.S. trade delegation this week, arranging a session with President Xi Jinping and planning pledges to cut tariffs and ease regulations. It will likely take more than that to impress the visiting Americans and head off a trade war.

By Bob Davis in Washington and Lingling Wei in Beijing

It will be a high-stakes meeting, starting Thursday. U.S.-China economic relations have sunk to their lowest point in decades with the U.S., angry over alleged Chinese pressure on U.S. firms to transfer technology to Chinese partners and other misdeeds, threatening tariffs on \$150 billion in Chinese goods and prohibitions on Chinese purchase of U.S. technology.

The trade mission gives both sides a chance to ease those tensions, but chances of a quick resolution are slim.

The U.S. team plans to take tough positions, say U.S. officials, who are skeptical that China's pledges will amount to much. The U.S. hasn't sent an advance team to Beijing for preliminary negotiations, as is typical. Rather, when the two sides meet, the U.S. may simply note President Donald Trump's threats of tariffs and U.S. complaints, and wait to see what the Chinese offer, figuring that will force China to offer even deeper structural changes and faster action.

It is a risky strategy that could help produce deep changes in China's economy if successful, but deepen hostilities if the tactics backfire.

"If the trip isn't well coordinated and China doesn't have a sense of U.S. red lines, the discussions are unproductive," said Michael Hirson, a former U.S. Treasury representative in Beijing who is now a Eurasia Group analyst.

Mr. Trump's announcement on April 24 that he would send a team of negotiators to Beijing helped ease rattled markets and led to hopes the two nations could come to an agreement. In Beijing, officials scurried to figure out what the U.S. would ask and what they could offer.

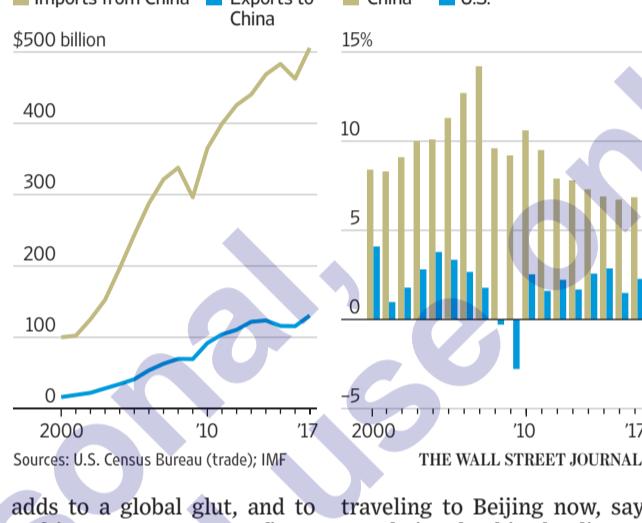
Among the ideas that Chinese are likely to put forward, say Chinese officials: Cutting a 25% tariff on foreign vehicles; easing the quota on the number of imported films which are shown in China on a revenue-sharing basis; buying more U.S. goods to help cut the vast U.S. trade deficit; and offering to negotiate a U.S.-China free-trade deal, which could cover many structural issues and be enforced by trade sanctions.

But there are limits to how far Beijing will go. It won't halt its plans to develop advanced technology through domestic subsidies and other assistance, seeing the move as crucial to China's competitiveness. It won't prop up the value of the yuan to help U.S. exports.

On the U.S. side, the Trump administration faces divisions about how to handle China. Treasury Secretary Steven Mnuchin has wanted to head to Beijing since he had a phone conversation with Chinese economic envoy Liu He in late March, say people involved in the trip. He is in charge of negotiating a financial services deal with China and more broadly wants to de-escalate trade tensions with China.

U.S. Trade Representative Robert Lighthizer is the administration's main China strategist. He has used tariff threats, as Mr. Trump wanted, to press China to cut excess capacity of steel and other metals, which

Persistent Gap



adds to a global glut, and to end its pressure on U.S. firms to transfer advanced technology to Chinese partners. Mr. Lighthizer opposed traveling to Beijing now, say people involved in the discussions, feeling that U.S. leverage increased as the U.S. drew closer to imposing tariffs.

Xi and Modi Vow To Ease Security, Commerce Tensions

The leaders of China and India pledged to improve communication over military and security matters, an agreement that emerged from a quickly arranged summit meant to repair relations after a bitter border standoff and other simmering disputes.

Over a two-day meeting in central China that ended on Saturday, Chinese President Xi Jinping and Indian Prime Minister Narendra Modi also agreed to expand trade and investment as a way to foster friendlier ties between the world's two most populous nations, according to statements by both governments.

The summit marked a thaw in relations that have soured over recent years, amid Indian displeasure at China's economic largess to its rival Pakistan and disputes along contested stretches of the Indian-Chinese border. Last summer, their troops engaged in a tense, 72-day standoff at a strategic Himalayan pass.

Mr. Xi told the Indian leader both countries should "consult each other on major issues of mutual concern in a timely manner," China's Foreign Ministry said. The account didn't refer to the border dispute. India's Foreign Ministry said Messrs. Modi and Xi instructed their militaries to strengthen communication and implement measures to "prevent incidents in border regions."

Delhi has also expressed concern over Beijing's push to develop land and maritime trade routes around India's periphery through Mr. Xi's program to develop trade and infrastructure links between China and much of the world.

—Chun Han Wong



U.S. Trade Representative Lighthizer has used tariff threats to press China to cut excess steel capacity; a steel plant in Dalian, China.

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WORLD NEWS

Familiar Snapshots Emerge in Korea Deal

Accord echoes that of earlier pacts, raising concerns latest effort will falter as well

BY JONATHAN CHENG

SEOUL—Peace, prosperity, shared goals, continued dialogue, unification: The sweeping commitments signed by North and South Korea's leaders on Friday were hailed by many as a breakthrough for inter-Korean relations.

But skeptics are getting a case of *déjà vu*.

Much of the language in the Panmunjom Declaration, they point out, mirrors that of agreements reached at inter-

ANALYSIS Korean leadership summits in 2000 and 2007, illustrating the intractable nature of the conflict and the failure to realize past promises.

In their earlier agreements in Pyongyang, the two Koreas said they would follow up with further summit meetings and cultural and humanitarian exchanges, such as resuming reunions of families separated by the Korean War. In 2007, they said they would de-escalate military tensions and move toward a formal peace agreement to end the war, in consultation with the U.S. and China.

More than a decade on, those same promises reappeared in the joint statement from the North's Kim Jong Un and the South's Moon Jae-in after a day of talks in the inter-Korean demilitarized zone.

The similarities prompted critics of the North-South détente to warn that Mr. Kim, the North's third-generation leader, had recycled many of the same vows his father, Kim Jong Il, and grandfather, Kim Il Sung, made but which remain unfulfilled.

"Repeating the same themes and language from the 2000 and 2007 joint declarations doesn't bode well, because those were eras full of



South Korea President Moon Jae-in, above right, takes part in a planting ceremony with North Korea leader Kim Jong Un, above left, a show of unity reminiscent of Mr. Kim's father, Kim Jong Il, with South Korea leaders Roh Moo-hyun, below left, in 2007, and Kim Dae-jung, in 2000.



optimism, too, and they had no impact whatsoever on North Korea's nuclear program," said Van Jackson, a senior lecturer in international relations at Victoria University of Wellington in New Zealand.

President Donald Trump hailed Friday's accord on Twitter, writing: "Good things are happening, but only time will tell!" But many U.S. officials remain cautious. After Mr. Kim

said this month that he would close a nuclear test site and suspend long-range missile launches, a senior administration official warned: "It may be less than meets the eye."

On Sunday, Pyongyang said it would invite international observers to demonstrate that it had shut its test site—an echo of the destruction of its nuclear cooling tower in 2008, which was televised live by in-

ternational broadcasters.

To be sure, there are differences today. An important goal of Friday's summit was to sustain momentum for the first meeting between the leaders of the U.S. and North Korea in the coming weeks.

The styles and priorities of the leaders this time meant that the context was "completely different," said Christine Ahn.

Whatever the caveats, some analysts saw limited progress on the most troublesome issue: Pyongyang's nuclear program.

"For true peace on the Korean Peninsula, North Korea will have to change in some fundamental ways," said Daniel Pinkston, a professor at Troy University in South Korea. For one, North Korea could show sincerity in declaring an end to atomic testing by signing the

Comprehensive Nuclear Test-Ban Treaty. Until then, he said, "Everything else is just hype."

"This all seems to be straight out of a playbook that they've gone to before," said Jack Kim, co-founder of Han-Voice Support Association, a North Korea human-rights nonprofit based in Toronto. While some things were different, "at this point in time, the only thing we can say is that these words have been said before, and nothing really happened," he said.

"No one in the Trump administration is starry eyed about what's happening here," John Bolton, Mr. Trump's new national-security adviser, told Fox News on Sunday.

And Hong Joon-pyo, the leader of South Korea's conservative opposition party, dismissed the inter-Korean joint statement as a "lavish party of words" worse than previous inter-Korean agreements, in a Facebook post over the weekend.

Still, the new inter-Korean statement had some new twists.

The declaration's most substantially new proposal was for the opening of an inter-Korean liaison office in Kaesong, a city on the northern side of the demilitarized zone, said Tereza Novotna, a Korea Foundation Fellow at Seoul National University.

But there, too, there were echoes of the past: The two sides previously ran a joint industrial park at Kaesong, which was featured in the 2007 agreement.

Both sides, meanwhile, agreed to dial down tensions in the disputed waters off their western coasts, as they did in 2007. Each time, the Koreas agreed to turn the maritime area into a peace zone.

Three years after the 2007 summit, those waters served as the backdrop for two North Korean attacks that killed 50 South Koreans. On Friday, Mr. Kim expressed regret to Mr. Moon over one of those incidents.

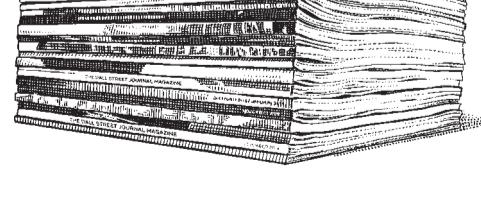
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WORLD NEWS

KOREA

Continued from Page One

"We hope a number of things could be achieved. I talked about getting the release of the American detainees. And then we talked a great deal about what it might look like, what this complete, verifiable, irreversible mechanism might look like....We use the word irreversible with great intention."

On CBS, White House national security adviser John Bolton said the North would have to do something similar to Libya, which let U.S. and U.K. observers into their nuclear sites. "What we want to see from them is evidence that it's real, and not—not just rhetoric," he said.

For Mr. Kim, the example of Libya may not hold that much appeal. While the Libyan government didn't have a nuclear weapon, in 2003 it voluntarily gave up its nuclear program and other weapons of mass destruction, allowing in inspectors to verify the dismantlement of the programs. In 2011, allies launched a bombing campaign on Libya that eventually led to an overthrow of the government and the death of strongman Col. Moammar Gadhafi.

Mr. Bolton's emphasis of U.S. and allied inspectors, rather than inspectors from a group like the International Atomic Energy Agency, could be telling. Mr. Bolton has long been skeptical of the effectiveness of international verification regimes.

Verification—and how to achieve it—will be central to the North Korean issue.

"You can verify that they have given up their program. You can verify that they have no facilities. But you can't verify that there are no [plutonium] pits or fissile material anywhere in North Korea," said Robert L. Gallucci, professor at Georgetown University and the chief negotiator with North Korea during the Clinton administration. "You can't verify to that level, and the administration should be honest with the U.S. Congress."



North Korean leader Kim Jong Un, third from left, inspecting a missile launcher last year.

eliminating intermediate missiles altogether.

Early agreements, before the Reagan-Gorbachev era of the 1980s, involved generally nonintrusive verification regimes, which weren't aimed at dismantling nuclear arsenals. The countries were able to monitor the number of missile launchers, bombers and submarines with spy satellites or other reconnaissance technology.

Later U.S.-Soviet agreements, including the Intermediate Nuclear Forces agreement, allowed for more intrusive inspections of facilities, which was necessary because they aimed to dismantle entire classes of weapons.

There are few precedents for a verification system like what would be needed in North Korea. One successful example of denuclearization is South Africa, starting in 1989. However, that agreement was forged amid less mistrust than with North Korea.

Inspectors and experts say they don't need to find everything to effectively enforce an arms-control agreement and that no verification system can be ironclad. But if North Korea's missiles and warheads are eliminated, it may not matter if it retains some plutonium.

"You have to work out what the real purpose is," said Ms. Lewis, now a scholar at the U.K.-based Chatham House institute. "The purpose is to remove the capability to strike. And so even if they have cheated, you ask if the cheating has defeated the purpose. In verification, that is called 'military significance.'"

For North Korea, inspectors would have to monitor the dismantling of a nuclear warhead, which is unprecedented. In South Africa, inspectors came in after the government's nuclear-weapons program was dismantled.

"These have only been tested in benign environments," Ms. Lewis said. "As far as I know, it has never been carried out in real-life, in potentially hostile environments."

—Michael R. Gordon contributed to this article.

WORLD WATCH

PAKISTAN

Imran Khan Launches Election Campaign

Tens of thousands of supporters of an opposition lawmaker who hopes to become Pakistan's prime minister gathered in the city of Lahore as his party launched its campaign for July elections.

Chanting slogans for change and waving flags, supporters of Imran Khan, a former cricket star, and his Pakistan Tehrik-e-Insaf party filled a park and surroundings in the power base of rival and former Premier Nawaz Sharif, who was disqualified in July by the Supreme Court for concealing his assets abroad.

—Associated Press

SYRIA

Government Forces Take, Lose Villages

Government forces briefly captured four villages east of the Euphrates River in the eastern province of Deir el-Zour after rare clashes with U.S.-backed Kurdish-led fighters, then lost the area in a counteroffensive by the Kurdish-led force. The area close to the border with Iraq has been the site of recent clashes between the two sides.

—Associated Press

UNITED KINGDOM

Child in Life-Support Controversy Dies

Alfie Evans, a gravely ill toddler at the center of an international controversy over end-of-life care and parental rights, died at a hospital in northwest England, his father said.

The case raised legal and ethical questions about the state's role in disputes between hospitals and family members over treatment, and pitted U.K. courts against Italian authorities and the Vatican.

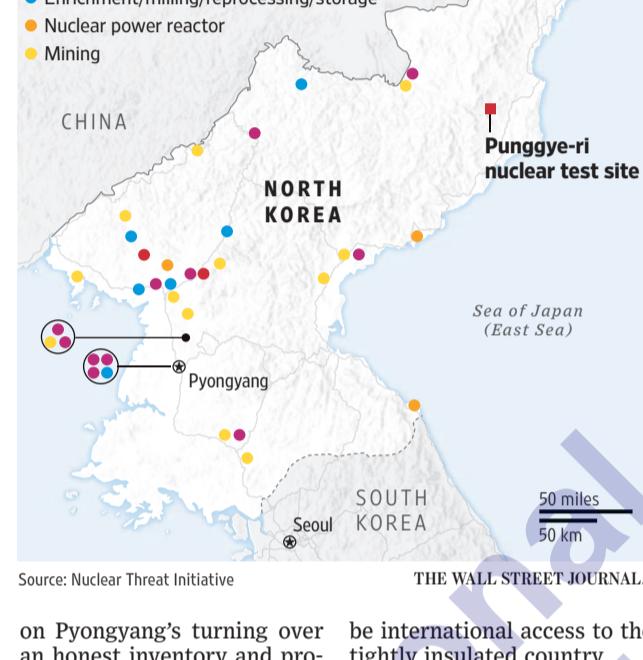
The parents of the child, who had a degenerative neurological condition, fought a months-long battle to stop his hospital from turning off his life support.

—Jenny Gross

Far-Flung Network

Inspectors from the International Atomic Energy Agency, the United Nations nuclear watchdog, would be responsible for many sites under a potential U.S. agreement with North Korea on its nuclear program.

Known and suspected sites of North Korea's nuclear facilities



Source: Nuclear Threat Initiative

on Pyongyang's turning over an honest inventory and providing access for timely inspections, experts said. Because of North Korea's history of violating agreements, experts said a critical aspect of any verification regime would

be international access to the tightly insulated country.

Verification regimes between the U.S. and Soviet Union succeeded in building confidence so the two superpowers could move from limiting long-range missiles to

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IN DEPTH

FREE

Continued from Page One

"The entire S.F. economy is V.C. subsidized," said Mr. Yu, who last year co-founded a blockchain technology startup called Stream. "It's a historical world of excess."

Venture capital has barreled by the billions into startups aimed at urban millennials, hunting for hits in businesses meant to shake up food delivery, home cleaning and car sharing, typically starting in the tech-savvy Bay Area.

But investors don't always have patience for slow growth. So companies juice demand with heavy discounts to first-time users—and generous referral bonuses for anyone who signs up a friend. Ideas that gain traction spawn competitors who tend to spend even heavier on marketing.

All the promotions make for a golden consumer age in San Francisco, so long as these businesses last.

Want a rental car? Getaround starts at \$5 an hour, and the first \$20 is free. A snickerdoodle cookie within 15 minutes? Doughbies offers \$10 off your first delivery. Or \$20 off your first \$30 order of marijuana?

Eaze will deliver in San Francisco within 20 minutes with a discount code.

Elad Ossadon and Noam Szapiro, who work in software engineering, have become referring pros. In 2016, they created a website called VC Fund My Life, which catalogs discounts and freebies. When a user signs up for the startups listed, they get a referral bonus, often altered by a buzz of their phones.

Mr. Ossadon said before he started the site, he was pushing startups with bonuses on anyone he knew. "Friends that visit here, move here—friends of friends, random people," he said. His reward: free burgers and Thai food delivered by startup Postmates and "months over months" of free housecleanings from on-demand services company Handy.

In all, Mr. Ossadon and Mr. Szapiro estimate they have earned over \$10,000 in referral credits, although many startups have started to put an expiration on the credits. "The challenge after a while became, can you use your credits before they expire?" said Mr. Szapiro, in a gray knit shirt acquired with the aid of referral credits from online retailer Everlane.

Referral credits can be good for business if the new consumer becomes a loyal—and



Ben Yu helped finance his Mini Cooper with startup deals.

paying—customer. For instance, Handy's chief executive, Oisin Hanrahan, said its "referral program has long served as a key contributor to our growth." The six-year-old company is now profitable, he said.

But bargain hunters, and those they refer, are often just looking for deals.

"A lot of those customers are bad customers in that they'll never pay you what your product is worth," said Henry McNamara, a partner at venture-capital firm Great Oaks Venture Capital, which invests in startups including Allbirds shoes and meal company Plated.

Such discounts are everywhere in the highly competitive

food-delivery space, troubling some participants. "The industry can't get itself off the incentives," said James Beriker, chief executive of Munchery. The discounting, he said, was driven by a desire "to grow and get customers at all costs."

He said Munchery has cut back substantially after heavy spending on bonuses, and now limits referral bonuses—typically a free meal—to five per person.

Many of the best deals have already come and gone. Chris Hutchins, a former venture capitalist who runs a financial-planning startup, used to love getting Za'atar Spiced Chicken delivered to his office by food-

delivery service Sprig. He bought discounted credits from a friend who accumulated about \$1,000 of them, though he suspected the company was losing money.

"I was literally trying to use my Sprig credit fast enough because I was sure they were going to shut down," he said.

Sprig, which raised \$56 million, shut down in May.

The list of failures is growing. On-demand package-boxing company Shyp initially used \$35 bonuses to win new users. It shut down in March. Its chief executive lamented getting caught up in a growth-at-all-costs mind-set. Other bonus-heavy startups that have folded include on-demand laundry service Washio and on-demand parking valet Luxe.

Mr. Yu, long a fan of bargains, stepped up his game around four years ago, after he noticed a barrage of offers from food-delivery companies.

He estimates he ate about 100 cooked meals, delivered to his door, courtesy of Munchery. It offers \$20 in credit to those who refer new users.

When he grew tired of Munchery's pan-seared salmon and roasted carrots, he tried competitors that had similar referral programs. In all, he estimates he ate thousands of dol-

lars worth of free and discounted meals.

Next he shifted to transportation. Beyond Uber and Lyft referral discounts, he helped pay for a \$9,000 used Mini Cooper thanks to rental-car startup Getaround, which at the time, guaranteed users \$6,000 income from renting their own cars through the service for a minimum of 72 days. He says the company cut him a \$2,944 check after he made about \$3,000. Getaround didn't respond to requests for comment.

He rode on a shared private jet between San Francisco and Los Angeles and Las Vegas after receiving a complimentary three-month membership from a jet-charter startup JetSmarter.

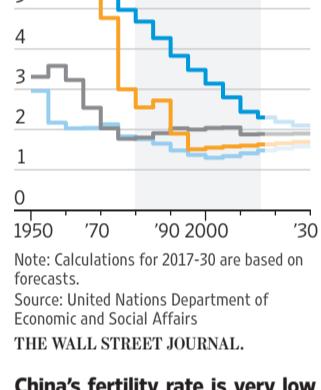
His most lucrative deal was a 2015 offer from cryptocurrency exchange Coinbase, which offered users \$75 for every new person referred to sign up. After announcing the referral code to friends in a Facebook post, Mr. Yu said he earned about \$4,200.

Coinbase paid him in bitcoin, he said, and he kept it in the account, accruing a value today of more than \$140,000. Coinbase declined to comment.

Mr. Yu has turned away from San Francisco and recently moved to Las Vegas. A main appeal? "Everything is subsidized," he said, by the casinos.

Baby Bust

China's fertility rate, once above India's, is now among the lowest in the world.



China's fertility rate is very low and its workforce is aging, but policies still discourage childbirth. Laws stipulate penalties for those who have more than two children.

cry online. Yunnan province authorities later put out a statement saying forced surgeries aren't allowed and that the officials had been wrong.

Mr. Hu confirmed his social-media post, saying he didn't want to talk about his treatment and wasn't seeking compensation. An official at the family planning bureau of Zhaotong, which was responsible for investigating the incident, said there had been an apology to Mr. Hu; she offered no further comment.

Wealthier Chinese have other options. Zou Yue, a blogger based in Guangzhou province, gave birth to her third child at an Irvine, Calif., clinic in 2016. Having a child overseas usually means the fine can be avoided. "I'd rather spend that money in the U.S. than paying a fine," she said.

U.S.-based Chinese researcher Yi Fuxian believes China overstates its population numbers and fertility rate—the number of children a woman has over her lifetime, which official data puts at around 1.5. He said a different reading of available data suggests the fertility rate is as low as 1.05.

In China, as elsewhere in the world, the hesitation to have more than one child is strongest in big cities, partly because of higher child-raising costs. Shanghai is especially lopsided, with low fertility rates and about a third of the population over 60, according to the municipal government. In New York City, adults over 65 make up about 13% of the total population, according to the city government.

The fertility rate in Liaoning, a province in China's northern rust belt, is at 0.74, official data show. Even so, Liaoning punishes those who have a third child, with some couples fined more than 145,000 yuan (\$23,000), according to public records. The Liaoning family-planning commission didn't respond to faxed questions.

The March congress move hasn't persuaded people such as a mother in Dalian, a Liaoning port city, who said she has been hiding since her third child's birth to avoid a fine she fears would be five times her family's annual income.

—Liyan Qi and Fanfan Wang



China's Population

Math Since Mao

For China's leaders, population math has never been simple. In Communist rule's early days, Mao Zedong said: "With many people, strength is great."

As the Communist Party struggled to build the economy, some officials began calling for population control to help China catch up with the West. In

1980, Deng Xiaoping launched the one-child policy saying "We must do this...Otherwise, our economy cannot be developed well and people's lives won't be improved."

Fertility rates dropped below replacement levels in the early 1990s and have continued falling. Yet Beijing codified the one-child policy in 2001, passing the Population and Family Planning Law that provided a legal framework. It amended the law

ment age or relying on immigration. Singapore, which has liberal immigration policies and which offers a "baby bonus" of up to 10,000 Singapore dollars (\$7,500) in cash as well as grants for parents toward health and education, has a growing population despite a low fertility rate of 1.16. Japan has steered healthy retirees back to work, sometimes with the help of technology making up for age-related deficiencies.

Despite one of the lowest retirement ages in the world, at 55 on average, Beijing has been slow to implement a plan to gradually raise the retirement age amid severe opposition.

Past policy changes haven't fixed the trend—not even ending the one-child policy. Newborns rose by 1.3 million in 2016, the first year without the policy—less than half the official projection—to 17.86 million, from 2015, according to the National Bureau of Statistics.

In 2017, births slowed to 17.23 million, well below the official forecast of more than 20 million.

In a generation that grew up without siblings, a one-child mind-set is deeply entrenched. Maternity-leave policies have been expanded but some women say taking leave twice is a career impediment. An All-China Women's Federation survey found 53% of respondents with one child didn't want a second.

Even without birth limits, China's economic development would have reduced fertility rates, says Martin Whyte, a Harvard University Chinese-studies expert. That has been the pattern elsewhere in the world: When incomes rise, the sizes of families tend to go down.

If the nation drops birth policies now, Mr. Whyte said, "China will learn what many other countries have learned—that it is much more difficult to

get people to have more babies than the other way around."

Local enforcement

When Ms. Li, the Qingdao professor, refused to abort her third child, she said, her university employer accused her of selfishly putting at risk her supervisors' careers, the school's future and co-workers' bonuses. A university spokeswoman didn't respond to faxed inquiries.

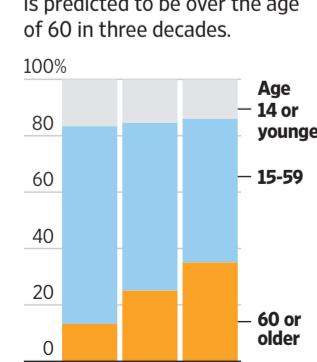
With the help of local church friends, her family moved to the Philippines, where she gave birth in November.

Hu Zhenggao, 42, ran afoul of the limits last year visiting his Yunnan province hometown. A father of four, he was taken away by local county officials who forcibly sterilized him, saying he had broken family-planning rules, he said in an account he posted on social media.

His ordeal prompted an out-

Senior Moment

A third of China's population is predicted to be over the age of 60 in three decades.



Sources: National Bureau of Statistics of China (2010); United Nations (2030, 2050)

THE WALL STREET JOURNAL.



China will soon have more people over 60 than the entire population of the U.S. Above, a nursing home in Beijing.

WUHONGFA/SHUTTERSTOCK

GREATER NEW YORK

Storm Protocol Tightened Up at JFK

Airlines must receive permission to land before planes depart from airport of origin

By PAUL BERGER

John F. Kennedy International Airport will impose new requirements on airlines and terminal operators to prevent a repeat of the days of delays and confusion endured by passengers following a January snowstorm.

When the next storm hits JFK, the Port Authority of New York and New Jersey, which operates the airport, says it will require airlines to get permission to land at JFK before planes depart from their origin airport. Port Authority Executive Director Rick Cotton said the rule, as well as other new measures, will kick in only when the airport declares a storm emergency.

The measures result from a series of meetings with airport groups such as terminal operators and airlines aimed at avoiding another breakdown like the one that occurred over several days beginning Jan. 4. "The 'no action' option was off the table," Mr. Cotton said.

The International Air Transport Association, a trade group, declined to comment on whether it supported all of the new procedures. A spokesman



Annie Sanchez and daughters Ana Sofia, Alejandra and Christina waited out a delay at John F. Kennedy International Airport on Jan. 7.

The new Port Authority measures require terminals to share equipment, staff and gates. It also forces airlines to provide a baggage service in their arrivals terminal.

Terminal One, which is operated by a consortium of four airlines, serves 21 carriers. Yet, only six of those airlines have dedicated baggage services, said Steve Rowland, executive director of Terminal One Group, the terminal's operator.

The terminal opened a communal baggage service in March that offers electronic luggage tracking and communications with passengers, he said. A handful of airlines already have signed up, Mr. Rowland noted, and he expects more to follow shortly. "That's a great win for passengers," he added.

Mr. Cotton said all airlines would be forced to comply with the new protocols. The measures are intended to supplement those put in place by the Port Authority in the wake of the January storm. Chief among them was the establishment of an expanded emergency-operations center that brings together the Port Authority, airlines, terminal operators, and airport-service providers.

The Port Authority is awaiting the results of an investigation it commissioned into the storm breakdown by former Transportation Secretary Ray LaHood. The report is expected in May.

said: "We look forward to working with the Port Authority and all stakeholders to collaboratively develop procedures based on industry best practices and expertise that will enhance the customer experience going forward."

JFK, which handles nearly 60 million passengers a year, had trouble coping with an in-

flux of international flights following the January storm.

Some long-haul flights took off before the Port Authority realized it couldn't open JFK because of the snow. Most diverted to other U.S. airports, setting up days of confusion as some terminals, which often run at or near capacity on a normal day, were overwhelmed

with arriving flights.

Some aircraft landed at JFK even though there weren't enough gates to handle the arrivals. And some terminals struggled to operate a regular schedule while they were backed up with empty aircraft from previous days taking up gate space.

As a result, passengers were stranded on planes for hours in

remote sections of the airfield waiting for buses to retrieve them. When they made it to the terminals they were separated from their luggage, in some cases waiting days to be reunited with bags.

The airport's six terminals, each run by different airlines or private operators, didn't coordinate during the storm.

Big Law Firm to Move to Sixth Ave.

By KEIKO MORRIS

One of the world's top-grossing law firms has signed a lease to relocate its New York City office to a Sixth Avenue tower undergoing a major overhaul, underscoring the demand for new or modernized space and boosting the Midtown office corridor's run of large corporate lease deals.

Law firm Latham & Watkins LLP late last week closed a deal to take 407,000 square feet at the former Time & Life Building, now called 1271 Avenue of the Americas, according to the tower's owner, Rockefeller Group. Latham plans to leave behind its current offices at 885 Third Ave., known as the Lipstick Building, and occupy floors 25 to 34 at Rockefeller's skyscraper, which is in the midst of a \$600 million makeover.

The lease term is for 15 years, according to a person familiar with the deal.

"They were one of the most sought-after tenants in the market, and many of our competitors were seeking them aggressively," said Ed Guittiani, senior vice president and head of Rockefeller's leasing.

Several years ago, concerns arose about the future of Sixth



Latham & Watkins signed a lease for multiple floors at the former Time & Life Building on Sixth Avenue.

Avenue, also known as Avenue of the Americas, as some big companies announced departures to other Manhattan locations. One of them was Time Inc. In 2014, Time, which Meredith Corp. recently acquired, announced it was moving its headquarters from 1271 Avenue of the Americas to 225 Liberty St. in lower Manhattan.

The addition of new office

buildings in Manhattan also increased competition for the owners of older buildings and has helped boost concessions. And rising towers on the far West Side also have signed lease deals with major firms from other Manhattan neighborhoods.

But over the past few years, a number of those vacant spaces on Sixth Avenue have been leased by big tenants.

Though average asking rents were flat, the first-quarter availability rate for the Sixth Avenue and Rockefeller Center corridor fell to 9.8%, from 11.1% in the previous year, according to real estate services firm CBRE Group Inc.

Rockefeller said it has signed 1.5 million square feet of new leases and renewals at 1221 Sixth Ave. since renovations began.

Please see SIXTH page A10B

Caviar Lovers Get Their Old-Time Sandwich Back

By CHARLES PASSY

New Yorkers have been known to bemoan the menu items lost to history.

Say, for instance, the date-nut bread sandwich from the long-closed Chock full o'Nuts chain of dining spots. Or the orange drink at the similarly shuttered Nedick's chain.

But diners, take heart: The caviar sandwich at the Grand Central Oyster Bar is back.

The bustling restaurant, a fixture at Grand Central Terminal since 1913, hasn't been in any danger of closing. But the under-\$15 sandwich, a novelty item that served as a kind of low-rent riff on the luxury lifestyle, disappeared from the menu several months ago.

The reason? The cost of the bowfin caviar, a cheaper variety of fish eggs used for the sandwich, had suddenly soared. That left the restaurant with two options: Increase the price of the sandwich threefold or nix it from the menu altogether.

Given that the whole point of the sandwich was to offer customers some caviar on the cheap, the Oyster Bar chose the latter.

Oyster Bar executive chef Sandy Ingber figured the situation would remain that way because he wasn't finding any caviar purveyors cutting deals.

"Once the sandwich was gone, I didn't think we would get it back," he said.

But fate, and caviar-sandwich fans, intervened.

The item, which had been on the menu for more than 15 years, had never been a huge seller, as a typical day saw up to 10 orders. But those who liked it really seemed to like it, Mr. Ingber said.

The appeal went beyond the



The caviar sandwich on white toast with a side of sour cream.

novelty aspect, he said. The dish, with the caviar served on plain white toast and paired with chopped egg with a dollop of sour cream on the side, is a perfect study in contrasting textures and flavors: salty, creamy and crispy.

Mr. Ingber found himself being won over by the sandwich's fans. Especially writer Oli Coleman, who penned an "elegy" for the sandwich earlier this year in the New Yorker magazine. "It went well with a severe martini," Mr. Coleman declared.

But Mr. Ingber still needed to find a source for low-cost bowfin caviar. Fortunately, one turned up at a trade show in Boston last month. The product is the same quality, he said, and only a tad more expensive when factoring in shipping.

Mr. Ingber was able to reinstate the sandwich on the menu two weeks ago, raising the price by only a dollar to \$13.95.

Oyster Bar regulars are relieved, and ordering it once again. Among them: Gerry Seitz, a 79-year-old Manhattan attorney who has been coming to the restaurant for a half-century. He stopped in this past Friday for a caviar-sandwich lunch.

"God works in wonderful ways," he said.



Grand Central Oyster Bar has been around for over 100 years.

Landlords Win Ruling on Raising Rent

By JOSH BARBANEL

In a rare victory for landlords, the New York Court of Appeals has ruled they acted properly in pushing up rents when they converted thousands of regulated apartments to market-rate units.

The unanimous decision last week overturned an appellate court ruling that challenged the process landlords and state regulators had followed for many years in deregulating apartments with high rents.

The law allows the deregulation of vacant regulated apartments when rents exceed a threshold—for many years that was \$2,000 a month, but it currently is \$2,733 a month.

The lower court had said landlords should use the final rent paid by the previous tenant to calculate the rent of regulated units, but landlords instead typically added up to 20%—the amount allowed after a vacancy—and the costs of renovations to the rent.

The case "had the potential to completely upend the city's residential market," said lawyer Jeffrey Turkel of

Past Decisions Riled Building Owners

Landlords have been critical of the New York Court of Appeals in the recent past.

They said the court has moved from a close reading of state statutes to a broader focus on public policy and the plight of vulnerable tenants.

Among other decisions,

they cited a 2010 case in which the court held that tenants could look back many years to challenge rents if they made a plausible claim of fraud, despite a law that precluded a look at rental history "prior to a four-year period."

Tenant lawyers said the decisions were firmly grounded in the law.

All current Court of Appeals judges were appointed by Gov. Andrew Cuomo, a Democrat.

Rosenberg & Estis, who argued the appeal on behalf of the landlord.

"Tenants lost today, especially struggling tenants who need it most, there is no question about that," said Lawrence W. Rader, who represented Richard Altman, a lawyer and tenant who lived in a small apartment building in the West Village and filed suit to challenge his rent.

At issue in the case is the interpretation of convoluted rent regulation laws that the Court of Appeals once described as an "impenetrable thicket" for laymen and lawyers.

Landlords routinely add in a vacancy allowance of 20% as well as a rent increase to cover the costs of renovations before determining what the legal rent was. But in 2014, Mr. Altman sued and said that nine years earlier, a previous owner of the building had illegally deregulated his apartment.

Under a strict reading of the law, he said, the owner shouldn't have included the vacancy allowance in the calculation, which increased the rent to a level high enough to deregulate the unit.

An appellate court agreed

and the current owner was ordered to pay back \$165,000 in rent, interest and penalties, and to lower the rent to \$1,829, the same amount the prior tenant had paid.

That triggered about 20 additional lawsuits against other landlords, Mr. Turkel said, and fears that many more would follow.

The language in the law covered apartments deregulated between 1997 and 2011, when about 118,000 vacant apartments were deregulated because of high rents, according to figures compiled by the city's Rent Guidelines Board. It isn't clear how many included the extra rent increases in the calculation.

But the Court of Appeals, in a case known as Altman v. 285 West Fourth LLC, ruled the statute included two different criteria for the legal rent, including one that allows other additional rent increases. It cited legislative history to bolster the interpretation. It found the state legislature adopted the language to overturn a more narrow interpretation of the provision by the New York City Council.

MARIO TAMA/GETTY IMAGES

GREATER NEW YORK

GREATER NEW YORK WATCH

NEW YORK CITY

Three Dead, Others Critically Hurt in Fires

Three people died and others, including children, were critically injured in two fires over the weekend.

An 82-year-old woman, an 87-year-old man and a 32-year-old woman were killed in a house fire that broke out late Saturday night at a two-story home in Queens.

Eight other people were taken to hospitals. Three, including an 8-year-old girl, were listed in critical condition. The other five were hospitalized in stable condition with injuries that aren't believed to be life-threatening.

On Sunday morning, meanwhile, three people including two children were hospitalized in critical condition after a blaze in a Harlem apartment building, the Fire Department of New York said.

The causes of the fires are under investigation.

—Associated Press

NEW JERSEY

Girl, 16, Is Killed By NJ Transit Train

Transportation officials say a 16-year-old girl was struck and killed by an NJ Transit train before dawn Sunday.

The train was heading through Clifton just east of the Paterson station when it struck the girl at about 5:30 a.m. Sunday.

NJ Transit said on Twitter that there had been delays because of what it called a "trespasser fatality."

An NJ Transit representative said there were no passengers at the time of the accident and the three crew members on the train weren't hurt.

The girl, who officials said was from Franklin Lakes in Passaic County, hasn't yet been identified. The case is under investigation.

—Associated Press

Actor Plays His Part, Knows the Life

BY BARBARA CHAI

Long before he ever walked a mile in their shoes, actor Brian Tyree Henry knew his characters.

He empathized with the rapper he plays in the FX series "Atlanta," Alfred "Paper Boi" Miles, and understood what it meant to grapple with newfound fame and to struggle to feel at home in a city he has known his whole life.

He also knew the security guard William in Kenneth Lonergan's play "Lobby Hero," a fast-talking, upstanding man who takes authority seriously.

When his brother is arrested and accused of committing a horrible crime, William is forced to weigh his strict morals against the realities of how law enforcement and the criminal justice system treat black men.

"I know him. I know that life," Mr. Henry said of William, whom he currently plays on Broadway. "I live in Harlem, I know what it's like to walk down the street and be made to feel that way."

Mr. Henry, 36 years old, spoke about his own rising fame, and how his life intersects with his characters' lives. Here are edited excerpts.

Your character William in "Lobby Hero" also has to put up with disrespect, from his junior security guard, Jeff, whose actions profoundly change William's life.



Brian Tyree Henry, left, and Chris Evans in a scene from 'Lobby Hero' at the Hayes Theater.

baby holding his hands up to be picked up, who wants to be protected. He wants to know that somebody is protecting him. I live around it.

When you wear the security-guard uniform, and spend the play talking to other characters in police uniforms, how does that inform your performance?

It's amazing what uniforms do. I came from a family of security workers. My sisters all were in security and I thought it was really interesting being the only boy, that I would watch these women come in with their bulletproof vests and a gun and mace.

Even when they're in those uniforms, they're different people.

The play is also very funny. How do you balance William's authority with his humor?

I have a very bad radar for how people are going to respond to certain things, so I did not think that people would find it funny. There's humor, sure, but especially with William and Jeff, I did not think that people thought our relationship would be funny. I was like, "Oh my God, are we like 'The Honeymooners' here? I didn't realize I was Ralph!" But there's still a sense of hardness that I have to have, and I love that people can find humor in the hardness that I play.

SIXTH

Continued from the prior page
tions to the lobby and plazas were announced in 2013.

In 2016, Salesforce announced an expansion and creation of its new regional headquarters at 1095 Sixth Ave., now known as Salesforce Tower New York. Also, that year, a venture led by RXR Realty bought 1285 Sixth

Ave. and renewed more than 900,000 square feet of space for Swiss banking giant UBS Group AG.

Last year, Sixth Avenue topped other Manhattan thoroughfares for the highest leasing of the largest 50 deals completed, according to a report from Avenue of the Americas Association, a civic improvement group that includes many of the corridor's building owners. Almost all of those deals on the avenue

were above West 40th Street.

"Many people think of Sixth Avenue as an old-fashioned corporate row, when in fact it has some of largest media and technology companies in the country," said John P. Maher, executive vice president at CBRE and a part of the team representing Rockefeller in the deal.

The Wall Street Journal's offices and the headquarters of parent company News Corp are located on Sixth Avenue. Rockefeller took the op-

portunity to empty out 1271

Avenue of the Americas so it could launch a complete remodeling of the 1959 tower and restoration of its landmark lobby. The renovation includes the replacement of the 450,000-square-foot glass-curtain wall to create floor-to-ceiling windows inside.

"Many factors informed our decision to move to 1271, including its central Midtown location, architectural signifi-

cance, and top quality renovations, coupled with the opportunity to design a new office," said Michele Penzer, managing partner of the New York office of Latham, in an emailed statement.

With the Latham deal, the 2.1 million-square-foot tower is now more than 50% leased. Major League Baseball was the first to claim space for the redeveloped building with plans to set up a 400,000-square-foot headquarters there.

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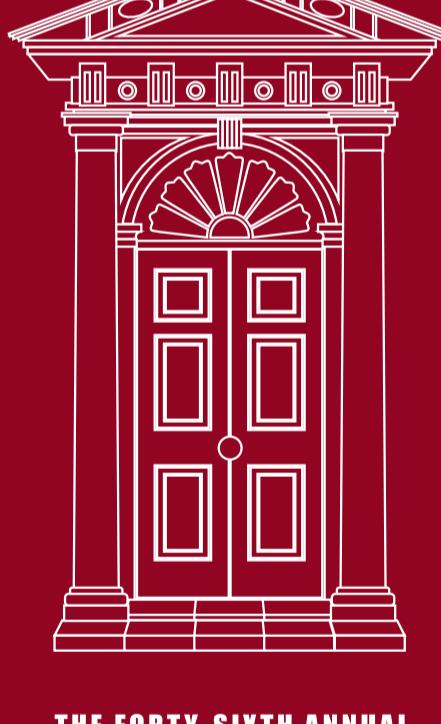
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LIFE & ARTS



Performers at Rolling Loud this year will include, from left, Lil Uzi Vert, 21 Savage, Post Malone, Migos, Young Thug, Future. Below, friends Matt Zingler, left, and Tariq Cherif, co-founded the festival.

MUSIC

Two Friends Who Built a Rap Festival

Miami hip-hop festival Rolling Loud will draw 60,000 fans daily May 11-13 to see artists like J.Cole, Migos and Post Malone

BY NEIL SHAH

ONE OF HIP-HOP'S biggest festivals comes from two millennials in Florida.

Rolling Loud, a three-day concert starting May 11 at the stadium where the Miami Dolphins play home games, will be headlined by J. Cole, Travis Scott and Future, with Migos, Post Malone and more than 100 other rappers and groups also performing.

The annual event, now in its fourth year, was created and continues to be run by Tariq Cherif, 28 years old, and Matt Zingler, 29. The two men met as elementary-school students in Hollywood, Fla., and cut their teeth in the music business promoting local shows by rappers like Rick Ross and Kendrick Lamar.

"At the time, [hip-hop] was a niche genre," Mr. Cherif says. "But as the niche genre became mainstream, our brand grew."

In an industry where high-profile festivals like Coachella, Lollapalooza and Bonnaroo have corporate owners such as Live Nation and AEG Presents, Rolling Loud stands out. "Our independence has allowed us the freedom to create this world," says Mr. Zingler.

It hasn't always been easy. In its first year, Rolling Loud drew 7,000 attendees but lost money.

"It rained like crazy," Mr. Cherif says. "A lot of things went wrong."

The next year, he and Mr. Zingler generated enough revenue to recoup their first-year losses and turn a profit. Last year's Rolling Loud, whose three-day passes cost \$300 plus \$83 in fees, brought in



40,000 attendees a day. Now the Miami festival is "self-sustained through event revenues," a festival spokesman says.

Austin McGreevy is among the 60,000 fans expected to attend this year's Rolling Loud each day. The 19-year-old student, a freshman at the University of Miami, says festivals sometimes make the mistake of spending most of their budget on big headliners, at the expense of the rest of the bill. Rolling Loud's lineup, however, is notably comprehensive, he says.

"It's a who's-who of hip-hop pretty much," Mr. McGreevy says.

Cultivating relationships with artists and their managers and agents early on has been key. On Sept. 25, 2012, Messrs. Cherif and Zingler helped Mr. Lamar perform

in Tallahassee, Fla. Five years later, he headlined Rolling Loud.

"When we're reaching out to [artists] today, they think, man, these kids have come a long way—and I've come a long way," Mr. Zingler says.

Rolling Loud's lineup spans the subgenres and generation gaps of hip-hop, ranging from mature stars (Gucci Mane, Lil Wayne) and mainstream favorites (Future, 21 Savage) to left-field acts (Big K.R.I.T., N.E.R.D., Metro Boomin) and up-and-comers (Ski Mask the Slump God, CupcakKe, Yung Lean).

Despite hip-hop's popularity, large-scale rap festivals aren't common. Rock the Bells, a long-running hip-hop festival, ended in 2013. New York hip-hop radio sta-

tion HOT 97 hosts a one-day "Summer Jam" every June, but with 15 acts this year, it is much smaller than Rolling Loud.

Jeanne Wilkinson, former senior vice-president of global research at Live Nation and now executive director of the Music Industry Research Association, says the economics of single-genre festivals are tough because their potential audience is smaller. With rap, many festival professionals also lack strong ties to artists and managers. "It's a relationship business," Ms. Wilkinson says.

Another factor: the perception that rap events are more prone to violence, something promoters say is based on stereotypes, not reality, but which can lead to higher security and insurance costs.

There were 47 arrests at last year's Rolling Loud in Miami—most of them not related to violence—which is in line with other festivals of its size, according to the Miami Police Department.

The roots of Rolling Loud go back to the duo's college days.

As hip-hop fans, Mr. Cherif and Mr. Zingler noticed that rap events weren't as bountiful in Florida's markets as electronic-dance-music ones. In 2010, they began working as promoters, earning kudos for lining up three to five shows in different parts of the state for an artist instead of just one.

In Florida, "we were the guys you'd go to," Mr. Zingler says.

They modeled Rolling Loud not on Rock the Bells or other hip-hop shows but on EDM festivals that draw tens of thousands of fans. At the same time, South Florida became one of rap's hottest scenes.

Now Rolling Loud is expanding into new markets. The two owners last year launched events at the Shoreline Amphitheatre in Mountain View, Calif., which is operated by Live Nation, and the National Orange Show Events Center in San Bernardino, Calif. Live Nation declined to comment.

They are working on festivals in Europe and Asia and expect to announce some events this year. Initially,

One of Mr. Cherif's priorities is ensuring quality across events. "I see Rolling Loud like Coca-Cola, McDonald's," he says.

Mr. Cherif "will be like, 'oh man, I don't know if that's a good thing to do,'" Mr. Zingler says, "but realistically, he's going to jump in with me, because we're brothers."

ABOVE: WSJ PHOTO ILLUSTRATION: GETTY IMAGES (5); ZUMA PRESS (POST MALONE); CHRISTIAN CASAS (BACKGROUND); FOUNDERS FROM LEFT: JEFFERY SALTER FOR THE WALL STREET JOURNAL; MATIAS VASQUEZ

WHAT'S YOUR WORKOUT? | By Jen Murphy

A RUN TO GET A BUDDY BACK ON TRACK

ADRIENNE GRUNWALD FOR THE WALL STREET JOURNAL
Volunteers and homeless members of the nonprofit Back on My Feet form a huddle before an early-morning run.

WORKING OUT can sometimes seem selfish. But Andy Levine has found a way to give while putting in miles. One morning a week, he joins Back on My Feet, a nonprofit running group focused on the homeless.

"It's such a fascinating group to run with," says Mr. Levine, the chairman of Development Counselors International, a public-relations firm headquartered in New York City. "I'm encouraging these guys but I think I get just as much out of it as they do."

For nearly 20 years, Mr. Levine, 57, was a regular at the 10-mile Saturday runs held by a running club in Westfield, N.J. "I looked forward to those runs all week," he says. The group inspired him to run his first marathon in 1998. He went on to run 11 more.

In 2014, Mr. Levine developed Haglund's deformity, a painful, bony enlargement on the heel that a specialist told him resulted from years of running on hard surfaces. "Running had become a big part of my life so I was devastated," he

says. His doctor said running every other day would be OK if he could manage the pain with icing and stretching. Mr. Levine found six miles was the farthest he could run pain-free so he had to give up his long-distance running group.

Last summer, he learned about Back on My Feet at a dinner party. "I'd always been interested in the struggles of the homeless and thought this was a way to pair two interests," he says. In September, he started running with a chapter that meets at a homeless shelter near his Manhattan apartment.

George Lyons, 51, an ex-Marine who has been in and out of jail and struggled with narcotics, was one of Mr. Levine's favorite running buddies. Mr. Lyons recently finished his first half-marathon and is training for the TCS New York City Marathon in November. "To get somewhere you have to start one step at a time," says Mr. Lyons. "That goes for running and life. I've found this beautiful community that is helping me keep step-

Please see WORKOUT page A12

LIFE & ARTS

YOUR HEALTH | By Sumathi Reddy

Are Friends the Secret to Good Health?

To curb loneliness among the elderly, redone senior centers encourage socializing with classes such as kung fu with canes

KERSTIN GERST EMERSON kept hearing an unusual complaint from doctors she worked with.

Elderly patients kept coming to see them without any health problems. They weren't feeling sick. They were feeling lonely.

Dr. Emerson, a clinical assistant professor at the University of Georgia's Institute of Gerontology, did some digging with a health economist and found that adults 50 and older who were categorized as lonely were going to see their primary-care physicians more often than those who weren't lonely. They published their findings in the American Journal of Public Health in 2015.

"A lot of people have known their doctors for a really long time, they know the office staff, and it really does become a social interaction," Dr. Emerson says.

Numerous studies have documented how loneliness can negatively affect health, particularly among the elderly.

Now, one health-care provider is going as far as combating loneliness as a treatable medical condition. CareMore, a California-based subsidiary of Anthem that provides health care to 150,000 Medicare and Medicaid patients across the country, is screening its elderly patients for loneliness.

They've created a "togetherness" program for those deemed lonely and they are remodeling their clinics to encourage seniors to socialize, even when not waiting for a medical appointment.

Dr. Emerson says CareMore's effort to tackle loneliness is among the first national efforts in the U.S. The United Kingdom and Australia have formed national campaigns or coalitions to end loneliness. U.K. Prime Minister Theresa May even appointed a minister for loneliness earlier this year.

At a newly remodeled CareMore clinic in Modesto, Calif., there are large, square tables, coloring books, puzzles and games like chess and backgammon.

"Our care centers are no longer just medical office spaces, they are like community centers," says Sachin H. Jain, president of CareMore, a subsidiary of Anthem insurance company.

Studies show loneliness is a risk factor for everything from cardiovascular problems and Alzheimer's disease to diabetes and stroke.

"Loneliness is an independent risk factor for death and func-



At a CareMore center in Modesto, Calif., Mike Reynolds played guitar for other members including his wife, Lorraine, left, and Beverly Barney. Below, Sandy Jostad, and Julius Emery Jr., tackled a puzzle; at right, a round of chair volleyball.



tional decline," says Carla Perissinotto, associate chief of clinical programs in geriatrics at the University of California, San Francisco. She is first author on a 2012 study that found that elderly people who identified themselves as lonely had a greater risk of death and a decline in the ability to perform everyday activities like getting dressed and eating.

Other analyses have found that lacking social connections has a similar impact on mortality as smoking 15 cigarettes a day, and that loneliness affects mortality risk more than obesity.

"People who are socially isolated or lonely, typically the first thing to go is their level of self-care," Dr. Jain says. "They don't take their medicines, they don't eat as well, they don't exercise."

About a year ago, CareMore appointed Robin Caruso to manage a program of more than 700 seniors, and hopes to recruit more. Her title: chief togetherness officer.

CareMore members are screened for loneliness during physical exams and in health assessments when they first join.

"That's one of the most difficult things about this disease," says

Ms. Caruso. "These people are invisible."

Once in the program, seniors get regular phone calls from CareMore employees called "connectors," who check in on them and try to connect them with services for food, transportation and socialization. Some also get home visits.

"One of our goals is to really get them reconnected to their health care," says Ms. Caruso.

She recalls an elderly patient with a severe mental illness who was lonely. People didn't want to be around him because he was dif-

ficult. Once he started receiving regular phone calls, his behavioral health team says he stopped skipping appointments. He also agreed to try his medications again, which he had been refusing to take.

Employees also urge patients to use the company's free Nifty After Fifty gyms, which are usually attached to their clinics. The gyms include classes like seniors zumba and cane fu (kung fu with canes).

Patricia Loeb is among those in the togetherness program. The 70-year-old Bellflower, Calif., resident joined in November after a telephone outreach call. Her husband died about 15 years ago and she lives alone with a part-time caregiver. As part of the program, a social work intern, Sara Santos, visits her at home once a week.

"I have some kind of little support behind me to help me and keep me on the right path," says Ms. Loeb. "It's helpful knowing that somebody is out there that cares. I'm not as depressed anymore."

Before the visits, Ms. Loeb, who uses an electric wheelchair, says she didn't get out of the house much. Now, she's started going to a nearby Nifty After Fifty gym once a week, where she focuses on mostly upper-body strength-training. She hopes to be able to play chair volleyball soon.

Charlotte Yeh, chief medical officer for AARP Services, says survey data of Medicare seniors shows that 27% to 29% of them are lonely. The organization is testing ways to combat loneliness. One method uses animatronic pets that can imitate real cats and dogs with sounds and motions. She notes that one senior who brought an animatronic cat to dinner at a restaurant found people approaching her to ask about it.

Steve Cole, a genomics researcher at UCLA, says there is genomic evidence showing how loneliness can cause disease. Transient loneliness that occurs from something temporary, like moving to a new city, doesn't have the physiological and biological effects that chronic loneliness has, he notes.

Studies he and others have done show that lonely people have certain more active genes that make the proteins that cause inflammation in the body. That inflammation is often a precursor to chronic conditions and diseases. Research has also found that some genes involved in defending against viral infections are less active in lonely people.

Other chronic stressors, like the death of a loved one, cause similar genomic changes, says Dr. Cole.

"That molecular defense program is basically running all the time in lonely people," says Dr. Cole. "It's not just their psychology; their cells are running differently."

WORKOUT

Running With Purpose

WORKOUT

Continued from page A11

ping in the right direction."

Mr. Lyons recently completed his time at a drug-and-alcohol treatment center that works with the homeless and now lives on his own and works for the Fortune Society, a nonprofit that helps people transitioning out of incarceration. He runs with an uptown chapter of Back on My Feet.

Mr. Levine says despite everyone's differences, when they lace up their sneakers they're all just runners. "I've gotten to interact with a segment of the population I knew nothing about," he says. "It's given me a very different perspective on life."

The Workout

On Wednesday mornings, Mr. Levine runs 1.5 miles from his apartment in New York to meet the Back on My Feet runners at 5:30 a.m. The group of 20 to 25 men and women greet each other with hugs. "It's weird when you first do it but then becomes habit," he says.

A designated captain takes attendance and poses a random question to the group, like "Do you prefer ice cream in a cone or a foot?"

"It breaks the ice for newcomers and we learn something quirky about each other," says Mr. Levine.

Volunteer co-captains lead the group in a warm up of jumping jacks, squats and stretches. Then, the group forms a huddle and says the Serenity Prayer used by Alcoholics Anonymous as a show of solidarity. More than 60% of Back on My Feet members have some sort of addiction problem, accord-



ing to the organization's CEO, Katy Sherratt. The group then departs for a run of about 5 miles.

"You never let anyone run alone," says Mr. Levine. "If someone starts to drop off from the group one of us slows down to wait for them." They end back at the shelter, cool down, huddle up and repeat the prayer and hug each other goodbye.

Mr. Levine tries to run three more days a week, usually along the boardwalk near his main home in Ocean Grove, N.J., or when he is on the road for work travel. He aims to run 4 miles at a 9- to 9:30-minute pace. "It's about all my foot can handle," he says.

For the last five years, Mr. Levine has worked one-on-one with a personal trainer in Asbury Park, N.J. They meet twice a week between 5:30 a.m. and 7 a.m. for 30 minutes. A typical full-body workout includes lat pull-downs, dips, a seated leg press, hip adduction, leg curls,

push-ups, bicep curls, lower back extensions and crunches.

The Diet

Mr. Levine makes a smoothie of coconut milk and frozen strawberries and pineapple for breakfast. After his Wednesday runs he splurges on a toasted whole-wheat bagel with nothing on it. "It's my treat for the week," he says. Lunch is often a Chipotle burrito bowl or salad. He and his wife might make grilled chicken or turkey sausage with vegetables for dinner. He says dining out for work is his downfall.

The Gear & Cost

Brooks Running Co. is the national partner of Back on My Feet and supplies members with sneakers and apparel. "If you passed us on the street you couldn't tell the residents apart from the volunteers," he says. Mr. Levine has been devoted to Asics sneakers for 20 years and runs in the Asics Gel-Nimbus (retail \$160).



Top, Andy Levine (in maroon), runs in New York. Running buddy George Lyons, above, finished a half-marathon.

Back on My Feet is a running club with a social cause. Founded in 2007, the nonprofit now has 12 chapters throughout the U.S. and has helped more than 5,000 people find jobs and housing.

"There's a negativity surrounding the word homelessness," says Katy Sherratt, the San Francisco-based CEO of Back on My Feet. "But many people end up in shelters because they've lost everything and have no family. They're just like you and me, just born into different circumstances or they've had a tough break."

The program works with more than 70 homeless shelters and residential facilities around the country. Volunteers must go through an orientation that explains ground rules, such as no money exchange. Members must be sober and clean for 30-60 days to participate in the program. Sobriety must be verified by the caseworker and confirmed by the member. They must also sign a commitment letter promising to run with the group three days a week.

After 30 days with 90% attendance, members have access to the organization's Next Steps program, which provides access to job training and interviews with employment partners. Runners get incentives such as T-shirts and medals for hitting mileage milestones.

"The idea is to show people that good things will come if they work for it," Ms. Sherratt says. "The program is designed around restoring confidence and self-esteem so people can get back on their feet."

LIFE & ARTS



ART REVIEW

Recasting History

BY DOMINIC GREEN

London **'IN MY SPARE TIME,** I simply haunt the British Museum," Auguste Rodin told an interviewer in 1903. The museum had the Elgin Marbles—more than half of the surviving statues and friezes designed by Phidias (c. 480-430 B.C.) for the Parthenon at Athens.

Rodin (1840-1917) was not so much haunted as captivated by Greece. Compelled to incorporate and extend its forms, he created a new genre, the partial figure, and adopted the fragment, archaeology's gift to Modernism, as the expression of the complete work.

Brilliantly conceived, the British Museum's new exhibition "Rodin and the Art of Ancient Greece" juxtaposes Rodin with his idol Phidias. More than 80 works in marble, plaster and bronze, many from the Musée Rodin in Paris, are presented alongside selections from the Elgin Marbles in the clear, albeit not Attic, light of the Sainsbury Exhibitions Gallery, whose end wall is a window.

The rhythm of surface resemblance runs between the pairings, but it is the deep

resonances and contrary pressures that make this exhibition so stunning. Cicero praised Phidias for summoning "a sort of extraordinary apparition of beauty" from his imagination (*phantasia*). Rodin sought "the entire truth, not only what is on the surface." His sculptures are immersed in the fragmentary past, but their extraordinary beauty emerges as an intensely present reality.

Juxtaposing the French sculptor with selections from the Elgin Marbles.

The nude male in Rodin's "The Age of Bronze" (1877) raises an arm like the tensely posed unmounted youth who prepares for the cavalcade on the north frieze of the Parthenon. The posture also invokes Michelangelo's "The Dying Slave" (1513-16), and the Doryphorus (Spear-Bearer) of Polykleitos (440-430 B.C.). Instead of replicating Polykleitos' arithmetical perfection and Phidias' impersonal muscularity, Rodin presents a nervous,

boyish figure. "The Kiss" is a modern archetype, so we easily forget that the lovers are the adulterers Paolo and Francesca from Dante's "Divine Comedy," and that Giancotto, his brother and her husband, is about to discover and kill them. Pairing a large plaster version of "The Kiss" (after 1898) with two diaphanously draped goddesses from the Parthenon's East Pediment emphasizes the erotic flow of drapery and flesh-like marble between the goddesses.

Rodin obscures his mortal faces; Phidias' goddesses have lost their heads which, judging from surviving pedimental heads, would have been impassive. The body must talk, and the conversation runs between the pairings. Unfinished patches behind the goddesses are echoed by the *all'antica* roughness of the lovers' seat. The crack where a goddess's arm has broken is doubled by the crevice in Paolo's back muscles. The goddesses have never seemed so three-dimensional, or so intimately alive.

The Parthenon sculptures were made as architectural ornaments, but dismantled as art objects. A similar fate befell "The Gates of Hell,"

commissioned by the French state in 1880 for a decorative-arts museum in Paris that failed to materialize. Over the next decades, the figures climbed down as independent works, resonant with living myth.

The river god Ilissos, who once reclined on the West Pediment of the Parthenon, undulates next to "The Earth" (1896), in which Gaia strains against formlessness as though aspiring to pedimental perfection, and "Ari-

adne" (1905), who began as "Reclining Woman" in "The Gates of Hell," before being renamed after the "Sleeping Ariadne" in the Vatican. Time has exposed the hidden plane that predestined Ilissos to emerge from his marble block, a rippled striation that runs diagonally across his back from his left shoulder, and then down his right thigh.

Rodin builds the same plane with Ariadne's sinews.

The Victorian Neo-Helle-

Auguste Rodin in his Museum of Antiquities at Meudon on the outskirts of Paris (c. 1910)

nists, too late for Byronism and too early for Hollywood, aimed for perfection. Rodin saw the Marbles as they were: damaged and cryptic, defaced by the hammers of Christian zealots and dilapidated by Turkish gunpowder. Then and later, Athenian life was an *agōn*, a contest of forces.

Bibi, the Parisian laborer who modeled for "Man With the Broken Nose," resembles a Silenus or a Sophocles. He is not drunk on wine or language, but dazed by a blow from a shovel. We see the modern *agōn* in the broken planes of his face. He was denied entry to the Salon of 1865 (though he gained admittance in 1875).

With similar fluidity, Rodin invents the "Sister of Icarus" (1894-96), raises a naked dancer to the pantheon as "Iris, Messenger of the Gods" (1895), and combines fragments into "The Centaur" (1903-04). Her exaggerated stretch anticipates further modern dislocations. Before T.S. Eliot's "heap of broken images," Rodin was exploiting his "mutilated gods" as the material of new composites.

This is the first time that the British Museum has mixed Phidias' Marbles with the work of another artist. Few could endure the contest. And Rodin, who never visited the Acropolis, might have appreciated this exhibition's implicit argument for retaining the Elgin Marbles in so illuminating a spiritual exile: that the Rodin pairings put them into dialogue with the history of sculpture, rather than the myths of Athens. "What perfect unity there is in this fragment," he marveled. "Is not the entire Acropolis here?"

Rodin and the Art of Ancient Greece

The British Museum, through July 29

Mr. Green is a historian and critic in Boston.



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Large plaster version of Rodin's 'The Kiss' (after 1898)

SPORTS

NBA PLAYOFFS

CAVS SURVIVE IN GAME 7

BY BEN COHEN

"Whole game," LeBron James said. "I'm playing the whole game."

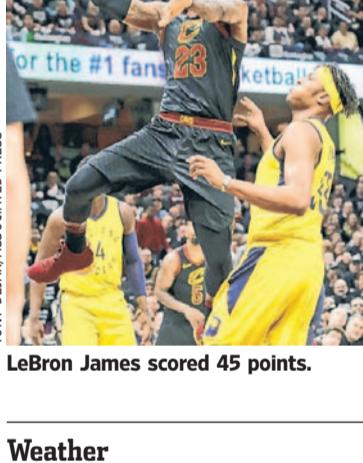
It was the first half of the Cleveland Cavaliers' draining 105-101 win over the Indiana Pacers in Game 7 of their exhausting playoff series on Sunday when James informed the home crowd that he intended to be on the court for all 48 minutes with the season on the line.

That he didn't play the whole game was surprising considering it was just about the only thing that James couldn't do in another epic game in which he scored 45 points to close another epic series in which he averaged 34.4 points, 10.1 rebounds, 7.7 assists. But that he even thought he had to play the whole game turned out to be the most revealing thing about the first round of the NBA playoffs.

The paradox of Cleveland winning this series is that it showed why Cleveland can't win for much longer. The first round has been a working vacation for James in recent years. He hadn't lost a game in the first round since 2012, when the Miami Heat eked out a 4-1 series win over the New York Knicks. That's how long it's been since any team made James sweat this early: The Knicks were actually in the playoffs.

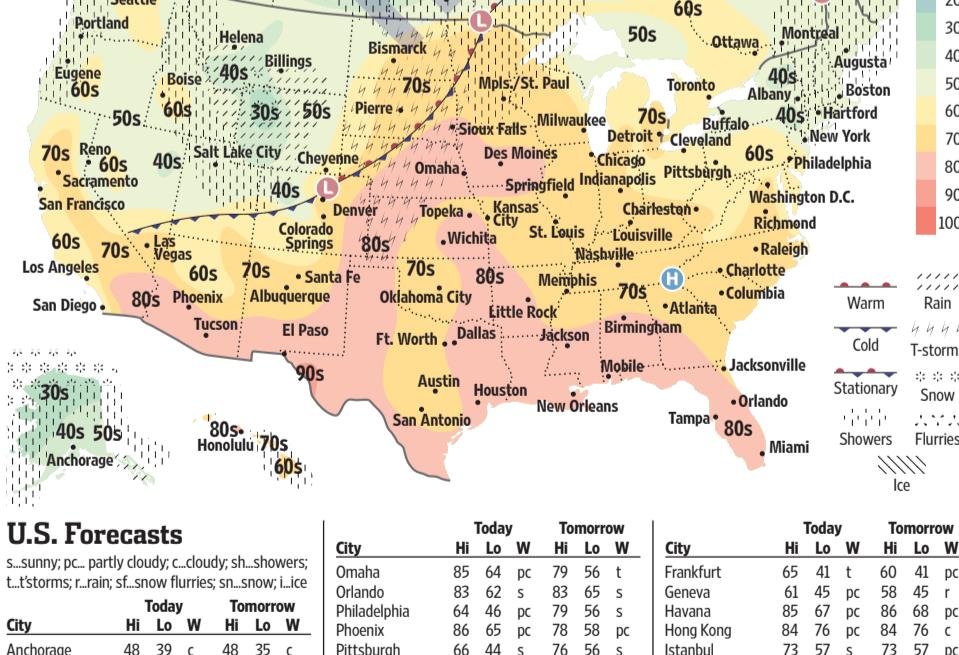
James could afford to play heavy minutes in the three first rounds since he came back to the Cavaliers because he knew that a sweep would give him more than a week of precious time to rest. The effort would be worth the reward on their inevitable road to the Finals.

The difference this year is that he didn't have a choice. The Cavaliers lost as many games in the first round to the Pacers as they did in their six Eastern Conference series over the last two years combined, and they survived because they had James. But that's not a strategy. It's a problem: They only have James.



LeBron James scored 45 points.

Weather



U.S. Forecasts

S...sunny; pc...partly cloudy; c...cloudy; sh...showers; t...storms; r...rain; sf...snow flurries; sn...snow; l...ice

Today Hi Lo W Tomorrow Hi Lo W

OPINION

Mexico's Two-Man Race

AMERICAS
By Mary Anastasia O'Grady

Mexico's presidential campaign kicked into high gear last week when the five official candidates who will be on the July 1 ballot participated in the first of three televised debates. Questions focused on security, corruption and democracy, giving Mexicans their best look yet at their options.

The event produced two early indications. The first is that, barring any unexpected development, this is already a two-man race. The current favorite is Andrés Manuel López Obrador—popularly called AMLO—of the left-wing National Regeneration Movement party, known as Morena.

A fiery but vulnerable populist leads the contest—for now.

The underdog is Ricardo Anaya, running on the For Mexico in Front coalition ticket, which combines the support of his center-right National Action Party (PAN) and the left-wing Democratic Revolutionary Party (PRD).

The second indication is that AMLO is vulnerable. A mid-April survey by the Mexican polling company Mitofsky gave him 32% of the vote against 21% for Mr. Anaya. But 25% of respondents were undecided. Another 20% was divided among the three other candidates, whose support is likely to decline as Election Day approaches and voters



Andrés Manuel López Obrador



REUTERS

Ricardo Anaya

shift to a second choice they believe can win.

Independent candidates Margarita Zavala (wife of former President Felipe Calderón) and Jaime Rodríguez Calderón (former governor of the state of Nuevo León) each polled below 5% in the Mitofsky survey. The debate didn't change their odds.

Institutional Revolutionary Party (PRI) candidate José Antonio Meade Kuribreña, who had 17% in the mid-April poll, didn't have a good night either. The Yale-trained economist is an able technocrat who has held a variety of ministerial posts—including foreign affairs, energy, and finance and public credit—but he is not a natural politician and has no connection with voters.

To be fair, the PRI's high negatives under current President Enrique Peña Nieto are a liability even a skilled politician would find difficult to overcome.

History will probably be kinder to Mr. Peña Nieto than Mexicans are today. Early in his six-year term he spent serious political capital amending the constitution to introduce competition in energy and telecommunications, and impose standards on the powerful

teachers union. These reforms were considered third rails in Mexican politics only a decade earlier.

Yet gains from structural reforms materialize in the long run. In the short term, organized crime and corruption are the hotbed election issues and voters are taking out their anger on the incumbent party. In an April poll by the Mexican daily Reforma, nearly 60% of respondents said that their main goal in the election is "to remove the PRI from power."

Mr. Meade is widely considered an honest person, but he is unlikely to overcome a voter perception that PRI apparatchiks and politicians are almost genetically predisposed to flouting the rules and padding their pockets.

The Peña Nieto government lost public trust after a 2014 scandal in which a government contractor designed a \$7 million home for Mr. Peña Nieto's wife. The president tried to regain the nation's confidence in 2016 with a public apology and an anticorruption law, but the damage was done.

When a 7.1 earthquake devastated Mexico City in September 2017, civil society performed heroically. The federal

response was far better than it was in the 1985 earthquake, but frustration over government ineptitude and corruption landed on the presidential palace of Los Pinos.

Mr. Anaya is a 39-year-old career PAN politician, though he has also run family businesses over the years. He has a master's degree in tax law and a doctorate in political science. He is fluent in English. He opposes President Trump's border wall but is by no means anti-American. Like Mr. Meade, he believes in continuing the modernization of Mexico, and its economic integration in North America.

AMLO is riding a wave of antiestablishment fervor by tagging his PRI and PAN rivals as "mafias of power." Some predebate polls gave him an even wider lead than in the Mitofsky survey. Yet AMLO's claim to outsider status is not supported by his record.

The 64-year-old Morena candidate has spent his life in politics—much of it in the PRI, including as party president in Tabasco in 1988. His promises to roll back economic reforms are part of his view that Mexico needs to return to the days of populism, nationalism and corporatism. This explains why he is backed by the likes of Elba Esther Gordillo, a former head of the teachers union who is under house arrest on embezzlement charges, and former Interior Minister Manuel Bartlett Diaz.

When Mr. Anaya pointed some of this out in the debate, the normally nimble AMLO was left flat-footed. Snap polls gave the evening to Mr. Anaya by a wide margin. The choice before the nation couldn't be more stark.

Write to O'Grady@wsj.com.

How to Keep Online Speech Free

By Mark Epstein

Mark Zuckerberg testified recently that he expects Facebook will soon employ artificial intelligence to identify and delete "hate speech." Yet he struggled to define the term. He acknowledged last year that standards for acceptable speech are subjective: "Our community spans many countries and cultures, and the norms are different in each region," making universal standards "less feasible." The CEO concluded his company needs "to evolve toward a system of more local governance."

Silicon Valley's recent acquiescence to political censorship contrasts with the early days of social media, when the platforms were expected to herald global freedom. In January 2010, Secretary of State Hillary Clinton urged that "censorship should not be in any way accepted by any company from anywhere. And in America, American companies need to make a principled stand." A few months later, Google announced it would refuse the Chinese government's requests to take down information. The company redirected visitors of its China homepage to the Hong Kong one. This bravery didn't last long. The New York Times reported last month that the Chinese government had "successfully persuaded Google to

pull down content that had been available around the globe," including corruption accusations by dissidents.

Online censorship extends beyond China and other authoritarian governments. András Ansip, vice president of the European Commission, recently issued guidelines on "illegal content online," demanding that platforms remove "terrorist propaganda" within an hour of notification. In January, Germany implemented NetzDG, which imposes prison sentences and fines of up to €50 million for failing to remove hate speech and other illegal content quickly.

America's commitment to free speech is exceptional. The First Amendment generally protects hate speech, fake news and even terrorist propaganda. Section 230 of the Communications Decency Act gives online platforms near total immunity from legal liability for user-generated content, with the recently added exclusion of sex trafficking. But censorship abroad still can restrict speech at home. Last year David Kaye, the United Nations special rapporteur on free speech, wrote that because "major companies operate at scale," the European regulations risk seeping "into global corporate practices with an impact on the uses of social media and search worldwide."

The U.S. should respond by

opposing foreign restrictions and limiting their domestic effects. On occasion, the feds take proactive measures like imposing sanctions on companies that censor at the Iranian government's request. But the government rarely addresses Europe, even with soft measures.

Freedom House's "Freedom Across the Net" ranking—funded by the State Department—lists all Western

as violating Section 230, but the law remains murky.

Congress should clarify that courts and regulators may not enforce any law or judgment against constitutionally protected speech. The Internet Association, which represents tech platforms including Google and Facebook, advocates blocking enforcement of all global content injunctions to prevent "situations where countries with weaker standards on free speech and due process can impose extraterritorial control on the activities of U.S. citizens and companies."

Friendly nations often recognize and enforce foreign judgments, on matters like intellectual property. Thus, limiting protection to First Amendment concerns would prevent it from becoming a smokescreen to undermine Europe's antitrust, privacy or copyright laws.

In his "Four Freedoms" address, Franklin D. Roosevelt said that "freedom of speech and expression—everywhere in the world" was not merely a "vision of a distant millennium." Social media has the potential to achieve this ideal. But if global internet platforms continue to appease foreign censors with no pushback from the U.S., expect speech to become more restricted across the globe.

Mr. Epstein is an antitrust attorney and freelance writer.

A Vicious Wolf Gives Trump the Last Laugh

By Peter Funt

No matter how you feel about Donald Trump or the Washington-based journalists who cover him, you should be angered by what was offered Saturday as entertainment at the annual White House Correspondents' Association dinner.

Michelle Wolf, recently of Comedy Central and soon to have her own series on Netflix, was foul-mouthed about Mr. Trump and downright cruel about members of his administration, several of whom were in the room. Worse, though it proved to be beside the point, she wasn't funny.

"Trump is so broke," she quipped, that "Southwest used him as one of their engines."

She called Vice President Mike Pence a "weirdo": "He

thinks abortion is murder, which, first of all, don't knock it till you try it. And when you do try it, really knock it. You know, you got to get that baby out of there."

'She had some great one-liners,' Douglas Brinkley said on CNN. He changed his mind.

Ms. Wolf's material—most of which was laced with too much profanity to print here—wasn't about the First Amendment, as some suggested. Nor was it about the #MeToo movement, which she attempted at one point to hide behind. It was simply a Saturday Night Massacre

of dignity and common sense.

It helped prove two unfortunate truths: First, the notion of having working journalists dress up for "nerd prom," as they call it, and fawn over celebrity guests while listening to a hired comic roast the officials they cover each day was never a good idea. Now, in the free-wheeling age of social media, it's completely bankrupt.

Second, Mr. Trump was right to skip the event. No reasonable person, even among his harshest critics, would have expected him to sit through this.

On Twitter the next morning, Mr. Trump called it a "big, boring bust." He was too kind. The event has given Mr. Trump's supporters more ammunition to use in what is essentially an unreasonable

attack on "fake news" and "mainstream media."

Many pundits were as conflicted about Ms. Wolf's act as they are about how to cover the Trump administration, as CNN's instant analysis following the event proved. Historian Douglas Brinkley immediately said, "She had some great one-liners."

About 20 minutes later, he retreated to: "She has the right to say what she did." After an hour's reflection, Mr. Brinkley concluded: "The dinner is broken. I think it needs to be reimaged next year."

Through this misguided event, the Correspondents' Association has given Donald Trump what he wants most: the last laugh.

Mr. Funt is a writer and host of "Candid Camera."

BOOKSHELF | By D.G. Hart

The Gilded Age Alms Race

Holy Humanitarians

By Heather D. Curtis
(Harvard, 370 pages, \$29.95)

Approval ratings for evangelicals in the United States are not especially high at the moment. Nearly every day, it seems, someone decries the hypocrisy of their support for President Donald Trump, and hypocrisy is not the only charge. Billy Graham's recent death inspired comments suggesting that Graham's outlook, as well as that of his followers, was disturbingly retrograde. One professor, in a *New York Times* op-ed, compared Graham unfavorably to Reinhold Niebuhr, the mid-20th-century ethicist whom President Barack Obama ranked as his favorite theologian. The professor said that Graham stood for a vision of faith that people like Niebuhr had abandoned as "indefensibly racist, sexist, imperialist, chauvinistic, homophobic and anti-intellectual."

Heather D. Curtis's "Holy Humanitarians" may not turn the critical tide, but it does vividly show the folly of such simplistic evaluations. The book's main figures are Louis

Klopsch and Thomas De Witt Talmage, both of whom, for the better part of two decades after 1890, used a magazine they edited, the *Christian Herald*, to publicize the plight of people around the world who were suffering from earthquakes, famines and oppressive politics. Few readers will know their names, though some may recognize their occasional partner, Charles Sheldon, the author of "In His Steps" (1896), a book that, a century after it was published, spawned the ubiquitous WWJD bracelets ("What would Jesus do?"). Sheldon was one of many progressively inclined evangelicals who, under the banner of an unashamedly "Christian America," promoted humanitarian uplift for new immigrants and the needy in foreign lands.

If readers know anything of Klopsch and Talmage today, their awareness likely stems from the Bowery Mission in Manhattan. The shelter for indigent men originated in 1879, but Klopsch took it over later and underwrote it through fundraising and promotional reporting in the *Herald*. Even before the magazine's work in New York, Klopsch had helped alert U.S. evangelicals to the 1891 Russian famine through stories and drawings designed to move readers to donate funds for foodstuffs.

From there, the magazine reported on and solicited aid for the survivors of varied crises: the victims of Constantinople's 1894 earthquake; Cubans in 1898 suffering in the war for the island's independence from Spain and Filipinos during a similar quest for political autonomy; the victims of India's famine in the 1890s and of food shortages soon after in China and Japan; the residents of San Francisco after the city's 1906 earthquake. If the *Herald*'s editors appeared sometimes as the ambulance chasers of Victorian philanthropy, Klopsch and Talmage reassured readers and donors that they were not only doing God's work but also fulfilling America's role as a Christian nation, "the hope of the nations of the whole earth."

How a couple of evangelical magazine editors rivaled the Red Cross in providing disaster relief and humanitarian aid throughout the globe.

As with any humanitarian endeavor, the *Herald*'s efforts faced difficulties. In Cuba, for instance, crates of food rotted on docks because adequate plans for distribution were not in place. Determining which people qualified for aid was another problem that do-gooders like Klopsch and Talmage were not always equipped to solve in an age influenced by Andrew Carnegie's notion that help should go not to delinquents but to the "deserving poor."

As Ms. Curtis shows, the need to cooperate with people on the front lines of disaster relief meant that Klopsch and Talmage sought access to presidents Grover Cleveland, William McKinley, Theodore Roosevelt and William Howard Taft and their diplomatic corps to coordinate American philanthropy with foreign governments. Among the most striking features of Ms. Curtis's lively account is the direct contact that low-level religious figures like Klopsch and Talmage enjoyed with high-ranking officials in Washington, a reminder of the limited scale of American government and the democratic nature of the nation 125 years ago.

The highest hurdle that Klopsch and Talmage had to clear was competition from secular philanthropies. For as long as Talmage (who died in 1902) and Klopsch (who died in 1910) were active, they needed to argue that their enterprise was as good as—if not superior to—Clara Barton's American Red Cross. In the aid to Constantinople's earthquake victims, the *Herald* and Red Cross worked together, though relations were strained. In Japan and China the two agencies went head to head. Even when the Red Cross secured TR's blessing as the preferred agency for sending aid to Japan, the *Herald* raised almost four times what the American Red Cross did. But in the case of San Francisco's earthquake, the Red Cross dominated relief operations.

This competition was a harbinger of charity to come. As a secular agency with ties to big donors, the Red Cross would soon make Klopsch's religious humanitarianism look like little more than a mom-and-pop operation. By the time that industrialists like John D. Rockefeller Jr. entered the field with endowed foundations, the *Herald* was raising only a quarter of what the millionaire's trust funds could produce, from interest alone, for any given disaster.

Ms. Curtis opens her book with Klopsch's exploits as a 14-year-old who orchestrated fake robberies to look as if he had resisted the burglars and closes with a firsthand account of the Bowery Mission's assistance to a poor woman visiting the shelter. Ms. Curtis neither dwells on the mixed motives of the *Herald*'s editors nor avoids their inconsistencies. As such, her book shows that evangelicals have always displayed a mixture of innocence and partisan zeal. That was as true of Billy Graham as it was of forerunners like Klopsch and Talmage.

Mr. Hart, who teaches history at Hillsdale College, is a fellow at the Foreign Policy Research Institute's Center for the Study of America and the West.

OPINION

REVIEW & OUTLOOK

Menendez and the Democrats

Robert Menendez escaped conviction on corruption charges this year thanks in large part to the Supreme Court's 2016 *McDonnell* standard demanding clear evidence of a specific quid-pro-quo. But that's all the more reason for voters to exercise their own electoral judgment, and now they have new evidence to judge Senatorial sleaze as Mr. Menendez seeks re-election.

Late last week the Senate Ethics Committee—three Democrats and three Republicans—released a four-page letter that “severely admonished” Mr. Menendez for abusing his office and bringing “discredit” to the Senate.

The letter says that for six years Mr. Menendez “knowingly and repeatedly accepted gifts of significant value” from his close friend Salomon Melgen, a Palm Beach doctor and Democratic Party donor. These gifts included private and commercial plane flights, a luxury Paris hotel stay, and lodging on 19 occasions at a Dominican Republic villa.

Mr. Menendez also failed to gain “required Committee approval” for the gifts and “failed to publicly disclose” them “as required by Senate Rule and federal law.”

At the same time, Mr. Menendez intervened with federal officials “to advance Dr. Melgen’s personal and business interests.” This included lobbying for Melgen right up to the Secretary of Health and Human Services in a \$8.9 million Medicare billing dispute. Mr. Menendez is fortunate that then HHS Secretary Kathleen Sebelius rejected his lobbying because the lack of a specific government act may have saved him in his criminal case.

The Senator also threatened to hold a public hearing if the State Department failed to settle a contract dispute involving a Melgen port-security services company. And he supported visa applications for Melgen’s overseas girlfriends. Melgen was convicted of Medicare fraud in April 2017.

The Ethics Committee acknowledged that prosecutors dropped the criminal case after the *McDonnell* decision in 2016. But it said this doesn’t supplant the Senate’s rules or standards

of conduct—which the Senator violated—and the committee brushed aside Mr. Menendez’s claim that this was merely constituent service, since his efforts for Melgen went “well beyond Senate norms.”

The Ethics Committee also noted that Mr. Menendez’s “acceptance of private plane flights” coincided with the Senator’s vote for a law “severely curtailing public officials’ acceptance of free travel on private planes.” In other words, Mr. Menendez, who came up through the corrupt Hudson County machine, knew exactly what he was doing.

Given these facts, the Senators left Mr. Menendez off easy with a severe admonishment when he deserved censure or worse. It says something about our age that Al Franken was pushed out of the Senate for crude behavior toward women before he was a Senator, but Mr. Menendez can keep his job despite cashing in on a political friendship while in office.

Democrats are already giving him a pass for re-election. His New Jersey Senate colleague Cory Booker, who hopes to ride opposition to Donald Trump’s ethics to the White House, offered absolution: “I haven’t had the chance to read the letter, but I’ve only known Bob Menendez to be an honest public servant who has worked tirelessly on behalf of our state and nation and who has put New Jerseyans first.” Don’t expect that reading the letter will change Mr. Booker’s mind, if he ever does read it.

Essex County Democratic Chairman Leroy Jones told northjersey.com that the Ethics letter doesn’t change his support for Mr. Menendez. As for hurting election prospects in the fall, Mr. Jones said, “Not as long as Donald Trump is President.” Translation: Sleazy behavior is no problem in the age of Trump as long as you’re a Democrat.

We wonder if that’s the same standard New Jersey voters want in their politicians. Mr. Menendez’s Republican opponent in November is likely to be former Celgene CEO Bob Hugin. If voters want politicians who are more honest than Bob Menendez, under the *McDonnell* standard they will have to clean the stables.

The Wolf Who Came as a Wolf

The Beltway media brigades held their annual night of industry awards and partying on Saturday, but this year’s event is notable for triggering some buyer’s remorse.

The White House Correspondents’ Association typically hires a comedian as entertainment. This year it was Michelle Wolf, formerly of Comedy Central. Ms. Wolf unleashed such a torrent of nasty gibes and vulgar jokes about Republicans and Donald Trump that even the anti-Republican, anti-Trump crowd had second thoughts.

Peter Funt describes nearby some of the unfunny bits, and Ms. Wolf was especially vicious to White House press secretary Sarah Huckabee Sanders, who was seated on the dais. In an act of remarkable discipline, Ms. Sanders listened in stoic silence without walking out.

The performance had media elites professing shock at Ms. Wolf’s excesses. “Media hands Trump big, embarrassing win,” wrote Mike Allen, whose morning newsletter broadcasts the conventional Washington wisdom. There were many similar sentiments on Twitter.

U.S. Fighters for Taiwan

Chinese bombers and warships conducted exercises near Taiwan this month, a show of force that officials in Beijing called a warning not to pursue formal independence. Last year the number of Chinese air patrols off Taiwan’s east coast quadrupled, and Beijing under President Xi Jinping has stepped up pressure on the island democracy to “reunify” with the motherland.

China’s bullying is raising alarms in the U.S., which is obligated to help Taiwan defend itself under the Taiwan Relations Act. The mainland People’s Liberation Army is deploying new jets, ships and other weapons in such numbers that the island’s defenses are in danger of being overwhelmed. Past U.S. Administrations failed to sell Taiwan the weapons it needs, and much of its arsenal is outdated.

The island’s most pressing need is air power. The mainstay of Taiwan’s fighter force is a fleet of 144 F-16s bought in the mid-1990s. Fewer than half the planes are ready for combat at any time, thanks to the maintenance required by aging aircraft and upgrades. Taiwan is pleading for new fighters to counter China’s advanced planes such as the Russian-made Su-35.

China also deploys more than 1,500 ballistic missiles within range of Taiwan, some highly accurate. They could damage airfields and destroy planes on the ground in minutes. Taiwan has bought advanced versions of the Patriot system to counter this threat, but the number and sophistication of Chinese missiles means many would get through. A 2009 Rand study said China could likely achieve air superiority over the island within days.

U.S. Senators John Cornyn and James Inhofe asked Donald Trump last month to support Taiwan’s request to buy the vertical takeoff version

Yet what did they expect? Michelle Wolf merely gave them what she no doubt assumed, with ample reason, the correspondents wanted.

She comes from a network and recent style of comedy that specialize in attacking the politics and values of half the country.

Much—not all—of the press corps has responded to Donald Trump’s surprising victory not by trying to understand it, much less report on it with any balance. Instead they have treated it like an alien invasion that must be repelled, and anyone associated with it as deserving disdain, ridicule or worse. Any reporter who doesn’t follow this herd of contempt is expelled from polite media company. Ms. Wolf was merely putting a cruder face on what she reads every day.

All of which plays into the hands of Mr. Trump, who didn’t attend the event but did indulge in some Twitter gloating afterward. On a trip to Michigan on Saturday night, Mr. Trump also rolled out his typical and nasty attack lines about the press. If reporters want to know why millions of Americans believe him, look in the mirror of Saturday night.

The anti-Trump comic gave the media what she thought they wanted.

of the new F-35 fighter. They wrote, “The survivability of the F35B and modern long-range sensors could help Taiwan intercept Chinese missiles, promoting deterrence well into the next decade.”

In a crisis the F-35B can be based almost anywhere, making it hard for Chinese missiles to destroy on the ground. Its stealth and other capabilities mean Chinese military planners couldn’t count on air superiority in a conflict.

There are several reasons the U.S. is unlikely to sell Taiwan the F-35B right away. One is the difficulty of getting the consortium of nations behind the F-35 to agree amid China’s inevitable howls of outrage. Another concern is China’s past success in recruiting spies within Taiwan’s armed forces, meaning the plane’s secrets could be stolen.

One solution would be to sell Taiwan the latest version of the F-16 and lease some used fighters as a stopgap. Over the next few years, the U.S. could lay the groundwork for the F-35B sale as well as another layer of missile defense, the Terminal High Altitude Area Defense or Thaad. That would give President Tsai Ing-wen time to follow through on her promise to increase military spending, a key requirement if Taiwan is to strengthen its defenses.

Beijing keeps pressing the U.S. to abandon Taiwan. Last December a Chinese diplomat in Washington threatened war if a U.S. Navy ship visits a Taiwanese port. But the threats and intimidation are backfiring, fostering a consensus in Washington that Taiwan needs more U.S. arms and closer security cooperation to deter Chinese adventurism. A sizable sale of fighter aircraft this year would shore up a democratic ally and reduce the chance of conflict in the Taiwan Strait.

The island democracy needs advanced air power to deter China.

Its stealth and other capabilities mean Chinese military planners couldn’t count on air superiority in a conflict.

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LETTERS TO THE EDITOR

The Humanities Help Doctors Treat Humans

Chris Pope and Tim Rice correctly identify time and cost as barriers to entering medical school and medicine as a career (“English Literature Isn’t Brain Surgery,” op-ed, April 24). Yet the premise that liberal-arts courses carry little benefit to future physicians is grossly inaccurate.

As an anesthesiologist who majored in philosophy as an undergraduate, I appreciate more and more the seeds that degree planted. Liberal-arts degrees teach future doctors how to think critically, ask the right questions, work in teams and advocate effectively for patients. Those skills have reinforced my development as both a clinician and practice leader, and I cannot imagine working without them.

JAY MESROBIAN, M.D.
Milwaukee

The objective of studying philosophy, ethics, logic, humanities, ancient and modern literature, history and other liberal arts is to learn how to think, and what is good and true (not to mention beautiful). While it could be helpful to find ways to make medical education more efficient and proficient, doing so at the expense of the liberal arts isn’t the way.

I, for one, want a doctor who can think, and knows what is truly good.

KEVIN CALLAHAN
Arlington Heights, Ill.

Uwe Reinhardt, the late, eminent health economist, showed that the reason American health care is so expensive is the price, not the amount of inputs into the system. Physicians earn much more in the U.S. than in Europe and our hospitals charge much more than in Canada because they can and have done so in the past. This supports innovation and wide availability of services. The idea that more physicians would lead to lower costs totally ignores the fact that the density of physicians on the West and East coasts is far greater than in the interior of the U.S., yet the costs are much higher in those locations.

As someone who spends his time

educating medical students, I could not disagree more with the prescription of the two policy experts on this matter. It made me want to suggest some recommendations about how economists should be trained.

PROF. STANLEY GOLDFARB, M.D., FACP
University of Pennsylvania
Philadelphia

The authors fail to point out that hospital administrators with a bachelor’s degree or at most a master’s degree have a median income of over \$750,000 a year (and not unusually, in the millions), often from nonprofit facilities serving the poor. This level of income is protected by the hospital associations which do a lot of good for the communities they serve, but in reality are primarily trade groups for hospital administrators. These salaries have to be accounted for in hospital charges, hence the high cost of medical care.

BEN SHWACHMAN, M.D., J.D.
Covina, Calif.

Physician income is hardly the reason health care is so expensive. It has consistently gone down over the last 30 years, while hospital administrators and insurers have made record profits. European doctors make less because they work less in their socialized systems. Shortening the time to become a doctor won’t save the overall system any money, and if there is a shortage of doctors on the horizon, it’s because of a predatory malpractice system, long hours, less patient contact, low relative pay, low job satisfaction and overbearing regulations. A recent survey revealed that 45% of physicians were planning on leaving their practice within the next five years, and nine out of 10 wouldn’t recommend medicine as a career for their children. A few extra years of humanities and a well-rounded education might create a more mature individual who picks medicine for the right reasons, and thus may manage the rigors of medicine better without bailing out after a few years.

RICHARD A. SCHATTZ, M.D.
San Diego

Letters Connect Loved Ones, Living and Past

I relished reading “Letters My Father Wrote” (Journal Report, April 23) in which Robbie Shell tells about finding boxes of family letters between her father and his parents during World War II and other times past. Our family had similar boxes. Years ago we organized them into well-labeled loose-leaf binders, and what a treasure those letters are.

A first set is from summers in the 1920s, describing family vacations between New Jersey and Maine. A set of 1930s letters are between my Dad and his parents while he was away at boarding school and then college. We also have letters from my dad’s WWII service in the Navy. Grandma wrote him every day, and all her letters are beautifully handwritten. The “boys”

wrote daily too, but those letters are typed and double spaced. After the war, my father wrote his mother every Monday morning about our family events during the ‘50s and ‘60s. When we went off to the college, he wrote us every Monday. I have the complete set from 1976 to his death in 2001. I started writing my parents and in-laws every Monday about our family events starting in 1993. The kids are grown now, but I still write a monthly missive.

Ms. Shell bemoans that these days we leave only digital skeletons. Please know that there are still letter writers out there, and I hope that future archaeologists find our families’ sets.

MARGARET SILVERS MYATT
Milford, Mass.

Migration of Blue Staters Is a Complex Thing

In their analysis of the exodus of taxpayers from blue states, Arthur B. Laffer and Stephen Moore assume that taxes will remain low in red states, despite the influx of residents from blue states (“So Long, California; Sayonara, New York,” op-ed, April 25). All those New Yorkers and Californians moving to Tennessee and Texas are not going to suddenly become fiscal conservatives.

They are going to demand the same scope of public services that existed in the communities they left. Those new residents of red states are going to support politicians who want to tax and spend, just like they did at home. Aspiring “progressive” politicians in Tennessee or Texas may soon have the numbers to get elected. Increased population density in those low-tax states will be used to justify increased spending on infrastructure, education and social services. Red-state residents should also brace themselves for tax increases.

CLARK WHITSETT
Queens, N.Y.

droves to states like Texas, Arizona, Nevada and Oregon. California also lost a lot of people who had a high-school diploma or some college education in this period.

On the flip side, California gained more adults between ages 26 and 35, many with bachelor’s or master’s degree—mostly from New York and Illinois. With this, the face of California is changing into one that looks wealthier and middle aged.

The authors seem to forget that California is the “location everyone is looking for”—sunshine, ocean breezes, mountains, beautiful topography, the forever summer and high salaries. Why would anyone want to move to Texas where it’s hot, humid, has bugs as big as small animals, poisonous snakes, tons of mosquitoes and lower salaries? Ditto for Florida.

I’ll take the high taxes and the Santa Barbara beaches any day.

GORDON HARTWIG
Santa Barbara, Calif.

Pepper ... And Salt

THE WALL STREET JOURNAL



Watch your slippers, dear, and don't sign any non-disclosure agreements.

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OPINION

Starbucks Is Not the Next Selma

By Robert L. Woodson Sr.

Is Starbucks the next Selma? Many in the race-grievance industry are trying to convince Americans that it is. The story began earlier this month, when two black men visited a Starbucks in an upscale Philadelphia neighborhood. They asked to use the restroom but refused to buy anything. When they were asked to leave the coffee shop, they refused, prompting the store manager to call the cops. When the two men also refused police orders to leave, they were handcuffed and arrested.

Today's protests are a useful diversion for those who reap the profits of the race-grievance industry.

The scene was caught on cellphone videos that were soon posted online, sparking "civil rights" protests. The Washington Post's editorial page editor, Fred Hiatt, writing from the site of Alabama's new lynching memorial, ruminated on the "arc of the history of white supremacy from slavery to the arrest of two black men at a Starbucks in Philadelphia." This is an outrageous comparison, and it trivializes not only the people who suffered during those most onerous and oppressive times but also the brave men and women who gave their lives confronting injustice.

Those of us who marched during the civil-rights movement had clear goals. We demanded that blacks be left alone to exercise their right to live and work where they pleased. We demanded an end to segregation and to the many manifestations of racial discrimination. We were confronting real issues and working for concrete outcomes that would benefit all who had suffered discrimination, regardless of their station in life.

What do the Starbucks protesters want? Who are the intended beneficiaries of their goals? Who are the losers? In response to the outrage, the Starbucks CEO came to Philadelphia to meet with the two aggrieved men. He apologized and pledged to close all the company's 8,000 stores for a half-day of "racial sensitivity" training.

It's easy to see who benefits from this kind of response: The consultants who devise and conduct sensitivity-training sessions. The civil-rights organizations that will get money from donors anxious to relieve their white guilt. The two young arrestees, who have already claimed their status as celebrity victims, probably leading to a talk-show tour and perhaps a legal settlement from Starbucks. Starbucks may come out of this a winner, too, if its mea culpa encourages more blacks to buy coffee at its citadel of racial justice.

Who are the losers? Here's an illustrative story: Some years ago, a trio of shoplifters was operating at an upscale department store near



GETTY IMAGES

Signs in New York in 1965 and Philadelphia in 2018.

my home in Silver Spring, Md. One member, a young black man dressed in a jogging suit, would act as suspiciously as possible, picking up expensive garments as he looked around cautiously. This was intended to draw in the security guards, at which point a well-dressed white couple would gather up armfuls of designer apparel and slip out the door. The trio then would meet in the parking lot to divide the booty.

There are parallels between that scheme and what is going on with Starbucks. Although many of the young protesters may authentically believe they are rallying for racial justice, they are in fact playing the role of the decoy. They are a useful diversion for those who reap the profits of the race-grievance industry. Similarly, the continuing mantra of racism serves as a shield for black officials in cities where black neighborhoods have declined and decayed.

Gentrification in recent decades has brought not only Starbucks but an influx of upscale residents. As in most areas of Central South Philadelphia, low-income families have had to move out of their former neighborhoods. No voice has been raised in their defense, given that this shift was a result of housing policies in a city controlled for decades by black elected officials.

But these developments have had serious consequences for low-income blacks: Most have had to move to areas without the supportive community institutions that once provided them stability and resilience. The few families left behind live among the signals of their coming displacement—like the opening of another Starbucks. Here is the true tragedy in this sad morality play.

Mr. Woodson is founder and president of the Woodson Center.

To Promote Nonproliferation, Kill the Iran Deal Now

By Jamil N. Jaffer

Will President Trump terminate the Iran nuclear deal? Many national-security experts are concerned he will, by refusing to waive sanctions that are up for renewal in mid-May. Some worry that unilaterally reimposing sanctions on Iran would isolate the U.S. internationally, as Europe's leaders still broadly support the deal, known as the Joint Comprehensive Plan of Action. Others argue that the JCPOA is working and Iran is largely abiding by its commitments. Still others urge the U.S. to continue waiving sanctions if the Europeans are willing to consider potential changes to the deal.

Each of these camps is deeply misguided. Should Mr. Trump refuse to continue the Obama-era policy of waiving Iran sanctions and opt to reimpose them unilaterally, Europe will have no choice but to go along. The key sanctions imposed by Congress in 2011–12—in the face of staunch opposition from the Obama White House—are "secondary" sanctions, meaning they operate by imposing

costs on countries that continue to do business with Iran. Under this regime, every nation must choose between doing business with Iran and maintaining access to the American banking system. This isn't a real choice, since no country can function economically by cutting itself off from the U.S.

Indeed, the Europeans lobbied hard against these sanctions—and convinced the Obama White House to do the same—because they knew they could never choose Iran over the U.S. They were right. When it became clear that congressional support for the sanctions was sufficient to override Mr. Obama's threatened veto, Europe also went along, albeit unhappily. The massive economic pressure produced by the sanctions forced the Iranian regime to the negotiating table for the first time in years.

The Obama administration ultimately squandered its negotiating leverage on a weak deal with deep and enduring flaws: extremely short sunsets, after which Iran will be able to sprint to a nuclear weapon even faster than before; the ability to

conduct research under the deal on advanced uranium centrifuges that will further shorten Iran's breakout time; expanded testing of ballistic missiles that would widen the kill zone of an Iranian nuclear weapon; a self-testing regime on existing nuclear military sites that protects Iran's illegal weaponization activities;

The Europeans won't do business with Tehran if that means losing access to American banks.

sanctions relief providing an economic boost to the Iranian regime, removing significant pressure and providing the time, space, and resources to work on a valid warhead design; and no link whatever to Iran's destabilizing activities in the region or support for terrorist groups world-wide like Hezbollah.

Iran doesn't intend to keep up its end of the bargain. Even if it did, the JCPOA would be still be a bad deal.

It was never really in the national-security interests of the U.S. Bipartisan majorities in both houses of Congress recognized this by voting against the deal, albeit not by large enough margins to get past a filibuster threat in the Senate.

Some of the JCPOA's opponents have recently come out—including in these pages—in favor of keeping it in place, at least while Congress or the Europeans try to "improve it by creating a unified front on new restrictions. But President Trump has tried this approach for more than a year and it hasn't worked. Congress has so many other, more pressing priorities, and getting 60 votes in the Senate for a revised deal isn't in the cards.

Europe's leaders have an interest in maintaining the status quo. If the deal survives, they get the economic benefits for which they've been waiting. Perversely, the Europeans have an incentive to string the U.S. along; the longer they can convince the administration they are willing to work on revising the deal, the longer they can dine out on its benefits. Then, if the Trump

administration does toss the deal overboard, they get to blame Washington. Mr. Trump ought not be fooled by the Europeans' feigned interest in further negotiations, particularly since they oppose extending the deal's sunsets indefinitely and tying Iran's continued support for terrorist groups to the deal. These issues are key for the U.S.

The president should stop waiting for Congress or the Europeans to get serious about renegotiating the JCPOA. Instead, he should force everyone's hand and restore American leverage by reimposing sanctions now. If the president wants an opportunity to demonstrate his deal-making ability, he should drag everyone to the negotiating table and put their commitments to nonproliferation to the test.

Mr. Jaffer is founder of the National Security Institute at the George Mason University's Scalia Law School. He worked as an associate counsel to President George W. Bush and as chief counsel and senior adviser to the Senate Foreign Relations Committee.

The Jones Act Drives America's Finest Into Exile

By Colin Grabow

America's Finest, a brand-new 264-foot fishing trawler, ought to be the pride of the fleet. As a newspaper in its birthplace of Anacortes, Wash., explained, the ship features an "on-board mechanized factory, fuel-efficient hull, and worker safety improvements"—priceless features for fishermen operating in the treacherous seas off Alaska. The ship is also said to have a smaller carbon footprint than any other fishing vessel in its region. According to Fisherman's Finest, the company that ordered the ship, it would be the first new trawler purpose-built for the Pacific Northwest since 1989.

Sadly, it seems increasingly doubtful that the ship will ever ply its trade in U.S. waters. That's because it contravenes the Jones Act, the 1920 law mandating, among other things, that ships carrying cargo between U.S. ports be domestically built. While America's Finest was constructed in an American

shipyard, parts of its hull were bent and cut in the Netherlands. By weight, that means the vessel counts as about 10% foreign-made, according to federal rules related to the Jones Act. The maximum for foreign-worked steel is 1.5%. The shipyard says it simply wasn't aware of the rule. Fisherman's Finest, for its part, doesn't think its ship should be grounded for a mistake it didn't make.

Desperate to remedy the situation, the parties tried to leverage support from Washington's Rep. Rick Larsen and Sen. Maria Cantwell to get a congressional waiver inserted into the recent omnibus spending bill. After some political haggling—during which competing fishing companies demanded that any waiver include limits on how many fish Fisherman's Finest could catch and process—the effort failed.

Fisherman's Finest appears resigned that it will never be able to use the vessel, with the company's president stating his intention to list it for international sale. That leaves

the company with a fishing fleet composed of two vessels built in 1979. The Seattle Times reported last year that the Jones Act violation "threatens to sink" both Fisherman's Finest and Dakota Creek Industries, which built the ship. Since February of last year the shipyard has seen its payroll shrink from 330 to 195, with a further half-dozen layoffs recently reported.

In short, because of the Jones Act, an American fishing company's future is in doubt, and its staff will be forced to work on more dangerous, less fuel-efficient ships that are nearly 40 years old. But the law's effects are far from limited to one company. By driving up the price of new vessels, the Jones Act encourages the use of older ships, which, as a 2013 Government Accountability Office report noted, "burn fuel faster and less efficiently compared to newer vessels."

This episode also debunks the claim that the Jones Act contributes to national security. The law's proponents argue that it guarantees work

for American shipyards, preserving a maritime industrial ecosystem that could be vital in a time of war or national emergency. The Anacortes shipyard builds tugboats, ferries and fishing trawlers. It is doubtful that such a shipyard could be quickly retooled in a time of war to churn out far-larger military vessels.

Limits on imported steel threaten to sink both a U.S. shipbuilder and its domestic customer.

Perhaps more important, the importation of parts can bolster a shipyard's ability to deliver an affordable product that meets customers' specifications. Rather than a threat, foreign-worked steel is an asset. How much more could American shipbuilders accomplish without restrictions such as the 1.5% limit hanging over their heads?

Some in Washington, including Sen. John McCain, have taken notice of the toll imposed by the Jones Act and sought its repeal. Those calls for reform were renewed last year after the law's requirements made it difficult to ship emergency aid to Puerto Rico. Although the Trump administration granted a 10-day waiver of the Jones Act after Hurricane Maria, the law's burdens demand permanent reform.

The sad saga of America's Finest captures the story of the Jones Act altogether. Companies in the U.S. are rendered less competitive and less financially viable. Sailors and fishermen are forced to operate on older and more-dangerous vessels. The environment takes a heavier toll as more fuel is burned. All in exchange for alleged national-security benefits that are vastly overstated if not outright fictitious. The Jones Act needs to go sleep with the fishes.

Mr. Grabow is a policy analyst at the Cato Institute's Herbert A. Stiefel Center for Trade Policy Studies.

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Notable & Quotable: Media and Human Rights

From "Our Self-Obsessed, Parochial Press Corps" by Kelly Jane Torrance, WeeklyStandard.com, April 27:

There's nothing the media love more than a story about themselves. . . . A particularly shameless example of this never-ending navel-gazing was a briefing the State Department held last week upon the release of its 2017 Country Reports on Human Rights Practices. . . .

Most members of the media who questioned Michael Kozak, a senior official in the State Department's bureau of democracy, human rights, and labor, weren't interested in hearing about the horrors faced by men, women, and children raped, tortured, and murdered by governments around the world. Neither were they

curious about what effect the reports might have on those governments or on the policymakers and diplomats in our own. No, they wanted to talk about themselves.

The first question came from the Associated Press's Matt Lee, whose reporting is distributed to outlets across the country and beyond. "I realize that this report doesn't cover the United States," he said as he began his query—which focused almost entirely on the United States. "I'm just wondering how effective you think that you can be in leading by example when you accuse numerous countries of, say, assaults on press freedom when here in this country we have a president who routinely excoriates the press, calling individual media outlets—and

individual reporters sometimes—fake news," he asked. "How do you not open yourself up to charges of hypocrisy?"

Kozak gave a clear answer, free of bureaucratese: "The countries that we criticize for limiting press freedom, it's for things like having criminal libel laws where you can be put in jail for what you say. It's for things like yanking the licenses of media outlets you don't like or, in many cases, killing the journalists," he said. "So I think we make quite a distinction between political leaders being able to speak out and say that that story was not accurate or using even stronger words sometimes, and using state power to prevent the journalists from continuing to do their work."

WORLD NEWS

Pompeo Presses Iran After Taking Reins

Top U.S. envoy takes hands-on approach as Trump deadline looms for nuclear agreement

President Donald Trump's new chief diplomat emphasized the administration's view of Iran as a danger to the Middle East and beyond, as a deadline looms for the U.S. to decide whether to remain in the nuclear deal.

By Donna Abdulaziz in Riyadh, Saudi Arabia, Dov Lieber in Tel Aviv and Felicia Schwartz in Washington

Secretary of State Mike Pompeo landed in Amman on Sunday after stops in Brussels, Riyadh and Tel Aviv, capping a whirlwind trip after being sworn in on Thursday.

Concerns about Tehran's influence in the Middle East and the threat of its nuclear program have dominated the trip, which comes ahead of Mr. Trump's self-imposed May 12 deadline.

Iran "is indeed the greatest sponsor of terrorism in the world, and we are determined to make sure it never possesses a nuclear weapon," he said in Riyadh alongside Saudi Foreign Minister Adel al-Jubeir on Sunday. "The Iran deal in its current form does not provide that assurance. We will continue to work with our European allies to fix that deal, but if a deal cannot be reached, the president has said that he will leave that deal."

Mr. Pompeo's approach to his new role contrasts with his predecessor, Rex Tillerson, whom



U.S. Secretary of State Mike Pompeo arrived in Amman, Jordan, on Sunday, following visits to Brussels, Riyadh and Tel Aviv.

Mr. Trump fired in March.

The new chief envoy made a point of visiting embassies and meeting with staff in Brussels, Riyadh and Tel Aviv, and he was expected to do the same in Amman. Mr. Tillerson initially eschewed such stops, which infuriated the diplomatic corps.

"The State Department will be at the front and center of every foreign-policy decision in support of the president's agenda," Mr. Pompeo told American diplomats at the embassy in Riyadh on Sunday.

European and Arab officials are awaiting Mr. Trump's decision and trying to take the temperature of his new national-security team.

"He'll make that decision. It's his call," Mr. Trump's national-security adviser, John Bolton, said on Sunday on CBS. "I don't want to get into a discussion of what the hypotheticals might be, but certainly withdrawal is under consideration."

The Trump administration is seeking what it has described as improvements to

the 2015 nuclear deal between six world powers and Iran. It is trying to enlist Saudi Arabia and other regional powers to contribute more to confronting Iran in the region.

"We remain deeply concerned about Iran's dangerous escalation of threats to Israel and the region, and Iran's ambition to dominate the Middle East remains," Mr. Pompeo said on Sunday, speaking alongside Israel's Prime Minister Benjamin Netanyahu after meeting with him in Tel Aviv. Earlier

Sunday, he met with Saudi Arabia's King Salman in Riyadh.

Although French President Emmanuel Macron and German Chancellor Angela Merkel seemed unable to persuade Mr. Trump to remain in the Iran deal while in Washington last week, Mr. Pompeo on Sunday said the U.S. was still seeking ways to address concerns with the deal that Mr. Trump laid out in January. Those involve Iran's ballistic-missile program, expiring limits on Iran's nuclear program and inspec-

tions of Iran's nuclear sites.

Mr. Pompeo discussed those efforts with European officials on the sidelines of a North Atlantic Treaty Organization meeting in Brussels on Friday. He said he received support for trying to "fix" the deal from Saudi Arabia in meetings over the weekend.

"They said, 'Great, we'll support you if you get the fixes that are very much in line with our policy there,'" he said of the Saudis while en route to Tel Aviv from Riyadh.

Israeli officials said they also support changes, if they go far enough.

"I think the best thing is not to cancel the nuclear agreement; it's to change it. And I think there is a chance to do it if the European Union will go with President Trump and be determined," Israel's intelligence minister Yisrael Katz said in a recent interview in New York.

European officials don't want to change the deal itself, which they say is working. Iranian officials have said they don't support the discussions for a side agreement and say they will withdraw from the deal if the U.S. does.

"We are urging nations around the world to sanction individuals and entities associated with Iran's missile program, and it's been a big part of our discussions with the Europeans," a senior State Department official said in Riyadh on Saturday.

The U.S. and the United Nations' international nuclear watchdog have said consistently that Iran is meeting the deal's terms. The Trump administration believes the deal gives Iran too much in sanctions relief in exchange for too few curbs on Iran's nuclear program.

U.K. Home Secretary Steps Down

BY JASON DOUGLAS

LONDON—U.K. Home Secretary Amber Rudd resigned following criticism of her handling of an immigration scandal, a departure that risks upsetting a delicate balance on Prime Minister Theresa May's top team between ministers eager to make a clear break with the European Union and those who favor closer ties.

A Downing Street spokeswoman said Mrs. May accepted Ms. Rudd's resignation late Sunday.

Ms. Rudd had come under pressure to quit in recent days after being accused of misleading lawmakers about the existence of Home Office targets for the removal of illegal immigrants.

The furor arose after the pursuit and, in some cases, deportation of members of the so-called Windrush generation, British citizens who arrived from the Caribbean after World War II but who struggled to document their citizenship. The Home Office has pledged to compensate those affected.

Ms. Rudd's resignation means Mrs. May's government has lost one of its most prominent advocates of maintaining close ties with the EU.

Syria's War Kills a Tradition: Truffle Hunting

BY RAJA ABDULRAHIM

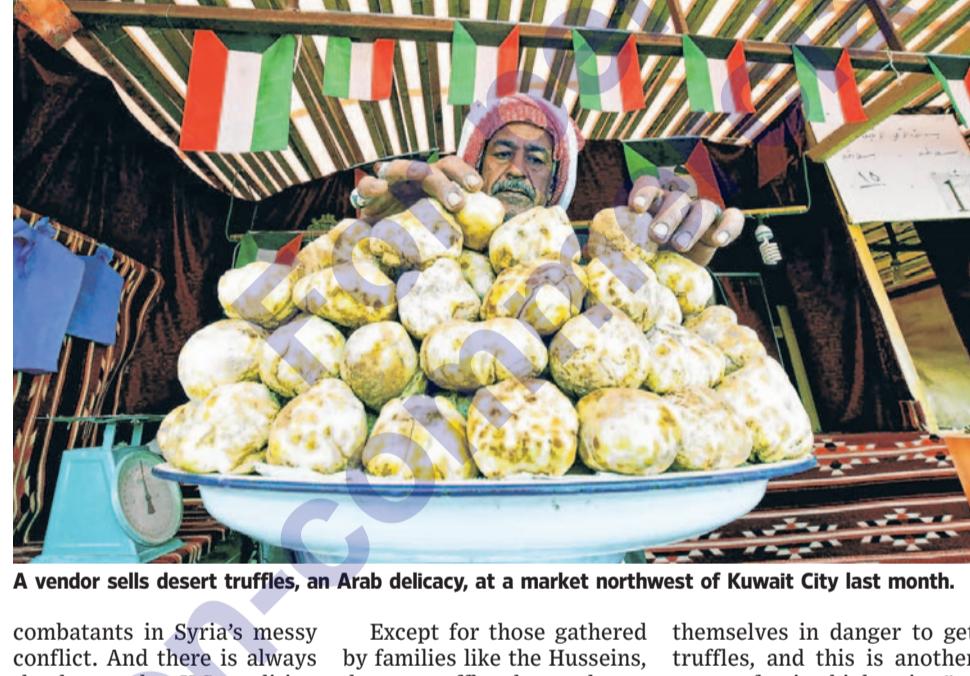
Seven years into Syria's war, its truffle fields have become battlefields.

Even as bombs fell and fighting raged elsewhere in the country, Syria's seasonal hunt for desert truffles weathered the first few years of the conflict largely undisturbed. As they had for generations, families would spend days foraging in the eastern desert for the delicacies to eat or to sell.

But the war shifted eastward last year as U.S.-backed forces and the Russian-backed Syrian regime fought Islamic State militants, upending the truffle tradition and putting the prized fungus out of reach for all but Syria's wealthy.

Ibrahim Hussein used to go to the desert every spring with his family. They would take a tent and spend their mornings and evenings searching for the meaty truffles—dun-colored and bulbous, but more similar in taste to mushrooms than to the stronger-flavored European variety—and nights grilling them on open fires.

But this season, which ends in May, he couldn't get to the truffles for a second year in a row. He was concerned about Islamic State sleeper cells in the desert or IEDs that could be left behind by any of the



A vendor sells desert truffles, an Arab delicacy, at a market northwest of Kuwait City last month.

combatants in Syria's messy conflict. And there is always the danger that U.S.-coalition drones could mistake truffle foragers for extremists.

Frontlines now cut through the once empty desert, separating Mr. Hussein, a 29-year-old activist from the countryside near the eastern city of Deir Ezzour, from a cherished custom. "I feel a tightness in my chest because I wasn't able to go this year and last year," he said.

Except for those gathered by families like the Husseins, desert truffles have always been a delicacy in Syria, and even a mark of wealth, depending on how often a family would eat them. But the war has made the fungi exorbitantly rare and expensive.

Half a pound of desert truffles used to cost about 200 Syrian pounds (about \$4). Now in Damascus, it can cost more than 100 times that much.

"Collectors are putting

themselves in danger to get truffles, and this is another reason for its high price," a shop owner in Damascus said.

Many in the desert region lament the loss of a revered local cultural tradition.

"The truffle season was an important thing for the people of this area before the war—it was like a celebration," said Saeed Saif, 35. "We used to leave the cities in groups of five or six and head into the desert with a tent

and an electric generator and supplies."

A song by a regional crooner plays on the process: "I'm pretending to go and collect truffles, but I'm here to see my love."

In the early years of the Syrian war that began in 2011, some people in Deir Ezzour began selling truffles as an alternative source of income to make ends meet in a wartime economy, residents said.

Mr. Saif had to flee his hometown in the eastern desert part of Homs province years ago and now lives in the Rukban camp near the Jordanian border. The tent encampment in southeast Syria benefits from the security of being near a U.S. military outpost—the only reason Mr. Saif was able to go out this spring and forage for truffles.

He went out alone over three days and gathered about three pounds of truffles, a far cry from the more than 1,000 pounds the family used to collect in past seasons.

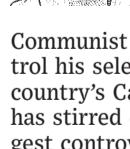
But Mr. Saif savored what little he had, boiling the truffles in salted water and sharing them with friends. Afterward, they drank the water.

"Everything that's rare and limited has a special flavor," he said.

—A special correspondent in Damascus contributed to this article.

URBI ET ORBI | By Francis X. Rocca

Even the 'Supreme' Power of Pope Francis Has Its Limits



VATICAN CITY—The prospect of Pope Francis agreeing to let China's

Communist government control his selection of the country's Catholic bishops has stirred one of the biggest controversies of his reign, with critics denouncing the plan as a betrayal and a capitulation.

"I would make a cartoon showing the pope kneeling and offering the keys of the kingdom of heaven and saying, 'Now, please recognize me as pope,'" Cardinal Joseph Zen, retired bishop of Hong Kong, the most prominent critic of the prospective deal, said in March. "The advisers of the pope are giving him advice to renounce his authority."

Certainly, the pope has no prerogative more consequen-

tial than choosing the world's bishops. It is a right essential to his exercise of what the catechism of the Catholic church calls the pope's "full, supreme, and universal power over the whole church."

Yet this right is practically a novelty in historical terms. Until the late 19th century, popes chose the bishops of central Italy, but almost all other bishops around the world were picked by secular potentates or elected by local clergy.

History shows that whatever church law and doctrine may say, a pope's actual power is contingent on political realities, external and internal to the church, and on the unquantifiable but essential factor of moral authority, closely linked to his public image.

Even today, the pope's power to choose bishops isn't absolute in principle or

in practice. In February, Pope Francis backed down in a long struggle over a Nigerian diocese with priests who had refused to accept a bishop from another linguistic group.

Still, the papacy has never wielded more power over the church than it has in the past century and a half. Ironically, it acquired that power only after losing the last of its once vast sway over secular affairs, with the fall of the papal states to forces of the newly unified Kingdom of Italy in 1870.

But the advent of the celebrity papacy brought liabilities for the office, as popularity became an inevitable criterion of a pontiff's success.

Even the telegenic Pope Francis has discovered the price of engagement with the media.



Pope Francis with Hong Kong's retired Cardinal Joseph Zen

Pope Francis also faces a challenge to his authority from some doctrinal conservatives. Under Popes John Paul and Benedict they considered a strong papacy to be a guarantor of orthodoxy, but under a more liberal pope

have emphasized arguments for the limits to papal power.

This month in Rome, a conference heard several talks on the topic, including one by U.S. Cardinal Raymond Burke, a critic of Pope Francis' leniency on divorce, who

has warned that the pope could be subject to a "formal correction" from cardinals if he doesn't make clear that his statements on divorce are faithful to orthodox teaching.

In his lecture, Cardinal Burke cited the judgment of a medieval writer that the "pope must, as a duty, be disobeyed" if he exercises his power in a sinful manner.

Addressing the same conference, via video, was Cardinal Zen, defender of papal prerogative and critic of papal China policy, who lamented that the concerns of Chinese Catholics were going unheard in the Vatican.

"Many voices from this periphery don't reach the center," the cardinal said. "But in this world now there are many means of communication, so I will continue often to express my view."

TECHNOLOGY: GOOGLE'S PARENT PAYS MEDIAN SALARY OF \$197,000 B4

BUSINESS & FINANCE

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THE WALL STREET JOURNAL.

Monday, April 30, 2018 | B1

Bruised Walmart Revisits Global Plan

The world's biggest retailer has concluded it can't take on the whole world by itself.

Walmart Inc. is in discussions to give up control over

By Sarah Nassauer
in New York,
Luciana Magalhães
in São Paulo
and Newley Purnell
in New Delhi

hundreds of stores in the U.K. and Brazil, two big markets where it has struggled for years, according to people familiar with the talks. At the same time, it is preparing to pour billions of dollars into an Indian e-commerce startup to

crack a promising market that has long eluded the U.S. giant.

After spending decades building stores around the globe and taking on local players, Walmart is forming joint ventures in competitive markets and focusing investments in areas executives think will provide growth to a company with \$500 billion in annual sales. The strategy shift comes as Walmart works to fend off

Amazon.com Inc. and a growing crop of discount grocers in the U.S. and abroad.

Walmart is near a deal to sell a majority stake in its U.K. grocery chain Asda to rival **J Sainsbury** PLC, according to

people familiar with the situation. The agreement is expected to be announced Monday and Walmart would retain around 40% of the merged company, one of these people said.

Walmart is also in talks to sell a controlling stake in its Brazilian operations to private-equity firm Advent International, according to people familiar with those negotiations. Though a deal isn't final, Advent could take an 80% stake in the Brazil business as soon as next month, one of these people said.

At the same time, Walmart is in advanced discussions to buy a majority stake in **Flipkart** Group, a homegrown startup that has become India's

largest e-commerce company. The deal isn't yet complete and could fall apart, said a person familiar with the Flipkart discussions. Flipkart said it was valued at \$11.6 billion in a funding round last year.

The three deals, if they are reached, would dramatically reshape the Bentonville, Ark., company, which has more than 6,300 of its 12,000 stores outside the U.S. In recent years, the company's international sales growth has lagged behind the U.S. market, which still accounts for two-thirds of total revenue and most of Walmart's profits. On Feb. 1, the company changed the executive in charge of its inter-

national operations.

"There's more work to be done on the portfolio," Chief Executive Doug McMillon said during a conference call to discuss earnings in February. "We've set priorities, focused on our North American core and key growth markets, including China and India."

Walmart shares have tumbled about 20% since they touched an all-time high of \$109.98 in late January. After cheering the company's initial success at expanding online U.S. sales, investors have grown concerned about the costs of its battle with Amazon and signs that web growth

Please see DEALS page B2

Retail Empire

Walmart operates more than 6,300 stores outside the U.S.

International retail units

6,360 total
India 20
Argentina 106
Japan 336
Chile 378
Canada 410
Africa 424
China 443
Brazil 465
U.K. 642
Central America 778
Mexico 2,358

Source: the company

THE WALL STREET JOURNAL.

Disney's Star-Packed Superhero Epic Runs Up Record Numbers at Box Office

Largest opening weekends

Article on B5

Avengers: Infinity War	\$250.0 million (estimate)
Star Wars: The Force Awakens	248.0
Star Wars: The Last Jedi	220.0
Jurassic World*	208.8
Marvel's The Avengers	207.4
Black Panther	202.0
Avengers: Age of Ultron	191.3
Captain America: Civil War	179.1
Beauty and the Beast	174.8
Iron Man 3	174.1

*Jurassic World was distributed by Universal Pictures. All other movies listed were distributed by Walt Disney Co. Source: Box Office Mojo; Photo: Marvel/Walt Disney/Everett Collection



THE WALL STREET JOURNAL.

Marathon To Make \$20 Billion Purchase

BY DANA CIMILLUCA AND DANA MATTIOLI

Marathon Petroleum Corp. plans to buy pipeline and refining company **Andeavor** for more than \$20 billion, according to people familiar with the matter.

The cash-and-stock deal, which values Andeavor at about \$150 a share, is expected to be announced Monday. That would be a roughly 23% premium over Andeavor's closing price Friday after the stock surged about 50% in the past year.

Marathon, based in Findlay, Ohio, is the second-largest refiner in the U.S., according to its website. Marathon-branded gasoline is sold in 20 states, and its Speedway unit owns the nation's second-largest convenience-store chain. It also owns a midstream master limited partnership with about 11,000 miles of crude oil and light-product pipelines.

Andeavor, based in San Antonio and formerly known as Tesoro, operates 10 refineries in the western U.S. with total capacity of more than 1.2 million barrels a day. Part of the rationale of the deal centers on the companies' complementary footprints; with Marathon in the East and Andeavor in the West, regulatory approval could be easier to win.

The deal is expected to produce \$1 billion of synergies, people familiar with the matter said.

Marathon Chief Executive Gary Heminger is expected to run the combined company, with a senior role for his counterpart at Andeavor, Gregory Goff.

Utilities and energy merger activity has surged this year as oil prices recover.

INSIDE



STEEL PRICES CLIMB AS TARIFFS LOOM

THE WEEK AHEAD, B2



INDIANS POUR SAVINGS INTO STOCKS

MARKETS, B9

Regional Banks in Fight for Deposits

By CHRISTINA REXRODE AND RACHEL LOUISE ENSIGN

Last year, businesses started pulling money from their bank accounts at **Fifth Third Bancorp.**

In response, the Cincinnati-based lender started offering higher interest rates to some consumers. But the bank still ended 2017 with slightly fewer deposits, the first drop in seven years.

Welcome to the new world of Main Street banking, where deposits are starting to head out the door after years of growth. This month, major regional banks reported the increasing competition for deposits in their first-quarter earnings. Some lenders, including Dallas-based **Comerica** Inc. and Birmingham, Ala.-based **Regions Financial** Corp., lost deposits compared with a year ago. Others are still adding deposits, but at a much slower pace than recent years.

The drain represents another consequence of the Federal Reserve's decision to raise short-term rates, which influences the mortgage market, stocks and other corners of the economy. The higher rates now available in money-market funds and other investments are luring clients to move their money out of bank accounts that still offer minimal interest rates.

In 2017, 10 of 22 major regional banks experienced declining U.S. deposits, com-

AT&T Trial Is a High-Stakes Slog

BY BRENT KENDALL

WASHINGTON—The Justice Department's case against **AT&T** Inc.'s planned acquisition of **Time Warner** Inc. has shown signs of strain after a grueling trial, highlighting the difficulty of challenging a merger involving companies that aren't direct competitors.

A key government witness drew skepticism from the judge, and five weeks of testimony turned up few major revelations from senior executives. Closing arguments, scheduled for Monday, give the Justice Department a final chance to frame its arguments and AT&T an opportunity to

cement its gains. It also provides a venue for U.S. District Judge Richard Leon, who is deciding the case, to further signal his thinking, although he isn't expected to rule for several weeks.

The trial is one of the biggest antitrust cases in decades and the stakes are high. Should the Justice Department lose, it could embolden companies, including in the media industry, to seek more transformative deals. A government loss also could prompt it to shy away from future lawsuits against vertical mergers, which combine companies that operate at different rungs of the same industry ladder.

Meanwhile, a win for the Justice Department would give antitrust enforcers additional momentum and new court precedent for pushing back against mergers at a time of industry concentration. It could also become a defining legacy for antitrust chief **Markman Delrahim**, who made the decision to sue AT&T within weeks of taking office.

The Justice Department filed suit to block the \$85 billion deal last November. The merger would vertically integrate AT&T's pay-television business, including its DirecTV satellite service, with Time Warner's movie and television programming, which includes

HBO and the Turner networks. That, the government argued, would give AT&T both the incentive and ability to charge higher prices for Turner networks such as TNT, TBS and CNN, because, it contended, rival pay-TV distributors must have them for their lineups.

Judge Leon, however, has focused less on theoretical incentives than on what will actually happen if the merger is approved. AT&T and Turner executives testified that they couldn't credibly threaten to withhold Turner programming from rivals because the networks' profitability depends on wide distribution.

Please see ATT page B2

HEARD ON THE STREET | By Dan Gallagher

Apple's Big Payday Will Only Go So Far



You can buy whole country with \$269 billion. But it might not be enough cash to buy **Apple** Inc. out of its current jam.

That jam is the company's current iPhone cycle, which isn't as good as expected. The launch of three new iPhone models last year—including the redesigned iPhone X—seems to have cooled early. Several companies that supply components for the device have warned investors of weakening demand on their quarterly reports, though they remain careful not to mention the iPhone by name, per Apple's strictures. Apple's share price has slipped 9% over the past couple of weeks and is

now down 4% since the start of the year.

These all may set up a potentially difficult report for the company's fiscal second quarter, coming Tuesday afternoon. Several analysts already have been trimming their iPhone sales projections for the remainder of the year. And yet the targets may still be too high. Wall Street's current consensus has iPhone revenue rising 13% year over year, to \$39.2 billion, in the March quarter and up 18%, to \$29.9 billion, for the June period. And since unit sales are projected to grow only in the low single digits for those periods, analysts still seem to be counting on a fairly rich dose of the highly priced iPhone X in the sales mix.

A downbeat report and forecast won't do wonders

for the stock. But offsetting it this time around could be a capital-return bonanza. Apple has typically boosted its dividend and buyback during its springtime report, and this year's will likely benefit

from the \$269 billion Apple has stashed overseas that was freed by last year's tax overhaul. Toni Sacconaghi of Bernstein expects Apple to spend about two-thirds of that amount on capital returns over the next 2½ years.

Given the unlikelihood that Apple will ever plow that money into a monster deal, the company is right to give back some of the largess. It also would be good to pay down some of the \$122 billion in debt that has piled up over the past five years—largely to finance previous capital returns while its cash sat offshore. But Apple's stock remains closely hinged to its product cycle, and that cycle remains dominated by the iPhone. Some things even a country's worth of money can't change.

Re-Call

Apple's revenue by product segment



Note: Fiscal year ends in September

Sources: the company; FactSet (projection)

for the stock. But offsetting it this time around could be a capital-return bonanza. Apple has typically boosted its dividend and buyback during its springtime report, and this year's will likely benefit

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BUSINESS NEWS

Prologis To Acquire Logistics Firm DCT

BY DANA MATTIOLI
AND JENNIFER SMITH

Prologis Inc. agreed to buy logistics-property owner **DCT Industrial Trust Inc.** for \$8.4 billion including debt, as a surge in e-commerce ramps up demand for warehouses and distribution centers.

DCT shareholders will receive 1.02 Prologis shares for each share, valuing the deal at \$67.91 per DCT share, the companies said Sunday, confirming an earlier report by The Wall Street Journal. That amounts to a roughly 16% premium over DCT's closing share price Friday.

DCT, based in Denver, is an industrial real-estate investment trust.

Prologis, based in San Francisco, has a market value of about \$36 billion. It is the world's largest owner of distribution centers and logistics properties, which are proliferating rapidly as e-commerce fulfillment needs draw more investment into the field, and warehouse development in the U.S., Europe and Asia booms.

The growth of online shopping has fueled demand for more distribution facilities, including pricey sites near population centers that are used to ship online purchases more rapidly to consumers.

Prologis had 676 million square feet of warehousing under its control at the end of 2016, according to National Real Estate Investor. DCT was No. 10 in the world in the same survey, with 74 million square feet of space. Both companies have a footprint in key industrial real-estate markets such as Southern California and Northern California's Bay Area, New Jersey, Atlanta and Chicago.

—Paul Page contributed to this article

Samsung to Mold Simpler Setup

Affiliates plan to sell a \$1 billion stake in de facto holding firm, cutting opaque links

BY TIMOTHY W. MARTIN

SEOUL—Samsung plans to simplify the conglomerate's ownership structure in coming months, according to people familiar with the matter, untangling a web that has long been criticized for benefiting the ruling Lee family at the expense of minority shareholders.

Two Samsung affiliates intend to sell off their roughly \$1 billion stake in the conglomerate's de facto holding company, **Samsung C&T Corp.**, the people said. The moves are pending board votes at the affiliates, **Samsung Electro-Mechanics Co.** and **Samsung Fire & Marine Insurance Co.**, with the sale's timing to be determined by financial-market conditions, they said. Samsung officials have shared the plans with large South Korean and foreign investors in recent weeks, the people said.

The moves would weaken the grip of Lee Jae-yong, the 49-year-old Samsung Electronics vice chairman, who was recently released from prison with a suspended sentence in connection with a corruption scandal in South Korea. He is a grandson of the conglomerate's founder.

Unwinding the Samsung affiliates' stakes in the de facto holding company, the people familiar with the matter said, will dissolve the last four examples of Samsung's circular shareholdings, an opaque ownership structure that has come under fire from foreign investors and South Korean regulators. Samsung has been reducing the cross shareholdings since 2013, when there were about 80 such significant arrangements, which gave the Lee family wide leverage to indirectly exert power across



The Samsung conglomerate's Lee Jae-yong, left, with his father Lee Kun-hee, front, in 2009.

0.65% of Samsung Electronics, while his father ranks as the company's fifth-largest shareholder, with a 3.86% stake worth roughly \$12 billion. The elder Mr. Lee is the wealthiest South Korean, with a net worth of roughly \$20 billion.

The younger Mr. Lee, Harvard-educated and trilingual, has tried to overhaul Samsung's opaque culture. He has viewed South Korea's family-run system as being too sprawling, conservative and corrupt, telling those around him that "the chaebol system is done," according to people familiar with his thinking.

Circular shareholdings have been targeted by the Korea Fair Trade Commission. Over the past year, the number of circular shareholdings among South Korea's big conglomerates has fallen 85%, the Korea FTC said recently.

Samsung over the past year has boosted dividends, diversified a board that previously consisted of nine Korean men,

Company's Boss Faces Legal Woes

Samsung's expected moves to simplify the conglomerate's ownership structure come as Lee Jae-yong, vice chairman of Samsung Electronics, contends with legal problems.

Mr. Lee was convicted and jailed last year for offering bribes to a close friend of the former president of South Korea in exchange for government backing of a merger of two

Samsung affiliates.

He has denied wrongdoing and was released from prison in February on a suspended sentence. His case is set to be heard by South Korea's Supreme Court, though no trial date has been set.

The merger at issue, between Samsung C&T and **Chell Industries Inc.**, was viewed by some foreign investors and governance advocates as a way for Mr. Lee to consolidate his power. In December, at final testimony for his appeals trial, he sought to dismiss any no-

tion he sought presidential support to push through the affiliates' merger. "Having the CEO title of Samsung or increasing my shares of affiliate companies holds little meaning to me," Mr. Lee told the judge. He said he wants his role as Samsung's leader to be judged on his performance, not the size of his ownership stake.

Since leaving prison, Mr. Lee has kept a low profile. He hasn't attended a Samsung Electronics board meeting since his release, according to people familiar with the situation.

the whole conglomerate.

The Samsung revamp marks a significant development in South Korea, where family-run conglomerates, or *chaebols*, have erected complex ownership frameworks that were necessary to fuel business expansion after capital markets tightened following the 1997 Asian financial crisis.

More recently, critics have said, the ownership labyrinths have given ruling families a way to avoid the country's hefty inheritance tax and

transfer power to younger generations using intraconglomerate mergers, spinoffs or other complex tactics.

With Mr. Lee's succession planning, the most likely option is pretty straightforward, said people familiar with the situation. His father, Lee Kun-hee, the chairman of Samsung, has been incapacitated since suffering a stroke in 2014, and when he dies, a multibillion-dollar inheritance tax of at least 50% will be levied.

A Samsung spokeswoman

said, "All taxes related to the inheritance will be transparently paid as required by law."

The most likely scenario, according to a person familiar with the situation, is that Lee Jae-yong will cover the tax bill by selling his father's sizable stakes in key Samsung affiliates. Doing so would leave the younger Mr. Lee—a billionaire—with far less control over the business empire than his father enjoyed when leading the conglomerate.

The younger Mr. Lee owns

and said it would cancel some \$35 billion in treasury shares, a type of holding that has long concentrated voting power in the hands of ruling conglomerate families.

Yet even with the moves, the Lee family retains significant control of Samsung Electronics, the conglomerate's crown jewel, through a roughly \$26 billion stake held by a life-insurance affiliate. Samsung Life Insurance Co. is the electronics giant's second-biggest shareholder, an ownership stake that isn't considered a circular shareholding. No decision by Samsung has been made on this life insurer's holding, said people familiar with the matter.

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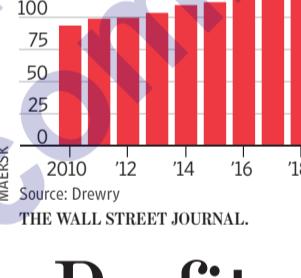
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Cold Front

Volumes of seaborne refrigerated trade are on the rise as global demand for fresh products increases.



Source: Drewry

THE WALL STREET JOURNAL.

Shippers Reap New Profits By Transporting Fresh Food

BY COSTAS PARIS

One of the shipping industry's hottest markets is cold boxes. Demand to ship fresh food across the oceans is twice as high as it is for other products, according to ship analyst Drewry.

Containers including reefers move about \$4 trillion worth of cargo annually.

Stijn Rubens, a senior supply-chain consultant at Drewry, said fresh produce sailings are showing steady growth, but the market is also supported by relatively new products like orange juice, pharmaceuticals, vaping supplies and candy.

The main reefer trade is from the Southern Hemisphere to the north. Exporters in places like South America, South Africa, Australia and New Zealand move fresh produce to supplement demand in the north during the winter months. The U.S. and Canada are also exporters of vegetables, citrus and other fruit along with meat and seafood, mainly to Asia.

"Ten years ago, you could find strawberries in Denmark for only three months a year. Now, it's year-round, thanks to reefers, and everyone from the smallest to the biggest shippers can join the supply chain," said Anne-Sophie Zerlang Karlsen, head of reefer management at Danish operator **Maersk Line**, the world's largest shipping company.

One of the smaller customers, Peru-based **Sun Fruits Packs SA**, last year shipped

700 reefers of grapes to Philadelphia and 220 containers of avocados to Spain and the Netherlands.

"Reefers are absolutely vital to our business," said Walter Munoz, a Sun Fruits executive. "We can now ship even a single container of fruits to Europe and the U.S. at prices of up to 50% higher than if we sold them to local markets in South America."

It takes up to 18 days to ship grapes from Peru to Philadelphia. The fruit "is put to sleep" in a controlled atmosphere that delays the ripening process before it is distributed to supermarkets along the East Coast.

Until the late 1990s, fresh produce was shipped on break bulk ships—general cargo vessels with big refrigerated spaces—from the production site to a single destination.

Cargoes were usually limited to bananas, with the ships being operated by major distributors like Chiquita. Smaller producers that couldn't afford to hire such vessels confined themselves to local markets.

Chiquita is gradually shrinking its "Great White Fleet"—ships painted white to prevent the bananas from overheating—and switching to reefers. Earlier this year, it chartered container vessels and ordered 2,500 reefers from Maersk that monitor the atmosphere inside the container.

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TECHNOLOGY

WSJ.com/Tech

Baidu Spinoff Gets Cash

A \$1.9 billion infusion gives Du Xiaoman the firepower to challenge China's fintech leaders

By LIZA LIN

Baidu Inc.'s former financial-services unit has attracted a \$1.9 billion investment from firms including U.S. private-equity giants TPG and the Carlyle Group, giving it fresh ammunition to compete in China's increasingly crowded financial-services space.

The new firm, **Du Xiaoman Financial**, spun off from Chinese search giant Baidu as part of a corporate strategy to shed peripheral businesses and focus on a push into artificial intelligence.

It also has attracted other investors including **Agricultural Bank of China Ltd.** and **Taikang Group**. Baidu announced the new investment on Saturday.

The financing will be used to develop new financial-technology platforms and to expand the unit's presence in China's financial ecosystem, Baidu said.

Launched in 2015, the Beijing-based financial-services group runs a mobile-wallet service as well as provides consumer loans and wealth-management services for its users.



The Baidu World Technology Conference in Beijing last year. Baidu is shedding peripheral units.

By the end of 2017, Baidu had built up its financing business to a loan balance of 28 billion yuan (\$4.42 billion), TPG said.

This latest investment will give the company, previously known as Baidu Financial Services Group, more firepower to compete in China's increasingly competitive fintech space.

Alibaba Group Holding affiliate **Ant Financial Services Group**, and rival WeChat Pay, run by Chinese social media

giant **Tencent Holdings**, are currently the dominant players in China's mobile-payments space. But Du Xiaoman Financial sees room for growth in the broader market.

Investable assets in China's private wealth market were predicted to grow 14% year over year to reach 188 trillion yuan by the end of 2017, according to a study by Bain & Co and China Merchants Bank released last August. Official figures were unavailable to confirm that.

TPG, which manages more than \$82 billion in assets worldwide, said the firm was eager to tap into China's growing financial services market. "As savings and lending activities move online, technology companies are able to use their big-data analytics to offer flexible micro-financing to the younger generation of consumers," said Chang Sun, TPG's China managing partner.

◆ Heard on the Street: Baidu has good news B12

Companies Have Yet to Embrace AI

By STEVEN NORTON

For all the talk of machine learning and AI's potential in the enterprise, many firms aren't yet equipped to take advantage of it fully, panelists said Friday at the MIT Digital Economy Conference.

"Most organizations are not set up to do this well," said Hilary Mason, general manager of machine learning at **Cloudera Inc.** Few firms have

a solid understanding of how machine learning works and where it can be applied, and tend to focus on small-scale changes rather than creative applications that could generate new revenue or products.

Machine learning can create value by improving existing processes. Small enhancements to forecasting, for example, can generate big improvements to the bottom line.

In addition, artificial intelligence is moving deeper into some business processes, and many companies are turning to software robots, powered by machine learning, to automate mundane tasks and help employees work more efficiently.

Still, few companies have deployed these technologies in a core business process or at scale, said panelist Michael Chui, a partner at **McKinsey**

Global Institute. "We're very early."

To reap the true benefits of machine learning, firms first must digitize their business processes to get the data they need to power advanced algorithms, he said.

That includes not only having the correct systems in place, but also changing employee behavior as they learn to work with new technologies.

Google Parent Pays Median of \$197,000

By DOUGLAS MACMILLAN

Google parent **Alphabet Inc.** said its workers earned a median pay package of over \$197,000 last year, the fourth-highest pay among the hundreds of companies in the S&P 500 index that have disclosed those figures. Alphabet's median pay was about 18% lower than at rival internet giant **Facebook Inc.**, where employees earned a median salary of \$240,000.

The relatively high pay at two of the world's biggest tech firms is a sign of the talent war in Silicon Valley, where skilled engineers are in limited supply. Their pay numbers far surpassed most of the 379 companies in the S&P 500 that had disclosed compensation figures through Friday afternoon. The median figure among that group was \$69,205.

Facebook and Google also dwarfed another tech giant in this category, **Amazon.com Inc.**, where a median worker makes just \$28,446. Most of the roughly half-million employees at Amazon unload trucks, drive forklifts and walk miles collecting products to fill orders—all for around the same pay as workers in other retail companies' warehouses.

Companies in the technology sector as a whole are reporting higher figures, with half reporting median employee pay over about \$85,000. But even within tech, there is a split, with software and services firms tending to report higher median income than semiconductor and hardware manufacturers.

The highest median pay reported in the S&P 500 so far was by **Incyte Corp.**, a Wilmington, Del., biotechnology firm with 1,208 employees. Incyte's median pay was about \$253,000. The third highest, below Facebook and above Alphabet, was **Vertex Pharmaceuticals Inc.** at more than \$211,000.

The median pay at Alphabet is far higher than the salary of Larry Page, the company's chief

executive, who last year took a nominal compensation of \$1, the company said in its 2017 proxy filing. Facebook's Mark Zuckerberg also took a base salary of \$1, but his overall compensation was more than \$8.8 million to cover travel and security costs, the social-networking company said in its proxy, released earlier this month.

Eric Schmidt, who stepped down from his role as chairman of Alphabet in January, earned the highest total compensation among top officers at Alphabet last year. His total pay was about \$4.7 million.

In its proxy, Alphabet asked shareholders to vote against an investor proposal seeking a management review of potential abuses of Google's digital plat-

\$240K

Median salary for workers at Facebook last year.

forms, such as Russian interference in U.S. elections. The proposal was filed by **Arjuna Capital** and supported by the New York State Common Retirement Fund.

Also on Friday, in a letter to shareholders, Google co-founder Sergey Brin alluded to recent concerns, raised by regulators and the media, that technology's advances are posing new risks to society. "There are very legitimate and pertinent issues being raised, across the globe, about the implications and impacts of these advances," Mr. Brin said. "This is an important discussion to have. While I am optimistic about the potential to bring technology to bear on the greatest problems in the world, we are on a path that we must tread with deep responsibility, care and humility."

—Theo Francis contributed to this article.

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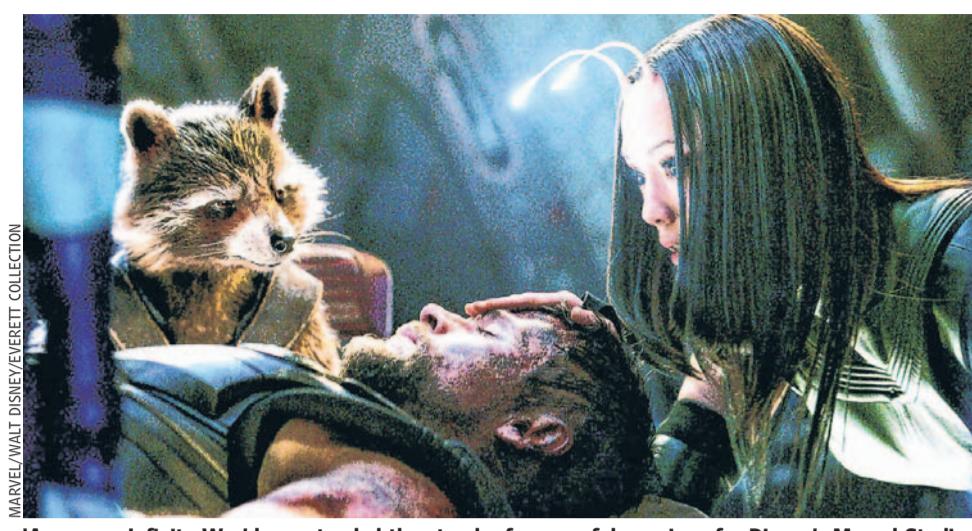
'Avengers' Sets Domestic, Global Box-Office Records

By ERICH SCHWARTZEL

LOS ANGELES—Walt Disney Co.'s superhero epic "Avengers: Infinity War" set new records for the biggest domestic and global opening of all time this weekend, collecting an estimated \$250 million in the U.S. and Canada and totaling \$630 million around the world.

The movie has yet to open in China, the world's No. 2 market. With this latest release, Disney now has nine of the 10 biggest box-office domestic openings of all time. "Avengers" barely passed the domestic record held by "Star Wars: The Force Awakens," which made its debut to \$248 million in 2015, and trounced the \$541 million global record set by last year's "The Fate of the Furious."

The studio is on an unprecedented box-office streak. It crossed the \$1 billion mark at



'Avengers: Infinity War' has extended the streak of successful openings for Disney's Marvel Studios.

the domestic box office in 117 days this year—another industry record.

"Infinity War" opened in about 72% of available markets, and its already stagger-

ing overseas haul will rise when it premieres in China on May 11. The movie was No. 1 in all markets where it opened this weekend, setting records in South Korea, Brazil and the

Philippines, among others.

With a budget of about \$300 million, "Avengers: Infinity War" is the first half of a two-part culmination for Disney's Marvel Studios, which

has been building out a "cinematic universe" of interconnected characters and story lines over 19 movies so far.

"Infinity War" combines those elements, tossing characters like Doctor Strange, Black Panther and Spider-Man into the same movie as the good guys team up against a civilization-crushing villain called Thanos. A follow-up to "Infinity War" is scheduled for release in May 2019.

Marvel's success in building a cinematic universe has shifted the strategy of every Hollywood studio now looking for similar narrative and marketing devices, whether in Warner Bros.'s DC Comics franchise or Paramount Pictures' "Transformers" series. But no rival has had the success of Marvel, which already this year released the hit "Black Panther," now the third-highest grossing movie

of all time at \$688 million.

The enthusiasm behind February's "Black Panther" helped propel interest in "Infinity War," which features Chadwick Boseman as the African king and crucial scenes set in his fictitious country of Wakanda.

Scheduling the two movies back to back "wasn't serendipity," said Dave Hollis, Disney's president of world-wide distribution. "It's been 10 years of planning that culminated in the biggest movie ever."

The massive opening lifted business across all exhibition venues. The world's largest movie-theater chain, AMC Entertainment Holdings Inc., said "Avengers" had the highest Friday and Saturday box-office gross of any title in the company's history. IMAX Corp. said the movie, filmed using the company's technology, collected \$41 million in its auditoriums around the world.

Estimated Box-Office Figures, Through Sunday

FILM	DISTRIBUTOR	SALES, IN MILLIONS			CUMULATIVE % CHANGE
1. <i>Avengers: Infinity War</i>	Disney	\$250	\$250	--	
2. <i>A Quiet Place</i>	Paramount	\$10.7	\$148.2	-49	
3. <i>I Feel Pretty</i>	STX Entertainment	\$8.1	\$29.6	-49	
4. <i>Rampage</i>	Warner Bros.	\$7.1	\$77.9	-65	
5. <i>Black Panther</i>	Disney	\$4.4	\$688	-11	

*Friday, Saturday and Sunday Source: comScore

Steve Wynn Files Defamation Suit

By REBECCA DAVIS O'BRIEN

Steve Wynn, the former chief executive of **Wynn Resorts** Ltd., filed a defamation lawsuit last week against a former Wynn Resorts employee, alleging that he smeared Mr. Wynn by spreading false accusations of alleged sexual misconduct in media reports.

Jorgen Nielsen, a former artistic director of the Wynn Las Vegas salon, was quoted by name in two articles about Mr. Wynn and the casino company in The Wall Street Journal.

Steve Wynn resigned in February as chairman and CEO of Wynn Resorts.

Earlier this year, the articles detailed allegations from people who have worked at Wynn Resorts that would amount to a decadeslong pattern of sexual misconduct by Mr. Wynn, and managers' practice of ignoring or dismissing their complaints.

Mr. Wynn resigned in February as chairman and CEO of Wynn Resorts after the Journal published the first article, in January. He said at the time of his resignation that he couldn't be effective in an environment in which "a rush to

judgment takes precedence over everything else, including the facts." In a statement for the first Journal article, which reported Mr. Wynn had paid \$7.5 million in 2005 to a mani-curist who told others he forced her to have sex, Mr. Wynn said the idea that he ever assaulted a woman was "preposterous."

The lawsuit alleges the Journal's reporting set off an "open season" on Mr. Wynn, "where truth and context were ignored, and his guilt was presumed based only on unproven accusations."

Mr. Nielsen said he was unaware of the lawsuit and declined to comment further. A spokeswoman for Dow Jones, publisher of the Journal, said: "We stand by our reporting."

The lawsuit was filed in state court in Nevada.

Mr. Nielsen alleges that Mr. Nielsen's statements were motivated by an effort to create "workplace issues" for Mr. Wynn as he was "embroiled in a highly contentious and public litigation with his ex-wife, Elaine Wynn." The lawsuit describes Mr. Nielsen as Ms. Wynn's longtime personal hairstylist.

According to the lawsuit, Mr. Wynn sent Mr. Nielsen a letter in March, "to afford him an opportunity to mitigate the harm he had caused by retracting his false statements." Mr. Nielsen hasn't retracted his statements, according to the lawsuit.

Aramco Adds Woman To Board Before IPO

By SUMMER SAID

DUBAI—Saudi state-oil giant Aramco shuffled its board, adding five members including its first-ever female director, as it prepares for a public listing.

Aramco said Sunday it was adding three non-Saudi board members, including Lynn LaVery Elsenhans, the former chairwoman, president and chief executive of U.S. oil refiner Sunoco Inc. She is now among the top-ranking women in business in Saudi Arabia and adds a female voice to Aramco, where few women hold leadership roles.

Aramco appointed former **Chevron Phillips Chemical** Co. President and Chief Executive Peter Celli and Andrew Liveris, former executive chairman of chemical giant **DowDuPont** Inc. All three non-Saudi appointments underline Aramco's focus on building its petrochemicals and refining business.

Aramco's 11-member board

now has five non-Saudi members but remains packed with government officials, which could limit its options for listing on Western exchanges.

Saudi Energy Minister Khalid al-Falih remains the company's chairman, and the board added two powerful senior government ministers on Sunday: Finance Minister Mohammed al-Jadaan and Economy Minister Mohammed al-Tuwaijri. All three men are playing key roles in Crown Prince Mohammed bin Salman's plans to remake the Saudi economy, using its oil wealth to jump-start other industries.

The centerpiece of those plans is raising money through the initial public offering of **Saudi Arabian Oil** Co., as Aramco is officially known. Saudi officials have said they want to raise as much as \$100 billion, though a number of analysts and Aramco insiders say that figure is unrealistic.

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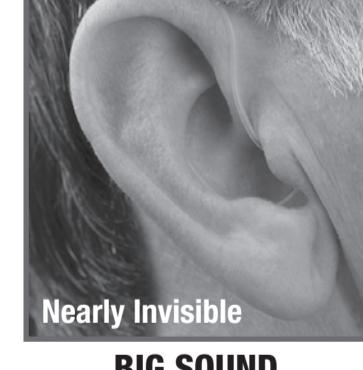
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MONEY & INVESTING

Pimco Raises Funds For Commercial Real-Estate Vehicle

By JUSTIN BAER

Pacific Investment Management Co. is raising money for a new, multibillion-dollar commercial real-estate debt fund, the bond manager's latest foray into more lucrative—and less liquid—markets, people familiar with the matter said.

Pimco Commercial Real Estate Debt, or PCRED, will invest in both public and private debt—including mortgages, mortgage-backed securities and mezzanine loans—the firm wrote in a public job listing seeking to hire investment staff. Pimco's U.S. real-estate team will manage the fund, which will target deals valued at \$20 million to \$500 million.

Commercial real-estate debt funds finance properties ranging from office buildings and shopping centers to hotels. Mezzanine loans are riskier than senior debt and typically pay investors a higher interest rate.

The push into privately held debt, real estate and other alternative investments is a key plank in the strategy led by Emmanuel Roman, the former hedge-fund firm manager tapped as the firm's chief executive in 2016. Driving Pimco's move: the pressures traditional stock- and bond-pickers are facing from exchange-traded funds and other low-cost investments options. Alternatives command higher fees and their strategies can't be easily mimicked by exchange-traded funds, insulating them from a passive-investing wave that has turned the asset-management industry on its head.

In addition to alternatives, Pimco, a unit of Germany's Allianz SE recently unveiled plans to invest heavily in computer-driven trading and investing. The firm also plans to open an office in Austin, Texas, in the coming months.

Pimco's portfolio of alternative funds has grown from \$26 billion in assets in late 2016, when Mr. Roman was hired, to some \$30 billion today. The firm oversees more than \$1.7 trillion in total.

In its bid to beef up its alternatives business, Pimco has sought to take advantage of big banks' reticence to lend as often as they had before the financial crisis amid a number of new capital requirements.

Three Bravo funds, which



Pimco's Emmanuel Roman

invested in different kinds of loans, from Pimco have raised more than \$12 billion since 2011.

The first fund, Bravo I, produced a net return of 22.1% from its inception through June 2017, according to a memorandum made public by Pennsylvania's Public School Employees' Retirement System, a Pimco client. Bravo II, launched in 2013, had an 11.8% net return as of June, the memo said. Pimco launched Bravo III last year, raising \$4.6 billion.

PCRED, the new fund, is narrowing that strategy to focus exclusively on commercial real-estate loans.

The company's U.S. real-estate group is led by John Murray and Devin Chen. Mr. Chen said in a September interview on the company's website that "more than \$1 trillion of U.S. commercial real-estate loans are set to mature over the next three years" and banks may be unwilling to refinance all of that debt. Pimco is hoping to step in.

Pimco has taken other steps to build out its alternatives business.

The firm formed a joint venture with private-debt investor Solar Capital Partners in December 2016, and in 2017 hired former Blackstone Group executive Greg Hall to lead its private-strategies business.

Late last year, though, Pimco dissolved the Solar partnership before raising any money from outside investors after the firm determined it was "better for us to own 100% of something," Mr. Roman said in a recent interview.

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CLASS ACTION

IN THE SUPERIOR COURT OF CALIFORNIA, COUNTY OF SAN DIEGO

SUMMARY NOTICE OF PROPOSED SETTLEMENT OF CLASS AND DERIVATIVE ACTION AND SETTLEMENT HEARING

TO: ALL HOLDERS OF THE SECURITIES OF PULSE ELECTRONICS CORPORATION ("PULSE") BETWEEN SEPTEMBER 25, 2014 AND APRIL 13, 2015. THE DATE OF THE CONSUMMATION OF PULSE'S GOING-PRIVATE TRANSACTION (THE "MERGER") IN APRIL 2015 (THE "CLASS"). A SHAREHOLDER CLASS ACTION COMPLAINT CONCERNING THE MERGER SETLED. YOU MAY BE ENTITLED TO COMPENSATION AS A RESULT OF THE SETTLEMENT IN THE ACTION CAPTIONED:

Odintoski v. Vazales, et al. Lead Case No. 37-2015-00009254-CU-SL-CTL

YOU ARE HEREBY NOTIFIED, pursuant to California Code of Civil Procedure Section 382 and an Order of the Court, that the above-captioned action has been provisionally certified as a class action and that a settlement for \$825,000 has been proposed. Under the proposed settlement, the settlement amount, minus any Court-approved attorneys' fees, incentive awards, expenses (not to exceed \$310,000.00), and administrative costs (approximately \$50,000.00), will be distributed on a per-share basis to Class Members who owned shares of Pulse common stock immediately prior to the time the Merger became effective, other than one shareholder that previously released its claims. A hearing will be held before the Honorable Richard E. L. Strauss in the San Diego County Superior Court, department 75, at 330 West Broadway, San Diego, CA 92101, at 9:00 AM on July 27, 2018 to determine whether the proposed settlement should be approved by the Court as fair, reasonable, and adequate, and to consider the application of Plaintiffs' Counsel for attorneys' fees and reimbursement of expenses and incentive awards for the named Plaintiffs.

IF YOU ARE A MEMBER OF THE CLASS DESCRIBED ABOVE YOUR RIGHTS WILL BE AFFECTED. IF THE COURT APPROVES THE PROPOSED SETTLEMENT, YOU WILL BE FOREVER BARRED FROM PURSUING THE RELEASED CLAIMS. You may obtain copies of the Proposed Settlement of Class and Derivative Action, a detailed Notice of Proposed Settlement (the "Notice"), and instructions concerning your right to appear and object to the proposed settlement or award of attorneys' fees by visiting the website <http://www.chooseccg.com/cases-info/pul/> or contacting Plaintiffs' Counsel:

Brodsky & Smith, LLC
Attn: Evan J. Smith
9595 Wilshire Boulevard, Suite 900
Beverly Hills, CA 90212
877-534-2590
esmith@brodskymth.com

As described more fully in the Notice, you need not file a written objection in order to object and may appear personally to make an oral objection. In the event there is a written objection it shall be filed with the Court and served upon Plaintiff's Counsel above ten court days prior to July 27, 2018, or no later than July 13, 2018. Further information may be obtained by contacting the Plaintiffs' Counsel listed above. PLEASE DO NOT CALL THE COURT.

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China Widens Fund Access

Beijing eases stricture on foreign money managers' control of local joint ventures

By CHAO DENG

BELIJNG—China will give foreign money managers greater access to raise funds from domestic investors as part of an awaited relaxation in securities rules that analysts say is likely to benefit larger overseas fund managers.

Guidelines released over the weekend by the securities regulator gave formal authorization for foreign firms to control 51% of a local securities joint venture, up from 49%. That cap would be removed in three years, allowing 100% control. The changes, effective immediately, make good on a promise Beijing announced in November of last year.

A statement that accompanied the guidelines said that qualified foreign fund managers may apply for a 51% stake in a fund-management joint venture—something that hadn't been clear in the initial announcement.

Delays by China to open up its financial sector have become a point of contention with the U.S., which for years has urged Beijing to liberalize. A continuing trade fight between the two countries is further putting China's stance toward U.S. firms in the spotlight.

The measure is the latest in a slow-moving liberalization for China's mutual-fund industry, according to Peter Alexander, founder of research firm Z-Ben Advisors in Shanghai. "Access matters more today than at any point in the past," he said.

Until now, foreign firms

have only been allowed minority stakes in fund-management businesses that are allowed to market products to the public. About a dozen are also permitted to independently operate a private fund serving only wealthy Chinese. The new measures give foreign companies with a presence in the market the prospect of control and, analysts said, may entice others that have been looking for a way in.

Firms such as UBS Asset Management and JP Morgan Asset Management Ltd., for example, have set up local joint ventures to operate public mutual funds. **BlackRock** Inc. and **Vanguard Group**, the world's largest asset managers, have approvals to independently raise money from high-net-worth Chinese. Both have expressed interest in expanding in China.

Mr. Alexander believes continuing changes important to money managers, such as allowing more private firms to invest on behalf of public pensions, will lift industry assets under management to \$12 trillion in a decade from about \$2 trillion now. "China's market is one that can have a real impact on a global manager's top and bottom line," he said.

Still, some analysts warn

that the recent opening may only offer limited opportunities. Foreign firms will need to negotiate new deals with their local partners for control. Meanwhile, those coming in anew face an already crowded and competitive market.

Foreigners might have an edge being able to sell public-mutual-fund products that invest in overseas stocks and bonds, but regulators still control Chinese money flowing out. Asset managers need permission under quota-capped programs, for example, to take money abroad.

In that sense, the move has parallels with China's treat-

ment of its auto sector. Beijing this month scrapped joint-venture rules for foreign car makers after decades of requiring them to work with locals. After the change, several global auto makers said untangling the web of partnerships with Chinese companies over decades may prove too difficult.

Foreign firms already in fund-management joint ventures "can increase their stake, but it's by agreement with a local firm," said Natasha Xie, a Shanghai-based finance regulatory lawyer with JunHe LLP. New entrants still face the hurdle of obtaining public mutual fund licenses, she said.

Z-Ben's Mr. Alexander predicted that renegotiating terms with existing partners for foreign firms hoping to turn their minority shareholdings in existing ventures into controlling stakes is likely to be a "daunting" process.

—James T. Areddy

contributed to this article.



The U.S. for years has pushed for Beijing to liberalize its financial sector. Shanghai Stock Exchange.

QILAI SHEN/BLOOMBERG NEWS

Subprime Winner Hits Hard Times

By GREGORY ZUCKERMAN

A decade after the financial crisis, The Wall Street Journal has checked in on dozens of the bankers, government officials, chief executives, hedge-fund managers and others who left a mark on that period to find out what they are doing now. Today, we spotlight hedge-fund managers John Paulson and David Einhorn.

The investor who made the largest fortune betting on the U.S. housing-market collapse has struggled to get much right ever since.

Hedge-fund manager John Paulson made about \$20 billion buying derivatives that served as insurance on risky mortgages and shorting, or betting against, financial companies ahead of the financial crisis.

For a while, his hot hand continued. His firm, **Paulson & Co.**, was among the first to shift to gold, benefiting from a

subsequent rally. The fund prematurely turned bullish on the U.S. economy, but its bullish bets eventually paid off as the market took off in 2009. Investors flocked and by 2011 his firm was managing \$38 billion.

Then, Mr. Paulson's fortunes reversed. His touch has gone frigid in recent years, his firm's performance crippled by losses in drug stocks, collapsing gold companies, and even a Chinese fraud, forestry company **Sino-Forest Corp.**

He also bought four hotels in Puerto Rico at discounted prices. Hurricane Maria left the U.S. territory in ruins, making Puerto Rican investments more challenging, but someone close to the firm said the Paulson hotels are about 95% full.

Mr. Paulson, a 62-year-old Queens, N.Y., native who spent years as a merger arbitrageur, was little known on Wall Street in 2006, the year he began executing the trade that

would make his fortune.

He became convinced that problems were ahead for the U.S. economy, amid a frenzied pace of buying by homeowners, some strapped for cash. His firm bought boatloads of derivatives that served as protection against bundles of potentially toxic

After making billions, John Paulson has stumbled since the financial crisis.

mortgages.

Some clients fretted. Mr. Paulson had little expertise in mortgage investing, but when the subprime market collapsed in value in 2007, the firm made \$15 billion, the largest one-year payout in the history of the financial markets.

Mr. Paulson then took bear-

ish positions on shares of Lehman Brothers Holdings Inc., British banks such as **Royal Bank of Scotland Group PLC** and **Lloyds Banking Group PLC**, and other firms with housing exposure, scoring another \$5 billion in profits in 2008 as the U.S. fell into a recession.

Lately, Mr. Paulson is again seeing his biggest gains in debt investments and traditional merger-arbitrage investing. But he manages less than \$9 billion, most of which is his own money, after client defections.

Paulson & Co. has been letting employees go and is moving into smaller New York offices in the headquarters of Steinway & Sons, the piano maker purchased by Mr. Paulson's firm for more than \$500 million in 2013. Recently, Mr. Paulson made a historic \$1.5 billion tax payment for gains from the subprime trade that had been deferred for a decade.

Victory Is Elusive After Big Lehman Score

By IRA JOSEBASHVILI

Hedge-fund manager David Einhorn struck it big with his wager against Lehman Brothers Holdings Inc. before the bank's 2008 collapse, but his fund's performance has been much spottier since then.

His firm, **Greenlight Capital Inc.**, has suffered from bets against some of the market's best-performing stocks, including **Tesla Inc.** and **Amazon.com Inc.** The main fund lost more than 10% between the end of 2014 and the end of 2017, The Wall Street Journal has reported. The S&P 500 index notched a 38% total return in that period.

This year, the fund lost 14% in the first quarter, according to people familiar with the matter, compared with a 0.8% loss for the S&P 500.

Yet Mr. Einhorn can still move a stock price just by announcing that he is targeting it.

At the Sohn Investment Conference this past week, he told a packed auditorium he was betting against shares of **Assured Guaranty Ltd.**, calling the bond insurer a "melting ice cube that is paying out

the drops while it still can."

The company's stock price was down 6% at one point in aftermarket trading last Monday.

Some of Mr. Einhorn's most famous trades have taken a long time to pay off. A protracted battle with leveraged-buyout financier Allied Capital began in 2002, when Mr. Einhorn said the company was overvaluing its investments. Allied executives at the time called his claims unfounded,

saying the company was committed to transparency.

He described the struggle with Allied in a book called "Fooling Some of the People All of the Time." Allied Capital shares eventually fell and it was acquired by fellow lender **Ares Capital Corp.** in 2010. Mr. Einhorn made millions on the investment.

Mr. Einhorn, 49 years old, has made his name by seizing on what he perceives as mispricing in stocks, often providing

meticulous arguments for why he believes a particular company's shares are overvalued. In 2011, he blasted Green Mountain Coffee Roasters Inc., in an hourlong presentation that required more than 100 slides.

In 2008, he said Greenlight Capital was betting against the stock of Lehman Brothers. The bank filed for bankruptcy protection later that year.

Assured Guaranty's shares rose by the end of day on Tuesday and are higher since then. In response to the comments at the Sohn conference, Assured said "we reiterate our strong disagreement with Mr. Einhorn's assertions. He fails to acknowledge the positive implications of our significant financial strength and strong operating performance, and he demonstrates a fundamental lack of understanding of our business model and the municipal debt markets."

At the conference, Mr. Einhorn began discussing the frothy valuations for bond insurers back in 2008 and seemed to get nostalgic.

"Bubbles do pop, you know," he told the crowd. "Or at least they used to."



BRENDAN McDERMID/REUTERS

David Einhorn's firm suffered from bets against highflying stocks.

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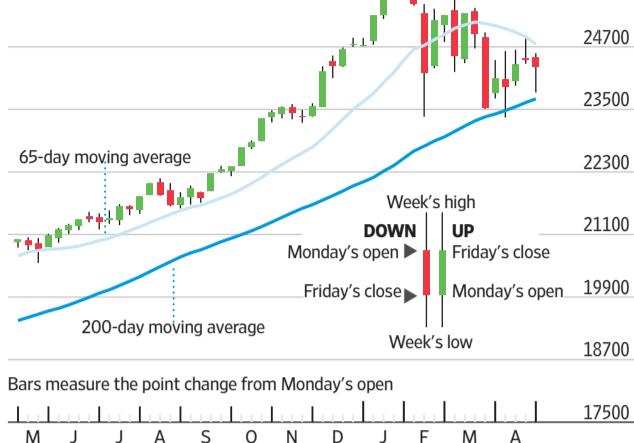
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Dow Jones	High	Low	Latest Week Close	Net chg	% chg	Low	Close (●)	High	% chg	YTD	3-yr. ann.
	24579.94	23823.08	24311.19	-151.75	-0.62	20606.93	26616.71	16.1	-1.7	10.5	
Industrial Average	24579.94	23823.08	24311.19	-151.75	-0.62	20606.93	26616.71	16.1	-1.7	10.5	
Transportation Avg	10684.03	10297.79	10549.40	-29.50	-0.28	8783.74	11373.38	16.0	-0.6	6.2	
Utility Average	710.99	688.47	708.68	17.54	+2.54	647.90	774.74	0.6	-2.0	6.3	
Total Stock Market	27857.01	27143.20	27677.39	-40.30	-0.15	24391.29	29630.47	11.9	0.02	7.8	
Barron's 400	727.48	709.30	715.95	-5.94	-0.82	624.99	757.37	12.1	0.7	7.5	

Nasdaq Stock Market

Nasdaq Composite	7197.15	6926.97	7119.80	-26.33	-0.37	6011.24	7588.32	17.7	3.1	12.1
Nasdaq 100	6750.78	6426.57	6656.35	-11.40	-0.17	5580.55	7131.12	19.2	4.1	13.7

S&P

S&P 500 Index	2683.55	2612.67	2669.91	-0.23	-0.01	2357.03	2872.87	12.0	-0.1	8.2
MidCap 400	1915.59	1873.08	1892.23	-8.27	-0.44	1691.67	1995.23	9.2	-0.4	7.5
SmallCap 600	969.42	949.80	956.18	-5.58	-0.58	817.25	979.57	12.3	2.1	9.9

Other Indexes

Russell 2000	1574.48	1539.95	1556.24	-7.89	-0.50	1355.89	1610.71	11.1	1.3	7.5
NYSE Composite	12675.93	12408.78	12594.02	-13.13	-0.10	11423.53	13637.02	9.2	-1.7	4.1
Value Line	559.67	548.00	554.28	-1.98	-0.36	503.24	589.69	5.8	-1.4	2.4
NYSE Arca Biotech	4608.10	4424.32	4555.39	-10.46	-0.23	3507.64	4939.86	25.3	7.9	5.0
NYSE Arca Pharma	532.45	518.82	531.45	6.43	+1.22	511.84	593.12	3.8	-2.5	-3.0
KWB Bank	109.90	106.62	108.35	0.96	+0.89	88.87	116.52	18.8	1.5	14.3
PHLX® Gold/Silver	84.09	81.98	82.93	-2.18	-2.57	76.42	93.26	-0.2	-2.7	5.0
PHLX® Oil Service	158.97	151.74	156.56	2.38	+1.54	117.79	165.78	2.0	4.7	-9.9
PHLX® Semiconductor	1285.01	1223.09	1258.11	-12.72	-1.00	1004.62	1445.9	25.1	0.4	21.8
CBOE Volatility	19.84	15.25	15.41	-1.47	-8.71	9.14	37.32	42.4	39.6	5.5

\$ Nasdaq PHLX

S&P 500 Index

2669.91 ▼0.23, or 0.01% last week
 High, low, open and close for each of the past 52 weeks

Trailing P/E ratio * 24.09 24.17
 P/E estimate * 16.99 18.42
 Dividend yield 1.95 1.97
 All-time high 2872.87, 01/26/18



M J J A S O N D J F M A 2100

20 23 24 25 26 27 April

Financial Flashback

The Wall Street Journal, April 30, 2009

Time Warner Inc. said it expected to press ahead with a spinoff of all or part of ailing Internet unit AOL following their disastrous 2001 merger.

New to the Market
Public Offerings of Stock
IPOs in the U.S. Market

Initial public offerings of stock expected this week; might include some offerings, U.S. and foreign, open to institutional investors only via the Rule 144a market; deal amounts are for the U.S. market only

Expected pricing date Filed	Issuer/business	Symbol/primary exchange	Shares (mil.)	Pricing Range(\$)	Low/High	Bookrunner(s)
5/1 4/6	PermRock Royalty Trust Oil and gas royalty trust.	PRT N	6.3	19.00/ WFS, GS, UBS, DB, 21.00 Jefferies, Stifel, Oppenheimer		
5/2 4/6	Inspire Medical Systems Developer of medical devices.	INSP N	5.0	14.00/ BofA ML, GS, 16.00		
5/2 4/5	Unity Biotechnology Developer of therapeutics that prevent, halt, and reverse various diseases of aging.	UBX Nq	5.0	16.00/ GS, MS, Citi, 18.00		
5/3 4/9	Carbon Black Software company providing an endpoint security platform.	CBLK Nq	8.0	15.00/ MS, JPM, 17.00		
5/3 4/6	Construction Partners Civil infrastructure company building and maintaining transportation networks.	ROAD Nq	11.3	15.00/ RW Baird & Co, Raymond James & Assoc, Stephens		
5/3 4/6	Spirit of Texas Bancshares Holding company for Spirit of Texas Bank SSB, a state savings bank.	STXB Nq	1.9	20.00/ Stephens, Stifel, 22.00		

Lockup Expirations

Below, companies whose officers and other insiders will become eligible to sell shares in their newly public companies for the first time. Such sales can move the stock's price.

Lockup expiration	Issue date	Issuer	Offer symbol	Offer price(\$)	Offer amt (\$ mil.)	Through Friday (%)	Lockup provision
April 30	Nov. 1, '17	Allena Pharmaceuticals	ALNA	14.00	74.7	6.6	180 days
	Nov. 1, '17	Evoqua Water Technologies	AQUA	18.00	575.0	13.6	180 days
	Nov. 1, '17	Funko	FNKO	12.00	125.0	-26.6	180 days
	Nov. 1, '17	Spero Therapeutics	SPRO	14.00	83.6	-11.1	180 days
May 1	Nov. 2, '17	ACM Research	ACMR	5.60	11.2	80.2	180 days
	Nov. 2, '17	Aquantia	AQ	9.00	70.6	16.3	180 days
May 6	Nov. 7, '17	CBTX Inc	CBTX	26.00	71.8	10.5	180 days
	Nov. 7, '17	Four Seasons Education (Cayman)	FEDU	10.00	101.0	-31.0	180 days
	Nov. 7, '17	InflaRx	IFRX	15.00	106.0	155.8	180 days
	Nov. 7, '17	Metropolitan Bank Holding	MCB	35.00	124.8	34.9	

MARKETS

Bitcoin's New Hub Rises in The Swiss Alps

BY BRIAN BLACKSTONE

ZUG, Switzerland—When 24-year-old Ian Worrall launched his crypto-investment startup **MyBit** last year, he chose this Swiss lakeside city as its home.

It was an odd fit: the no-holds-barred corner of the financial markets meeting button-down Switzerland.

Yet this nation, as closely tied to its ultra-safe Swiss franc as it is to the Alps, is entranced by volatile digital currencies. Buildings in Zug and in Zurich, Switzerland's financial center, are blossoming into crypto-finance hubs.

Four of the 10 biggest initial coin offerings last year were in Switzerland, according to PwC, more than any other country.

The hope is the country's banking prowess, low taxes, elite universities and the Swiss brand itself will do for Switzerland what Silicon Valley did for the U.S.

Efforts to expand the "Crypto Valley" into what Switzerland's economics minister has called Crypto Nation have seen some success and may offset the country's shrinking banking sector. The number of banks here has fallen 20% in the past decade, according to the Swiss Bankers Association.

Switzerland "is the best from a tax, legal and operational standpoint," Mr. Worrall said from the MyBit headquarters in a startup hub called Crypto Valley Labs.

MyBit is an investment platform to fund Internet of Things devices such as self-driving automobiles. It raised the equivalent of some \$3 million in an initial coin offering last summer.

The number of companies at Crypto Valley Labs and another location jumped from 15 early last year to over 100, said Matthias Ruch, managing partner at Lakeside Partners, which developed the site. "I'm signing contracts on a daily basis," he said.

The canton of Zug, with a population of around 120,000, has emerged as the heart of Switzerland's Crypto Valley. Its population grew at the fastest rate of all Swiss cantons in

2017, and its jobless rate is 2.3%, below Switzerland's 2.9% average and down 0.2 percentage point from a year ago. Its corporate tax rate is 14.6%.

Matthias Michel, Zug's economics minister, said Crypto Valley wasn't a grand plan. Rather, it began five years ago when pioneers of blockchain platforms like Monetas put down roots in Zug, attracted by the business-friendly environment. Others followed, and an ecosystem developed.

In the process, Zug became a pilgrimage destination for global crypto devotees, complete with guided tours. There is a "Bitcoin accepted here" sign at city hall.

"You cannot copy and paste [what Zug has done], it's a systematic approach which makes it strong," said Mr. Michel.

Recently, officials from Finma, the Swiss financial regulator, met industry representatives at a packed conference here. The meeting showcased another Swiss advantage—nimble regulators, or as Mr. Worrall described the approach: "Do your best, and if you mess up, we'll work with you."

While Finma is receptive to cryptocurrencies, the Swiss National Bank is skeptical and has warned of the risks associated with them. Executives from large banks echo those worries.

There are other drawbacks for Switzerland. Despite a skilled workforce, the country lacks a startup culture. There is a greater stigma attached to failing at a new business in Switzerland than there is in the U.S. High living costs will make it hard to scale up. If Mr. Worrall expands, it will probably be in Berlin.

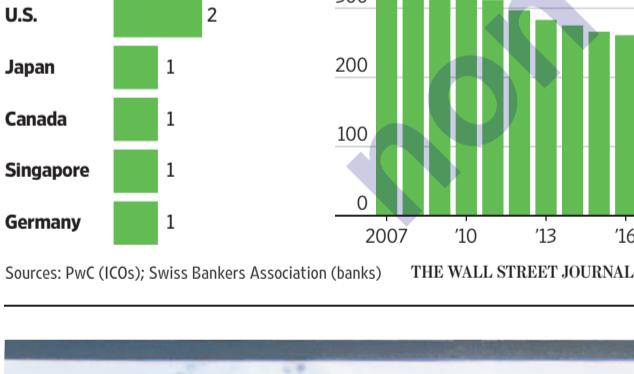
The biggest fear, though, isn't the central bank or living costs, industry participants say, but rather the potential to run afoul of U.S. regulators.

Switzerland has spent years distancing itself from a reputation as a shady-money haven. Banks have spent billions of dollars settling damaging charges from U.S. authorities related to tax evasion and mortgage-backed securities. Crypto startups say it is hard to open a business bank account.

Swiss Made

Switzerland has become entranced by cryptocurrencies as the country's banking sector shrinks.

Number of initial coin offerings in the top 10



Sources: PwC (ICOs); Swiss Bankers Association (banks)

THE WALL STREET JOURNAL.



A yearlong campaign by the Indian government is encouraging citizens to invest in the nation's stock market.

Indians Flood Into Stocks

Going Local

While a torrent of domestic cash into the Indian stock market helped drive the benchmark index up, some foreign investors are pulling out.

Annual net flows into Indian equities



Sources: Morgan Stanley (flows); Thomson Reuters (index) THE WALL STREET JOURNAL.

S&P BSE Sensex index performance



US\$ vs. Fri per US\$ YTD chg (%)

sion you might have to go five villages away to another town to get it and hopefully, you'll actually get the money," said Anil Agarwal, equity analyst at Morgan Stanley. "Today, you can open a bank account in seconds and the money comes right in."

Keshab Jena, who works at an infrastructure firm in Dhenkanal, a small city in Odisha, said he had always thought investing in stocks was too risky.

"I used to keep my money only in bank deposits. I have also invested some amount in real estate," he said. "But when I realized that stocks can give better returns compared to other assets, I decided to start investing in mutual funds."

Now the 39-year-old says he is investing 10,000 rupees (about \$150) a month in mutual funds to help pay for his daughter's higher education and marriage, and for his retirement.

helped the effort by pushing the country's largest retirement-fund manager to triple its investments in Indian equities—from 5% of incremental flows two years ago to 15% today, with plans to gradually lift those investments to 25%.

The result is that investors inside India are crowding out foreign investors for the first time in decades.

Domestic investors poured more than \$14 billion into Indian stocks through mutual funds in 2017, compared with around \$8 billion by foreign investors, according to Morgan Stanley.

About \$1 billion a month is flowing into Indian equities through small automatic payments from everyday citizens, according to Morgan Stanley's analysis of data from the Association of Mutual Funds of India. Many are investing in the stock market for the first time, pulling out of underperforming investments in real estate, gold and bank fixed deposits.

India's growth had long disappointed investors who say based on its demographics it should have outpaced China's as the fastest-growing large economy. But decades of erratic economic policy, compli-

cated tax laws, inefficient infrastructure and bureaucratic red tape have stymied its growth, though there are signs that some things are improving.

"Before, if you had a pen-

Currencies

U.S.-dollar foreign-exchange rates in late New York trading

Country/currency	Fri in US\$	Fri per US\$	YTD chg (%)	US\$ vs. Fri per US\$ YTD chg (%)
Americas				
Argentina peso	.0487	20.5295	10.4	
Brazil real	.2892	3.4575	4.4	
Canada dollar	.7805	1.2813	1.9	
Chile peso	.001650	606.20	-1.5	
Ecuador US dollar	1	1	unch	
Mexico peso	.0537	18.6133	-5.4	
Uruguay peso	.035222	28.3900	-1.4	
Venezuela b. fuerte	.0001566870.0001	64499.1	-3.0	
Asia-Pacific				
Australian dollar	.7581	1.3191	3.0	
China yuan	.1579	6.3336	-2.6	
Hong Kong dollar	.1274	7.8473	0.4	
India rupee	.01501	66.620	4.3	
Indonesia rupiah	.0000721	13865	2.8	
Japan yen	.009170	109.05	-3.2	
Kazakhstan tenge	.030503	327.53	-1.5	
Macau pataca	.1237	8.0847	0.5	
Malaysia ringgit	.2552	3.9190	-3.5	
New Zealand dollar	.7086	1.4112	0.1	
Pakistan rupee	.00865	115.600	4.5	
Philippines peso	.0194	51.630	3.3	
Singapore dollar	.7555	1.3236	-1.0	
South Korea won	.0009365	1067.85	0.1	
Sri Lanka rupee	.0063408	157.71	2.7	
Taiwan dollar	.03834	29.555	-0.4	
Thailand baht	.03173	31.520	-3.3	
Vietnam dong	.00004393	22764	0.2	
Middle East/Africa				
Bahrain dinar	2.6522	.3770	-0.2	
Egypt pound	.0565	17.6955	-0.4	
Israel shekel	.2787	3.5881	3.1	
Kuwait dinar	3.3216	.3011	-0.1	
Oman rial	.25976	.3850	0.01	
Qatar rial	.2746	3.641	-0.2	
Saudi Arabia riyal	.2666	3.7500	unch	
South Africa rand	.0811	12.3292	-0.3	
Europe				
Czech Rep. koruna	.04763	20.997	-1.3	
Denmark krone	.1628	6.1421	-1.0	
Euro area euro	1.2131	.8244	-1.1	
Hungary forint	.003878	257.85	-0.4	
Iceland krona	.009896	101.05	-2.4	
Norway krone	.1256	7.9618	-3.0	
Poland zloty	.2883	3.4688	-0.3	
Russia ruble	.01609	62.155	7.8	
Sweden krona	.1155	8.6575	5.8	
Switzerland franc	1.0124	.9878	1.4	
Turkey lira	.2474	4.0422	6.5	
Ukraine hryvnia	.0381	26.2325	-6.8	
UK pound	1.3784	.7255	-2.0	
Middle East/Africa				
Bahrain dinar	2.6522	.3770	-0.2	
Egypt pound	.0565	17.6955	-0.4	
Israel shekel	.2787	3.5881	3.1	
Kuwait dinar	3.3216	.3011	-0.1	
Oman rial	.25976	.3850	0.01	
Qatar rial	.2746	3.641	-0.2	
Saudi Arabia riyal	.2666	3.7500	unch	
South Africa rand	.0811	12.3292	-0.3	
WSJ Dollar Index				
Close	85.30	-0.14	-0.17	-0.78
Net Chg				
% Chg				
YTD Chg				

Sources: Tullett Prebon, WSJ Market Data Group

MARKETS

Junk Bonds Withstand Falling Treasurys

Fund outflows, stock volatility fail to dent demand for riskier corporate debt

By SAM GOLDFARB

The market for riskier corporate bonds is picking up again, showing the resilience of investor appetite for high-yielding junk debt in the face of rising Treasury yields, large fund outflows and volatility in stocks.

After two months of negative returns, bonds rated speculative grade, or "junk," by credit-rating firms have returned 0.6% in April, counting price changes and interest payments, according to Bloomberg Barclays data, compared with minus-1.3% for investment-grade bonds.

The average junk-bond yield was 3.33 percentage points above the comparable Treasury yield on Friday, up from a postcrisis low of 3.11 percentage points on Jan. 11 but down from its recent peak of 3.66 percentage points on Feb. 9.

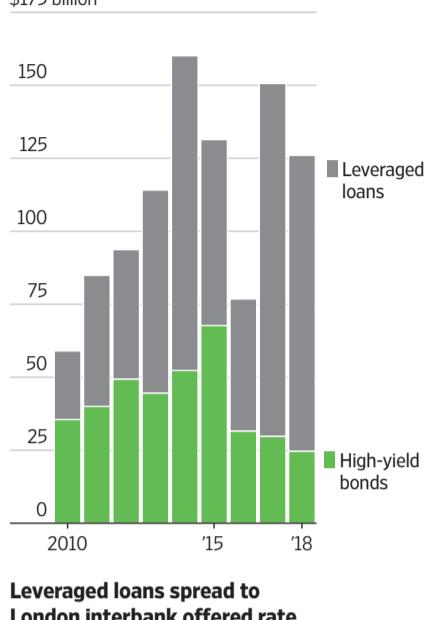
A shrinking spread signals greater confidence in the credit quality of the bonds, which sometimes have picked up signs of economic stress earlier than other assets. A strong and stable junk-bond market has been the norm in recent years, but its performance of late is notable given the obstacles it has faced.

Since the end of last year, the yield on the 10-year U.S. Treasury note has climbed to around 2.96% from 2.41%. When Treasury yields rise, yields on corporate debt generally must rise as well—as their prices fall—because even the strongest companies carry greater default risk than the U.S. government. Rising rates also can enhance the appeal of Treasurys relative to corporate bonds and spook investors, leading to cash outflows



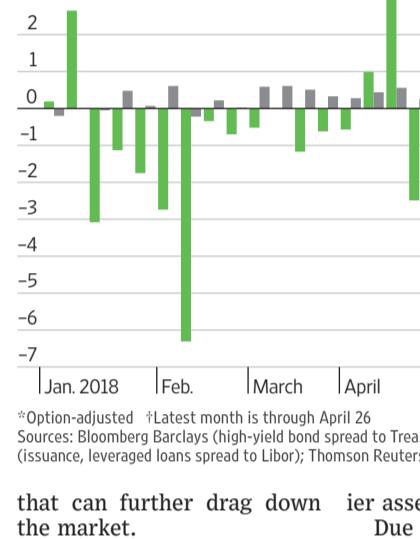
Average high-yield bond spread to Treasurys*

Net issuance through April of each year



Leveraged loans

Net fund flows, weekly



High-yield bond total return by month†



Leveraged loans spread to London interbank offered rate



*Option-adjusted †Latest month is through April 26

Sources: Bloomberg Barclays (high-yield bond spread to Treasurys, bond return); LCD, a unit of S&P Global Market Intelligence (issuance, leveraged loans spread to Libor); Thomson Reuters Lipper (flows)

that can further drag down the market.

So far this year, investors have pulled more than \$14 billion from high-yield mutual funds and exchange-traded funds, according to Thomson Reuters Lipper. Along with the threat from rising interest rates, analysts have attributed the outflows to broad concerns about the value of risk-

ier assets.

Due to their risk profile, junk bonds often move in tandem with major U.S. stock indexes, which have swung sharply this year between gains and losses. They also tend to be less volatile than stocks, thanks in part to the relatively large coupons that they pay out, which can offset price declines.

Investors and analysts say that the outflows from publicly accessible high-yield funds have likely been mitigated by stable or even increased demand from institutional sources, such as pension funds, that see opportunity in rising yields.

High-yield bonds also have gotten an assist from a somewhat unlikely source: lever-

aged loans, which are the secured, floating-rate debt often issued by the same junk-rated companies that borrow in the bond market.

Though the leveraged loans can sometimes compete for investor dollars with high-yield bonds, the two assets also can help each other. This year, retail investors have poured more than \$4 billion into loan

funds, highlighting the appeal of their adjustable coupons while interest rates are rising. Demand from other investors, such as managers of collateralized loan obligations, also has been robust, creating an incentive for companies to borrow in the loan market instead of the bond market.

Net supply of high-yield bonds—or total new issuance excluding bonds that were used to refinance old debt—has dropped this year to around \$25 billion from \$30 billion through April of last year and \$68 billion three years ago, according to LCD, a unit of S&P Global Market Intelligence. That means that even as demand for junk bonds has fallen, supply has decreased as well, creating a market that is more or less in balance.

Through April 25, bonds accounted for 19.6% of net issuance of syndicated high-yield debt, according to LCD, compared with 23.4% last year and 49.9% in 2010.

"If you're an issuer who was going to go to the bond market," it is easy to say, "I'll just do a bigger loan, because there's a massive amount of demand for loan paper," said Andrew Susser, head of high yield at MacKay Shields.

In addition, Mr. Susser said, many junk-bond investors also hold loans, which they can sell if bond prices are falling and they want an alternative way of raising cash to meet redemptions or buy new bonds.

In the meantime, high-yield investors have generally been welcoming to the relatively small number of companies that have sold new bonds this year. In recent sessions, two debut issuers, **Jagged Peak Energy** LLC and **WeWork** Cos., both increased the size of their bond deals to match strong demand, while **Netflix** Inc., a frequent borrower, increased a sale to \$1.9 billion from \$1.5 billion.

HEARD ON THE STREET

FINANCIAL ANALYSIS & COMMENTARY

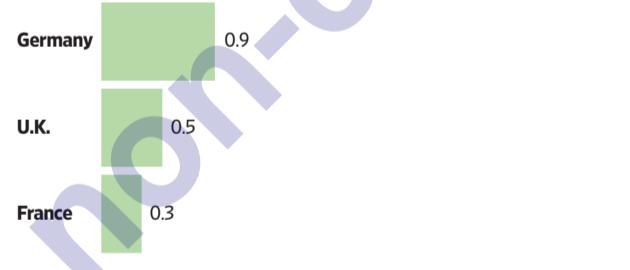
WSJ.com/Heard

Email: heard@wsj.com

Turmoil for Toys as Stores Close

Playtime Is Over

Amazon.com estimated toy sales, 2017



Source: One Click Retail

brand equity so they don't get tangled up in a price erosion they can't unwind," she added.

On Thursday, Mattel reported a loss that was almost three times bigger than the same period last year.

Revenue fell to \$708.4 million from \$735.6 million a year ago, though it beat expectations.

Hasbro suffered too. In the U.S. and Canada, sales fell 19%. (It was comparing

against a very strong period last year, while Mattel was comparing against a very weak one.) The company reported a first-quarter loss of \$112.5 million, or 90 cents a share, and revenue dropped to \$716.3 million.

Yet the disruption is likely a transitory one. Other retailers, including **Amazon.com**, are rushing to take Toys "R" Us's market share and increase their toy offerings.

—Elizabeth Winkler

against a very strong period last year, while Mattel was comparing against a very weak one.) The company reported a first-quarter loss of \$112.5 million, or 90 cents a share, and revenue dropped to \$716.3 million.

Meanwhile, manufacturers are building out their e-commerce capabilities, which have lagged behind. Only about 20% of Hasbro's sales occur online.

Of the two manufacturers, Hasbro is far better positioned to evolve with the industry.

Unlike Mattel, Hasbro isn't constrained by debt and it has more continuity and stability in its management team, which has been together for eight years. Mattel, which recently named a new CEO, has seen several abrupt pivots in leadership. It also has debt coming due beginning next year.

With a debt-adjusted market value about 50% higher than Mattel's, Hasbro is the more expensive stock. But it has options and that is what the market values. One might be to take over Mattel. An offer it made last fall came to nothing. The timing may be right to revive that discussion. At its current level, Mattel is ripe for the taking.

OVERHEARD

Perhaps a sign of grudging respect from **Microsoft** comes when the software giant refuses to say your name.

That may be the case for smash videogame "Fortnite." Microsoft noted in its fiscal third-quarter report Thursday that software and services revenue from its Xbox business grew 24% year over year, a sharp jump. The company credited "record levels of engagement driven by a third-party title." Analysts who cover the company identified the game as "Fortnite."

While "Fortnite" benefits its Xbox Live service, the game is such a hit with the younger crowd that it may be drawing some players away from "Minecraft," a global gaming phenomenon that Microsoft acquired for \$2.4 billion in 2014.

But, viewing microtransaction revenue from other games, **Todd Juenger** of Bernstein theorized that Microsoft's strong numbers indicate that "Fortnite" may not be hurting other games as much as thought.

Baidu Has Good News For Investors

China's search-engine giant **Baidu** has found a way to make users stick around: tailored news content generated by artificial intelligence.

Nasdaq-listed Baidu has been on a roll. Its adjusted revenue in the latest quarter grew 31% from a year ago. Baidu expects the growth to continue, forecasting sales could increase by around one-third again this quarter, excluding disposed businesses.

Baidu's news feed is now an important growth driver. The function delivers personalized content to users based on their search history and what they previously read. This has encouraged app users to spend more time there, which has made advertisers more willing to buy ads. Baidu's average revenue per advertising customer rose 19% from a year ago, contributing to a doubling of its operating profit.

The popularity of the news feed has addressed a crucial weakness—people not spending much time on Baidu's apps. **Alibaba** and **Tencent**, Baidu's bigger rivals, have done better; the former through its Taobao and Tmall shopping platforms, the latter via China's largest social network WeChat. Accordingly, Baidu's stock price has lagged behind the other two.

Baidu also plans to sell a majority stake in its financial-services business, which faces strong competition. Netflix-like video service **iQiyi**, which has just raised \$2.3 billion in an initial public offering, is still losing money but its losses have at least narrowed as a percentage of revenue.

Baidu's search for growth has started turning up better results.

—Jacky Wong

Auto Investors Focus on Change Ahead of a Murky Future

The auto industry is enjoying the benefits of a healthy global economy and increasing demand for lucrative SUVs, a stream of first-quarter results confirmed last week. But investors don't seem too interested in the macro trends that have typically driven these stocks.

Instead, they are looking into a vaguely threatening future of driverless electric cars and at companies' capacity to boost their valuations by shedding assets and costs.

At **Volkswagen**, newly appointed Chief Executive Herbert Diess is expected to create value by floating the truck business while reining

in spending at the Volkswagen brand. Mercedes owner **Daimler** also has raised hopes that it will float its truck unit.

The Germans are tacitly following the lead of Sergio Marchionne, chief executive of **Fiat Chrysler**. Having spun out an industrial-vehicles business in 2011 and luxury brand Ferrari in 2016, the company said this month it would spin off parts maker Magneti Marelli.

In the U.S., **General Motors** moved aggressively to trim its portfolio last year while investing heavily in its driverless-car unit. Its Detroit rival **Ford Motor** has been slower but is showing

signs of following GM's lead under a new management team. Chief Executive Jim Hackett brought forward a key margin target Wednesday and said he would sell underperforming units.

Merger situations have revived interest in the French manufacturers. Carlos Ghosn, chairman of the Renault-Nissan-Mitsubishi Alliance, continues to drop hints that **Renault** and **Nissan** could merge. **Peugeot** faces a huge task—and opportunity—in boosting margins at Opel, which it bought last year from GM.

Many of these reforms have come into sharper focus this year, buoying share

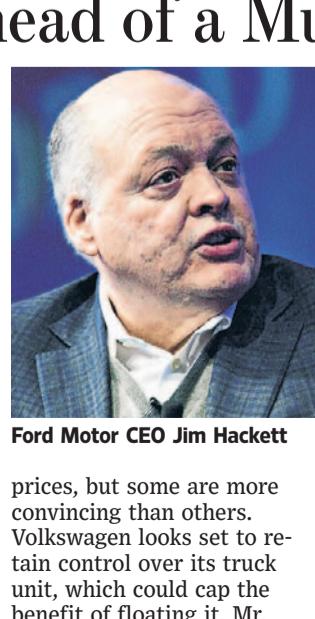
prices, but some are more convincing than others. Volkswagen looks set to retain control over its truck unit, which could cap the benefit of floating it. Mr.

Marchionne will retire next year, leaving a question hanging over Fiat Chrysler's future. After strong runs, both stocks look vulnerable to disappointment.

With GM's stock trading at six times earnings, though, it appears investors have shifted from enthusiasm for the company's electric and driverless-car efforts to worries about an uncertain future.

Money likely could be made betting that they will change their minds again. Car makers seem more open to change than is often assumed. The trick may be to buy when others aren't paying attention.

—Stephen Wilmot



Ford Motor CEO Jim Hackett

ANDREW HARRER/BLOOMBERG NEWS

ARTIFICIAL INTELLIGENCE

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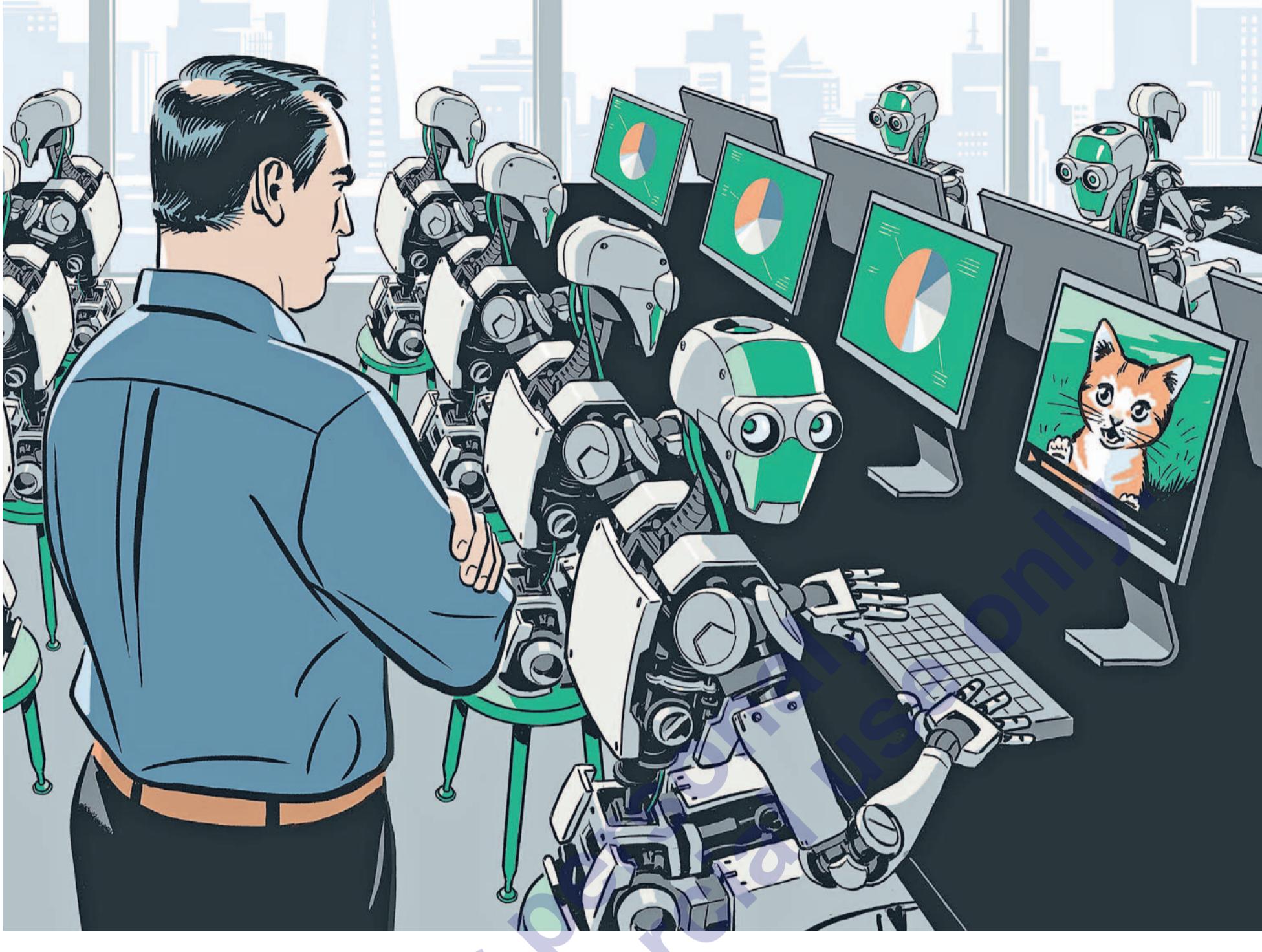
THE WALL STREET JOURNAL.

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Monday, April 30, 2018 | R1

Seven Jobs Robots Will Create—or Expand

Artificial intelligence threatens to destroy a lot of jobs. But there's another side to the story.



BY DANIELA HERNANDEZ

AS MACHINES GET SMARTER, there is a persistent fear in the minds of economists, policy makers and, well, everybody: Millions of people will be left obsolete and jobless.

But the effects of artificial intelligence are likely to be a lot more complex than that.

Yes, jobs will be lost, and many people will be forced to learn new skills to keep up in this new environment.

But experts say the picture has a surprisingly big silver lining.

For one thing, AI opens up opportunities for many new jobs to be created—some that we can imagine and many we probably can't right now. Already, many companies are discovering that they need a range of new workers to keep their smart new world running smoothly—and not just software developers but also managers, operators and artistic designers.

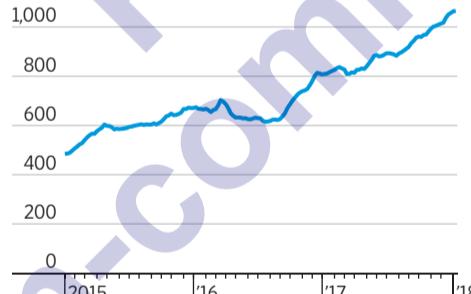
Meanwhile, the machines aren't smart enough right now, and probably won't be for some time, to do all the things that people can, so they will need humans to supervise them. As a result, many jobs will be transformed rather than eliminated, as people rework their old roles to include collaborating with AI in some form.

Consulting firm McKinsey & Co. predicts that investments in technology, including AI and automation, could add 20 million to 50 million jobs globally by 2030. Calculating job loss is more complicated, according to the firm, because in many cases people won't lose their jobs outright, but instead will switch occupations. In one study, the firm found that somewhere between 75 million and 375 million people may need to switch jobs by 2030 due to adoption of automation.

Here's a look at some jobs that will be created—or transformed—by these new smart technologies.

Growing Demand for AI Talent

AI-related job postings in the U.S. per million postings



Note: AI-related postings include those with any variant on the titles data scientist, machine learning engineer, predictive modeler, cmt analytics manager, computer vision engineer, computational linguist, and information strategy manager.

Source: Indeed Hiring Lab

Boon for Coders

The number of new technology jobs expected to be created in the U.S. by 2030 for selected titles as a result of investment in AI, automation and related technologies

Software application developers	289,000
System software developers	111,000
Computer system analysts	108,000
Computer user support specialists	94,000
Computer programmers	84,000

Source: McKinsey & Co.

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To find skilled candidates, iRobot has extended its recruitment efforts globally because such talent is scarce and in high demand. The result is an arms race among companies to find the best talent. According to jobs site Indeed, demand for AI-related roles has more than doubled in the past three years. The two most sought-after: machine-learning engineers and computer-vision engineers.

When parents ask Mr. Campanello what second language their children should learn, he suggests Python, a programming language popular in machine learning.

CUSTOMER-ROBOT LIAISONS

For all the promise of AI systems, getting employees to accept them can be tough—especially when they involve changes as potentially intrusive as bringing robots into the workplace. That is why some companies that make AI applications use so-called customer success managers to help ease clients into working with the systems, answering complaints and making adjustments as needed. The role is currently among the most sought-after AI-related positions on jobs site ZipRecruiter.

Will Catron is one of those managers, at Cobalt Robotics Inc. in Palo Alto, Calif. Mr. Catron, 36, is in charge of ensuring clients are happy with the robots the company has rented out as security guards on graveyard-shift and weekend duty.

He starts by getting a "good handle" on how comfortable clients are interacting with robots, he says. "No one's onboarded a robot." He helps them get acquainted with other Cobalt employees with whom they'll be interacting.

Mr. Catron spends most of his workday monitoring usage reports that Cobalt's robots generate and interfacing with customers through calls, text, email and on-site visits. A lot of the job is building relationships and understanding what people want, he says.

Please turn to the next page

AI BUILDER

As more products, services and research come to depend on AI, there will naturally be a greater need for people who can develop the underlying systems that make AI work. What's more, other fields will need people with knowledge of how to integrate their work with AI to fit into this new world.

Consider how AI has changed things at just one company: iRobot Corp., a maker of self-guided robotic mops and vacuums. As recently as five years ago, the Bedford, Mass.-based company was more focused on hiring hardware developers to build its machines' physical bodies. The robots of the past had software brains that were much less complex, consisting of roughly 100 lines of code.

That number has jumped to millions. To keep pace with the higher workload, iRobot has roughly quadrupled its staff of software engineers focused on consumer robots to approxi-

mately 125 last year from 30 in 2015. The majority are involved in making iRobot's products smarter through more advanced AI and computer-vision systems, according to Russ Campanello, executive vice president for human resources and corporate communications.

"Before, the robot would have to physically bump into something" to know there was a barrier, he says. "Now the robot can see," thanks to more sensors.

The robot can also tell its owner when it has completed a cleaning job, how long the task took and where it cleaned. In addition, the machine gives its human owner feedback on where the dirtiest parts of the home are and when filters need to be changed.

Building out those capabilities requires iRobot to hire more Ph.D.-level scientists with expertise in AI, navigation, computer vision and robotics, who are able to not just build the company's products but also conduct research that will lead to improvements in future devices, according to Mr. Campanello.

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JOURNAL REPORT | ARTIFICIAL INTELLIGENCE

What Exactly Is Artificial Intelligence, Anyway?

Everybody's talking about AI these days. Here's what all the fuss is about.

BY TED GREENWALD

ONCE THE STUFF of sci-fi fantasies, artificial intelligence is taking over the world.

It completes half-written words in your texts. It answers questions through your smartphone or smart speaker. It plots the quickest route from here to there. It recognizes familiar faces at your door, curates your social feed, fills your playlist. It slaps ads for those cool boots you considered buying on every webpage you look at.

And it's only going to become more sophisticated. Auto makers are conceiving self-driving vehicles to ferry people to their destinations, then park or carry other passengers until pickup time. Lights and thermostats can connect to your smartphone's location sensors, so your home can go to sleep when you depart and wake up when you return. Factory robots are sorting goods into customer orders that might be carried to your doorstep by autonomous quadcopters.

AI isn't the next big thing—it's here now, and it shows no sign of letting up.

Here's an introduction to the technology you soon may come to regard as your new helper, teacher, colleague, neighbor, or overlord—I mean best friend.

What is AI?

Let's start with what it's not. AI is not a high-tech replacement for a human brain. Generally AI is anything a computer can do that formerly was considered a job for a human. But the pace of change in computing makes that a slippery formulation. Two decades ago, Deep Blue, the International Business Machines Corp. system that

beat world chess champion Garry Kasparov, was the epitome of AI. Now a freebie smartphone game can accomplish much the same thing.

How does AI work?

Early efforts were based on code that mimicked human problem-solving ability by applying logic to predefined objects and actions, or emulated human thinking by following if-then rules. Those techniques often failed because programmers couldn't map out entities or instructions that covered the profusion of actual possibilities.

Meanwhile, a set of techniques known as machine learning sidestepped the need to manage endless possibilities by using statistical analysis of real-world phenomena to make predictions about how the world works. But such programs couldn't learn much without huge amounts of data and processing power to crunch them—rare commodities in decades past.

Then came the internet. Net-based applications from search to e-commerce started to produce motherlodes of data, and processing power mushroomed as companies like Google and Amazon.com Inc. pooled their servers into global mega-computers.

Supercharged with floods of data and endless horsepower, machine-learning algorithms took off—especially a type known as neural networks. These self-learning programs are built of simple software routines modeled on early notions of how biological neurons work. Digital neurons are arranged in interconnected layers, each sending its output to the next. A network with many layers is said to perform deep learning.

Neural nets learn without being explicitly programmed with logical relationships or

rules. Programmers start by curating and labeling a large body of data; say, images of cats. Then they feed the images into a neural net in a step known as training.

Once the network has digested the pictures, they feed it a new set of unlabeled shots, some depicting cats, some not. If all goes well, the neural net will pick out the felines—an operation often called inference.

Why is everyone talking about it?

AI has overpromised and underdelivered ever since Dartmouth College mathematician John McCarthy invented the term in the mid-1950s. A few years ago, though, it started delivering in spades.

In 2012 Geoffrey Hinton and his colleagues at the University of Toronto used a neural network to win a competition that required identifying the contents of 15 million images in 22,000 categories. Mr. Hinton's software achieved an error-rate score of 15.4%, compared with the next-best entry's 26.2%.

Mr. Hinton's demonstration that neural nets can mimic human perception set in motion a tsunami of AI research and development that promises to leave no industry unchanged. Suddenly computers can learn to see, hear and otherwise sense the world around them, and begin to reason based on what they learn.

How long before they wink into sentience, or blunder unconsciously into dystopian mayhem? Maybe soon, maybe never.

What is AI good for?

In many cases, AI is used to mimic human senses. When you're searching Facebook photos for pictures of purple berets, the social network's



Skydio's camera-equipped drone recognizes obstacles in its surroundings as it follows you.

software assesses shapes and colors and factors in tags entered by users to deliver appropriate snapshots. Likewise, AI is good at recognizing words it hears. It's excellent at language translation and useful for extracting meaning from written or spoken statements.

The ability to recognize imagery from digital cameras has led to an explosion of machines that see their surroundings and respond in useful ways. Skydio Inc. makes a camera-equipped drone, for instance, that can follow a person, avoiding obstacles as it goes. Warehouse robots, too, are watching to adapt their behavior to changing conditions.

AI also gives devices a semblance of reasoning ability. The Waze navigation app, for instance, assesses traffic speed to spot jams and predict drive times. The ability to find the most efficient path comes in handy in tasks like optimizing electrical grids and other large networks.

Many companies are racing to use machine learning to match medical treatments with records of patients seeking help, and the technology has myriad applications in health care from helping manage supplies to recommending healthy lifestyle choices.

How intelligent is it?

AI lately has become far smarter than it once was, but

it's still not terribly smart. Current technology can be fairly sharp-witted when it's confined to narrow domains, but it still doesn't cope well with the wide world.

Take Alexa, the AI that speaks through the Echo smart speaker from Amazon.

It has a firm grasp on everyday spoken language, and out of the box it can answer simple questions about the time of day, weather forecast, and latest headlines. You can expand its knowledge to other slices of the world by loading any of 40,000 so-called skills, enabling it to serve up recipes or retrieve your bank balance.

But try to engage Alexa, or Siri from Apple Inc., Cortana from Microsoft Corp., or Google Assistant, in a free-form conversation, and you're likely to lose them. Examples of so-called weak AI, they have no common sense, and their understanding of context develops little, if any, from one moment to the next.

Strong AI, on the other hand, would possess human beings' native abilities to

sense, learn, reason, imagine, express and build up context around subjects both abstract and practical. Such capabilities for now remain the domain of sci-fi robots like Star Trek's Data and the Terminator.

Some computer scientists believe a big enough computer running a big enough AI program might, at some point,

awaken into sentience.

But it's generally agreed that breakthroughs—unforeseen and unpredictable—will be required before the dream of a human-level AI can approach reality.

How is AI limited?

Neural nets can take ages crunching through reams of data, depending on the net's size and the hardware it's running on, before their designers know how well they're working. That limits how quickly data scientists can hone their formulas. Intel Corp., Nvidia Corp., Qualcomm Inc. and a host of others are designing AI-specific processors that speed up training and inference.

The algorithms themselves are difficult to design properly, and there are many ways to go wrong. What's more, when machine-learning software renders a decision, it can be difficult to know what factors determined the result. So if, say, a self-driving car doesn't yield appropriately to traffic, it can be hard to address the problem.

The need to amass sufficient training data is another limiting factor. If there is too little data, the algorithm won't have enough examples of a given feature to learn anything useful about it. Too narrow in scope, and it may gain a lopsided view of the world. Too old, and it can't recognize

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Jobs Robots Will Create or Expand

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Once, he went over to a client site to oil a squeaky wheel on a robot. On another occasion, Mr. Catron helped a client who was moving to a new location to secure a last-minute certificate of insurance, required by the client's new landlord to have the robot on patrol.

ROBOT MANAGERS

It is a constant theme in AI work: Even though AI can be amazingly smart at some jobs, its judgment can be very limited compared with a person's. Hence the job of robot specialist: someone who oversees the work of machines to make sure they're doing their jobs properly, and intervenes if the AI asks for help in a tricky situation. That need for human involvement is "the part that people underestimate the most," says Mehdi Miremadi, a partner at McKinsey who focuses on automation.

At Cobalt, for instance, Shiloh Nordby works nights and weekends overseeing several robotic security guards at multiple sites across the San Francisco Bay Area, through feeds that capture video and other data from the machines' sensors. That information is displayed on a computer at Cobalt's Palo Alto offices. If the robot notices a pipe leak or an intruder, it alerts Mr. Nordby, who then susses out the situation and calls the proper authorities for backup, if needed.

His responsibilities also include ensuring the robot guards don't behave awkwardly when people are around by lurking over a person's desk or by barreling through a crowd of people during shifts, he says. In those circumstances, he takes over the machine's autopilot to redirect it. In fact, Cobalt hired 36-year-old Mr. Nordby, a former restaurant manager, for his social finesse and administrative skills, rather than his technical chops.

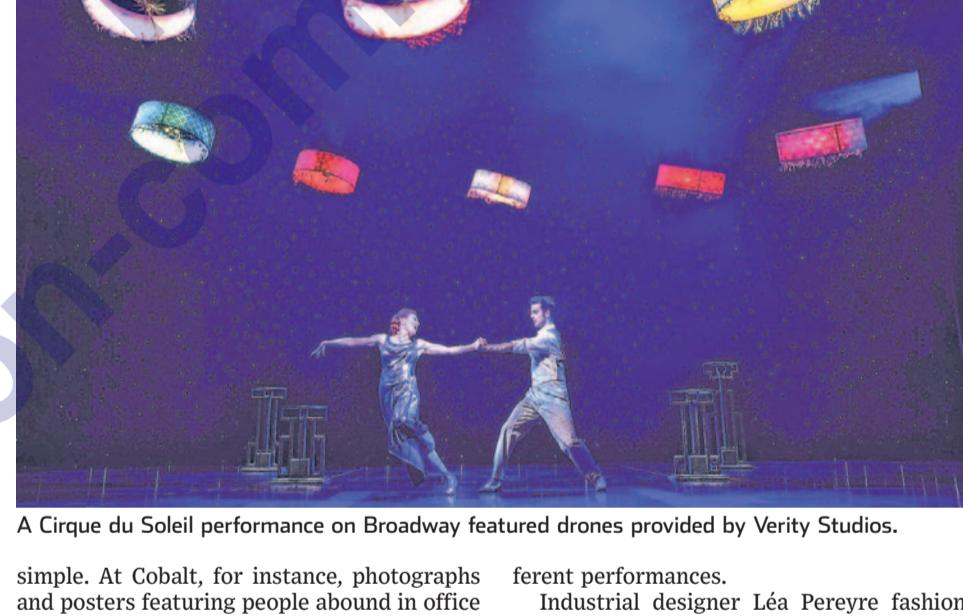
The job is "about talking to people," including employees and other on-site security guards at client sites, and "making them feel comfortable," says Mr. Nordby. He also helps manage the other specialists in Cobalt's crew.

DATA LABELERS

For AI to properly understand the world, it needs humans to explain what things are—meaning, the data that the AI absorbs need to be labeled. That could mean identifying objects in images—labeling which part of the image is a face, for instance—or parsing sentences to teach it what phrases mean.

Many workers are tasked with doing just that, looking over information and marking it for a computer. Companies such as self-driving-car developers and large tech firms can have "hundreds and hundreds of folks, sometimes even more, sitting and labeling data," says McKinsey's Mr. Miremadi.

Sometimes the data being labeled is fairly



RICHARD TERMINE

A Cirque du Soleil performance on Broadway featured drones provided by Verity Studios.

simple. At Cobalt, for instance, photographs and posters featuring people abound in office settings, which the robots' computer-vision systems can mistake for trespassers. Employees, including engineers and robot specialists, have flagged these as false positives, so over time the machine has learned these aren't potential threats.

Others are more subtle. At the Pacific Northwest National Laboratory in Richland, Wash., Donna Flynn has been spending a lot of time lately labeling images of clouds from laser-based radar, or lidar, so that the lab's AI can learn to identify them more accurately. The idea is to use these data to improve scientific understanding of cloud formation, which, she says, should help improve climate and weather-prediction models.

Each image is roughly two million pixels, and for each pixel she must label whether it includes a piece of cloud or not—a complex job because debris, haze and dust can show up in the images and make them tough to decode.

Ms. Flynn, who has a background in atmospheric science and electrical engineering, has almost 20 years of experience working with lidar data. Interpreting the images requires not just deep knowledge of the atmosphere, but also understanding the intricacies of how lidar instruments work, she says.

DRONE-PERFORMANCE ARTISTS

Drones are becoming a fixture at sporting events, where they provide overhead shots of the action. But they're also starting to work their way into the arts, where they act as dynamic light installations and flying props. And there is a growing need for artists who can customize those drones to suit the needs of dif-

ferent performances.

Industrial designer Léa Pereyre fashions costumes for drones at Verity Studios AG, a small Zurich-based company that puts together drone shows for concerts, musicals, circuses and sporting events. She makes them look like birds and flowers, for instance, and has experimented with giving drones scales.

Before Ms. Pereyre, 25, joined Verity she helped design robots that taught children how to code. In her new role, she had to learn to work within the physical constraints of the drones she was dressing. That meant taking into consideration not just aesthetic qualities but also physical limitations, like weight, aerodynamics and a drone's battery life.

Costumes, for instance, can get stuck in the drone's propellers. For one show, Verity was outfitting drones as lamp shades. The decorative fringe on the circumference couldn't be too long, or it would get sucked in. The team also had to minimize the noise the drones made.

"This is a crazy opportunity, because I have a blank slate and I can develop whatever I want this field to be," Ms. Pereyre says.

AI LAB SCIENTISTS

Smart software is remaking drug development, sifting through vast amounts of information much more quickly than humans could, and coming up with new directions for medical research. That offers new opportunities for experts, like data scientists and computational biologists, to teach AIs about the life sciences or chemistry so that computers can surface novel ideas. Then there are the technicians who test the results that AI comes up with to see which are valid and which aren't. Those results get fed back into AI machines to make them

smarter.

BenevolentAI Ltd. uses AI to identify new molecules to develop into therapies for neurodegenerative disorders and other diseases based on analyses of medical journals, clinical trials and genetic and chemical databases.

The company's "ideas come from a machine brain, rather than a human brain," says Ken Mulvany, BenevolentAI's founder.

But experimental biologists must test AI-suggested molecules in tissue and animal models, prerequisites to clinical testing and approval in humans. Last year, the company had about 100 unverified computer-generated hypotheses, but not enough scientists to validate them, according to Mr. Mulvany.

The London-based company recently acquired a lab-testing company, adding 50 scientists to its staff to test molecules AI software suggests. The data from these real-world experiments then feeds back into the company's algorithms to improve them.

SAFETY AND TEST DRIVERS

There are lofty predictions about the future of self-driving vehicles and how they will spread across the automotive landscape. But most of the vehicles aren't fully capable of working on their own just yet—and that means opportunities for people who help the vehicles do their jobs safely. These workers act as a second set of eyes in tricky situations and can take over driving chores if necessary.

May Mobility Inc., a maker of self-driving microbuses, employs safety drivers who oversee the machines while they're transporting people to and from offices and parking structures. The drivers provide feedback when a vehicle encounters a situation it is unsure how to handle—for instance, if a sensor isn't quite sure of the color of a traffic light or if double-parked vehicles are obstructing its right of way and it needs to merge into oncoming traffic.

"The driver authorizes the vehicle to drive through" if it is safe, says Edwin Olson, chief executive of the Ann Arbor, Mich., vehicle maker. "It is much more of a permission system than a remote control."

The company is about to triple its number of safety drivers as it expands its service. In addition to drivers, May Mobility hires test engineers, who devise scenarios for shuttles, like navigating a double-lane rotary. The company also has a maintenance crew responsible for everything from cleaning and charging cars to "doing a dance in front of the car" to test whether its sensors detect objects, Dr. Olson says.

"These vehicles are not human-free," he adds. "There are absolutely people behind the scenes."

Ms. Hernandez is a Wall Street Journal reporter in New York. She can be reached at daniela.hernandez@wsj.com.



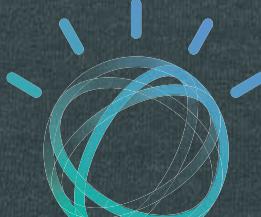
“We've got
65 million
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Henrique Albuquerque
Bradesco Bank
AI Manager

“Watson
helps us
answer
thousands
of client
questions
at the
same time.”

Lauricleia Gomes
Bradesco Bank
Product Leader

Let's put
smart
to work.TM



When Bradesco, a Brazilian bank, wanted to improve customer service, they turned to IBM Watson. They taught Watson the nuances of Portuguese and trained Watson with 10 million questions. Now what used to take 10 minutes takes seconds.

Learn more by watching “Serving Millions, One-on-One,” a short documentary by Errol Morris. Visit ibm.com/servingmillions

JOURNAL REPORT | ARTIFICIAL INTELLIGENCE

Sold! AI Systems Help Companies Find Customers

Automated assistants engage potential buyers before handing them off to a human sales rep

BY ANGUS LOTEN

WHEN THE 100-plus sales team at **Snowflake Computing** Inc. had more leads than it could handle, the company assigned each rep a personal assistant: an automated, artificial-intelligence-powered chatbot designed to engage with potential buyers by email or text.

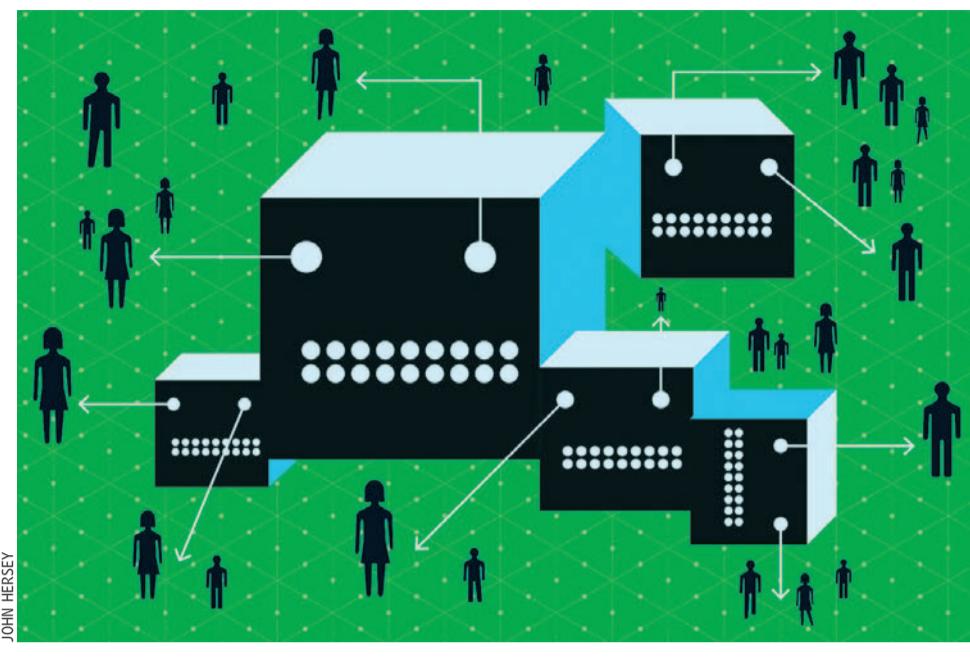
Sales showed a "tangible boost" after just four months, says Denise Persson, chief marketing officer of the San Mateo, Calif., data-storage firm. Each automated assistant, developed by Foster City, Calif., technology firm **Conversica**, speaks six languages and works around the clock contacting, engaging and following up with prospects who have reached out to Snowflake through its website, email, text, social media or other channels.

When it determines that a lead is ready to buy, it alerts a human sales rep, handing off useful tips, like the best contact number or time of day to call.

The sales rep takes it from there.

Fewer dead ends

Digital tools powered by intelligent algorithms are changing the way corporate sales teams operate. Automated assistants and other smart tools take over repetitive, time-consuming tasks from harried sales staff, who spend too much time chasing dead ends that don't produce a sale, and not enough time chasing those that do, sales managers say.



The use of AI is spreading in part due to the broad adoption of cloud computing to increase computer-processing power, storage and data-gathering abilities. With the cloud, businesses are able to rent much-higher-capacity computer infrastructure from third-party vendors, avoiding the hefty costs and additional resources needed to run their own data centers. Indeed, many large cloud providers are adding AI capabilities to their existing enterprise IT platforms and services. **Salesforce.com** Inc., the cloud-based business-software giant, last year announced a partnership with **International Business Machines** Corp. to develop data-analytics offerings for sales teams using AI. Each of the partners has its own AI platform—Einstein and Watson, respectively.

Sales departments are the most common business units acquiring AI technology, largely because they are already awash in data and need help analyzing it. In a survey about corporate uses of AI, Forrester Research found that 46% of more than 400 business and technology professionals identified sales and marketing as leading AI spending and adoption, followed by product management and customer support, at 40%, and engineering at 31%.

"That transactional data is so rich and clean, companies want to pull value from it," says John Bruno, a Forrester Research analyst.

Gartner Inc. estimates that 30% of all business-to-business companies world-wide

will employ some form of AI in at least one of their primary sales processes by 2020. "Saving salespeople time is important," says Todd Berkowitz, a Gartner analyst, "and these tools can help them be more effective."

The conversation

Not all of the vendors in this space are cloud-based giants.

Conversica, the provider of AI sales assistants to Snowflake Computing, says more than 2,000 companies are currently using its product, generating \$18 million in annual recurring revenue. "We've found that the platform becomes part of the sales team, and I mean that literally, with a name, a job title and an email," says Conversica Chief Executive Alex Terry.

"The key piece is that AI has been trained to understand the type of back-and-forth of a sales call," he adds.

"It is having that conversa-

tion."

Cindi Stevenson, sales director at **Insperity** Inc., a Houston-based provider of human-resources and other business services, says her company last July deployed an automated sales assistant designed by **Nudge Software** Inc. that scours Twitter, Facebook and other social-media data for potential sales leads. "It has already paid off, big time," says Ms. Stevenson. "All this intel and data is out there in the universe, and you have to go find it." The firm's 450 sales reps have "too much on their plates to go digging into every prospect's Twitter feed every single day," says Ms. Stevenson.

Toronto-based Nudge has about 20,000 users spread across thousands of different companies, says Chief Executive Paul Teshima. Using AI, the platform "helps identify which relationships need attention and what's going on in their world, so you can priori-

tize sales reps' time," says Mr. Teshima.

John Stewart, chief executive of **MapAnything**, a Charlotte, N.C.-based maker of software for designing more-productive sales trips, says about 2,100 businesses currently use his company's AI product.

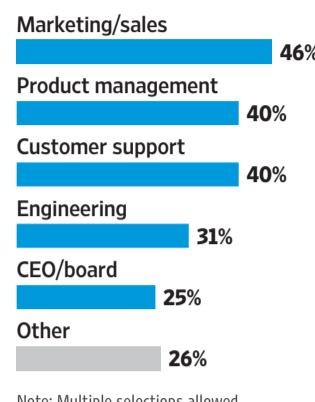
The software analyzes data from Salesforce's customer-relationship-management platform, GPS and other resources such as real-time traffic patterns to optimize sales routes for traveling reps. The software identifies and links clusters of customers and can fill any gaps in a schedule arising from last-minute cancellations.

"This is computationally heavy stuff," Mr. Stewart says, "but in the end sales is all about knocking on doors, and this allows them to knock on more doors."

Vince Lowe, a senior vice president of sales optimization and integration at branded credit-card issuer **Synchrony**

Sales in the Lead

Business and tech professionals said in a survey that these parts of their organizations were most interested in AI



Note: Multiple selections allowed.

Source: Forrester Research Inc. survey of 418 business and tech professionals, 2016

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Financial, says that before his company used MapAnything, its sales reps would "dump Excel spreadsheets" onto laptops as they headed out to meet a customer.

"We have some 365,000 locations across the U.S., so you can imagine the complexity of that," Mr. Lowe says, referring to the retailers, manufacturers and other brand-name businesses that offer branded credit cards through Synchrony Financial.

Now the company's sales teams travel with iPads, CRM platforms and visualization tools to track customer data, Mr. Lowe says.

"MapAnything helps to aggregate all that data together on the go and predict exactly where the next sales visit should be and when," Mr. Lowe says.

Mr. Loten is a reporter for The Wall Street Journal in New York. He can be reached at angus.lotan@wsj.com.



The Woebot chatbot offers users immediate advice on coping with troubled feelings.

AI Tools Target Mental Health

Chatbots and algorithms aim to help the treatment of depression

BY AILI MCCONNON

EVERY DAY Nick Impson, a 25-year-old graduate student at Georgetown University, checks in with Woebot, a text-based chatbot. Woebot asks Mr. Impson, who has been battling depression, what is happening in his life that day and how he is feeling. Woebot analyzes the language Mr. Impson uses and provides coping strategies drawn from cognitive behavioral therapy. The whole exchange takes about 10 minutes.

Mr. Impson started using Woebot as part of a study aimed at determining whether the tool, created by Stanford University lecturer and clinical research psychologist Alison Darcy, could mirror the therapeutic process for depression, as cost and perceived stigma prevent many people from seeing human therapists. Dr. Darcy's study, published in 2017 in the peer-reviewed *Journal of Medical Internet Research Mental Health*, tracked 58 college students for two weeks and found that those who used Woebot experienced a decrease in depression symptoms of 20%, a result that can take four to six weeks with traditional behavioral therapy.

"Now instead of keeping things bottled up and feeling isolated, I have an outlet and my worries don't seem so overwhelming," says Mr. Impson, who continued using the tool after the study ended.

Dr. Darcy, founder and chief executive of **Woebot Labs** Inc., is just one of many re-

searchers at universities and companies exploring how AI might be used to help treat depression and other mental-health conditions. Some are developing AI-powered chatbots such as Woebot and Tess, from San Francisco-based startup **X2AI**, to help treat people directly. Others are developing algorithms that can spot patterns in the spoken language or brain scans of those with mental-health disorders and then use those patterns to identify the best type of traditional treatment for new patients with similar conditions.

The tools—most of them experimental—aim to provide access to mental-health care at a lower price and to help patients avoid the side effects of therapies that aren't suited to them.

"Psychiatrists and neurologists are overwhelmed by the number of mental-health patients," says Guillermo Cecchi, a computational psychiatrist at International Business Machines Corp.'s IBM Research unit. "We need to come up with tools to multiply the reach and effect of mental-health practitioners."

Among those working on AI systems designed to home in on the most effective treatments for depression is Conor Liston, an assistant professor of neuroscience at Cornell University's Weill Cornell Medicine. Dr. Liston studied the brain scans of 1,188 people, a third of whom were depressed. His system found pat-

terns that helped categorize four different types of depression, classifications a clinician couldn't make by speaking with a patient.

With these categories, Dr. Liston's AI system was able to predict with approximately 88% accuracy whether transcranial magnetic stimulation, a form of treatment for severely depressed patients, would work for new patients.

Dr. Liston's study examined only one form of treatment for depression, but "it is a really important first step," says Joshua Gordon, the director of the National Institute of Mental Health. "The next step would be a study that would suggest which category of depressed patient would respond best to which specific type of treatment."

Canadian startup **Aifred Health** appears headed in that direction. Aifred says its algorithm is "learning" to recognize patterns in depression treatment data to better predict outcomes, using 35,000 patient records gathered from universities and open-data initiatives. The company aims to collect 35,000 more starting this summer and then begin clinical trials of the algorithm this year.

"We want to take the process of what can be months or years to find the right treatment down to minutes," says David Benrimoh, Aifred chief executive officer.

Similarly, David Fleck, an associate professor at the University of Cincinnati, is working on an AI system to identify which people with bipolar disorder are most likely to bene-

fit from lithium—a treatment that specifically targets mania symptoms but that he says works on about 50% of patients.

By looking for certain patterns in patients' brain scans, Dr. Fleck's system was able to predict with approximately 95% accuracy in a 2017 study who was most likely to benefit from lithium and who should avoid the treatment, the side effects of which can include dry mouth, tremors and long-term kidney problems.

At IBM, Dr. Cecchi's team is developing a tool that analyzes patients' speech patterns in real time—such as when they are talking to a doctor—to determine whether a given treatment is working or needs to be adjusted. The tool is trained to make that determination by analyzing classes of words patients use (are they more related to perception or action?), syntactic patterns (the frequency of adjectives used versus nouns) and acoustic features (pitch, variance of volume, frequency of pauses).

In a recent study, AI systems that Dr. Cecchi's team developed with universities including Columbia University were able to predict with 83% accuracy which patients with schizophrenia would go on to have a psychotic episode.

While many see early benefits from this and other research, "we need studies of thousands of patients to have confidence that this is really something that is not dependent on the particular features of a particular cohort or protocol," says Dr. Cecchi.

To be sure, critics have raised concerns about the safety of emerging AI-powered mental-health tools and the sensitivity of the information being gathered, analyzed and recorded by these systems. Although the information used to train AI systems is typically scrubbed or anonymized, some worry about system hacks and leaks.

Others raise concerns about people using apps before larger randomized clinical trials have been conducted. With "any mental-health website or app, there needs to be an evaluation of the negative impact as well as the benefits," says Adam Miner, an AI researcher and clinical psychologist at Stanford University. "If the app doesn't work, are people less likely to get the help they need?"

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Primer

Continued from page R2
conditions that have emerged in the meantime.

Ultimately, today's AI can't devise new ways to solve problems. It knows what it has been told or shown, and learns about things it has been told to consider. Some algorithms are designed to decide what's noteworthy in a particular data set. But they can't generate new ideas. That's still a job for humans.

Is it dangerous?

Some very smart, well-informed people have warned of the potential dangers of AI. The late astrophysicist Stephen Hawking said AI "could spell the end of the human race." Elon Musk, founder of Tesla Inc., has called AI research "summoning the demon."

The crux of such concerns often is a version of the notion, popularized by science-fiction author Vernor Vinge in the 1990s, called the technological singularity: the moment when machine intelligence equals human intelligence. At that point, computers would be able to give themselves ever greater intelligence and pursue goals even more distant from human needs or desires.

Singularity skeptics point out that scientists don't know how to make a sentient robot, much less one that can guide its own actions.

Nonetheless, AI presents clear—though likely not existential—risks today. The nonprofit think tank OpenAI recently published a report detailing ways malicious actors could subvert current technology in the service of fraud, cyberattacks, even physical assaults by bomb-carrying delivery robots.

A more pervasive danger may be overreliance on underdeveloped technology. Two fatal crashes of Tesla Inc. cars are known to have occurred while the drivers were using the vehicle's semi-autonomous Autopilot system. In one case, the car's sensors apparently didn't recognize a white trailer as it crossed the road against a bright sky.

Thoroughly testing such complex systems is a tall order. Users of any AI will do well to exercise caution until the specific product or service is proven to perform well in extensive use.

How will it change our lives?

"AI is the new electricity," declared Andrew Ng, chief executive of factory-automation specialist Landing.ai and former head of Baidu's autonomous-vehicle program and founder of the Google Brain deep learning project. In a speech last year, he said machine learning is poised to transform one industry after another, spurring radically new capabilities and new businesses the same way Thomas Edison's discovery did beginning in the late 19th century.

Indeed, ubiquitous AI appears to be a foregone conclusion, as major internet companies restructure their data centers to train deep-learning software and as consumer devices from smartphones to doorbells are outfitted for inference.

Current trends in AI could lead to greater efficiency in consumption of all kinds of resources. AI in the home can automatically turn on lighting, air conditioning and other equipment only when it's needed, or run washers and dryers when energy costs are lowest. Businesses can use it to price goods and services and to stock inventory to create less waste. Self-driving cars promise to save lives and reduce traffic congestion. Municipalities aim to route traffic to minimize congestion and accommodate pedestrians. Farms may allocate water and nutrients to individual plants as needed rather than en masse to whole fields.

The advent of machine vision and hearing also portends surveillance systems that track people's activities on behalf of not only vendors but also employers, building security and law enforcement. The prospect of integrating and centralizing such networks poses severe challenges to civil liberties and individual privacy.

Some computer scientists believe AI will become embedded in who we are, as neural implants and prostheses increasingly shore up human physiology.

AI's present is filled with potential, its future unpredictable, with many surprises in store.

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JOURNAL REPORT | ARTIFICIAL INTELLIGENCE

How You Can Raise Robot-Proof Children

There will still be jobs in the future. Just make sure your child is ready for them.

BY ALEXANDRA SAMUEL

PARENTS WORRY about a lot of things—like whether their children will get into college, or become drug addicts, or get abducted by strangers. But I spend a lot more time worrying that my children are going to live with us forever because robots have taken all their potential jobs.

As somebody who has spent her adult life focused largely on two things—studying technology trends and raising children—I'm acutely aware of the effect that continued advances in artificial intelligence could have on my children's opportunities. After all, a recent McKinsey report predicts that by 2030, when my two children are just joining the workforce, up to 30% of today's current work will have been automated.

The problem is, we don't know which specific jobs will be automated years from now, because AI is constantly developing in surprising ways. So while it's helpful to get a broad sense of which kinds of jobs or skills are likely to be taken over by robots, all of that is only so useful.

Then how do you raise robot-proof children? Helping them develop a broad set of particular skills is the best way to improve their odds of being gainfully and happily employed. Here is a list of things you can do, whatever career path they go down.

Teach them to code: Yes, robots will eventually do most of the actual coding, so this isn't about coding jobs.

The point of learning to code is that there's no better way to anticipate where automation is heading than to understand what kinds of problems code is or isn't good at solving. Coding knowledge will also help future workers survive or excel in fields that become increasingly automated. For example, lawyers may do less contract-review work, but more work establishing the rules for contract-reading bots.

Even if your children won't take a programming class per se, you can still teach them the principles of coding logic with a mobile game like LightBot, toys like Wonder Workshop's programmable Dash robot, or our new family favorite, the card



game Potato Pirates. Yes, these can get expensive—but not compared with feeding your unemployable child for the next 30 years.

Include arts education: We already know arts education is good for the soul and creative thinking. But now it's essential to foster that kind of creativity as a competitive advantage.

That's because jobs that involve creativity are less likely to be automated than routine or predictable activities, or those that involve processing large amounts of information.

Include some after-school art classes in your children's education (whether that means painting, music or theater) alongside sports or academic enrichment, and look for teachers who focus on creative thinking as much as technical skill. You may need to get creative yourself to find the activity that's a fit for your child. My eldest loved every kind of arts class, but my youngest was only interested in tech-related activities, so we found a digital art class that suited him better than sculpture and painting.

Nurture emotional intelligence: Even the most breathless forecasts still put the arrival of emotional robots very far in the future.

While some chatbots and robots are learning to recognize emotional cues and respond with simulated emotional affect, there are many career paths—like teaching or nursing—that require an emotional connection far beyond what any AI will be able to provide. And in any field, nothing will give your child an edge over the machines like a strong empathetic orientation and great interpersonal skills.

A book titled "The Whole-Brain Child" by Daniel J. Siegel and Tina Payne Bryson helped me learn some conversational strategies for prompting emotional self-reflection in my children. Or look for a program like Roots of Empathy, which brings babies into classrooms to teach empathy to elementary-school children.

Rethink the rules: Both the traditional school system and a lot of parenting advice frame child discipline in terms of compliance and

rule-following. But rule-following is exactly where robots excel, and where even the most disciplined worker is likely to fall short in comparison. So encourage your children to question rules and think independently—because that fosters the kind of thinking that robots can't master. Yes, it makes parenting a bit harder in the short term. I regret all the rule-questioning whenever I'm just trying to get my youngest to sleep. But I'm banking on it paying off in a couple of decades.

Insist on self learning: Make sure your children teach themselves at least one significant skill or subject—like a language or a tech skill—to a level equivalent to at least a year-long course. It's crucial that your children learn how to learn, not just in the classroom but also on a do-it-yourself basis, because they'll need to continuously reskill to keep up with technological change.

My children have enjoyed learning digital illustration from tutorials on TutsPlus.com, math via KhanAcademy.org and beginning animation at JAM.com.

Skip entry-level service jobs in favor of entrepreneurship: Many children need part-time or summer jobs to pay for college, contribute to their family's financial well-being or get a little pocket money. But if you're insisting that your child take a first job at a store selling, say, coffee or clothes, because you think it will help them build useful work experience—well, think again. Front-line service and retail jobs are widely predicted to disappear, so the experience children gain in these jobs will be far less useful than the experience of starting their own business, since many of them will need to create their own jobs as small-business owners, consultants or freelancers.

Help your children develop an entrepreneurial mind-set and skill set by encouraging them to run their own businesses, even if they are small or time-limited: They could create their own online storefront, selling their own creations or reselling pre-existing products, or run an offline business like dog walking or babysitting. One of my children set up an Etsy store at age 8, with some parental help, and six years later still draws on that experience in a new online business doing art and illustration work by commission.

Talk about the bigger picture: While you're busy robot-proofing your children, take the time to engage them in the bigger questions that a robotic future will bring, and how they can prepare for a world in which they are likely to be working side-by-side with robots and artificial intelligences. Movies like "WALL-E," "Big Hero 6" and "Bicentennial Man" for younger children or "The Matrix," "Her" and "Robot & Frank" for much older children can give you a starting place for conversations about what kinds of things robots are really good at, and what is uniquely human. The more your children learn to reflect critically on the role of automation in our society and our economy, the more they will be prepared to shape that future.

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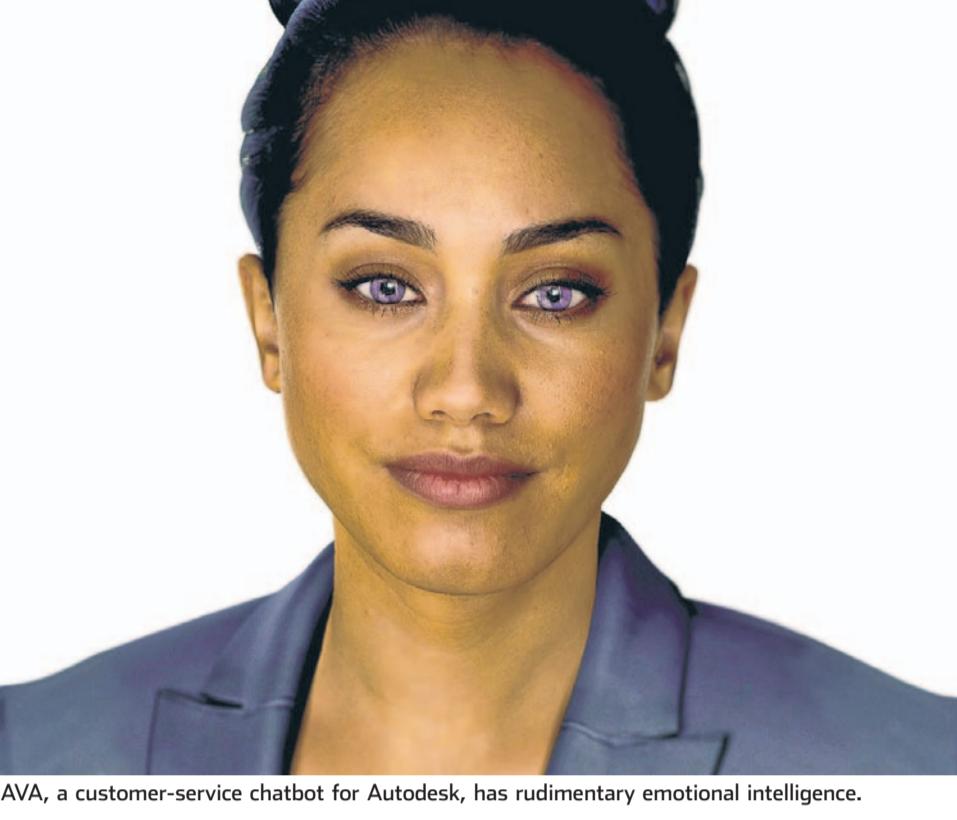
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JOURNAL REPORT | ARTIFICIAL INTELLIGENCE

Digital Assistants Start To Get More Human

The coming chatbots will be smarter and more useful. But they will still have plenty of limits.



AUTODESK

AVA, a customer-service chatbot for Autodesk, has rudimentary emotional intelligence.

BY TED GREENWALD

SHE'S SMART, a master of high-end design software. She's kind, ready to help at any time of day or night.

She's the new AVA—an acronym for automated virtual assistant—a next-generation digital assistant created by Autodesk Inc. to help its customers with its software. She's scheduled to replace the company's current text-only chatbot that goes by the same name in mid-May.

Autodesk hopes AVA's animated face, New Zealand-accented voice and touch of emotional savvy will engage customers at a deeper level than current conversational software can. "If a customer tells [the virtual-human version of] AVA, 'I'm having trouble,' I want her to frown a bit

and say, 'I'm sorry, let me see if I can help,'" says Rachael Rekart, who manages Autodesk's digital support channels.

Chatbots lately have become ubiquitous in the form of automated helpers on messaging services and social networks, voices issuing from smart speakers, and text-input boxes on business websites. But for all their high-tech underpinning, current chatbots can be maddeningly unhelpful and unengaging. They tend to trip over all but simple statements and requests, and they're lost if conversation strays outside their areas of expertise.

So bot makers are experimenting with various strategies they hope will make automated conversations more satisfying.

Eva, from the United Ser-

vices Automobile Association, understands enough about USAA's banking and insurance products and its customers to present likely options that will steer conversations in a productive direction. Harman International Industries' car-dashboard assistant tries to predict drivers' needs before they ask, suggesting a place to stop for coffee, for instance. And Autodesk's new AVA not only looks and sounds fairly human, but also will be able to detect and react to users' emotional state, according to her developers.

"We're going to spend more of our time interacting with automated systems like robots and self-driving cars," says Greg Cross, co-founder of Soul Machines Ltd., the New Zealand company that developed AVA's face, voice and emo-

tional IQ. "Our view is that these machines are more helpful if they can engage with us and respond to us."

AVA, whose ability to understand language is provided by Watson Assistant technology from International Business Machines Corp., looks almost realistic enough to pass as human, though her voice doesn't quite synchronize with her animated mouth. She delivers news that your software subscription can include more products at no additional cost with a hint of a smile, word that you'll need to buy a new license with a slightly pained look, and instructions such as "Now, let's try again" with a schoolmarm's stern demeanor.

Steep challenge

The history of chatbots is rife with inept digital helpers, but that began to change with the 2014 debut of Alexa, resident in Amazon.com Inc.'s Echo speaker. Alexa set a new standard in voice recognition with her ability to distinguish commands spoken across rooms and amid noise.

Like virtually all current bots, though, Alexa has limitations around grasping what words mean. Her "skills"—custom programs that give her knowledge of a particular domain—cluster around consumer transactions such as playing music or buying tickets, where a limited number of simple requests generally will suffice.

Programs designed to relieve the load on customer-service desks face a steeper challenge. Callers don't necessarily know what the bot can and can't do or what commands it recognizes. So these systems generally need to have deeper knowledge within their area of expertise. Indeed, customer-service bots may be first to deliver something approaching real conversation, according to some people in the field.

"You'll have richer dialogues with enterprise bots than the thing in your house because there's a wider range of questions within a narrow scope," says Tom Heiner, leader of the cognitive innovation group at Nuance Communications Inc., which specializes in voice-interaction technology.

Take Eva, a voice-and-text bot built by Nuance for USAA. It helps USAA's membership perform simple tasks like changing the PIN on a credit or debit card on the web or through an app. But it also can see around some of the corners such interactions entail. For instance, it can look into accounts to find out whether customers have more than one card and, if so, prompt them to tell it which one they need help with.

Launched in 2012 and continually updated, Eva handles around 70% of questions it receives without passing them along to a human agent, says Chris Cox, the company's chief digital officer. When the bot escalates a call to a human agent, it's able to send it to the right department roughly 90% of the time, he says.

Of course, Eva knows about USAA's services. Ask it about buying a car, and it comes up short. That narrow focus is by design. Current language-understanding technology can't yet cope with the full range of things people might ask for. Coaxing a computer to converse meaningfully as context builds and shifts is extraordinarily difficult, says Nuance's Mr. Heiner. "It's harder than image recognition, speech recognition, self-driving cars—much harder than all these amazing things." So the usual solution is to confine the possibilities for interaction to narrow, tightly defined cases.

Some of the latest bots can shortcut conversational complexity by anticipating what users will ask for next and beating them to the punch by offering suggestions, potentially reducing many complicated requests to a simple "yes" or "no."

Harman is taking a proactive approach with its automobile dashboard. In Harman's tricked-out Maserati GranCabrio demo car, Watson Assistant maintains driver profiles, noting frequent destinations such as Starbucks, says Stephen Surhigh, head of cloud services at Harman. After a long stretch on the road, he says, it might say something like, "It's time to take a break. There's a Starbucks ahead at Exit 98." If the right moment for a coffee break has passed and the

driver says, "How about lunch," Watson will suggest a nearby restaurant that matches the driver's profile or ask what kind of food the driver has in mind, Mr. Surhigh says.

A long emotional road

If bots are to remain confined to simple conversations for now, they might be better helpers if they know how users feel, so they can head off confusion or frustration and recognize when automated assistance isn't sufficient and it's time to call in a human agent. That's why Autodesk is outfitting AVA with rudimentary emotional intelligence.

Chatbots might be better helpers if they know how users feel.

"Emotional IQ will be the limiting factor on AI," says Autodesk's Ms. Rekart. "People want to feel understood, and these things will fall short until we figure out how to give them empathy."

When the new AVA goes live later this month, she'll smile, frown and adjust her tone based on clues to the user's emotional state, if all goes well. She's designed to process emotional cues from users' tone of voice and facial expressions. (She'll tell users that if they turn their camera on she'll be able to see them.)

At first, she'll respond purely to positive and negative signals. Later she may be programmed to differentiate, say, frustration from sadness, Ms. Rekart says. After that, she might be given arms so she can express herself through hand gestures and the like, according to Soul Machine's Mr. Cross.

Autodesk aims to take it step by step, gauging AVA's impact on customer satisfaction before making her more elaborate, Ms. Rekart says.

"We're just sticking our toe in the water," Ms. Rekart says. "We have a long way to go."

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What I Learned From Building My Own Chatbot

Once I knew the way they work, I began not to hate them so much. And maybe even like them.

BY ALEXANDRA SAMUEL

Happy Valentine's Day! This is Cupid, ready to answer all your questions about love, sex and the weird friends who brought me to life. Are you ready to feel the love?

This was the very first question uttered by the very first chatbot I'd ever built. Cupidbot's introductory question was also a great question for me, a chatbot skeptic: Was I ready to feel the love toward chatbots, the notionally intelligent conversation partners that now appear in instant-

I built my bot in Dexter, one of a growing number of chatbot platforms that aim to make it easy for regular folks to build their own bots. You don't need to be a programmer to use Dexter, but it helped that I have experience building websites and doing some basic scripting.

In theory, bots are pretty simple computer programs: You set up a bunch of triggers (things people might say to a bot) and then a bunch of responses (things your bot will say in return). The problem is that there are an awful lot of things people might say, and an awful lot of potential answers to each of those potential questions.

Given my limited time, I structured my Valentine around just a few menus that ensured people could find some options for interesting interaction, like: "What kind of Valentine's Day ideas are you looking for? 1) gifts 2) a romantic evening 3) fun with friends 4) romantic gestures." Behind the scenes, every service bot is trying to do the same thing as my Cupidbot: channel customers down a limited set of paths to one of a predefined set of options. Unlike my little experiment, busi-

nesses may go through months of developing their bots, testing their interactions and then iterating new paths. But at the end of the day, the number of paths is limited.

The lesson for those of us using bots was pretty basic: Unless we enjoy wrestling with a robot, we're more likely to have a positive experience by working within the structure and choices a bot offers us so that we get the answers and information we need as quickly as possible.

Our not-so-personal conversations

As people started interacting with my chatbot, I discovered a whole new set of dilemmas around the rise of bots. I kept an eye on the chatbot's logs, so I would know if there was an error in my logic. The most obvious clue was seeing that a user had received the message "[Dexter Error] This bot doesn't have a response for that."

But looking at the logs meant looking at what people were asking and saying to Cupidbot—and much to my surprise, some of that felt very personal:



fect response to a given question. Soon I was imagining the potential of an Alexbot that can serve up tech advice based on my archive of blog posts and columns. Now that I've seen how satisfying it can be to build a bot, watch it start interacting with people, and work on continually improving it, it's easy to anticipate a time when most of us will have these virtual selves as a way of answering routine questions or extending our professional footprint.

Before I built my own chatbot, I would have felt uncomfortable at the prospect of a world where humans and bots work alongside one another, where we can't always tell the difference between them, and where we no longer necessarily care. But now that I've built one myself, I'm no longer so frustrated by what bots can't do, because I can also see where they uniquely excel.

There are many situations in which we provide the same information or solutions over and over again, and in which having actual humans parrot these repetitive answers is an exercise in frustration. (Have you ever had a chat with a service rep who is obviously working from a script?) I'd far rather deal with an actual bot in these circumstances—and see them complemented by human service teams that are empowered to address the atypical questions or problems that robots can't resolve.

So do I feel the love for chatbots yet? As I said, maybe not. But I'm starting to be less afraid of the coming of our robot overlords—as long as they're willing to answer my awkward personal questions, and to delete the chat logs as soon as we're done.

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• I am in love with a guy who lives too far away.

• What is the secret to a happy marriage?

• How do I get to third base when I'm a 70-year-old guy?

If I felt uncomfortable reading questions like these anonymously, you can imagine how I felt when people started interacting with my bot via Facebook Messenger. For these, my chatbot logs showed each Facebook user's real name. So I knew exactly which of my friends was worried about her diminishing interest in "Star Trek," and which was wondering if he should try Tinder.

It all was eye-opening. Despite all the talk about how robots will never be able to satisfy the human need for intimacy and emotional connection, it was pretty clear that on some subjects, it's easier to talk with a faceless, impersonal bot, because they offer the illusion of a judgment-free, secret confidant.

Emphasis on *illusion*. Looking behind the scenes at my bot's logs, I immediately thought about every other bot I've ever interacted with. I've shrugged off my friends' pri-

vacy concerns when they've asked me if I worry about all the stuff I tell the various chatbots I interact with on a regular basis. Some companies do keep their chatbot logs, depending on their privacy policies. So now I'm suddenly visualizing those conversations sitting captured forever in logs that look like Cupidbot's, and I don't feel so sanguine.

The place for bots

If reading conversation logs left me uncomfortable with the prospect of bot-enabled surveillance, my overall experience with Cupidbot also got me excited for the first time about the business and social potential of bots.

A Valentine chatbot might have been a disposable trifle, but the process of building it helped me see how chatbots could become a valuable tool for me and for many organizations.

I knew I'd embraced the bot as an extension of myself when I found myself getting mildly offended by friends or family members who swore at my bot or made fun of it—and equally, when I took pride in its success delivering the per-

sonalized responses to my questions.

messing apps like Facebook Messenger, voice-controlled virtual assistants like the Amazon Echo, and an increasing number of customer-care websites?

After all, chatbots can be pretty hard to love. I've always hated corporate voice-response systems and every other form of structured, scripted interaction. There are so many problems with bots: the glitches, the misunderstandings, the desperate search for the keywords (*help? operator?*) that will actually connect me with a human being.

But, I wondered, maybe chatbots can become more useful and less annoying if I understand how they work.

So, I spent the last six hours of Feb. 13 building Cupidbot, an interactive Valen-



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JOURNAL REPORT | ARTIFICIAL INTELLIGENCE

What Kind of Regulation Does AI Need?

Three experts debate what the government should do—and when

BY HEIDI VOGT

ARTIFICIAL INTELLIGENCE brings tremendous opportunity for business and society. But it has also created fear that letting computers make decisions could cause serious problems that might need to be addressed sooner rather than later.

If a computer consistently denies a loan to members of a certain sex or race, is that discrimination? Will regulators have the right to examine the algorithm that made the decision?

Some big technology companies are seeking to set ethical standards through alliances with futurists, civil-rights activists and social scientists—which critics see as an effort to prevent regulation by government. Some experts are calling for regulations to define the boundaries of the technology while it is still new; others worry about quashing innovation just as it is getting started.

To get a sense of the options and potential pitfalls, The Wall Street Journal reached out to three experts in artificial-intelligence policy: Julia Powles, a researcher in law and technology at New York University School of Law and Cornell Tech; Adam Thierer, a researcher with the Technology Policy Program at George Mason University's Mercatus Center; and Ryan Calo, an associate law professor at the University of Washington and a co-director of the school's Tech Policy Lab.

Here are edited excerpts.

WSJ: Should there be any government regulation of artificial intelligence? What form could it take?

MR. THIERER: AI applications already are regulated by a host of existing legal policies. If someone does something stupid or dangerous with AI systems, the Federal Trade Commission has the power to address unfair and deceptive practices. State attorneys general and consumer-protection agencies also routinely address unfair practices and advance their own privacy and data-security policies.

There are other issues that de-

serve policy consideration and perhaps new rules. But before we resort to heavy-handed, legalistic solutions, we should exhaust all other potential remedies. When innovators have to seek permission before they offer a new product or service, it raises the cost of starting a new venture and discourages activities that benefit society.

MS. POWLES: Whether or not regulation is heavy-handed is going to be entirely case-specific. If AI-powered systems are going to be carrying our bodies [with driverless cars], surely we should have as much capacity to independently assess AI as we do for cars, food and drugs? Asking for some proof to support these claims of societal benefit doesn't stop innovation, it saves it.

MR. CALO: What's fascinating about Adam's typically thoughtful reply is that, were it followed 20 years ago, it would have harmed the development of the commercial internet. If we had decided that no change was needed, Congress would never have needed to pass the Communications Decency Act, a law that immunizes platforms such as Google or Facebook for unlawful content users post there.

WSJ: Adam, you mention issues that could warrant some new rules. Can you give an example?

MR. CALO: Probably the thorniest issue comes down to the transparency of decision making. Innovators using AI to accomplish important tasks will be challenged at every juncture to identify how and why some decisions were made. More profoundly, we're going to be debating the fairness of many AI-enabled outcomes for many years to come. If algorithmic accountability becomes a regulatory straitjacket, then we will lose out on many socially and economically enriching innovations.

MS. POWLES: I agree that we don't want to introduce overly complex explanations. But that doesn't mean decision-making systems shouldn't be required to provide explanations that allow people to understand why they are treated in certain ways and to have recourse



ANASTASIA VASILAKIS

to vindicate their rights. The demand to explain how and why decisions are made is essential.

MR. CALO: One of the ironies of artificial intelligence is that proponents often make two contradictory claims. They say artificial intelligence is going to change everything, but there should be no changes to law or legal institutions in response. That doesn't make sense to me. The question is not whether there should be regulation but how can regulation best channel AI toward its ultimate goal of promoting human flourishing.

WSJ: And how can regulation do that effectively?

MR. CALO: This is a question perhaps best answered by flagging a few things we shouldn't do. We shouldn't do nothing. The idea that by being hands-off we'll achieve an optimal result strikes me as optimistic to the point of being goofy.

We shouldn't let industry go this alone. A good model is the Partnership on AI, which bridges industry, academia and civil society and aims to create best practices around AI with respect to safety, fairness and other issues.

WSJ: What role do you think private industry can or should play?

MR. THIERER: Some companies and trade associations are rolling out best practices to address concerns about privacy, safety and security of AI-based systems. This will be buttressed by government efforts.

MS. POWLES: At the moment, private industry is playing all the roles. You'd be hard-pressed to find experts that don't also hold a position at or find funding from big tech. Industry academics are the dominant voices of intellectual and civic leadership around AI. The consequences are dramatic—basic concerns that ought to be at the center of debate, like whether technologies ought to be explained and proven before being released in the wild—are readily dismissed.

MR. CALO: We need industry to play a big role, in part because only a handful of companies are positioned to move AI forward. But for this very reason, industry should not play the only role. [Mr. Calo's technology-policy lab is partly backed by Microsoft.]

WSJ: Should government programs that use AI (things like predictive policing), have different rules?

What about health care?

MR. THIERER: We already treat some applications of AI or machine learning differently, and that is likely to continue. Driverless cars and commercial drones are regulated by existing federal agencies. Health-care services are overseen by a litany of government bodies.

The use of AI and machine learning in the field of law enforcement is trickier and involves more serious issues. This is where the case for oversight is stronger because of the potential for harm if AI systems get things wrong.

MS. POWLES: We are allowing extraordinary private power to consolidate around these technologies, for no good reason. Why are cities and communities giving away citizen data to tech companies, instead of investing in infrastructure, bringing in technical expertise and maintaining control over data to spur innovation in the public interest?

MR. CALO: What you do is take this new set of tools as an invitation to inventory the goals of law and of society, and see whether those goals can be met and how. This requires an examination of AI in every context into which it is introduced. The first step is to make sure government has the impartial expertise it needs to make decisions. Years ago, I proposed a Federal Robotics Commission which could advise officials, courts and lawmakers. And it is why I support refunding the Office of Technology Assessment, which helped Congress understand technology until it was defunded in the 1990s.

WSJ: Europe is making sure people can manage AI data with a "right to be forgotten" and "right to explanation." China is researching the potential risks of AI to society. Where does the U.S. fit in? And how can regulation do that effectively?

MR. THIERER: We live in a world characterized by global innovation arbitrage, and innovations are flowing to jurisdictions which treat them more hospitably. Over the past 20 years, we've seen many information-technology innovators flee from Europe to escape burdensome data regulations. It's one of many reasons we need a careful and measured approach to AI policy.

MS. POWLES: Americans have just as much interest in their data being used in a manner that is justified and proportionate as people from the 100-odd countries that have data-protection laws. Yes, in a small proportion of cases these principles clash with other rights. But we can address them thoughtfully, rather than throwing out citizen protections.

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