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● How Ford revived the Bronco 54
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Is the vaccine ready yet?

When? Now? Soon? 2020? Fall? Fast? Winter? Q4? Nearly there? How about now? Done? Almost done? Next week? Right now? Hello?

The world is watching Oxford professor Sarah Gilbert

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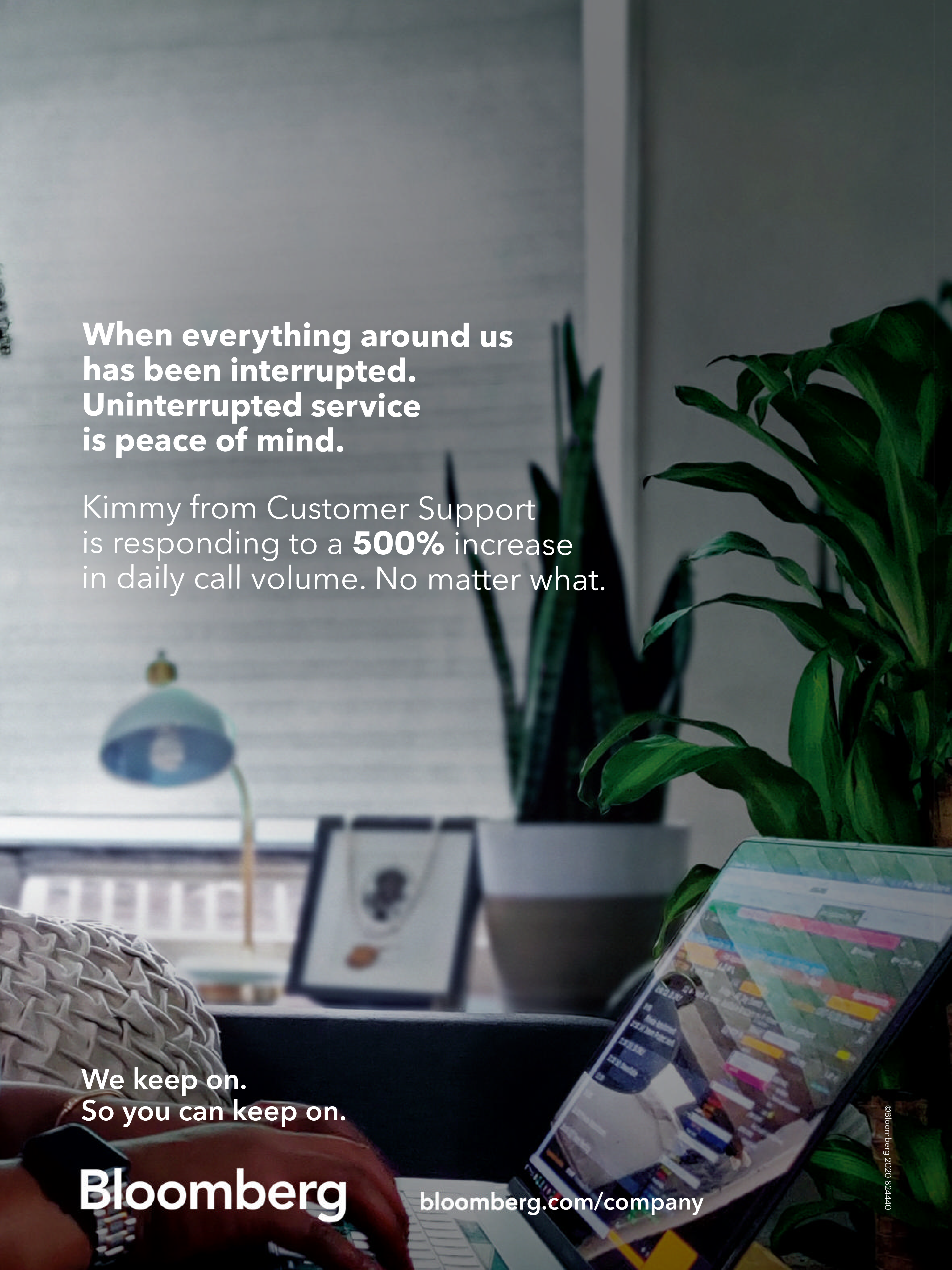
Today? Yesterday? Please?


Photographed responsibly by Kimmy with a tripod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July 20, 2020

◀ Members of Ford's "Bronco Underground" with the new model, which features a removable roof and doors

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The Bronco, and the obsessive Ford crew that roused it back to life

PHOTOGRAPH BY BRIAN WIDDIS FOR BLOOMBERG BUSINESSWEEK

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COVER TRAIL

How the cover gets made

"This week we're talking about the vaccine!"

"The vaccine?"

"Yep. The one we're all waiting for. Seems like Oxford professor Sarah Gilbert is furthest along. We should photograph her."

"On it."

[Some time passes]

"How's that photo shoot coming?"

"She canceled! Prince William visited the lab. Rescheduling."

[More time passes]

"Shoot done yet?"

"Not possible, but they sent us a pic!"

[Later]

"Almost there?"

"Nope."

[...]

"ETA?"

"It'll be done when it's done."

[...]

"Hello??"

"It's a magazine cover, not a vaccine, OK?"

Cover: John Cairns/University of Oxford

CLEVELAND: PHOTOGRAPH BY DA'SHAUNAE MARISA FOR BLOOMBERG BUSINESSWEEK


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● Worldwide, the number of Covid-19 cases is nearing

13.4m

and more than 579,000 people have died. The virus continues to spread quickly in America's Sun Belt. Florida reported almost 15,000 new cases on July 13, a record daily total for a U.S. state.

● A coronavirus vaccine Moderna is developing produced antibodies in all 45 patients in its initial safety trial, researchers said.

Moderna's shares climbed 6.9% on July 15. The same day, AstraZeneca's stock rose 7.5% after the *Lancet* said it will publish positive news on the vaccine the company is working on with Oxford researchers. ▷ 42

The recently discovered Neowise comet has been dazzling onlookers as it crosses the night sky in the Northern Hemisphere.

● The U.K. has banned the use of Huawei Technologies gear in the country's 5G mobile networks.

The move will delay the rollout of the next-generation network in the U.K. and hit British businesses with billions of pounds in extra costs.

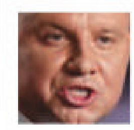
● In an EU lower-court ruling on July 15, Apple won its fight over a record

€13b

($14.9 billion) Irish tax bill. It's a defeat for Margrethe Vestager, the Union's antitrust chief, who's campaigned for five years to get rid of allegedly unfair deals member countries have offered companies.

● China said it will impose sanctions on Lockheed Martin after the U.S. approved a $620 million deal for the defense contractor to supply missile parts to Taiwan.

● President Andrzej Duda



eked out a second five-year term in Poland's July 12 election, furthering the populist transformation of the EU's largest Slavic member. During the campaign, his Law & Justice Party bashed immigrants and gays, denounced Germany, and warned that his rival, Rafal Trzaskowski, would bow to "Jewish interests."

● "This is not a normal recession. The recessionary part of this you're going to see down the road."

Despite JPMorgan Chase's strong results, CEO Jamie Dimon told investors on its July 13 earnings call that there are perils ahead.

● Banks had a mixed quarter.

JPMorgan Chase

At JPMorgan, profits fell a less-than-expected 51%, to $4.7 billion, helped by gains in stock and bond trading.

citi

Citigroup recorded a profit of $1.3 billion for the second quarter, 73% lower than a year earlier.

Wells Fargo

Wells Fargo reported its first quarterly loss—of $2.4 billion—since 2008. It cut its dividend sharply.

Goldman Sachs

But Goldman Sachs saw profits jump to $2.4 billion as trading revenue surged 93%.

● Joe Biden announced an aggressive proposal to fight climate change on July 14. His plan includes spending

$2t

on clean energy over four years and setting a 100% clean-electricity standard by 2035. The National Oceanic and Atmospheric Administration said on July 13 that 2020 would likely be the warmest year on record.

COMET: ALBERT LLOP/GETTY IMAGES. DUDA: SEAN GALLUP/GETTY IMAGES

India Must Open Up To Meet the Latest Challenge From China

It's hard to find a China dove in Washington these days. In New Delhi, it's impossible. After a brutal skirmish in the Himalayan region of Ladakh last month left 20 Indian soldiers dead, anti-Chinese fury has surged on the subcontinent. There's talk of consumer boycotts and investment bans; the government appears to be slow-walking once-routine approvals for Chinese imports. Authorities even booted goofy-video platform TikTok off Indians' phones, along with 58 other Chinese apps.

The anger is understandable. China enjoys a massive surplus in trade with India, has invested heavily in its more modern and capable military, and is steadily encroaching on its rival's sphere of influence in the Indian Ocean and along their disputed land border. It poses an unmistakable long-term challenge.

But restricting trade, as Prime Minister Narendra Modi's government seemed inclined to do even before this latest clash, would be a hopelessly misguided response. A protectionist wave will hurt ordinary Indians when they can least afford it, raising prices for consumers in the middle of a pandemic, depriving companies of key inputs, and choking off much-needed investment. Given that India is only China's 16th-largest trading partner, moreover, such measures are unlikely to strike fear into Beijing.

Instead, India needs to be doing the opposite: expanding trade with other nations. Even absent long-term competition with China, that would be a precondition for the kind of growth India needs to create tens of millions of jobs for young workers and lift many millions more out of poverty. The worsening rivalry between the countries only makes meeting that challenge more urgent. The good news is that there's a clear path forward for India—and, increasingly, an opportunity.

Most obviously, India needs to finally develop an export-led manufacturing sector, as China and other East Asian nations have done, and work diligently to join global supply chains. With many multinational companies now looking to diversify production outside of China, India should seek to fill the gap by implementing long-delayed structural reforms. Any new trade barriers—say, restricting Chinese investment in sensitive technologies such as 5G or reshoring production of critical goods, including pharmaceutical ingredients—should be carefully targeted.

India's greatest advantage over China remains its long list of potential partners. New Delhi's foreign policy mandarins would be wise to shed their suspicion of external alliances and deepen the country's military and economic ties with Australia, Indonesia, Japan, and Vietnam—all of which fear Chinese bullying. India should also be working with the U.K. and Europe to shore up international institutions. Above all, it should intensify its cooperation with the U.S., the only power strong enough to provide India with the weaponry, intelligence, and diplomatic support it will need to resist China's incursions.

There are also things India can do on its own. It should focus on modernizing a troop-heavy military that's weighed down by salaries and pensions. It should work harder to improve relations with its neighbors in South and Southeast Asia, including by treating its own Muslim minority better. And indeed, it should continue to engage with China where it can, especially on efforts to combat climate change.

Even a nation of India's size and history cannot take on a rival like China alone. Only an economically vibrant country, working with fellow democracies within a reinforced international order, will be able to protect its interests. Ⓑ

For more commentary, go to bloomberg.com/opinion

■ AGENDA

ILLUSTRATION BY JACK SNELLING

▶ Housing Hopes

Economists expect a rare bit of good news when the National Association of Realtors reports June sales of existing U.S. homes on July 22. Shoppers, unable to visit houses during the lockdown, have returned to the market.

▶ Key gauges of consumer sentiment in Germany and the EU will be released on July 23. Analysts aren't optimistic that Europe will escape its pandemic doldrums just yet.

▶ The U.K.'s Office for National Statistics will publish its June retail sales figures on July 24. Economists are forecasting a 17.1% decline from the period a year earlier.

▶ Markit reports its Manufacturing Purchasing Managers' Indexes for France, Germany, the euro zone, and the U.S. on July 24. Excluding France, the prognosis is grim.

▶ South Korea releases its estimate of second-quarter GDP on July 22. Economists say growth should rebound slightly, to almost 1%, after declining 1.3% in the first quarter.

▶ The South African Reserve Bank sets interest rates on July 23. Analysts foresee a quarter-point cut, to 3.5%. The country's GDP is expected to shrink as much as 10% this year.

▶ The National Hockey League returns to the ice with a 24-team expanded playoff format beginning on Aug. 1. All games will be played—sans fans—in Toronto and Edmonton, Alberta.

This Is the Way the

● Google is redefining the way web ads are sold. It's a boost for some and risky for others—like Facebook

● By Alex Webb

You may not have noticed, but the web is on the cusp of a revolution. Groups of engineers around the world are beavering away on the biggest upheaval to it in a decade. The shift has the potential to drastically reshape the power dynamics of the internet and the $330 billion digital advertising industry that supports it.

It's all about cookies. If the web is an unfathomably complex machine driven by billions upon billions of cogs, then cookies are the lubricant that keeps the thing moving. That's because the web is, for the most part, funded by ads. And the tiny little text files known as cookies determine which ads get shown to whom. For now. Come next year, that's all going to change.

The overhaul might also give publishers, not least the media industry, a chance to mend their bungled approach to making money in the era of digital consumption. If they get their act together, that is.

Whenever an ad seems to stalk you, cookies are to blame, but their origin in the mid-1990s was innocent enough. Engineers at the then-popular web browser Netscape needed a way for websites to remember what you'd placed in an e-commerce shopping basket, or simply your preferences. They put a small text file on your device noting the data. Then, when you returned to that site, you didn't have to log in again, and your basket still contained a VHS of *Titanic*, a Furby doll, and whatever else people bought in the '90s.

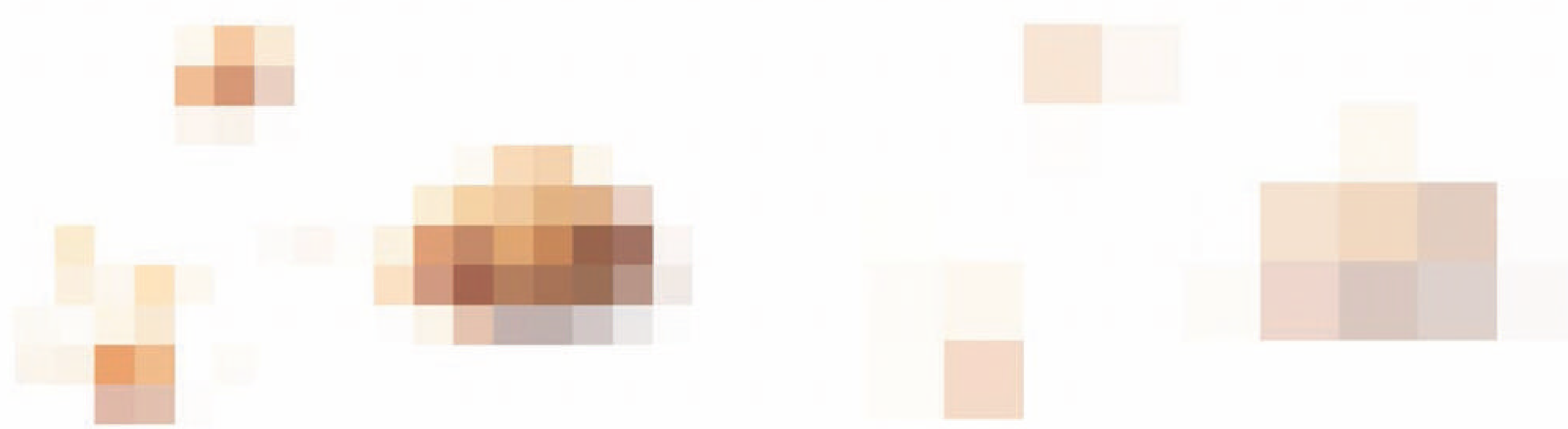
Over time, advertisers realized that such cookies could also be used to track users across the internet. They started piggybacking on websites, with those sites' consent, to drop "third-party" cookies onto devices, as distinct from the first-party cookies coming from the websites themselves. (You—the user—are technically the second party, but you don't produce cookies.) The more websites in an advertising network, the more complete a picture they could build of users' browsing habits and, by inference, their likely purchasing preferences. Knowing that you were interested in the film *Titanic*, Furbys, and the *BusinessWeek* website was valuable data.

In the intervening years, a vast cookie economy has developed where hundreds upon thousands of companies trade user data to target ads more precisely to would-be customers. Agency trading desks use demand-side platforms to buy ad impressions programmatically from ad networks and supply-side platforms on exchanges running a real-time bidding process. It's confusing and opaque.

"It has historically been really easy for third parties with no legitimate agency or claim to the consumer's data to gain an understanding about the user and then monetize and

PHOTO ILLUSTRATION BY 731; PHOTO: GETTY IMAGES

Cookies Crumble



resell that understanding," says Wil Schobeiri, chief technology officer at MediaMath Inc., a New York-based firm that manages online ad campaigns. "The debate now is," he says, "who gets to control that and make decisions about the user and the user's privacy?"

Apple Inc. Chief Executive Officer Tim Cook has identified user privacy as a key selling point for iPhones, iPads, and Macs. In 2017 the company introduced tools for its Safari web browser that made it easier to block third-party cookies. Last year, Mozilla Corp., the maker of Firefox, followed suit. But the biggest upheaval came in January when Google, whose Chrome browser has more users than everyone else combined, announced that it would phase out third-party cookies over the following 18 months. The ad technology industry took a deep breath.

Google was preempting the inevitable. The European Union's General Data Protection Regulation, introduced in 2018, had already started to unpick the cookie economy by giving citizens more control over their data and letting them opt out of ad-tracking efforts. An array of copycat legislation such as the California Consumer Privacy Act, which went into effect in January, is rolling out around the world. The cookie's days were numbered before Google's announcement.

Discussions now focus on what comes next. Every week, members of the World Wide Web Consortium, or W3C, an international standards organization founded by a creator of the web, Tim Berners-Lee, dial into a video call to work out the options. The standards organization has a group focused on improving web advertising that consists of more than 200 members. About 80 join the weekly call: engineers from Google, Facebook, Microsoft, Amazon.com, Apple; publishing giants such as Hearst Communications, Axel Springer, and the British Broadcasting Corp.; advertising agency groups such as WPP; and plenty more besides. Anyone can join for as little as $300 a year. Discussions continue online in a series of open groups on GitHub, the coding repository and forum owned by Microsoft Corp.

The participants are all trying desperately to nudge the tiller in a direction that satisfies their needs. But the captain steering the ship is undoubtedly Google, whose $162 billion in 2019 revenue makes it the gatekeeper for almost half of all global digital ad spending. It has the biggest ad exchange (where brands bid against one another programmatically to show you an ad every time you open a web page); the biggest ad network (virtual real estate where it can place ads on websites); Android, the biggest mobile operating system; and, in Google Search, Maps, YouTube, and Gmail, the most valuable web properties for serving ads. Most significant, Chrome is the biggest web browser, with a 64% market share, according to the web traffic analysis firm StatCounter.

Even without third-party cookies, Google will be able to track users' activity so long as they're on Chrome. Whatever it decides, goes. It already vetoed a plan to extend the role of W3C's web privacy group, Bloomberg News reported last year. So while your data may no longer be traded willy-nilly around the internet, there's a good chance that Google ▶

◀ will still be able to use your browsing history to target you with ads tailored to either your interests or products you've already considered buying. Just how it will do that is as yet unclear. Google dubs its latest proposal Turtledove, which stands for Two Uncorrelated Requests, Then Locally-Executed Decision On Victory. It replaced an earlier effort called Private Interest Groups, Including Noise, or Pigin. If you find the ornithological acronyms confusing, you're not alone; other advertising technology firms have complained about the lack of clarity.

"Chrome is driving this process, and the rest of us are providing feedback," Alan Chapell, a lawyer for a number of startups, wrote in a July 6 email to fellow participants in the W3C's advertising business group, or WABG. "Please note that the success or failure of many in the WABG are already contingent upon maintaining a good relationship with Google. As such, there is likely to be some perceived risk to being openly critical of the dominant market player in a public forum. And that is likely to color some of the feedback provided."

A slew of companies will go out of business after whatever Google decides to implement. Even Facebook Inc. is likely to encounter some difficulties. At the moment, if you see an ad for a pair of sneakers on the Instagram app on your phone, then decide to buy it a week later through the Chrome browser on your laptop, Facebook can tie the events together through third-party cookies, because you're likely signed into one of its services on the laptop. It estimates that in cases where an ad was converted into a sale within 30 days, just 20% started and ended on the same app and the same device. Severing Facebook's ability to measure the effectiveness of its ads is a threat to its business. And if that poses a challenge to the world's second-biggest ad tech player, imagine the peril to the hundreds of smaller companies.

For another group, publishers, it presents a tremendous opportunity. In web parlance, that means anyone producing online content. But it's particularly acute for the news industry, whose failure to manage the transition from print to digital has been well chronicled: U.S. newspapers' cumulative advertising revenue fell from a 2006 peak of $49 billion to an estimated $14 billion in 2018, the lowest in 40 years, according to the Pew Research Center. Google's U.S. ad revenue jumped from $11 billion to $63 billion in the same time frame.

That divergence isn't just because print advertising has disappeared. It's also because media organizations have all too willingly outsourced the responsibility for serving their audience with ads to other companies, not least the Google Display Network. That seemed like a good decision 15 years ago, automating the marketing sales process while eliminating the need to invest in costly engineering teams to develop the technology in-house. But it also meant that the value of each ad was tied to the identity of the person looking at it, rather than where it appeared. A brand might pay the same amount for an ad alongside a Pulitzer Prize-winning investigation as it would a fake news story written by a kid in a dorm room, because they were targeting the same person.

That undermined the importance of context, the idea that the website where an ad appears can accentuate or diminish a brand's appeal. According to Sam Tomlinson, a partner at PwC specializing in the measurement of ad effectiveness, "publishers have always had to have a strong granular understanding of their audience to create the compelling content that sees their audiences coming back time after time."

The loss of control has been highlighted by Covid-19: U.K. newspapers have warned they could lose £50 million ($63 million) in advertising revenue over three months, even as online readership has spiked. Brands have added vocabulary associated with the coronavirus to so-called blocklists, which means that their ads won't appear alongside news stories containing those words. While intended to avoid advertising alongside conspiracy theories, the effect has been far broader, and news groups are beholden to the whims of the ad tech industry.

News organizations have in recent years started to make up the ad revenue shortfall by leaning into online subscriptions. And encouraging users to register, whether or not they actually pay a subscription, can also result in harvesting personal information. In the absence of third-party data generated by cookies, the value of first-party data will increase. Knowing someone's name, address, and interests is valuable: A user can be grouped with a cohort of others with similar interests and income levels—with that person's permission.

The New York Times Co. has just started that approach. It's inviting users to fill out an optional questionnaire and informing them that the results will be used to build audience segments that target ads on its website. "We are not interested in sharing our users' information into broad open networks that re-create the cookie universe we're in today," says Allison Murphy, the newspaper's head of ad innovation. Instead, it may sign agreements with brands that have their own first-party data and target ads that way. "If both of us have first-party data, we can match that in environments that are secure and respect the consent we have from users," Murphy says.

Given the regulatory pressure against Google, it may also be in the Mountain View, Calif., company's interest to reinvigorate the media industry's revenue streams. The U.S. Department of Justice could bring an antitrust case against the company as soon as this summer. Sacrificing a chunk of the $22 billion a year it makes from the Google Display Network might help its antitrust case, even as it squeezes out other ad tech players by making the case for better privacy. That's surely an outcome Chief Executive Officer Sundar Pichai would prefer to a deeper breakup of Google's ad tech business and the control it has over the buying, selling, and bidding processes.

If they can get it right, media organizations might be able to reclaim some of the billions of ad dollars hemorrhaged over the past 15 years. Sure, it will be easier for companies with the scale of the New York Times, Condé Nast, or Gannett than it will for independent regional organizations. But the cookies are disappearing from the jar, and everyone should prepare to scramble to catch the crumbs. Ⓑ

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1

BUSINESS

These Tobacco Substitutes Don’t Give a Spit

Edited by
James E. Ellis
and David Rocks

● New nicotine-laced oral products are pitched as healthier than cigarettes

Chewing tobacco once called to mind men in double-breasted suits gathered around a spittoon or a baseball player sending a mouthful of brown spittle spewing across home plate. But do a hashtag search for #oralnicotine today, and you'll see young women in parkas playing with a sleek container labeled Epok. Try #snus, and you'll see a freckled Swedish maiden whose crown of flowers is studded with a tin of Ace Superwhite nicotine pouches.

Such Instagram-friendly products, known as dip, snuff, pouches, or snus, are being positioned as a replacement for cigarettes. Traditional smokes are a more than $700 billion-a-year global business that for decades has been dogged by health concerns and changing social norms that have led to a slow, steady decline of users. Big Tobacco in recent years had hoped to get its mojo back by steering smokers toward vaping. Instead, the industry ran into new trouble with concerns that fruity vape flavors helped addict a young generation to nicotine and that the liquids aerosolized into harmful chemicals. Then came Covid-19: Public-health agencies warn that smoking may worsen the symptoms of the virus, and vaping's effect on them isn't fully understood.

Such long-standing health concerns have created an opening for new oral tobacco products, which are neither heated nor inhaled. Although the U.S. Food and Drug Administration on July 7 said Philip Morris International Inc.'s Iqos heat-not-burn device exposes users to fewer harmful chemicals than traditional smokes, the agency hasn't authorized any e-cigarette to be marketed as fully safer than cigarettes. But last October it granted that status to Swedish Match AB's snus, saying that compared with cigarettes, the product has a lower risk of causing mouth cancer, heart disease, lung cancer, stroke, emphysema, and chronic bronchitis. The FDA is also reviewing a bid by Marlboro maker Altria Group Inc. to get the same status for its Copenhagen snuff fine cut and by Reynolds American Inc. for its Camel snus.

"The oral pouch seems to be the first oral tobacco product that is taken seriously as an alternative to cigarettes," says Chris Bunka, chief executive officer of Lexaria Bioscience Corp., a Canadian biotech that's working on ways to increase the speed at which nicotine reaches the brain.

These new smokeless products have come a long way. In 2020 global retail sales of the moist snuffs are estimated to reach $12.7 billion, up 4.8% from 2019, according to Euromonitor International—even though snus isn't sold in most of the European Union. There's about $1 billion in annual sales for chewing tobacco. Vaping products are expected to log $22.6 billion in sales this year.

The new products don't require spitting because tobacco or other solids are enclosed inside single-serving pouches that are lodged between the gums and lips, sucked on discreetly, and easily discarded like chewing gum, making them more appealing to young or female consumers who've been averse to traditional snuff products. Some of the flavors are citrus, berry, mint, and cinnamon. And there's a cool factor: Many brands hail from Nordic countries—in particular Sweden, whose 200-year-old tradition of moist snuff gave rise to the term "snus."

Lexaria, which holds patents on methods to get fat-soluble drugs into the bloodstream quickly, signed a licensing deal with Altria in 2018. Three of Lexaria's employees spent a year researching oral methods to deliver nicotine with equipment from Canada's National Research Council, and the company is now waiting to see if Altria will pay it for further research.

Bunka says he's seen more interest in Lexaria's patents from global tobacco companies, which wouldn't be restricted by the U.S.-only deal with Altria. "Covid-19 has certainly put oral tobacco on more people's radar screens," he says. He declined to name the other companies, and Altria declined to discuss its deal with Lexaria or comment on its research related to oral products.

The Lexaria-Altria deal is but one example of how the race to provide nicotine without combustion—or even tobacco—is heating up. Swedish Match, which dominates the Scandinavian market, has sold Zyn nicotine pouches in the U.S. since 2016 and is expanding fast. They were sold in 67,000 stores across the U.S. at the end of December and in 80,000 by the end of March.

British American Tobacco Plc's modern oral category, which includes the Epok and Velo brands, saw revenue rise 273% last year, to £129 million ($162 million), outpacing that of heated tobacco and vapor products.

At Altria, talk of oral tobacco now dominates investor conference calls that used to focus on its license to sell the Iqos device in the U.S. and on its $12.8 billion investment in vape maker Juul Labs Inc.

Altria entered the oral nicotine pouch market in 2019, when it bought a $372 million stake in Burger Söhne Holding AG and agreed to start distributing the Swiss company's On! brand in the U.S. In a trial of adult smokers and dippers who used On! ▶

▼ Global sales in 2019

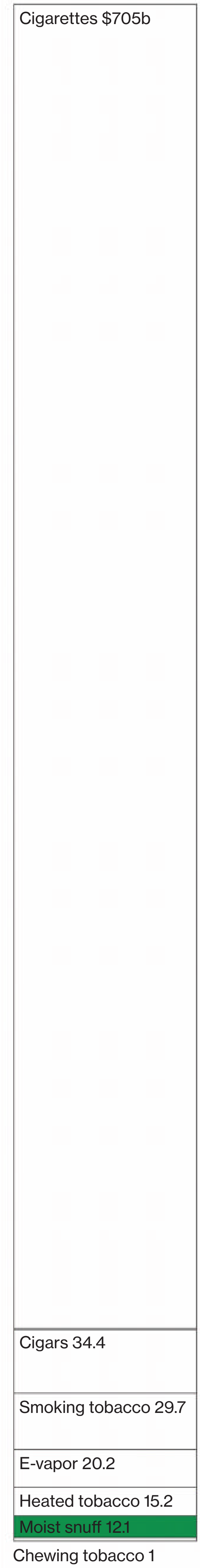


PHOTO ILLUSTRATION BY 731; PHOTOS: GETTY IMAGES (2). DATA: EUROMONITOR INTERNATIONAL

◀ for six weeks, more than a quarter completely switched to On! products, and more than 70% of the adult dippers did the same, Altria says. Women were as likely as men to switch.

Altria recently submitted data to the FDA to authorize U.S. sales of On!, which would pit it against Swedish Match, BAT, and smaller companies that make so-called modern oral pouches such as Dryft Sciences LLC's Dryft brand and NicoGen Pharma Solutions' Rogue brand. If Altria wins that approval, it intends to also seek permission to market On! as a reduced-risk product.

The On! pouches, available in seven flavors and five nicotine strengths, are tobacco-free. That puts them in the growing category of "white" or "modern" pouches that don't contain tobacco leaf, only the nicotine that's extracted from it. Rogue, Dryft, Velo, Epok, and Fiedler & Lundgren AB's Lyft nicotine pouches are all in that category.

The On! brand team plans to use Altria's huge database of tobacco users to reach consumers, the company says. But even though On! doesn't contain tobacco, Altria says the product's marketing will comply with all laws involving the sale of tobacco and only reach out to users over age 21.

That hasn't silenced critics. "Tobacco-free is a deceptive language," says Matthew Myers, president of the Campaign for Tobacco-Free Kids. It's the nicotine in such products that's addictive, and the industry's own internal documents have indicated how flavors help attract younger users, he says.

Oral nicotine has so far shown a solid safety edge over cigarettes and older forms of oral tobacco. Some newer kinds of oral nicotine also use pasteurization, which kills the bacteria blamed for chewing tobacco's carcinogenic chemicals, says Dr. Michael Steinberg, a professor at Rutgers University's Robert Wood Johnson Medical School. Still, he says, "we don't know that snus is harmless." Evidence suggests that it increases the risk of heart attacks, dental disease, and some cancers, he says.

"The faster you can get it to your brain, the more addictive a product is," says Steinberg. Part of the reason oral nicotine has never really competed with cigarettes is that it takes too long to do just that. Although a speedier hit from snus could help lure more smokers to a safer product, it could also addict new users. "We have to be careful. A reduced-harm product means you're comparing it to the most deadly legal product in our society, which is cigarettes," Steinberg says. "It may be true, but it's not that impressive." —*Tiffany Kary and Corinne Gretler*

THE BOTTOM LINE Oral tobacco, such as snuffs and pouches that deliver nicotine while being sucked, is a $24 billion business. Being able to claim they're safer than smoking could buoy sales further.

Making Faux Meat Taste Real

● Ingredients makers see profits in improving the flavor and mouthfeel of vegetable proteins

In a sun-filled room of Givaudan SA's Innovation Center, a four-story brick building in the gentle hills east of Zurich, dozens of white containers are stacked in neat rows. While they have labels such as "bacon," "fried fat," and "pork lard," what's inside is made of extracts of foods such as herbs, garlic, and onion, or enzymes and amino acids from cooking–and not a molecule of animal protein.

The flavorings are aimed at the growing business of meat alternatives from newcomers such as Beyond Meat and Impossible Foods and at

industry stalwarts like Nestlé, Perdue, Smithfield, and Tyson. Increasing sales of those products is a huge opportunity for the likes of Givaudan, which can help turn insipid, mealy concoctions into something consumers crave. The Swiss company and rival producers of flavors and fragrances for innumerable consumer products–from liquor to lotion to laundry detergent–are carving out a niche in making vegan foods more appealing and nutritious. "Everyone wants in, whether it's some defense or a desire to disrupt," says Louie D'Amico, president of Givaudan's flavor division. "We help companies make their products taste better."

Analysts predict meat alternatives could make up some 10% of the global meat market in the next decade, and Givaudan, founded in 1895 as a fragrance maker, aims to profit from that growth. The company has a pool of more than 3,000 ingredients it uses to create hundreds of thousands of flavorings such as elderflower, leek, or grape-jasmine. While it's the biggest player, Givaudan faces increasing competition from the likes of Switzerland's Firmenich, Germany's Symrise, and New York-based International Flavors & Fragrances, which have been beefing up their research capabilities and buying smaller players to better understand various proteins and how to make them tastier and healthier. Crop processing giant Archer-Daniels-Midland Co. joined the fight in 2014 when it acquired Germany's Wild Flavors, and it now helps produce the soy-based Rebel Whopper for Burger King in Brazil.

Startups are jumping in as well, with venture capital funding for companies making newfangled food ingredients up sixfold in the past three years, to more than $700 million in 2019, according to researcher PitchBook. Thai Union Group has invested in Flying Spark, an Israeli company that makes protein from fruit fly larvae. In April, San Francisco's Prefix Capital invested in Manus Bio, which uses fermentation to create sweeteners and other natural ingredients. And Boston-based Motif FoodWorks Inc. has raised more than $115 million to create alternative proteins and ingredients. Such companies can help make "plant-based or blended products with better taste, texture, and nutrition," says Rosie Wardle, investment associate at CPT Capital, a London venture capital fund that's backed Motif and more than 30 other alternative protein companies.

With some 15,000 employees worldwide, a $500 million-plus annual research budget, and manufacturing facilities in more than 30 countries, Givaudan remains the giant in the field. The company last year opened its Innovation Center, where chemists work on seasonings, scents, and additives. The building is surprisingly odor-free for a place where flavors and aromas are developed. In one room, washing machines churn laundry to test fragrances for detergents. In another, perfume ideas are concocted in domed glass containers and test tubes, with their chemical formulas scribbled across sliding glass windows. In a third, flavors for candies and drinks are sorted in see-through packets or glass bottles, with labels such as pear-vanilla and cola-mandarin. In a test kitchen on the ground floor, chefs cook up samples for visitors and customers—effectively every big foodmaker you've ever heard of, though neither Givaudan nor most clients are willing to disclose the relationships. For lunch on a sunny Friday, they're serving mushroom and quinoa balls with a distinct smoky taste, a soy-based tuna replacement, and a vegan lamb shawarma.

A key initiative is helping make plant-based meats more palatable, especially in terms of texture. While Givaudan scientists have a suite of flavors that generally work—getting rid of bitter aftertastes common to plant protein, adding grill notes, or boosting umami—the biggest goals are nutrition and approximating the mouthfeel of meat: "How are things released, what do color and texture have to do with it, and how do you mirror that?" D'Amico says.

"Everyone wants in, whether it's some defense or a desire to disrupt"

To boost its understanding of the field, Givaudan has teamed up with Plant Meat Matters, a group of food industry giants led by scholars at Wageningen University & Research in the Netherlands that studies the appearance, taste, and texture of plant proteins. With students at the University of California at Berkeley, Givaudan is seeking better ways to produce plant-based products. The company has tie-ups with dozens of startups to help them develop tastier foods while bolstering its own expertise in the field. In November it joined with Israeli startup Innovopro to study chickpeas as a base for products such as vegan mayonnaise, puddings, and ice creams. Since May it's been working with a California company called Terviva to create meat alternatives extracted from pongamia, a tree native to Southeast Asia. And in June it said it's helping Israel's Redefine Meat—which uses 3D printers to lay down ersatz meat mixture—to create a product it says will be indistinguishable from a cut of beef carved from a steer.

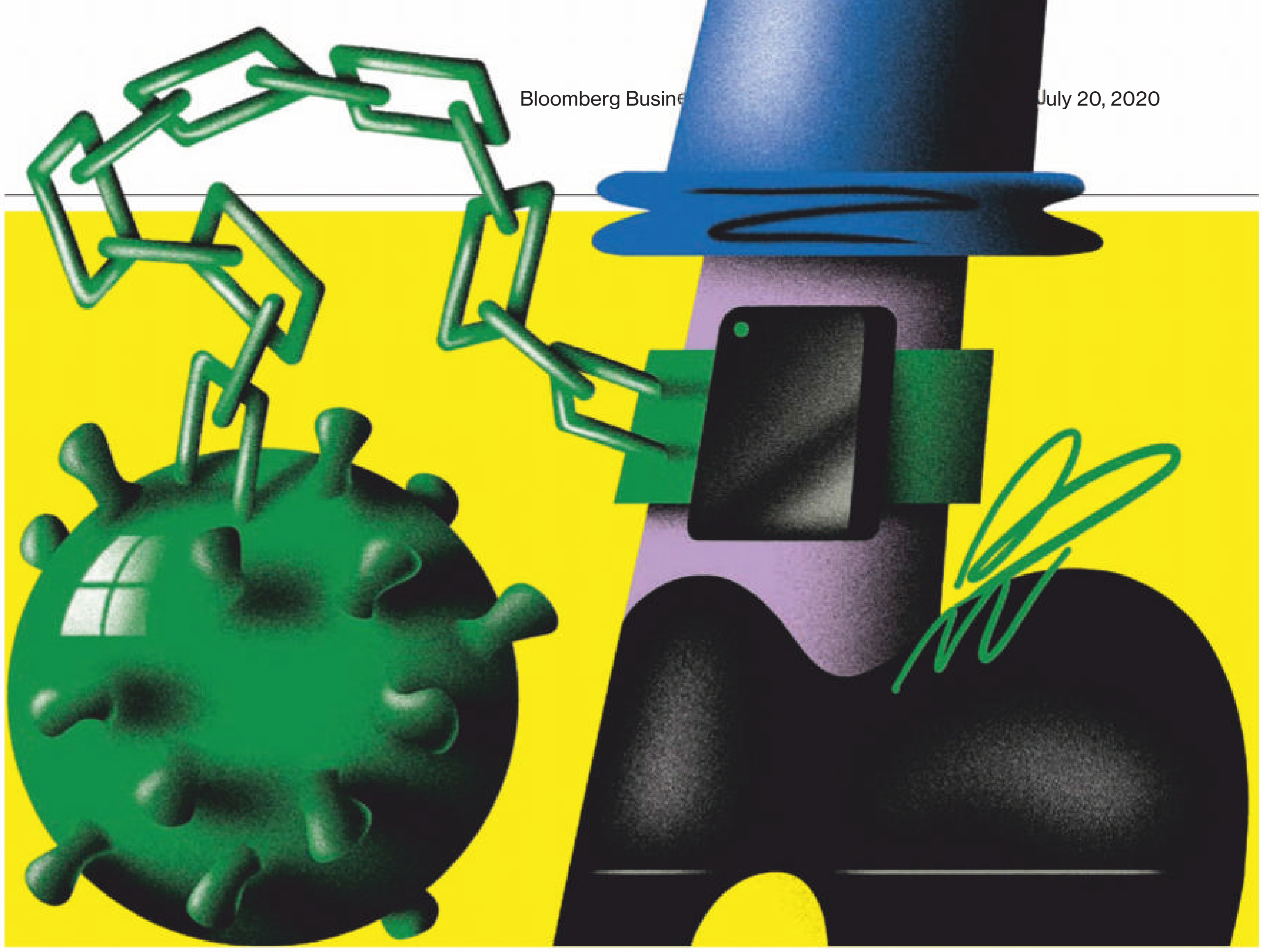
Givaudan in October introduced a technology it says can replicate the juiciness of meat. Vegan patties tend to dry out in the pan because vegetable oils burn off faster than those in animal protein, but the Givaudan offering encapsulates plant fat in a matrix of starch so it acts like cells in meat. The company says the product provides the mouthfeel of meat while cutting fat content by 75% and reducing calories by 30%. That's important because there's growing concern about the nutritional value of meat alternatives. While consumers initially assumed meatless foods were inherently healthier, they're now balking at the fat and sodium content, which is often higher than the levels in meat. "People look at that now and say, 'Wow, that's a problem,'" D'Amico says. "There's still a way to go with flavor and taste, and the next challenge is helping with the nutritional profile."
—Corinne Gretler and Agnieszka de Sousa

● Venture capital funding in 2019 for startups making novel ingredients

$700m

THE BOTTOM LINE Alternative proteins could account for 10% of the global meat market in the next decade, and flavor makers such as Givaudan aim to tap into growing sales of such products.

ILLUSTRATION BY SOPHI GULLBRANTS



A Bigger Market for Electronic Monitors

● Corrections centers are stocking up as they release prisoners because of Covid-19

In mid-March, as Covid-19 threatened vulnerable prison populations in the Netherlands, 200 nonviolent inmates nearing the end of their sentences were released with electronic monitoring equipment. "We heard the news on a Saturday, and by Tuesday all the prisoners had bracelets," says Eric Staal, policy adviser for Dutch probation services. They had enough for the discharged convicts, but to ensure a steady supply, the Ministry of Justice and Security purchased 1,500 additional bracelets from Attenti Group Ltd., a leading manufacturer.

The coronavirus has decimated many businesses, but electronic monitoring (EM) makers are thriving. Governments around the world are releasing record numbers of prisoners out of concern that the pandemic poses undue risks to inmates' health; there are about 25% to 30% more prisoners wearing bracelets now than a few months ago, according to *Bloomberg Businessweek* estimates. The companies are betting that this can be a test run for a longer-term shift in sentencing. Criminal justice reformers say they're worried about an added layer of surveillance in a field that's been rife with abuse.

"Coronavirus gives electronic monitoring companies an opportunity like they've never had before to expand," says James Kilgore, director of the U.S.-based parole reform project Challenging E-Carceration. (He spent more than six years in California prisons—and was subsequently on a monitor—for his role in the Symbionese Liberation Army, which staged kidnappings and bank robberies in the 1970s.) Kilgore adds that newer monitoring equipment tracks data such as biometrics, consumer habits, and health issues, though it's not clear what the companies are doing with the information.

European Union nations have put thousands of nonviolent offenders on monitoring equipment since the pandemic began—about 3,400 in Spain and 1,000 in Italy, for example—and in the U.S., the Federal Bureau of Prisons has placed about 4,600 inmates in home confinement, a 160% increase since the end of March. States such as Wisconsin have outfitted almost 1,500 inmates with bracelets, while Cook County in Illinois plans to add 700; in New York and New Jersey, the numbers are about 150 each.

Edited by Katrina Nicholas and Bret Begun

ILLUSTRATION BY YANN BASTARD

18+

WHAT IS
AVAXHOME?

AVAXHOME -

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

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Cheap constant access to piping hot media
Protect your downloadings from Big brother
Safer, than torrent-trackers

18 years of seamless operation and our users' satisfaction

All languages
Brand new content
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"Demand has spiked everywhere," says Robert Murnock, vice president for partnership development at BI Inc., a monitoring-equipment maker in Boulder, Colo. Like some other manufacturers, he wouldn't elaborate on his clientele because of confidentiality agreements, but he says BI now has 1,300 U.S. accounts. "We're getting calls from different jurisdictions and other countries we've never worked with," Murnock says.

Typically, an inmate is fitted with an ankle bracelet that uses either GPS, which lets wearers travel to preapproved locations, or radio frequency, for when they're mostly confined to home. If someone leaves a specified area, a monitoring center alerts law enforcement. The bracelets that Attenti supplied to the Dutch cost about €2,000 ($2,300) each, according to the ministry, and that's just for the hardware—not the costs associated with monitoring software or the probation and parole officers who check up on people. (Attenti didn't respond to a request for comment.) In the U.S., it costs about $100 a day to house a federal prisoner, according to the Bureau of Prisons, and about $140 for a state prisoner, according to the Vera Institute of Justice, a think tank in Brooklyn, N.Y. A majority of EU countries pay €100 or less, a report by the Council of Europe shows.

Research demonstrates that EM can lower criminal justice costs, decrease prison populations, and reduce recidivism. But prisoners are often expected to pay costs, which can run from $10 to $35 daily, depending on the state, according to academic studies and media reports; it's unclear if rates have been affected by the surge of prisoners being released amid the pandemic.

The costs can have devastating financial effects. In a 2018 federal class-action lawsuit against Alameda County in California and monitoring company Leaders in Community Alternatives (LCA), Robert Jackson, one of three lead plaintiffs, called his payments "extortion." Jackson was released with a bracelet to care for his three daughters after his wife died. A forklift operator, he paid the company $4,500 for 113 days of monitoring. In the suit, he said that he didn't ask for a fee reduction because he was worried he'd be sent back to jail. He said that LCA routinely called to harass him about being behind on payments and that the fees cost him his house, which caused him to have to find alternative custodians for his children. (A county spokesperson didn't return a request for comment. Ordan Trabelsi, president of the Americas for SuperCom Ltd., the Israeli company that now owns LCA, says, "We believe the multiple dismissals from the court speak for themselves," in reference to parts of the class action that a judge dismissed. Other parts are being appealed.)

Faulty equipment is also an issue and can land inmates back in prison. When bracelets don't charge properly, they can't keep tabs on people; at that point, alarms sound in monitoring centers, police are dispatched, and wearers can be accused of violating their release conditions. In Los Angeles County, one in four GPS devices were found to be faulty, according to a 2013 state probation audit.

Critics say that the swift expansion in EM hasn't come with an equal uptick in the housing, counseling, and employment services required to ensure that the system operates responsibly. Dutch consultant Michiel van der Veen, who advises governments on how to employ monitoring programs, says vendors need to better understand what they're selling. They've "never been interested in how the material is used," he says. "There are no guidelines." BI's Murnock says: "If agencies request a device, we will get it to them. Our job is not to determine what corrections does with the equipment."

Some officials who run EM programs say they were overtaxed before the pandemic and are even more so now. In Cook County, Sheriff Thomas Dart wrote to state criminal justice stakeholders saying that he doesn't have the resources to keep up with the surge in monitored prisoners. "We have been at, or exceeding, capacity" for some time, he said.

"We're getting calls from different jurisdictions and other countries we've never worked with"

Businesses that sell monitoring equipment offer other services to prisons, too. Critics object to such entanglements, saying they put unfair financial burdens on inmates and their families. Securus Technologies Inc., which owns monitoring company Satellite Tracking of People, provides phone services. It was accused of charging 100 times the normal market rate for inmate calls, and in 2016 San Diego County inmates Juan Romero and Frank Tiscareno were lead plaintiffs in a class-action suit against Securus alleging that the company illegally recorded their private calls. (Securus settled the Romero and Tiscareno case without admitting wrongdoing. A Securus spokeswoman says: "Our monitoring technology has helped some jurisdictions move more people out of correctional facilities and back into their communities while maintaining public safety. We have also provided nearly 20 million free calls to help keep families connected.")

Monitoring companies sometimes have political connections, and those relationships can raise questions. The Institute for Justice, a public interest law firm in Arlington, Va., filed a suit in May against Judge Paul Bonin of the Orleans Parish Criminal District Court in New Orleans for ordering defendants to wear bracelets and pay more than $1,000 to ETOH Monitoring LLC. Company executives contributed to Bonin's election campaign, and he's had ▶

◀ long-standing personal and professional ties to them, the suit alleges. "Judge Bonin violated the 14th Amendment's guarantee of due process by requiring defendants to pay fees to a company he had a relationship with," says Jaba Tsitsuashvili, an institute attorney. "Private electronic monitoring companies must be held to constitutional standards when they perform governmental functions." (Bonin and ETOH didn't reply to requests for comment.)

Back in the Netherlands, Staal, the probation services policy adviser, says the country plans to use bracelets with prisoners or pretrial detainees as long as the coronavirus is a threat. "For the foreseeable future, prison systems may depend on location monitoring," he says. "Electronic bracelets are the best tool we have." —*Cara Tabachnick*

THE BOTTOM LINE Prisons and jails are releasing offenders to electronic monitoring, but some corrections officials say they can't support the programs, which can be costly and unfair to convicts.

Asia's Vendors Embrace the Web

● With tourism paused, merchants have taken to platforms such as Facebook to sell wares

Bangkok's sprawling open-air Chatuchak market is a shadow of its former self. Coronavirus has emptied its thousands of tiny stalls and quieted its hundreds of narrow passageways, which usually teem with tourists sweating in the soupy heat. Some locals still venture there for essentials, but the famed shopping complex, which normally sells everything from rattan place mats to street fashion, is largely deserted.

Yet many mom and pop retailers, robbed of their market income, haven't given up. Instead, they've turned to social media platforms such as Facebook and Instagram to hawk their wares. So many small vendors have embraced buying, selling, and haggling online that Thailand is now Southeast Asia's largest market for so-called social commerce transactions, according to Line Corp., maker of the popular eponymous messaging app. Everything from home-baked brownies to lemongrass-scented cleaning products can be found on Thailand's virtual shelves. Some fishermen are even selling their daily catch from the Andaman Sea. A similar trend is unfolding in Indonesia and the Philippines, where outdoor markets and street vendors are also common and traditional retail has been upended by Covid-19.

Lalilladar Sirisukamon, whose Rock Me Jewelry sells cute pineapple-shaped rings and tropical-motif pendants, established her first outlet at Chatuchak in 2013. After the virus hit and sales stopped, she shifted online. "Chatuchak, out of all our stores, is the place with the lowest sanitation and cleanliness. So we were hesitant to reopen there," the 34-year-old says. "We started doing live Facebook video sales to make some money so we could pay employees and cover our costs. It's the only thing keeping us afloat right now."

Much of the online activity in Thailand is "conversational commerce," the sort of buying and selling that takes place over chatrooms, messaging services such as WhatsApp, or platforms such as Instagram. It can be particularly useful for micro-retailers, allowing them to connect quickly and directly with consumers and to offer personalized service, with little to no upfront investment.

"You just need to know how to take a nice picture, post it online, and set a price for what you made," says Vilaiporn Taweelappontong, a lead partner at PwC Consulting in Thailand. "In the beginning it was small items like homemade cookies or other food products, but now it's getting

● Share of the Philippines' 73 million internet users who are on Facebook

98%

▼ Sirisukamon

PHOTOGRAPHS BY LAUREN DECICCA FOR BLOOMBERG BUSINESSWEEK

▲ Most shops in Bangkok's Chatuchak market have been shuttered by the pandemic

serious. People are selling land, their houses, condos." Big brands are also getting in on the act: Last year, McDonald's Corp. used Facebook's in-stream live video ads to reach 3.5 million people in the Philippines over a two-month period.

Selling via livestream is already huge in China, where the megastar saleswoman known professionally as Viya can draw audiences of more than 37 million. In April, she sold space on an upcoming rocket launch to a satellite company. The price: $5.6 million.

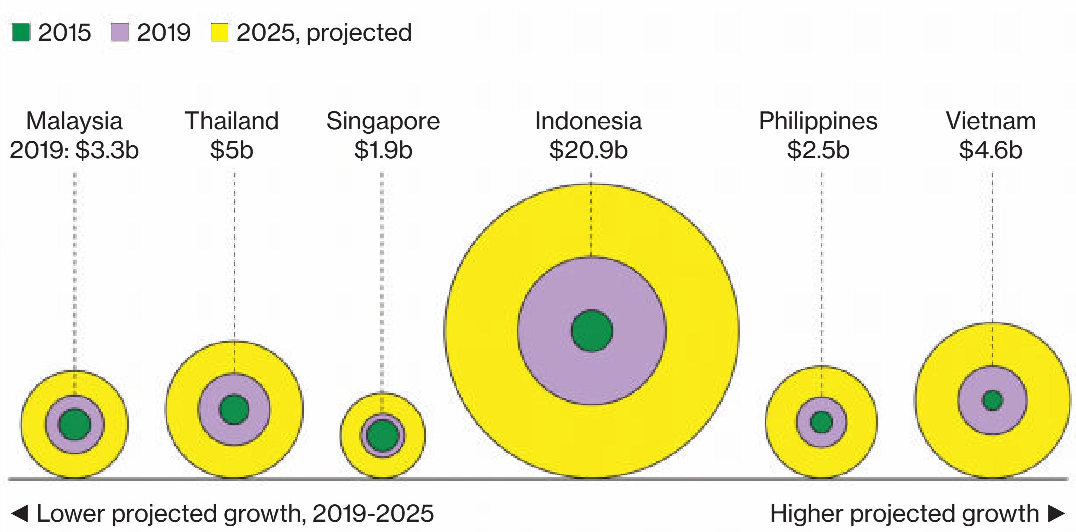
One drawback of using social media platforms to transact is that some don't have payment systems. Money is typically transferred directly, by bank transfer or cash upon delivery; it's a system that relies on mutual trust. But in much of Southeast Asia, where cash payments are still common, that works.

The process may gradually become more structured. Facebook Inc. recently launched Facebook Shops, a feature that allows users to set up an online store within its main app, and plans to start rolling out a similar service for Instagram later this year. "People have been using live video on our apps to showcase products for years, from shoe stores announcing new sneakers to beauty influencers trying on different lipsticks," the company said in a statement in May. "Now we're making it easier to shop for products in real time."

Facebook is also the social media platform of choice in the Philippines, where 98% of the roughly 73 million internet users are on it. Since lockdowns began there in March, conversational commerce has mushroomed. Thousands of Filipinos have become online merchants using Facebook or Viber, a messaging app from Japanese company Rakuten Inc. that's also hugely popular. The potential for growth is enormous. In terms of gross merchandise value, the Philippines' total internet economy—including e-commerce—was worth just $7 billion in 2019, the lowest figure in the region, according to a study from Google, Temasek, and Bain & Co. It's projected to grow to $25 billion by 2025, but that would still leave it far behind Indonesia (projected to reach $133 billion by then), Thailand ($50 billion), and Vietnam ($43 billion).

"So many people are struggling to find a way to make a living," says Jay, who uses Facebook to sell produce from Pangasinan, a province north of Manila famous for its mangoes and oven-baked rice cakes. The 29-year-old canteen owner asked not to be quoted by his full name because the government is looking to tax home-based transactions. "Without a vaccine and until there's no fear of going out, operating a store isn't viable," he says. "Facebook is really the medium for the smallest retailers." —*Natnicha Chuwiruch and Ian Sayson*

E-commerce in Southeast Asia



DATA: GOOGLE, TEMASEK, BAIN & CO.

THE BOTTOM LINE With traditional retail restricted, buying, selling, and haggling online has exploded across Southeast Asia. Facebook and its peers are angling to formalize such markets.

3

FINANCE

Hair Metal Returns!

Edited by Pat Regnier and David Rocks

● Investors are buying up song rights, and lots of artists need cash

Bon Jovi's *Livin' on a Prayer* was a Billboard No. 1 hit for four weeks, the official video has more than 690 million views on YouTube, and it's an enduring anthem of Gen X's hairspray-drenched mid-1980s glory days.

Jon Bon Jovi, the band's lead singer, initially didn't care for the song and had to be convinced of its merits by guitarist Richie Sambora. Thankfully the band's most celebrated hit was saved. "I always look at songs as houses," Sambora says on the phone from Laguna Beach, Calif. "And *Livin' on a Prayer* was a mansion."

The real estate comparison is apt. Earlier this year, Sambora, who co-wrote the song, sold his share of it and many of his other prized assets to Hipgnosis Songs Fund Ltd., an investment vehicle publicly traded in London. The fund works a little bit like a real estate investment trust, which holds a portfolio of property. Similarly, Hipgnosis, launched in 2018, allows billion-dollar pension funds and mom and pop investors access to royalty streams and intellectual property from a selection of tunes. Its portfolio includes rights to songs made famous by artists as diverse as Adele, the Eurythmics, and Al Green. The fund just raised £236 million ($297 million) in a share sale to help pay for further acquisitions.

Hipgnosis, named for a now-defunct design group that made iconic album covers, is run by Merck Mercuriadis, who used to manage artists such as Elton John, Beyoncé, and Iron Maiden. The stock is up more than 9% this year, making it a rare bright spot on the London Stock Exchange, where many companies have been roiled by the spread of coronavirus and subsequent lockdowns.

In fact, lockdowns have brought about new opportunities for those in the business of buying songs, with artists looking for alternative ways to get cash as the money they might have made from live shows vanishes. "There's no question that our pipeline, which was already pretty massive, has grown during the course of the pandemic," says Mercuriadis. "A lot of artists are going to not be able to tour for the next couple of years."

With Hipgnosis, Mercuriadis is attempting to leverage his experience in the music business to match two seemingly disparate worlds: that of songwriters and artists eager to earn cash from their music and that of investors—big or small—hungry for yield as bond returns dwindle and virus-hit companies cancel dividends. The market is attracting a growing number of players. Providence Equity Partners and Warner Music started the $650 million Tempo Music Investments fund at the end of last year. Primary Wave Music Publishing LLC has raised $1 billion for two intellectual-property funds in the past four years and is preparing soon to launch a third, significantly larger fund, according to a person familiar with the matter.

The flurry of activity over the past five years reflects a change in fortunes for music rights as an asset class. From 2000 through 2015, revenue from music royalties seemed to be in an irreversible slide. The total money generated by music royalties in the U.S. in 2015 was less than half what was earned in 1999, according to the Recording Industry Association of America.

The first blow to sales came from Napster, BitTorrent, and other file-sharing platforms. By the time the industry cracked down on file sharing, consumers had lost the habit of buying expensive CDs. "That had a big effect on investors," says David Pullman, who's best known for turning David Bowie's music royalty flows into "Bowie bonds" in 1997. "At that same time, the entire securitization market shut down," he says, referring to the financial crisis of 2008.

The slump has been reversed in recent years as the industry learned to make money from streaming. Platforms such as Spotify and Apple Music offer consumers an inexpensive way to listen to their favorite songs—either through a subscription or by sitting through some ads—coupled with an unprecedented level of choice. In 2019 music streaming accounted for more than half the revenue recorded by the RIAA, compared with less than 12% five years earlier. "It has picked up the record industry and literally saved it," says Nina Matsuura, head of New York-based Massarsky Consulting Inc.'s valuation practice. While the business hasn't returned to levels seen around the turn of the century, "we are on a trajectory to get back to that place relatively soon."

The pandemic, while hitting performers' live revenue, hasn't significantly dented streaming numbers. There was an initial slowdown when commuting habits were interrupted, but streaming has recovered in the months since, according to funds and industry watchers. Spotify Technology SA, the world's largest streaming audio service, added 15 million monthly active users in the first three months of the year, according to its latest trading update.

Hipgnosis saw its streaming revenue rise in the first quarter, making up for losses on what it earns when songs are performed live. "In a recession, we don't stop listening to music," says Paul Flood, a ▶

▼ Revenue generated by recorded music, U.S.

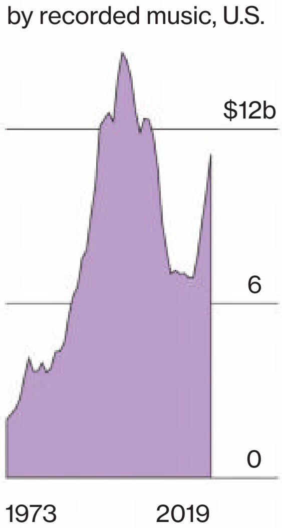


PHOTO: TIME LIFE PICTURES/DMI/THE LIFE PICTURE COLLECTION/GETTY IMAGES. DATA: RECORDING INDUSTRY ASSOCIATION OF AMERICA; MASSARSKY CONSULTING INC.

◀ fund manager at Newton Investment Management Ltd., who counts Hipgnosis as one of his top investments. "You might listen to a little bit of Leonard Cohen or something a bit more depressing when you lose your job, but you still listen to music."

Although streaming revenue may be an attractive opportunity for investors, it's been no panacea for artists, who often struggle to make ends meet. The majority of streaming platforms pay only fractions of a cent for a single play. The fact that money managers are swooping in to buy has its pros and cons, says Crispin Hunt, chair of Ivors Academy, which represents the interests of songwriters and composers in the U.K. While funds could be a powerful force in showing that songs have real value, the organization doesn't agree in principle with music writers selling their art.

"Hopefully the investors getting involved in the value of the song and the long-term return that they can hope to get will help drive value back into the song," Hunt says. But once it becomes clear that music is valuable again, he adds, "I think people will be very reluctant to sell their rights, because they know it's either 100 grand as a pension or 10 grand in the pocket."

There's a complicated, often unhappy relationship between those who create their music and those who own it. Artists from the Beatles to Taylor Swift to Prince have all fought to own more of their rights or have protested their ownership by others. Bowie, when he issued his bonds with the help of Pullman in the '90s, used much of the money he made to buy back his own work from a former manager.

Along with the financial considerations, artists are often keen that their music not be used in a way they object to, but selling the rights also means the new owner can decide on a song's use. "I don't ever want there to be negative emotion about having made the sale," Mercuriadis says. Even after the rights are sold, he makes sure "that the artist knows what's happening so that they're not blindsided on a Friday night if they hear an interpolation of their song, or a new cover version, or whatever the case may be."

Even for some of the most successful writers, there's an appeal to realizing a return now on assets that will have to be managed for decades to come. "What are you gonna do, give them to your kids? And they don't know what to do with it," Sambora says. "I probably won't exist that many years, but the songs will continue." *—Lucca De Paoli, with Vernon Silver*

THE BOTTOM LINE Investors are turning to music rights as another asset from which they can earn income. Artists who aren't able to make money touring now are motivated to sell.

The Disruptive Dutchman Set To Shake Up Swiss Banking

● Ralph Hamers turned ING into a digital leader. Can he do the same at safe-and-steady UBS?

The headquarters of UBS Group AG sits on Zurich's toniest shopping street flanked by the likes of Chanel and Prada. The century-old stone colossus is fronted with pillars that evoke the Parthenon, the floors are marble, the walls are oak, and executives can use a special side entrance and elevator. Everything about the place projects an image of quiet wealth, the gravity of serious people with serious money, and above all discretion in their efforts to preserve fortunes for generations.

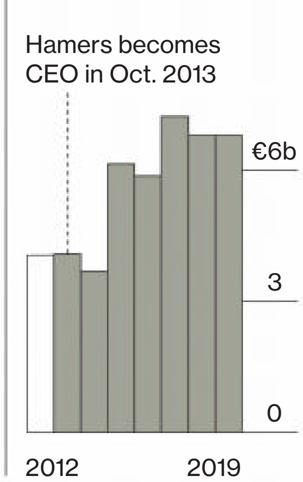
The bank's incoming boss in January inaugurated a new headquarters at his old employer, ING Groep NV, that's almost entirely transparent—a metaphor for what that bank says is an open and informal culture. The building sits in a gritty corner of Amsterdam near shops such as H&M and KFC, floor-to-ceiling windows offer views deep inside, and board members must climb a public staircase to reach their meeting room, which is visible to any visitor.

The building was the brainchild of Ralph Hamers, a 54-year-old Dutchman who ran ING for seven years until June 30. When UBS in February said it had selected Hamers as its chief executive officer, the choice surprised the finance world. His expertise—mass-market banking for the Digital Age, has little to do with UBS's specialty: wealth management for rich people accustomed to personalized service with scant interest in banking via apps.

Hamers is credited with leading ING's digital transformation, adding millions of clients across Europe who use phones to tap into mortgages, insurance, and savings accounts, with no paper forms or office visits. On his watch, pretax profit jumped about 65%, to €6.8 billion ($7.8 billion) in 2019. "We saw customers moving online and the rise of the mobile phone," Hamers said in a video posted by ING upon his departure. "The story was all built around: OK, guys, if these are the trends, we've got to become the bank of the future."

Hamers, who will take over UBS in November, joins as the Swiss giant struggles with rising payroll and costs, friction among executives, staff grumbling about disjointed digital initiatives, and of course the unknown fallout from the coronavirus

▼ ING's profits before tax



pandemic. Like the rest of the industry, UBS has tried to cut expenses and boost revenue as passive investing eats into management fees and negative interest rates upend the business of deposits and lending. Since the financial crisis, UBS has scaled back its investment bank, which had lost ground to American giants, and focused instead on serving millionaires and billionaires. The wealth arm at UBS now manages $2.3 trillion, but it's still trying to figure out how to make the costly, high-touch business more efficient—and is betting that Hamers's tech-savvy approach can help get it there. "Ralph was one of the first executives at a big bank who saw the importance of IT," says Ali Niknam, founder of online bank Bunq.

Hamers spent nearly three decades at ING and met his current wife there when she was a secretary (not for him). He prefers khakis, sneakers, and open-collar shirts to pinstripes, and as CEO he continued to manage a handful of relationships with midsize companies. He likened ING to a tech startup, taking teams of executives on repeated field trips to Silicon Valley and seeking to nurture a creative culture, with yoga classes and wellness programs in the office. He wanted the new headquarters to be a physical manifestation of that style. "We intentionally didn't build a marble castle like other banks," says Coen van Oostrom, CEO at Edge, the developer of the building.

Yet in the Netherlands, Hamers is best known for the size of his paycheck and for a €775 million fine the bank paid to settle a money laundering case. In March 2018 the supervisory board proposed boosting his salary by about half, to €3 million a year—still relatively modest by global banking standards—but withdrew the offer following public outcry. Six months later the public prosecutor imposed the fine, saying the bank had put "profits before compliance," at least in part because top management set the wrong tone. Pay likely won't be an issue at UBS, as his new salary could make the raise he sought at ING look like peanuts. While the Swiss bank hasn't disclosed Hamers's compensation, outgoing CEO Sergio Ermotti is one of Europe's highest-paid bankers, earning more than $12 million last year.

When Hamers gets to Zurich, he'll need to deliver cost-cutting that goes beyond layoffs, automation, and combining offices, and he'll have to oversee the appeal next year of a €4.5 billion fine imposed by French prosecutors for allegedly helping clients evade taxes. On the plus side, Hamers will benefit from tech changes that helped UBS weather the coronavirus, as clients and workers alike have deemed the company's work-from-home program a success. In the past two years, UBS has closed more than 70% of its external servicing centers, struck a partnership with Microsoft Corp. to move some services onto cloud platforms, and brought outsourced technology roles in-house.

In the wealth division, UBS is focusing on top clients while those on the lower rungs—a few million dollars in assets—are increasingly relegated to call centers. There's debate within UBS about the wisdom of these moves. Opponents say that while digital services may work at a place such as ING, even the less-than-hyperrich expect to be able to dial their personal banker at any hour. In Asia, though, UBS has successfully introduced services via WeChat.

What's clear is that any UBS apps will be more complex than those Hamers is accustomed to. The typical UBS client banks in various currencies, owns multiple businesses and properties, and needs to be vigilant about tax laws. The key to wealth management is personalization, and delivering that at scale is critical, says Anna Zakrzewski, a partner at Boston Consulting Group. "An app is useless if you don't create the user experience, if you are not able to really react to clients' preferences," she says.

The investment bank poses the thorniest problem. Hamers has said investment banking makes little sense for European lenders, and the unit has been hit hard by cost-cutting. At ING, Hamers kept some investment banking in the Netherlands, but he sold or merged much of the business. If he does something similar at UBS, tailoring the division to the needs of the wealthy, it would be straight from his playbook: Sacrifice existing operations for new ideas with a greater potential for profit. "I am a believer in disrupting yourself before somebody else does it," Hamers said when he started as CEO at ING in 2013. "I will not shy away from a bit of cannibalization if I feel it will make us grow." —*Marion Halftermeyer and Ruben Munsterman*

THE BOTTOM LINE UBS manages $2.3 trillion, but it's struggling to make its costly, high-touch business more efficient and is betting the tech-savvy Hamers can get it there.

● Hamers

PHOTO: WALTER BIERI/EPA-EFE-SHUTTERSTOCK. ILLUSTRATION BY JINHWA JANG. DATA: ING

Bypassed by The Rescue

Not much of Washington's $2 trillion has reached Cleveland's predominantly Black neighborhoods

Everywhere Miriam Scott looks, she sees an unrelenting crisis closing in on her church and her flock.

Her First Love Outreach Ministries has been regularly handing out 15,000 to 20,000 pounds of food at its Saturday distributions, just shy of what it once would have done in an entire year. She's counseled members of her congregation on Cleveland's impoverished East Side whose relatives have been struck down by Covid-19 and those who've lost jobs and are struggling to pay rent. She's worried she's falling out of touch with the parade of vulnerable men who head straight from prison to the homeless shelter and used to fill her pews for Sunday services now held on Facebook. She's not quite sure how she's going to pay for the new boiler and roof her church needs. Or the past-due electric bill. Every time she flicks the light switch, she says a little prayer that there will be light.

What Pastor Scott worries about most, though, is that this pandemic is going to take away the church she and her husband, Robert, have spent more than a decade building between shifts as corrections officers. And, more important, that losing the church will leave those who rely on it searching for a new spiritual home as the nation deals with its own epochal predicaments.

In a pandemic that's wreaked widespread economic havoc, Cleveland has been among the hardest-hit cities in the U.S. Its unemployment rate peaked at 23.1% in April, after one-fifth of its labor force, mostly lower-income service workers, lost their jobs in a matter of weeks. Scott's accumulating emergencies represent the

Edited by
Cristina Lindblad

PHOTOGRAPH BY DA'SHAUNAE MARISA FOR BLOOMBERG BUSINESSWEEK. DATA: U.S. CENSUS BUREAU, BLOOMBERG ANALYSIS OF SMALL BUSINESS ADMINISTRATION DATA AS OF JUNE 30 all-too-easily-forgotten collateral damage. A tiny church serving a vulnerable corner of American society is having a life-or-death moment that will never show up in the data. "I'm literally on the last thousand dollars in the bank," Scott says one morning in June, her eyes tearing up as she sits among plastic bags full of food ready for distribution. They're piled into the pews where people once sat. Every time she goes looking for help, "all the doors are shut."

There's no doubt that the $2 trillion Coronavirus Aid, Relief, and Economic Security Act Congress passed in March has saved the economy from sliding into a depression and helped millions of families weather the initial plunge into lockdown. Its $1,200 stimulus checks, enhanced unemployment benefits, and flood of money for small businesses, along with the billions of dollars the Federal Reserve has pumped into the financial markets, demonstrate that the American policy elite is determined not to repeat the mistakes of the last crisis. Concerns about deficits, debt, and inflation have been set aside. Everyone has rallied around a whatever-it-takes approach that, though focused on businesses and markets, has included social programs that set new benchmarks for economic impact.

And at a time when the U.S. is engaged in another conversation about its foundational racial inequities, the rescue is amplifying those imbalances in places such as Cleveland, where half the population is Black, and fueling the anger of a new generation in communities too used to being left behind. "I'm not going to play my people for a fool," says Stephen Rowan, pastor of Bethany Baptist Church, pointing to what he sees as a pattern: Wealthy institutions such as the nearby Cleveland Clinic receive $200 million in Cares Act help, while increasingly frustrated members of his congregation miss out. "There comes a point in time when I cannot justify or say to them that 'God will make a way' despite what they are seeing right in front of their face."

The coronavirus has ravaged Cleveland's Black communities. Black patients account for 61% of the city's 3,777 identified cases. White ones make up just 16%. The virus has also reinforced the long-standing, gaping economic disparities between the largely Black neighborhoods east of the Cuyahoga River and the predominantly White ones to its west. At $21,769, the median income of a Black household in the city in 2018 was about half the $40,485 of a White one. The legacies of decades of redlining and other discriminatory lending policies are plain to see. Roughly one-third of Black households own their homes; three-quarters of White ones do.

Data released by the federal government on the Cares Act's Paycheck Protection Program underscore these inequities. In the 44102 ZIP code between Cleveland's downtown and the affluent suburb of Lakewood, where 47% of the population is White, small businesses received 343 loans of less than $150,000 each, for a total of $11.9 million, or $260 per person. In the 44104 ZIP code, home to Scott's church and a population that's 96% Black, small businesses received just 83 loans of less than $150,000 each, for a total of $2.8 million, the equivalent of $140 for each resident. The disparity is similar for loans greater than $150,000: as much as $60 million in 44102, compared with $27.4 million in 44104.

For those who live on the East Side, it's a repeat of an economic pattern that last manifested itself in the foreclosures that accompanied the financial crisis more than a decade ago, but one with 400-year-old roots in slavery.

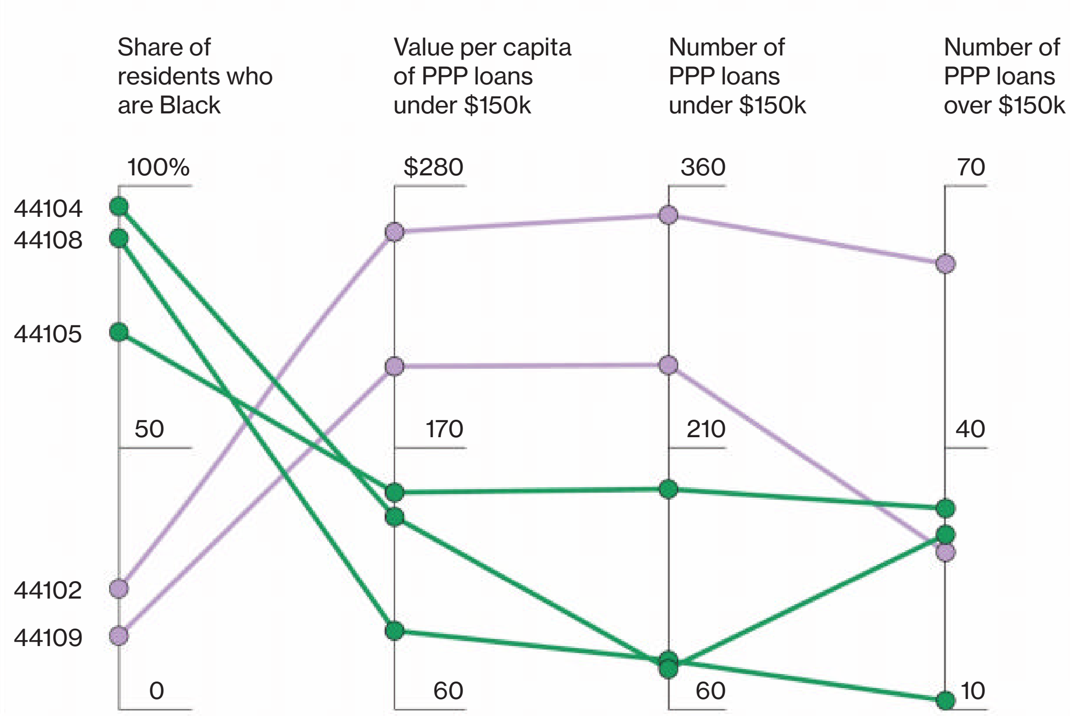
Tony Jones, who owns T.J.'s Barber Shop, a three-chair affair decorated with photographs of Muhammad Ali, Barack Obama, and members of Jones's family, thrusts his phone forward and says, "Have you got six minutes? Watch this. Then we can talk."

He's loaded up a video in which author Kimberly Jones (no relation) likens the economic travails of Black Americans to a centuries-old Monopoly game in which White players get a pile of cash to start and Black ones get nothing. Worse, whenever a Black player builds up a little wealth, the White players take it away. The protests that hit ▶

◀ Scott

Follow the Money

Paycheck Protection Program loans in select Cleveland ZIP codes



◀ Cleveland and other cities after George Floyd's death, the video argues, are the equivalent of Black Americans upending the board in anger. "See," the barber says. "It's all about economics."

The economics for Jones have only gotten more dismal. He was forced to shut his shop in March when Ohio locked down. Since reopening on May 15, he's had a trickle of customers. Some days just two people sign the logbook near the door. Jones never tried to get a PPP loan for himself and his one employee. It seemed too complicated. He filed for unemployment, only to become one of the almost 380,000 Ohioans, about 30% of those applying, who've been deemed ineligible for traditional unemployment benefits since March.

Jones's application for Pandemic Unemployment Assistance, the Cares Act program that expands benefits to self-employed workers, was also denied, because he didn't pass a threshold for weeks worked over the past year. So he's had no choice but to dig into his savings to pay the rent and endure the lost business, absorbing the cost of masks, disinfectant, and other equipment he needs to operate while waiting for customers still too afraid to sit in one of his light-green chairs.

His business crisis has been amplified by a family one. One of his sons worked with coronavirus patients for a time, and by the end of June had been hospitalized for anxiety attacks. "Every time it feels like we've gained 10 yards, we get pushed back 15," Jones says.

Across East 105th Street from T.J.'s, Rowan's Bethany Baptist Church received a PPP loan that allowed it to keep paying staff. Many in its congregation have been less lucky. Ellwood Clark, a Bethany deacon, applied for a PPP loan for his home maintenance business when the program became available, but his application was kicked back by his bank when the first round of funds quickly ran out. He was told to wait for a call that never came. "My bank didn't call me, and I'm quite sure the big companies got calls," says Clark, who, rather than go on unemployment, has cobbled together what work he can.

Even with its PPP funding, Bethany Baptist has been forced to scale back. Kingdom Korner, a storefront next to the barbershop where the church provides counseling and other services to community members, has been closed since March. Its weekly legal aid clinics are on hiatus for now, which means a popular program to help local residents expunge criminal records is on hold.

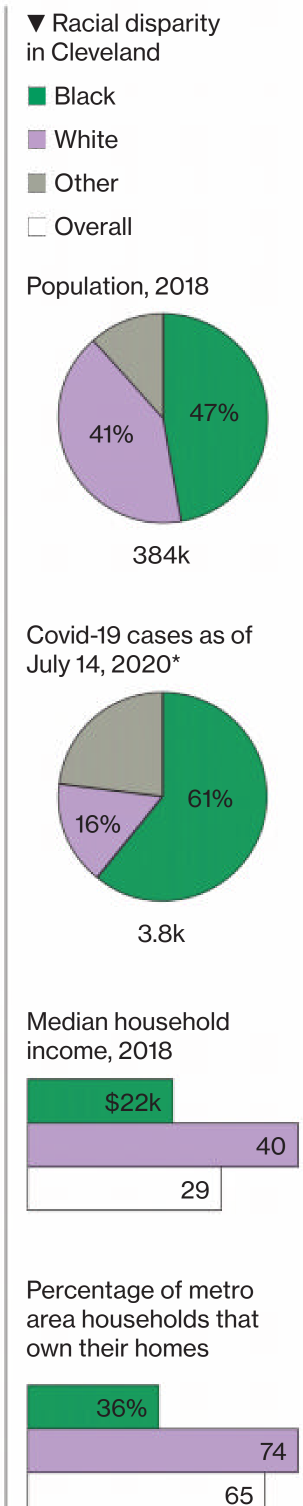
It's a key step for many job seekers in a community where too many men have spent time in prison, says Adrianne Thomas, Kingdom Korner's director. In a tight labor market, a felon has a chance of finding a job; in a world of double-digit unemployment, a criminal record is an easy excuse for an employer to choose someone else. That matters in a place like Cleveland, which has one of the highest incarceration rates in the country, according to the Prison Policy Initiative, an advocacy group. "People say they hire felons," Thomas says. "But that's only a small number of people."

The issue of criminal records has had other repercussions. The Small Business Administration, which administers the PPP program, initially barred applicants with criminal convictions within the past five years. The rule was changed after Ohio Senator Rob Portman, a Republican, intervened on behalf of a constituent with a conviction who ran a small business that hired other workers with criminal pasts. The criminal record exclusion was emblematic of the ways in which the Cares Act, assembled hastily over 10 days of bipartisan negotiations, inadvertently discriminated against the Black community, Portman says: "We just didn't think through all this stuff, because it's hard to."

Portman and Senator Sherrod Brown, Ohio's senior Democrat in Washington and a resident of Cleveland's East Side, insist that focusing on the legislation's shortcomings misses the bigger story of a depression averted. Plus, Congress has an opportunity to plug some of the holes as it debates the next phase of the rescue. Brown is pushing for an extension of the $600-a-week boost in unemployment benefits beyond its expiration at the end of July. Portman wants a $450-a-week back-to-work bonus to replace it, to counter the disincentive some small-business owners say that enhanced unemployment benefits create.

Both Brown and Portman want to see more targeted help for Black-owned businesses in the next stimulus bill. The pandemic, Brown says, "revealed all the racial disparities in our country, in health care and housing and jobs and the economy overall, in education. And Congress has fallen short."

In the eyes of Blaine Griffin, a city councilman who represents some of Cleveland's poorest neighborhoods, Covid-19 is just the latest manifestation of the long-running public health crisis that is racism. Griffin was the architect of a vote in June declaring just that. The move was symbolic. But the 49-year-old former community activist, who once ran a program to reintegrate violent offenders coming out of prison into their communities, argues that to fix a problem you have to diagnose it first. Plus there's little doubt the economics of racism have health consequences for his constituents, who've long battled what Griffin calls pandemics of



PHOTOGRAPH BY DA'SHAUNAE MARISA FOR BLOOMBERG BUSINESSWEEK. *INCLUDES BOTH PROBABLE AND CONFIRMED CASES. OTHER INCLUDES CASES WHERE RACE IS UNKNOWN. DATA: U.S. CENSUS BUREAU, CLEVELAND DEPARTMENT OF PUBLIC HEALTH crime, lead poisoning, and chronic unemployment.

A child born near the corner of 110th and Woodland in Griffin's ward has a life expectancy more than two decades shorter than one born in an affluent neighborhood 2 miles away. "This right here is the epicenter of all of those pandemics coming together," Griffin says, waving his arms across the intersection one morning in June.

And that's unlikely to change as a result of any of the rescue efforts coming from Washington, he argues. Stimulus checks and unemployment benefits have helped pay off his constituents' bills. Some small businesses have received loans. But no one's trajectory has changed. "The Cares package, in my opinion, has not been friendly to any urban core that I know of in the United States," he says. "And it definitely has not been here in Cleveland."

Bridget Ferguson has a chance to change her own life trajectory, if the virus doesn't ruin things for her. The 28-year-old single mom moved into Griffin's ward in June after more than a year of living in a women's shelter, during which she and her five children shared one room. The move was originally supposed to happen in March but got delayed by the pandemic. The virus also has complicated her job search.

Ferguson has vouchers to cover the rent at the three-bedroom house she found for the next six months, as well as child care. Her small pot of savings was boosted by her $1,200 federal stimulus check and one for the father of one of her children, who'd fallen behind on child support. She has hope, even job leads. "I want to be working," says the culinary school graduate.

But Ferguson also knows she'll have to start paying $900 a month in rent in six months, and she's looking for work in a pandemic-stricken economy. A job in a kitchen isn't an option in a world where restaurants are closing for good and hotels have skeleton staffs. More important, she needs to find day care—not an easy proposition when public health guidelines are forcing centers to cut capacity.

Scott, the First Love pastor, will be the first to tell you how hard it is to change trajectories. Even in normal times, her church had a tenuous existence. A 10-minute drive from downtown, it sits in an area long dubbed the city's "Forgotten Triangle." More than half the residents in the church's ZIP code, and three-quarters of its children, live below the U.S. poverty line.

When Scott and her husband bought the 120-year-old building for $15,000 eight years ago, they had to call the city to tow away abandoned cars. Then they had to coax visitors down a dead-end street that housed little else. Until

▲ Jones

the pandemic, the church eked out an existence on $300 to $400 in weekly tithes, supplemented occasionally by Scott and her husband.

When Ohio ordered a lockdown and Sunday services stopped, so did the donations. But the bills didn't. The boiler died in the spring. The refrigerator conked out a few weeks back, and the fragile freezer next to it is straining. Scott needs $18,000 to fix a roof with gaping holes. Not to mention those unpaid electric and gas bills.

She also started seeing demand for food surge and organized weekly distributions of milk, cheese, and produce she managed to get through the Cleveland Food Bank. When the fridge died the night before one distribution, Scott and her volunteers laid the milk and eggs out on the pews and maxed out the air conditioner to keep the perishables cool.

Scott and her husband each received $1,200 stimulus payments that have covered such church costs as renting a van to pick up food donations and paying for cleaning supplies and masks. She thought she might be eligible for a federal small-business loan for faith-based institutions. But when she looked up the criteria online, she found the church didn't qualify because no one at First Love is paid. She's explored other grants and loans but has found nothing.

The idea of reopening for in-person services terrifies her. She's also confronted with the diverging paths before her every time she shows up to check on her church after her overnight shift at one of the county jails, where fear of a Covid-19 outbreak has added to her angst.

In the abandoned white clapboard church next door to First Love, she sees a terrifying omen. "You take out a church like this that does nothing but outreach in an impoverished neighborhood, and it is like cutting off someone's leg," Scott says. "I do believe that because of what we do, we'll make it. But we do need help." *—Shawn Donnan, with Jason Grotto, Wei Lu, and Laura Davison*

"The Cares package, in my opinion, has not been friendly to any urban core that I know of in the United States"

THE BOTTOM LINE Unequal access to programs created by the $2 trillion Cares Act may further widen inequality in Cleveland, where nearly half of the population is Black.

A Scare for Foreign Students

● The U.S. backed down from a controversial policy, but students are still feeling the chill

It wasn't the Trump administration's first attempt to deter foreign students, but it could have been the most disruptive. The U.S. Immigration and Customs Enforcement agency sought to bar visas for international students at colleges that offer only virtual instruction. Students on existing visas would have had to transfer to a school that offers at least some in-person teaching if they wanted to remain in the U.S., or return home. The rules came as colleges and universities weighed how to reopen in the fall amid the Covid-19 pandemic, and immediately provoked anger and a flurry of lawsuits. At a July 14 hearing in Boston, U.S. District Judge Allison Burroughs announced that the U.S. had agreed to rescind them.

ICE's guidance, issued on July 6, threatened to upend the lives of students who feared deportation if their college were to pivot to online-only instruction, as schools first did in March to curb the spread of the novel coronavirus. Incoming students who need a new visa already face another hurdle: waiting for interview appointments at U.S. embassies shuttered by Covid-19. (The State Department announced it was restarting some routine visa services on July 15, depending on location.)

The policy swiftly brought together a broad coalition of colleges, states, and businesses that

Edited by
Amanda Kolson Hurley

opposed it. "The overwhelming negative reaction to this proposal in a very short period of time shows that the administration really struck a nerve with this," says Terry Hartle, senior vice president of government and public affairs for the American Council on Education, which represents more than 1,700 colleges and trade groups. "It's unprecedented for that many colleges and universities to file suit against the federal government."

Harvard and the Massachusetts Institute of Technology were the first universities to seek a court order to stop the U.S. from enforcing the policy. Harvard President Lawrence Bacow said in a statement that it was coercive: "It appears that it was designed purposefully to place pressure on colleges and universities to open their on-campus classrooms for in-person instruction this fall, without regard to concerns for the health and safety of students, instructors, and others." The Trump administration defended the rules in a court filing, claiming Harvard and MIT couldn't persuasively argue "there is a correlation between physical presence in the United States and the quality of education" if all students are learning online.

While the U.S. has long welcomed students from abroad, the rise of Donald Trump began to change that in 2016. His anti-immigrant rhetoric and policies likely persuaded some people considering U.S. schools to take their cash and talents elsewhere. By the 2018-19 school year, enrollment from abroad had stalled at 1.1 million, a gain of less than 1% from the previous year, the lowest in a decade, according to the Institute of International Education. The administration has previously tried to make it easier for foreign students to rack up "unlawful presence" violations and considered ending a popular work program for international students.

Takeharu Imai, a junior at Keio University in Tokyo who studies economics and political science, weighed graduate school in the U.S. but became wary when the visa changes were announced. "If my legal status can't be assured while I'm studying in the U.S., then I would find it really difficult to complete an education there," Imai says.

While the government's reversal is good for students and schools, uncertainty about how welcome foreign students are in the U.S. will linger. "The repeated attacks on international students certainly don't make the United States as desirable a destination as we would want," Hartle says.

Prospective students may turn to more welcoming countries such as Australia, Canada, and the U.K., says Alan Caniglia, acting vice president for finance and administration at Franklin & Marshall College. About 20% of the undergraduate population at the school in Lancaster, Pa., is from overseas. Referring to the latest visa obstacles, Caniglia asks: "What is the message being sent not only to current students but the future cohorts of students?"

Alienating global students would be costly—for schools and the larger economy. Universities have long relied on revenue from overseas students, who often pay full tuition, subsidizing the cost of higher education for others. Institutions are already under strain, bearing unforeseen expenses and loss of revenue associated with the pandemic. They're anticipating fewer domestic students enrolling in the fall, and as a recession sets in, many public universities are expecting budget cuts. International students contributed $44.7 billion to the U.S. economy in 2018, the Institute of International Education found.

Daniel Diermeier, a political scientist and chancellor of Vanderbilt University in Nashville, says the benefits of recruiting from abroad go beyond finances even if an imminent threat is gone. He speaks from experience, having arrived in the U.S. in 1988 as a graduate student from Germany. "You take the best grad students and put them in the best labs with the best faculty, and magic can happen," he says. "It's important for the university, but it is just as important for the country." Graduate students in particular are key to U.S. universities' research. "They have fueled the innovation economy in a whole variety of different areas," he says. "Cutting yourself off from that supply is very shortsighted."

Almost a quarter of the country's billion-dollar startups had a founder who first came to the U.S. as an international student, according to a 2018 study by the National Foundation for American Policy. A loss of talent because of limits on student and nonimmigrant work visas would hurt the nation's scientific competitiveness, say Miriam Merad, director of the Precision Immunology Institute at the Icahn School of Medicine at Mount Sinai in New York, and Brian Brown, the institute's associate director.

"Having these scientists and students here—many of them on the visas the administration wants to suspend—has enabled America to be the leading nation in biomedical research, spurring the development of numerous life-changing and life-saving medicines," they wrote in a letter circulating in the scientific community that has hundreds of signatories.

Almost 60 schools, including Princeton, Stanford, Vanderbilt, and Yale, filed a brief supporting Harvard and MIT's lawsuit. California filed its own suit, saying no state has more international students—almost 185,000 as of January. Its suit claimed the "attempt at a policy change to force in-person learning in the middle of a pandemic is absurd and the essence of arbitrary and capricious conduct." ▶


● Diermeier

▼ International students in the U.S. at close of the academic year

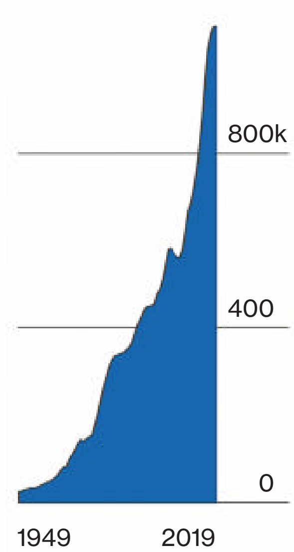


ILLUSTRATION BY INKEE WANG. DIERMEIER: ROBERT KOZLOFF/UNIVERSITY OF CHICAGO. DATA: NATIONAL CENTER FOR EDUCATION STATISTICS, IIE

◀ Some students already in the U.S. say they aren't deterred. Tiffany Gu, 21, from Hong Kong, is a rising senior studying chemistry at Haverford College in Pennsylvania. Despite the uncertainty, she intends to continue studying there to get the research experience she'll need if she pursues a doctorate in the U.S. "It has never been easy for international students to study here," she says. "There's always a lot of restrictions from the start."

Diermeier says it's not too late for the U.S. to retain its advantage in the eyes of international students. "The sense of possibility that so many young people have about the United States is still alive," he says. "It needs to be fostered. It's very important that these things are not destroyed and inhibited." *—Janet Lorin, with Yifan Feng and Nick Wadhams*

THE BOTTOM LINE The U.S. walked back new restrictions on international students, but America's appeal to foreign talent may be further diminished.

Australia's Got a Beef With China

● Its new stance toward Beijing puts national values and strategic concerns over trade ties

As he took the podium to address Australia's Parliament in November 2014, China's President Xi Jinping lauded a relationship at an all-time high. "We are not burdened by historical problems between us, nor do we have any conflict of fundamental interests," Xi told lawmakers. He vowed the nations would be "harmonious neighbors who stick together in both good times and bad times."

Five years later, the bad times have come—and the two nations are poles apart, despite their A$235 billion ($165 billion) trade relationship. A downturn in their relations tipped into a crisis in April, when Australia, a strong ally of the U.S., led international calls for China to allow investigators into Wuhan to probe the origins of the novel coronavirus, a move that badly bruised China's pride.

Now Chinese ministers are refusing to answer the phone calls of their counterparts Down Under. China is using its embassy in Canberra and state propaganda arms to accuse Australia of being a puppet of the U.S. and of not doing enough to halt racist attacks against Chinese students and tourists in Australia. It's placed crippling tariffs on Australia's barley exports and halted beef imports from four large meat plants. In April, China's ambassador to Australia, Cheng Jingye, said Chinese consumers might choose to boycott the nation's exports because of strained relations.

China's "continued coercion is partly about deterring Australia from doing future actions contrary to China's interests and partly about deterring third parties," says Darren Lim, a senior lecturer in international relations and Asia at Australian National University.

Meanwhile, the U.S. is spurning some traditional alliances under President Trump's "America First" doctrine, and U.S. leaders are distracted by the pandemic and the upcoming presidential election. So Australian Prime Minister Scott Morrison is attempting to band what he calls "like-minded" democracies—such as Japan, India, and European countries—into multilateral groupings that can act as a counter to China's expansion.

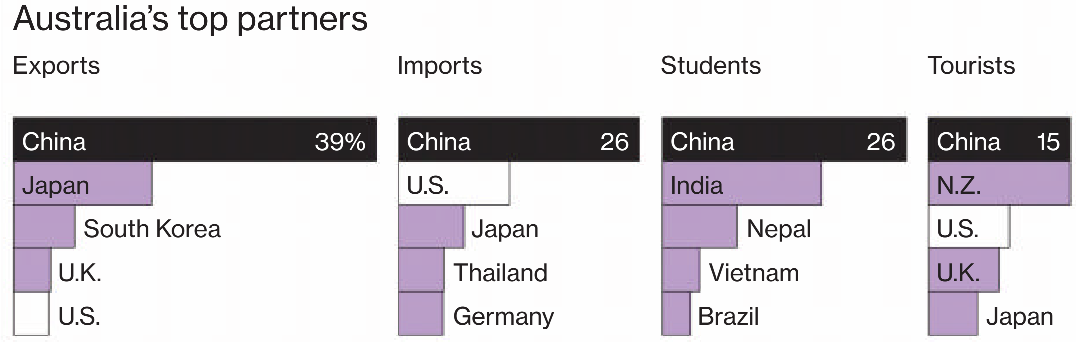
Morrison "has realized the time has come for Australia's national interests and values to be best served by allowing strategic concerns to override trade considerations," says Malcolm Davis, a former defense adviser to the government and now a senior analyst at the Australian Strategic Policy Institute in Canberra. "He knows Beijing will retaliate, but bending the knee to it isn't an option."

"He knows Beijing will retaliate, but bending the knee to it isn't an option"

The Australian business community is aghast at the tit-for-tat recriminations. Australia is more dependent on China than is any other developed economy in the world. But most of the public agrees with Morrison. The annual Lowy Institute Poll, which tracks Australian views on foreign policy, last month showed 23% of Australians trust China to act responsibly in the world, down from 52% two years ago. Confidence in Xi's ability to handle global affairs has almost halved since 2018, to 22%.

The Australian government is readjusting policy and is prepared to harden its stance against

Australia's top partners



Beijing on a number of fronts: China's handling of the pandemic in its early stages, apparent breaches of its "One Country, Two Systems" pledge for Hong Kong, and further militarization of the South China Sea.

During the past couple of months, Australia has announced it will ramp up military spending and concentrate its defenses to protect its vast sea border. And it's warned that government, health, and education services and various industries were being targeted by a "sophisticated" actor conducting state-based cyberattacks. Some Australian academics have said this actor was likely China.

Last week, Australia suspended its extradition treaty with Hong Kong in response to Beijing's sweeping new security law for the territory and warned Australian citizens they risk "arbitrary" arrest in China.

The rise of China and its assertive foreign policy are matters of increasing concern to Australian leaders, with the building of military bases on disputed islands in the South China Sea and U.S.-China relations becoming heated. "China does gain a lot from commerce with Australia, and disrupting it would impose major costs on the Chinese economy," Lim says. "But if the political imperative to be aggressive is there, then that economic logic may get blown away."

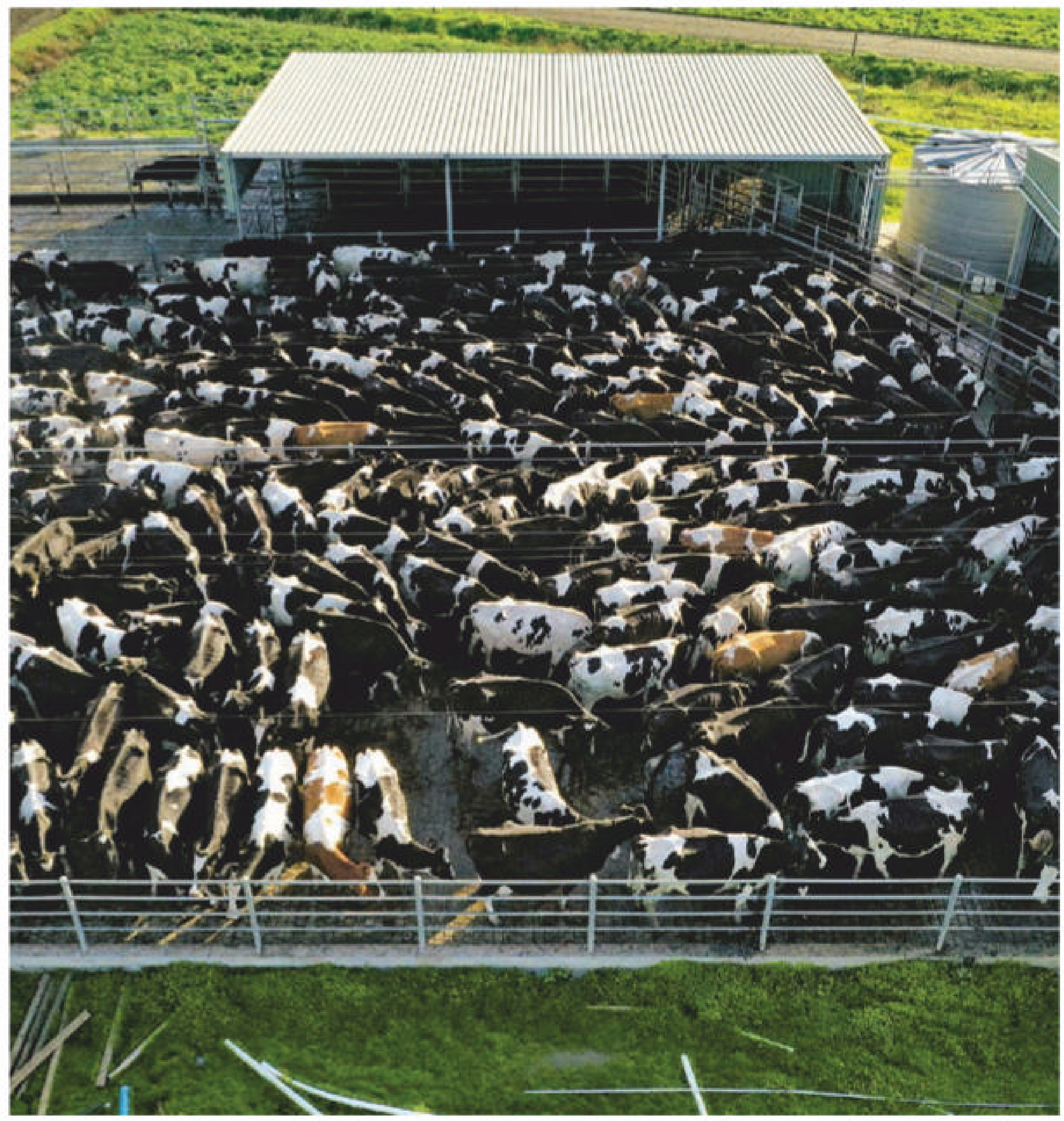
Australia's decision in 2017 not to ratify an extradition treaty with China can be seen as the start of the present decline; it was certainly viewed as an affront by the Chinese. Since then, political and diplomatic ties have deteriorated, especially after Australia's 2018 decision to ban Huawei Technologies Co. from participating in its 5G network and the passage of anti-foreign-interference laws.

Even so, there has been a steady increase in trade and investment. Australian exports to China have risen every year since 2016, reaching $107 billion in fiscal 2019. That means greater dependence on the Chinese market, which took more than 38% of Australian exports in 2019, up from about 22% a decade before.

More than 90% of respondents in the Lowy poll said they wanted the government to seek other markets for exports. But that task has been complicated by the pandemic—a world hit by recession is less likely to pay more for Australian goods, and that strengthens Beijing's hand.

Australia views the threat of trade retaliation as China following its playbook against nations it squabbles with, as it did in 2017 with South Korea and in 2012 with Japan. As in those cases and others, there's no direct evidence that China is using customs rules or domestic regulations to limit trade and business to punish actions it doesn't like.

Chinese consumers aren't boycotting Australian goods. In fact, beef exports to China have risen so fast this year that they hit the safeguard level at which higher tariffs are imposed two months earlier than in 2019. Although there was speculation in May that China was limiting Australian coal imports as punishment, it now seems China has imposed broader import restrictions to protect domestic miners.



▲ China stopped beef imports from four Australian meat-processing plants in May, a move seen as retaliatory

The boycott threat is mainly psychological and only works if Australia feels vulnerable. But Morrison and his ministers seem to be waiting for China to lower the temperature so a new "settling point" in the relationship can be found.

The Australian government knows the country's relationship with China has changed permanently. "I don't think anyone in the strategic-policy community in Australia really believes this is going to get any better," says Davis of the Australian Strategic Policy Institute. "China is a rising, assertive, would-be hegemon that's seeking to overturn the world order. Australia has now realized it has to do its bit to stop that from happening." *—Jason Scott and James Mayger*

THE BOTTOM LINE Despite their economic ties, Australia is increasingly willing to risk its diplomatic relationship with China to check Beijing's assertive foreign policy.

CARLA GOTTGENS/BLOOMBERG. DATA: UN COMTRADE, AUSTRALIAN DEPARTMENT OF EDUCATION, SKILLS AND EMPLOYMENT; AUSTRALIAN BUREAU OF STATISTICS. DATA IS FOR 2019 EXCEPT STUDENTS (JANUARY TO APRIL 2020)

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Now in the Epidemiology Business

Without uniform guidelines from public health agencies, companies large and small are having to take matters into their own hands

On the last day of February, when health officials in Washington state announced some of the earliest known Covid-19 cases in the U.S., a Microsoft Corp. executive emailed officials at the King County health department to ask for help. Seattle business leaders were meeting the next day, and "they would like someone that can best speak to what businesses should do," wrote Colleen Daly, a senior benefits executive. In a follow-up the next morning, she wrote that companies were "spinning on" questions of whether to cancel events, restrict travel, or send workers home. "Since this is an emotional situation we are seeing businesses struggle to stay grounded," she wrote.

It was an early brush with a problem now vexing companies everywhere: how to understand and respond to a new world of risks that most businesses have never encountered. Executives who've been around for a while have already had to learn how to steer their businesses through terrorist attacks, natural disasters, and financial crises. But no one alive today has ever before had to deal with this species of global calamity. It's forced shutdowns of entire economic sectors, ▶

ILLUSTRATION BY ROSE WONG

Edited by Rick Schine

◀ scrambled supply chains, and—at least in the U.S.—shown no sign of abating.

The chaos is compounded by a kind of fog of war that's made it almost impossible for managers to know where to turn for reliable information. Public health authorities have been caught up in the politicization of crucial questions such as when to impose or lift restrictions. With a lack of clear guidance from the federal government and with states and local governments setting their own sometimes conflicting policies, companies face a bewildering tangle of inconsistent rules and guidelines. And they're forced to figure out how to protect their employees' and customers' health while still attempting to turn a profit.

Some are better equipped to do that than others. At pharmaceutical giant Bristol Myers Squibb Co., David Shepperly oversees the well-being of 30,000 employees spread around the globe. His job as the executive director for occupational health was radically transformed in the aftermath of the January novel coronavirus outbreak in China. He moved quickly to impose quarantine rules and travel restrictions for the company's more than 1,400 employees in the country.

Shepperly, a physician who also has a master's of health sciences degree in biostatistics from Johns Hopkins, mobilized a team of scientists and analysts to monitor data around the globe on new cases, hospital capacity, and local guidance. They developed criteria for which circumstances would trigger escalating levels of restrictions.

They made the call on March 13: More than 250 of Bristol Myers's sites around the world would go into what Shepperly calls the "red phase"—only the most essential manufacturing staff could remain. It was six days before the U.S.'s first statewide stay-at-home order in California.

The timing for reaching the "green" phase of normalcy remains "the big question," Shepperly says. Bristol Myers, which consults with occupational health teams at other leading drugmakers on a weekly basis, lets the data drive its decisions. "Everything we've done to protect our employees is based on the science of Covid," he says.

Many companies don't have an in-house bench of medical experts and data scientists to guide their reopening decisions. They rely on authorities and outside advice to determine what precautions to take—and how to minimize the risk of litigation if workers or customers blame the business for exposing them to the virus. The U.S. Chamber of Commerce and other business groups have lobbied Congress to protect businesses from Covid-19-related lawsuits. The chamber has also called for "uniform guidelines that can be practically implemented" as states reopen.

So far, that hasn't happened. Instead there's a patchwork of federal, state, and local rules that companies must sort out. In early July, for instance, Kansas ordered people to wear masks in public if they can't keep 6 feet apart. Across the border in Missouri, there's no statewide mask rule, but St. Louis requires them. Apple Inc. shut its retail stores in Arizona, the Carolinas, and Florida on June 19 as case counts rose. That was about a week before governors dialed back their reopening plans. AMC Entertainment Holdings Inc. initially said masks would be optional when its movie theaters reopen, but a swift backlash prompted the chain to backtrack.

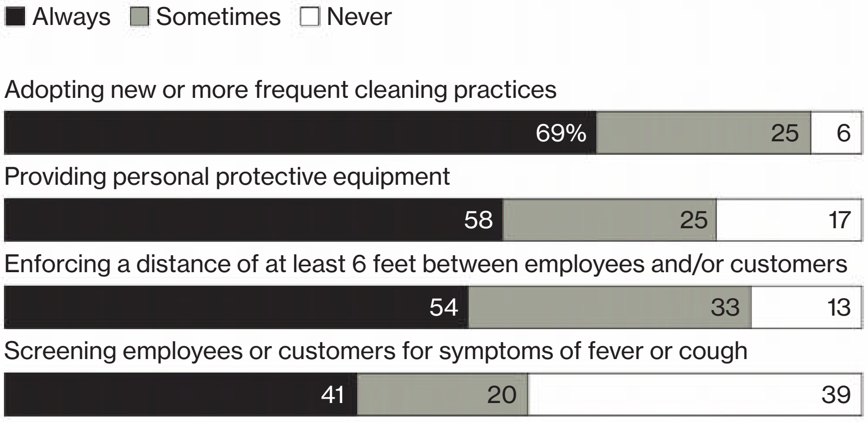
Wary of missteps, companies are turning to consultants and academic experts for guidance. "The appetite for the information is huge," says Mike Van Dyke, an associate professor at the Center for Health, Work & Environment at the Colorado School of Public Health. The center began doing weekly webinars for businesses related to Covid-19 this spring that attracted at least 200 attendees each, compared with the 40 or 50 who typically attended the group's online events before the pandemic.

Businesses are also hiring more hands-on help. Van Dyke, consulting directly with employers, has advised them on such questions as how high plastic barriers should be, whether employees should sit back-to-back, and what kind of changes to the ventilation system might reduce the risk of spreading viral particles. The advice he gives is grounded in science, but few of the interventions have been tested in practice.

Van Dyke did some early work with meatpackers trying to minimize exposure in the absence of clear instructions from regulators. "At that point there was really a big void. There wasn't much guidance out there," he says. While agencies have begun to catch up, employers still want assistance putting official guidelines into practice. "There's a lot of 'You should do this in general,'" he says. "But there's not much 'This is how you do it.'" ——*John Tozzi and Riley Griffin*

Preventive Measures Reported by Workers

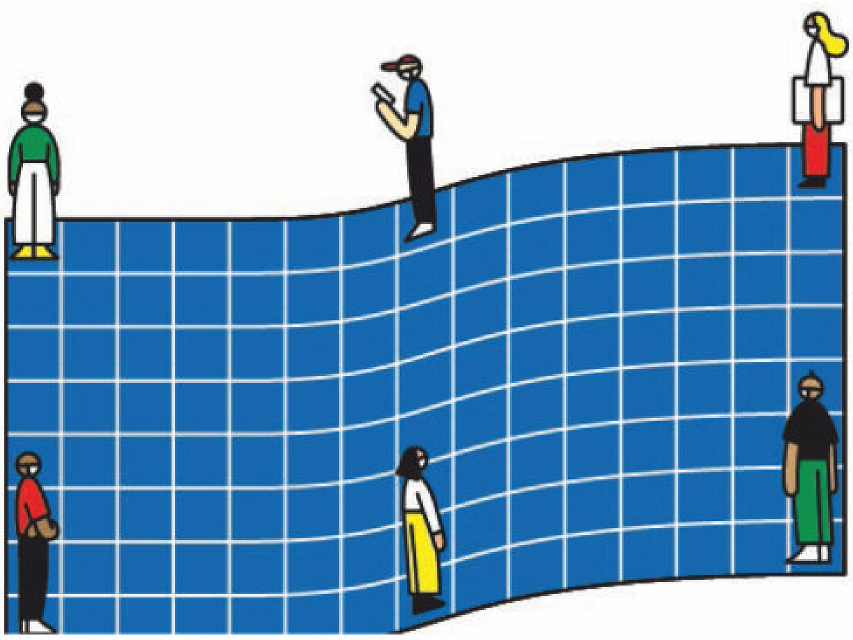
To what extent is your employer currently taking these steps to avoid spreading the coronavirus?



THE BOTTOM LINE Companies are turning to public health experts to get hands-on help as the coronavirus resurges across many parts of the U.S. and the globe.

ILLUSTRATION BY ROSE WONG. DATA: GALLUP PANEL, MAY 25-31. DOES NOT INCLUDE EMPLOYERS WITHOUT ON-SITE WORKERS

Building Safer Spaces



As in past pandemics, the latest scientific thinking will inform how we redesign our physical space

Six feet. As Covid-19 has torn through the world, that distance has come to define daily life. Six feet is how far we stand from other shoppers or the space we try to maintain while catching up with a friend.

It's painfully clear that our world has been constructed for a reality that no longer exists. Crowded subway cars, packed restaurants, and bustling sidewalks all pose a threat every time someone nearby sneezes, talks, or even just breathes.

Eventually, architects and engineers will reconstruct the world around us to take into account the pandemic—and others that may follow. Temporary plexiglass barriers and markings on the floor may give way to designs that favor privacy and small groupings of people to limit the spread of pathogens. "You're going to see a style where things look safe to reassure people," says Aaron Betsky, director of Virginia Tech School of Architecture + Design. "We're going to make things that reassure people that there's not something hiding somewhere that's going to come out and bite them or make them sick."

Betsky suspects we may see a resurgence of the aerodynamic and streamlined design of the 1920s and '30s, a time which brought us, among other things, hospital rooms with rounded corners, making them easier to clean. The reimagining of cities and architecture in the wake of pandemics has been going on for centuries. In the 1800s, after cholera killed tens of thousand of Parisians, Georges-Eugène Haussmann razed overcrowded medieval neighborhoods to make way for the wide avenues and parks we know today.

The trouble is that the science informing our decisions about how to redesign our public spaces is rudimentary at best. Studies in the early 20th century argued that infectious droplets fell within a few feet, in line with the 1-meter distance the World Health Organization recommends as safe today. But a 2003 study of SARS, a coronavirus closely related to the one that causes Covid-19, indicated that droplets can spread farther. It showed that SARS could be transmitted to others as far as 6 feet away from an infected person while traveling on an airplane. The Centers for Disease Control and Prevention recommends maintaining a distance of at least that—or "about two arms' length"—from other people.

The latest thinking is that the disease spreads both via large droplets that fall to the ground and tiny airborne ones. "It's a continuum," says Lydia Bourouiba, an epidemiologist who studies fluid dynamics at MIT, whose recent work demonstrated that "turbulent gas clouds" can carry pathogens 27 feet. She was among 239 scientists who signed an open letter to the WHO urging the organization to consider airborne transmission of Covid-19 in its guidelines. The agency recently updated its advice to say the virus can be airborne in poorly ventilated, indoor spaces.

Variables such as temperature, humidity, and airflow can all affect how effective that 6-foot distance really is. Indoors, without a mask, 6 feet isn't really all that safe, says Gabriel Isaacman-VanWertz, a scientist at Virginia Tech who studies the way particles change in the atmosphere.

It's also not known whether the smaller droplets actually contain enough virus to be infectious. The answer, says Isaacman-VanWertz, is somewhere between "maybe" and "probably."

And so we've begun to rearrange our activities in the world we built before Covid-19. At stores, 6-foot spacing is marked on the floor and many parks have painted white circles on the ground to designate where to sit.

Safety, of course, isn't the only factor in deciding the right amount of social distancing, says Isaacman-VanWertz. We need to be able to maintain some semblance of economic and social activity. It would be hard to do that at 27 feet. Still, "what almost any researcher would agree on," he says, "is that the farther away you can be, the better." —*Kristen V. Brown*

THE BOTTOM LINE The pandemic is likely to kick off a new era of architecture and design that accommodates wider distances between people. That may make us feel safer, but it may also be more alienating.

When Covid Meets Hurricanes

Saline solution, already a fragile commodity, could be imperiled by the onset of storm season

Three years ago, when Hurricane Maria devastated Puerto Rico, it crippled Baxter International Inc.'s ability to manufacture saline solution, an essential hospital supply. With another hurricane season threatening the island, Baxter says it will do better if disaster strikes again, even in the midst of the coronavirus pandemic.

As the Atlantic hurricane season gets under way, the looming confluence of bad weather and a deadly global pandemic has the medical world increasingly on edge. Hospitals rely heavily on saline solution-filled pouches to deliver medications such as antibiotics and painkillers, as well as to hydrate patients. Baxter, which dominates the saline market, makes most of those clear bags in Puerto Rico, drawn there by tax incentives, as are dozens of other drugmakers.

This year, as the pandemic rages in the U.S. and strains hospitals, forecasters expect hurricane season to be much more active than normal. The National Oceanic and Atmospheric Administration predicts as many as six major hurricanes, double the number in an average year.

Lessons learned from Maria have helped Baxter build "a more resilient supply chain," says Lauren Russ, a spokeswoman. The company has invested $1 billion in its manufacturing network and has won clearance from the U.S. Food and Drug Administration to make saline in other countries should the need arise, Russ says. After Hurricane Maria, the FDA allowed Baxter to import saline made in the company's facilities in Australia, Canada, Ireland, and Mexico. In addition, Baxter now immediately ships newly produced saline bags from Puerto Rico to the U.S. mainland rather than holding supplies there. "With those two strategies in place, we're feeling comfortable," says Sam Calabrese, chief pharmacy officer at the Cleveland Clinic, one of the largest hospitals in the country.

Ohio isn't a Covid-19 hot spot like Florida or Texas. Still, some critical medications are in short supply following months of treating Covid-19 patients. The state's pharmacy board granted a waiver that allowed the hospital to make its own versions of some drugs, including the painkillers hydromorphone and fentanyl.

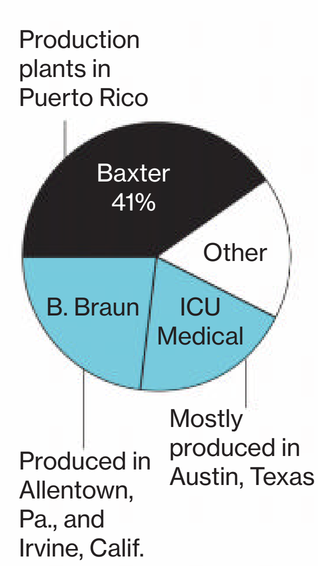
Elsewhere, the virus has stretched the supply chain for drugs needed to care for Covid-19 patients, creating shortages of sedatives, antibiotics, and pain medicine. At the same time, China, a major pharmaceutical producer, curtailed output as the virus spread there.

A similar fate hasn't befallen saline yet, but supplies "remain a concern to the U.S. government because of the increased demand for their use with Covid-19 patients," Jonathan White, director for the division of recovery in the Office of the Assistant Secretary for Preparedness and Response, said in an email.

Saline is one of many older, generic drugs that have low profit margins and a dwindling number of providers. Baxter makes the bulk of the country's regular small saline bags, although a few other companies provide limited supplies.

In late June, the American Society of Health-System Pharmacists, a pharmacy organization that tracks shortages, flagged low supplies of saline bags that don't contain polyvinyl chloride, known as PVC, or a chemical called DEHP. The special PVC/DEHP-free bags are needed, particularly for pediatric patients, to mix infusions of specific drugs, mainly certain chemotherapies, the sedative lorazepam, and drugs to prevent organ rejection after transplant, says Erin Fox, a drug shortage expert at the University of Utah. Some makers of PVC/DEHP-free bags are conducting hourly reviews of supplies to ensure they have enough saline on hand to meet demand.

U.S. market share for IV solutions



That's just the kind of situation that keeps disaster experts up at night. "There are still a lot of variables," says Nicolette Louissaint, executive director of Healthcare Ready, a nonprofit organization formed after Hurricane Katrina pummeled New Orleans in 2005. That, she says, makes "it difficult to know if we are sufficiently prepared." —*Anna Edney*

THE BOTTOM LINE Despite a $1 billion investment in its supply network, Baxter faces challenges stocking hospitals with saline solution, most of which is made in hurricane-prone Puerto Rico.

ILLUSTRATION BY ROSE WONG. DATA: IBIS WORLD

In global financial markets, uncertainty is the only constant. From unexpected policy revisions to new pandemic lockdowns, from sudden export slumps to surprise industry closures – when you need to make sense of market upheaval, Bloomberg delivers the tools to help you get your bearings and act with confidence.

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Jon Stein

Founder and CEO, Betterment

"We believe everyone should have access to great financial advice"

In 10 years, the man who helped popularize robo-advising has built a company that manages $20 billion on behalf of 500,000 customers and, at last count, was valued at $800 million. And, as he tells *Bloomberg Businessweek* Editor Joel Weber, he barely pays attention to the stock market.

Photograph by Aundre Larrow

JOEL WEBER: The financial-services industry has so many players. You jumped into the fray 10 years ago with Betterment. What motivated you to enter such a competitive landscape?

JON STEIN: I had graduated from college and opened, like, seven different brokerage accounts. And what I found was they were very good at telling me what they wanted me to do for them: "Trade this, buy this fund, do this thing." But none of them were telling me what was right for me.

So I thought it was time to build a service around what's right for the customer: "These are your goals. Here's how much you need to contribute to reach your goals. You're on track and everything's OK." That's the kind of messaging that Betterment delivers. And now we've created a whole category—this idea of a more advised, customer-centric future for financial services.

That category is the robo-adviser, which you helped create in the aftermath of the financial crisis. You had zero customers then; now you have 500,000 and $20 billion of assets under management. And here we are living through another crisis. How are Betterment customers behaving during the pandemic?

I like to say that we were born in a crisis and that we're at our best in a time like this. In March, when volatility was at its highest, all of our algorithms and automation kicked into high gear. We saw $8.5 billion of trading that month. And a lot of that was two-sided trading, meaning we were selling off assets that hadn't fallen in value to buy assets that had. When things rebounded as they did, that rebalancing made our customers a lot of money. We were also tax-loss harvesting and taking advantage of all the opportunities in this environment. We do that without customers having to do anything. They can just stay the course, they're on track to their goals.

And we've been growing. March was a record customer-growth month for us. Q1 was a record quarter. Q2 set another record. So we've seen sustained inflows and continued customer growth, which is exciting.

What kind of flows are you projecting for the year?

This is a particularly challenging time to project. But in the worst time, we still saw 26% more customers making deposits than withdrawals. And for millennials it was even more—37% more deposits than withdrawals. So across our entire customer base, and particularly for our younger customers, they're just continuing to deposit, continuing to grow their accounts with us.

One thing that's really interesting about Betterment is your emphasis on behavioral science. You appeal to a side of the brain that investors might suppress when things get really bad. How do you keep people committed when the sky looks really dark?

Behavior is huge. We've done a lot of analysis of customer behavior over time to help people stay the course. We've seen, for instance, that if we put red and green colors on gains and losses, customers are more likely to trade than if it's just black and says, "You're on track." That's in contrast to, I think, some services out there that are really trying to gamify trading and leaning into the gambling element, which I think does appeal to a segment of customers.

Betterment is all about making the most of our customers' money in the long term. And that generally means not trading. Because when customers trade, they tend to underperform the market significantly over time.

Retail day trading has been such an interesting phenomenon during the pandemic. What do you make of that?

I think people are bored. Casinos are closed, there's no sports or sports betting. So people are just looking for ways to let off that same steam. And that's OK. That's a very ▶

◀ human thing to do. It's fine to do with small change. It just shouldn't be your primary investing strategy.

How do you approach converting someone from being that day-trading type into more of a long-term investor, especially with a younger crowd who may not have as much investing experience?

Yeah, I mean, I was one of those people. When I opened all those brokerage accounts, I wanted to read the financial news, understand which companies I might buy, and go invest. I learned the hard way. I bought Enron on the way down thinking, Wow, this is a great deal. Which is reminiscent of Hertz these days.

I made some good investments, too, things that I bought cheap and made several times my initial investment on. But I also had some mutual funds, and over time I found that those were performing about as well as I was, even though I was investing all this time into trading—and stressing. And I realized the best use of my time wasn't day trading, but to pursue something else with my free time.

Maybe that's a thing that some of us just have to go through. As a company, we at Betterment ought to accept customers as they are. Come as you are. We're all human and subject to these same kinds of behavioral biases. So let us take your portfolio and coach you over time to reach an optimal allocation for your goals.

Your platform lets investors personalize their portfolios and set goals. I'm wondering, what are some of your favorite goals people have set?

There are some amazing ones: wedding rings, trips, babies, "FU" money, all kinds of fun goal names. We've had 300,000 or 400,000 achieved goals over the last 10 years. Even though most of our customers are saving for long-term things like retirement, they might have near-term goals on the side—be it safety net or a shiny sports car or what have you.

You've also recently begun offering checking and savings accounts, which has you really looking like a bank. What do those offerings accomplish for you?

The thing most in your control is how much you're saving. You can't control what's going to happen to the market or what's going to happen with tax rates. But you can control how much you're contributing every month or year. And so we realized that if we wanted to have the most impact for our customers, one of the most important things we could do is help them manage their everyday spending and savings better. And so from the very original vision, we had talked about eventually getting into checking and savings. And we just did both of those things within the last year. These are amazing services: high-yield savings, ATM fees reimbursed worldwide, fee-free checking, mobile-deposit capture. You can manage everything from your phone, and it's all linked and integrated to this best-in-market investing and retirement solution. It's very easy to automate all of your money, to have your paycheck come in and have a regular contribution going into your IRA, your HSA, or even your 401(k). It's all integrated and working smartly for you.

I'm curious about how your customers used their stimulus checks. What was surprising to you about those numbers?

Most of our customers put their stimulus check into savings and investments. I think part of that is because a lot of our customers are professionals, who maybe aren't living paycheck to paycheck. Many times they were putting it toward safety-net funds or retirement or building wealth. Very little was going towards a short-term savings goal.

We've seen so much more awareness of social injustice and economic inequality of late. One fact about equities is that a lot of people just aren't invested in them, especially Blacks and Latinos. So how do you get more people investing?

I've seen some of this data, and it's striking. Far too little of the wealth in this country is in minority hands. The numbers just haven't changed. It's been eye-opening. Like many people in this time, I've been learning and seeing what more we can do. My team has a ton of energy around social-justice and equality-driving initiatives. I think in part that energy comes from them being so motivated. It's what brought them to Betterment in the first place. We are a mission-driven company. We believe everyone should have access to great financial advice. We have no minimum balance, no minimum fee. We've always thought, We're open to everyone.

But now, in this time, we're thinking even harder about what can we do to un-bias our advice, to reach new demographics, to improve our hiring diversity, and so on. Because we have to do better at moving the needle on these metrics.

We continue to face a retirement crisis in the U.S. What policy changes might help address this colossal challenge?

I think policy changes are ultimately what's needed to help people save enough for retirement. Something like only 11% of retirement spending today comes from personal savings. A third of it is Social Security. A third of it is people working in retirement. There's some other government programs and this and that, but very little is actually from investments. And yet, when you think about retirement,

"Betterment is all about making the most of our customers' money in the long term"

the conventional wisdom is, "You have to save for your own retirement, that's part of life." But it's really a small set of people who do. And we all ought to be doing it. And yet the behavioral economics side of me knows that just telling people to do a thing or giving them tax incentives to do a thing isn't going to drive real change.

We have to make it a smart default, like they do in Australia, where everyone is required to contribute to a superannuation fund. We have to decouple it from the employer. Why should this have anything to do with where you're working? It should be something that's available to everyone, that's portable across companies, where there's competition in the market instead of everybody having to use an employer-specified plan.

At Betterment, we've often said that we are trying to build the feeling of defined benefits in a defined contribution world. Since the 1980s we've been living in a world where pensions have been declining. Today almost no one has a pension, unless you're a government employee. Instead we have defined contribution plans, like the 401(k). But through technology, through smart advice, we can help people feel, I'm on track, I'm saving enough, even in our defined contribution world. That's what making advice accessible to everyone is all about.

Betterment was built on the back of the exchange-traded fund. If I radically simplify what you do, you have low-cost, plain-vanilla ETFs beneath a layer of advice and personalized portfolios. Could you have built Betterment without the ETF?

There's no way. We're standing on the shoulders of giants, those who came out with ETFs and popularized them. When we launched in 2010, it was just at that inflection point where ETFs were broadly enough adopted and liquid enough that you could have a product like Betterment with a globally diversified portfolio all through ETFs. We couldn't have existed before then because buying mutual funds meant building a pipe to each mutual fund company, which is a very expensive undertaking. And so we just use ETFs. You can do everything with them now. So this revolution of advice depends on ETFs.

But there's another revolution coming. Today we can do so much more personalization. We're hearing more and more calls for socially responsible investing, women-led investing, Black-led investing. Leaning into that, building truly personalized portfolios with specific stocks for specific clients that still track an index—that's clearly where things are trending, in our view.

Does that mean that you won't need ETFs?

ETFs are an efficient way to get an index. But if you want to personalize that index for any reason, there will be more small, separately managed accounts or direct indexing. Personalizing an ETF involves buying some of the individual stocks that track the index [while excluding others].

How else do you want Betterment to innovate?

We're also doing much more around cash management and automating the flows into your various accounts. We've already launched our two-way sweep, which through cash analysis of your checking account, figures out how much cash you need to cover 21 to 35 days' worth of expenses. It always maintains that much in your checking account by looking at your bills and paychecks—in a real-time way—and then sweeps all the rest into savings. If you have a big bill come up or need extra cash, it automatically sweeps money back into your checking account. That kind of smart automation—putting things on autopilot and just letting you be—is the future of all financial services.

There's been so much downward pressure on fees. What sort of downward pressure do you expect on your business?

A lot of that has been the move from active funds to passive funds. We've seen less pricing pressure on advice fees. Investment advisers haven't been reducing their fees. These are highly trained people who know how to talk to clients and understand how to manage a portfolio. The cost of the technology they're using, which we also provide with Betterment for Advisors, has come down—or at least ours has.

Where I see the next price battle, I hope, is around banking services. Because I think banks charge too much in nuisance fees. They try too hard to push people into debt. They don't pay people any interest on their savings. Those traditional ways of making money off of people's weaknesses I don't think are aligned with the kind of society that we want to create, where people are empowered and get to manage their own money. A great adviser would tell you, "Don't pay these fees. Don't go into debt. Earn something on your savings." And as a great adviser, we're trying to drive that price competition into banking and everyday cash-management services.

How do you feel about going public?

I've always wanted us to be an independent public company. It's been my ambition from Day One. And we're moving along that path. We're continuing to grow and attract customers at an exciting rate. Ultimately this is a scale game. And for us to be a large-scale player, we're going to have to be a public company—someday.

Any sense of what that timeline might look like?

Not today, no.

So 10 years on, what advice do you have for your younger self?

Just go and build it. Make it real. What customers want is performance, convenience, and peace of mind. Keep investing in those themes and you're always going to be attracting more customers and doing better for them.

Jon, how often do you actually look at the stock market?

It depends on how bad of a day it's been. *[Laughs.]* I generally don't. My uncle calls me sometimes and says, "I assume you saw what happened in the market today." And I always say, "Nope." Because my investments are with Betterment, I do not look at the day-to-day ups and downs. In March, when things were looking really bleak, it was hard to avoid. You can't avoid it on days like that. But by and large, I don't have to. I have a financial adviser. It's called Betterment. Ⓑ

Edited for space and clarity.

The Front-Runner

By Stephanie Baker
Illustration by Xia Gordon

Oxford's Covid-19 vaccine, devised by Sarah Gilbert, is in human trials. AstraZeneca has lined up agreements to produce 2 billion doses. Now the world waits

In April, Sarah Gilbert's three children, 21-year-old triplets all studying biochemistry, decided to take part in a trial for an experimental vaccine against Covid-19.

It was their mother's vaccine—she leads the University of Oxford team that developed it—but there wasn't a big family talk. "We didn't really discuss it, as I wasn't home much at the time," Gilbert told me recently. She'd been working around the clock, as one does while trying to end a pandemic, and at any rate wasn't worried for her kids. "We know the adverse event profile and we know the dose to use, because we've done this so many times before," she says. "Obviously we're doing safety testing, but we're not concerned."

With safety low on her list of worries (her triplets are fine), Gilbert is focused on quickly determining how effective the vaccine will be and how it will be made. In April, Oxford struck a deal with British pharmaceutical giant AstraZeneca Plc to spearhead global manufacturing and distribution and help run more trials around the world. AstraZeneca has agreed to sell the vaccine on a not-for-profit basis during the crisis if it proves effective and has lined up deals with multiple manufacturers to produce more than 2 billion doses.

Gilbert has been all over the British press, but she appears to regard public attention as a distraction. For more than two decades she worked anonymously, developing vaccines while also, of necessity, churning out endless grant applications. Her research was rarely discussed outside scientific circles. Now she's leading one of the most high-profile and advanced vaccine candidates against Covid-19, with Phase III, or final-stage, trials under way involving thousands of people in Brazil, South Africa, the U.K., and, soon, the U.S. Money is no longer a struggle.

At the end of April, crunching a process that normally takes about five years into less than four months, Gilbert and her colleagues at Oxford's Jenner Institute started a human trial on 1,100 people. When Gilbert testified before a parliamentary committee in early July, one member compared her effort to going into a shed and coming out with a jet engine. Gilbert's team has leapfrogged other vaccine contenders to the point where it will likely finish vaccinating subjects in its big 10,000-person efficacy trial before other candidates even start testing on that scale, Kate Bingham, chair of the U.K. government's Vaccine Taskforce, told the committee in early July. "She's well ahead of the world," Bingham said. "It's the most advanced vaccine anywhere."

Anthony Fauci, director of the U.S. National Institute of Allergy and Infectious Diseases (NIAID), has sounded a note of caution about Oxford's front-runner status. "You've got to be careful if you're temporarily leading the way vs. having a vaccine that's actually going to work," he told the BBC recently. Most vaccines in development fail to get licensed. Unlike drugs to treat diseases, vaccines are given to healthy people to prevent illness, which means regulators set a high bar for approval and usually want to see years' worth of safety data. In the Covid-19 pandemic, it's not yet clear what regulators will accept as proof of a successful and safe vaccine. The U.S. Food and Drug Administration has said a vaccine would need to be 50% more effective than a placebo to be approved and would need to show more evidence than blood tests indicating an immune response. Regulators in other countries haven't spelled out what would be acceptable.

Gilbert has voiced remarkable confidence in her chances, saying the Oxford vaccine has an 80% probability of being effective in stopping people who are exposed to the novel coronavirus from developing Covid-19. She has said she ▶

◀ could know by September. Asked by MPs in early July whether the world would have to struggle through the winter without a vaccine, Gilbert said, "I hope we can improve on those timelines and come to your rescue."

Gilbert, who is 58, has the hyperefficient, serious demeanor you'd expect from someone who might be on the cusp of a breakthrough and hasn't a minute to spare. When I first called her in early March, she abruptly ended the conversation after 10 minutes to speak to someone about the technical process of manufacturing the vaccine. It would have been crazy to take offense. Gilbert says she wakes up at around 4 a.m. most days "with lots of questions in my head," works from home for a few hours, then rides her bicycle to the institute, where she works into the evening. The Oxford team, just a handful of people in January, now comprises roughly 250.

The vaccine is a so-called viral vector type based on years of research by Gilbert and Adrian Hill, the head of the Jenner Institute. Traditional vaccines are made with a weakened or inactivated form of the germ that causes infection to stimulate an immune response. They aren't easy to develop and produce quickly. The Oxford team has created a technology that can speed the process by using a harmless virus as a kind of Trojan horse to carry the genetic material of a pathogen into cells to generate an immune response. In the case of Covid-19, Gilbert has taken a chimpanzee adenovirus (a common cold virus) and inserted genetic material from the surface spike protein of the SARS-CoV-2 virus as a way of tricking the immune system to fight back. The chimp adenovirus platform stimulates both antibodies and high levels of killer T-cells, a type of white blood cell that helps the immune system destroy infection.

Gilbert's approach is similar to a viral vector vaccine developed by the Chinese company CanSino Biologics Inc. that's in Phase II human trials. The difference between the two is small but may be crucial: CanSino uses a vector based on a human adenovirus that many people

A bioreactor at Oxford Biomedica, one of the companies contracted to make Gilbert's vaccine; the Jenner Institute's home at the edge of Oxford

have already been infected with. Early tests showed that people with preexisting antibodies to the adenovirus neutralized the vaccine before it could elicit a strong immune response to SARS CoV-2—the Trojan horse is destroyed before the troops can get out. Johnson & Johnson is developing a similar vaccine based on a human adenovirus; it will begin human trials in the second half of July.

A successful vaccine likely won't be 100% effective, no matter who wins the race, and success might have different definitions. Not all vaccines produce what's called sterilizing immunity, in which the body produces neutralizing antibodies that block a virus from getting into cells. Some vaccines don't prevent infection but trigger the immune system to protect against illness. Jonas Salk's polio vaccine doesn't stop infection but prevents the disease that crippled millions. I asked Gilbert what her definition of a successful vaccine would be, but she wouldn't be drawn out on specifics. "We need a vaccine with a high level of efficacy against disease, which also has a significant impact on virus transmission," she said.

The Oxford team probably wouldn't be so far along with its Covid vaccine had it not been for another deadly pathogen that threatened to cause a pandemic: Ebola. In 2014 the Jenner Institute led the first trial of an Ebola vaccine, devised by GlaxoSmithKline Plc, as part of the rapid response to an outbreak spreading through Guinea, Liberia, and Sierra Leone. The outbreak ended before they were able to finish. (Merck & Co. got there first to test its experimental vaccine while cases were still spreading in Guinea in 2015 and won regulatory approvals in the U.S. and Europe at the end of last year.) That experience taught the Oxford team about the importance of speed. "We were horribly conscious the whole way through, that one week, one way or the other, might make a difference," Hill says. "It still might."

In the wake of the Ebola outbreak, Gilbert responded to a call from the World Health Organization for researchers to come up with methods to rapidly respond to a clutch of emerging pathogens. It meant having a plan for "Disease X"—that unknown yet inevitable pathogen lurking around the corner. Before Covid-19 presented as the nightmare Disease X scenario, Gilbert began working on Middle East respiratory syndrome, or MERS—another coronavirus that causes pneumonia and had threatened to spark a global health crisis. It first emerged in 2012 in Saudi Arabia, but an outbreak didn't occur until 2014. MERS is much more deadly than Covid-19, killing about a third of those infected.

Gilbert worked on a MERS vaccine using the chimp adenovirus, in this case fused with the genetic material of the MERS virus. She traveled to Saudi Arabia in November 2015 for a conference with leading vaccinologists, hoping it would result in funding. It didn't. She and Hill had government grants to develop a number of vaccines, but that could take them only so far, and in 2016 they created a private company called

BIOREACTOR: COURTESY OXFORD BIOMEDICA. JENNER INSTITUTE: GREG BLATCHFORD/SHUTTERSTOCK. HILL: JOHN CAIRNS/UNIVERSITY OF OXFORD

"We could say, 'OK, we can start tomorrow.' We don't have to make 10 different varieties of this. We knew it could be manufactured"

Vaccitech. It went on to raise more than £30 million ($37.8 million) from Google Ventures (now GV), Sequoia Capital China, and Oxford Sciences Innovation, a venture capital fund set up to commercialize scientific research coming out of Oxford. The company holds the rights to several vaccines Gilbert and Hill are developing using the chimp adenovirus platform, including a promising prostate cancer therapy.

The VC funding, along with some government money, helped them fine-tune the viral vector program and push the MERS vaccine into a small safety trial with 24 people in 2018. The subjects were divided into three groups getting low, intermediate, and high doses. The results, published in April 2020, showed the vaccine was safe and produced an immune response that persisted for a year. It produced high levels of T-cells, but only 44% of people receiving the highest dose generated neutralizing antibodies. That raised the question of whether two doses might be needed. The MERS safety study couldn't prove whether the combination of T-cells and neutralizing antibodies induced by the vaccine worked to prevent disease, because it was too small and took place in the U.K., which has had only a handful of MERS cases since 2012. In December 2019, just a few weeks before the novel coronavirus emerged in Wuhan, China, Gilbert's team began a second trial for the MERS vaccine in Saudi Arabia, where most of the world's cases have been reported. Even there, only about 200 cases of MERS are reported annually, so proving the vaccine works could take many months.

The work gave Gilbert a running start when Covid-19 emerged. "The spike protein of MERS shares a 40% to 50% similarity to the spike of SARS-CoV-2," says Naif Alharbi, a Saudi scientist who studied under Gilbert at Oxford and is running the MERS vaccine trials in Riyadh. "We know the chimp adenovirus is safe in humans, and it's been tested in humans with the MERS spike. Given the similarities, the only question with the Covid-19 vaccine is whether it's going to be protective or not."

"The MERS study was absolutely critical," says Tom Evans, chief scientific officer of Vaccitech. "We could say, 'OK, we can start tomorrow.' We don't have to make 10 different varieties of this. We knew it could be manufactured. We knew it was immunogenic in humans."

When she first heard about the cases of pneumonia in China over the New Year, Gilbert was unsure how quickly it would spread. "We didn't know what it was early on," she says. "I was talking to colleagues thinking, yeah, as soon as the sequence comes out, we'll make something; we'll test it in mice; we'll show what we can do." The moment the Chinese scientists published the genetic sequence of the novel coronavirus on Jan. 10, Gilbert got to work.

Oxford had an advantage unusual for an academic institution: its own vaccine manufacturing facility, at which it was able to quickly manufacture the shot for the first phase of human trials. Gilbert arranged for the next, larger batch to come from Italian pharma company Advent, and persuaded the university to underwrite the contract until she could secure further funding. On Feb. 17 her team began injecting mice with the vaccine. To accelerate a process that normally takes months, she was performing several steps at once—testing in animals, applying to regulators for human trials, and talking to manufacturers.

"Her level of knowledge of the detail is extraordinary," says Andrew McLean, who worked with her for years as an investor and board member at Vaccitech. "It's very unusual for a scientist to know the practical parts of getting a drug made and be able to talk to manufacturers on a toe-to-toe basis."

Hill, Gilbert's collaborator and head of the Jenner Institute

But in early March, Gilbert was still scrounging for money. She got a small grant from the Coalition for Epidemic Preparedness Innovations, or CEPI, a foundation set up in 2017 with funding from the Bill & Melinda Gates Foundation, the governments of Norway and India, and the Wellcome Trust Ltd., a research charity based in London. It was enough to keep them going.

Around this time, there was a debate within the Jenner Institute about whether to go straight into human trials or wait until they got results from a study of their vaccine in nine rhesus monkeys at the Rocky Mountain Laboratories in Montana, part of the NIAID. They knew that in tests for a vaccine against the first SARS virus, which caused an epidemic in Asia in 2002-03, some vaccinated animals became more severely ill after they were challenged with the virus than unvaccinated ones did. The phenomenon is known as antibody dependent enhancement, or ADE. Scientists around the world were worried that might happen again with a SARS-CoV-2 vaccine, and the Oxford team wanted to test it in monkeys to rule it out. But time was of the essence: People were dying from Covid-19, and waiting for the monkey results would mean losing crucial weeks.

"We were doing that monkey experiment for safety and to convince the pessimists that the vaccine was going to be safe after infection," Hill says. "The big question was, when you have a vaccine available and you have people lined up ready to go, do you wait for the monkey results to vaccinate them?"

They decided to play it safe and wait while pressing ahead with planning the trials, setting up manufacturing, and looking for more money. On March 23, the same day U.K. Prime Minister Boris Johnson ordered the country into lockdown, the government announced a £2.2 million grant to Gilbert's team to support testing and manufacturing.

During the search for money, Bill Gates pushed Gilbert and Hill to partner with a big pharmaceutical company, and as a CEPI founder he had leverage. ▶

“It doesn’t need to cure you…. We want a vaccine to stop people from going to hospital and dying. If you can do that, I think people will be pretty happy”

◀ “We went to Oxford and said, you are doing brilliant work,” Gates recalled in a call with reporters in early June. “You really need to team up, and we told them a list of people to go and talk to.”

The Oxford team was initially reluctant, Hill says, because they’d run plenty of trials on their own. “What we struggle against all the time is the perception from funders that we can’t do this,” he says. They held talks with several potential partners, whom he declined to name, asking them two questions: How much can you manufacture, and by when? “They didn’t answer either of those questions no matter how many times we asked,” Hill recalls.

AstraZeneca was different. In early April, Mene Pangalos, the company’s head of research and development for biopharmaceuticals, had been hearing positive things about Oxford’s work. Although AstraZeneca isn’t a big player in vaccines—it produces a nasal flu spray vaccine but nothing else—he thought it was worth calling John Bell, an immunologist and professor who directs the university’s medical research strategy, to find out more. “It seemed like they needed a partner,” Pangalos recalls. “I called John up and said, ‘Are you interested in working with us on this? Because we think we can help.’ ”

Pangalos negotiated the partnership agreement with Bell and the rest of the Oxford team in about 10 days through a flurry of Zoom calls, with Gilbert walking everyone through the data. AstraZeneca agreed to be responsible for worldwide distribution and manufacturing.

Big money followed the announcement of the deal at the end of April, as Pascal Soriot, AstraZeneca’s chief executive officer, pledged to make the vaccine available at only a “few dollars” per dose. The British government gave £65 million to accelerate the work and order 30 million doses for the U.K. by September as part of a deal to make 100 million in total, with some reserved for developing countries. Days later, AstraZeneca announced a $1.2 billion deal with the U.S. Biomedical Advanced Research and Development Authority (Barda) to develop and produce 300 million doses, one of the largest deals the agency has announced. AstraZeneca will work with the National Institutes of Health to test it in 30,000 people in the U.S., scheduled to start in August. The company later struck a licensing deal with the Serum Institute of India to produce a billion doses for developing and middle-income countries. Because of expected political pressure—any country with a role in the production of a vaccine might act to secure doses for its own people—AstraZeneca is setting up independent supply chains within countries to prevent delays at national borders.

As the AstraZeneca deal was being finalized in mid-April, the results of the monkey study came through from Montana. “It wasn’t promising—it was fantastic,” Hill says. “Not only were the monkeys fine, but as a bonus we saw some protection.” They’d vaccinated six monkeys and then 28 days later exposed them to a massive dose of SARS-CoV-2 via multiple routes—eyes, mouth, nose, and trachea, to expose the lungs. It was much more than a person might encounter on public transportation or even in a Covid ward. After exposure, the animals showed no signs of pneumonia in their lungs. By all indications, they felt fine. Nasal swabs, however, showed they still had the virus, meaning they might be able to infect others. The study’s aim was to determine safety, not efficacy, so the Jenner team was encouraged to see it provided some protection in the face of an overwhelming dose of the virus. The day after the preliminary results came in, a team headed by Andrew Pollard, a colleague of Gilbert’s running the clinical trials, started injecting people.


Gilbert in her lab, pre-Covid and pre-fame

When the full results of the monkey trials were published in mid-May, critics pounced, seeing the results as weak. William Haseltine, a former professor at Harvard Medical School who spent years researching HIV, wrote a piece in *Forbes* arguing that the Oxford vaccine looked like it would be only partially protective, because it didn’t generate high levels of neutralizing antibodies, which defend cells against infection.

“What happens when you have a vaccine with people running around with virus spewing out of their nose? Anyone who is not vaccinated or not vaccinated well is going to get infected,” Haseltine told me on a Zoom call. “My guess is the Oxford vaccine isn’t going to be powerful enough for older people, so they will have to boost it up, and boosting it up can have side effects.”

On July 14 the U.S. government released results from the safety trial of another vaccine candidate, from Moderna Inc. The company’s stock rose sharply on news that the vaccine produced neutralizing antibodies in all patients. (It also produced side effects in some.) Moderna’s vaccine, produced using a technique called messenger RNA, will go into late-stage trials by the end of July.

Team Oxford-AstraZeneca argues it’s not realistic to expect clear nasal swabs from monkeys after they got a whopping dose straight up their noses. “It doesn’t need to cure you of SARS-CoV-2,” AstraZeneca’s Pangalos says. “I don’t know if we will completely knock out shedding or people being infectious, whether we’re going to cure people completely or whether we will just dampen down the illness. We want a vaccine to stop people from going to hospital and dying. If you can do that, I think people will be pretty happy. Neutralizing antibodies is one of the things you’ll look at, but the T-cell response is going to be important."

Hill says the same thing: Haseltine's focus on neutralizing antibodies is misplaced. Scientific debates aside, I was starting to sense a Harvard-Oxford, American-British rivalry playing out. "It's simpler to measure antibodies. It's less expensive, people do it all the time. But often the antibodies are a surrogate for the T-cell number," Hill says. "Nobody knows in SARS, in MERS, and in Covid-19 the relative importance of those two."

A flurry of recent research has shown that T-cells may play an important role in responses to SARS-CoV-2. But the only way to know the most effective levels, or titres, of antibodies and T-cells is to test the vaccine in people where the virus is circulating. "No one knows how strong the immune response needs to be to achieve protection in people of any age," Gilbert says. "If we get a strong T-cell response, we don't need such a high neutralizing antibody titre to achieve protection. The two arms of the immune response work together to give better protection." The Jenner Institute team is taking blood samples of people in the trials that began in late April and May in the U.K. to measure antibodies and T-cell responses several weeks after vaccination, but blood results can't prove it will prevent disease. It's a numbers game: They're looking for very few cases of Covid-19 in people who've received the vaccine, and a significantly higher number in a control group of people who haven't. "The better the vaccine is, the quicker you get a result, and the smaller number you need," Hill says. If they reach, say, 20 cases in the control group and 18 among the vaccinated cohort, that's not a great vaccine, and they would need a lot of cases to show a difference. But if you have 20 in the control group and two among the vaccinated, "you're home and dry," he says.

Of course, a quicker way of figuring out if it works would be to stage human challenge trials like those done with the monkeys. So far no Covid-19 vaccine developer has used challenge trials because of ethical concerns and the lack of an effective treatment for the disease. That hasn't stopped more than 30,000 people from more than 140 countries from registering to take part in a potential challenge trial through an organization called 1DaySooner.

When I asked Gilbert in April what was worrying her the most, she said it was going to be difficult to prove the vaccine works as the virus waxes and wanes around the world. "In order to determine vaccine efficacy for any novel coronavirus vaccine, the trial has to be set up in the right place at the right time, and that's very hard to predict," she said. "It's why we're planning to do multiple trials in multiple countries." In early June, as U.K. cases began to drop, AstraZeneca set up trials of the vaccine in Brazil and South Africa, where the virus is surging.

Producing millions, if not billions, of doses of the vaccine may be the biggest challenge in the history of the pharmaceutical industry. AstraZeneca is signing production agreements with companies worldwide, including Oxford Biomedica Plc, a small gene and cell therapy company a 10-minute drive from the Jenner Institute. Oxford Biomedica has agreed to produce several million doses, with the potential to scale up into the tens of millions if it works. James Miskin, the company's chief technical officer, describes a multistep production process that sounds to my layperson's ears like a cross between making a sourdough starter and boiling down sap to make maple syrup.

It begins with nurturing a few milliliters of human embryonic kidney cells, kept in a frozen vial that needs to be gradually defrosted. As the cells are fed a sugar solution, they multiply in a controlled atmosphere of oxygen and carbon dioxide. Over the course of a week the mixture is moved into larger and larger vessels, and eventually into a 200-liter stainless-steel bioreactor. The master seed stock of the vaccine—which contains the adenovirus with the spike protein—is added to this soupy mixture, which is stirred, purified, concentrated, and filtered down.

Scaling the process up to get to millions of doses is full of unknowns, says Matthew Duchars, CEO of the U.K. government-funded Vaccines Manufacturing and Innovation Centre (VMIC), which is helping coordinate British manufacturers. I ask him about the sourdough analogy. "It's like trying to go from making a loaf of sourdough in your kitchen to making 100,000 sourdough pizzas," he says. "Scale-up of any process is never as simple as you think it will be, especially with biological material."

At the end of May, Gilbert's team pressed ahead with more advanced trials on more than 10,000 people in the U.K. after getting the green light from an independent scientific panel that reviewed its progress so far. To be ready to go, the Oxford group had spent months working with Advent, the Italian manufacturer, to produce the vaccine for the large-scale trials. Under the eye of Stefania Di Marco, a biochemist and Advent's scientific director, Advent staff worked into the evenings and over weekends to produce 13,000 doses of the vaccine, at a time when Italy was the epicenter of the Covid-19 pandemic. With the seed stock, they made 100 liters of unpurified product and reduced it down to about 3 liters of vaccine. On May 4, they'd finally reached the stage where they could start filling glass vials with the vaccine. Di Marco and about 15 people from her team of 25 gathered that evening as the filling began, with some tears and hugging. "We were excited," she says. "This is precious material."

Two weeks later, after extensive checks and documentation, the first shipment of the vaccine arrived in Oxford in temperature-controlled boxes. At the end of May, Advent's batch of vaccine started going into people over the age of 55 to find out if there's a variation in immune responses to the shot in people of different ages.

How the vaccine performs in this much larger and more diverse group, particularly older people, could well determine whether the Oxford vaccine will help end the pandemic, or whether the world must continue to wait. B

—With Vernon Silver and James Paton

JOHN LAWRENCE/SHUTTERSTOCK


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Covid Conversations With a Wall Street Titan

How the pandemic looks to one of America's wealthiest people

By Max Abelson

PHOTO ILLUSTRATION BY 731. PHOTOGRAPH BY FRANK FRANCES FOR BLOOMBERG BUSINESSWEEK

On the day the coronavirus was declared a pandemic, I called the richest person I know. The world was spiraling into chaos, with 118,319 confirmed cases and 4,292 deaths in at least 100 countries, and I thought someone so well connected might know what was going on.

"What the f---, I'm not worried," he said. "I'm sure I already have it. What do I care?" His family was heading to their country house outside New York City, but he was staying put, working the phones for his job investing billions of dollars for clients. He didn't know much about the unfolding catastrophe, which made him just like everyone else.

The next day, March 12, the stock market collapsed, ending an 11-year bull market. The S&P 500's 9.5% plummet was the biggest since Black Monday in 1987. I called the investor back. "It's not this panic, 'Oh my God, the world is going to end,'" he said. "Everyone knows it's over in two months." His dismissiveness was almost eerie. "You know the world is fine."

In the previous 24 hours, the World Health Organization had reported almost 7,000 more cases globally, and the death count had grown by more than 300. Northern Italian hospital hallways were filling with beds. Tom Hanks fell sick in Australia. March Madness was canceled. Broadway shut down. President Trump congratulated himself on what a great job he was doing and said it would all go away.

I want to tell you a bit about the guy I called up—my billionaire. There's no way to understand American power without understanding people like him. He's part of a generation of executives who've made fortunes from the proliferation of private equity, hedge funds, and other forms of financial engineering over the past few decades, as Wall Street became more and more central to the U.S. economy. Wealth on his scale sometimes flattens a personality, but he usually comes off as open and lighthearted, with a confidence that can be infectious rather than off-putting.

Members of his class are supposed to be brilliant at analyzing and managing risk, so I was surprised to find that he seemed unbothered by what looked to the nonbillionaires around me like a uniquely dangerous threat. I asked him how his circle was talking about the virus. "Some people are going to die, but it's old people, and if they do, it's OK," he replied. Then he paused. "Not that it's OK. This isn't that bad."

He seemed to know how cold and disconnected that sounded. Some billionaires take pleasure in playing up nasty reputations, but this one considers himself to be thoughtful, generous, lucky, and friendly to his workers. Still, he didn't walk his words all the way back.

It felt somewhat perverse to be soliciting the thoughts of someone so privileged and well protected at a time of such intense vulnerability. Why should Americans hear from a rich White man right now? Without question, the stories of the people who were suffering, and those who were on the front lines aiding them, needed to be told urgently. At the same time, there were already signs that the unequal system Wall Street thrives on would exacerbate the crisis, while lower-income communities were disproportionately harmed by both the virus and its economic effects. There was speculation, as New York City declared a state of emergency and Congress negotiated sweeping relief packages, that the pandemic could become a great equalizer, a cataclysm that would lead to change that leveled an unlevel field. Or it could prove to be just another opportunity for the country's most powerful capitalists—to make money, and perhaps to tilt the field further. If anyone could help me gauge this dynamic, I thought, it would be my billionaire.

I asked him if I could keep calling. He said yes, and that he'd tell me what was really on his mind as long as he remained anonymous. After considering what might be coming in the U.S., I agreed. I wanted to know how people like him would experience this calamity. And I couldn't turn away.

We spoke again the next week, on March 16. The days in between had been ugly. Case numbers in New York City were starting to boom, and officials sent home more than a million students. The U.S. declared a national emergency, and Covid-19 tests were in short supply. Wall Street was in the midst of its worst week since the global financial crisis. Worldwide, there were 167,515 reported cases and 6,606 deaths.

The investor told me the economic wipeout didn't look so bad if you compared it with the vastness of the U.S. economy. Technically, this was true, but Federal Reserve officials were already tearing through their playbook from the last crisis. Big banks were preparing to shut branches. I asked him if he'd talked to the boss of the biggest one, JPMorgan Chase & Co.'s Jamie Dimon, and he sneezed. "Now if you're on a bus and you start sneezing, everybody gets upset," he said. I asked if he actually takes the bus. "No," he replied.

I mentioned that other rich people were scrambling to protect their health. Some were securing special access to virus tests and experimental drugs, if not their own ventilators. "I could get my hand on a test," he said. He told me his peers were quietly inquiring about reserving beds at private hospitals in case they got sick. He had connections to the boards of the best hospitals but said he'd call in favors only for the people closest to him.

Meanwhile, he joined his family at his country house, taking work calls on the phone. There was no staff, so he drove to the store himself, wearing a mask. He could have hopped in his private jet and escaped, but really, he pointed out, where was he going to go?

The catastrophe spread. By March 23, New York City's case count was rising by thousands each day. People at Rikers Island jail fell sick, and city hospitals were running out of masks and gloves. The U.S. was threatening to become a new hub for the virus, right as Trump was saying the economy would soon reopen. The U.K. announced it would lock down. Deaths were spiking in Western Europe and Iran, with 14,509 in total worldwide, and 332,930 cases.

When I spoke with my billionaire that day, I thought he might be scared or sad. Instead, he was irritated. “Everyone’s working remote and realizing remote sucks,” he said. I asked how it was different from the 2008 financial crisis. “I have to make individual calls. It’s so hard. It’s so hard to deal with all these things. You can’t get five people in a room, 10 people in a room. I’m dealing with all this shit with my hands tied behind my back.”

“I’m not worried. I’m sure I already have it. What do I care?”

The country was sliding toward a recession, leaving Wall Street facing billions of dollars in potential loan defaults. But it was also profiting from the carnage. JPMorgan’s derivative traders were on their way to making $1.5 billion in the first few months of the year, while a small group of hedge funds was pulling in billions from exotic types of bets. It wasn’t just credit-default swaps—the derivative that starred in the 2008 financial crisis—but credit-default swaps on indexes that were themselves made up of credit-default swaps. Private equity executives, who together had about $2 trillion of cash to spend, were on the hunt for bargains.

In Manhattan, fevers had been reported inside Goldman Sachs Group Inc.’s skyscraper, but some traders at JPMorgan’s derivatives desk were still sitting close together. My billionaire thought young and healthy workers should be in the office, and he didn’t just mean his own. “Why aren’t we saying, ‘Hey, anybody who’s 30 or under, you guys still go to work—you guys just don’t see your parents?’ ”

One answer was that they might be afraid to die. A poll would soon show that almost 9 out of 10 Americans weren’t ready to return to daily life. His pronouncement sounded like the ones coming from Trump and his circle. The president was now saying the economy should restart quickly despite the warnings of health officials.

The billionaire saw Trump as a buffoon, and yet he mostly agreed with what the president was saying about the virus. “If people aren’t going to work, it’s a depression. Trump isn’t wrong. He just doesn’t know how to explain it,” the billionaire said. He took a stab at putting it succinctly: “Do you want to end up losing your life savings so that the old person you don’t know can live?”

I asked if he intended to say that Americans were going to have to die to save the economy. Public health and private profit were at odds, he answered, and one was going to win out. “By focusing on the economy, a lot of people are going to get sick. And if we focus on public health, a lot of people are going to lose their jobs,” he said. “I know which way it’s going to end, but you can’t say it. You sound insensitive. In today’s world, everybody’s going to attack you.”

Wall Street holds sway over millions of American workers. Private equity firms buy up companies and exercise control over their employees. Activist investors buy up stakes in companies and can push them to cut staff. Alternative funds help determine the fate of corporations by owning their debt or lending to them directly. I wondered if the carnage might present opportunities for my billionaire to profit. It would, he told me. But what he seemed to crave right then was a return to the economic reality he’d known before.

“The person who explained this best to me is my contractor,” he said, referring to a man who was building a house for him. “I say to him, ‘Hey, what are you going to do if we have this lockdown? How long do you think we won’t be able to build for?’

“He looks at me like, ‘What, are you talking to me?… If you’re willing to pay us, we’re willing to show up.’

“I said, ‘Aren’t you worried?’

“He said, ‘I don’t have money in the bank like you. If I ain’t working, my family ain’t eating, and then my mortgage ain’t getting paid. Can I take two weeks off? Sure. But anything more than that? No.’

“I said, ‘OK, I don’t care. If you guys want to show up, I’ll pay you.’

“He looked at me: ‘Hey, big guy, this is America.’ ”

The billionaire stopped his story and addressed me directly. “How would you like it if you didn’t get paid?” he asked. Then he shifted gears.

“Why don’t you talk about yourself?” he said. “How much do you make?” He ventured a guess and was way off. I wouldn’t tell him by how much or in which direction.

“Don’t be embarrassed,” he said. “You’re doing a great job.”

By the end of March, forklifts were loading bodies into refrigerated trucks outside New York City hospitals. In Staten Island an Amazon.com warehouse worker led a walkout over health concerns and was swiftly fired. Black communities were being hit especially hard. And in the past week the number of deaths worldwide had more than doubled, to 36,405, with 750,890 cases.

There was action in Washington, though. Trump had signed the largest stimulus package in U.S. history, a $2 trillion bill that doled out loans and tax breaks to businesses big and small, sent $1,200 to many Americans, and provided an extra $600 of weekly unemployment benefits. But it still left millions of people vulnerable in a country where about 27.5 million were without health insurance and more than 100 million still had to be physically present at their jobs.

My billionaire and I didn’t discuss any of that when I called. It was after dinner, and he had to get back to his family. “I’m playing Risk,” he said.

We picked up again the next day, April 1. The game was still going on. “We wiped out the other two guys,” he told me. “I think I’m in a good position.” ▶

◀ I asked him if he'd reconsider our anonymity agreement and let me use his name in the story. No, he said. Americans were too angry at rich bosses. "Everybody's perception is the same: 'You should be paying us irrespective of the fact that we're not working. And if you don't, it's because you're greedy.'

"You're wrong. Sure, I'm happy to pay you for a month. I'm happy to pay you for two months. But at a certain point you have to stop."

I wanted to know if he could understand why employees might feel they deserved pay for work they were missing only because of a national emergency. He dove into a genuine attempt at empathy. A month ago, he acknowledged, most Americans hadn't expected to get paid without working. "Now it's, 'Hey, wait a minute. I can't work, not because I don't want to, but I can't. And you should be paying me, and if you don't, you're jeopardizing my life.' " He went on in the voice of a worker: "So-and-so can afford to pay me, but I can't afford to go to work. If I do, I'm jeopardizing my life. Is my life not worth it?"

He remembered that he'd originally wanted young and healthy employees to get back to work as soon as possible. But he'd changed his mind. "Everybody's come to the conclusion, myself as well, you can't do that. Because you're having people who are 20 and 30 getting symptoms and being rushed to the hospital," he said. "The system is overwhelmed, and if the system is overwhelmed, you might as well wait."

Inside the White House, Trump had been backtracking from his cheeriness, warning at a briefing of great pain to come. Over the past three years, his administration had been particularly good for rich executives, cutting their taxes and stripping back corporate rules. I asked the investor what he made of the president on the whole.

"The things he's done on the business side I would tell you have all been positive. Does that offset all the harm he's done? Economically, yes, for me, that's been beneficial. Socially, how it hurts people, how I view the world, no, I would rather have less money to have a better world. But, OK, my punishment is I have more money to have a more f---ed world."

Two days later I called him back and asked who won his game of Risk.

"I did," he said.

When we spoke again two weeks later, on April 19, pain was everywhere. In a month, 22 million workers had filed unemployment claims, shattering the U.S. record and wiping out the entire decade of job gains that had followed the financial crisis. Self-employed people were still waiting for the unemployment benefits promised by the $2 trillion rescue package. In the meantime, infections had more than tripled in the U.S., to about 700,000, and the death count had crossed 30,000.

The billionaire's family was doing fine. He seemed to be the only person I knew who wasn't experiencing near-constant bewilderment, dread, and rage. "We watch the briefings, and we feel horrible, but then you get back to what you're doing," he said.

At work he was looking for investment opportunities and figuring out how and when to seize them. His contractor was still building, sending crews in shifts. When I asked him about the sea of workers losing their jobs, he said the people running corporations had no choice but to let them go. "They've got no revenue, and nobody's going in. It's nobody's fault. You just feel bad."

The U.S. government was on an all-out blitz to prop up markets. The Federal Reserve had bought so many bonds that its balance sheet had topped $5 trillion for the first time, and that was before it took the unprecedented step on April 9 of unveiling a program to provide as much as $2.3 trillion in loans.

When I asked the investor if he was in any financial danger, he told me work wasn't keeping him up at night. He said that the outbreak hadn't created any catastrophes or triumphs for him and that he was thinking about what to do next. How did he stay so calm? "When you've been lucky, you just assume you're always going to be lucky," he said.

I thought about the rage at bosses he'd described on our last call and asked him if I could float some ideas about the source of that anger. Was it the sheer size of the gap between the rich and the rest of us? He shrugged that off. "You've always had that gap," he said. "Now everybody knows about it." I pointed out that inequality had gotten worse. He insisted that the most significant change was how much attention we've been paying to the gap. He blamed social media.

I wondered if the bubbling frustration might be fueled instead by the different ways billionaires loom over our lives, and not only because we can't check email, stream movies, or post photos without their products. Earlier in April, Bill Gates had suggested his foundation would spend billions of dollars to fund a coronavirus vaccine, reminding everyone that it was the rich, as often as not, who seemed to be guaranteeing our survival, rather than government. I asked the executive if depending on the goodwill of such a small group might make us resent them.

"That makes no sense," he said. "Why is there deep rage that somebody's helping you?" He again steered the blame to social media, where "everybody is trying to show you how

"When you've been lucky, you just assume you're always going to be lucky"

great their life is, so there's a constant comparison." He told me people hadn't been as mad at John D. Rockefeller, apparently forgetting the breakup of Standard Oil Co. "David Geffen is posting a picture of himself on a boat. And somebody just got laid off. Do you think you would be mad at that? Yes."

So none of this was about frustration with the system itself—with tax cuts that favor the rich, government bailouts for big corporations, or the decline of the social safety net? "I'm sorry," he said. "Nobody's worried about the system. They're mad about what's happening in their life."

I reminded him that his views on some things had evolved since the pandemic began. Could he eventually change his mind about this? "It's not 'the system,'" he reiterated. "Everybody's got to stop with 'the system.'" He didn't sound exasperated, just amused. His voice had the same tone of charmed mellowness it'd had five or so weeks earlier. It's a rich sound.

"Grasshopper," he said. "Grasshopper, I've got to teach you."

We didn't speak again for another month. By then, May 22, more than 325,000 people around the world had died of the virus, and 5 million people had been infected. In the U.S., employers had cut 20.5 million jobs in April, tripling the jobless rate in the span of a month, to its highest point since the Great Depression. Covid-19 was killing people in majority Black counties at a rate more than twice the national average. As states moved ahead with reopening plans, especially in the South, anxiety about virus flare-ups was rising.

Wall Street, though, was thriving. The stock market had bounced into the third-quickest rebound in history, in part because of the massive interventions from central banks around the world. Every hour for the previous eight weeks, the Fed and its global peers had been buying an average of about $2.4 billion of financial assets, according to data compiled by Bank of America Corp. "Everything is going great," the investor said. "Work has gone really well." It was "actually a really interesting time." I asked about the video calls he'd said he hated. "Now I've gotten into Zoom. I have! I like it now. I like to see the face."

His voice brimmed with enthusiasm. The plan at work was "to try to take advantage of the situation." I asked him what kind of advantage he meant. "I used the wrong words," he replied. "It's not 'take advantage.' It's a huge opportunity for us. That's what it is."

But his initial phrase lingered. "You're in the right place at the right time," he said a few minutes later, "and you can take advantage of that."

The rich were poised to profit while the vulnerable suffered and the elderly died. It was such a bleak picture. "Yes, it is," he said. "It's horrible"—he recognized the extent of the agony. He just didn't seem able to imagine an alternative.

Someone nearby called him to dinner. He said he'd have to go soon. I asked whether he thought it was fair for the richest to keep getting richer.

"I don't know," he said. "Is war fair? Do people die in a war? Yes. You've got a virus that is affecting people. It's pretty clear who it affects." He meant people who were old and sick. "So nature is saying, 'I'm going to pick on you.' Is it fair? Is it right? No." His voice was as steady and calm as ever. "But that's life."

Three days later, a White Minnesota police officer knelt on George Floyd's neck for about eight minutes. The footage of Floyd begging in vain for his life sparked nationwide demands for equal justice for Black Americans. It was the first thing I asked my billionaire about when we got on the phone for our final interview, on June 5.

"It was just surprising. I mean it's like, Why? I didn't understand," he said. Officer Derek Chauvin had been charged with Floyd's murder. "I don't think he wanted to kill him. I think he wanted to embarrass him. He wanted to show him who was superior. He wanted to give him pain."

Police brutality, he added, was utterly wrong. I asked him about the movement protesting it from Minneapolis to Manhattan and well beyond. The demonstrations had mostly been peaceful, but the windows of some fancy Midtown shops had been smashed. "I don't like when somebody overruns a police station and burns it. I don't like when you're destroying property," he said. "If you don't like the system, I have no qualms. You want to break the system? Then you'd better be in charge." His words rang in my ears.

Three months earlier, when my billionaire had picked up my first phone call, the global financial system had been buckling under the threat of a pandemic. Now the financial system had roared back—vindication, of a sort, for one of its biggest winners, who didn't see any need for it to change fundamentally. For most everyone else, there would be consequences. About 17 million more Americans were on track to become food insecure in 2020, bringing the total to 54 million. White-collar workers who'd lost their jobs were facing fewer open positions and the prospect of lower pay if they landed one.

Those failures weren't independent of the reasons people were packing streets and bridges. The protesters were demanding that American systems that had let them down be reshaped—systems marked by racism and other forms of inequality that exclude some and privilege others. Their demands might start with policing, but they didn't end there.

My billionaire had in mind something more incremental: replacing bad sheriffs, police chiefs, and other officials, rather than radically transforming or abolishing the infrastructure they oversee. "It's easy to change the system—it really is. It's never hard to change the system. We have a way of going about that," he said.

"You want to change the system? I get that. You want to break the system? You better win. Because, if you don't, the system is going to break you." B

THE BRONCO

IS

THE SUV THAT O.J. MADE FAMOUS IS GETTING A MAKEOVER, THANKS TO A FEW OBSESSED FORD EMPLOYEES

BY KEITH NAUGHTON
PHOTOGRAPHS BY BRIAN WIDDIS

BACK

Dan Schaffer, a four-wheel-drive engineer at Ford Motor Co., gets into an SUV, points it up a steep and slippery dirt hill, and hits the gas. It lurches into action, but halfway up the 45-degree climb it bogs down. Schaffer pounds the pedal, and it continues its ascent, as if it had just been catching its breath.

At base camp below, a group of middle managers hoots and hollers as the vehicle tops the hill at this off-road course north of Detroit. “Did you see that?” says Tom Patterson, an advanced product strategist. “That was amazing. To see it in action, in motion, that’s just so sweet.”

They’re cheering on a Ford Bronco—now available in “cyber orange”—and they’ve been waiting awhile to do it. The group, known as the Bronco Underground, has agitated for years inside Ford for the return of the SUV, which has been out of production for more than two decades and is best known for the white model that O.J. Simpson drove that June day in 1994. In their free time, and without any boss’s approval, they sketched and modeled a reborn Bronco that played on its ’60s heyday; they drew up business plans, begged for space in factories, and tried to convince management that there was still life left in the brand.

The project seemed doomed because of recessions, fluctuating fuel prices, and changing consumer tastes—until gas got cheap a few years ago and Americans fell in love with the Jeep Wrangler and other retro SUVs. But Ford, which had made an ill-advised bet on small cars a decade ago, didn’t ▶

◀ have one. That gave the Bronco Underground an opening.

Bringing back the Bronco is part of a broader strategy to play off Ford's greatest hits. Its F-150 pickup is getting Tesla-like hands-free driving technology, and the Mustang is going electric. The Bronco, unveiled on July 13, has a removable roof and doors, a familiar chrome bucking horse emblem on the tailgate, rubberized floors with drain holes so the interior can be hosed down, and a dashboard with mounts for cameras or phones for riders to show their followers how much fun they're having.

"So many people doubted us," says Mark Grueber, director of advanced product marketing, who pushed relentlessly for the Bronco's revival. He spoke as Schaffer kicked up a dust cloud turning doughnuts after descending the hill. "They all said Ford would screw it up."

In 1999, three years after Ford stopped production of the Bronco, the Underground initiated a secret program to resurrect it. The plan was to move away from the boxy rendition that by then had unshakable cultural baggage. "We looked back at the original Bronco, and we saw it"—the new one—"as being a back-to-basics vehicle," says Moray Callum, now Ford's chief designer, who led the project in the automaker's Dearborn, Mich., studios.

The program was code-named U260, "U" for utility and "2" for two-door. The "60" comes from a separate code name, T6, for Ford's small Ranger pickup, which would provide the mechanical underpinnings for the new Bronco. This "platform sharing" is a critical way for automakers to keep costs down, and though Ford had looked at building the Bronco on the chassis of a Land Rover—the fancy British SUV brand it purchased in 2000—that was deemed too expensive.

Callum's team developed two-door and four-door versions with a minimalist design and low price aimed at young buyers. He had the two-door painted bright red and invited then-Chief Executive Officer Jac Nasser to check it out. "He loved it," Callum recalls. The next step was to show it to potential buyers in marketing clinics, the industry's version of Hollywood test screenings.

But before that could happen, Ford was embroiled in a safety scandal involving faulty Firestone tires on its Explorer SUV; more than 250 people died in rollover crashes. A congressional investigation and a massive recall followed, leading to lawsuits and losses. Nasser was fired, and the Bronco became collateral damage. With budgets under pressure, Ford killed the program. "After the Explorer event, things were getting tight," Callum says. "Programs got more scrutiny, and if the business case wasn't strong, they went cold."

Stinging from the U260's cancellation, Ford's then-chief designer, J Mays, took another whack at the Bronco. Mays was too senior to be in the Underground, but he was a sympathizer. He ordered his styling studio in Irvine, Calif., which specialized in futuristic concepts, to design the Bronco of its dreams, hewing to the original but with a healthy dose of 21st century industrial design.

The silver Bronco that rolled onto the stage of the 2004 Detroit auto show, looking carved out of aluminum, was a sensation. It seemed like Ford's answer to the Hummer, based on the Humvee military vehicle that was deployed in both Iraq and Afghanistan. The new Bronco was such a star that it was eventually cast as Dwayne "The Rock" Johnson's ride in the movie *Rampage*.

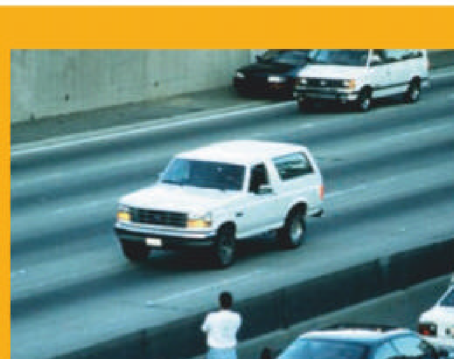
But it was more idea than reality. Unlike the U260, the show car wasn't designed to fit atop the Ranger. Without a platform to build the Bronco on, the concept car was going nowhere. "It gave us a lot of hope and a lot of frustration," Grueber says. "It confirmed what the Underground believed—that there was a customer out there for another Bronco."

The Underground was getting desperate. Patterson, the marketing strategist, stewed that company execs weren't taking advantage of the Bronco's popularity at the auto show. "We were just kind of scratching our heads," he says. "And we resolved to never give up."

The Bronco's brand of old-school SUV was becoming a dying breed, however. Rising gas prices and aging buyers led SUVs to morph into curvy, comfy, fuel-friendly cars known as "crossovers," because they were part sedan, part truck. "As all the crossovers came in, there was this portion of the buying population that just sort of felt like their SUV had been neutered," says Will Neafsey, a Ford consumer research specialist. "Those people wanted a true sport utility vehicle. They were always out there, and they just grew more frustrated."

Further complicating efforts was Ford's plan to stop selling the Ranger in the U.S., because the market for small, cheap pickups was dying. But they were strong sellers overseas, and Ford designed a new one for those markets.

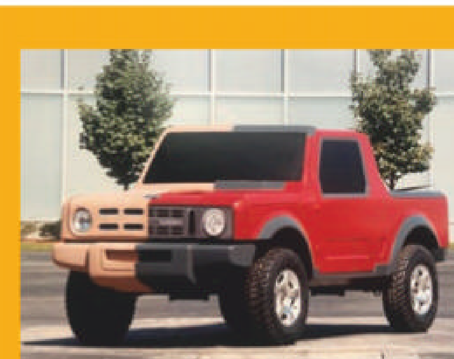
The Underground seized on that to make another run at reviving the Bronco. In 2006 designer Melvin Betancourt reworked the auto show concept to fit the underpinnings of the Ranger being sold overseas. Then Patterson persuaded



1 The Bronco's heyday was in the '60s; Ford's new lineup plays off its greatest hits

2 The white Bronco that carried O.J. Simpson on June 17, 1994, on the 405 Freeway

3 "U260," the prototype that the Bronco Underground started working on in 1999



1 The Bronco comes in “cyber orange” and has a removable roof and doors

2 The dashboard has built-in mounts for cameras and phones

3 The SUV is available in two-door, four-door, and “sport” versions

a Ford factory in South Africa that was already building the Ranger to make space on its assembly line for a new Bronco that would be shipped to the U.S.

But the brass rejected the plan to import it. It was seen as too risky and expensive with fuel prices soaring because of the war in Iraq, sales of gas-guzzling SUVs stalling, and the economy beginning its slide into the Great Recession. “There was always somebody in the room,” Patterson says of the naysayers. “There were definitely some that were on board, but it was just never enough of the right people. And the business case with importing it was just not going to work.”

Ford would soon have plenty of other problems to worry about. It needed a lifesaving $23 billion loan to survive the recession in 2009 without resorting to the bailouts and bankruptcies that befell crosstown rivals General Motors Co. and Chrysler LLC.

Management didn’t want to hear any more about the Bronco. In company discussions about Ford’s portfolio, it was the name that couldn’t be uttered. “We were literally forbidden from using the B-word,” Grueber says. “The leadership got so tired of us talking about it, they would say, ‘We’re not doing a Bronco. What don’t you understand?’”

The brand fell into such disrepute that the company almost lost control of it. In 2013 the trademark was expiring; Ford had to use the name to retain ownership. Grueber, who was in charge of naming rights, says he told Patterson, “Hey, we’re going to lose this. If that happens, then we’re dead forever.” The Underground devised a plan to slap a Bronco badge on the back of a “special edition” Ford Expedition that was displayed at trade shows in Las Vegas and Florida. They didn’t want it to attract too much attention, and it didn’t. Just putting the emblem on the Expedition was enough to keep the trademark alive. Legally speaking, the Underground had provided a legitimate use case.

An unexpected turn reversed the Bronco’s fortunes in 2015. Ford’s leadership decided it was time to bring the Ranger pickup back to America after watching GM rack up record sales with a pair of new small trucks. But the Ranger wasn’t expected to sell enough to fill up an entire factory’s worth of capacity. The company needed another vehicle to build in the suburban Detroit plant that had been selected.

Ford’s then-president of the Americas, Joe Hinrichs, asked his team to come up with ideas for a model that could be built alongside the Ranger. When word got to Grueber, he asked his boss, Ed Ostrowski, who was in charge of developing future products, “Can we do whatever we want with the second product? When he said, ‘Yep,’ it was like winning the lottery.”

Even 21 years after the slow-speed chase on that Los Angeles freeway, there was still concern that the Bronco name was irreparably damaged.

Ford did intensive consumer research. Focus group participants were asked about their impression of the word “Bronco,” without any indication whether it was in reference to the car, the Denver football team, or an untamed steed. And though the O.J. association came up, it didn’t overwhelm the discussion. The subjects mostly associated the word with being wild and free. “It confirmed for us that the brand was still solid and we could bring it back without being weighed down by O.J.,” Grueber says.

The Underground got help from Ford’s chief operating officer, Jim Farley, who happened to be taking the 405 Freeway home from work on the day of the pursuit. Like other waylaid motorists, Farley stood beside his car and watched as the white Bronco rolled by, followed by an armada of police cruisers.

At the time, Farley was a junior executive at Toyota Motor Corp. One of his last big projects at that company was the FJ Cruiser, a small SUV with retro-military style and aspirations of taking on Jeep. But shoppers said it looked like a toy, and Toyota pulled it from the U.S. market five years ago. “The FJ design was trying too hard, and its usability was compromised,” Farley told the Underground. “So let’s make sure the Bronco is really usable in the real world, a super-authentic off-roader.”

Farley’s boss, CEO Jim Hackett, desperately needs a hit. The company, slogging through a turnaround, has been on a bad run for three years, with mounting losses, a botched release of the new Explorer, and a stock in free fall. Now smitten with the Bronco, the company has expanded its lineup. There’s a two-door and a four-door version, as well as a smaller Bronco Sport model based on Ford’s compact Escape SUV. They can be customized with doors that have oblong-shaped cutouts that allow riders to feel the breeze and with seats wrapped in the same water-repellent fabric used on boats. And though Ford isn’t offering an electric or hybrid version, it’s hinting that this could be an option down the line.

The introduction was going to be elaborate, with unveilings at auto shows in New York and Detroit and an event in the California desert at the site of King of the Hammers, an off-road race. The coronavirus pandemic forced Ford to scrap all those plans for a televised debut in July instead. The company settled on the 13th. That was after Tanya Brown, sister of Nicole Brown Simpson, O.J.’s murdered ex-wife, complained about an earlier date that Ford had picked. Unintentionally, the company said, it had chosen July 9—O.J.’s birthday. B

BRONCOS: FORD MOTOR COMPANY (2); WHITE BRONCO: JEAN-MARC GIBOUX/HULTON ARCHIVE. 2020 BRONCO: PHOTOGRAPHS BY BRIAN WIDDIS


Circles drawn in the grass promote responsible social distancing at a waterfront park in Brooklyn, New York.

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THE YEAR OF THE QUARANTINE BLOCKBUSTER

Netflix says 85 million people watched the Mark Wahlberg action movie *Spenser Confidential*, not one of them in a theater. Is Hollywood finally waking up to the potenti l of the streaming smash?

By Lucas Shaw

SPECIAL ENTERTAINMENT SECTION

In partnership with Screentime, Bloomberg's new digital endeavor

July 20, 2020

Edited by Chris Rovzar

Businessweek.com

While putting the finishing touches on his latest movie, *Spenser Confidential*, director Peter Berg worried viewers wouldn't laugh. The film, an action-comedy modeled after *Lethal Weapon* and *Die Hard*, relies on humor to break the tension between explosions and firefights. The movie had thrilled audiences in test screenings. A theater packed with 300 people gave it an average score of 96—the highest of his career. But *Spenser Confidential* wasn't going to appear in theaters. It would be available exclusively on Netflix, the world's most popular paid streaming service.

This is new ground for Berg, the 56-year-old filmmaker behind *Hancock* and *Lone Survivor*. In the past two decades he's directed 11 movies that have collectively grossed more than $1.5 billion at the box office. He attributes their success to the power of a shared experience. When people cried during *Patriots Day* or *Friday Night Lights*, their emotion affected everyone in the theater. "I don't know how those experiences play out when people watch them by themselves, or on a TV or a computer," Berg says from his home in Los Angeles.

Regardless of the experience, the impact surprised him. Not long after *Spenser Confidential* premiered on March 6, fans sent him direct messages on social media sharing their favorite moments, and friends texted congratulations. Berg has been wearing a mask in public during the pandemic, but that didn't stop strangers from approaching him whenever he left his house. The volume of inbound messages grew by the day. Based on his unscientific gauge, he felt like he had a hit on his hands. Maybe his biggest ever.

"WE'RE LIVING IN A RADICALLY DIFFERENT TIME"

In April, Netflix Inc. said 85 million households watched *Spenser Confidential* in the first four weeks after its release, the third-largest film opening in company history. In comparison, about 76 million tickets were purchased to see 2018's *Black Panther* during its entire run in theaters in North America.

While rivals scoff at Netflix's metric, which counts anyone who watches at least two minutes, it's clear the company is satisfied. Berg and star Mark Wahlberg have signed on for a sequel, drawing again from Robert Parker's bestselling novels.

Spenser Confidential marked the start of the first summer season in history when all of the biggest blockbusters have opened online. With theaters shut down around the world, Netflix has released more than 30 movies since mid-March, drawing huge "crowds" with another action film, *Extraction*, starring Chris Hemsworth, as well as the comedy *The Wrong Missy*. *Extraction* has been viewed by more than 100 million households; *The Wrong Missy*, more than 60 million. Rival studios, meanwhile, have shifted movies once destined for theaters to their own streaming services or online rental, releasing *Trolls World Tour*, *Hamilton*, and *The King of Staten Island* that way.

Theater chains have dismissed this year as a one-off phenomenon because of the global pandemic. Studios are still eager to release big blockbusters such as the live-action *Mulan* and the new James Bond film in theaters. Christopher Nolan, the director of *Inception* and *The Dark Knight*, hopes to use his movie *Tenet* to reopen theaters in August. (Warner Bros. has already pushed back the release date twice.)

Yet with each streaming hit, many filmmakers and Hollywood executives are starting to believe this year has provided a glimpse into the future.

"We're living in a radically different time in terms of how people appreciate viewing content; whether that's good or bad, I don't know. It's just a real thing," Berg says. "There are people who've watched *Spenser* on their phones, on their iPads, on their computers, and on their TVs. For them it's been very satisfying." Once adamant that his movies play on the big screen, Berg observes that missing out on theaters this time "didn't really feel that relevant to me." He's working on two more projects with Netflix, including a documentary series about the Sackler family behind opioid maker Purdue Pharma LP.

It wasn't long ago that a director like Berg would have dismissed Netflix out of hand. Most filmmakers were initially reluctant to make movies for the internet, which felt like making a TV movie. (That's not a good thing.) When given the choice between Netflix and another studio, they typically pick the path that involves the widest release in theaters. The preference is both artistic and financial. Filmmakers want to see their work on the biggest screen possible—and they can make more money if they do. Robert Downey Jr. made $20 million upfront for *Avengers: Endgame*, according to *Deadline*, and $55 million more from his share of the profits. While Netflix might offer Downey more upfront for a movie, it doesn't pay any money on the back end.

But in the past few years, filmmakers have had a harder time getting anything made through the traditional system. Hooked on the profitability of comic book movies and sequels, major studios have closed their independent divisions and, save for Oscar season, all but given up on the midbudget drama.

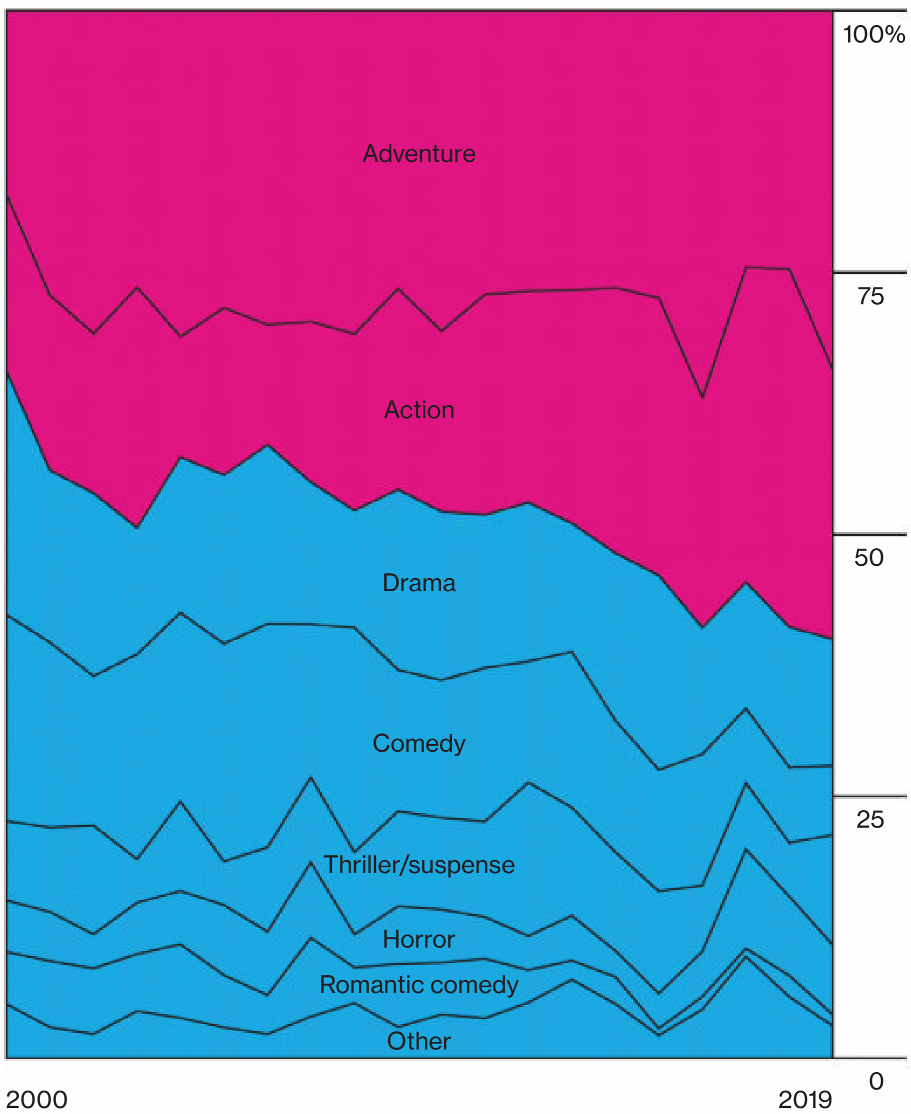
Even comedies have become a scarce commodity—the genre's share of annual ticket sales has plunged more than 50% since 2013, according to the movie-business data site the Numbers. All 10 of the highest-grossing films in the world last year were either comic book movies, sequels, or remakes—and only one of them was set in anything approaching the real world. (It was *Joker*.) "Outside of Marvel and *Star Wars*, it's becoming harder to get people in the cinema unless it's a big event," says Hemsworth, known to millions as Thor.

This created an opportunity for Netflix, which has been happy to make the movies other studios have forsaken. Its first original projects were low-budget, independent films, the kinds that premiere at festivals such as Sundance and Toronto. The service then expanded into comedies, both

WAHLBERG AND DUKE: COURTESY NETFLIX. DEVICES: ALAMY (8). DATA: THE NUMBERS

THE BIGGEST PIECE OF THE ACTION

Percentage of film ticket sales, by genre, since 2000



sophomoric (Adam Sandler's *The Ridiculous 6*) and romantic (*To All the Boys I've Loved Before*), before tackling serious drama with Alfonso Cuarón's *Roma* and Martin Scorsese's *The Irishman*—and giving filmmakers the kind of creative freedom they relish. Last year the company earned the most Oscar nominations of any studio, the first time a streaming service had done that. The list of movie stars and filmmakers working with Netflix this year includes George Clooney, David Fincher, Ron Howard, Meryl Streep, and Charlize Theron.

"It's one of the first places I've pitched things where studios might say, 'It's too much for us,' and [Netflix] says, 'Give us more,'" says Theron, who stars in *The Old Guard*. Based on a graphic novel about a team of immortal mercenaries, the movie was released to generally positive reviews on July 10. Once scheduled in between *Minions: The Rise of Gru* and *Tenet*, it now has the first half of July to itself. (Well, it's one of about 60 new films, shows, and specials to be released by Netflix this month. But most of the service's myriad projects aren't aimed for huge audiences or awards prestige.)

The trio of *Spenser Confidential*, *Extraction*, and *The Old Guard* is a watershed moment for Hollywood. Action movies anchored by stars usually rule the summer box office, having turned Tom Cruise, Will Smith, and Bruce Willis into global celebrities. Now it's the latest genre people expect to watch at home. "Those big-movie-star, big-actor-driven projects have really been hitting home," says Scott Stuber, the head of Netflix's film division. "Action is something we needed to move into as a big global company."

The breadth of films available at home keeps growing, and it seems clear this summer will accelerate a trend years in the making. Moviegoing in the U.S. and Canada sank to a 92-year low in 2019, when people averaged fewer than four films a year. Unwilling to surrender the other 48 weekends to Netflix, rivals Disney, Comcast, and AT&T have conceived slates of movies for their respective streaming services Disney+, Peacock, and HBO Max. Walt Disney Co. is making the sports drama *Safety* and the family drama *Clouds*, and HBO Max has filmed movies starring Streep and Seth Rogen.

The longer theaters stay closed, the more studios experiment with models, and the more customers get used to seeing new movies at home. ViacomCBS Inc., which previously sold many projects to Netflix, pulled its latest *SpongeBob Squarepants* movie from theaters and will release it for online rental before putting it on its streaming service, CBS All Access. Warner Bros. employed a similar strategy with *Scoob!*, which is on HBO Max. (AT&T Inc. owns both HBO and Warner Bros.) Comcast Corp.'s Universal Pictures has been the most aggressive in collapsing the lag time between when a movie appears in theaters and is available at home, and its success with *Trolls World Tour* and *The King of Staten Island* has convinced its leadership that this model is here to stay.

Not every filmmaker will embrace streaming. Nolan has said he will never work with Netflix, and Scorsese chose to stick with a more traditional release for his next project. Studios remain committed to giving their biggest movies a long run in theaters, and not just because theaters have threatened them if they don't. They can still make more money with certain projects from a full run in theaters. *Avengers: Endgame* earned $900 million for Disney, making it last year's most profitable film. Netflix didn't make that much as an entire company in any quarter of 2019.

But the number of movies that require a full three-month run in theaters is dwindling.

"Why do we make movies? We make it for an audience," says Gina Prince-Bythewood, director of *The Old Guard*. Like Berg, Prince-Bythewood was reluctant to work with Netflix at first. She wanted to see her movie on the big screen.

But she changed her mind when she considered the opportunity in front of her. Throughout her career, she's been told that people outside the U.S. don't want to see movies with Black stars. Two of her three previous films didn't even get a proper international release, and the third, *The Secret Life of Bees*, made 95% of its money in North America. Netflix released *The Old Guard* in more than 190 countries on the same day. "Ultimately," she says, "you want the biggest audience to see the work." Ⓑ

The No-Concerts, No-Theaters, No-Sports Guide to Culture for The Rest of 2020

The best new TV shows, books, video games, and more that you can experience via screens this fall
By Renata S. Geraldo, Lucas Shaw, and Maya Tribbitt
Illustrations by Tomi Um

For the Single Adult So Over Quarantine

SELENA GOMEZ'S COOKING SHOW
We're getting tired of cooking for ourselves, but what if you could make pasta with one of the world's most popular celebrities—and some famous chefs? *This summer on HBO Max*

FIFA 21
Soccer fans who can't play or attend games can get their fix with the latest version of the bestselling sports video game of all time. You can play with friends around the world for hours, without risk of the story ending or repeating. *Oct. 9 on PlayStation 4, Xbox One, and PC*

THE SCHOOL NURSE FILES
Korean TV dramas are wildly popular across Asia, but they are just starting to get their due in the U.S., thanks to streaming. *The School Nurse Files* is about a young nurse with the ability to see ghosts. She enlists the help of a teacher to exorcise evil spirits. If you like the show, the service has a growing trove of K-dramas to keep you occupied. *This fall on Netflix*

THE SEARCHER
Tana French, author of award-winning novels *In the Woods* and *The Witch Elm*, is back with a tale that combines two of her strengths: Ireland and crime. *The Searcher* follows a Chicago cop who moves to an Irish village that he thinks will provide a calm, tranquil new life. (Spoiler: It doesn't.) *Oct. 6*

MIDNIGHT SNACK
From Sirius XM host Michelle Collins, this hilarious biweekly podcast showcases talented comedians and examines love, dating, and other complexities of living single in a pandemic. *On all podcast platforms now*

VIRTUAL BLACK ROCK CITY
Although Burning Man was canceled, causing legions of burners to skip their annual trip to the playa, at least this year anybody can get a ticket—to whatever this turns out to be. *Late August through Sept. 7*

For Parents At Their Wits' End With Small Children

SESAME STREET
The most famous kids' TV show in the U.S. returns for a new season on a new service. Expect celebrity cameos from Billy Porter, Issa Rae, and Stephen and Ayesha Curry. *This fall on HBO Max*

PAPER MARIO: THE ORIGAMI KING
A twist on the classic *Super Mario Bros.* video game. This time the characters have become origami and are counting on Mario to save them from the Origami King. *On Nintendo Switch now*

CLASS ACT
A follow-up to *New Kid*, the first graphic novel to earn the Newbery Medal, Jerry Craft's *Class Act* audiobook features a young student discussing being one of the few kids of color at a ritzy private school. *Oct. 6*

NIGHT LIFE
Sarah Lovell's just-released children's album is billed as a collection of lullabies, but you and the tots will be bopping to *I Don't Want to Go to Bed* all day long. And there's the soulful *Lullaby for Grownups* for when you need a break. *On Spotify now*

For the Political Junkie Counting the Days to Nov. 3

THE TRIAL OF THE CHICAGO 7
Aaron Sorkin wrote and directed this dramatization of the protests outside the Democratic National Convention in 1968 and the subsequent trial, when seven leaders of the antiwar movement were charged with conspiracy. *This fall on Netflix*

THE COMEY RULE
A miniseries starring Jeff Daniels and based on former FBI Director James Comey's best-selling book, *A Higher Loyalty*, will offer plenty of debate fodder before the election. *Sept. 27 on Showtime*

HIS VERY BEST: JIMMY CARTER, A LIFE
Carter is our only living one-term president. Sound like something you'd want to read about? Jonathan Alter's new biography promises to offer a fresh look at a familiar face. *Sept. 29*

BOYS STATE
One of the biggest sales at this year's Sundance Film Festival was a documentary about teens trying to build a new kind of representative government at Texas' Boys State leadership conference, run by the American Legion. Can they fix democracy? *Aug. 14 on Apple TV+*

For Students Stuck at Home

CAROUSEL
Thanks to the New York Philharmonic, drama majors can view this Rodgers & Hammerstein classic without leaving the couch. *July 10 to Sept. 8 on Lincoln Center at Home*

BERLIN PHILHARMONIC'S SEASON-OPENING CONCERT
For an eminently reasonable subscription fee starting at €9.90 ($11), viewers can stream live events from arguably the world's best orchestra, and that includes the first concert of its season. Led by conductor Kirill Petrenko, the performance features music by Mendelssohn, Brahms, and Webern. Make sure you've got good speakers. *Aug. 28*

THE 99% INVISIBLE CITY: A FIELD GUIDE TO THE HIDDEN WORLD OF EVERYDAY DESIGN
A gift to liberal arts majors around the world, from the creators of *99% Invisible*. Like the popular podcast, the book (and accompanying audiobook) will shed light on the overlooked urban minutiae—power grids, graffiti tags, drinking fountains, wacky waving inflatable arm-flailing tube men—that make a city a city. If you like the book, you have about 400 episodes to keep you occupied. *Oct. 6*

FRIEZE ART FAIR
As with Art Basel in Switzerland, the U.K.'s premier contemporary art fair has been canceled. But while galleries can't showcase art in tents in London's Regent's Park, Frieze's robust online sales platform will mean billionaires can still buy pieces from the comfort of their homes and the rest of us can browse the latest the art market has to offer. *Oct. 7*

***PEN15*, SEASON TWO**
The best middle-school comedy on TV right now is a good study break, work break, or anything break. Maya Erskine and Anna Konkle star as teenage versions of themselves. *Sept. 18 on Hulu*

CYBERPUNK 2077
This open-world, action-adventure video game follows V, a corporate hacker/nomad/street kid—you choose!—navigating California following an economic disaster. Now her (or his) reality is filled with gangs and violence. (An animated series from Netflix is in the works.) *Nov. 19 on all major gaming platforms*

ENERGY
The new album from the electronic music duo Disclosure can be the soundtrack to your Zoom party. It might not be as loud as your local bar or dorm party, but it won't be as sweaty, either. *Aug. 28*

For the Budding Black History Scholar

LOVECRAFT COUNTRY
A young Black man travels across the 1950s Deep South in search of his father and finds human violence and actual monsters along the way. Produced by Jordan Peele (*Get Out*, *Us*) and J.J. Abrams (*Star Wars*), the series is based on a novel and connects the cosmic horror of H.P. Lovecraft and racism in the U.S. during the Jim Crow era. *Aug. 16 on HBO*

GENIUS: ARETHA
One of two projects about the late Queen of Soul, this TV miniseries stars Oscar nominee Cynthia Erivo as Aretha Franklin and examines the singer's role in defining the music of Black America. Academy Award winner Jennifer Hudson tackles the role in *Respect*, scheduled for Christmas Day. *This fall on National Geographic*

BLACK IS KING
Based on *The Lion King* (2019) soundtrack, Beyoncé's new visual album (à la *Lemonade*) is a celebration of Black excellence and culture. *July 31 on Disney+*

ALL RISE
Gregory Porter, one of the great jazz vocalists of our era (and a favorite of Michelle Obama's), drops his new album. *Aug. 28*

WOKE
A comedy inspired by the life of artist Keith Knight and his autobiographical comic strip *The K Chronicles* is a biting take on race, politics, and current events. The show was created by Knight and Marshall Todd, who co-wrote *Barbershop*. *Sept. 9 on Hulu*

CASTE: THE ORIGINS OF OUR DISCONTENTS
After chronicling the great migration of Black Americans to the North, Pulitzer Prize winner Isabel Wilkerson now tackles racism intrinsic to our social caste system. *Aug. 4*

A Two-Act Play

This fall, Microsoft and Sony will release dueling consoles. The technology is similar, but their aggressive sales tactics couldn't be more different. *By Jason Schreier*

Silicon Valley's richest titans have tried to conquer the $150 billion video game industry—and so far failed. Last fall, Google introduced what it billed as a console-killing streaming service, Stadia. Apple Inc., meanwhile, has attempted to build a "Netflix for iPhone games" with its $5-per-month, all-you-can-play Arcade. Amazon.com Inc. has been investing in gaming, too, for more than six years, only to see its initial PC and console offerings flop.

When the video game story of 2020 is written, it will look very much like it has for the past two decades: Redmond, Wash., vs. Tokyo, as Microsoft Corp.'s Xbox and Sony Corp.'s PlayStation battle it out again.

This fall, all signs point to the next iterations of their platforms being hits. A June reveal of Sony's forthcoming PlayStation 5 has already drawn almost 28 million views on YouTube; a vague teaser for Microsoft's *Halo Infinite*, which it will release alongside the new Xbox Series X, has more than 100,000 likes on Twitter. (Nintendo Co., the other major console manufacturer, said it doesn't plan to sell new hardware this year.)

Consoles are typically released every six or seven years. Sony was the big winner last time, selling more than 110 million PlayStation 4s since its debut in 2013. At $400, it was $100 cheaper than the Xbox One, giving it momentum that Microsoft couldn't match even after it met the PS4 price in 2014. The discrepancy grew so large that by the end of 2015, Microsoft said it would stop reporting Xbox sales, telling investors it would instead focus on monthly users and engagement. (In 2016 an executive at publisher Electronic Arts Inc. said Sony had sold 36 million PS4s, while the Xbox One hovered at about 19 million, a disparity that analysts estimate has grown over time.)

Now, Microsoft has a chance to flip the script. The Series X will have a more powerful graphics processing unit than the PlayStation 5—the shorthand that game companies use is "teraflops," a way of measuring computing performance. (The Series X will have 12 teraflops; the PS5, 10.28.) The company has also spent the past two years acquiring development studios to compete with Sony's library of games such as the treasure-hunting adventure *Uncharted* and comic book staple *Spider-Man*.

Neither brand has disclosed prices, but Doug Clinton, a managing partner for venture capital company Loup Ventures LLC, wouldn't be surprised if Microsoft undercuts the PS5: "They lost the last two cycles, and they don't generate meaningful profit from the console. The early winner usually compounds over time thanks to network effects." Clinton expects each to sell 3 million to 4 million units by the end of the year, in line with the previous generation's figures. Most big releases from third-party publishers, including this fall's *Assassin's Creed: Valhalla* and *Marvel's Avengers*, will be available on both. But there are some key strategic differences.

SONY'S PLAN:
BIG EXCLUSIVES

Most video games are released on as many platforms as possible to reach the widest audience. *Call of Duty* comes out every fall on PlayStation, Xbox, and PCs, helping it break annual

12
"teraflops"

The measurement shorthand for computing performance in the Xbox Series X

Halo Infinite

MICROSOFT'S PLAN:
XBOX ANYWHERE

Unlike the PS5, the Xbox Series X won't have exclusives. Microsoft has taken the opposite approach and put its games wherever people want to play. *Sea of Thieves*, *Gears 5*, and other sales records. The latest, *Call of Duty: Modern Warfare*, brought in more than $1 billion in its first two months, according to parent company Activision Blizzard Inc.

Sony, however, has traditionally paid internal and external developers to make games only for the PlayStation, a strategy that limits its audience but forces players to adapt to its hardware. That worked wonders with the PS4 because critically acclaimed releases such as the open-world role-playing game *Horizon Zero Dawn* and the action game *God of War* each sold more than 10 million copies.

The Japanese tech giant appears to be taking the same approach for the PS5. During a digital event in June, it unveiled a sequel to *Horizon Zero Dawn* and a remake of the PS3 classic *Demon's Souls*, among others. Sony has implied they'll be exclusive to the PS5, which would require die-hards to buy a new console to play them.

The design, which resembles an alien artifact, also stands in contrast to Microsoft's basic black box. It will include a powerful computer processor for bigger, more beautiful worlds and be available with or without a disc drive, reflecting the rapid growth of digital options. (Sony said in 2019 that more than 50% of its customers were buying games digitally.)

The PS5 will also have a solid-state drive, an upgrade from traditional hard drives that allows data to load more quickly.

Marvel's Spider-Man: Miles Morales

110m

PlayStation 4 consoles sold since 2013

big titles were available on Xbox and PCs. The run-and-gun-style *Cuphead*, which has sold 5 million copies in two years, was released on the Nintendo Switch and even in Teslas.

This fall's big Series X title will be *Halo Infinite*, the latest entry in the multiplayer sci-fi series that's sold more than 65 million copies. But you'll also be able to get it on PCs and even on the old Xbox One. Microsoft is also expected to announce a lower-powered version, the Series S, for the budget-minded.

The company appears to be ceding the console advantage to Sony and doubling down on services. "The business isn't how many consoles you sell," Phil Spencer, Xbox executive vice president for gaming, told the *Verge* last year. "[It's] how many players are playing the games they buy."

Many companies have set out to develop the "Netflix of video games," but a close analogue already exists: the Xbox Game Pass, a Microsoft-driven service that, for $10 a month, offers more than 300 games, including the racing series *Forza*, *NBA 2K20*, and *Lego Star Wars*. Microsoft also tends to put its own games, such as this year's *Minecraft Dungeons*, on the service at once, saving subscribers from buying $60 titles.

Game Pass seems to be one of Xbox's biggest strengths. In April the company announced the service had surpassed 10 million subscribers.

COURTESY COMPANIES

Happy Little Trees

To soothe pandemic anxiety, check out the tutorials of Ryan Neil, the Bob Ross of bonsai

By Heather Arndt Anderson

Ryan Neil talks about trees as if they are a source of ancient metaphysical power. He doesn't grow them; he "engages" with them. He talks about "utilizing" them. He's not a destination man; this is all about the journey.

Operating out of St. Helens, Ore., Neil is the founder of Bonsai Mirai LLC. The company sells a few trees on request, but its primary mission is to service those who already participate in the 800-year-old Japanese art of carefully guiding tiny trunks, by pruning and training, to grow into the wizened old trees they were meant to be.

On its site, there's a $72 pair of concave cutters for trimming your specimen next to a $3,285 ceramic pot that mimics a pocked slab of raw basalt. The company can pack up and move a bonsai with all the precaution of transporting a painting, and it offers a boarding program in case you need someone to plant-sit your prized Rocky Mountain juniper while you're away.

But the best service it provides are Neil's oddly compelling, members-only, how-to videos, available via subscription (from $18 a month). On camera, Neil looks like a friendly neighbor with big arms and short-cropped silvering hair, the sort of slightly bro'd-out guy with whom you might swap home brewing tips. He has the charisma of a motivational speaker, but instead of teaching you how to create a growth mindset, he breezily discusses "vascular productivity"—that is, the development of a tree's stems and branches—and "foliar mass," or how many leaves and needles it has.

In a recent tutorial on how to properly defoliate a bald cypress, he waxed poetic about the importance of trimming during the tree's "energy-positive state"—his name for the active growth period in early summer—over the calming *snip-snip-snip* of pruning shears.

Full disclosure: I do have degrees in forestry and botany and can keep up with the science. But even a novice can follow along as Neil spends a full minute discussing the springtime movement of phloem inside the trunk of deciduous species. And he doesn't take himself too seriously: He uses big hand movements and a *whoosh!* sound effect to describe the shape of a tree's growth. He'll drop Latin names such as *Metasequoia glyptostroboides* but then describe its buds as "little green BBs."

Watching him on my laptop talk about coaxing the hidden personality out of a potted azalea—one of two videos devoted to the plant—I began to feel the precise mood-stabilizing effect I associate with old PBS videos like *The Woodwright's Shop* or a painting session with Bob Ross. Amid a pandemic, I'd begun to see screens as an IV drip of anxiety. And yet here was a gateway to relaxation, an antidote to my helpless doomscrolling over the past few months: unambiguous in a time of uncertainty, authoritative in a year when no one has any answers.

Pretty soon I was bingeing two-minute episodes on my phone as part of a beginner series on soil. Who knew that the sight of gravel being gently pressed with a bamboo pick into the interstices of the roots could be so utterly mesmerizing?

I moved to longer, more advanced episodes. A two-hour deep dive on "pomegranate styling" gave me a better idea about how to arrange branches, but Neil also made the point that our quest for the perfect shape shouldn't blind us to a tree's true form. You can't force a pomegranate to grow like a pine, after all.

Like many traditional Japanese art forms, bonsai is fairly prescriptive, and it's susceptible to a rigid adherence that can make it feel inaccessible to outsiders. During the bald cypress tutorial, Neil had talked about "going solid akadama," a seemingly unheard-of technique that uses a certain granular claylike mineral as its only soil. He admitted that it was "controversial" not to blend akadama with pumice or granite or another common nutrient. But he sidestepped any drama by saying growers should have the freedom to experiment with what works for their conditions or environment, as opposed to a slavish devotion to dogma.

I found myself suddenly desperate to live in a world where the biggest controversies are about whether bonsai should be grown in a 100% red clay substrate, or whether a rough-hewn ceramic container really is the best way to showcase an aspen.

More than with any meditation app, I felt guided into a sort of Zen acceptance that although real growth might come at a glacial pace, it's still important to express ourselves in the meantime. It doesn't always take a firm hand to achieve our potential. Or, as Neil puts it: "Gotta let a tree be a tree." B

ILLUSTRATION BY BRANDON CELI

Throne of Games

With a SecretLab Omega 2020, the ergonomics of play elevate your home office

Photograph by Janelle Jones

Chances are, if you don't already have a "gaming chair," it's an item you've either long obsessed over getting—or didn't know existed. Designed to deliver comfort and posture support for video game fanatics who spend hours a day sitting down, these chairs have become increasingly posh since car seat manufacturer DXRacer USA marketed a racing-inspired version in 2006. Several companies specialize in them now, and the popular Omega chairs from Singapore-based SecretLab are available in 24 colors and variations, including "Dark Knight" for Batman lovers and the *Game of Thrones*-inspired "House Lannister." The Omega 2020 comes in black nappa leather (pictured, from $749). It's a great tool for gamers—or, for that matter, anyone who's been working from home.

THE COMPETITION

• The GTRacing Gaming Chair ($176) is made from cheaper materials but is similar in style to the Omega and comes with built-in Bluetooth speakers. Aficionados are divided on the value of this amenity, since they can't match the quality of a good roomwide sound system. But it's a neat trick for when friends are over.

• If you want a cushy perch that can double as an executive hub, the Noblechairs Icon Black (€580, or $655) doesn't scream, "I wish I were in a race car!" like many other gaming chairs.

• Herman Miller, the manufacturer behind midcentury Noguchi tables and Eames loungers, is partnering with software maker Logitech Inc. The new seats, based on its Embody series of task chairs that are beloved by gamers, will be available this fall, price TBA.

THE CASE

Gaming chairs are high-backed and built to support the upper back and shoulders—something most office chairs neglect. Giving those muscles a break can actually encourage you to sit straighter, more comfortably, and for longer. Plus, the Omega comes with additional lumbar and head cushions that are super squishy and can be adjusted to wherever you need them. Sculpted indentations around the elbows allow for freer arm movement as well, whether you're playing *Halo* with friends at midnight or clutching your coffee during a Zoom meeting at 8 a.m. Or both. *$749; secretlab.co*

The NCAA Keeps Blocking Athlete Pay

By Joe Nocera

ILLUSTRATION BY GEORGE WYLESOL

NCAA Athletic Grant-in-Aid Cap Antitrust Litigation

Case # 19-15566

● Aren't college athletes also allowed to get money for endorsements and autographs? A number of states have passed so-called name, image, and likeness bills that would eventually allow the practice. But the NCAA has gone to Congress, seeking legislation that would put it in control of the process—and minimize what athletes will get.

● Have benefits for athletes improved since O'Bannon? Yes. Scholarship athletes now get a check for what's called the "full cost of attendance"—the difference between the scholarship and what college really costs, with books, fees, and the occasional pizza. At the University of Alabama, that amounts to $6,564 per school year.

❶ THE ORIGIN Since the 1950s, the National Collegiate Athletic Association has insisted that amateurism–the idea that college athletes play for the love of sports, not for money–was what made intercollegiate athletics unique. If players were paid, the association claimed, fans would turn against college sports and competition would be diminished. In antitrust terms, the NCAA thus contended that amateurism was "procompetitive."

❷ THE PRECEDENT In 2009 an antitrust lawsuit was filed in California against the NCAA. The plaintiffs, led by former UCLA basketball star Ed O'Bannon, argued that the NCAA was illegally suppressing the wages of the players and that the association's amateurism rules were anticompetitive and hence illegal. The NCAA dragged the case out for years, but it was finally tried in 2014. The trial judge, Claudia Wilken, agreed with O'Bannon. But she also put restrictions on how much athletes could get. The U.S. Court of Appeals for the 9th Circuit later ruled that any benefit an athlete received had to be "related to education." The NCAA quickly moved to cap those benefits.

❸ THE CASE The current case was filed in March 2014. Its goal was to get Wilken to eliminate all limits on athlete compensation–to move college sports to a free market. Again, the NCAA filed various delaying motions. Again, it took five years before the trial began. And again, Wilken ruled mostly for the plaintiffs. She issued a permanent injunction to prevent the NCAA from restricting education-related compensation.

❹ THE APPEAL Did the NCAA appeal? Of course! At a March 2020 hearing, it argued that without caps, players could get lavish benefits such as cars, trips abroad, and highly paid internships at Nike. The 9th Circuit didn't buy it, ruling in May that Wilken had it right. But unpaid college athletes won't be getting more benefits anytime soon. On July 7, the NCAA told the 9th Circuit that it planned to appeal to the Supreme Court. In football terms, that's what they call a Hail Mary. Ⓑ —*Nocera is a columnist for Bloomberg Opinion*

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