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Out of the ashes of Notre Dame

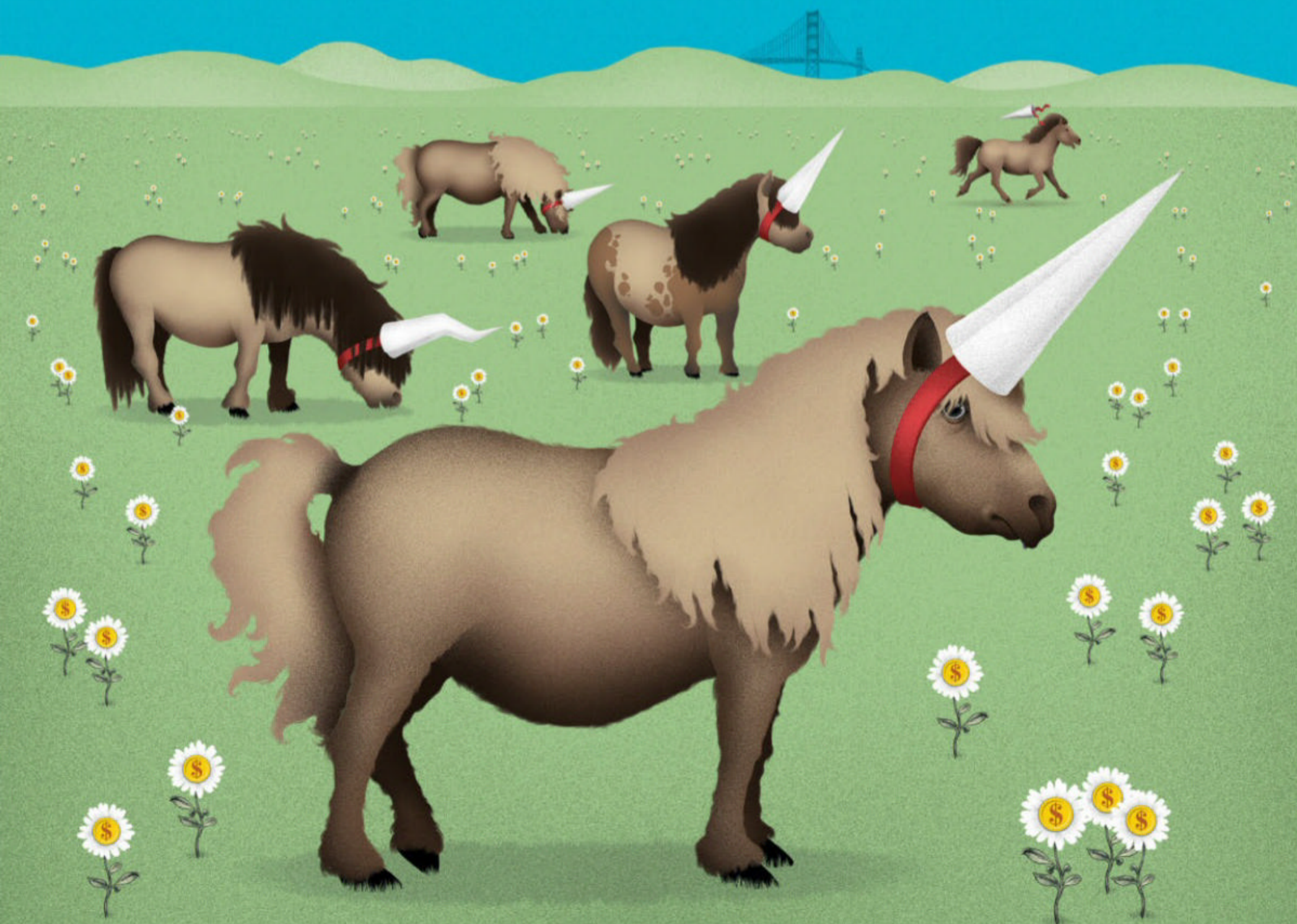
Buttigieg: unpronounceable. Electable?

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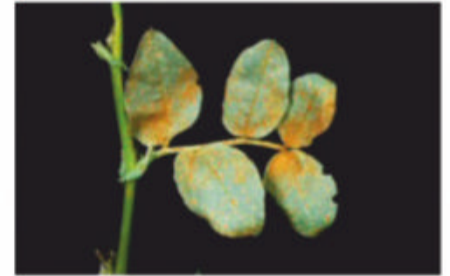
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Notre Dame, a medieval cathedral immortalised by Victor Hugo, Hollywood and innumerable tourist selfies, caught fire. More than 400 firefighters brought the blaze under control, but the roof is gone, and with it the spire. The interior damage is extensive, but many artefacts and relics, including a supposed part of Jesus's crown of thorns, were saved. Emmanuel Macron, the French president, visited the site and vowed that the cathedral will be rebuilt. Two French billionaires pledged a total of €300m (\$340m) towards that effort.

The Finns Party, an anti-immigrant outfit, won 17% of the vote in **Finland's** election. Other parties do not want to work with it. The winning Social Democrats will try to form a government without it.

Britain pondered what to do with **Julian Assange**, a co-founder of WikiLeaks. America wants him extradited for conspiring to help a soldier hack a classified computer network, with the intention of publishing military secrets. Sweden may also want him: a woman who says he raped her has asked prosecutors to reopen the case. He also faces jail in Britain for jumping bail.

Nigel Farage, one of the prime movers behind Britain's referendum on leaving the EU in 2016, launched a **Brexit Party** to fight next month's European elections. Change UK, a group of Labour and Conservative defectors who are pushing for a second referendum in the hope

of cancelling Brexit, received approval from the Electoral Commission to form a party.

The strongman gets stronger
Egypt's parliament passed constitutional amendments that would allow President Abdel-Fattah al-Sisi to rule until 2030. Mr Sisi, a former general, was re-elected in 2018 with 98% of the vote. Other changes would give the president control over judges and increase the army's political power. The amendments will now be put to a referendum.

The African Union threatened to suspend **Sudan**, following a military coup that deposed Omar al-Bashir, who had ruled for more than three decades. The AU gave the generals who now run the country 15 days to hand power to civilians.

Seven soldiers were killed in **Chad** in an attack on an army base by Boko Haram, a jihadist

group that has displaced more than 2m people in neighbouring Nigeria.

No escape
Spain arrested Hugo Carvajal, a former head of **Venezuela's** military intelligence service, after America asked for his extradition. He had defected and called on the army to stop supporting Venezuela's dictator, Nicolás Maduro. His arrest on drug-trafficking charges may discourage other bigwigs from abandoning Mr Maduro, thus impeding America's goal of removing him.

The natural history museum in New York decided not to provide the venue for a gala honouring **Brazil's** president, Jair Bolsonaro. Environmentalists, outraged at his plan to open up Brazil's rainforest to mining, had objected.

The United Conservative Party won an election in the oil- ▶▶

We see possibilities in ultra-fast EV charging

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▶ producing Canadian province of **Alberta**. The incoming premier, Jason Kenney, is expected to abolish the province's tax on carbon emissions and to challenge the federal policy of imposing a carbon price on provinces that do not have their own.

"A non-starter"

Nancy Pelosi, the Speaker of America's House of Representatives, warned the British government that there would be "no chance whatsoever" of a **free-trade deal with America** if Brexit caused any disruption to the two-decade-old Anglo-Irish peace agreement. The peace deal depends on an open border between Northern Ireland and the Republic of Ireland—something EU membership conveniently supplied.

Donald Trump blocked a bipartisan resolution in Congress to end American military aid to Saudi Arabia in the **Yemen**

war. It was only the second veto of his presidency.



Pete Buttigieg officially launched his campaign to be the Democrats' presidential candidate. Mr Buttigieg has surprised primary watchers by running well against better-known rivals in the party's crowded field of nominees, quite an achievement for the mayor of South Bend, Indiana.

The first challenger to Donald Trump emerged for the Republican nomination. The long-shot bid is from **William Weld**, a moderate and former go-

vernor of Massachusetts. Mr Trump raised \$30m for his campaign in the first quarter, rivalling the combined amount of the top two Democrats.

It's that time of the year

In **Afghanistan** the Taliban launched a spring offensive against the government, which recently began its own offensive against the jihadists. This came despite the progress in peace talks between America and the Taliban.

Terry Gou, the boss of Foxconn, which assembles iPhones for Apple, said he would run for president in **Taiwan**. He is seeking the nomination of the Kuomintang party, which is friendlier to China than the ruling Democratic Progressive Party. Foxconn has many factories in China.

Both Donald Trump and Kim Jong Un mused publicly about another summit to discuss

North Korea's promise to relinquish nuclear weapons and long-range missiles in exchange for security guarantees and aid.

Malaysia agreed to resume construction of a high-speed rail line after the Chinese consortium building it cut the price. Malaysia's new government had cancelled the project last year, saying the country could not afford it.

Some 300 people gathered at a monument in eastern **China** to mark the death of Hu Yaobang, a liberal-minded Communist Party chief whose funeral in 1989 triggered the Tiananmen Square protests.

Only three **turtles** of the Yangzi giant softshell species are known still to be alive after the death of one in China. The female, aged over 90, died in the city of Suzhou at a zoo which still has a male softshell turtle aged over 100.

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Chevron agreed to take over **Anadarko** in a \$49bn deal. The acquisition expands Chevron's shale-oil assets in America's Permian basin, where Anadarko is a leading independent operator. It also gains a huge liquefied-natural-gas project in Mozambique. Big oil companies have been increasing their shale production targets, adding to the pressure on smaller, independent outfits to consolidate.

Friends again

Following years of costly litigation, **Apple** and **Qualcomm** settled their dispute over royalties and reached a six-year licensing agreement. Their quarrel had revolved around patent fees for the use of Qualcomm's chips in Apple's iPhone. While the dispute dragged on, Apple had switched to Intel to supply it with chips, but Intel had encountered problems designing chips for next-generation 5G phones and now plans to exit that business.

Investors pored over **Uber's** prospectus, which it released ahead of its forthcoming IPO. Overall revenues hit \$11.3bn last year, though growth is slowing at Uber's core ride-hailing service. Uber Eats, its food-delivery service, accounted for 13% of sales, a big jump from the previous year. Uber is aiming for a \$100bn stock-market valuation, which would make it the biggest flotation in five years.

German prosecutors charged **Martin Winterkorn** with "particularly serious" fraud relating to the emissions-cheating scandal at Volkswagen that happened during his time as chief executive. Mr Winterkorn resigned soon after the scandal broke in 2015. He has been indicted in America on similar charges but is unlikely to face trial there. The German authorities want him to return some of his pay, and he could face up to ten years in prison, making this one of the gravest legal cases brought against a German executive.

Volkswagen unveiled an electric SUV that it will build in China from 2021, stepping up its production of zero-emission vehicles to take on Tesla in the world's biggest car market. vw described its new car as "a lounge on wheels".

America's big banks reported earnings for the first three months of the year. JPMorgan Chase made a net profit of \$9.2bn, a record for the bank. A strong showing in consumer lending drove Bank of America's net income of \$7.3bn. Citigroup's \$4.7bn profit was boosted by investment banking. And Wells Fargo, which is trying to put a series of scandals behind it, saw its income rise by 16% compared with the same three months last year, to \$5.9bn, thanks to one-off gains. Profit at Goldman Sachs dropped by a fifth, to \$2.2bn, as trading revenues tumbled.

UniCredit's parent company and the Italian bank's German and Austrian subsidiaries reached a settlement with American regulators for violating sanctions against Iran, Libya and other countries between 2002 and 2011. The banks will pay a \$1.3bn fine. The German subsidiary also pleaded guilty to steering at least \$393m through the Amer-

ican financial system on behalf of sanctioned entities. It is the second big penalty for sanctions-busting recently, following a \$1.1bn fine slapped on Standard Chartered.

The **Chinese economy** grew by 6.4% in the first quarter, year on year. That was a bit better than markets had expected, possibly reflecting the easing of trade tensions between America and China. The negotiations on a deal to resolve that conflict are in their final stages.

Publicis undertook the biggest acquisition in its 93-year history when it agreed to buy **Epsilon**, a digital-marketing agency, for \$4.4bn. The deal goes some way in helping the French advertising group, which counts Saatchi & Saatchi among its assets, to meet the challenge posed by Google, Facebook and other online-advertising platforms.

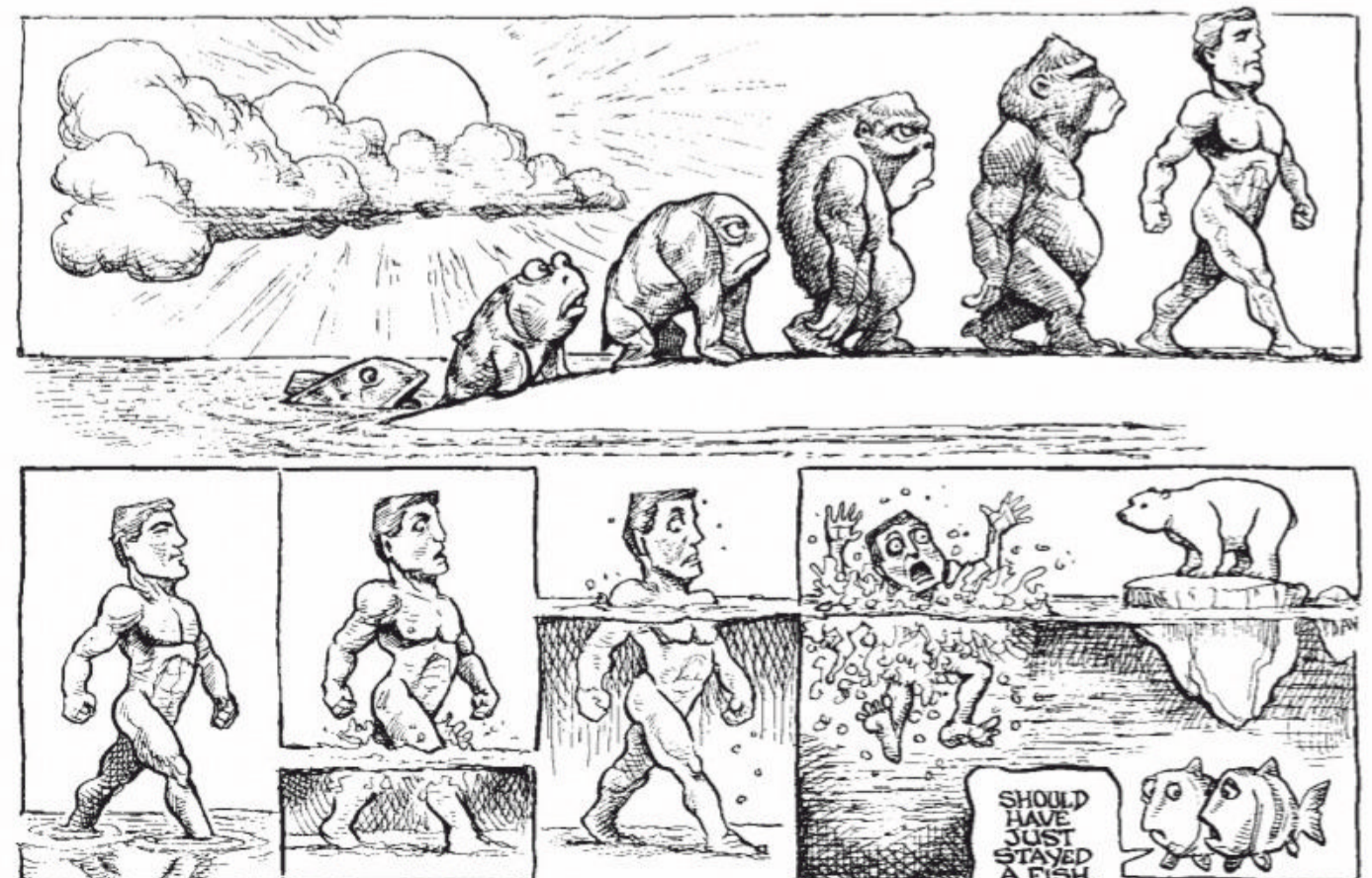
Jet Airways' share price plunged amid reports that it would have to cease all operations. The Indian airline is beset by a funding crisis that has left some staff unpaid since December and led to its aircraft being seized by creditors. It recently cancelled all its international flights.

The ripples from the grounding of Boeing's 737 MAX aircraft following two fatal crashes continued to be felt across the **airline industry**. American Airlines cancelled all flights on MAX jets until mid-August (it had hoped to find substitute planes). That came after Southwest, which has the largest fleet of MAX aircraft, extended its flight cancellations.

The wonderful world



Disney took the wraps off its new video-streaming service, entering a market dominated by Netflix and Amazon. **Disney+** will launch in November in America and in later months worldwide. It will feature Disney's own rich catalogue of films, as well as the Marvel, Pixar and Star Wars franchises, and cost half as much as Netflix. Disney is clearly no dumbo when it comes to price wars.



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The trouble with tech unicorns

Millions of users, cool brands and charismatic bosses. Tech's latest stars have everything—except a path to high profits

INVESTORS OFTEN describe the world of business in terms of animals, such as bears, bulls, hawks, doves and dogs. Right now, mere ponies are being presented as unicorns: privately held tech firms worth over \$1bn that are supposedly strong and world-beating—miraculous almost. Next month Uber will raise some \$10bn in what may turn out to be this year's biggest initial public offering (IPO). It will be America's third-biggest-ever tech IPO, after Alibaba and Facebook. Airbnb and WeWork could follow Lyft, which has already floated, and Pinterest, which was set to do so as *The Economist* went to press. In China, an IPO wave that began last year rumbles on. Thanks to fashionable products and armies of users, these firms have a total valuation in the hundreds of billions of dollars. They and their venture-capital (vc) backers are rushing to sell shares at high prices to mutual funds and pension schemes run for ordinary people. There is, however, a problem with the unicorns: their business models.

As we report this week, a dozen unicorns that have listed, or are likely to, posted combined losses of \$14bn last year. Their cumulative losses are \$47bn (see Briefing). Their services, from ride-hailing to office rental, are often deeply discounted in order to supercharge revenue growth. The justification for this is the Silicon Valley doctrine of “blitzscaling” in order to conquer “winner-takes-all” markets—or in plain English, conducting a high-speed land grab in the hope of finding gold.

Yet some unicorns lack the economies of scale and barriers to entry that their promoters proclaim. At the same time, tighter regulation will constrain their freedom to move fast and break things. Investors should demand lower prices in the IPOs, or stay away. Tech entrepreneurs and their backers need to rethink what has become an unsustainable approach to building firms and commercialising ideas.

Today's unicorn-breeding industry would not have been possible 25 years ago. In 1994 only \$6bn flowed into vc funds, which doled out cheques in the single-digit millions. Before Amazon staged its IPO in 1997 it had raised a total of only \$10m. Three things changed. Growing fast became easier thanks to cloud computing, smartphones and social media, which let startups spread rapidly around the world. Low interest rates left investors chasing returns. And a tiny elite of superstar firms, including Google, Facebook and China's Alibaba and Tencent, proved that huge markets, high profits and natural monopolies, along with limited physical assets and light regulation, were the secret to untold riches. Suddenly tech became all about applying this magic formula to as many industries as possible, using piles of money to speed up the process.

Make no mistake, the unicorns are more substantial than the turkeys of the 2000 tech bubble, such as Pets.com, which went bust ten months after its IPO. Ride apps are more convenient than taxis, food delivery is lightning quick, and streaming music is better than downloading files. Like Google and Alibaba, the unicorns have large user bases. Their core businesses can avoid owning physical assets by outsourcing their IT to cloud providers. As IPO documents point out, their sales are growing fast.

The big worry is that their losses reflect not temporary growing pains but markets which are contested and customers who are promiscuous. In the key digital monopolies, the network becomes more valuable to each user the more people use it—hence Facebook's 67% market share in social networking. The unicorns' dynamics are not as compelling. Despite subsidies, ride-sharing customers are not locked in to one firm. No wonder Lyft's shares have fallen by over 20% below their IPO price. Anyone can lease an office and rent out desks, not just WeWork. Some unicorns have to fight other richly funded rivals and established firms. Spotify, which listed in 2018, has a 34% share of music streaming in America and is going head-to-head with Apple.

Because the unicorns' markets are contested, margins have not consistently improved, despite fast-rising sales. Managers are terrified of cutting their vast marketing spending, for fear of losing customers. Many firms are scrambling to develop ancillary products to try to make money from their users. And without deep moats around their businesses a permanent question-mark hangs over the unicorns: if Uber really is worth \$100bn, after investing only \$15bn or so, why wouldn't its rivals keep trying their luck, or an established tech giant be tempted in?

External forces will make blitzscaling harder, too. The earlier generation of firms did not face many rules—few legislators had imagined the internet—so they could charge ahead first and beg forgiveness later. The unicorns followed suit: Airbnb sidestepped taxes on hotels and Uber drove through regulations on taxi-licensing. Today a reaction is in full swing, including over digital taxes and data and content laws. The unicorns' investor circulars have pages dedicated to their legal dangers and gory regulatory risks.

All this is good for consumers. Money is being thrown at them; the subsidy to the public from the dozen firms amounts to \$20bn a year. Whereas the commanding heights of the tech industry, such as search and social media, have been monopolised, the unicorns are at least creating competition in other areas.

Investors, meanwhile, need to hold their nerve. It is tempting to extrapolate the triumph of Google and Alibaba to an entire new group of firms. In fact, most unicorns face a long war of attrition and soggy margins. Eventually, struggling firms may be bought. And here another risk arises: most unicorns cap outside investors' voting rights (Uber is an exception), and many have “poison pills” too, making takeovers hard and constraining investors' ability to intervene if the firms do not eventually find a way to make enough profits to justify their IPO valuations.

And what of Silicon Valley and China's bustling tech hubs, where the unicorn idea was dreamed up? Billions of dollars are flowing to vcs, tech founders and employees. The familiar question is how many luxury homes, philanthropic vanity projects and personal space programmes they will pay for. The urgent question is how this capital will be recycled into new technology firms. The blitzscale philosophy of buying customers at any price is peaking. After the unicorns, a new and more convincing species of startup will have to be engineered. ■



Notre Dame

The human spark

It is not wrong to care more about a building than about people

“WHAT IS CIVILISATION?” asked Kenneth Clark 50 years ago in the seminal BBC series on the subject. “I don’t know, and I can’t define it in abstract terms, yet. But I think I can recognise it when I see it, and I’m looking at it now.” And he turned to gesture behind him, at the soaring Gothic towers and flying buttresses of Notre Dame.

It seems inhuman to care more about a building than about people. That the sight of Notre Dame going up in flames (see Europe section) has attracted so much more attention than floods in southern Africa which killed over 1,000 arouses understandable feelings of guilt. Yet the widespread, intense grief at the sight of the cathedral’s collapsing steeple is in fact profoundly human—and in a particularly 21st-century way.

It is not just the economy that is global today, it is culture too. People wander the world in search not just of jobs and security but also of beauty and history. Familiarity breeds affection. A building on whose sunny steps you have rested, in front of which you have taken a selfie with your loved one, becomes a warm part of your memories and thus of yourself. That helps explain why China is in mourning—WeChat, young China’s principal means of talking to itself, has been throbbing with the story, and Xi Jinping, the country’s president, sent a message of condolence to Emmanuel Macron, his French counterpart—while India was largely indifferent. Tourism from India to the West is a trickle compared with the flood from China.

This visual age has endowed beauty with new power, and social media have turned great works of art into superstars. Only a few, though, have achieved this status. Just as there is only ever a handful of world-famous actors, so the pantheon of globally recognisable cultural symbols is tiny: the Mona Lisa (see Books & arts section), Michelangelo’s David, the Taj Mahal, the Great Pyramid—and Notre Dame. Disaster, too, is visual. In the 24 hours after the fire started videos on social media of the burning cathe-

dral were viewed nearly a quarter of a billion times.

Yet the emotions the sight aroused were less about the building itself than about what losing it might mean. Notre Dame is an expression of humanity at its collective best. Nobody could look up into that vaulted ceiling without wondering at the cumulative genius of the thousands of anonymous craftsmen who, over a century and a half, realised a vision so grand in its structural ambition and so delicate in its hand-chiselled detail. Its survival through 850 years of political turbulence—through war, revolution and Nazi occupation—binds the present to the past.

The fire also binds people to each other. The outpouring of emotion it has brought forth is proof that, despite the dark forces of division now abroad, we are all in it together. When nationalism is a rising threat, shared sadness makes borders suddenly irrelevant. When politics is polarised, a love of culture has the power to unite. When extremism divides Muslim from Christian and religious people from atheists, those of all faiths and none are mourning together. An edifice built for the glory of God also represents the unity of the human spirit.

And it will be rebuilt. The morning after the fire, the many Parisians who went to the cathedral to mourn its destruction found comfort instead. Although the spire is gone, the towers are still standing and it seems likely that the whole building can be revived. The effort to rebuild it, like the fire, will bring people together. Within 24 hours, €600m (\$677m) had been raised from businesses and rich people, and a rash of crowdfunding campaigns started. A high-resolution laser scan of the building, carried out recently, should help.

It will never be the same, but that is as it should be. As Victor Hugo wrote in “The Hunchback of Notre Dame”, a three-volume love-letter to the cathedral: “Great edifices, like great mountains, are the work of centuries. Art is often transformed as it is being made...Time is the architect, the nation is the builder.” ■



Crops and climate change

Time to see the blight

More needs to be done to protect crops from the havoc that warmer temperatures might wreak, even in temperate regions

RISE IN CARBON-DIOXIDE levels and the climate change associated with them portend many problems, but one group of people might be expected to give them a cautious welcome: farmers in Earth’s temperate zones. More CO₂ typically results in more photosynthesis and therefore higher yields, and milder weather means longer growing seasons. Balanced against these potential benefits, however, is the potential for blight. It is hard to predict how changes in the climate and the atmosphere’s chemistry will affect the prevalence and virulence of agricultural diseases (see Science section). But there is a risk that such changes will make some plant infections more common in all

climatic zones, perhaps catastrophically so. To fend off this danger, seed companies and botanists need to band together to stockpile a genetic arsenal before it is too late.

Part of the problem is that centuries of selective breeding have refined the genomes of most high-value crops. They are spectacular at growing in today’s conditions but genetic variations that are not immediately useful to them have been bred out. This is good for yields but bad for coping with change. A minor disease or even an unknown one could suddenly rampage through a genetically honed crop. Indeed, this is already happening in America, where a mysterious pathogen is killing apple ►►

▶ trees, and India, where warmer-than-usual winters have spread wheat-blast disease, ravaging the country's second-largest crop.

New diseases are unlikely to make the West starve. It will always be able to buy its way out of a shortage by importing calories from elsewhere. But soaring world food prices would cause widespread malnutrition and suffering. What is more, the threat of new diseases is a problem with a ready solution.

All crops have wild relatives that are ill-suited to agriculture but which have vastly more genetic diversity than their cultivated cousins. Within the DNA of these wildlings are genes with the potential to grant resistance to future pathogens. As an insurance policy, those genes need to be collected, studied and stored, usually in the form of seeds, until a time comes when a threat arises that requires them to be inserted into the genome of a specific crop. This is being done, but too slowly. Gene-banks contain too few specimens of two-thirds of the pertinent wild relatives of crops. The rest are not included at all.

You might think that the giant commercial agribusinesses would help. Ploughing more resources into gene-banks and understanding wild varieties would strengthen food security and, in the long run, would boost the firms' bottom lines. However, in spite of the threat, firms like Bayer and Syngenta still see future-proofing crops against disease as a responsibility for governments to take on.

Perhaps that is because the gargantuan task of preparing for all the possible pathogens for all the main crops is too uncertain

to be commercially attractive. Wheat alone needs to be tested against hundreds of potential diseases at a range of projected temperature, humidity and CO₂ levels in order to identify the biggest future threats. That done, genes collected from wild species can be inserted into the domestic versions and the experiments run again, to see what works.

Academic botanists can indeed help, as the agrifirms say. However, the work is monotonous and receives little reward or recognition. Whereas curing an epidemic builds careers, ensuring that a would-be plague never surfaces is a route to obscurity.

If they are to act, plant scientists will need incentives including money for salaries and for the research itself. Large grant-providing agencies, including America's Department of Agriculture, will have to shift cash towards preparations for future threats.

One barrier to funding and recognition is official dogma. America's National Science Foundation rejects grant requests that include the words "climate change", applicants say, because the administration and its allies have decided it does not exist. Europe is in need of a scolding, too, for its reactionary attitude to genetic engineering. Although the genes of wild-crop relatives can be woven into commercial crops through plant breeding, even modern versions of this technique will be slower than editing a plant's DNA directly. Gene editing will be essential, even if it makes European consumers, and therefore policymakers, queasy. The sooner they accept it, the better. ■



Hacking and the law

Justice for Julian Assange

The WikiLeaks co-founder is accused of hacking, not leaking. He should be extradited

WHEN JULIAN ASSANGE was dragged out of Ecuador's embassy and into a London courtroom on April 11th, you could be forgiven for thinking that it was his life's work, moral character and personal hygiene in the dock. Mr Assange was "no hero", said Jeremy Hunt, Britain's foreign secretary. Nonsense, retorted Jeremy Corbyn, leader of the opposition Labour Party, he "told us the truth about what was actually happening in Afghanistan and in Iraq". Ecuador's president complained that Mr Assange had repaid his country's hospitality by smearing faeces on the embassy wall. These soundbites miss the point. America accuses Mr Assange of hacking Pentagon computers. Does that charge justify his extradition?

To be sure, Mr Assange's legacy deserves scrutiny. WikiLeaks did some good in its early years, exposing political corruption, financial malfeasance and military wrongdoing. But the decision to publish over 250,000 diplomatic cables in 2010 was malicious. The vast majority of messages revealed no illegality or misdeeds. Mr Assange's reckless publication of the unredacted versions of those cables the following year harmed America's interests by putting its diplomatic sources at risk of reprisals, persecution or worse.

In 2016 Mr Assange's organisation showed even poorer judgment in engaging with Guccifer 2.0, an online persona widely as-

sumed—and later proven—to be a front for Russia's GRU spy agency. As America's presidential election approached, WikiLeaks disseminated lurid conspiracy theories around the Democratic Party and Hillary Clinton, and asked the Russians for stolen emails relating to Mrs Clinton.

When Mr Assange said in 2010 that "I enjoy helping people who are vulnerable," his fans cannot have thought he meant President Vladimir Putin. The contrast between WikiLeaks's attacks on American spy agencies and its collaboration with their autocratic rivals speaks volumes about Mr Assange's real motives.

Yet neither Mr Assange's journalistic malpractice, nor his hostility to the West and narcissism, however contemptible, are the subject of criminal prosecution. Instead, an American courtroom will focus on his hacking (see Britain section). Mr Assange is accused of helping Chelsea Manning, who stole the war logs and diplomatic cables in 2010, try to crack the password to a classified military network. Though Mr Assange was probably unsuccessful, the alleged act made him a "co-conspirator" in the effort by Ms Manning.

America's indictment has some troubling elements. It sets out how Mr Assange helped Ms Manning conceal her communications and exhorted her to provide more information. Both are acts within the legitimate bounds of a relationship between pub- ▶▶



► lisher and source, rather than signs of nefarious intent.

Yet the central charge—computer hacking—is an indefensible violation of the law. Neither journalists nor activists, like Mr Assange, have *carte blanche* to break the law in exercising their First Amendment rights. They are entitled to publish freely; not to break and enter, physically or digitally, to do so.

Some critics gripe that going after Mr Assange for hacking is like going after Al Capone for tax evasion—that it was the only charge prosecutors think they can make stick, and that the real reason they want to lock him up is because he threatens national security. But there is nothing wrong with prosecutors acting pragmatically, and they were right not to file bigger charges, such as espionage, that might threaten press freedom if they were successfully used to convict the WikiLeaks founder. Mr Corbyn is therefore misguided when he suggests that Mr Assange is being targeted for extradition “for exposing evidence of atrocities in Iraq and Afghanistan”. If that were really how the system worked, hundreds of American journalists would be in jail.

In fact, he is being pursued for the alleged law-breaking that sets him apart from real journalists. So if British courts judge that America’s request is lawful, Sajid Javid, Britain’s home secretary, should let it proceed. New charges may yet be issued—particularly if the publication of the Mueller report on April 18th reveals new details of WikiLeaks’s dealings with Russia. But America cannot add these once Britain has agreed to dispatch Mr Assange, without a further request.

If Sweden reopens its rape case against Mr Assange, which was closed in 2017 because he could not be arrested, Mr Javid might have to judge the precedence of the two claims. That would be hard: is trying to hack military secrets with intent to publish them, risking lives and national security, more or less serious than rape? Both charges carry similar sentences. And although America’s request has come first, Sweden issued its original warrant in 2010. The best option would be for Britain to extradite him to Sweden, if Sweden requests it, and when justice has been done there, for Sweden to extradite him to America. ■

Spain

Heading nowhere?

More political paralysis after its election will not serve Spain well

WHEN HE FAILED in February to get his budget passed, Spain’s Socialist prime minister, Pedro Sánchez, had little choice but to call a snap election. His government, just eight months old, had surprised many by lasting as long as it did. With only 24% of the seats in parliament, but without coalition allies, its every move had been a tricky negotiation. As the country heads to the polls on April 28th, the signs are that the political paralysis which now grips Spain may only worsen. The Socialists look set to win the most seats, but the new parliament will contain five big parties, thanks to the arrival of the ultra-nationalist Vox (see Europe section). None will have anything like a majority, so the options will be another short-lived minority government, an argumentative coalition or, most likely, fresh elections—the fourth in as many years.

The pattern is becoming familiar in Europe, where fed-up voters have abandoned the traditional parties of right and left (ask France’s Republicans, or Italy’s Democrats) and opted for a plethora of new groups, some on either extreme of the spectrum, others harder to pin down. Political fragmentation has caused protracted delays to the formation of governments in Germany, Italy, Sweden and Estonia in the past year or so. Finland this week looked likely to go the same way after its own inconclusive election. And when governments are eventually formed they tend to be weak, lowest-common-denominator affairs, further enhancing the popular distrust of established politicians; or else chaotic unions like the mixture in Italy of nationalist right and maverick left. France has been an exception, but even President Emmanuel Macron’s ratings have fallen sharply.

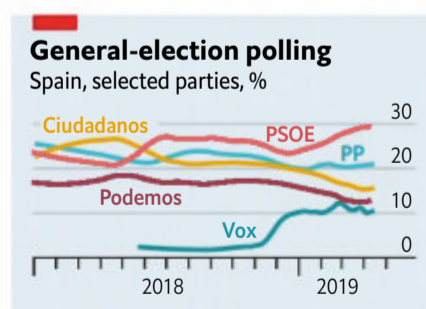
It might be tempting to say that political paralysis is not a death knell. Mariano Rajoy, who lost a confidence vote at the hands of Mr Sánchez last June, managed his own minority government pretty well after losing his majority at the end of 2015. Although growth has now slowed to an expected 2.1% this year, it

was above 3% in 2015, 2016 and 2017 as Spain smartly recovered from the disruption of the euro-zone crisis, trimming both its budget deficit and its high unemployment rate at the same time.

But that recovery was part cyclical and part the delayed result of painful reforms that Mr Rajoy enacted before his People’s Party (PP) lost its majority. Spain faces a number of knotty problems that a weak government will not be able to solve. To sustain growth, it needs plenty more reform: to its schools system, its pensions, its complicated political structure and the labour market, building on Mr Rajoy’s useful work. One danger is that a new Socialist-led government may opt to rely on the left-wing Podemos party, which would frustrate some of this agenda and risk blowing up the budget again.

The next government must also deal with the crisis in Catalonia, whose regional government declared independence after an unconstitutional referendum in 2017. Mr Rajoy, backed by Mr Sánchez, responded with direct rule. The Catalan government has now been restored, but nine of its former leaders are in jail and being tried on charges likely to result in long sentences. That will shatter an uneasy calm. Catalonia also bedevils the formation of any new government. The Socialists favour dialogue, but their other potential partner, Ciudadanos, is intractably against it—sadly, since in other ways it would act as a useful pro-market influence on Mr Sánchez.

The alternative, a right-of-centre coalition between the PP and Ciudadanos, is a worrying prospect of a different kind. It would offer the Catalan separatists only further confrontation, and would almost certainly need to bring Vox into government in order to create a majority. For a country that has struggled so hard against the ghosts of Franco’s nationalism, that would be a step in the wrong direction. Ideally, Spaniards would vote on April 28th for Mr Sánchez’s party in large enough numbers for it not to need allies. But that looks highly unlikely. ■



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Chinese and Laotian technicians carry out welding at a steel structure processing plant of the China-Laos railway project in Luang Namtha, Laos, on March 21

For the Public Good

The Belt and Road Initiative delivers shared benefits as vision turns into reality

By Li Ziguo

When the Belt and Road Initiative was first put forward in 2013, few might have imagined that it would encompass more than 100 countries and international organizations in collaborative projects in a matter of years.

The initiative, proposed by Chinese President Xi Jinping and consisting of the Silk Road Economic Belt and the 21st-Century Maritime Silk Road, aims to boost connectivity along and beyond the routes of the ancient Silk Road. With a view to enhancing both China's development and its cooperation with global partners, it focuses on cementing links in five key areas: policies, infrastructure, trade, finance and people-to-people bonds.

In May 2017, China hosted the First Belt and Road Forum for International Cooperation (BRF), inaugurating the top-level platform. The Second BRF, to be held in Beijing in late April under the theme Belt and Road Cooperation: Shaping a Brighter Shared Future, is expected to send a positive message of strengthening international economic cooperation, promoting global growth, and building an open global economy.

Policy coordination

The number of cooperation documents signed between China and other countries has increased substantially as the circle of participants in the Belt and Road Initiative widens. Italy became the first member of the Group of Seven to sign a memorandum of understanding on the initiative with China in March. Italian Prime Minister Giuseppe Conte said Italy is glad to seize this historic opportunity to join the Belt and Road Initiative, with its special geographical advantage in building connectivity.

To date, China has signed 173 cooperation documents with 125 countries and 29 international organizations. According to Building the Belt and Road: Concept, Practice and China's Contribution issued in May 2017, there were only 46 agreements with 39 countries and international organizations at the time. Meanwhile, the Belt and Road vision has been incorporated into

the documents of major international institutions including the UN, the Group of 20, the Asia-Pacific Economic Cooperation and the Shanghai Cooperation Organization.

Third-party market cooperation was put forward for the first time by China and France in 2015. Using this concept, China aims to cooperate with developed countries to promote the development of the Belt and Road Initiative. Over the past years, many projects have been carried out in third-party markets, and tangible results have been achieved.

Japan, previously reluctant to participate in the initiative, has changed its attitude and begun to work together with China in third-party markets. In October 2018, during the first forum on China-Japan third-party market cooperation, a total of 52 agreements with a combined value of \$18 billion were concluded by the two sides. These covered fields such as infrastructure, finance, and logistics and information technology. The results of third-party market cooperation have effectively responded to the doubts and prejudices some countries have about the initiative.

Connecting countries

China has continued to work with relevant countries to create a transport infrastructure network connecting the sub-regions in Asia and linking Asia, Africa and Europe to enhance connectivity and boost the efficiency of regional and sub-regional logistics. Over the past two years, the Mombasa-Nairobi railway and the Addis Ababa-Djibouti railway have started commercial operations, while the construction of the China-Laos railway, the Hungary-Serbia railway, the China-Thailand railway and the Jakarta-Bandung high-speed railway in Indonesia has begun. Moreover, the Moscow-Kazan high-speed railway and transportation corridors between China and Russia have both emerged as promising projects.

Among all the projects, the China-Europe railway express is the most striking. In 2018, trips made by cargo trains traveling between China and Europe totaled 6,363, a year-on-year increase

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of 73 percent. The number of return trips from Europe to China was 2,690, an increase of 111 percent over 2017. Plenty of high-quality products from other countries participating in the Belt and Road Initiative enter the Chinese market this way.

Achievements have been made in the construction of free trade areas. On January 1, 2018, the free trade agreement (FTA) between China and Georgia took effect, the first of its kind since the Belt and Road Initiative was proposed. Subsequently, China completed FTA negotiations with the Maldives and Mauritius. The agreement with the Maldives is the first bilateral FTA for the country, while Mauritius is the first African country to sign an FTA with China. As of March 2019, China had signed 17 FTAs with 25 countries and regions, while nine more are under negotiations, involving more than 30 countries.

High-quality implementation

Production capacity cooperation under the framework of the Belt and Road Initiative fits participating countries' economic diversification and modernization strategies. Industrial parks and the China-Kazakhstan model are two representatives of this.

By the beginning of this year, 82 industrial parks had been built by Chinese enterprises in 24 countries, with a total investment of \$30.45 billion. A total of 4,098 enterprises had been attracted to these parks.

China-Kazakhstan cooperation in production capacity is quite different, where there are no geographical restrictions and governments play an obvious guiding role. Intergovernmental discussions have brought about the establishment of funds and special loans, enabling the projects to be carried out. In November 2018, the 15th discussion on production capacity and investment was held, during which 55 key projects were agreed upon with a total investment of about \$27.4 billion. This model has been applied to other countries. For instance, China and Saudi Arabia signed a memorandum of understanding on key projects concerning capacity cooperation in February, which identified 18 key projects.

In recent years, the Belt and Road Initiative has been facing critical questions by some countries. As the number of projects carried out under the initiative increases, it is a fact that they might be implemented with varying quality. China is making significant policy shifts to ensure high-quality implementation.

The emphasis is on guidance for Chinese enterprises. For example, in August 2017, the National Development and Reform Commission, the Ministry of Commerce, the People's Bank of China and the Ministry of Foreign Affairs issued a joint circular to provide further guidance and regulation on overseas investment, which drew a clear line between the do's and don'ts. Other documents include a code of conduct on private enterprises' overseas investment and operation promulgated in January 2018, and guidelines on compliance management of enterprises operating overseas issued in December the same year. These are intended to guide enterprises to operate in compliance with laws and regulations.

Another focus is put on services to these enterprises. Examples include the guidelines on taxation for enterprises going global issued by the State Taxation Administration in October 2017 and an overview of foreign exchange management policies in Belt and Road participating countries issued by the State Administration of Foreign Exchange a year later. These documents are designed to help enterprises operating overseas become better equipped to cope with uncertainties in foreign markets.

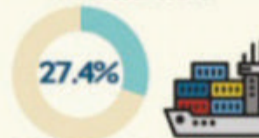
Belt and Road Trade

Total trade volume between China and other Belt and Road countries reached



8.37 tln yuan
(\$1.25 tln) in 2018

This accounted for



of China's total foreign trade

Growth in trade with other Belt and Road countries in 2018



Growth rate: 3.6 percentage points

Higher than the growth of China's foreign trade

(Source: General Administration of Customs; designed by Pamela Tobey)

China-Europe Freight Trains

By the end of February 2019, trips made by China-Europe freight trains had totaled

14,000



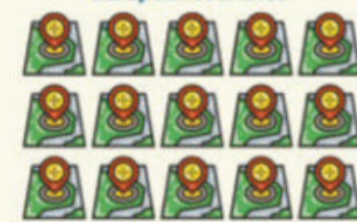
and reached

50 cities



across

15 European countries



(Source: National Development and Reform Commission; designed by Pamela Tobey)

The Belt and Road Initiative is a new path for state-to-state relations based on dialogue, partnership and mutual learning and enrichment. It supports the multilateral trading system and embraces an economic globalization that is more open, inclusive and balanced so that its benefits can be shared by all. The initiative is an important platform for building a community with a shared future for humanity and a new type of international relations.

The reason why the initiative has grown in popularity is that it focuses on development, the biggest concern for many countries. This means it is in line with the strategic interests of these countries. In most Belt and Road countries, there is a large development gap, and much remains to be done regarding infrastructure and urban construction. With a full range of industries, strong capacity and high efficiency, China can cooperate with them in a broad array of areas. In addition, given burgeoning cooperation between China and developed countries in third-party markets, an even stronger synergy will be forged.

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The author is deputy director of the Center for the Belt and Road Initiative, China Institute of International Studies

Will Kazakhstan change?

Far from being a “showman”, Nursultan Nazarbayev, the departing president of Kazakhstan, is a shrewd autocrat who has put his country on the map during his 30-year rule (“A showman exits”, March 23rd). As the World Bank’s energy pointman in the country for 15 years, I witnessed a big contradiction in Mr Nazarbayev’s policies: bold reform orientation in the economy (Kazakhstan’s GDP per person is now on a par with Russia’s) coupled with soft political dictatorship (earning a “not free” status in democracy from Freedom House).

As you rightly noted, even after his resignation, Mr Nazarbayev will keep pulling the strings as *Elbasi*, or Leader of the Nation for life, resisting any opening towards democracy. Despite all the simmering social tensions, there are no bright prospects for a “colour revolution” in the country as long as growing petroleum revenues allow the ruling elite to keep its end of the social bargain: a predictable rise in living standards in exchange for limited political change.

Regarding his real succession plans, Mr Nazarbayev is facing a big dilemma between his daughter, Dariga Nazarbayeva, and Kassym-Zhomart Tokayev, the interim president and a professional diplomat. Mr Tokayev would ensure a smooth prolongation of his much-praised balanced foreign policy, while Ms Nazarbayeva would safeguard her father’s business empire.

ISTVAN DOBOZI

Former lead economist at the World Bank
Gaithersburg, Maryland

Valuing workers

Buttonwood’s column on how book value has lost its meaning addressed “the complexity of valuing a firm’s assets in the digital age” (March 23rd). Value, he wrote, “depends on a firm’s capabilities.” He mentioned intangibles such as reputation and “the know-how of staff and relationships with

customers and suppliers.”

One important determinant of many firms’ capabilities is the skills of their employees, which often goes unmeasured. Most firms couldn’t state their return on investment in training or reduction in assets because of staff turnover. Factories, machines, land and office buildings can be counted as capital assets. The more complex, but perhaps equally important, task is valuing a firm’s human resources.

ARNOLD PACKER

Former chief economist of the Senate Budget Committee
San Diego

Oregon’s bisexual governor

I was pleased to read your piece on the growing acceptance of gay politicians in America (“A welcome shrug”, April 6th). However, you labelled Governor Kate Brown of Oregon as “a lesbian”. Actually, she is bisexual, and indeed is happily married to a man with two stepchildren. Prominent bisexuals, such as Freddie Mercury, Aleister Crowley and Ms Brown, are often mis-categorised as gay, making it harder for the rest of us to achieve social acceptance.

THOMAS ROBERTSON

Oxford

The middle ground

Britain’s Liberal Democrats can’t make gains if we fail to distinguish ourselves from the “sensible” factions of the Labour Party (“Hope for the hopeless”, March 23rd). Chris Leslie’s statement about the Lib Dems being “tainted by coalition” and therefore impossible to work with sheds light on the ugly truth of how people on the left see the Lib Dems as traitors of a leftist project. Which is why Mr Leslie can work with Anna Soubry but not Jo Swinson.

To succeed the Lib Dems must embrace liberalism wholeheartedly and abandon our milquetoast attempts at being Tony Blair’s doveish heir. We should embrace liberal principles on free trade and open markets, anti-paternal-

ism and human rights. The Independent Group are welcome to their centrist national service. The Lib Dems have an intelligent policymaking process, dedicated activists and a rich political tradition to build on. But we are not going to be able to capitalise on any of this if we keep trying to be Chuka Umunna, but with legalised weed.

ARIA BABU

Liberal Reform
London

Taking a toll on tokers

You reported our research showing the effect of high-potency cannabis on rates of psychosis across Europe (“Strong pot is hot”, March 23rd). The legalisation of recreational cannabis in the United States and Canada represents a huge experiment concerning the effects of cannabis on the brains of young people. Will this lead to an increase in rates of psychosis, or not? Sadly, neither state nor federal governments are carefully monitoring the effect. Perhaps they would rather not know the answer.

ROBIN MURRAY

Professor of psychiatric research
King’s College
London

Ethical review

The constraints on corporate conduct you listed in “The new age of corporate scandals” (April 6th) were “regulation, litigation, and competition”. Has *The Economist* concluded that companies are no longer constrained by ethics?

BARRY NELSON

Jupiter, Florida

Rescue dogs

It was interesting to read about how scientists are working on a diagnostic device based on the odour associated with Parkinson’s disease (“Sniffing out Parkinson’s”, March 30th). On San Juan Island in Washington state, an organisation called Pads for Parkinson’s uses specially trained dogs to

detect the Parkinson’s scent. These particular dogs seem to have hyperosmia and are successful at this task. Developing an electronic sniffer for Parkinson’s is a worthy goal, but man’s best friend provides a low-cost alternative to sniff out vulnerable patients now.

MICHAEL DEVIRIAN

Friday Harbour, Washington

Spring blossoms

As a counterbalance to the “dark past” of Japan’s *somei-yoshino* cherry trees you could have mentioned the sunlight *sakura* (“Flower power”, April 6th). This variety of cherry was developed by Masaaki Takaoka specifically to mourn those who fell in the second world war, both Japanese and foreign. He spent 30 years trying to create a hybrid that would flourish in climates from Siberia to the tropics, so that they could be sent around the world as a prayer for peace. Eventually he succeeded, and to date 50,000 have been planted in more than 20 countries.

The story is told in a film directed by Gen Takahashi called “Yoko the Cherry Blossom”.

BEN JONES

St Nicholas-at-Wade, Kent

Always one step ahead

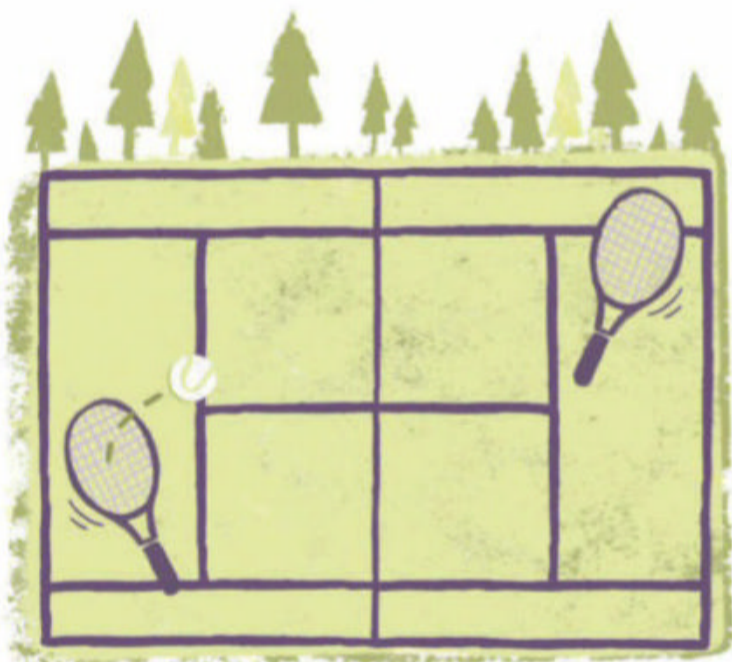
You ask us to imagine “if you could move all your friends and posts to Acebook, a firm with higher privacy standards than Facebook and which gave you a cut of its advertising revenues” (“Europe takes on the tech giants”, March 23rd). This may merely be an exercise in circularity as the domain name “Acebook.com” is, in fact, owned by Facebook. I don’t anticipate them giving me any share of the advertising revenues.

ALLEN CONTI

Canfield, Ohio

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Herd instincts

SAN FRANCISCO

The wave of very highly valued startups heading to market suggests that Silicon Valley needs to rethink its focus

IF YOU WANT to go unicorn spotting, take a turn around the brand-new park on top of San Francisco's Transbay bus terminal. This is not because it is perched on a spectacular, undulating building that itself looks quite like a mythical beast (Moby-Dick, in this case) nor because its tastefully planted flora, all native to flower-power California, offer a particularly enticing equine habitat. It is just that, as a would-be icon of San Francisco's business district, the park is conveniently placed for looking out on their corporate headquarters.

There are 88 privately held startups worth more than \$1bn each in the San Francisco Bay Area, more than in any other region in the world, and a fair few of them, including Slack, a corporate messaging service, and Instacart, a delivery firm, are hard by the Transbay terminal. You can't quite see the headquarters of Lyft and Uber, two ride-hailing services, from its leafy roof, but were you to climb the swanky Millennium Tower next door you could.

The hitch is that the park is currently in-

accessible. Last September, just six weeks after it opened, cracks found in two steel beams forced the closure of the Transbay terminal's crowning gardens as well as the rest of it. You can still climb the Millennium Tower—but you need to be aware that the city's tallest residential building has developed an unwelcome departure from the perpendicular, something which is generating a prodigious amount of litigation and not a little mockery.

Rather than damaging the emblematic purpose for which this sort of prestige architecture was conceived, such shortcomings enrich it. With buildings and businesses alike, everything looks shiny and new from a distance. The unicorns are exciting businesses from the same Silicon Valley stables as Alphabet (*née* Google), Apple and Facebook. Indeed, the production of unicorns has become the dominant part of what the Valley does. And an unprecedented number of the beasts have either just offered their shares to the world through initial public offerings (IPOS)—

Lyft did so on March 29th—or are gearing up to do so, as Uber will on May 10th. It is not the only such cavalcade; a lot of Chinese unicorns are approaching IPOs too. Memories of the epic public debuts of Facebook and Google, and also of Alibaba, in China, make this a heady prospect for some investors. The American companies alone stand to raise up to \$100bn, according to Kathleen Smith of Renaissance Capital, a fund-cum-research firm.

But on closer inspection, there is trouble afoot. Look the market-bound herd of unicorns in the teeth and they are not as impressive as their myth might have you think. Some seem bred for show, not for work; not all of them are up to winning their races. These weaknesses are not just individual quirks; they are signs that the business culture which has tailored itself to churning out such beasts is beginning to suffer from its own structural flaws and lopsidedness.

A knacker's yard in reverse

When Aileen Lee, the founder of Cowboy Ventures, an investment fund, gave the word "unicorn" its current connotation in 2013, she saw the term as betokening something both wonderful and rare. Back then, that made sense. In 2013 Ms Lee found just 38 unicorns in America.

Today there are 156, and slightly more than that elsewhere, according to CB Insights, a data provider. There are three ex- ▶

planations for this population boom: an ideology that sees the rapid creation of companies with very large user bases as the best—possibly the only—business strategy available; an infrastructure that makes it ever easier to follow through on this belief; and a climate in which, until recently, there was not much pressure to take these new companies public.

The ideological analysis is an odd combination of cornucopianism and constraints. First, the plenty. The Valley believes that “software is eating the world”, and that there is still a lot of the business world for it to eat. As atoms are replaced by bits—or, more prosaically, possessions and activities by convenient services ordered through screens—it becomes possible for industry after industry to be disrupted by startups. But the nature of the disruption means that in any given industry only a very limited number of startups can make good. Network effects, which make the value of the system grow more with each new user the more users it has, mean that the big get bigger while the small stay small, and that the quicker you can get bigger the bigger you get.

This does not necessarily mean monopoly; some sectors, such as ride-hailing, may support a big fish and a littler one. But it does mean that growing as large as possible as fast as possible—“blitzscaling”—becomes a paramount goal. As Reid Hoffman of Greylock Partners, a venture-capital firm, and the co-author of a book about blitzscaling, puts it: “In a connected world, someone will build an Amazon. The only question is who and how.”

This analysis has changed the way that startups are born and bred. During the dot-com boom of the 1990s venture capital was decidedly artisanal. Entrepreneurs came up with an idea, made guesstimates to back it up and pitched it to venture capitalists. If they bought in, the startups would spend much of their multi-million-dollar jackpot

on building their infrastructure before rushing to go public, hoping thereby to get their hands on the much larger amounts of money they needed to grow.

After the debacle of the dotcom bust, things got more serious. As size became increasingly valued, ways to build it were developed. Today there is a “new regime of company formation”, according to Martin Kenney and John Zysman, of the University of California in Davis and Berkeley, respectively, the authors of a paper entitled “Unicorns, Cheshire Cats, and the New Dilemmas of Entrepreneurial Finance”. The design and manufacture of unicorns has become industrialised, and many of the ingredients needed are available on tap as online services. Smartphones let the companies distribute what they offer at home and abroad, social media let them market it and cloud computing lets them ramp up as demand grows.

Yet while the production of unicorns gathered pace and slickness, their disposal did not keep up. The rate at which venture-backed companies move on to the public markets has slowed. In 2013 the average age of a venture-backed American company putting on an IPO was seven years. By 2018 it had grown to ten.

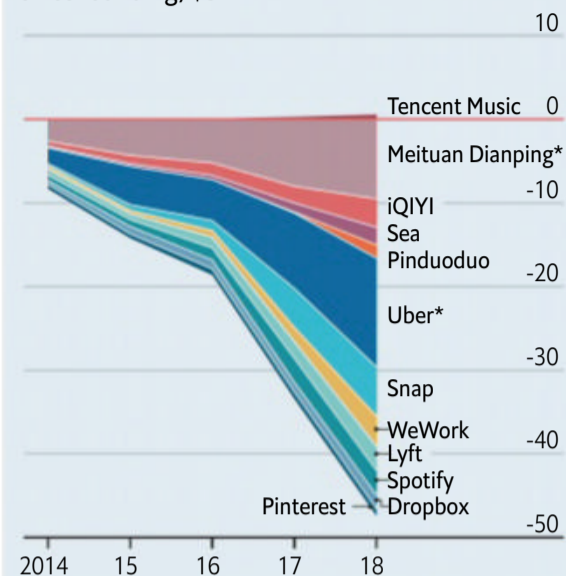
One reason for this was regulation. After the dotcom bubble burst, new rules intended to protect investors, particularly the Sarbanes-Oxley Act, made going public much more burdensome. The JOBS Act of 2012 subsequently increased the number of shareholders beyond which startups must disclose financial information from 500 to 2,000, excluding holders of stock options. That made it easier to stay private longer.

Gates of horn and ivory

And there was no significant shortage of private capital willing, indeed eager, to help with that. A dearth of interesting alternative investments and endemic fear of missing out saw institutional investors, of-

Losing their way

Selected companies, cumulative profits since founding, \$bn



Sources: Company reports; Bloomberg; The Economist

*Excluding exceptional items booked in 2018

ten from hedge and sovereign-wealth funds, eager to join in ever larger rounds of financing. As Randy Komisar, a venture capitalist at Kleiner Perkins, puts it: “Silicon Valley’s lust for scaling...is more a result of the desires of capital than the needs of innovation.” Last year investors financed more than 120 rounds of more than \$100m, CB Insights says.

At last, though, according to Barrett Daniels, an IPO expert at Deloitte, an auditing and consulting firm, a number of factors have come together to bring this period of reticence to an end. A lot of venture-capital funds were started around 2010, and they mostly have a ten-year term; investors want to cash out. A number of public listings last year showed that public markets have a big appetite for tech shares. And the window of opportunity may soon close; a global downturn would both limit investors’ appetite and severely test some of the unicorns’ business models.

Much the same might happen if a number of IPOs failed to live up to their hype. So again the incentives are to go big and go quick. The move to the exits is not quite a stampede, but it is a pretty concerted group trot, even a canter. As many as 235 venture-backed American firms have plans to go public this year, says Ms Smith.

To get a sense of the going, *The Economist* has examined a panel of a dozen former and current internet-focused unicorns in Silicon Valley and elsewhere (see chart 1). It is not a random sample, being weighted towards both prominence and accessible data. But it includes most of the larger prospects and covers a range of industries. Uber and Lyft are in transport, Spotify in music-streaming, WeWork in real estate, Meituan and Pinduoduo in Chinese e-commerce. Six are American, five Asian and one European. Like unicorns at large, they are on average ten years old. ▶▶

Horses for courses

Selected companies

Company	Equity value April 2019, \$bn	2018 sales \$bn	Business type	Global users m
Uber* (US)	100.0	11.3	Ride-hailing	91
WeWork* (US)	47.0	1.8	Office space	0.2
Meituan Dianping (China)	39.3	9.9	E-commerce	400
Tencent Music (China)	29.9	2.9	Music	644
Spotify (Sweden)	26.2	6.2	Music	207
Pinduoduo (China)	25.2	2.0	E-commerce	272
iQIYI (China)	17.2	3.8	Entertainment	87
Lyft (US)	17.1	2.2	Ride-hailing	19
Snap (US)	15.8	1.2	Social media	186
Pinterest* (US)	11.3	0.8	Social media	265
Sea (Singapore)	10.5	0.8	Games, e-commerce	135
Dropbox (US)	9.5	1.4	File storage	13

Sources: Company reports; Bloomberg; The Economist

*Privately held

► These firms are looking at a combined valuation of more than a third of a trillion dollars—roughly, as it happens, the same as that which resulted from the IPOs of Alibaba (2014), Facebook (2012) and Google (2004). Those IPOs, which led to the creation of over a trillion dollars of value, were among the most successful ever and have been burned into the memory of fund managers. If you owned those shares you outperformed; if you didn't you risked being fired.

The current herd all seek to suggest that they offer the same sort of opportunity as that illustrious trinity: vast potential markets; limited physical plant and staff; high margins; imposing barriers to entry. They lay stress on their user numbers—2bn of them in all, though not all are frequent customers or paying ones. They claim that the areas they work in are but a subset of the markets they can hope to dominate. Uber and Lyft say that the entire transport industry is their hunting ground, rather than the modest taxi trade; Airbnb is looking at lodging of all sorts. They also point to strong revenue growth of 44% for the median firm in the past quarter compared with the year before. Overheads are scant. They have just \$6bn of fixed assets between them, and not many staff.

Queens of air and darkness

But what they also lack, in 11 cases out of 12, are profits. Today, according to Jay Ritter of the University of Florida, 84% of companies pursuing IPOs have no profits. That is remarkably high. Ten years ago, the proportion was just 33%. To see profitlessness as rampant as today's you have to go back to the peak of the dotcom boom in 2000.

Back then the promise (one soon and spectacularly broken) was that profits would follow once the companies grew. This time round, though, the profit-free companies have already grown. Indeed our panel has burned through \$47bn doing so (see chart 2 on previous page); its companies got through \$14bn in 2018 alone. This is profligate even by the standards of Amazon, which before and after its IPO was seen as a particularly profit-averse company; it had cumulative losses of \$3bn between 1995 and 2002. Uber lost almost \$4bn just last year, excluding exceptional items.

If all this dearly bought growth has not supplied profits, what will? The unicorns have three answers: yet more growth; more spending by existing customers; and higher margins. The first is not necessarily that plausible. Among the companies in our panel that disclosed the number of customers they have in America, growth slowed to 9% last year. Though priding themselves on their overall user numbers, the firms in our panel are reluctant to reveal details of customer churn—how often customers switch to rival firms or switch



off completely.

What is more, few of the firms sit behind barriers to entry as strong as those that protected Alibaba, Facebook and Google. They can lose customers as well as gain them. Lots of property companies can rent out office space, as WeWork does. Spotify customers can get music from Apple, too. Drivers often toggle between Lyft and Uber apps; so do passengers. There are already several big Chinese e-commerce firms to choose from.

To counter this concern the companies ask investors to consider “cohort analysis”, which separates out customers by vintage. Lyft says that customers who first used its service in 2015 took 2.7 times as many rides

last year as they did back then. WeWork says that in its “mature” offices the revenue for each desk that it rents out is 50% higher than in other locations. The firms also argue that they can sell new stuff both to existing customers and new ones. Perhaps the best-known such strategy is Uber now offering food deliveries through Uber Eats, but the other 11 are expanding their suite of services, too. This, though, reveals something of a tension. If these firms can move on to other people's turf, can they be sure that their own turf is as well protected as they would like investors to think? Plenty of firms are keen to offer people a diverse range of services through their phones, including Walmart, JPMorgan Chase, Apple, Amazon and Netflix in America and Alibaba and Tencent in China.

The third line of defence is “operating leverage”: economies of scale will kick in, allowing their margins to soar. This is plausible, but there is little evidence as yet that it is true. For a subset of ten firms for which quarterly data are available, total sales have doubled since mid-2017, which is impressive; but there has been no obvious improvement in operating margins, which were around minus 30% both in aggregate and for the median firm (see chart 3). Contrary to the sales-pitch, some of these firms face high variable costs. Insurance costs for the ride-hailing firms are rising sharply as they provide more trips.

None of this necessarily means they are bad businesses. But it does make them look like very pricey ones. All told, the IPO valuations the companies in our panel have received or are apparently looking for add up to \$350bn. Based on a discounted cashflow model, in aggregate the dozen firms will need to increase their sales by a compound annual rate of 49% for ten years to justify that valuation. That is the same as the average growth of Amazon, Alphabet and Facebook in the decades after their IPOs. In other words, these firms have to be as likely to outperform the very best of the previous crop as to underperform them.

But that is not enough. Justifying the valuation means not just staggering increases in sales, but also a very large improvement in margins. In aggregate these would have to increase by 34 percentage points. That would be truly unprecedented. The average for Amazon, Facebook and Google was only 19 percentage points.

Public down rounds

It is no secret why the valuations are high. The logic of the unicorn-building business requires it. Firms need not only to get big but also to be seen to be getting big; winning unicorn status and continuing to grow quickly thereafter is important for branding and attracting top talent. Thus every investment round is engineered to create a higher valuation than the previous ►



one; the alternative, a “down round”, is seen as a dismal sign. To ensure that the only way is up, investors coming in at later stages get privileges over earlier ones, such as guaranteed returns. This means that their shares are worth more than those issued earlier.

The valuation figure generated by an investment round assumes that all the shares are worth the same as the shares just issued. If you take into account the fact that this is not the case, and that earlier shares are in fact less valuable, it is possible to calculate the degree to which such values are overstated. According to Ilya Strebulaev, who teaches at the Stanford University business school, such calculations show the average unicorn to be overvalued by about 60%.

Overvaluation does not mean that the coming spate of IPOs will not go ahead, or that they will not raise money. But it does suggest some rough times ahead. Some unicorns have already floated for less than they were previously said to be worth. Pinterest was privately valued at \$12bn but is expected to go public at about \$1bn. Others have seen the pop they got at their IPO swiftly dissipate. When Lyft went public its share price popped 8.7% on the first day of trading, giving it a market capitalisation of \$22.4bn. But many got out of the stock, and short sellers piled in. Lyft’s capitalisation is now \$16bn, and its shares are now well below their price at the IPO.

That bumpy ride may be an exception. Lyft has threatened to sue Morgan Stanley, an investment bank, for offering a short-selling product to pre-IPO investors who are usually bound by agreements not to sell their shares for some time, typically six months (the bank denies the allegations). But if Lyft’s rollercoaster turns out to be the rule, unicorns could become a much less attractive investment and the flow of capital into Silicon Valley could slow.

This all suggests that the Valley would be wise to come up with an alternative to blitzscale-and-hope as a strategy. So far, it has not. “I don’t like the model of growth at almost all costs, but I don’t see the end of it yet,” says Mr Komisar. Instead, investors are fine-tuning the unicorn-making machine. Funds will continue to professionalise by using more data and even automated algorithms to make investment decisions, predicts Mike Volpi of Index Ventures. Some venture capitalists are thinking about ways that they might do away with the IPO entirely. “Firms are getting so big that they no longer can go public,” says Mike Moritz of Sequoia Capital, which has put money into 20 unicorns. “What you need is four to five like-minded investors with a time horizon of 20 years.”

A more fundamental threat to the model is the possibility that barriers to entry and the benefits of size are both getting

harder to acquire and offering less value to their possessors. The tech industry has benefited from a legal exceptionalism, particularly when offering services to consumers. The existing giants took full advantage of Western governments’ haplessness. They successfully lobbied to avoid being held responsible for the content produced by their users, or restricted from doing what they pleased with personal data, or bothered by pesky antitrust laws. Regulators were often overpowered by blitzscaling startups, rushing for size.

Now the world is undergoing what could be called the “great pivot”, in reference to the about-face startups perform when they see that their original idea does not work. Politically, the dark sides of some online services—disinformation campaigns, data leaks, monopolistic behaviour and so on—are getting harder to ignore. Regulators have started pushing back. The effects of Europe’s strict new privacy law, the General Data Protection Regulation, are being felt around the world. Britain, a bellwether in online regulation, is considering both sweeping new regulations of online content and stricter antitrust laws. The advantages and perquisites of unregulated size are under challenge; so are the routes by which it can be attained.

Time to cultivate the garden

Beyond this there appears to be a growing concern that the innovation produced by some unicorns does not leave society better off. Whether the benefits of being able to run more and more of one’s life through screens outweigh the costs remains an open question, argues Dan Breznitz of the University of Toronto. There are real benefits. But critics point to real downsides, too. Increased congestion and other environmental costs, a weakening of public tran-

sport systems, the precarious lives of the workers who make these platforms function and a more friable body politic.

The wave of IPOs is unlikely to reverse these trends. Indeed it may exacerbate them, especially if the firms do less than spectacularly. Google almost quadrupled in value in the year after floating, which bought tech a lot of diffuse goodwill. No one expects Uber to do that. If today’s unicorns turn out to have created most of their value for private investors before floating, the public will take note.

How should Silicon Valley react? Tim O’Reilly, a publisher who serves as one of the industry’s intellectual leaders, argues that it needs a deep rethink. “The pursuit of monopoly has led Silicon Valley astray,” he recently told the readers of *Quartz*, a website. “The goal for Lyft and Uber—and for all of the entrepreneurs being urged to blitzscale—should be to make their companies more sustainable, not just more explosive.” But if the logic of the sort of technologies the Valley develops is indeed inherently monopolistic, game theory suggests that that may be hard to do. What value is there in a sustainable business model that gets outcompeted by a blitzscaler?

Again the park on top of the Transbay terminal is an apt metaphor. It is lovely and airy; but it is hemmed in by corporate buildings whose workers enjoy an ease of access to its flowers and fountains denied to *hoi polloi*. It is a walled garden, even if it has some gates. Meanwhile the terminal on which it sits is still a decade away from becoming the transport hub it is meant to be. Things that are gleaming and shiny and particularly nice for the better connected are not bad in themselves, even when they are hyped. But they are hardly the be-all and end-all of human innovation, inspiration and aspiration. ■





City politics

Sorry, we're full

SAN FRANCISCO

On the West Coast, the Democratic coalition is split over housing costs

SAN FRANCISCO liberals are the kind of people who abhor nativism in all its forms and recoil at statements, like those recently made by President Donald Trump, that America “is FULL!”. Yet in their own neighbourhoods, they often act as if the country were packed to the brim. The city council, acting unanimously, recently rejected a 63-unit housing complex because it would cast a shadow on an adjacent park. In nearby Berkeley zoning officers can deny new development that “would unreasonably obstruct sunlight, air or views.” Local residents in a posh part of the city have raised over \$100,000 to contest plans for a new homeless shelter, claiming that the new “megashelter” will breed crime and violence (“drug users” and “pets, including those designated as ‘vicious’ will be allowed” they warn). These tactics, along with excessive environmental reviews, have hampered new development in the city. Since 1990 the city has averaged a mere 1,900 new housing units each year.

San Francisco, where median monthly rent for a one-bedroom flat has reached \$3,500 according to Zillow, a real-estate

website, is only the most pathological example. West Coast cities, which are under near-total control of the leftiest Democrats around, rank among the least affordable for middle-class Americans and most inhospitable to the poor. Every morning traffic in the Bay Area is clogged by service-sector commuters, some of whom live far off in the state’s Central Valley and must make three-hour long treks in each direction. The smog from the cars settles in the valley, resulting in some of the worst air quality in the country.

Fixing this is proving fractious. Democrats are increasingly unified on issues of national ideology. Surveys show that a majority now self-identify as liberals. But the politics of land use in thriving cities scrambles this harmony.

Three jockeying coalitions each cling to the label of liberal. First there is the landed gentry, older residents who bought at the right time and are precious about maintaining their housing value. Then come the leftist activists who favour rent control, massive public-housing spending and who think gentrification is terrible. Last, are the

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market-oriented urbanists who want cities to fix their housing-supply shortages by building more.

The rent-control faction appears newly emboldened. In February Oregon passed the first-ever statewide rent-control law. The new legislation will limit rent increases to 7% plus inflation—meaning that it will be largely irrelevant except in cities like Portland. Kate Brown, the governor, said that it would “provide immediate relief to Oregonians struggling to keep up with rising rents and a tight rental market.” That might be true of current renters lucky enough to qualify, but rent controls also work to constrain housing supply, hurting future renters. A study by three Stanford economists of a rent-control law change in 1994 in San Francisco found that affected landlords decreased supply by 15%, increasing rents citywide. Nearly 1m flats in New York City—roughly 30% of the housing stock—are either rent-stabilised or rent-controlled, yet it is hardly cheap.

In California the degree of rent control that cities can impose is limited by a state law known as Costa-Hawkins. In 2018 activists launched an effort to repeal the rule by referendum. They were defeated (the proposition attracted its highest level of support—53%—in San Francisco county). Unbowed, state legislators have proposed a suite of bills that would increase local rent-control capacities. In Seattle, also thriving due to a tech boom, Kshama Sawant, a socialist city councillor, is pushing an ordinance that would limit rent increases to ▶▶

▶ move in step with inflation.

Housing prices are high because demand has grown more quickly than supply. Supporters of rent control pay no heed to the opportunities they deny to poor and middle-class people to move to thriving cities. And yet the market-urbanist coalition, which pushes for relaxed zoning rules and more building, had little sway over local politics. Their plans smelled suspiciously neoliberal. Ideas that economists are fond of seldom inspire popular movements. But that has changed with the emergence of the YIMBY movement, a loosely organised bloc of those who say “yes in my backyard” to new development.

The most ambitious YIMBY proposal comes from Scott Wiener, a former San Francisco city councillor who is now in the state senate. He has written a bill, known as SB 50, that would pre-empt local zoning rules and allow high-density building near transit stations and centres of job growth or high-quality schooling. For many cities in the Bay Area, this would essentially legalise high-density building citywide.

Among top local Democrats, the reaction has been polarised. The mayors of San Francisco, Oakland and Sacramento are all in favour; the San Francisco city council is overwhelmingly opposed, purportedly to slow gentrification (have they looked around?), as is the mayor of Palo Alto, a neighbouring low-slung town where the median home value is \$3.1m.

SB 50 is a modified version of legislation Mr Wiener submitted last year, only to have it die in committee. The new version contains concessions to activist concerns—like delaying implementation in poor neighbourhoods and adding tenant protections—and looks politically hardier as a result. “Rather than having these two camps, or sub-camps, divided and fighting with each other, they should be unified,” says Mr Wiener. “In the end, the common opponent is the no-growth people who do not want any development in our community. They want to freeze their communities in amber even though their children won’t be able to live where they grew up.”

In California the success of SB 50 will depend on Gavin Newsom, the new governor, who has shown a desire to fix the state’s deep housing problems. During his campaign Mr Newsom pledged to build 3.5m new housing units by 2025. He has also ordered his administration to sue Huntington Beach, an attractive small town near Los Angeles, for failing to build sufficient affordable housing—a requirement of a largely unenforced state law. The intra-party politics of housing reform remain difficult. SB 50 has cleared one committee hurdle, but has yet to emerge from the state legislature. And for all his efforts elsewhere, Mr Newsom has yet to weigh in on whether he would actually sign it. ■



Tinseltown

Sunset brouhaha

LOS ANGELES

Worried by declining salaries, Hollywood’s writers sack their agents

KRISTA VERNOFF, a television writer and the executive producer of the television drama “Grey’s Anatomy”, called her agent of 20 years on April 12th and told him tearfully that he could no longer represent her. “He has done his job well, guided and supported my career, and made me a lot more money than I would have made without him,” Ms Vernoff wrote in the *Hollywood Reporter*. Nevertheless Ms Vernoff sacked him, as part of an acrimonious standoff between the Association of Talent Agents, a trade association made up of talent agencies, and the Writers Guild of America (WGA), a union of television and film writers. The guild complains that agencies are prospering at the expense of the screenwriters they are supposed to represent.

Following several months of heated negotiations, the guild instructed its 13,000 active members to dismiss agents at companies that had not committed to its new code of conduct, which the majority of Hollywood’s biggest agencies have not. Many writers did so dolefully. John August, who wrote the film “Big Fish”, wrote on Twitter: “My agent of 20+ years is a great friend and a fighter for my career. I would give him a kidney tomorrow. But this isn’t about him or any single agent.” Before hanging up with her longtime representative, Ms Vernoff plaintively quoted the “Hamilton” playwright Lin-Manuel Miranda, telling

him: “See you on the other side of the war.”

While the entertainment industry is booming, with companies such as Disney, Fox, Time Warner, Comcast, CBS and Viacom hauling in more than \$50bn in operating profits in each of the past three years, the writers guild reports that screenwriters’ median weekly earnings dropped 23% between 2014 and 2016 and that, compared with the late 1990s, per episode fees have declined when adjusted for inflation. While the union has previously directed its ire about pay at production studios, staging a strike in 2007 and nearly striking again in 2017, it is now targeting agencies.

Agents used to make money from television writers by taking a commission—usually 10%—when their writers were hired to work on a show. But for the past few decades agents have preferred to waive their commissions and instead collect fees from studios in exchange for offering “packages” of television contributors, such as a showrunner, a director and several writers, that studios can hire at once. By forgoing commissions and instead taking pay from the studios they are supposed to be negotiating against, writers feel agents have no incentive to wrangle them the best deals. One television writer says she has heard of agents offering to accept lower salaries for a writer in order to get a show on the air and secure packaging fees.

The writers also complain that three large talent agencies, William Morris Endeavor Entertainment, Creative Artists Agency and United Talent Agency, have launched affiliated companies that finance shows themselves. They wonder how agents can possibly haggle for high salaries for their clients while at the same time fretting over production costs. According to research conducted by the writers guild, almost 90% of scripted series in the 2016-17 television season were packaged, with William Morris or Creative Artists involved in four-fifths of those packaged series.

Agency practices are not the only thing hurting writers’ salaries. Streaming services have also played a role. Writers used to derive a significant part of their income from residuals, which are fees that television networks pay writers for replaying their work. Netflix, Amazon Prime and Hulu have upended that model, paying writers far less in such fees. They have also inspired an industry-wide move to television seasons with fewer episodes, meaning that writers are guaranteed work for shorter periods. Even though agency practices are not entirely to blame for dwindling salaries, there is a sense among writers that the time has come for the agents to alter their behaviour. “When Harvey Weinstein came tumbling down,” says Ms Vernoff, with an eye on the story arc, “the idea that Old Hollywood can’t be changed crumbled with him.” ■

Predicting the primary

How early is too early?

WASHINGTON, DC

At this stage presidential primary polls are more wrong than right

THERE ARE still 65 weeks to go until the Democratic Party holds its nominating convention in Milwaukee—about the same amount of time a rhinoceros pregnancy lasts. Is it too early to say anything meaningful about which candidate will win? Yes it is: at this point in the 2016 cycle Donald Trump had not even announced his bid for the presidency. But although the most widely watched information about the race, public polls, will not help you pick a winner until mid-summer, they can con-

vey useful information about the top-three candidates even this early.

Presidential primaries have changed greatly over the past half-century. It was once relatively easy to identify a winner, as fewer candidates ran and elite endorsements could make or break a campaign with ease. Most candidates did not formally announce they were running unless they already knew they were going to have a good shot at the nomination. The so-called “invisible primary” really was invisible to most Americans. Contests typically had just a handful of candidates and many fewer states used primaries to select a candidate than they do today. The timetable has changed too. William G. Mayer and Andrew E. Busch, two political scientists, calculated that back in 1976 voters had selected only 19% of all delegates by the sixth week of the primary season. By that point in 2020 just shy of 60% will have done so.

Though the process has sped up, it is still possible to tune in too early. Election-watchers querying when to pay attention to the 2020 race have to solve three puzzles. First, they must pick a point when the main candidates can be identified. Second, they have to determine when voters will start making up their minds about which candidates to support. Third, they must factor in when the public will have information at their disposal to shape those intentions. The best single indicator that offers insight into all three questions is public polling.

According to *The Economist's* analysis of polling data spanning Democratic and Republican presidential primaries from 1980 to 2016, polls taken this far away from nomination conventions are more wrong than right. Our statistical model estimates that just 35% of primary polls fielded 65 weeks before a party's nomination convention put the eventual winner in the lead. There is a caveat, though. Although polls this early do not pick the winner very often, they do often correctly place the candidate in the right tier. In polls taken as far in advance as today is from the 2020 convention, the eventual winner was among the top three contenders 85% of the time. The current field is unusual, though, and might defy this pattern. There are a lot of candidates, half a dozen of them look plausible and there is no overwhelming favourite.

If not now, when should you start paying attention to the primaries? According to our number-crunching, polls start picking the right winner more than half of the time 52 weeks before the convention, or about in mid-July of this year. By that point, most candidates have announced that they are running, the winners and losers are just a couple of spots from their finishing position and more voters have tuned in. Until then, the day-to-day and week-to-week fluctuations in the race are not as important as headline writers and Washington politicians would have you believe. ■

Freeing DC

Capital gains

WASHINGTON, DC

A long-standing push for statehood gets fresh impetus

FOUR YEARS ago Alan Amsterdam co-authored a ballot initiative that made it legal to own, use and grow marijuana in America's capital. As an investor in the dope trade—the aptly-named Mr Amsterdam co-owns Capitol Hemp, a shop that flogs bongos and pipes—he had a strong private motive. The referendum passed, yet it remains illegal to sell weed in Washington. And though marijuana peddlers tend to get around that by overpricing other goods and throwing a pungent-smelling “gift” into the bargain, this requirement remains a serious dampener on Mr Amsterdam's business. Washington is one of the most-visited places in America, he notes with frustration. “A lot of that is kids going to museums...but think what their parents would like to do in the evening!”

The fact that Washingtonians are free to smoke marijuana but not buy it is a reflection of their peculiar political circumstance. Because America's founders did not want a state government to exercise undue influence over the capital, they made the District of Columbia a federal jurisdiction. More than two centuries later its 700,000-odd residents—more Americans than live in Wyoming or Vermont—have no voting representation in Congress, and their city budget must be approved by congressmen. After the ballot initiative was passed a congressional rider was attached to DC's budget forbidding officials from spending federal or local funds to

legalise or regulate the market.

Such meddling by lawmakers in the city's affairs is one reason why fresh momentum is gathering behind a movement for DC statehood. In March the House of Representatives passed the “For the People Act”, a long list of measures to expand voting access that includes a statement of support for the statehood effort. In the Senate a similar bill is backed by the many Democrats there who are running for the presidency. On April 15th 20 Democratic attorneys-general from California to Virginia said in a statement, the first of its kind, that they backed the push for DC statehood.

Democrats' support for the movement is in part principled. Nearly half of the population is African-American. In 1961 worries about the disenfranchisement of black Americans led to a constitutional amendment allowing District residents to vote in presidential elections; Democrats remain exercised by such concerns.

It is also self-interested. Since District dwellers won the right to pick presidents they have plumped for Democrats by big margins. In 2016 Hillary Clinton took more than 90% of DC's vote. Republicans are understandably less anxious for DC to get its own congressmen and senators. Even if statehood did not require a constitutional amendment—which three-quarters of states would have to back—this means DC is unlikely to become America's 51st state any time soon.

Hotter in July

United States, presidential primary polls that put the eventual party nominee in the lead 1980-2016, %

Number of Polls 10 40



Sources: Charles Franklin; *The Economist*



Measles

The needle and the damage avoided

BROOKLYN

New York's struggle with measles has put vaccination rules on the spot

SIGNS WARNING people to stay away if they have fever and rash are posted at medical practices and pharmacies in parts of Brooklyn, a borough of New York City where health authorities have struggled to stop a measles outbreak that began in October. More than 320 people have contracted the disease so far and new cases show no sign of abating. With outbreaks going on in several other states, measles cases in America this year are on track to reach the highest number since 1994.

Most cases in Brooklyn have been in an ultra-Orthodox Jewish enclave, where many parents have refused to vaccinate their children. Pockets with vaccination rates lower than the 95% level that stops measles from spreading exist across America. But Brooklyn is densely populated and that has made the disease easier to spread. On a Sunday afternoon, playgrounds in a neighbourhood that has been the centre of the outbreak are so packed that there is hardly any space for children to run around. Large families are the norm among ultra-Orthodox Jews and their social life is largely confined within their community. The outbreak in Brooklyn began with an unvaccinated child who contracted measles on a visit to Israel.

There is no religious reason why Jews should not get the measles vaccine, says David Niederman, a rabbi in Brooklyn. Like him, most rabbis in the area support vacci-

nation and even urge people to get the jab. But that advice stands against anti-vaccine propaganda from Parents Educating and Advocating for Child Health (PEACH), a group that has aimed its publications at Jewish families. It blanketed parts of Brooklyn with a brochure claiming that vaccines are harmful and unnecessary, attaching letters by rabbis in support of its cause. PEACH also runs a call-line with recorded "lectures". One is by Andrew Wakefield, author of a discredited study from 1998 that linked vaccines with autism.

On April 9th New York City declared a public health emergency, making vaccina-

tion against measles mandatory in the parts of Brooklyn where cases have been concentrated. Residents were given 48 hours to comply or pay a \$1,000 fine. The authorities are also cracking down on child-care centres and yeshivas (religious schools) that have flouted a ban on attendance by unvaccinated children that the city issued in December. Nearly 40 cases of measles were traced to unvaccinated children in one such school that defied the ban. On April 15th the health department shut down a day-care centre for 250 children for non-compliance.

The outbreak in New York has charged an ongoing debate in America: whether to abolish the exemptions to vaccination for schoolchildren. New York and 46 other states currently allow unvaccinated children to attend school if their parents claim that they object to vaccines on religious grounds; a further 17 states have broader "philosophical" exemptions, too. In 2017-18 such non-medical exemptions were used for 2.2% of American schoolchildren, double the rate in 2010-11.

Paul Offit of the Vaccine Education Centre at the Children's Hospital of Philadelphia says that the religious exemption to vaccines is, in fact, a "misinformed-parent exemption." Vaccines were invented long after the main religious texts had been written and no widespread religious doctrine says people cannot be vaccinated, says Dr Offit. Proposals to abolish non-medical exemptions have been introduced in several state legislatures this lawmaking season. But such bills—as well as some that would make it easier to avoid vaccines—are a perennial feature in many states; some never get to a vote. By and large the trend in recent years has been to make non-medical exemptions harder to obtain (by asking parents for more paperwork or to renew the request every year, for example).

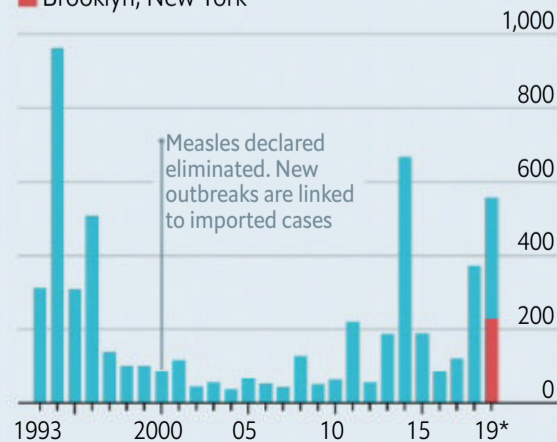
California bucked the trend and abolished non-medical exemptions in 2015 in response to a big measles outbreak. Vaccination rates went up, but so did the rate of medical exemptions. It turned out that some doctors were writing bogus ones—and parents would go to great lengths to find them. One child who came down with measles had received an exemption from all vaccines from a doctor's practice in a town several hundred miles away.

There is more that can be done. Most parents who worry about the safety or efficacy of vaccines are "convincible" and will choose to vaccinate their children if doctors answer their questions with patience and compassion, says Dr Offit. A small minority of parents, however, will remain strong believers in conspiracy theories about vaccines no matter what. The imprint of PEACH in Brooklyn suggests that paranoia and superstition can still cast a spell over science. ■

Coughs and sneezes

United States, measles cases

■ Brooklyn, New York



Sources: CDC; NYC Department of Health

*To April 11th

Voters v lawmakers

Nock, Nock

WASHINGTON, DC

Republican-led state legislatures are overturning ballot initiatives

IN HIS AUTOBIOGRAPHY, “Memoirs of a Superfluous Man”, Alfred Jay Nock had this to say about America’s system of self-government: “I could see how ‘democracy’ might do very well in a society of saints and sages led by an Alfred or an Antoninus Pius. Short of that, I was unable to see how it could come to anything but an ochlocracy of mass-men led by a sagacious knave.” Nock was among the first writers to call himself a libertarian and, via William F. Buckley and the *National Review*, exercised significant influence on American conservatism. Given that the Republican Party, the closest thing to a vehicle for the promotion of conservative ideas, is in the business of gathering votes, the equivocal feelings of some conservatives about the *demos* are usually kept quiet. Occasionally, though, they break cover.

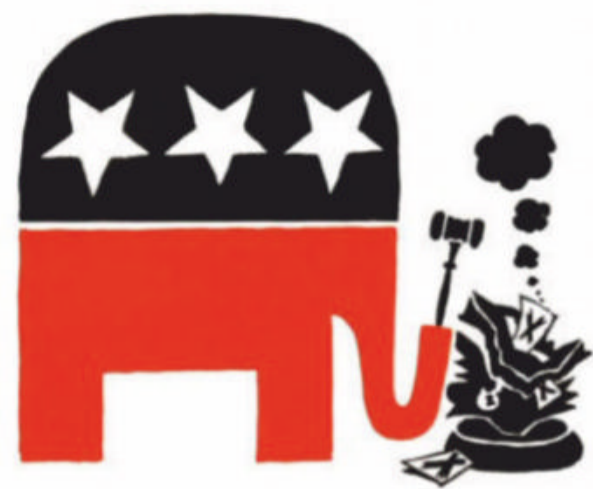
This is what seems to be happening around the country in state legislatures with Republican majorities. Last November voters in several states approved an array of policies in ballot initiatives. These

policies included establishing voting rights for ex-prisoners, the expansion of Medicaid (health insurance for the poor) and legalising medical marijuana. State governments were supposed to enact those reforms, but instead the Republican-controlled ones are seeking to roll them back.

In Utah, 53% voted in November in favour of Proposition 3, a ballot initiative to expand Medicaid eligibility to everyone earning up to 138% of the federal poverty level, which is about \$35,000 a year for a family of four. Some families who would have received coverage under this proposal have since had to go without. That is because propositions passed via ballot initiative in Utah are the same as any other laws passed by the legislature. They can be modified, replaced or just good old-fashioned repealed by lawmakers.

In this case the Utah state government replaced the proposal passed by ballot initiative with a new one that expands coverage for a smaller group: those earning up to 100% of the federal poverty level. According to researchers at the University of Utah’s Kem C. Gardner Policy Institute, the revised bill therefore extends Medicaid to 30,000-60,000 fewer residents than the ballot initiative that was passed by the voters would have done.

Republican-controlled state legislatures are also restricting Medicaid expansion in other states where voters gave it the go-ahead in November. A widespread



method for doing so is to require recipients to work to receive their coverage. In Idaho, state legislators—80% of whom are Republican—passed a law that removes a recipient’s coverage for two months if they do not work, volunteer or study for at least 20 hours per week. In Nebraska, which is moderately left-leaning compared with the others in the bunch, Republican governor Pete Ricketts plans to do the same. A similar rule enacted in Arkansas caused thousands of poor Arkansans to lose their care.

The most controversial case, though, is in Florida, where 65% of voters passed constitutional Amendment 4 in November. This amendment allows felons, who had been banned from voting in Florida, to register to vote so long as they had completed “all terms of their sentence including parole or probation.” Republican state legislators in Florida’s statehouse have since introduced a bill that would add an additional requirement for so-called “returning citizens” to pay all their fines and legal fees before being allowed to register.

Supporters of the bill in the state legislature point to the fact that the measure is in line with the language lawyers used when explaining the amendment to Florida’s Supreme Court. But the measure is not what voters voted for. The Florida Rights Restoration Coalition, which led the fight for the amendment, argues that legislation proposed should “neither limit the rights created by Amendment 4 nor infringe upon the will of Florida voters.” The additional prerequisite has been likened by some to a 21st-century “poll tax,” a reference to a scheme used to deny African Americans the right to vote in the early 20th century. One estimate suggests it could disenfranchise as many as 840,000 Floridians—a significant total given that last year’s gubernatorial election came down to a margin of just over 30,000 votes.

Somewhere along the road toward representative government, Republican lawmakers have decided to Nock popular sovereignty. They may well have a point, but when a majority has already decided in favour of something, it is odd for a party that is in the election-winning business to fight so hard against it. ■



Spruce goosed

Look Burt Rutan up on Wikipedia and it will claim he has retired. This aeroplane casts doubt on that statement. Mr Rutan is probably the most original aircraft designer in the world, and Stratolaunch, as the craft is known, is perhaps his *pièce de résistance*. It made its maiden flight on April 13th from the Mojave Air and Space Port in California. By wingspan (117 metres) it is the largest plane ever to have flown. It was built by Mr Rutan’s company for Stratolaunch Systems, a firm he founded jointly with the late Paul Allen, who, in turn, had co-founded Microsoft. Its purpose is to carry rockets (which will fit between the two fuselages) as close to space as possible before they are launched into orbit, thus saving fuel. When commercial operations will start is not yet clear.

Lexington | Mayor Pete for freedom

Pete Buttigieg's canny fusing of liberalism and tradition is a natural extension of his marriage



NEWTON'S THIRD law of motion also helps predict America's presidential succession. After Richard Nixon's sleaze, voters picked a Georgian Sunday School teacher who promised never ever to lie to them. After eight years of interracial progress and cool intellectualism from Barack Obama, they chose Donald Trump. Whoever succeeds him is liable to be as different from the know-nothing New Yorker as it is possible to imagine. For a growing number of excited Democrats, this points to Pete Buttigieg.

The 37-year-old mayor of South Bend, Indiana, is the anti-Trump of the moment. A Harvard and Oxford graduate, he is a gifted musician, linguist and scholar. He is also unfailingly genial and, for a politician, almost bashful about his achievements. Given that his main claim to the presidency, which he only recently became old enough to occupy, is his experience running Indiana's fourth biggest city, he might seem to have little choice. Even so, at a packed rally in Brooklyn this week, the gracious way he referred to his recent rise in the Democratic primary pack was refreshing.

The diminutive mayor, appearing before a crowd of bearded hipsters in his regulation shirtsleeves and tie, celebrated the fact that his campaign was being taken seriously. He did not spell out that, almost unknown three months ago, he is now polling in third place in Iowa and pulling in as much cash as any rival except Bernie Sanders. After his launch on April 14th he raised a million dollars in four hours. He also made no reference to his accomplishments—though another emerged at the rally. It had previously transpired, after he was approached by a Norwegian television crew, that he speaks fair Norwegian. In Brooklyn he spoke better French. As Notre Dame burned, he assured a French journalist that Americans “partageons la douleur mais nous remercions aussi de ce cadeau à la civilisation” (“we share in the pain but we also thank you for this gift to civilisation.”) On Twitter meanwhile Mr Trump urged the French to get hold of some “flying water tankers!”

American voters do not much like pointy-headed franco-phones. Yet in recompense Mr Buttigieg offers a convincing claim to public-spiritedness and decency. He quit a job with McKinsey to seek election in unglamorous South Bend—a city of 100,000 best known for a Studebaker car factory that closed half a century ago—and served as a naval reserve in Afghanistan. He is squeaky clean

and prone to moralise, but not in a cloying way. Alongside his youthfulness and relentless futurism—“there is no such thing as an honest politics that revolves around the word ‘again,’” he says—he sets the timeless values of the small-town Midwest: faith, family, community and a love of fried food and dogs.

Perhaps not since Bill Clinton have the Democrats produced an intellectual so good at playing the regular guy. Moreover, where Mr Clinton's skill became associated with his intemperance and cynicism, Mr Buttigieg's underlines the most significant detail of his candidacy: his status as the first openly gay presidential candidate.

A tacit rebuke to Mr Trump's illiberalism, this plays a contradictory role in the mayor's campaign. It is in a sense impressively peripheral. That Mr Buttigieg can plausibly offer himself as the candidate of restoring honest Christian values, as Jimmy Carter did, shows how relaxed Americans have recently become about sexuality. Opinion polls suggest they are readier to vote for a gay candidate than an evangelical Christian one.

Yet Mr Buttigieg's openness about his sexuality, ever since he came out in an article in the *South Bend Tribune* before his re-election in 2015, is at the same time central to his appeal. It has earned him a reputation for candour, integrity and courage, of which his marriage to Chasten, a schoolteacher who is by far the most prominent political spouse in the primary, provides a constant reminder. Chasten Buttigieg, who warmed up the crowd in Brooklyn and greeted his husband to the stage with a kiss on the lips, is by turn a comic sidekick, political surrogate and personification of the mayor's old-school values.

This is consistent with Mr Buttigieg's broader argument that Democrats need to reclaim the traditional values which he espouses from the right. “Freedom does not belong to just one political party,” he said in his launch speech. A liberal scion of the heartland, he has long witnessed Democrats ignore that truth, delight themselves with socioeconomic policy (on which he has hinted at pragmatism, but said little), and lose. Presenting his marriage as an elusive example of liberalism fused with tradition looks like a promising alternative strategy.

To understand why, recall how gay marriage proved such a felicitous exception to the culture wars. Liberals and conservatives alike felt their values were vindicated by the reform. Mr Buttigieg's campaign can be viewed as an effort to maximise his political gain from that niche. The unusual way he combines freethinking liberalism with punctilious social conformity—in his manners, religious practice and otherwise—is a sort of extrapolation of it.

A feud he appears to be trying to engineer with Mike Pence represents another bid to elevate his modest record in South Bend, battling potholes and derelict housing, into the grander fight over values he wants. To the evident surprise of the vice-president, who backed anti-gay measures while governor of Indiana, Mr Buttigieg refers to him as his nemesis. This could be the making of a spicy vice-presidential debate. It also deflects attention from Mr Trump, whose provocations Mr Buttigieg seems keener to ignore.

A bend in the river

He is not alone in that. Beto O'Rourke and Amy Klobuchar are also reluctant to go toe-to-toe with the president. The former is better-known than Mayor Pete, the latter more experienced. It is far from clear that he can emerge from the Democratic pack. Yet the early interest in him is merited. Mr Buttigieg is attuned to the way voters actually think, not how politicians want them to. He also represents great liberal progress. Both things are worth celebrating. ■



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Canada

Liberté against laïcité

TORONTO

Quebec wants to ban public servants from wearing religious garb

A LARGE CRUCIFIX has long hung above the speaker's chair in Quebec's legislature. The first one was installed in 1936 to acknowledge the bond between the Catholic church and the government of Canada's French-speaking province. It survived the "quiet revolution" of the 1960s against the church's grip on public and private life. The church ceased to run the province's schools, hospitals and social programmes. But politicians of all parties were loth to take down the crucifix, which was replaced with another in 1982. One premier reportedly said that he was no Joseph of Arimathea, the man who buried Jesus.

It may now finally come down. Last month the national assembly, as Quebec's legislature is called, voted unanimously to move the mahogany, bronze and steel object to a less prominent place in the building. But that will happen only if another measure passes which is more contentious. The right-leaning provincial government of François Legault wants to ban newly hired public servants, including teachers, police officers, lawyers and judges, from wearing religious symbols at work. This would make Quebec the first jurisdiction in North America to impose such a ban.

Mr Legault claims to be enshrining in law the concept of *laïcité*, an uncompromising version of secularism with roots in the French revolution. This seeks to prevent the state from interfering in citizens' religious lives, and to free the state itself from religious influence. It obliges citizens to put their faith to one side in their dealings with it. Mr Legault's critics accuse him of using secularism to hide a nastier agenda of putting religious minorities, especially Muslims, in their place. The relocation of the crucifix is just a decoy, they say.

The proposal, called Bill 21, pits Montreal, Quebec's biggest and most diverse city, against the rest of the province. Thousands of people have protested against it. The bill also sharpens differences between Quebec and the rest of Canada. The mayor of Calgary, Naheed Nenshi, who is Muslim, called the religious-attire ban "idiocy". Justin Trudeau, Canada's prime minister, said it would legitimise religious discrimination. But Mr Legault's party, Coalition Avenir Québec, has the votes to pass it.

Quebec's worries about both religion in public life and about cultural diversity have deep roots. The quiet revolution was an expression of mounting anti-clericalism. Francophones surrounded by Eng-

lish-speakers, Quebecers have had to struggle to preserve their language and culture. English-speaking Canada celebrates "multiculturalism", encouraging minority groups to maintain their distinctive identities. Quebecers prefer "interculturalism", which puts more emphasis on appreciation of the host culture.

Quebec separatism faded as a political force in the 2000s at the same time that immigration from non-European countries increased. In 2011 Muslims were 3% of Quebec's 7.7m people, double the share of ten years before. Such changes have brought about a "major shift", says Daniel Béland, director of the McGill Institute for the Study of Canada in Montreal. Legislators "stopped focusing on sovereignty and started focusing instead on issues of religious accommodation and immigration".

In 2006 a YMCA frosted a window to please synagogue-goers who did not want to see people working out in tight clothing. This and similar controversies prompted Jean Charest, the province's Liberal premier, to ask two scholars to study how Quebec could achieve a "reasonable accommodation of minorities". They said that worry about the erosion of Quebec's cultural identity was unfounded. But they nonetheless suggested that state employees who "exercise a power of coercion", such as police, be barred from wearing religious symbols. They also called for the removal of the crucifix from the legislative chamber.

Governments since 2010 have made three attempts to write *laïcité* into the law. Two failed because the governments sponsoring them lost elections. In 2017 then-premier Philippe Couillard, also a Liberal, ►►

introduced a measure barring people from covering their faces when proffering or receiving public services. It looked like a ban on Muslim face veils. The legislature passed the measure, but judges in Quebec courts suspended it. One said it could cause Muslim women “irreparable harm”.

Last October Quebecers who fear their culture is under siege helped elect Coalition Avenir Québec, which was founded in 2011 and had never before exercised power. Mr Legault, a former airline executive, campaigned to curb immigration, even though the province has a labour shortage, and to deny work permits to newcomers who fail tests of “Quebec values” and proficiency in French. The religious-symbols bill would change Quebec’s human-rights charter to acknowledge that the province considers “state *laïcité* to be of fundamental importance”. Mr Legault initially defended the crucifix as a historical symbol rather than a religious one. Accused of hypocrisy, he changed his mind.

Like Mr Couillard’s ban, Bill 21 would bar public servants from covering their faces on the job. Current employees will be able to continue wearing religious garb, but only if they stay in the same job. Mr Legault told trainee teachers that those who want to wear religious clothing should choose a different career.

The government has had a hard time explaining how the ban would work. The public-security minister said police officers could enforce it, then backtracked. Bill 21 applies only to “something that is not naturally on you”, said the immigration minister, Simon Jolin-Barrette. So Rastafarian dreadlocks and tattoos would be permitted. What about discreet items of religious jewellery? There won’t be a “strip search”, Mr Jolin-Barrette promised.

Ayesha Khan, a Quebec-born high-school science teacher who as an adult decided to wear a hijab, says the bill makes her feel like “a second-class citizen”. The bill probably affects more women than men because they are more likely to wear religious clothing. Some yarmulke-wearing Jews and turbaned Sikhs are also worried. David Ouellette, head of research at the Centre for Israel and Jewish Affairs in Montreal, says the bill restricts religious freedom. “State secularism is an institutional duty, not a personal one,” he says.

Hate crimes against Muslims in Quebec appear to be increasing. In 2017 the number of incidents reported to police (of everything from incitement of hatred to murder) nearly trebled, to 117. That year a white nationalist killed six worshippers at a mosque in Quebec City, the provincial capital. Charles Taylor, an author of Mr Charrest’s report, accused Mr Legault’s government of spreading the idea “that there’s something problematic” about Muslims.

The premier is braced for a legal chal-

lenge. His bill invokes the “notwithstanding clause” of the Canadian constitution, which allows provincial governments to override some constitutional guarantees, including of freedom of religion.

The government would be “naive” to think that the ban will be easy to enact, says Mr Béland. Lawyers are looking at whether it violates the constitutional right to equal treatment regardless of sex, which is not subject to the notwithstanding clause.

Such challenges could eventually doom the religious-symbols ban. Then Quebecers will find out whether the government is serious about secularism. If the crucifix remains in its position above the speaker’s chair, the answer will be “no”. ■



Cannabis in Jamaica

Ganja gamble

The weed is an opportunity, but the government has to be careful

WHEN JAMAICAN children catch a cold, mothers rub cannabis oil on their chests. Rastafarians smoke cannabis as a religious custom. Some believe that it grew on King Solomon’s tomb. Encouraged by the tropical climate, cannabis grows in many household gardens.

Until now, Jamaica’s connection to cannabis has mainly been a problem for the Caribbean country. It is the region’s biggest supplier of illegal weed to the United States, which coaxes the government to destroy illicit fields. Before 2015, a conviction for possession could result in a sentence of up to five years in jail. Thousands of young men were locked up.

Now Jamaica is starting to think of cannabis as an opportunity. Uruguay, Canada and ten American states have legalised it for recreational use. Ganja, as Jamaicans call it, is a “growth-oriented industry”, says Audley Shaw, the agriculture minister. In 2015 Jamaica decriminalised the possession of small amounts and allowed its cultivation for medical use. But Jamaica’s welcome is wary. It is trying to cash in on cannabis without provoking the United States. The risk of miscalculation is high.

Worldwide sales of medical marijuana will grow from \$11bn in 2017 to \$37bn in 2023, predicts Research and Markets, a research firm. A share of this could help Jamaica replace income from diminished sales of sugar, once its biggest cash crop. The government plans to issue regulations on cannabis exports by the end of April.

The island has become a magnet for marijuana merchants. In September Aphria, one of three “golden boys” of Canadian weed, bought a 49% stake in a grower in Jamaica with 22 employees as part of a C\$300m (\$226m) deal that included properties in Argentina and Colombia. In the same month, Jamaica-based Timeless Herbal Care exported the island’s first shipment of cannabis oil, to Canada. In February Jacana, a grower, said it had completed the first export of ganja flower, the most potent part of the plant (also to Canada). Its 40-hectare farm produces enough weed to roll 300m therapeutic joints a year.

Jamaica Medicann, based in Toronto, will provide Jamaica-grown cannabis for clinical trials of a drug to treat a rare form of leukaemia. The US Food and Drug Administration has given the drug “orphan status”, which allows firms to get tax credits and other incentives to test it. Diane Scott, the firm’s boss, claims that the island has rare strains of weed with curative properties.

The government says it will allow the sale of weed for medical and sacramental purposes, not recreational ones. The Cannabis Licensing Authority, founded in 2015 to regulate cultivation, processing and sale of legal weed, has granted only about 130 licences. It conducts background checks, requires that growers put up fencing and security cameras and regulates the distance between their fields and schools. The application process is “very thorough”, says one investor.

Exports—the big prize, says Mr Shaw—face extra hurdles. Health officials in Jamaica and the importing country have to approve each supply agreement. So far, just a few countries have issued permits. The United States government still prohibits imports of all but one cannabis-derived medicine (Epidiolex, which treats epilepsy with no euphoric effect).

Jamaica’s regulation is looser than it looks, however. The main sales channels for legal weed are “herb houses”, which

► have popped up across the island. Doctors on the premises write “prescriptions”. The best customers are drawn from the 4.3m tourists who visit each year. Today’s regulations amount to “a controlled-access tourist programme”, admits a foreign investor. That is better than letting tourists “stroll around on a Thursday night after a couple of rums looking for cannabis in God knows what corner of the city”.

Balram Vaswani, an Indian entrepreneur, opened the first of seven planned pot cafés last year in Ocho Rios, a resort on the northern coast. Canada’s Canopy Growth,

the world’s largest cannabis company, plans to open two pot shops in Jamaica by June. Its chief executive, Bruce Linton, hopes to encourage connoisseurship by labelling the weed with the name of the parish (territory) where it is grown and by conducting day trips to farms. “The government is very, very business-friendly,” says Jakob Ripshtein of Aphria.

But it dare not appear too friendly. Jamaican banks that do business with cannabis companies risk having their accounts at American banks shut down. If that happened on a large scale, Jamaica could be cut

off from access to American dollars, which would devastate the economy. Jamaica received \$2.3bn in remittances in 2017, more than its income from exports of goods. Jamaican officials also risk losing their access to American visas if the country is found to be flouting the United States’ drug laws, says Charles Nesson of Harvard Law School.

Herb houses do business mostly in cash, but banks will be harder to avoid as trade becomes more sophisticated. Cannabis can bring relief to a poor country like Jamaica, but only if it does not overdose. ■

Bello Lessons from the amauta



The Latin American left should rediscover Mariátegui’s pluralism and creativity

HE DIED AGED just 35, disabled for his last six years by the amputation of a leg. But in his short life José Carlos Mariátegui managed to become Latin America’s most influential Marxist thinker, at least until Che Guevara came along. Barely known today outside Peru, he also played a significant role in Latin American culture in the late 1920s, a period when artists and writers were trying to establish national identities based on the recognition of *mestizaje* (racial mixing) and of workers and peasants. An exhibition, currently at the Reina Sofia museum in Madrid and then bound for Lima, Mexico City and Austin, Texas, introduces Mariátegui to a broader audience while establishing him as a cosmopolitan figure at the hinge of revolutionary politics and artistic vanguards. It offers lessons for the region today.

The child of a *mestiza* mother and an absent aristocratic father, Mariátegui was an autodidact who became a journalist and writer. Exiled by Peru’s authoritarian regime, he lived in Europe from 1919 to 1923, mainly in Italy and Berlin. He attended the first congress of the Italian Communist Party and was influenced by its founder, Antonio Gramsci, whose thought was a bridge between liberalism and Marxism and who stressed the importance of culture. Mariátegui was introduced to a profusion of European artistic movements, including Italian futurism, Dada and surrealism.

He returned to Peru “with the idea of founding a magazine”, he wrote. That idea came to fruition in 1926 with *Amauta* (“wise one” in Quechua), a political and cultural journal. Mariátegui was never dogmatic or narrow in his interests, and he wanted *Amauta* to analyse the problems of Peru “in the world panorama”. The first issue contained articles by

Sigmund Freud and George Grosz, a German artist, as well as reports on political developments in Spain and Mexico. It included illustrations by Emilio Pettoruti, an Argentine cubist, and José Sabogal, a Peruvian artist who created *Amauta*’s modernist design.

In his writings, Mariátegui developed a distinctive revolutionary vision, which he briefly tried to put into practice when he founded the Peruvian Socialist (ie, communist) Party in 1928. Peruvian (and Latin American) socialism should not blindly copy European models, he thought. Rather, it should put the “problem of the Indian”, and thus land reform, at its heart. He believed that the Amerindian peasant communities of the Andes contained the germ of socialism.

This romantic view set him on a collision course with the apparatchiks from Moscow, who took over Latin American communist parties shortly after his death. But Mariátegui was right in stressing indigenous peoples, popular religiosity and culture in Latin America’s political identity. He was unusual, too, in counting

many women among his collaborators.

The exhibition highlights the loose continental network, with ties to Mexico and Argentina, to which *Amauta* belonged. It includes art by Diego Rivera and other Mexican muralists. But the visual highlight is the work of Peruvian “indigenist” artists, such as Sabogal and Julia Codesido, who painted portraits of Amerindian elders and scenes of Andean community life. Indigenism was seen as archaic compared with the revolutionary commitment of Rivera. But it endowed its subjects with dignity, and Mariátegui defended it. “The emergence of indigenism represented a radical upheaval that is hard to imagine today,” writes Natalia Majluf, the exhibition’s co-curator and the outgoing director of Lima’s Museum of Art.

Mariátegui was wrong about big things. It is capitalism, not communism, that has freed billions from poverty. But in the aftermath of the first world war and of the Russian and Mexican revolutions, and having seen the failure of liberalism to prevent Italian fascism, he was not to know that. What he saw was that in Peru a century of political independence and creole capitalism had not freed the Indian from near-serfdom.

Mariátegui was a committed socialist who also managed to be a free thinker. That makes him valuable today. Much of the Latin American left is blindly obedient to the failed models of Cuba and Venezuela, or still beguiled by populist *caudillos* (for whom Mariátegui had no time). It desperately needs some of the original thinking of the 1920s. For the right, “Gramscian cultural Marxism” is a new bugbear. They should recognise that Latin America suffers unacceptable inequalities based on sex and race, and needs more tolerance.





Defending Japan

A new front

YOKOSUKA

Japan's Self-Defence Forces are beginning to focus on China

ON A COLD spring day, crowds of Japanese gather to peer at the hulking grey ship moored in the port of Yokosuka, just south of Tokyo. The *Izumo*, the country's largest warship, has attracted attention at home and abroad since December, when Japan's government announced that it would upgrade her. Her deck, and that of her sister ship, the *Kaga*, will be reinforced to accommodate up to a dozen of the 147 F-35 fighter jets Japan recently ordered from America.

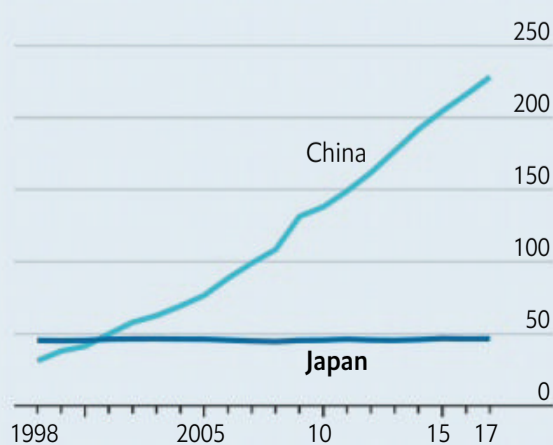
The refitting of the *Izumo* is one sign of Japan's shifting defence posture. The changes are small, by necessity. Japan is constrained by its constitution, written by occupying American forces after the second world war. It bars Japan from maintaining armed forces or settling disputes by war. Despite these strictures, Japan has long had an army in all but name: the "Self-Defence Forces". The SDF has focused, aptly enough, on defence—hunting submarines and warding off warplanes, for example—while relying on American troops based in Japan to go on the offensive, should that be required. Little by little, however, that formula is changing.

Since Shinzo Abe began his second stint

as prime minister in 2012, he has pushed to make the SDF more of a normal army, as part of a broader nationalist agenda. He has passed laws to allow Japan to come to the aid of allies and to permit the SDF to use its weapons in a wider range of circumstances while on UN peacekeeping missions. This month, for the first time, Japan even contributed two soldiers to an American-led peacekeeping mission, rather than a UN one, in Egypt's Sinai peninsula.

Kapow!

Defence spending, \$bn, 2016 prices



Source: SIPRI

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40 Cambodia's economy

In 2013 Mr Abe also established a National Security Council (NSC), staffed by 70-odd officials, to debate and co-ordinate defence and security policy. The NSC, which puts out guidelines every five years, issued its latest in December. They are "really significant", says Narushige Michishita, a former defence official at the National Graduate Institute for Policy Studies in Tokyo.

Three things stand out. One is the increase in spending on defence. Japan plans to splash out \$245bn over the next five years—an 11% rise over the past five years, and about \$49bn annually. That is less than a quarter of China's defence budget (see chart), and only around 1% of Japan's GDP, but it is more than Britain or France currently spend.

Second is Japan's acquisition of new offensive capabilities, which are stretching the constitution even further. The development of a seaborne strike force, in the shape of the F-35-laden *Izumo*, is the most eye-catching aspect. But as important is the acquisition of "stand-off" munitions with long ranges. The JASSM-ER, a cruise missile fired from a warplane, can travel more than 900km, about the distance from Okinawa to Shanghai. Japanese officials insist that the target would not be China's mainland but People's Liberation Army (PLA) ships and troops in Japanese waters or on Japanese soil, should that occur.

Third, the NSC's new guidelines recognise for the first time that Japan needs to prepare for war in space, cyberspace and on the electromagnetic spectrum. To that end, the air force is establishing a \$240m unit to track threats to satellites, backed by a pow- ▶▶

erful new radar in the south-western city of Sanyo-Onoda. Paul Kallender and Christopher Hughes, both of the University of Warwick, point out that Japan's dual-use space budget adds up to 10% to defence spending outside the formal budget.

Japan also plans to increase its ranks of cyber-warriors over the next five years, from 150 to 500. Here, too, the gap between defence and offence begins to blur. "The definition of defence capability in cyber-war is hard," admits a Japanese official. Tracking cyber-intrusions can sometimes require penetrating an adversary's networks first, and acts of espionage can look like preparations for sabotage.

These shifts are a response to the rapidly changing security environment. A Japanese defence official observes that since the country published its last defence guidelines in 2013, North Korea has tested 53 missiles and three nuclear bombs. And America, under President Donald Trump, is seen as a less reliable and more demanding ally. Japanese officials acknowledge that their defence drive is aimed partly at shoring up the alliance.

But Japan is not building military muscle primarily to please America. "Over the past ten years, we have had three serious national-security concerns," says a Japanese diplomat: "The first is China; the second is China; the third is China."

China's defence spending surged by roughly a third between 2013 and 2017; Japan's rose by less than 3%. Even the planned increase in the defence budget will barely make a dent in the disparity. In the first nine months of last year, Japanese warplanes scrambled 476 times against Chinese interlopers. There are also frequent Chinese incursions into the waters around the Senkaku Islands in the East China Sea (see map), which China claims, calling them Diaoyu, but which Japan controls. But the anxiety goes beyond this shadow-boxing. "China is 20% of humanity, decidedly authoritarian and still growing," says the diplomat. "They build submarines like sausages."

Japan was slow to shift its military resources from the north, where they were positioned during the cold war for fear of a Soviet invasion. Many American soldiers are based on Okinawa, in the Ryukyu Islands, a chain which ends just 100km from Taiwan. Now Japan, too, is building them into a military bulwark. In March it opened two new bases at the sleepy southern end of the chain, and is working on a third.

Taiwan, which is claimed by China, is an important but unspoken element in this shift. A Chinese war to seize Taiwan would probably draw in American forces in Japan, and so Japan itself. The SDF's ground forces, which last year formed their first unit of marines since the second world war, are practising anti-ship and amphibious



ous warfare—useful for defending and re-taking islands respectively.

"We are taking steps in the right direction, but it is slow," says Chiyuki Aoi, a professor and former government adviser on defence. For example, the new space radar won't appear until 2023. Staffing is a constant difficulty given Japan's shrinking, ageing population: the SDF has missed recruiting targets since 2014. Last year it had to raise the maximum age for new recruits. It is considering raising the retirement age.

And although Japan hopes its new vigour will "cause China to think twice", as Mr Michishita puts it, that will only happen if its fancy purchases are seen as credible weapons, not just sports cars parked in a garage. Take peacekeeping. Despite the change in law, Japan currently has no peacekeepers on UN missions; those who have been deployed in the past tend to have been engineers teaching people how to use Japanese-made equipment.

When Mr Abe did dispatch troops to South Sudan in 2017, he hinted that he would resign if a drop of blood was spilled. "Japan has not fired a shot in anger in seven decades," observes one Western diplomat. "Will they crap their pants and run home to the countryside? No one knows."

And then there are the constitutional constraints. The circumstances in which Japan can come to the aid of allies remain limited. Mr Abe appears to have all but abandoned his ambition of revising the constitution to make explicit that Japan has armed forces, let alone revoke the pacifist Article 9 altogether. Some 54% of the public are opposed even to the smaller change, according to recent polls.

That makes Japanese leaders coy about what they are doing. An official admits that translations of documents about the alliance with America used to play down the extent of Japan's obligations so as not to "expose the Japanese people to the full meaning of our responsibility". The SDF even calls the *Izumo* an "escort ship". With a deck full of F-35s, it will be hard not to see her as—whisper it—an aircraft-carrier. ■

Asian houbaras

The talons of a dilemma

LAHORE

Pakistan may be exterminating a bird that lays golden eggs

THE ASIAN houbara is an unlikely diplomatic asset. An elusive, desert-dwelling bird, its expression suggests bad temper rather than entente. Yet the migratory, chicken-sized fowl, also known as the Macqueen's bustard, is considered prized sport by Arab falconers. Its meat is also thought to be an aphrodisiac. For decades dignitaries from the Gulf have been visiting Pakistan to hunt, as the number of houbaras has dwindled in their own countries and as hunting has become dangerous in other places, such as Iraq and Syria. That has given Pakistan a special opportunity to butter up Gulf potentates.

Selling the hunters the required permits is lucrative in itself. In the province of Punjab, all six designated hunting grounds were used during the season that ended on March 31st. Each hunting party had paid \$100,000 to be assigned a territory and another \$100,000 for a ten-day permit authorising the killing of 100 birds, as well as \$1,000 for each falcon they brought with them. Hunting permits are also available in the provinces of Balochistan and Sindh.

But the sport's main value to Pakistan is diplomatic. This season saw visits from kings, crown princes, ministers and governors from Bahrain, Qatar, Saudi Arabia and the United Arab Emirates (UAE). Pakistan's leaders called on many of these grandees. It was the least they could do, given that Paki- ▶▶



A fat bustard

▶ stan is currently relying on handouts from Saudi Arabia and the UAE to fend off a balance-of-payments crisis.

Unfortunately for Pakistan's government and Arab hunters alike, the number of houbaras is declining, and hunting faces stiff opposition. The International Union for Conservation of Nature classifies the species as vulnerable to extinction. Reports that hunters have wildly exceeded their quotas heighten the concern.

Imran Khan, the prime minister, took up the issue while in opposition, chiding his predecessor's government for venality.

"For dollars, we are allowing the killing of houbara bustard, an endangered species," he fumed. Yet now he is in power his indignation has waned.

Much of the income from permits is spent on conservation and local livelihoods, hunting advocates say. The visitors have also donated money for roads, hospitals and wells near the hunting grounds. Captive breeding programmes, meanwhile, are releasing birds into the wild in an effort to replenish stocks.

Conservationists are not convinced. Nor are the courts. In 2015 the Supreme

Court ordered a complete ban on hunting to protect the species before reversing itself months later. Lahore's High Court has set up a commission to decide whether hunting in Punjab is sustainable. Parvez Hassan, the lawyer who heads it, says data will dictate its recommendations. It might suggest reducing the scale of the hunting, or perhaps a complete moratorium for a couple of years. A long hiatus or an indefinite ban would be deeply unpopular with the government, he acknowledges. But the survival of the species, he insists, trumps the demands of diplomacy. ■

Banyan Budding anxieties



Kyrgyzstan's neighbours have too little politics, but it may have too much

AT THIS TIME of year the wild cherry blossom spreads from the valley floor up the flanks of the mountains that form the glorious backdrop to Bishkek, Kyrgyzstan's laid-back capital. Kyrgyzstan itself used to be the democratic flower of Central Asia, surrounded by hulking autocracies. But democracy has not served the 6m people of the former Soviet republic particularly well, even if they would not swap it for the dictatorships of their neighbours. Kyrgyzstan is one of the poorest countries in the region. Worse, the government's petals are beginning to fall.

The people of Kyrgyzstan are proud that two revolutions, in 2005 and 2010, pushed corrupt presidents into exile, albeit at the cost of considerable bloodshed during the second uprising. After these events, voters approved constitutional changes that curtailed the president's powers, including the ability to dismiss parliament. Presidents may now serve only one term. Following a competitive election in late 2017, the country's first transfer of power from one elected president to another took place, when Almazbek Atambayev gave way to his protégé and former prime minister, Sooronbay Jeyenbekov.

Yet Mr Atambayev, for all that he claimed to champion the rule of law, had undercut democratic progress while in office. To get Mr Jeyenbekov across the line he took to jailing both leaders and supporters of the opposition. Mr Jeyenbekov is consolidating power in a similar manner. Last year Bishkek's main thermal plant broke down while it was being modernised by Chinese firms, leaving the city shivering. What looks suspiciously like a political purge ensued. The prime minister, Sapar Isakov, was ousted and arrested over the scandal. He faces

corruption charges in a closed trial.

A consequence, officials say, is that those in authority dare not put their names to any order or initiative. Moves to broaden the economy, strengthen institutions and improve health care and education have ground to halt. That matters in a country where a single gold mine, whose opencast deposits will soon be exhausted, generates nearly a tenth of GDP, while remittances from migrants toiling in Russia account for a further third. When measured by GDP per person, Kyrgyzstan is marginally poorer than Cameroon or Papua New Guinea. Income per person in next-door Kazakhstan is ten times higher. State employees earn a pittance. Banyan's driver in Bishkek was a doctor moonlighting from his job in a state hospital.

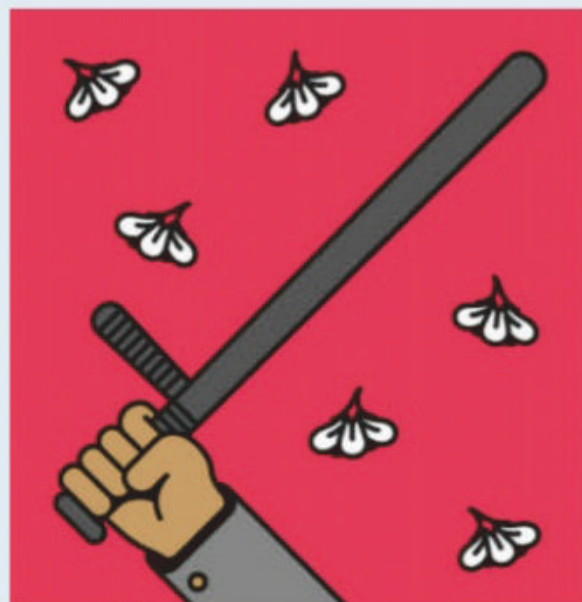
The risks of political trouble are mounting again. Mr Atambayev has taken bitter offence since Mr Jeyenbekov, once in office, refused to show deference. With reason, he views the arrest of Mr Isakov, his former chief of staff, and other allies as an attack on him. Mr Atambayev has kept a grip on the country's biggest party, the

Social Democratic Party of Kyrgyzstan.

Extraordinarily, last month he took the party, Mr Jeyenbekov's own, into the opposition. Parliament toyed with stripping former presidents of their immunity from prosecution—a move that could only be aimed at Mr Atambayev—but in the end did not. From his office, in which a vast safe squats next to him, the former president claims, with a measure of implied threat, that Mr Jeyenbekov is "pushing people to revolution".

With parliamentary elections next year, some MPs are joining Mr Atambayev's growing public protests as a way to flaunt anti-incumbent credentials. Now, to add to the volatility, comes the possible return to Kyrgyzstan of the presidential candidate, Omurbek Babanov, whom Mr Jeyenbekov beat in the election of 2017. Mr Babanov, a businessman and political moderniser, left Kyrgyzstan after Mr Jeyenbekov threatened to jail him, too, on spurious charges of attempting to overthrow the new government and of inciting racial unrest between ethnic Uzbeks and Kyrgyz—an accusation intended to call to mind clashes between the two ethnic groups in 2010 that led to hundreds of deaths.

On April 13th Mr Babanov was due to return to head a rally of his supporters in the capital. But claiming to have got wind of planned "provocations" by "third forces", he cancelled his return at short notice. Bishkek's (pro-Jeyenbekov) mayor has since proposed banning protests and rallies until next year, on the grounds that they are bad for business and upset tourists. That is more likely to provoke Mr Jeyenbekov's opponents than subdue them. The last thing most people want is more unrest. But with growing power struggles among the elite, that is what they seem likely to get.



Party politics in India

A matter of state

HYDERABAD

The next government is likely to be a coalition of mercenaries

THE HOTLY contested general election has made the face of Narendra Modi, the prime minister, hard to escape in most of India, beaming from walls, lamp posts, pillars and shop windows. Yet his image is nowhere to be seen in Hyderabad, the country's fourth-biggest city. Its dusty bazaars and gleaming industrial parks could be in another country.

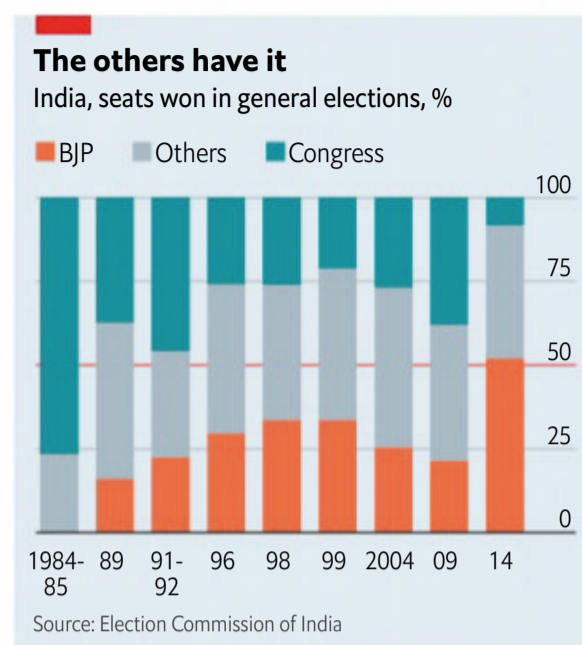
True, campaigning has already ended in Telangana, the state of which Hyderabad is the capital. Its voters went to the polls on April 11th, in the first of seven stages of an election that will not wrap up until May 23rd, when all the country's 900 or so votes will be tallied at once. But Mr Modi is absent mainly because in this part of India his Bharatiya Janata Party (BJP) hardly matters. In Telangana, as in many southern and eastern states, local parties dominate.

Most pundits predict that the prime minister, boosted by a surge of nationalism after briefly bombing Pakistan, will do well nationwide. Yet few think he can repeat the success of 2014, when the BJP won an outright majority in the 545-seat Lok Sabha, the lower house of parliament. After the previous seven elections, coalitions were needed to build a majority (see chart).

Mr Modi may not even be able to cobble together a majority by relying on close ideological allies such as Shiv Sena, a Hindu nationalist party centred in the state of Maharashtra. Instead, he may find himself competing with the Congress leader, Rahul Gandhi, to woo support from such regional overlords as K. Chandrasekhar Rao, who in December nabbed 88 of the 117 seats in Telangana's state assembly, or Naveen Patnaik, who has ruled the state of Odisha for 19 years, or Mamata Banerjee, whose party currently enjoys a 72% majority in West Bengal's state assembly.

In a country with 22 main languages and hundreds of lesser ones, it is not surprising that even big, rich parties like the BJP struggle to build—or in the case of its main rival, Congress, to sustain—a nationwide presence. Congress and the BJP do best in the largely Hindi-speaking north and west, where they face each other, not local parties. “It is very difficult for a national party to construct a narrative where a regional party is strong,” says K.C. Suri of the University of Hyderabad.

Local leaders, often far more secure than interlopers from “the centre”, as Indians call New Delhi, the national capital,



can drive hard bargains. Mr Suri reckons that the domination of politics in Tamil Nadu, a big, southern state, by two local parties has helped to make it richer. The state is seldom ignored by the “centre” because building a governing coalition typically entails enlisting one of the two rivals. “Tamil Nadu somehow always ends up with the largest contingent of cabinet members,” says Mr Suri.

Should Mr Modi want support from Jagan Mohan Reddy, a rising star in Andhra Pradesh whose party looks poised to land a majority of that state's 25 MPs, the price is clear. “He is completely indifferent to who wins the national election,” says a close aide to the 46-year-old upstart, who campaigned with a 340-day march on foot across his state. “He'll go with whoever agrees to give Andhra special status.” (A designation that entitles states to bigger budget allocations from the “centre”.) Mr Patnaik, who also looks set to command most of Odisha's 21 MPs, is similarly aloof:

“We are happy to support anyone who benefits us,” he tells an interviewer.

As prime minister, and leader of the party that will almost certainly have the most MPs, Mr Modi has plenty to offer. But some potential kingmakers dislike his politics. “In terms of plain ideology it's easier for us to gel with Congress, and they are also more used to working with lots of smaller partners,” says a southern politician. “But if Congress fails to win enough seats on its own, say 80 or 100, who will stay with them?” Noting that one of Tamil Nadu's two big parties has already announced an alliance with Congress, the politician points out that since the national party has few voters in the state, the alliance is really just about branding the local party as “secular” and raising its profile. The party would merrily dump Congress after the vote, if need be.

Before campaigning picked up, there had been much talk of Congress forging a broad coalition to fight the BJP. The logic is obvious. Seats in the Lok Sabha go to the party that wins the most votes in each constituency. In 2014 the BJP won lots of seats with a minority of votes thanks to its divided opposition. But with regional parties complaining that Congress overestimates its clout, talks have foundered in several states. If they fail in Delhi with the locally powerful Aam Aadmi Party, the BJP could walk away with all seven MPs, as in 2014.

Given widespread impatience with Congress and dislike of the BJP, why don't the smaller parties band together and form a government without either of them? Mr Rao, the Telangana strongman, talks of just such a “federal” front. It would not be unprecedented: a government took office in 1996 without Congress or the BJP. But the scrappy coalition fell in less than a year. ■

**A giant election**

Indonesians were voting in presidential, legislative and regional elections as *The Economist* went to press. For coverage of the results, please go to www.economist.com.

Cambodia's economy

Fast and loose

PHNOM PENH

Prosperity props up an authoritarian regime—for now

DRIVING ALONG Hun Sen Boulevard—named after the man who has led Cambodia since 1985—a shiny Mercedes-Benz dealership appears in the litter-covered scrubland, its chunky white vehicles nestled behind thick plate glass. Beyond, the cranes and towers of Phnom Penh loom. They speak to the riches Mr Hun Sen's authoritarian rule has brought to a minority. But even the majority can testify to a rapid economic recovery since the end of the long civil war in the 1990s, and the final extinguishing of the Khmers Rouges, a Maoist movement that had forced all Cambodians to become subsistence farmers in the 1970s. Between 1995 and 2017 Cambodia grew at an average rate of 7.7%; GDP per person rose from \$321 in 1994 to \$1,137 in 2017, after accounting for inflation.

Foreign money has flooded in and Cambodia's economy, which war and the Khmers Rouges had destroyed, has quickly revived. In the decade to 2015 more than 1.6m jobs were created in construction, garment-making and the hotel business, reckons Miguel Eduardo Sanchez Martin of the World Bank. Workers support family members left behind in villages. The proportion of Cambodians living below the Cambodian poverty line—\$0.93 a day—declined from almost 48% in 2007 to 13.5% in 2014. Inflation remains in check partly thanks to widespread use of the American dollar. And a budget deficit that was left over from the global financial crisis has largely been tamed.

Economic progress, however, has been accompanied by political regression. Mr Hun Sen's administration has hounded its opponents and locked up its critics. Trumped-up tax charges were used to close an independent newspaper in 2017. That year the country's Supreme Court also dissolved the main opposition party. One of its leaders is under house arrest; the other, in exile. An election last year proved farcical: the ruling party won all 125 seats in the National Assembly.

After a more competitive contest in 2013 garment workers staged protests against rigging for months. The government tried to win them over by gradually raising their minimum wage to \$182 a month. This time things are quiet. One businessman admits he is pleased the election was so peaceful. No doubt encouraged by the calm, Mr Hun Sen talks of introducing a minimum wage for other industries as well.



A far cry from subsistence agriculture

It is harder for the government to buy off foreign critics, however. In protest at the strangulation of democracy, the European Union has threatened to cancel tariff-free access to the European market for Cambodian goods under a concessionary regime called "Everything But Arms". This will hurt, given that clothing is Cambodia's main export, bringing in around \$5bn a year, and Europe its biggest market. Overall, two-fifths of the country's exports wend their way there. Garment factories, in particular, are easy to relocate; some firms are reportedly already contemplating moving to Vietnam or Bangladesh. Languid European procedures give the Cambodian government 16 months or so to repent or prepare. Mr Hun Sen shows no contrition, but also few signs of preparation.

Cambodia's infrastructure is straining under the pace of growth. Blackouts have become frequent as hydropower generation, which meets about half Cambodia's energy needs, has been curtailed by drought. The country plans to buy additional power from neighbours such as Thailand, but this will further increase already heady electricity prices. Transport costs are eye-watering, too, since all but the biggest rural roads are unpaved.

Bureaucracy also needs battling. Roughly half of Cambodia's workforce are

still farmers, many of them stuck tending tiny paddyfields. Agribusiness could help raise their productivity and incomes. But Sela Pepper, a four-year-old firm, initially encountered not encouragement but red tape as it tried to build Cambodia's only pepper-processing plant. The firm's marinated peppercorns have a sour tang; trying to get the business going left a similar taste, recalls Soeng Sopha, the general manager: "It was all extremely difficult."

Other bosses moan about corruption. Cambodia ranks 161st of 180 countries in Transparency International's latest corruption index, alongside Haiti and the Democratic Republic of Congo. The head of Cambodia's European chamber of commerce says "unfair competition" bothers his members. Yet there is little chance the kleptocratic elite would permit sweeping attempts to root out the problem. Mr Hun Sen himself likes to sport flashy watches and gleaming SUVs.

A fourth headache for investors is a shortage of skilled workers. Cambodia's young population should aspire to more than driving tour buses and sewing sequins, reckons Chheng Kimlong of the Centre for Governance, Innovation and Democracy, a think-tank in Phnom Penh. "We are far behind the region in spending on education," he says. Rural schools often lack textbooks, let alone internet connections. This makes a mockery of new schemes promoting employment in the digital economy.

Instead of getting to grips with these problems, the government appears to be counting on China. "Hun Sen thinks that China will be waiting over the cliff with a safety net," says Sophal Ear of Occidental College in America. Ties are indeed close. Chinese businesses, the largest source of foreign investment, had pumped a cumulative \$12bn into Cambodia by the end of 2016. Dozens of casinos and the vast majority of garment factories have Chinese owners. Chinese buyers are also a force behind the construction boom, picking up properties in developments such as Diamond Island in Phnom Penh and in the resort town of Sihanoukville. (According to the Ministry of Land Management nearly 6,000 construction projects valued at more than \$1bn have been approved in the past two years.) Of the 6m tourists who came to the country last year, almost a third were Chinese. Xi Jinping, China's president, visited in 2016. In January he promised almost \$600m in aid over the next three years.

It is unlikely that Chinese investors will be as enthusiastic if Cambodia loses tariff-free access to its main market, however. And whether the European Union pulls the plug or not, Mr Hun Sen seems more focused on stifling dissent than on economic reform. Sooner or later, that will sap the growth that underpins his longevity. ■



Immigration

Let them past

DONGXING

In a border town, China relaxes its controls on immigrant labourers

WHEN HE IS home in his native Vietnam, Nhi Quang Ninh spends part of the year on farms and part of it down coal mines. Since last year, however, he has been finding more rewarding work in southern China. The polite 24-year-old waits for a permit at a visa office in Dongxing, a Chinese city with a beguiling old town that is separated from Vietnam by a shallow, narrow river. The job he has secured in a nearby brick factory pays about as well as his previous stints as a miner, but is a lot less dangerous.

Vietnamese have been crossing into China for years in search of work. They have often come illegally, especially when demand for labour spikes during the sugarcane harvest. Some have obtained three-day work passes reserved for residents of Vietnam's borderlands. (Vietnamese traders in Dongxing are on the left of the picture above.) A Vietnamese migrant who sells fruit beneath the city's busy border bridge says she has been serially renewing hers for five years.

But under a scheme begun in 2017, Chinese firms in Dongxing and several nearby cities can now legally hire Vietnamese on monthly renewable visas, says Su Shihao, a local employment agent. The aim is in part to help manufacturing firms in Guangxi, a largely agricultural province, and in part to replace local residents who have left to find work in more prosperous areas of China. Locals don't mind their arrival, says a shopowner in Dongxing, because people on both sides share a similar culture.

Until recently China has tried to keep foreign blue-collar workers out of the country, preferring the affluent sort of foreigner who usually dwells in its richest cities. The guest-workers in Guangxi are a sign of reform. Demand for such people is driven mainly by two profound changes.

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One is massive internal migration that has hollowed out poorer parts of the country, such as Guangxi province where Dongxing is located. The other is the shrinking of China's labour supply. The working-age population has been falling since 2012 and could decrease by nearly one quarter between now and 2050.

The central government's immigration policy has remained very restrictive. In 2017 China granted permanent residence to about 1,800 foreigners, none of them ordinary workers. That is double the number it handed out five years earlier, but nothing compared with America, which doles out 1m "green cards" annually to immigrants. Relative to its size, China is home to fewer foreigners than almost anywhere else. A census in 2010 (the most recent reliable data) found only around 600,000 of them with resident visas, about 0.05% of the population. In many Western countries the proportion is 10% or higher.

In 2013 China introduced a much-revamped immigration law. It was aimed not so much at allowing more foreigners to come in (though highly skilled ones are always encouraged), but at clarifying the rules in order to make it harder for people to live and work in China illegally. It introduced stiffer penalties for businesses that hire foreigners without work permits and for those who help such people get jobs. A campaign against illegal aliens has greatly reduced the number of African traders liv- ▶

ing in Guangzhou, once one of China's most cosmopolitan cities. In 2016 the authorities said there would be three tiers of classification for employment-visa applicants. Those in the lowest tier, class C, would include almost anyone without a degree and a few years' working experience. The government said the aim was to "encourage the top, control the middle and limit the bottom". Last year it set up a new body called the State Immigration Administration (SIA). This was billed as marking a friendlier approach to dealing with foreigners, but the agency's staff still belong to the Ministry of Public Security, China's police, which has always held sway over such matters and is deeply conservative.

However, by clarifying the rules and building a more effective bureaucracy to manage immigration, it may be that China is trying to develop an ability to loosen and tighten controls according to need in the same way that many other countries do. This seems to be what is happening in Guangxi. The province's guest-worker programme is a step towards liberalisation. It is a very cautious one, limited to work in industries such as furniture-making, electronics and food processing. Those given permits usually have to return briefly to Vietnam before each monthly renewal in order to qualify. A Chinese academic says the police worry that Vietnamese with permits might head to other parts of China where they do not have permission to work. (Some Vietnamese have indeed found unauthorised jobs in factories in the neighbouring province of Guangdong, where China's labour shortage is biting.)

There are piecemeal attempts at immigration reform elsewhere, too. Shanghai has made it easier for foreigners at Chinese universities to stay in China after graduation. Foreign families in the city are being allowed to hire foreign maids. Wang Huiyao of the Centre for China and Globalisation, a migration think-tank in Beijing, believes the SIA may devise ways of allowing more people in with specific needed skills. That would help to remedy shortages of labour in essential sectors, such as social work and health care. The country has only about 2.5 nurses for every 1,000 people, about half the global average (Germany has 13). As China begins to age rapidly, its demand for them will grow apace.

But officials remain hesitant about changing the rules. They worry that letting in more low-skilled foreigners could stir resentment among ordinary Chinese. It is fine letting limited numbers of Vietnamese into Guangxi, which has much in common with Vietnam culturally. But would things go as well if the government were to allow them farther inland? In recent years officials have become even more inclined to portray foreigners as a threat to stability. Change will be slow. ■

Labour unrest

GitHubbub

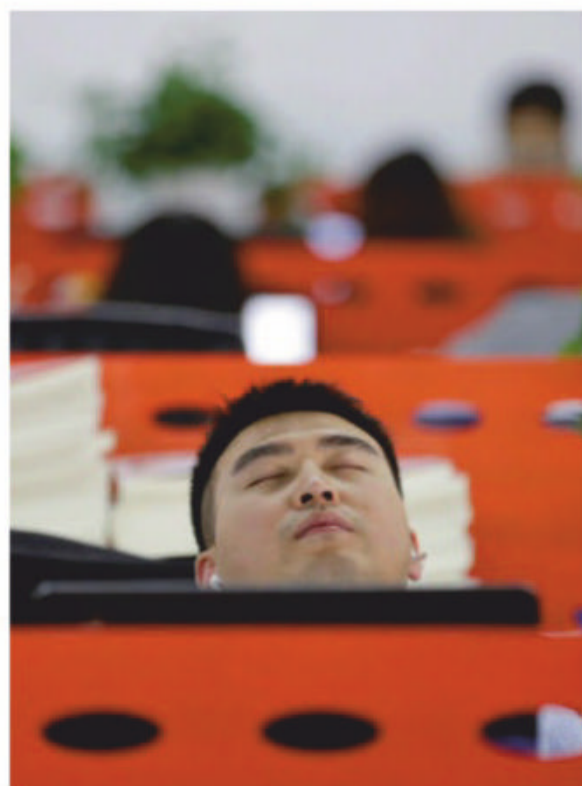
SHANGHAI

Burned-out tech workers organise a rare online labour movement

IN THE WORLD'S most censored region of cyberspace, finding an unpatrolled spot to air shared grievances is hard. Yet disgruntled Chinese software developers have recently found one at their fingertips: GitHub, a platform owned by Microsoft that allows developers to help each other build software. Fed up with the grindingly long work hours imposed on them by China's internet giants, this collective has recently built something else—a movement demanding more humane office hours and calling out the worst corporate offenders.

Their beef is the "996" regime, which refers to a work schedule of 9am to 9pm, six days a week, often without extra pay. Toiling such hours has become an unspoken rule in the frenetic world of Chinese tech. In late March anonymous activists created a webpage called 996.icu (the letters standing for "intensive care unit"). On it they listed firms at fault, including 58.com, a site for classified ads that popularised the 996 approach in 2016. A page with the same name was also set up on GitHub, which was also used to host a sister project called "955.wlb" (standing for "work-life balance"). This celebrates firms with more relaxed working hours. Almost all of those listed are foreign ones.

The anti-996 campaigners have a point. In 2016 Didi Chuxing, a ride-hailing giant, ranked the most "hardcore" internet companies by their overtime hours. Staff at



Sleep, balm of hurt minds

JD.com, an e-commerce firm, clocked out at 11.16pm on average (the latest). Relative idlers at Didi left at 9.24pm. Fewer workers now regard such long hours as something to be proud of. Tempers flared in January when Youzan, a firm that helps run others' online shops, implemented a 996 schedule and told non-compliers with it, more or less, to quit. (Staff complained to the labour authorities: the law limits the working week to 40 hours and requires overtime pay after that.) To the disappointment of his many fans, Jack Ma, the founder of Alibaba, a tech giant, spoke dismissively of the protesters, saying that "being able to work 996 is a huge blessing." Richard Liu, the chief executive of JD.com, wrote: "Slackers are not my brothers!"

The Chinese government is normally quick to censor discussion of protest. However, in this case it is the internet companies themselves that seem to be taking the initiative. Users say that web browsers including those of Alibaba, Qihoo 360 and Tencent have failed to load the 996.icu pages. The irony has not been lost on social-media users. "So 996 developers at 996 companies had to work 996 to block a website about 996," one wrote on Weibo, a Twitter-like service. Jeffrey Knockel of Citizen Lab, an internet research group at the University of Toronto, says that tech firms must fear that the protesters have clout.

The 996.icu page has been GitHub's most popular for weeks. That is because Chinese developers are such avid users of the platform for work purposes: their contributions are second only to those of Americans. They also know how useful it is for spreading sensitive information and evading China's vast web-filtering system. Because GitHub is encrypted, it is harder for the state to censor bits of it selectively. Blocking it entirely would cripple China's technology champions, whose programmers rely heavily on code shared on GitHub. In 2013 the government did try blocking the platform. Complaints from developers brought it back online within days. Its appeal is not limited to techies. Mengyang Zhao, who researches tech activism at the University of Pennsylvania, says that Chinese NGO workers now use GitHub to back up articles posted on WeChat that are at risk of being censored.

The GitHub page for 996.icu says that it is "not a political movement". But if the government does decide to crack down, it has leverage of its own that it can try to deploy, says Mr Knockel. That is, it has sway over Microsoft, whose other services, including Bing and LinkedIn, are allowed to operate in China with censored content. In the meantime, vendors on Taobao, Alibaba's retail platform, offer a "996" T-shirt with a more alluring interpretation: "Sleep at 9pm, rise at 9am, work six hours a day." Not one for Mr Ma, then. ■

Chaguan | Joining the resistance

China's assertiveness is encouraging new solidarity among Western envoys in Beijing



CHINA'S MESSAGE to the Western world has been called an argument in three parts. In order, it runs: China's rise is inevitable; there are rich rewards for those who co-operate with it; resistance is futile. In the tree-lined embassy districts of China's capital, there is no debate about the country's rise, which inspires a mix of admiration, greed and dread. But the rest of the argument inspires more scepticism.

Take that second claim about rewards awaiting China's partners. Diplomats describe much greater realism in their internal discussions. Their views are affected, inevitably, by the apparent consensus in Washington that China is a threat, bent on growing richer and more powerful at America's expense. But there has also been a broader change of mood. Only a few years ago, it is related, as soon as envoys sat to dine, "stealth boasting" would start. Isn't China tricky, the envoys would sigh—though, of course, my country's relations with it are rosy. Such bragging has become rarer.

Diplomats say that the new realism extends to countries like Germany, whose trusted brands and sought-after technology seemed to give it an upper hand in a symbiotic relationship with China. Even the biggest firms find themselves in competition with state-backed Chinese rivals that mean to defeat and replace them. France and Britain are more sober about their prospects, too, though Brexit Britain is suspected of dreaming about serving as a Singapore-style financial hub for Chinese capital.

Many countries are more clear-eyed about Chinese-led forums that have sprung up in recent years alongside older, multilateral bodies. On April 12th it looked like a win for China when Greece said it was joining the "16 plus One" group. That is a mechanism launched by China in 2012 as a way to co-ordinate its relations with a clutch of mostly eastern and central European countries, 11 of them members of the European Union (EU). That prompted talk of China trying to divide and rule in Europe. Greece is certainly eager to please China, a deep-pocketed friend. But Greece may have joined a group past its political prime. Western diplomats observe that members of what is now "17 plus One"—including the largest, Poland—seem both warier and wearier of the bloc, which has not delivered expected business opportunities and investments.

A few weeks earlier, Italy handed China a clear victory by join-

ing China's Belt and Road Initiative (BRI), a globe-spanning infrastructure plan, in defiance of advice from America, Germany and others. Still, Western governments are less starry-eyed than before. Just a couple of years ago, European leaders talked the BRI up as a potential bonanza for their firms. Now they are as likely to fret about BRI schemes leaving participating countries dangerously in debt, damaging the environment or locking swathes of Africa, Asia or the Asia-Pacific into technical standards set by Chinese firms.

Ahead of the Belt and Road Forum, a multinational gathering that will be hosted by President Xi Jinping in late April, Chinese officials and scholars suggest that it is time for other countries and multilateral lenders to join China in funding the BRI. That brings diplomats to the third part of China's message, namely, that resistance to its rise is futile.

It would be foolish to claim that China has united the world. But the grumbling is at least more co-ordinated. Among embassies in Beijing, groupings old and new are becoming more active and useful. Some are mostly about information-sharing, such as the "Group of Five", which does not officially exist but involves a meeting at least once a month of ambassadors from America, Britain, France, Germany and Japan. Envoys from the "Five Eyes" intelligence-sharing pact (America, Australia, Britain, Canada and New Zealand) regularly meet. Other groups try to devise common policy, such as the economics-focused "Like-Minded Nine", or 19 group, comprising America, Australia, Britain, Canada, France, Germany, Japan, South Korea and the EU. Embassy political officers whose briefs cover human rights have long met to co-ordinate their work. Their reports last year helped alert bosses to repression in the far-western region of Xinjiang, where China is accused of locking hundreds of thousands of Muslim members of the Uighur minority in re-education camps, and subjecting millions more to crushing surveillance. In an unusual move spearheaded by Canada, 15 Western ambassadors last year wrote to request a meeting with Chen Quanguo, Xinjiang's hardline Communist Party boss.

That led to a display of solidarity that startled China, when European ambassadors declined a peremptory invitation to visit Xinjiang. Chinese officials initially gave the ambassadors 24 hours to accept an offer to visit Xinjiang with their spouses from March 27th to 29th (though no meeting with Mr Chen would be possible). A day later the EU ambassador to Beijing was informed that this was a one-off invitation and that declining it would bring unspecified consequences. Though not all European governments are equally concerned about Xinjiang's horrors, all 28 EU members, plus Norway and Iceland, agreed that the Europeans should decline the offer. Only Albania and Serbia accepted.

China should thank Mr Trump

"Chinese assertiveness has recreated a Western community, without a doubt," says a diplomat. He notes other high points of Western unity, for instance in the aftermath of the bloodily suppressed Tiananmen Square protests in 1989. Post-Tiananmen unity did not last long, he adds. Even today it has limits. The same diplomat accuses President Donald Trump of pursuing selfish, might-is-right policies that resonate more with China than with Europe. As a result, he charges, no single China strategy unites America, Europe and Japan: "The Western world does not exist."

Another diplomat counsels patience. If a different American president were to try resisting Chinese aggression while defending universal values, that "alliance is there, waiting to be led." Such talk may appal Chinese officials. They have helped to start it. ■



China and the Arab world

Middle Kingdom meets Middle East

CAIRO AND DUQM

Chinese money is behind some of the Arab world's biggest projects

THERE IS NOT much to see for the first 500km south of Oman's capital, Muscat, as the highway slices through the Hajar mountains and down a barren coast. Then it hits Duqm, a sleepy fishing village that is being transformed into a mega-port. The government's hope is to capture a share of the shipping trade between Asia, Africa and Europe. And there, in the middle of nowhere, a consortium of Chinese firms wants to invest \$10bn to build a 1,000-hectare industrial zone. "Petrochemicals, glass, solar panels, car batteries—they want to attack all these markets," says Reggy Vermeulen, the port's CEO.

For decades the Middle Kingdom saw the Middle East as a petrol station. About half of China's oil came from Arab states and Iran. Little went in the other direction. In 2008 the region got less than 1% of China's net outbound foreign direct investment (FDI). Skip ahead a decade and Chinese money is everywhere: ports in Oman, factories in Algeria, skyscrapers in Egypt's

new capital. Last year it pledged \$23bn in loans and aid to Arab states and signed another \$28bn in investment and construction deals (see chart on next page).

The Arab world is hungry for such investment. Annual FDI inflows have fallen by two-thirds since 2008 and lag far behind other emerging markets. Take Egypt, which is famous for its cotton. Its state-run textile firms are a mess, with machinery that has not been updated in decades. Enter China: in January it promised 2.1bn Egyptian pounds (\$121m) to build modern textile factories outside of Cairo. Officials hope the project will create more than 100,000 jobs.

Such job creation is not common, though. Since 2005 China has signed \$148bn worth of construction deals with

Arab states, estimates the American Enterprise Institute, a think-tank. More than one-third of that sum went to energy projects which, while necessary, will not employ many locals. Even the construction itself does not create many local jobs. The China State Construction Engineering Corporation has built both a five-star Sheraton resort in Algiers and a less luxurious prison south-east of Algeria's capital. On these projects, and dozens of others in Algeria worth a combined \$16bn, some 40,000 Chinese labourers did most of the work.

Trade between China and the Arab world is lopsided. In 2017 Tunisia imported \$1.9bn worth of goods from China, 9% of its total imports. It exported just \$30m to China. "Twenty-five percent of our trade deficit comes from China alone," says Lotfi Bensassi, an adviser to the prime minister. The trinkets hawked to tourists in souqs are usually made in Chinese factories, not Arab workshops. In the occupied West Bank even the makers of keffiyehs, a symbol of Palestinian identity, cannot keep up with their Chinese competitors. A few Arab states hope that China's growing taste for olive oil will lower their trade deficits a bit. But China will not put millions of unemployed Arabs to work.

Instead it is following the model that has burdened some Asian and African states with crippling debt. Arab governments have been more cautious. There are ▶▶

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▶ no local equivalents of Sri Lanka's "ghost airport", built with Chinese capital and devoid of flights. Algeria, struggling with low oil prices and a high budget deficit, stopped signing big deals with Chinese firms two years ago. Infrastructure loans from China to the Middle East grew almost tenfold from 2015 to 2016, to \$3.5bn. But more than half went to the United Arab Emirates (UAE) to finance projects like the expansion of Dubai's airports, the world's busiest. Wealthy Gulf states like the UAE have no trouble repaying big loans.

Although the UAE is keen to attract China's cash, it is also nervous about its ambitions. Officials at DP World, a port operator mostly owned by Dubai, say its network of ports and railway hubs will complement the Belt and Road Initiative (BRI), a programme of global infrastructure projects by China. Maybe so, but the BRI is also a threat. Almost two-thirds of Chinese exports to Europe, the Middle East and Africa move through Emirati ports. If the Chinese-funded port at Gwadar, in Pakistan, becomes a trans-shipment hub, it could take business from Dubai's flagship Jebel Ali port. Duqm poses a similar threat.

Other countries that are active in the region worry about security. A Chinese firm won the tender to operate a new port in Haifa, Israel's third-biggest city, where American warships often call. America wants Israel to reverse the decision. Oman got a similar warning over Duqm. "They can have a piece of the industrial zone, but we're keen to keep them out of the military side," says an American diplomat in Muscat. In recent months Oman has signed deals that allow the American and British navies to operate in Duqm. China received no such privileges.

Part of what makes China an attractive partner is that its money comes with few strings attached. Its policy of political "non-interference" lets it build ties with mortal enemies—Saudi Arabia and Iran, Israel and Syria—and makes it a useful hedge against America, which Arab autocrats fear will abandon them. But the lack of strategic

engagement has a downside. Without ships in the Mediterranean, China needed Greece's help to extract its citizens from war-torn Libya. The opening of China's first overseas military base, in Djibouti, in 2017 may be a sign of broader ambitions.

Arab officials who once ignored China talk of it as a rising regional power—a softer sort than America or Russia. An influx of Chinese tourists has led to hotels in Cairo teaching staff to speak Mandarin and cook

Chinese dishes. Diplomats from Beijing often have a command of Arabic that puts their Western counterparts to shame. When Lebanon's prime minister formed a government in February, after nine months of deadlock, his first visit came from the Chinese ambassador. But China seems to have little interest in sorting out the civil war just over the border in Syria. Mercantilism is its priority, not fixing the region's many problems. ■

Lebanon

First woman

TRIPOLI

Raya al-Hassan takes on Lebanon's warlords—and the patriarchy

IN A COUNTRY of crusty old warlords, Raya al-Hassan is challenging stereotypes. A decade ago she was appointed Lebanon's finance minister, the first woman in the Arab world to hold such a post. In January she broke new ground, becoming the first female interior minister in the region. As such, she commands a force of over 40,000 police officers, including the elite counter-terrorism brigade known as the Panthers. The ministry's website features a photo of her leading a pack of female cadets.

Ms Hassan seems intent on weakening the men who fought Lebanon's civil war of 1975-90 and who have remained in power ever since. She has called on them to remove the roadblocks around their enclaves. She plans to visit Dahiya, Beirut's Shia-dominated southern suburb, to ensure that Hizbullah, the main Shia party-cum-militia, complies. If Ms Hassan, a Sunni Muslim by upbringing, is concerned about her safety, she doesn't show it. She has removed many of the walls around her ministry, jettisoned her predecessor's big motorcade and cut his large security retinue.

Women hail Ms Hassan as a role model for taking on the patriarchy. Parliament has only six female members (out of 128). In the previous government even the women's affairs minister was a man. The interior ministry only began admitting women into its forces in 2012. But three of the eight directors-general in the ministry are now women and Ms Hassan plans to promote more. The religious leaders who control family affairs are also in her sights. Within days of becoming minister she made headlines by calling on clerics to let Muslims and Christians marry each other.

The men under her command seem to like her. One compares her to Aisha, the Prophet Muhammad's favourite wife, who led Muslims into battle. In a country of backbiters, she has made remarkably



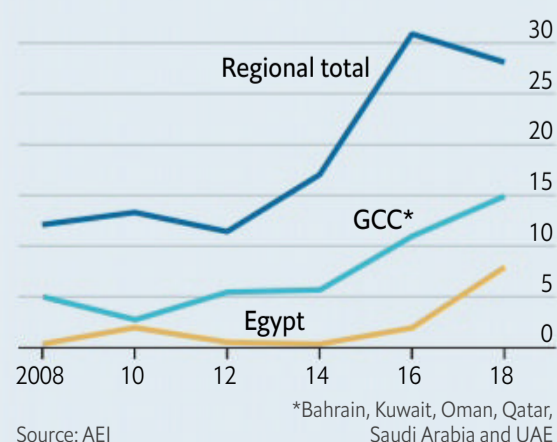
Raya, leading the way

few enemies. Her no-nonsense manner reminds some of Rafik Hariri, the post-war prime minister who rebuilt Beirut. Hariri, alas, was killed by a car-bomb in 2005 after calling on Lebanon's militias to disarm. Ms Hassan is more cautious. The state should have a monopoly on the use of force, but Hizbullah's weapons are a separate issue, she says.

Ms Hassan is not immune to the grubbiness and sectarianism of Lebanese politics. She is a member of the Future Movement, the Sunni party led by Saad Hariri, the prime minister (and son of Rafik). Her critics claim she turned a blind eye to graft when finance minister. The economic zone she launched in her home town of Tripoli is empty despite the millions of dollars earmarked for it. For all her talk of removing roadblocks, she has kept silent on those surrounding the enclave where Mr Hariri lives (when he is not in Paris). Cynics even say that Ahmad Hariri, the Future Movement's general secretary and the prime minister's cousin, can overrule the ministry. Not so, says Ms Hassan: "I am in charge."

Dragon in the desert

Chinese investment and contracts in the Middle East, \$bn



South Africa's energy crisis

A glimmer of light

UPINGTON

Eskom threatens to destroy South Africa's economy. There is a much cheaper, cleaner alternative

IN THE CONTROL ROOM of Scatec Solar in Cape Town Johan Badenhorst gazes at the six monitors on the wall. The screens display the status of the firm's 16 plants in 11 countries. The three in South Africa are doing nicely, producing enough energy to power 93,000 homes. Problems are rare, says Mr Badenhorst, Scatec's senior control officer, before correcting himself: once a bird dropped a tortoise on a solar panel, smashing the glass.

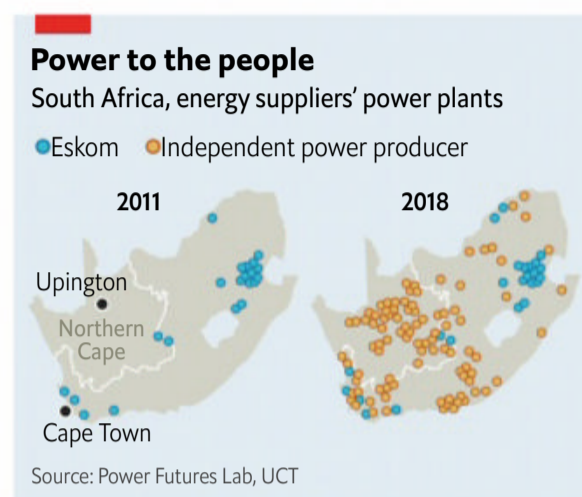
Such issues, while upsetting for tortoises, are minor compared with those faced by Eskom, the state-owned utility that supplies 95% of South Africa's electricity. At least one-third of its power stations are broken or shut for maintenance. Over recent months the talk of the country has been of "load-shedding": a euphemism for blackouts because Eskom cannot meet demand. March was the worst-ever month for load-shedding, when Eskom regularly took 4,000-megawatts (MW) off the grid, about one-eleventh of its total capacity (45,561MW), or enough to power 3m homes.

Further failures could have severe consequences. "Eskom is the greatest systemic risk to the South African economy," says Colin Coleman, the boss for sub-Saharan Africa of Goldman Sachs, a bank. Goldman reckons power cuts could reduce GDP growth by 0.9 percentage points, about half the rate of official growth forecasts.

Eskom also threatens South Africa's public finances. Since 2007 Eskom's debt has risen from 40bn to 420bn rand (\$30bn). It is effectively insolvent, borrowing to pay interest on its debts. In February the Treasury announced a 69bn rand bail-out. It will not be the last. "There is a real risk of financial meltdown," says Anton Eberhard, who advises President Cyril Ramaphosa on energy. The president, who took over from Jacob Zuma last year, is standing in elections on May 8th. People may not take kindly to voting in darkness.

Eskom's predicament has deep roots. Between the 1960s and 1990s the apartheid government built big and dirty power stations hoping cheap electricity would spark industrialisation. After white rule ended in 1994 the African National Congress (ANC) had Eskom provide power to the more than two-thirds of black households that lacked electricity, one of the fastest electrification projects in history.

In the past two decades Eskom has symbolised South Africa's failings, rather than



its successes. In the 2000s the government of Thabo Mbeki delayed building new plants, mostly because of overcapacity. By 2008, when this capacity was used up, Eskom started load-shedding. Two huge coal-fired power stations were meant to fill the gap, adding 4,800MW of power to the grid. But construction is running years late and about three times over budget, says Chris Yelland, an independent analyst.

One reason is that some of Eskom's bosses have spent more time stealing than managing. Cronies of Mr Zuma and his patrons, the Gupta brothers, are alleged to have siphoned off tens of billions of rand in inflated or irregular contracts. The utility sells less electricity than it did in 2007 but spends three times as much on employees and five times as much on coal (though inflation accounts for some of this).

Eskom's structure makes matters worse.



What did we use before candles? Electricity

The utility is "vertically integrated", meaning that it has a critical role in the three parts of electricity supply: generation (power plants), transmission (the national grid) and distribution (the final power lines). Most rich countries have ditched this monolithic model, with good reason. It blocks competition, reduces transparency and deflects accountability.

On February 7th Mr Ramaphosa said that Eskom would be broken up. It was the seventh time that a president has used his State of the Nation Address to make such a pledge. But this time may be different because there is a clear alternative to the coal-dominated monolith—a market-based model that is open to renewable energy.

It is a model with which the country has begun to experiment (see map). In 2011 South Africa launched a renewable power programme that was widely acclaimed for using auctions to drive down the cost of power. It was set up at the urging of the Treasury, an island of competence in a swamp of corruption. These auctions led to \$14bn in private capital investment and about 5,000MW of extra capacity.

But in 2015 Eskom refused to sign agreements with independent power projects that had won the auctions. This was because Mr Zuma's allies were trying to force through a ruinous deal he had struck with Vladimir Putin for Russian nuclear power stations. (Fortunately this venture was unsuccessful.) It was only last year that the stalled projects could go ahead. As part of this revival Scatec Solar is building three plants in Upington in the Northern Cape.

More renewable energy will help the environment. Just three countries in the world get a higher share of their electricity from coal. Yet there is also a financial case for them. Wind and solar stations can go up quickly without straining Eskom's balance-sheet. They also generate power more cheaply than that humming down the line from Eskom's coal-fired power stations. Recent international auctions have priced renewable power at about 30 South African cents per kWh, versus more than 50 cents for Eskom's existing coal plants. "South Africa should never build another coal station ever again, purely on the basis of economics," argues Tobias Bischof-Niemz, a former Eskom engineer who is now a director at ENERTRAG SA, a renewables firm.

Whether it will depends on the government's long-delayed Integrated Resources Plan, due to be published after the election. It ought to lay out how South Africa will make two transitions: from coal to renewables; and from a monopoly to a market-based system. Vested interests in Eskom and mining unions will resist both. Assuming Mr Ramaphosa wins on May 8th, he will have to face them down. If he fails, the future will be dark, for him and for South Africa. ■



France

The agony of Notre Dame

PARIS

The fire has devastated the world's most famous cathedral. But not destroyed it

THE CATHEDRAL of Notre Dame is a “majestic and sublime edifice”, a “vast symphony in stone”, wrote Victor Hugo. “Every surface, every stone of this venerable pile, is a page of the history not only of the country, but of science and of art.” The devastating fire that broke out on April 15th, and destroyed much of the gothic cathedral’s wood-timbered roof and spire, stunned and distressed the French with a force that far exceeded the building’s religious significance. As the flames engulfed the roof, President Emmanuel Macron spoke for many across France when he tweeted that he was witnessing “part of us burn”.

Why has the fire at Notre Dame stirred such emotion in France? In a city of broad vistas and stolen glimpses, it serves as a fixed point for Parisians; a stable presence that emerges reliably into view, like a much-loved aunt, from bridges across the river Seine. Visited by 13m tourists a year, the cathedral has been the backdrop to countless expressions of awe and romance, as well as been-there selfies. Locals may be riled by the narcissistic crowds, but

are proud of what draws them. The 850-year-old cathedral is a national landmark that offers something particular: a form of timelessness, drama and spirituality, to set against the modernity and engineering prowess of the Eiffel Tower.

On the night, as firefighters struggled to control the blaze, it looked for a stretch as if the centuries were dissolving in flames. For Parisians, watching in eerie silence on the bridges, the wait was agonising. In his preface to “The Hunchback of Notre Dame”, the novel that reawakened the French to the cathedral’s splendour, Hugo had warned darkly that “soon, perhaps, the Cathedral itself will have vanished from the face of the earth.” As the fire blazed, the visceral fear that Hugo might have been right

seemed to touch a profound yearning for Our Lady to survive.

The cathedral had withstood ransacking during the wars of religion, looting during the revolution, two world wars and Nazi occupation, becoming an emblem of resistance in the face of a constantly disrupted history. More than this, Notre Dame is a product of the paradoxes of that history. It is where an emperor, Napoleon, was crowned in 1804, and where the founder of modern republican France, Charles de Gaulle, was remembered upon his death. It was at once a living place of worship for the French Catholic church, and the property of the French secular state: a symbol in itself of the country’s history and its present, in all its glorious contradictions.

As he visited the site shortly before midnight, Mr Macron, so often perceived as out of touch, for once found the right words to express this. “Notre Dame de Paris is our history, our literature,” he declared. “The place where we have lived all our great moments, epidemics, wars and liberation. It is the epicentre of our lives and the point from which we measure distance from Paris. This history, it is ours and it is burning.”

Now that those flames have been extinguished, questions will turn to why Notre Dame burned, and how it can be rebuilt. The Paris public prosecutor has opened an investigation, declaring that “nothing suggests it was a deliberate act.” If this was indeed an accident, the focus will be the works to renovate the 19th-century spire, ▶

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► which began last summer. It was the oak-beamed roof above the vaults that proved to be both so flammable, and so difficult for the fire brigade to get to. Thanks to the efforts of 400 firefighters—as well as to the craftsmanship of the 12th- and 13th-century stonemasons who built the soaring stone vaults beneath the roof—the cathedral's main medieval structure was largely saved. Firefighters also managed to save many religious artefacts and relics.

How stable the remaining structure is, and whether the stone has been permanently weakened by the intense heat, say engineers, will have to be assessed once the masonry has cooled. Mr Macron vowed that, no matter what, the cathedral will be rebuilt, and launched a fundraising initiative to that end. In a country that lacks a tradition of private philanthropy, it was notable that France's richest businessmen vowed to contribute. Two luxury titans, Bernard Arnault and François Pinault, between them pledged €300m (\$340m).

The search for somebody to blame will absorb France for some time. Many will want to know exactly what precautions were taken by those working on the renovation, and what exactly was the nature of the disaster-planning for a monument of this scale and national importance, situated amid narrow streets on an inaccessible island in the centre of the city. A broader question is whose responsibility it should be to maintain secular France's great religious buildings. The government had contributed to the renovation of Notre Dame's spire. But the cathedral had to raise funds to renew its bells in 2012, and the agreement between the archdiocese and the government over upkeep is unclear.

On the morning after the fire, tourists gathered along the cobbled quays to get their shot of the old survivor, damaged but unfallen. For locals, sadness at the damage was mixed with deep relief that it had not been far worse. At one point, and after five months of unrest by *gilets jaunes* (yellow jackets), the fire seemed to be a ghastly symbol for the torment of France. It broke out just before Mr Macron was due to unveil his response to those protests, and to his "great national debate", in a speech he promptly had to postpone. The moment was supposed to mark the end of a disaster. Instead, it brought another.

Mr Macron now faces a different challenge. The country was already divided, and the president unloved. Today Notre Dame is charred, and Paris, and all of France, is in pain. Just occasionally, such a national drama can help to pull a divided country together. On the night, Mr Macron made a good start. But he has yet to bring closure to his great debate. It will take particular skill to do this while offering solace to a nation still in shock after the drama of Notre Dame. ■

Spain's general election

Mr Sánchez and his squabbling detractors

MADRID

The Socialists will win the most seats, but may find it hard to form a government

IN JANUARY 2017 in Dos Hermanas, a large dormitory town outside Seville, Pedro Sánchez launched a bid to regain the leadership of Spain's Socialist Party, from which he had been ousted in an internal coup three months earlier. Few in the Madrid political establishment gave him a chance, yet after months driving from rally to rally in his 12-year old Peugeot 407 he won his job back in a party primary. Last May he showed the same determination and sense of opportunity when he organised a censure motion that installed him as prime minister of a minority government at the expense of Mariano Rajoy, a conservative whose People's Party (PP) has been tarnished by corruption.

This month Mr Sánchez returned in triumph to Dos Hermanas to launch his party's campaign for a general election on April 28th. In the past ten months "we haven't been able to change Spain," he told some 2,000 supporters. But "we have set the course towards a fairer Spain." In what is the third general election in little over three years, opinion polls suggest the Socialists will be easily the largest party for the first time since the election in 2008, gaining perhaps 50 seats on top of their current 84 in the 350-member Congress of Deputies. That would still leave Mr Sánchez well short of a majority, because Spanish politics has become extraordinarily fragmented and fluid. Indeed, the polls suggest that some 40% of voters, an unusually high figure, remain undecided.

Until 2015, the Socialists and the PP alternated in power, sometimes relying on

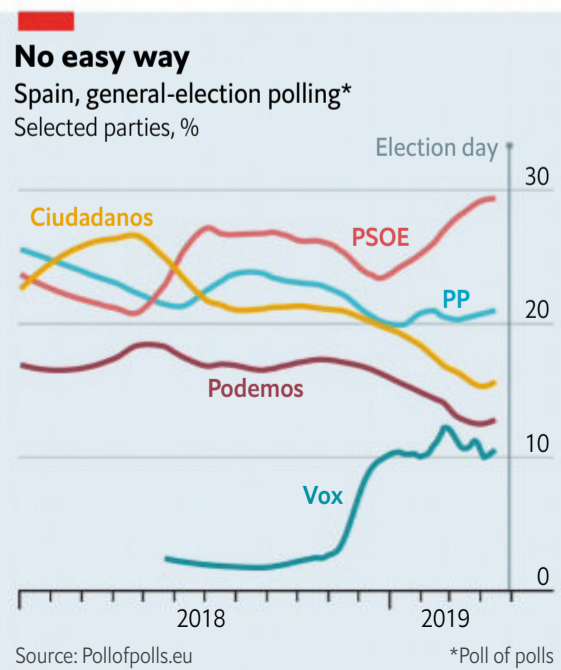
Catalan and Basque nationalists to make up the parliamentary numbers. But the discontent aroused by an economic slump that followed the bursting of a housing bubble in 2007 spawned two new national parties, Podemos on the far left and Ciudadanos, originally in the liberal centre. The slump was also a factor in the Catalan nationalists' espousal of independence, culminating in an unconstitutional referendum in October 2017. This threat to the existence of the nation has in turn fuelled the rapid growth of Vox, a new far-right party, and also pushed the PP and Ciudadanos to the right.

The three-way fight on the right has imprinted an ill-tempered character on the campaign. Whereas Mr Rajoy was a cautious moderate, his replacement as PP leader, Pablo Casado, is much more ideological and confrontational. Both he and Albert Rivera, the leader of Ciudadanos, have tried to turn the election into a plebiscite on Mr Sánchez. Neither has forgiven the prime minister for stealing a march on them with the censure motion, which succeeded with the votes of Basque and Catalan nationalists, or for holding inconclusive talks with the separatist regional administration in Catalonia (something Mr Rajoy did as well). Both threaten to impose direct rule on Catalonia and denounce the referendum in 2017 as an attempted coup.

When launching the PP programme in Barcelona this month Mr Casado accused Mr Sánchez of being "the ally of coup-mongers, separatists and terrorists" and of being a "public danger". This hyperbole is aimed at wooing back former PP voters who have turned to Vox, but it has distracted attention from the important differences between Mr Sánchez and his opponents on economic policy.

The Socialists used their months in power to roll back some of Mr Rajoy's cuts in the welfare state and decree a big increase in the minimum wage (as well as on a not-yet-successful attempt to exhume the remains of General Franco, Spain's former dictator, from his grandiose memorial at the Valley of the Fallen outside Madrid). The right wants tax cuts, and worries that the Socialists will curtail a strong economic recovery which is starting to run out of steam.

Under the influence of Vox, Mr Casado has talked tougher on immigration. He also ►►



► fumblingly introduced abortion into his speeches, only to be rebuffed on that by some on his own side. Polls show that most Spaniards are happy with the current *laissez-faire* abortion law.

Mr Sánchez's bet is that Spaniards are less angry and paranoid, and more socially liberal, than the right now thinks. He insists that he would talk to the Catalan separatists only within the parameters of the constitution and would not concede a referendum on independence. He proposes a constitutional amendment to "clarify" the assignment of powers between the centre and the regions. That sounds like federalism that dare not speak its name (since in Spain it is associated with a brief and chaotic 19th-century republic). The Socialists are now "the only moderate party", he said this week. He is seeking to mobilise undecided centrist voters by conjuring up the spectre of Vox entering government if the right wins.

Many political analysts in the past asserted that Franco had inoculated Spain against far-right nationalism. Vox undermines that claim. Rather than such national populist movements as France's National Front or Italy's Northern League it is more akin to the Catholic conservative nationalism of Poland's or Hungary's governing parties. "We are liberal on economics and conservative on moral questions," says Iván Espinosa, a Vox leader. "We have no memory of Franco." Vox is anti-feminist, pro-bullfighting and wants to abolish the constitution's regional autonomy, returning to a centralised state. It is a "metastasis of the PP", from which some of its leaders come, says a former Socialist leader. It represents the Spanish male id. It has drawn big crowds to some of its rallies. Some of its opponents fear that it is going to attract a hidden vote, not fully captured by the polls.

Maybe so, though the polls tend to exaggerate support for new parties. But Spain's electoral system, which is less strictly proportional in less populated provinces, is likely to penalise the right for its three-way split, denying the right-wing parties the legislative majority of which they were confident two months ago. It will help the Socialists, who are profiting not just from the cacophony to their right but also from the seemingly permanent decline of Podemos, which is racked by internal divisions.

Most political leaders accept that Spain is heading for its first-ever coalition government at national level since democracy was restored in 1977. "The new parties are now old parties—they know the system more and they know they have to make deals," says Pablo Simón of Carlos III University in Madrid. But it may require a fresh election in the autumn to define its make-up. All will turn on the precise parliamentary arithmetic, and on whether Mr Rivera is pressed into dropping his pro-

mise (made with an eye on Vox) not to enter a coalition with Mr Sánchez. "This is only the end of the beginning of the cycle of instability" that began in 2015 (when the PP lost its majority), Mr Simón adds.

In any event, Mr Sánchez is set to emerge as the most powerful social-democratic leader in Europe, reckons José Ignacio Torreblanca of the European Council on Foreign Relations, a think-tank. For a party that three years ago was flirting with irrelevance, that is quite an achievement. Mr Sánchez has shown he is a fighter. Now he may have to be a healer. ■



Finland

The populists hit back

HELSINKI

Bringing them into government did not work

THE FINNS are the happiest nation in the world, according to the United Nations, and tied with Sweden and Norway for the freest, according to Freedom House. They are also at or near the top in education, not to mention consumption of coffee. But after the national election on April 14th, they have given up their claim to have solved the problem of far-right populism. The Finns Party, an anti-immigrant, Eurosceptic party previously known in English as the True Finns, surged in the final weeks and took 17.5% of the vote, just a whisker behind the winning Social Democrats at 17.7%. The Social Democrats will probably now form a centre-left government, but as in so much of Europe, the far right's strength will make things complicated.

The Finns Party's result was almost exactly the same as in 2015. But after that elec-

tion, the country's centre-right National Coalition and Centre parties thought they had tamed them by bringing them into the ruling coalition, forcing them to take responsibility for compromises such as observing EU migration policy. But in 2017 the Finns' frustrated hard-liners quit the government while the party's more moderate MPs (including the then-leader) split off into a new faction called Blue Reform.

In the election, voters backed the party's old stalwarts, while Blue Reform failed to win any seats. The Finns Party is now as strong as ever, and more extreme. Its new leader once wrote blog posts affirming racial differences in intelligence and hoping that left-wing female politicians would be raped by migrants. The party's campaign video is a short horror film, in which the people's fury congeals into a "pissed-off monster" who attacks the country's masked and traitorous leaders.

Other parties say they will not negotiate with the Finns Party. Antti Rinne, the Social Democrats' leader, will try to build a coalition that matches the electorate's move to the left after four years of centre-right rule. His most likely partners are the Greens, who also did well, and the liberal National Coalition. In terms of policy, the leftward shift may be modest. All parties but the Finns agree on the goal of making the country carbon-neutral by 2035. Extensive hydropower and nuclear energy make this realistic. (Still, notes Ilkka Haavisto of EVA, a think-tank, the Finns Party implied that the government wanted to ban cars.)

The other big challenge before the next government is benefit reform. The country is moving towards an active, Danish-style employment policy aimed at returning the jobless to work, but the last government demanded that the unemployed find work or training within a short deadline or face cuts to their dole.

That was too harsh, says Joonas Rahkola of the Social Democrats' policy unit. "People have a sense of unfairness, and are insecure about their future." The party wants to raise the education and elder-care budgets. It should also push companies to sign better contracts with flexworkers, says Hannu Jouhki, head of the country's trade-union association. Insecurity, he says, can push voters towards populism.

As elsewhere in Europe, the election leaves Finland's parliament more fragmented. It is hard for mainstream parties to form majorities when populists take a sixth or more of the vote. Last week, across the Gulf of Finland in Estonia, the ruling Centre Party broke its campaign vow and cut a coalition deal that included the far-right EKRE party. The centrist Reform party, which finished first in the election in March but lost its chance to form a government, was furious. Still, as Finland shows, marriages with populists seldom last. ■

Charlemagne | Diplomatic baggage

Europe's history makes a common EU foreign policy a remote prospect



SEVERAL MIRAGE 2000 fighter jets took off from an air base in N'Djamena, Chad's capital, on February 3rd and flew north over the savannah and the scrubby Sahel towards the Sahara Desert. There the French planes bombed a column of some 50 lorries carrying rebels south from the Libyan border. Paris's action was co-ordinated not with the rest of the EU, but with Chad's brutal government and Khalifa Haftar, the Libyan warlord who controls swathes of his country. Today France is still backing General Haftar as he shells the post-Qaddafi "government of national accord" in Tripoli. On April 10th Paris blocked an EU statement urging him to stop, infuriating its European allies.

Africa is churning and Asia is rising. President Donald Trump has raised doubts about the transatlantic alliance. Europe's share of the world's population and wealth is shrinking. Yet the EU still generates 22% of global GDP. And its members are trying to act more as one. In 1993 the EU established a mechanism for a "Common Foreign and Security Policy". In 2011 it created the "European External Action Service", a form of diplomatic corps, and a "high representative" to lead it (currently Federica Mogherini, an Italian). In the decade since then it has brokered a deal curbing Iran's nuclear ambitions and taken on pirates near the Horn of Africa. In February it held its first summit with the Arab League and on April 9th it deployed newly tough language in a summit with China. Its new "Permanent Structured Co-operation" provides a framework for mutual defence and inspires talk of a "European army".

As recent events in north Africa show, however, this co-operation quickly ends where it collides with national impulses. France has oil interests in the part of Libya controlled by General Haftar and considers itself responsible for its former colonies to the south, such as Chad and Mali. Rome's interests centre on Tripoli and the migration-prone Mediterranean coast. So France backs General Haftar and Italy backs the Libyan government. Europe is divided. Likewise, the EU's recent summit with China belied growing bilateral links between southern and eastern European states and Beijing. And last month Italian objections prevented the EU from backing the popular uprising in Venezuela.

Crises nearer home are even more divisive. The EU has been "irrelevant" in the Syrian conflict, despairs one European diplomat.

Germany is still promoting NordStream2, a gas pipeline that will increase Russia's power over countries like Poland; Spain frustrates efforts to guide Balkan states towards EU membership; it does however back Turkish membership, whereas Austria viscerally opposes that and others have doubts. The EU's overseas missions remain inferior to its major national embassies and Ms Mogherini's monthly meetings with EU foreign ministers are quests to find the lowest common denominator. Slow progress towards common defence procurement, let alone a shared doctrine, renders loose talk about a European army ridiculous.

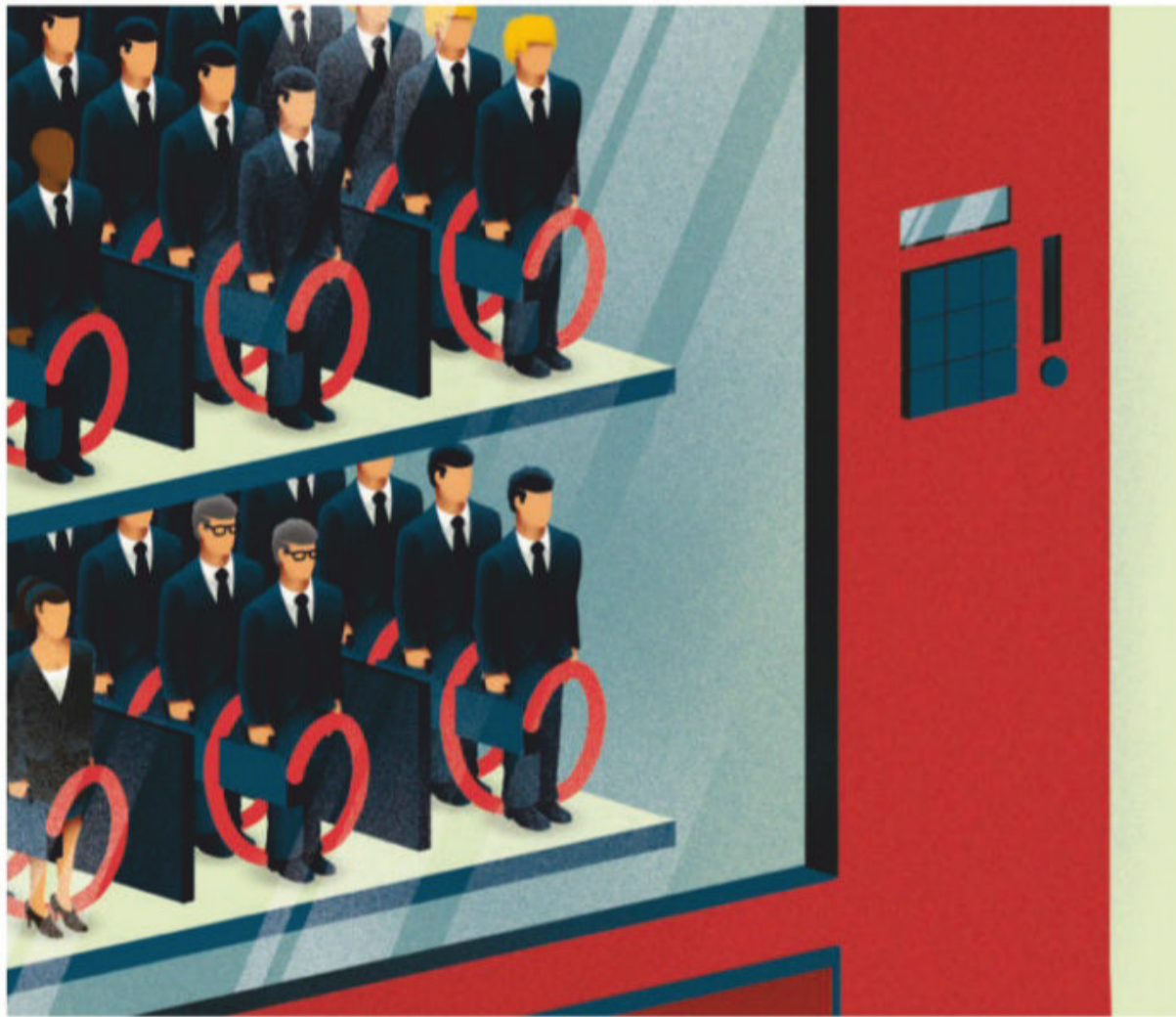
The common foreign and security policy still works on unanimity. It can take positions only where the EU's 28 member states agree. One sensible proposal is to adopt "qualified majority voting" on foreign policy, allowing the EU to act against the will of minority stick-in-the-muds. But that can only achieve so much. On matters where it already applies, like the single market, member states tend to find fudges preserving unanimity. Where they do not, decisions can prove divisive. In 2015 central European states simply ignored a vote imposing refugee quotas on them.

Look to architecture to see a representation of the problem. The EU diplomatic service is housed in a bland, modern office block in Brussels. France's foreign ministry sits in a palace completed in 1855 amid the pomp of the Second Empire; Rome's fascist-era Palazzo della Farnesina was signed over to Italian diplomats in 1940 as Italian tanks rolled through north Africa; Austria's foreign ministry is housed in a Habsburg-era pile. And how to find a common European identity in Ho Chi Minh City, in Vietnam, where France's consulate occupies a magnificent colonial mansion while the Brits and Germans squat in ugly office buildings? The buildings say what diplomats cannot: European foreign policies have different, centuries-old roots. They cannot easily be merged.

Concrete inaction

History is the elephant in the room. France and Italy cannot agree on Libya because both see it as part of their sphere of influence. Ever since its "Racconigi" bargain with Russia in 1909, Italy has strayed sporadically from western European foreign-policy positions; its reluctance to join the chorus on Venezuela belongs to this tradition. Spain's scepticism towards regional breakaways like Kosovo is rooted in its own centuries-old battle to hold Catalonia. Its Moorish heritage makes it a bridge between Europe and the Islamic world, including Turkey, whereas Austria nurtures old fears of the Ottoman invasion that reached the gates of Vienna. Germany's wariness about military might has understandable 20th-century roots, and the country has a certain romantic attachment to Russia—witness Willy Brandt's "Ostpolitik" rapprochement with the Soviet Union—that alarms Poles. And if central Europeans are naive about Chinese interference, this is at least partly because of their own historical links to Beijing, which for example backed the Czechs when the Soviets invaded in 1968.

The foreign-policy instincts of EU member states were forged by the experiences of invasion, destruction or the threat of those things. Today's challenges—China's rise or the migration crisis, say—are dramatic but not sufficiently so to forge a single narrative for the EU. So its foreign policy remains hopelessly underpowered, limited to coaxing national capitals towards agreement and supporting their ad hoc initiatives. Over a generation or two, these common experiences may grow into a common foreign policy culture. But the world is changing faster than that. Europe will struggle to get over its past before the future arrives. ■



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53 Bagehot: Saving the public square

The Conservatives

How to become the next prime minister

The next Tory leader must clear three hurdles to reach Downing Street

ADVISERS HAVE been hired, funds raised and sweeping speeches made. The *Daily Telegraph*, the house journal of Conservatism, features a buffet of op-eds by ambitious Tory MPs. Theresa May might still be resident in 10 Downing Street, but the race to replace her has already begun.

Sajid Javid, the home secretary, is being advised by a former Vote Leave executive and has taken to giving speeches nodding to his gritty upbringing. Boris Johnson has declared a wish to reunite Britain via a “proper Brexit” and has scooped up nearly £140,000 (\$183,000) in donations since late last year. Jeremy Hunt, meanwhile, insists that he is simply getting on with being foreign secretary, even as reports circulate that he has up to 100 MPs willing to support him should he stand.

There are three hurdles to be cleared before an MP can send the moving vans to Downing Street. The first involves getting rid of Mrs May, which could prove hard. The second consists of winning support among Tory MPs, who are split over both Brexit and the future of the party. The third and final test is a ballot of all 120,000 Con-

servative members, who—in a constitutional novelty—would have the final say on who became the next prime minister.

For now, Conservative MPs resemble family members squabbling over a will before the sick relative has died. After winning a party confidence vote last December, Mrs May has a 12-month grace period in which she cannot be challenged again. If she refuses to resign, plotting Tories will have to resort to unorthodox means.

They could change the party’s rules to allow another leadership challenge, according to former heads of the 1922 Committee, the organisation of backbench Conservative MPs which decides these things. Activists are mulling a confidence vote of their own, after scouring the party’s rule book. Another option is a cabinet coup. Government would grind to a halt if cabinet ministers simply told Mrs May it was time to go. A final option would involve Tory MPs refusing to back the government in a confidence motion, pledging to support the party only if Mrs May quit.

Only when there is a formal vacancy can the contest’s next stage start. Wannabe

Tory leaders must secure the support of their fellow MPs. Already they are drawing up spreadsheets of the parliamentary party, scoping out who will back whom. All the campaigns boast of an embryonic whipping operation to woo supporters.

In their would-be leaders, Tory MPs face a choice between competence and electability. Mr Hunt won a reputation as an efficient technocrat while running the health department for six years. He has been mostly sure-footed as foreign secretary. Mr Javid, meanwhile, has handled a tricky brief at the Home Office well. Michael Gove’s impressive record as environment secretary is offset by a reputation for treachery, earned when he kiboshed Mr Johnson’s attempt on Downing Street in 2016. “People have not forgotten him stabbing his colleague in the front,” says one MP. By contrast, Mr Johnson proved alarmingly inept as foreign secretary and chickened out of running in 2016 after losing Mr Gove’s support.

Yet Mr Johnson’s incompetence is balanced by his perceived electability. His leading role in Brexit has made him less popular and more divisive. But he is still the Conservatives’ most recognisable figure and best campaigner. If the Brexit Party, Nigel Farage’s new political outfit, blows a hole in the Tories at the European elections next month, MPs may swallow their concerns about Mr Johnson’s character. Keeping Jeremy Corbyn out of government (and keeping hold of their own seats) is what they want more than anything else. ▶

▶ The assumption is that an establishment (reformed Remain) candidate will face off against an insurgent (Brexit) in the final ballot of Tory party activists. Cabinet ministers who backed Remain, such as Mr Javid and Mr Hunt, suffer from original sin in the eyes of the Conservative Party's Brexit-supporting membership. They are competing with hardline Leavers such as Dominic Raab, a former Brexit secretary who has an established group of advisers and MPs banging his drum. The party has already tried a Remain-turned-Leaver in Mrs May, warns one MP, and will be reluctant to do it again.

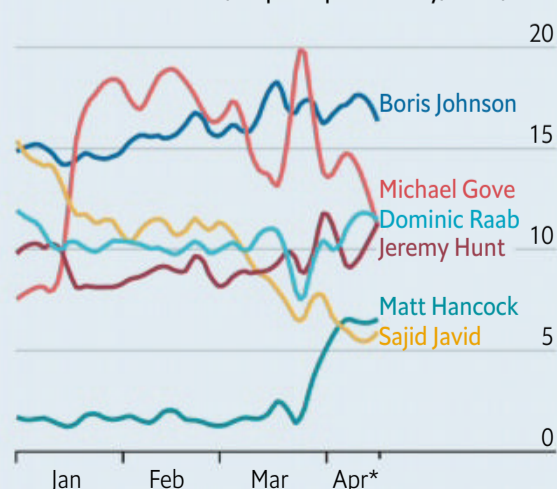
Conservative activists may look beyond Brexit. They opted for a young, untested David Cameron over the more familiar charms of David Davis in 2005. Even so, Mr Hunt and Mr Javid have both felt it necessary to become enthusiastic born-again Brexiteers. Mr Hunt absurdly compared the EU to the Soviet Union in a speech last year. Mr Javid, meanwhile, insists that a no-deal Brexit is a viable option.

Having a full-blooded Brexiteer is no guarantee of full-blooded Brexit. With enough chutzpah, a hardliner might even be the person most able to pursue a compromise—a “Nixon goes to China” strategy, as one Conservative MP puts it. The new prime minister is likely to call an election to firm up their mandate for the next stage of the Brexit talks, party insiders believe. Mr Raab's allies play down the idea, perhaps hoping to win support from MPs who fear facing the voters again. Yet many others accept that a poll may be necessary sooner than the scheduled vote in 2022.

Any new resident of Downing Street will face the same problems as its current tenant: a lack of votes in the House of Commons, Brexit negotiations that will leave swathes of voters dissatisfied, and a divided party approaching a decade in power. The Conservatives' woes go well beyond Mrs May. Her successor will find that out sooner rather than later. ■

Blues brothers

Britain, chances of becoming the next Conservative leader, implied probability, 2019, %



Sources: Betfair Exchange; *The Economist* *To April 16th 2019



WikiLeaks

Shown the Ecuadorean door

The fate of Julian Assange may lie with the home secretary

IN 2011 JULIAN ASSANGE was asked whether he had in mind a title for his autobiography. “Ban This Book: From Swedish Whores to Pentagon Bores” was his flip-pant suggestion—a reference to rape allegations made against him in Stockholm and his publication of American secrets through WikiLeaks, his anti-secrecy organisation. Although he originally fled to the Ecuadorean embassy in London to evade the rape investigation, it is the Pentagon bores who have now caught up with him.

Having exhausted his hosts' patience after nearly seven years inside, on April 11th he was dragged from the embassy and arrested. America has requested his extradition. Sweden may yet join the queue to put him on trial.

Mr Assange came to prominence in 2010 when WikiLeaks published huge troves of documents stolen by Chelsea Manning, an American soldier. Some were newsworthy, like evidence of an indiscriminate helicopter attack in Iraq. Others, like American diplomats' confidential missives, were titillating but revealed little wrongdoing. In 2013 WikiLeaks helped Edward Snowden, a whistleblower from America's National Security Agency, to flee from Hong Kong to Russia. In 2016 it collaborated with thinly disguised Russian spies to publish leaked emails, with the aim of hurting Hillary Clinton's chances in that year's American presidential election.

Mr Assange is no martyr for press free-

dom. His dumping of reams of sensitive information without redaction was the act of an anarchist, not a journalist. Worse still was his eagerness to work with suspected (later, proven) Russian spies to sway an election. Even so, it was never clear whether Mr Assange had broken the law. The Obama administration, after deliberating possible violations of the Espionage Act, decided he had not. But Donald Trump's lawyers were more resourceful.

They picked up on the claim that Mr Assange had helped Ms Manning try to crack the password to a classified Pentagon network (the same one that had earlier yielded copious military reports and diplomatic cables). That, says America's Department of Justice, constituted “conspiracy to commit computer intrusion”. The felony carries a relatively trifling five-year maximum prison sentence, rather than the decades permitted by the Espionage Act.

Mr Assange now faces two legal challenges, with a possible third to come. The first, for skipping bail in Britain, carries a one-year maximum sentence. The second is America's extradition request, which is governed by a bilateral treaty that came into force in 2007. That agreement allows America to try people only for the offence for which they were extradited. A judicial bait-and-switch—extraditing Mr Assange for hacking, then hitting him with bigger charges on arrival—would be illegal.

A third charge could arise if Sweden stakes its own claim. It dropped its rape investigation in May 2017 as Mr Assange could not be reached, despite his occasional Evita-like appearances on the balcony of the embassy. But it has until August 2020 to re-open the case if it chooses.

Sajid Javid, Britain's home secretary, who is ramping up an undeclared campaign to succeed Theresa May as prime minister, would arbitrate in any tug-of-war. Extradition requests are usually prioritised by the order in which they are made, as well as by the severity of the offence. Sweden's place in the queue is unclear: its original arrest warrant in 2010 preceded America's, but a new one would follow it. As for severity, the alleged rape would carry a maximum sentence of four years, one shy of America's hacking charge.

Political battle-lines are being drawn. “The extradition of Julian Assange to the us for exposing evidence of atrocities in Iraq and Afghanistan should be opposed by the British government,” declared Jeremy Corbyn, the Labour leader, on April 11th. The Swedish case, he added two days later, was different: “There can be no hiding place from those accusations.” Seventy mostly Labour MPs and peers have written to Mr Javid urging that Mr Assange be extradited to Sweden, should a request be made. In the meantime, Mr Assange will have plenty of time to work on that autobiography. ■

Bagehot | Saving the public square

Everybody suffers when controversial thinkers are driven from public life



SIR ROGER SCRUTON is once again at the centre of a firestorm. The philosopher recently gave an interview to the deputy editor of the *New Statesman*, George Eaton, in which he ranged over numerous subjects on the assumption that, as a former wine critic for the magazine, he was on friendly turf. Mr Eaton published some of the “highlights” of the interview on Twitter, chosen, and indeed edited, to make them look as outrageous as possible. A Twitter storm ensued. The government sacked Sir Roger from his position as head of an architectural commission. Mr Eaton celebrated, posting a picture of himself swigging from a bottle of champagne, while conservatives raged about a giant brought down by pygmies.

The Scruton case is more complicated than some conservatives imagine. They are right that Sir Roger is one of Britain’s leading public intellectuals, and that his books on aesthetics make him eminently qualified to head the government’s “Building Better, Building Beautiful” commission. They are also right that Mr Eaton behaved shoddily in twisting some of the philosopher’s words. In a tweet, he quoted Sir Roger’s comment that “each Chinese person is a kind of replica of the next one” without acknowledging that this was part of a criticism of Chinese government policy. (Mr Eaton stands by his article but has apologised for his behaviour on social media.) But Sir Roger is no saint. He is an inveterate provocateur who failed to recognise that, when you accept a public appointment, you have to be willing to bite your tongue. In his interview with Mr Eaton he made some worrying remarks about George Soros’s “empire” and about “huge tribes of Muslims” invading Hungary, which echo things he has said before.

Sir Roger is not the only person in public life who says silly things. David Lammy has recently made a fool of himself by comparing Brexiteers to the Nazis, but he is nevertheless, in general, an excellent parliamentarian. As a rule the health of public life depends on a willingness to recognise people’s talents and forgive their foibles. But the British have taken to doing the opposite. Indeed, the public square is increasingly patrolled by thought police who unleash the dogs of outrage if you dare to step out of line. Lord Adonis has repeatedly called for Andrew Neil, the BBC’s most forensic interviewer, to be sacked because he supports Brexit. Oxford students have demanded that John Finnis, one of the world’s most

distinguished legal scholars, should be silenced for the sin of opposing gay marriage. Oxford dons have cold-shouldered Nigel Biggar, a theologian, for holding a series of seminars on the ethics of imperialism that question the assumption that empire is always a bad thing. Cambridge University rescinded its offer of a visiting fellowship for Jordan Peterson, a Canadian psychologist, under pressure from students.

Though the situation in Britain is not as bad as in America, where the public square is piled high with the bodies of the disgraced, it is heading that way. Brexit has divided the country into warring tribes who loathe each other. The combination of the rise of populism and the rise of identity politics is poisonous: identity politics encourages people to confuse criticism of their arguments with criticism of their person, and populism encourages them to trample over the rights of minorities. Twitter is an almost perfect outrage machine because it encourages loudmouths to comment on almost everything in 280 characters.

The self-reinforcing outrage cycle is in danger of driving talented people from public life. Why should a young person contemplate a life in the public eye when a provocative argument or off-colour joke could end their career? There is a danger that the only people who are prepared to go into public life will be a weird collection of ideologues who are willing to sacrifice everything for the cause, provocateurs who make a living out of outrage, and bland functionaries who have nothing interesting to say.

How can Britain’s public square be saved from ongoing destruction? It is not enough just to push back hard when you are confronted with an outraged mob. That risks handing the initiative to the mob and making yourself look foolish whenever the mob happens to have a kernel of truth in its complaints. Rather, it is important to act on the basis of principles.

Rules of engagement

The most important one is that free speech is the core of a liberal society. The right to express a reasoned opinion should trump the right, for example, not to be offended. The right to free speech does not include the right to call for violence: Gerard Batten, the head of the UK Independence Party, put himself beyond the pale when he defended a tweet by one of his candidates about raping a Labour MP as “satire”. But it includes the right to express vigorous opinions on controversial subjects, such as whether Islam holds up economic growth or whether Israel is an imperial power.

The second principle is that both sides of the political divide should be held to the same standards. This is particularly important in universities, where the people in charge of educating the next generation lean strongly to the left. The hounding of conservative intellectuals not only deprives students of the chance to hear a range of opinions. It also deprives liberals of the bracing discipline of having to argue with people from alternative intellectual traditions. The third principle is to beware pressure groups demanding a veto on what can be said in the public square. It often turns out that those behind the cries for no-platforming speakers are a sliver of a minority who represent no one but themselves.

Liberal democracy is in essence government by discussion. If people are reluctant to engage in public discussion because they worry that they will be subjected to a howling mob then eventually liberal democracy dies. Public bodies, especially universities, need to do their utmost to defend the rights of contrarian thinkers, even if, as in the case of Sir Roger, those contrarian thinkers sometimes go too far. ■



Overthrowing despots

The putsch option

CAIRO AND KHARTOUM

Why coups tend to make a bad situation worse

ON THE STREETS of Khartoum, the capital of Sudan, people are breathing a heady mix of fear and hope. Since April 11th, when a cabal of army officers pushed out the 75-year-old Omar al-Bashir, the country's president for the past 30 years, Sudan has had two more of its bloodied leaders step down. On April 12th, just a day after taking control, Awad Ibn Auf, the defence minister and head of the self-appointed "transitional military council", resigned. The next day, so did Salah Abdallah Gosh, the head of the much-feared National Intelligence and Security Service (NISS).

On April 13th the latest military leader, Abdel Fattah Abdelrahman Burhan, announced his intention to "uproot" the military government, prosecute those guilty of killing protesters and reform the NISS. He has promised to hand power over to civilians within two years. The protesters camped outside the defence ministry over the past week have succeeded in changing their country.

Yet they have plenty to worry about. "There are so many militias, so many

armed groups, it's very scary," says Hamid Murtada, an activist among those protesting. Fights have already broken out between soldiers affiliated with different parts of the Sudanese state. Gunfire is heard at night. The soldiers now in charge might concede more to the protesters, perhaps even allowing a civilian government to form. But they might also try to break up protests by force, or even worse, start fighting each other.

Sudan is experiencing something seen in several countries since the Arab spring of 2011: popular protests against an ageing despot precipitating regime change. It follows Algeria, which on April 2nd learned of the resignation of President Abdelaziz Bouteflika, an 82-year-old so inactive that many Algerians joke he is dead. He was forced out by weeks of protests after he informed horrified Algerians that he planned

to stand for re-election yet again.

Such transitions offer hope. They show that street movements can effect change, even against brutal regimes. But they are also moments of great risk. The fall of long-standing despots such as Mr Bashir, who is wanted by the International Criminal Court for crimes against humanity, is a necessary part of any transition to democracy. But it can also start a civil war, or lead to a new dictatorship as the next strongman builds his own networks of power.

In general, armies everywhere have proven better at staging coups than at managing genuine transitions to civilian rule. Thailand's army, which has mounted 19 attempted coups (12 of them successful) since the end of absolute monarchy in 1932, most recently took power in 2014. This March it rigged an election under a constitution it had drafted to make its grip on power more or less permanent. In neighbouring Myanmar, an election and formal transfer of power in 2015 should have marked the end of more than half a century of military rule. But the constitution the army has foisted on the country guarantees it control of important ministries and enough seats in parliament to block reforms. Pakistan's army, which ruled directly from 1999 to 2008, now relies on less formal mechanisms to ensure its continued sway over the country's foreign policy, and to protect its economic interests.

In fact, the political turmoil witnessed in the past month bucks long-term trends. ►►

→ Also in this section

56 Predicting coups

► Data compiled by Hein Goemans of the University of Rochester and two other scholars show that two-thirds of national leaders in Africa and the Middle East who lost power between 1960 and 1989 were either forced out or died of natural causes. But since then, democracy has spread. “Irregular exits”, as Mr Goemans calls them, have become much rarer. Most Arab and African leaders now leave office because they are voted out or do not stand for re-election. Analysts counted 18 attempted coups around the world in 1966 and none at all in 2007 or 2018. According to CoupCast, a predictive model based on 68 economic and other variables, Africa is the only continent where the factors that foster coups are still fairly widespread (see map).

In both Sudan and Algeria the cliques now in charge may hope to cling to power despite the change of figurehead. Under Mr Bashir, Sudan has been run less by a government and more by a cartel of different armed groups. The president, says Alex de Waal, an analyst and former peace negotiator, was “the conductor of an orchestra”. Rather than just an army, the country has half a dozen semi-formal military outfits, from the NISS to pro-government militias such as the notorious Janjaweed, responsible for mass rape and massacres in Darfur over a decade ago. Each has its own leaders and weapons. Mr Bashir stayed in power by balancing these groups against each other.

In Algeria institutions are stronger, but authority is still wielded by what Algerians call *le pouvoir* (the power). This is a shadowy collection of army officers, businessmen and others, continually negotiating among themselves. Any politics involving people outside this clique is crushed.

The two regimes are alike in being based not on strong, visible institutions but on invisible webs of personal relationships. Leaders are less executive decision-makers than dealmakers, playing off different fac-

tions against each other so as to keep themselves in power. Offices do not matter as much as the individuals who hold them, and the alliances they have.

Changes of leadership will bring lasting change only if they overturn this politics. Other recent coups offer worrying lessons. In 2017 in Zimbabwe, President Emmerson Mnangagwa came to power after the army forced out Robert Mugabe, who had ruled for 37 years. Mr Mnangagwa, Mr Mugabe’s former chief enforcer, impressed gullible diplomats by promising a “new dispensation” and economic reform. But his election campaign last year was violent and fraudulent. Since then, inflation has soared as promised investment failed to materialise. Renewed protests in January were bloodily put down. Mr Mnangagwa was never serious about reform. He, like Mr Mugabe, relies on a personal patronage network to maintain his grip on power.

Changing the guard

Yet some places do offer hope. In 2014, Blaise Compaoré, the president of Burkina Faso in west Africa, fled the country for Ivory Coast after protesters stormed the parliament building and set it on fire. In that instance, the army took charge but then quickly handed power to a transitional government to organise elections. In September 2015, Mr Compaoré’s supporters in the presidential guard mounted a coup, intended, ultimately, to restore him to office. But though they succeeded in taking Ouagadougou, the capital, the coup plotters eventually had to give up when it became clear that they had no international support. The planned election was held in November of that year.

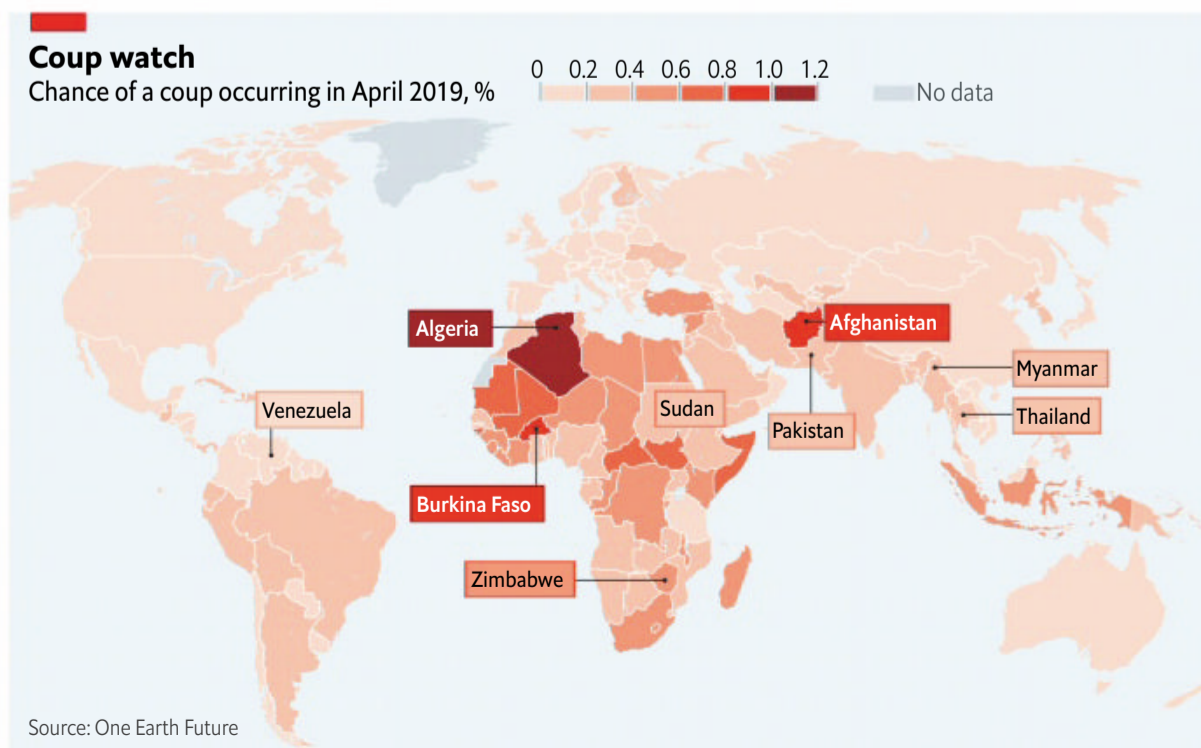
Could such a thing happen in Sudan or Algeria? In Sudan the African Union (AU) is insisting that the men with guns give up power—as it did with Burkina Faso, but noticeably failed to do with Zimbabwe. On

April 15th it gave Sudan’s new leaders 15 days to hand over to a “civilian-led political authority” or face suspension. The dramatic fall in the number of coups in Africa over the past two decades owes much to the AU’s refusal to accept sudden military takeovers. Unrecognised governments struggle to do much (sadly, it is less bothered about other outrages, such as rigged elections).

But even if power were handed over to civilians in Khartoum, the situation in Sudan could still prove dangerous. The protesters there are relatively well-off urbanites angry at the worsening economy. But the rest of the country is desperately poor, barely governed and awash with arms. It is held together by loose alliances, mostly organised by Mr Bashir. And since 2011, when South Sudan was given independence, Khartoum has lost the oil that is its main source of political finance. The danger is that any deal that satisfies the protesters of Khartoum will undermine the fragile half-peace in the periphery. That could stoke new rebellions that would quickly undermine any post-Bashir government. “It’s only a matter of time before Sudan falls again to military rule,” says Muhammad Osman, a Sudanese analyst.

One possible outcome is that the army finds more external sponsorship. Saudi Arabia and the United Arab Emirates would probably bail the new rulers out, in exchange for protection of their interests, chiefly the continued participation of Sudanese soldiers in the Saudi-led coalition in the war in Yemen. With an infusion of new cash, the delicate balancing-act between Sudan’s various armed forces that Mr Bashir had maintained might become somewhat easier. But there is every risk that a miscalculation might spark conflict, especially if one faction feels that it may have to face retribution for its role in previous violence. “People will shoot and defend themselves,” says Harry Verhoeven, an academic and the author of a book, “Water, Civilisation and Power in Sudan”. “These are people who owe everything to this system and the impunity it gave them.”

In Algeria the end of the protest movement already seems nigh. On April 12th police tried to take back the streets of Algiers, the capital, by blocking roads into the city. When that failed, they used water-cannon and tear-gas to drive demonstrators away. Mr Bouteflika’s downfall may usher in some change. But it will take longer than a few weeks. Only when a state has a broad base of support, and power vested in institutions rather than individuals, can a country really be coup-proofed. In Khartoum the people on the street speak of revolution. But they fear failure. “This might all be a game,” says Mr Murtada, the activist. “We can’t leave until we know the plan...We cannot trust the military at all.” Sadly, neither can they trust anyone else. ■



Coup data

Where's next?

Trying to spot the next despot to be toppled

THE REMOVALS in the same month of two presidents—Abdelaziz Bouteflika of Algeria and Omar al-Bashir of Sudan—look like an unforeseeable coincidence. But they are also two more data points for analysts trying to turn the art of predicting political upheaval into something approaching a science. Some believe they have the tools to make an attempt.

Coups and revolutions present unique challenges for forecasters. They are both extremely rare and, notes Andreas Beger of Predictive Heuristics, a consultancy, by definition conspiratorial—they do not advertise themselves in advance. Perhaps the most rigorous quantitative forecast of political upheaval comes from One Earth Future (OEF), an NGO based in Colorado that publishes a predictive model, CoupCast. It reckons that the factors correlating most strongly with the risk of a coup include: the rate of economic growth; how long a regime has been in power; how long since a country's most recent coup; and whether it has been hit by extreme weather, such as a flood or a drought (see chart).

Economic woes certainly played a part in the defenestrations of Mr Bouteflika and Mr Bashir. Real annual GDP growth has averaged just 2.8% over the past five years in Algeria, compared with 3.3% for Africa as a whole. Sudan's GDP grew at just 1.8% a year over the same period, and last year actually contracted by 2.1%. Inflation reached 63%. The IMF expects Sudan's economy to shrink by a further 2.3% in 2019.

The relationship between prosperity and political stability is complex. In 2015 a report from the World Bank noted that economic indicators alone could not have predicted the advent of the Arab spring in 2011. Economies in the Middle East and north Africa were growing steadily. Extreme poverty and income inequality were falling.

However, despite the rosy headline numbers, surveys conducted in the 2000s found that Arabs were growing increasingly worried about their financial prospects. The World Bank observes that, though the bottom 40% of earners in the region were becoming richer, the living standards of the middle 40%, who receive less in government transfers, had stagnated. In Tunisia, where the Arab spring began, 23% of graduates were unemployed in 2010, compared with only 13% for the population as a whole. This suggests that a lack of opportunities mattered more than poverty.



Maduro's still not waving goodbye

Political history matters, too. CoupCast finds that both new and very old autocratic regimes are at risk of being overthrown. Emerging tyrants need time to consolidate power. Longer-standing regimes like those of Mr Bouteflika and Mr Bashir tend to fade as their leaders age. CoupCast's data find that for dictators, the "sweet spot" in terms of political stability comes very early in their despotism—after just 18 months.

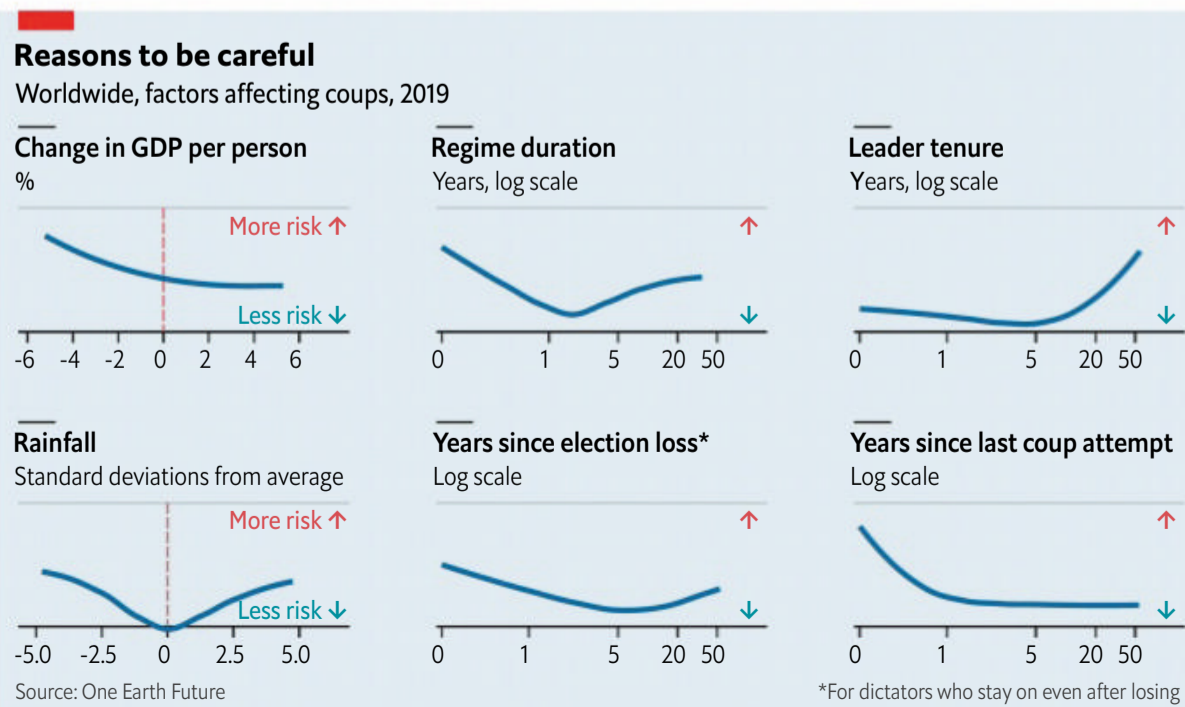
Clayton Besaw of the OEF says that one way dictators have adapted to modern politics is by choosing to hold elections. This is a risky strategy. Winning elections can help legitimise their regimes, but trying to stay on after losing tends to create further insta-

bility. Congo's former president, for example, rigged a vote count to keep out a rival, then swore in a successor but refused to move out of the presidential villa himself. No one would be shocked if Congo had a coup some day.

Perhaps the most likely place for the next putsch, however, is Venezuela. Nicolás Maduro, Venezuela's dictator, has presided over one of the worst economic catastrophes in modern history. The IMF estimates that unemployment is 44%, and expects inflation to top 10,000,000% this year. Mr Maduro won an unfair election in 2013 and a blatantly rigged one in 2018. The legislature says he is illegitimate, and that Juan Guaidó, the head of the legislature, should take over, as the constitution requires, pending proper elections. More than 50 foreign countries recognise Mr Guaidó as interim president.

Yet Mr Maduro may cling grimly on. Despite deep discontent among the lower ranks, the army's top brass still supports him. Jonathan Powell of the University of Central Florida notes that dictators can make coups less likely by lavishing cash on their armies and tampering with command structures to make it difficult for them to co-ordinate rebellions. A study by Mr Powell published in 2012 found that such "coup-proofing" efforts were actually more useful to tyrants than improving their countries' economies. Shrewdly, Mr Maduro has been showering his army with goodies, giving senior officers lucrative opportunities to embezzle, and has imported Cuban spooks to keep them in line.

Which country then, has the highest chance of seeing a sudden regime change? CoupCast's latest forecast points to Algeria. One of the strongest predictors of future political instability is past instability. Algeria already sat at the top of CoupCast's rankings prior to Mr Bouteflika's resignation. His sudden departure has not made the country any less volatile. ■





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The future of cars

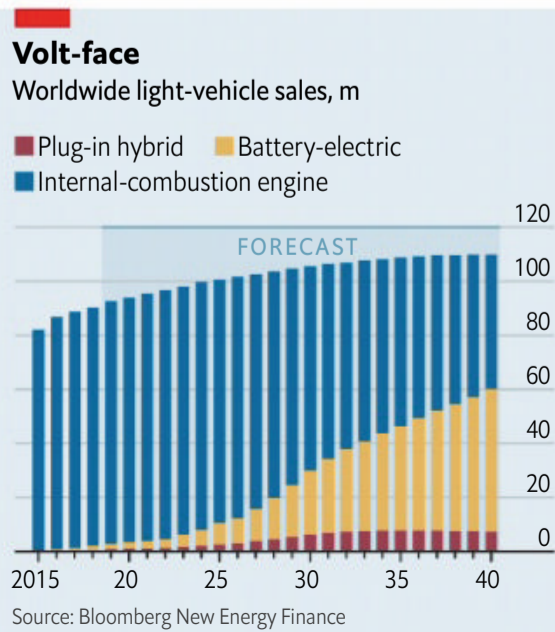
Charging ahead

Big carmakers are placing vast bets on battery power

IN 1900 ONE in three cars on American roads ran on volts. Then oil began gushing out of Texas. Cheaper than batteries, and easier to top up, petrol fuelled the rise of mass-produced automobiles. Cost and worries about limited range have kept electric vehicles (EVs) in a niche ever since. Tesla, which has made battery power sexy again in the past decade, produced just 250,000 units last year, a fraction of what Volkswagen or Toyota churn out annually. For every one of the 2m or so pure EVs and plug-in hybrids, which combine batteries and internal-combustion engines (ICEs), sold in 2018, the world's carmakers shifted 50 petrol or diesel cars.

EV sales are, however, accelerating as quickly as electric motors themselves. Some industry-watchers reckon that they will account for nearly 15% of the global total by 2025. By then, one in five new cars in China will run on batteries, according to Bloomberg New Energy Finance, a consultancy. The chief reason such optimistic forecasts no longer look outlandish is the entry into the electric race of the car industry's juggernauts. A survey by Reuters in

January put the industry's total planned EV-related spending worldwide (including on batteries) at around \$300bn over the next five to ten years. From GM and Geely to Mercedes and Nissan, big carmakers all want to turn out millions of such cars—and turn a profit doing so. Their strategies range from cautious to headstrong.



Making a profitable, mass-produced EV has proved elusive. A battery powertrain can be three times the price of an ICE. But a combination of better technology and greater scale may soon allow EVs to compete on price with petrol vehicles, and enable motorists to drive long distances without the fear of running out of juice.

They had better, carmakers are hoping. Worries about climate change and air pollution are prompting authorities around the world to consider phasing out new petrol and diesel engines in the coming decade. In the absence of federal regulations under America's climate-sceptical president, Donald Trump, some progressive cities and states there are tightening local rules. Fiat Chrysler (whose chairman, John Elkann, sits on the board of *The Economist's* parent company) has just agreed to pay Tesla hundreds of millions of euros to count the Californian marque as part of its fleet, and thus avoid steep fines for exceeding average CO₂-emissions standards for carmakers due to come into force in the European Union next year. In China, where half the world's EVs are already sold, the government sees the electrification of transport as a way to combat choking urban smog—and to overtake the West technologically.

Western premium brands appear best positioned to take an early lead. While batteries remain pricey, fancy marques can offset the cost with the higher prices that their vehicles command. Jaguar and Audi have already broken Tesla's monopoly at the lucrative top end of the market. Daim-

► ler, which owns Mercedes, has committed €10bn (\$11.3bn) to its EQ range and wants 20% of its cars to be fully electric by 2025.

Daimler and BMW, which has been bruised by losses on its poorly selling i3 electric hatchback, are hedging their bets by backing platforms—the basic architecture of a car—that are able to accommodate petrol and diesel engines as well as electric motors. This should help them contain costs, by avoiding duplication, but involves compromises over battery size and layout. Sacrificing range and interior space in this way may dent brands built on luxury

and technological prowess, says Patrick Hummel of UBS, a bank.

Many mass-market firms are likewise proceeding cautiously. Their thinner margins leave less room to absorb the cost of batteries. Renault of France and South Korea's Hyundai are nevertheless toying with the idea of a dedicated electric-only platform. PSA Group has said it plans to electrify more Peugeots, Citroëns and Opels. Fiat Chrysler has made similar noises, though the Tesla tie-up suggests its near-term plans are less ambitious. Toyota's early bet on hydrogen fuel cells, which lag behind

batteries on the road to widespread adoption, had long been a distraction. The Japanese giant has now acknowledged that buyers want battery power. It is planning ten models by the early 2020s.

The most daring by a long way is vw. The German group's heft—it produces 10m cars a year—affords it economies of scale only Toyota could hope to match. The €30bn vw plans to spend on developing EVs over the next five years, plus €50bn to fit them with batteries, leaves all other car-makers in the dust. In March Herbert Diess, its chief executive, promised 70 new elec- ►►

Bartleby It's a man's world

The subtle ways in which discrimination works

PREGNANT WOMEN have limited mobility. That is obvious to anyone who has had a baby, but didn't occur to the founders of Google when they designed their car park. When Sheryl Sandberg, then head of online sales, became pregnant in 2004, she made a simple request: parking spaces for expectant women as close to the building entrance as possible.

That is just one example of how many aspects of the workplace lack the female perspective. In her brilliant book "Invisible Women: Exposing Data Bias In A World Designed For Men", Caroline Criado Perez shows how widespread these subtle biases can be.

It starts at the recruitment stage. Women are put off from applying for jobs that use words in their adverts such as "aggressive" or "ambitious". When one company changed its ad to focus on qualities such as enthusiasm and innovation, and used a photo of a woman rather than a man, the proportion of female applicants rose from 5% to 40%.

Once you have a job, you must get to the office. Because they often care for children or elderly relatives, women are likelier to make multiple journeys. Those who use public transport often need radial routes whereas most systems favour commuters heading from the suburb to the centre of town. This means female journeys can be much longer than male ones, making it difficult for them to get to work on time.

Women experience more work-related stress than men, according to research by Britain's Health and Safety Executive, and face a particular problem with long working hours. But a study found that unencumbered people of both sexes (those with few or no caring responsibilities) could cope equally well with a 48-hour week. The stress occurred be-

cause women struggled to combine their caring responsibilities with work, a problem faced by a smaller number of men.

Those responsibilities may also mean that women find it more difficult to take part in after-work bonding activities like dinners, Ms Criado Perez argues. Many companies allow workers to put the cost of food and drink at such events on expenses, but not the cost of a babysitter. That is a problem for single parents, and women comprise 80% of that category in America and 90% in Britain.

When their performance is reviewed, Ms Criado Perez argues that women are criticised for being bossy, abrasive or strident, whereas men are encouraged to be more aggressive. But if women are warm and friendly, they get criticised for being insufficiently professional.

Women's physical health, too, may be affected by male-dominated design. Their bodies absorb chemicals more quickly than men's do. The long-term effects of inhaled particles on (mostly male) miners have been studied extensively; those of cleaning products on (mostly female)

cleaners have not. In construction and engineering, tools and safety jackets are designed for male hands and bodies, not female ones. Bulletproof and stabproof jackets are also designed for men and thus do not fit women comfortably; a British police officer removed her jacket so she could use a hydraulic ram to enter a flat, only to be stabbed and killed.

Many men do not realise there is a problem. Those who believe they are objective when recruiting are nevertheless more likely to hire another man than a woman with identical qualifications, as a paper from 2007 showed.

A similar issue is apparent with race, as Jennifer Eberhardt, a professor at Stanford University, describes in her book "Biased: The New Science of Race and Inequality". An American study showed that candidates with black-sounding names get fewer callbacks than those with traditional European names. Even highly qualified African-Americans received fewer calls for interview than whites with lesser qualifications. White people with a criminal record received as many callbacks from employers as black people who had never committed an offence. And this was true whether or not the company described itself as an "equal opportunity employer".

It is natural if you have succeeded in work to assume this was down to your own merits. But the existence of hidden biases shows that the playing field is not level. As both authors argue, preventing discrimination depends not on white men discovering their inner liberal but on decisions being taken by those with broader perspectives. If every executive carries a hammer, it might not occur to them that some jobs need a screwdriver.



► tric models by 2028, rather than 50 as previously pledged, and 22m EVs delivered over the next ten years. The company is contemplating a huge investment in a “gigafactory” to supply its own batteries rather than depending on outside suppliers.

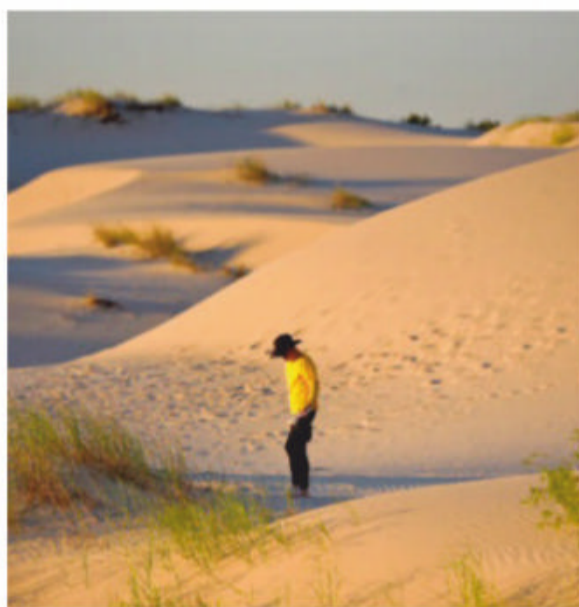
VW is already developing a dedicated platform and converting entire factories to EV production. The first, at Zwickau in Germany, will eventually turn out 330,000 cars a year for the VW brand as well as Audi and SEAT. Its medium-sized ID hatchback, to be shipped next year, will cost around €30,000, similar to an equivalent diesel-powered Golf, and travel 400-600km (250-370 miles) on a single charge. On April 14th in Shanghai Mr Diess unveiled a sport-utility vehicle to compete with Tesla’s snazzy Model X in China from 2021. Once the range of EVs reaches full production in 2022, VW believes, such models will start breaking even. By 2025, when it hopes one-quarter of its output will be electric, they should be as profitable as petrol cars.

As Mike Manley, boss of Fiat Chrysler, observes, it is no longer a question of whether carmakers can supply a fleet of EVs but whether people will pay for them. If governments withdraw generous subsidies which EV-owners have enjoyed, charging infrastructure fails to materialise or electric cars’ pitiful resale value does not increase, motorists may be reluctant to switch to battery power. Poor sales, combined with the large upfront investments, would hit carmakers’ margins, which for mass-market brands are already about as exciting as a Soviet-era Trabant in mud brown. The financial consequences could be “ugly”, warns Bernstein, an equity-research firm.

Electric field

At the same time, the big carmakers can expect more competition from rivals unburdened by complex ICE supply chains and large workforces. VW has 40,000 suppliers worldwide and directly employs 660,000 people. Lower capital intensity, and the relative simplicity of EVs, which use many fewer parts than petrol vehicles and are easier to assemble, is drawing in upstarts. They include Dyson, a British maker of vacuum cleaners, and a series of Chinese Tesla-wannabes, such as NIO and Byton. Bigger Chinese carmakers, such as Geely and JAC, have also developed expertise in EVs. With domestic sales stalling, they are beginning to eye export markets.

Other technological bumps are meanwhile starting to test the industry’s chassis. Self-driving cars and ride-sharing are forcing companies to rethink their established business model. Investing in EVs now leaves them with less to spend on adapting to everything else. They may be hoping that the electric race will serve as a practice lap for wider oncoming disruption. ■



American shale

Permian explosion

NEW YORK

A megadeal heralds consolidation in the fracking business

SHALE HAS transformed America into an energy superpower, which pumps more crude than Saudi Arabia. Investors are non-plussed. They clamour to buy bonds from Saudi Aramco (see Schumpeter). At the same time shale producers surveyed by the Dallas Federal Reserve gripe about access to debt. Oil prices climbed in recent months, but shares of many frackers failed to keep pace because of doubts over their ability to realise both growth and a steady income.

There is one group with deep pockets that is eyeing shale: the oil majors. Last year BHP, a miner, sold its American shale assets to BP, Britain’s oil giant, for \$10.5bn. In March ExxonMobil said it plans to produce 1m barrels of oil equivalent a day in Texas’s Permian basin by 2024. And on April 12th Chevron announced it would pay \$33bn in cash and stock to buy Anadarko, a smaller energy company with a big shale business (and assume its \$15bn of debt). It hands Chevron a big liquefied-natural-gas project in Mozambique. Anadarko’s holdings in the Gulf of Mexico will make Chevron the second-biggest producer there. But the main prize is its vast acreage in the Permian’s rich Delaware basin.

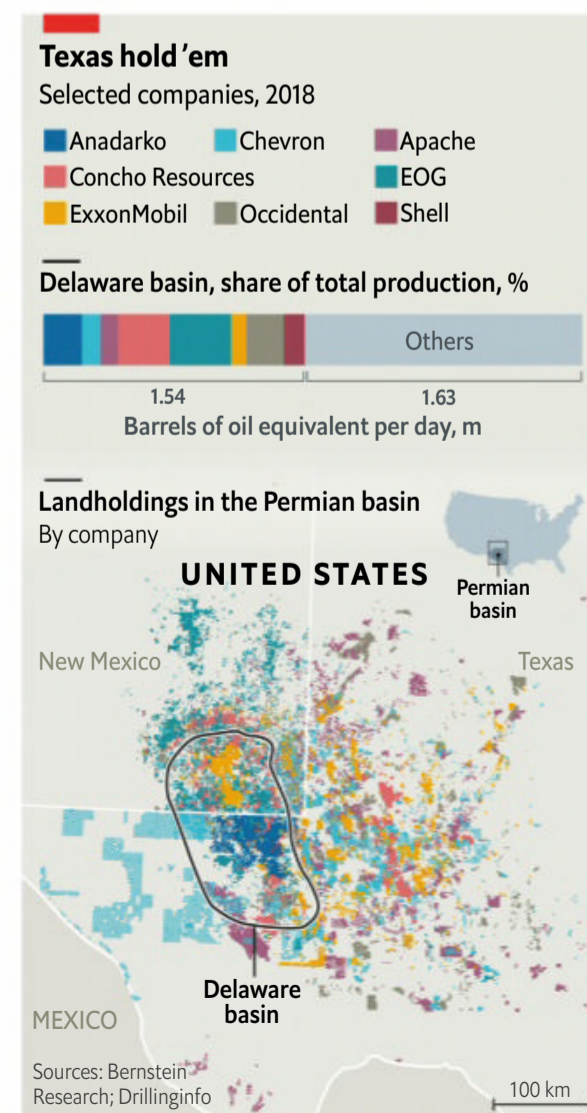
Chevron has held land in the Permian for decades. It had drilled wells in the conventional direction: down. Its properties began gaining value a decade ago, after wildcatters had success drilling sideways, and blasted shale with sand and water to force it to give up oil and gas. Anadarko’s contiguous plots will let Chevron drill farther sideways and ease transport of masses of sand and water needed for each well.

Frackers suffered after 2014, when Saudi Arabia declined to cut production and oil

prices plunged. Today, even with higher oil prices, they look constrained. Their median return on equity last year was less than half that of the S&P 500 stockmarket index, according to Morgan Stanley, a bank. More investors are demanding that they spend only as much as they earn—a novel concept. To many asset managers, shale looks passé. Chevron’s share price is down by 4% since the announcement; Anadarko’s is up by 36%, below the 39% premium Chevron’s bid represents on its pre-deal value. A group of climate-conscious shareholders has chastised Chevron for choosing shale over renewables.

For big oil companies, which are facing their own pressures, shale nevertheless looks alluring. They lost the title of the world’s most valuable corporations to tech firms. In an era of oil abundance, they are working not just to find new crude, as was their habit, but to produce it as cheaply as possible. The majors appreciate shale’s quick drilling times, predictable cashflows and favourable regulation. “It becomes your throttle,” says Bob Brackett of Bernstein, a research firm. “When times are good, you dial it up.” The question, then, is not whether Big Oil will bet on shale, but whether it will double down.

The Delaware basin certainly looks ripe for consolidation (see map). Last year the largest seven producers accounted for about half of output. Others each produced 4% or less. Wall Street may have cooled on the Permian. Big Oil certainly has not. ■





Apple and Qualcomm

Suing for peace

SAN FRANCISCO

Two technology giants settle a feud over intellectual property

THE COURTROOM battle in San Diego was supposed to last for weeks, if not months. It was over on the first day, April 16th. Evan Chesler, a lawyer for Qualcomm, a big chip designer, had only a few minutes left in his riposte to Ruffin Cordell, who represented Apple, a hardware giant, when it emerged that the two firms had agreed to a settlement. This included a one-off payment from Apple to Qualcomm and the decision to “dismiss all litigation between the two companies worldwide”. After a brief conference with the lawyers, the judge called off the trial and sent the jurors home.

Thus ended what was perhaps the most epic fight ever over intellectual property and royalty payments between two technology titans. It began more than two years ago, spanned the world and could have seen Qualcomm pay billions in damages. More important, the settlement creates a new balance of power among big players in the industry as it gears up to install “fifth generation” (5G) mobile technology, which is supposed to carpet the world with a dense wireless fabric.

The fight began in January 2017 when Apple sued Qualcomm in California and China, demanding more than \$1bn in damages. The iPhone-maker was unhappy about how Qualcomm charges for its patents, many of which are needed to build a mobile phone. Instead of demanding royalties from component-makers, Qualcomm collects them from device-makers, as a percentage of the retail price, typically 5%. The manufacturers have no choice but to pay because most also rely on Qual-

“WHEN YOU reach for the stars, you might not quite get one,” Leo Burnett once mused, “but you won’t come up with a handful of mud either.” The storied ad man could have been talking of the purchase by Publicis—the French owner of ad agencies like Saatchi & Saatchi, Publicis Media and, yes, Leo Burnett—of Epsilon, an American data-marketing business, announced on April 14th. The \$4.4bn deal is the firm’s largest since it was founded in 1926.

On its face, the move looks sensible. Advertisers are keen to amass customer data and the tools to analyse them. Epsilon provides both. The company gathers data—from promotional emails, browsing, transactions in physical shops and so on—to build detailed profiles of consumers, so advertisers can woo them more precisely. Publicis hopes this will give it an edge over rival holding companies such as WPP, Omnicom or Interpublic Group (IPG).

The online age has proved challenging for them. Their relationship with Facebook and Google, which together account for about half of all online ad spending, is one of uneasy dependence. Many makers of fast-moving consumer goods, traditionally some of their biggest clients, have brought more marketing in-house. Big consultancies have invested in creative capacities. Earlier this month Accenture said it would buy Droga5, a revered independent agency (and Cirruseo, a cloud-consulting firm).

Publicis now says that Epsilon, which it is buying from a company called Alliance Data, will help it “deliver personalised experiences at scale”. In announcing the deal, Publicis boasted that

comm’s “baseband processors”, the chips that manage a device’s wireless connection. This, Apple argued, is an abuse of market power and a tax on innovation, because it is in effect levied on all new features, such as a better camera, even if these are unrelated to Qualcomm’s patents.

Qualcomm reacted, as it had done in similar cases before, by suing Apple for patent infringement in America, China and Germany—with mixed results. It also stopped providing certain pieces of software the iPhone needed to test new devices, arguing that the code may end up in the hands of Intel, a rival chipmaker whose processors Apple had started using. As for

Epsilon employs some 3,700 data scientists. They have been busy; Epsilon has profiled 250m consumers using more than 7,000 traits. Its net revenues last year totalled \$1.9bn.

Other advertising giants aren’t sitting still. Last year IPG paid \$2.3bn for Acxiom, a data business that it, too, claimed would create “personalised brand experiences”. Such deals may boost advertisers’ spending with large holding companies, whose growth last year, excluding acquisitions, was 2%, half that in 2015. Those worried about the fate of ad agencies can take solace that revenue looks bleak only when the holding companies are considered alone. If spending on consulting firms is included, the industry would have grown by 4% in 2018, according to Brian Wieser of GroupM, part of WPP. Better than mud, in other words. But hardly stellar.



Seeking a leg-up online

the core of the case, Qualcomm argued that it had never threatened to withhold chip supply to obtain unfair licensing terms and that its approach made life easier for all involved: licensing patents for individual components would be simply too complex.

On the face of it, Apple had the stronger arguments. In an ongoing trial America’s Federal Trade Commission is making a similar case against Qualcomm. At any rate, if Apple has agreed to a settlement which looks quite favourable to Qualcomm (it also includes, among other things, a six-year licence agreement), it is not for legal reasons, but out of business sense. Apple needs 5G chips for its devices in order not ▶▶

Digital advertising Looking up?

NEW YORK

A big deal hints at advertisers’ virtual ambitions

▶ to fall behind Samsung, another smartphone-maker. But its preferred supplier, Intel, has been missing deadlines and Apple was losing confidence that Intel could deliver. This would leave it at Qualcomm's mercy. In fact, a few hours after the settlement Intel announced its "intention to exit the 5G smartphone modem business"—fuelling speculation that Apple had an inkling of Intel's plans when it settled with Qualcomm.

For the San Diego-based chip designer, all this is a surprising reversal of fortunes. The trial was a threat to its licensing model, which generates most of its profits. It now has a new long-term customer for its chips and gets a rumoured \$2.5bn in cash (the exact amount has not been disclosed). After

Apple sued, Qualcomm's shares lost a quarter of their value; after the settlement they rebounded by more than 23%.

For Apple the deal is clearly a setback. It will be dependent on Qualcomm for its 5G chips and probably pay higher royalties than it would like to.

The biggest loser is Intel. Yes, analysts are happy that the firm is leaving an expensive business in which it was an also-ran; after the 5G announcement Intel's share price rose by 4% in after-hours trading. In the longer run, though, the chipmaker's prospects in an important segment of computing devices looks further diminished.

The settlement and its ramifications are part of a bigger, global 5G game. Not all of its epic struggles will end as peacefully. ■

trolling stake, was expressly blocked from the bankruptcy auction last October. The winning bid, of 420bn rupees to pay creditors plus another 80bn rupees to spruce up operations, came from ArcelorMittal, a rival steelmaker based in Luxembourg and controlled by Lakshmi Mittal, an Indian-born billionaire.

The latest ruling leaves ArcelorMittal, which reportedly opened an office in Mumbai to manage the takeover, in limbo. The court decided that the dispute over which creditors get paid what be resolved before it assumes control. How long this will take is anyone's guess. Meanwhile, the Ruias have tried to sidestep their exclusion with an offer for Essar backed by Russian money that would satisfy all 544bn rupees in claims, including financial debt.

The Essar case ends a winning streak for bankruptcy reformers. In May 2018 Tata Steel, a big steelmaker, acquired Bhushan Steel, another "dirty dozen" company. Creditors recovered 76% of their claims. Another five companies on the RBI's list were bought and a further two liquidated. The law is also credited with pressing Nareish Goyal, another tycoon, to step down as chairman of Jet Airways and relinquish control of his ailing carrier to lenders in March. It was a rare instance of a big Indian company being wrested from a founding shareholder. Such "promoters" had been considered immovable.

All told, 1,484 companies have entered the insolvency system in the past two years. Although no comparable statistics exist for the earlier period, this is certainly a huge jump. Of these, 302 have been liquidated and 79 have been restructuring, which involves a repayment of more than one-fifth of debts and, often, an acquisition. Since March 2018 the level of non-performing loans on the balance-sheets of India's banks has begun to decline.

Perhaps inevitably, however, the law has collided with bureaucratic inertia and politics. The 270-day deadline is more an aspiration than reality; two-thirds of cases have exceeded it. In the busy Mumbai court established on the sixth floor of a battered tribunal building, the three hearing rooms are so packed that it is hard to see the chairs. Assurances that more space and judges are coming are treated with scepticism. The backlog of cases is growing (see chart). So are legal challenges.

Reorganising a sizeable part of the bureaucracy in a country snarled in red tape was never going to be easy. Nor was disempowering the feckless but well-connected tycoons behind some of India's powerful conglomerates. Cautious optimists, like Debanshu Mukherjee of the Vidhi Centre for Legal Policy, a think-tank in Delhi, talk of teething troubles. To those who view Essar as a test case for the new regime it looks more like a kick in the teeth. ■

Bankruptcy in India

The deadbeats strike back

MUMBAI

A much-ballyhooed insolvency regime collides with Indian reality

REINCARNATION IS A religious tenet in India. It has also traditionally guided corporate life. Many of the country's most powerful companies have looked dead and buried under a mountain of debt, only to be revived by biddable state-run banks willing to "extend (terms) and pretend (that politically connected debtors will pay)". In the 1990s, after India liberalised its licence-choked economy, a government report warned that it was "impossible to liquidate and wind up an unviable firm". Another in 2001 characterised the agency required to process such actions as "notoriously dilatory". Because there was no "threat of imminent liquidation", a third concluded in 2015, debtors felt no compulsion "to resolve their financial distress".

That was all supposed to change in May 2016, when parliament enacted a modern insolvency regime. Even a small missed debt payment would push a company into bankruptcy proceedings. These could not extend beyond 270 days. Owners and managers of an insolvent firm would lose control to a committee of creditors. The governor of the Reserve Bank of India (RBI) at the time, Raghuram Rajan, saw the law as a way to expunge incorrigible deadbeats from the financial system. Narendra Modi, the pro-business prime minister, hoped it would drag India out of the cellar of the World Bank's "ease of doing business" ranking. Moneymen saw it as the most important reform since the end of the Licence Raj in 1991, perhaps since independence in 1947.

This month the deadbeats got some life-force back. First, a decision by the Supreme

Court in early April voided an RBI edict that ordered banks automatically to refer large companies which are behind in their debt payments to the insolvency regime. Lenders, including state-owned ones, in effect regained discretion to extend and pretend, which the law was intended to do away with. Then, on April 12th, the court all but suspended the bankruptcy proceedings of Essar Steel, a company with financial debt of 494bn rupees (\$7bn).

The Essar decision is the biggest knock yet to the nascent insolvency regime. The company has been stiffing creditors since 1999 and features on the RBI's list of a "dirty dozen" companies which accounted for a quarter of the banking system's non-performing debt and were first in line for restructuring. The family of Essar's founders, Shashi and Ravi Ruia, which holds a con-



Schumpeter | Saudi Aramco looks east

The oil giant's shift beyond crude—and towards Asia—should worry its Western rivals



IN MOST WESTERN eyes Saudi Aramco inspires either awe or disdain. Financiers are in the first camp. They gobbled up the state-owned behemoth's first-ever global bonds last week, gasped at its \$11bn annual profit and, for all their professed concern about climate change, gushed over how cheaply it can pump oil for decades to come. The second group, which includes some American congressmen and chattering classes, liken Aramco's accomplishments to sticking a straw in the ground and sucking. They attribute its earnings partly to OPEC's price-fixing racket. And they are squeamish about Muhammad bin Salman, the crown prince into whose hands much of its money flows and who, Western spooks believe, ordered the murder last October in the kingdom's consulate in Istanbul of a Saudi journalist, Jamal Khashoggi.

Western rivals view Aramco differently. These days they think less about its oil, and more about its shift into natural gas, refined products, chemicals and plastics. As they see it, Aramco is no potentate's piggy bank. It is an increasingly formidable competitor—especially in Asia, where much of the future demand for petroleum products will come from.

Aramco's ties to the West, particularly America, run deep. It is named after the Arabian-American Oil Company. It still carries the DNA of its former shareholders, the forerunners of Chevron and ExxonMobil. Besides geological good fortune, it is imbued with Western-style business discipline. And Saudi Arabia remains a staunch American ally.

Yet the relationship is changing. America produces more of its own oil. As recently as April 2014 Aramco provided more than a fifth of America's crude imports. In January the share was less than a tenth. A big reason behind the kingdom's decision to postpone an initial public offering of Aramco were potential legal snags it faced if it listed in New York. The killing of Khashoggi, who lived in America and wrote for the *Washington Post*, has strained relations with the West. Under such circumstances, it is small wonder that Asia looms larger.

The aim of Aramco's Asian pivot is not merely to sell more oil. Even as fuel efficiency and electric vehicles crimp global demand for petrol, China, India and South-East Asia will still consume plenty of fuel to run lorries, ships and passenger jets. Aramco pre-

dicts that consumption of chemicals made from oil will increase even faster in Asia than demand for refined products. It hopes to strike big deals soon to become one of the world's largest producers of liquefied natural gas (LNG) in Russia and elsewhere. It has discussed its first shipments of LNG to Pakistan.

The scale of these "downstream" ambitions, and the financial firepower behind them, was laid bare in its \$12bn bond issue. It will help finance the \$70bn acquisition of 70% of SABIC, Saudi Arabia's biggest petrochemicals company, which would make Aramco the world's leading downstream concern, as well as its largest upstream one.

It is already throwing petrodollar promises around like confetti. Last year it spent \$8.7bn downstream, including on a giant refinery and petrochemical complex in Johor, Malaysia, adjacent to Singapore. In February it struck a \$10bn deal with a Chinese defence contractor, Norinco, to develop a similar complex in the north-eastern Chinese city of Panjin. Last year it announced a \$44bn joint venture with ADNOC, its Abu Dhabi peer, to build an even larger complex on the west coast of India. Like Mr McGuire in "The Graduate", Aramco's chief executive, Amin Nasser, appears to have just one word for Asia: plastics. He notes that the typical Indian uses scarcely 10kg of the stuff a year, one-tenth as much as a Canadian, and wants to pour \$100bn into chemicals over the next decade, on top of the SABIC splurge.

There is a cold logic to the strategy. The collapse in oil prices in 2014-16 reminded the industry that refining and chemicals are a useful hedge against volatility. As the warming world burns fewer hydrocarbons, Aramco is keen to secure captive markets for its crude feedstock.

Even with SABIC, it has plenty of room to grow. Dmitry Marinchenko of Fitch, a rating agency, reckons the combined entity's downstream activities will still provide no more than 9% of earnings before interest, tax, depreciation and amortisation, one-third the share at BP, a British firm. It can tap credit freely to fund big bets. Its returns on capital last year were a staggering five times the average of ExxonMobil and Chevron and their three European rivals, Royal Dutch Shell, Total and BP. With piles of cash on hand at the end of last year, it is aiming for net debt to rise to a modest 5-15% of capital. Were it to aim for BP's level of 30%, it could borrow almost \$150bn. That is more than BP's market value.

Winning the battle for Asia will be scrappy. ExxonMobil is mulling a reported \$10bn investment into downstream production in China. It is an efficient refiner and chemicals producer and will compete aggressively with Aramco, as will Shell. But Aramco enjoys two advantages besides its chequebook, says Jim Krane of Rice University. One is the world's cheapest feedstock. The other is geopolitics. It does not have to focus exclusively on the bottom line if business benefits the kingdom strategically.

Do you find me undesirable?

But geopolitics could come back to haunt Aramco. If oil prices continue to rise, President Donald Trump may resume his criticism of OPEC. Congress could revive a bill dubbed the No Oil Producing and Exporting Cartels Act, or NOPEC. This would hurt Aramco. The kingdom has hinted that should America turn against it, it may sell oil in other currencies besides the dollar, such as the yuan, which would challenge the greenback's hegemony. These are probably empty threats. Neither side wants a fight. Aramco may yet try to resurrect its New York listing. Even if it did, the Saudi colossus and the West are growing apart. ■



Goldman Sachs

Tarnished

NEW YORK

A new era at Goldman Sachs starts in the shadow of a scandal

NO ONE IS more aware of the value of a brand than Goldman Sachs. The investment bank, founded in 1869, has advised the biggest and best American companies on the value of theirs for the past 150 years. It helped F.W. Woolworth, a pioneering department store, with its initial public offering in 1912. It took Ford and Disney public in the 1950s, helped Amazon buy Whole Foods in 2017 and will take Uber public later this year. Yet these are troubled times for its own brand, tarnished by association with a fraud-ridden Malaysian state-run fund, 1MDB, and hurt by the bank's failure to adapt after the global financial crisis.

These issues were echoed in its first-quarter results, released on April 15th. Revenues came in below expectations—13% lower than for the first quarter of 2018—largely as a result of lower trading revenues. The share price fell by more than 3% and the earnings call was peppered with analysts asking questions about 1MDB.

The first task for David Solomon, who took over as chief executive last October, is

to clean up Goldman's reputation. In 2012 and 2013 it helped 1MDB raise \$6.5bn across three bond offerings, earning \$600m in fees—far above the norm for such work. American and Malaysian authorities have alleged that much of the money raised was stolen in a scheme masterminded by Jho Low, a Malaysian financier. He has denied wrongdoing (and vanished).

Last November America's Department of Justice (DOJ) announced that a former senior partner at Goldman, Tim Leissner, had pleaded guilty to conspiracy to launder money and to violate foreign bribery laws. And they indicted Mr Low and another former Goldman banker, Roger Ng, who has also denied wrongdoing. Goldman claims that Mr Ng and Mr Leissner, who transferred embezzled funds into his personal bank account, kept the bank in the dark about their actions.

But criminal charges have been filed against the firm in Malaysia. Though Goldman is contesting the case, it is spooking shareholders, who worry about both onerous fines and what it implies about over-

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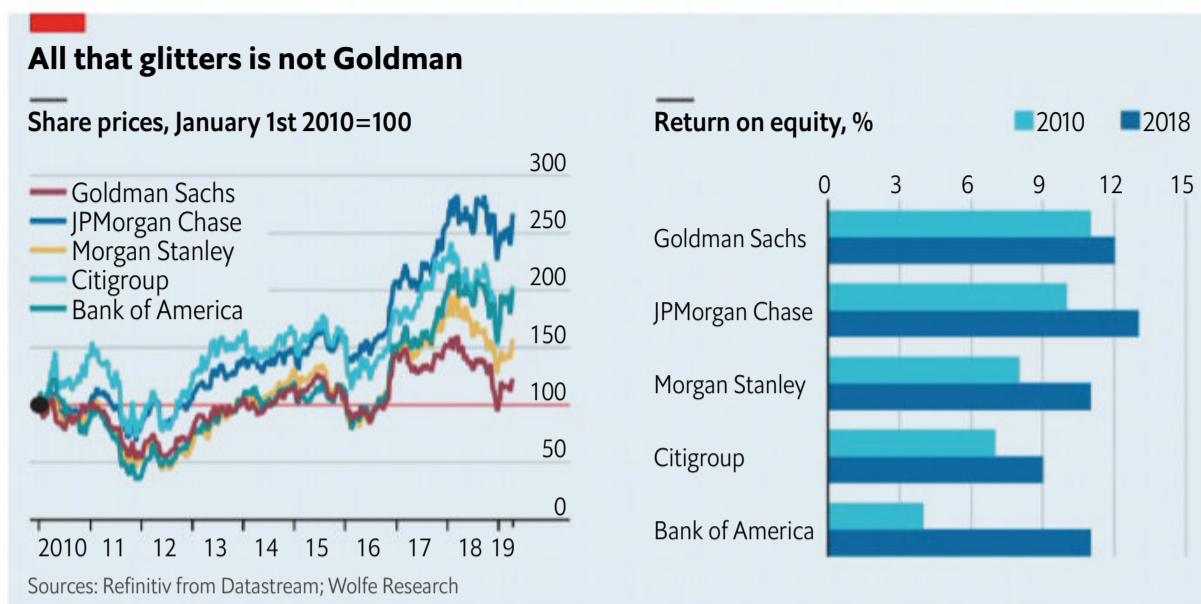
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sight at the bank. Since November its share price has underperformed an index of other bank stocks by 10.3 percentage points, suggesting that the scandal may have wiped as much as \$9.1bn off its value.

It is against these headwinds that Mr Solomon must convince Goldman's investors that it can reinvent itself. Its peers have already digested the fact that Wall Street's traditional model, in which banks advise on huge corporate deals and make bold trades on their own behalf, has become less profitable. According to Michael Spellacy of Accenture, a consultancy, 90% of the economic profit made in the capital-markets industry is now earned on the buy side—that is, by those who manage assets or investments—and just 10% from sell-side investment-banking activities. A decade ago that split was closer to 50-50.

Goldman's slowness in reacting to these structural changes has allowed its competitors to catch up. In 2010 its return on equity (ROE) was 11%, easily beating the 8% average for "bulge-bracket" American investment banks, a group including JPMorgan Chase and Morgan Stanley. But last year that group averaged an ROE of 11.2%, placing Goldman, at 12%, only slightly ahead of the middle of the pack. And investors are becoming concerned about the way it earns its returns. Volatile profits, like those from trading businesses, mergers and acquisitions, are less valuable than steady fee-based income, for example from wealth management. ▶



▶ In 2016 Mr Solomon's predecessor, Lloyd Blankfein, took the first steps towards a new strategy by launching a consumer bank, Marcus. In 2017 Goldman announced a target of increasing yearly revenues by \$5bn by 2020. But the focus on expanding consumer lending, which offers a relatively low return on investment, did not impress shareholders.

They have had a rough ride. Holding shares in the firm since 2010 would have earned investors just 13% (without adjusting for inflation), compared with an average of 71% for its bulge-bracket peers and 152% for the S&P 500. Goldman continues to trade at just 0.9 times its tangible book value, a measure of the money that might be returned to shareholders if it were liquidated. The average ratio of price to tangible book value for a bulge-bracket bank is 1.15.

As far as 1MDB is concerned, the big worry for shareholders is the size and scope of the penalties. A large fine is all but inevitable. It could be based on the \$600m Goldman earned from the bond issuance—or the \$2.7bn American authorities say was stolen from the proceeds. That will be multiplied by anything up to four, depending on the degree to which the firm is found culpable. That Goldman is co-operating with the DOJ will bring the multiplier down; if the DOJ decides the firm's oversight of compliance procedures was inadequate, it will be towards the higher end. Steven Chubak of Wolfe Research, an equity-research firm, thinks the total will be somewhere between \$1bn and \$4bn.

When it comes to the required shift in strategy, however, Goldman's efforts may soon start to bear fruit. Its expansion into consumer businesses is continuing apace. In 2018 it acquired Clarity Money, a personal-finance app. Last month Tim Cook, Apple's chief executive, announced that it will launch a credit card with Goldman this summer. When Marcus launched it was as a consumer lender; since then it has added deposit-taking. Though it offers market-leading interest rates, deposits are still a cheap source of funding. In 2012 just 8% of

Goldman's funding came from deposits. Last year that share had risen to 19%. If it can keep replacing wholesale funding with deposits at the pace of the past five years, says Mr Chubak, it will have reduced funding costs by \$500m by 2022.

It is not only on the consumer side that Goldman is rolling out new technology. More than a quarter of its employees are now engineers, says Heather Kennedy Miner, its head of investor relations. The firm has deployed a new platform, called Marquee, for institutional investors. It will expand into corporate cash management in 2020, which will further increase low-cost deposits.

Goldman also seems to be planning an

overdue restructuring of its fixed-income, currency and commodities (FICC) business. Revenues earned from FICC have fallen from \$13.6bn in 2010, accounting for more than a third of Goldman's revenues, to \$5.9bn now, or just a sixth. Last October Stephen Scherr, Goldman's newly appointed chief financial officer, announced a review of all its business lines, which will be published early next year. In January the *Wall Street Journal* reported that the commodities business would be scaled back. (Mr Scherr emphasises that Goldman has no plans to shrink its commodities business radically, as some of its competitors, including JPMorgan Chase and Morgan Stanley, did.) In March Mr Solomon announced plans to cut the number of staff in sales and trading by 5% this year.

Its new strategy will mean Goldman is competing on less familiar territory. Consumer deposits and corporate cash management are competitive markets long dominated by JPMorgan Chase and Bank of America. But they are also huge markets. Even a small slice could have a big impact on Goldman's profits, says Mr Scherr. Compared with the incumbents, Goldman is quick at developing and deploying technology; but unlike digital startups, its innovations are backed by a \$925bn balance-sheet. America's financial-services industry has been slow to adapt to technological change. An old brand with a new direction might be well-placed to disrupt it. ■

American banks

Swings and roundabouts

Markets sparkled, but that's not where the money was

AMERICA'S FINANCIAL markets made a stunning start to 2019. The S&P 500 stockmarket index climbed by 13.1% in the first quarter, its best beginning since 1998. But that was little use to Wall Street banks. Trading revenues depend on volumes, not prices. Quarterly earnings, reported in recent days, have confirmed that they were markedly lower than a year earlier. Never mind. The retail divisions of America's mightiest banks did well enough to boost profits overall. The giants' retail heft is likely to keep serving them well.

Start, though, with the grim stuff. Share-trading revenues fell by 24%, year on year, at Citigroup and Goldman Sachs; by 22% at Bank of America (BoFA); and by 13% at JPMorgan Chase. (Morgan Stanley, the remaining bulge-bracket Wall Street firm, was due to report earnings after *The Economist* went to press on April 17th.) New share

issues were delayed by a 35-day government shutdown that lasted until late January, holding up approvals at the Securities and Exchange Commission; equity-underwriting revenues tumbled by 20% at Citi, 23% at JPMorgan Chase, 29% at BoFA and 34% at Goldman. But debt underwriting was perkier at Citi and JPMorgan Chase, and advisory fees rose across the board.

Yet JPMorgan Chase, America's biggest bank by assets, still reported a 5.4% rise in net income, to \$9.2bn, a record. At BoFA, the number two, profits climbed by 5.7% to \$7.3bn, also a new high. That was largely due to an increase of 19% in earnings at JPMorgan Chase's retail bank and a 25% rise at BoFA. Despite the regulatory troubles that recently cost its chief executive his job, Wells Fargo (among the smaller fry on Wall Street, but America's fourth-biggest bank even so) also reported a healthy increase. ▶

► Banks were helped by wider interest margins and steady loan growth. Now that the Federal Reserve has stopped raising interest rates, that following wind may fade. But the biggest banks will find that easier to live with than their smaller competitors will. And they are determined to make a combination of scale and computing power tell; they are spending billions on IT. They may be starting to succeed. JPMorgan Chase is opening branches by the dozen; BofA has cut the cost-income ratio at its retail bank from 51% to 45% in the past year. Citi seems farther behind, but is wooing

credit-card customers outside the half-dozen cities where it has branches by offering them deposits and loans.

If America's giants need further consolation, they should look across the Atlantic to Europe, where banks' reporting season starts on April 24th. Already losing market share to the Americans on both sides of the pond and trailing in profitability, the Europeans' woes show no sign of abating.

Britain's Barclays is being pestered by an activist investor, Edward Bramson, who wants it to retreat from investment banking. In March it parted company with Tim

Throsby, the head of its investment bank, just two years after he joined. Germany's Deutsche Bank is in merger talks with its neighbour, Commerzbank, in the increasingly desperate hope of reviving its fortunes. On April 15th two American congressional committees subpoenaed Deutsche and other banks for information on their dealings with President Donald Trump. France's Société Générale is cutting 1,600 jobs. Switzerland's UBS has complained of "one of the worst first-quarter environments in recent history". That wobbly quarter on Wall Street wasn't so bad, was it? ■

Buttonwood Time and money

Bond maturities are decided by a tug-of-war between cost and uncertainty

IMAGINE TWO countries that differ only in the scale of public debt. In Vulgaria it is 50% of GDP; in Freedonia it is 5%.

Vulgaria used the proceeds of its extra debt-raising to buy land for public parks. Because of these assets, it is regarded as being as good a credit risk as Freedonia. Taxes do not affect incentives to work or save in either place (they are a bit higher in Vulgaria). Inflation is low and stable.

How should each country manage its debts? Specifically, how much should it raise by selling short-term bills, and how much by selling long-term bonds? A strain of public-finance theory, developed by Robert Barro of Harvard University, says it does not matter. Debt is deferred taxation. A dollar of debt will cut today's tax bill by a dollar, but at the cost of raising it by a dollar tomorrow. If the debt is a one-year bond, the tax bill will come sooner. If it is a ten-year bond, it will come later. In this frictionless world the maturity of public debt is irrelevant.

The real world is messier. The economy fluctuates, and so do interest rates. Taxes affect how willing people are to work. In such conditions, the maturity of debt is a tug-of-war between two influences. The government wants to keep today's taxes low: that pulls it towards short-term bonds, the cheapest to issue. But it is wary of sudden increases in interest rates: that pushes it to issue long-term bonds, to limit "rollover" risk when bonds come due. The balance of these forces decides debt maturity. Certainty matters more to high-debt countries like Vulgaria. Cost matters more to low-debt countries like Freedonia.

The IMF's "Fiscal Monitor", a health check of public finances, shows lots of variation around the world (see chart). A tendency for high-debt countries to issue long-term bonds is nevertheless evident.

In Europe, high-debt Belgium has an average debt maturity of ten years; in low-debt Sweden the average is less than five.

Rollover risk is a bigger concern for emerging markets. So although they have a lower debt-to-GDP ratio (the average is 53%) than rich countries do (104%), the average maturity of debt is similar, at around seven years. A big debt burden financed at short maturities can spell trouble (ask Egypt). Long-term debt might keep you out of it. South Africa's debt is also high by emerging-market standards—and its stubborn budget deficit means that debt is rising quickly. Its economy is sluggish. A saving grace is that much of South Africa's public debt is long-term. That buys the country time to address its problems.

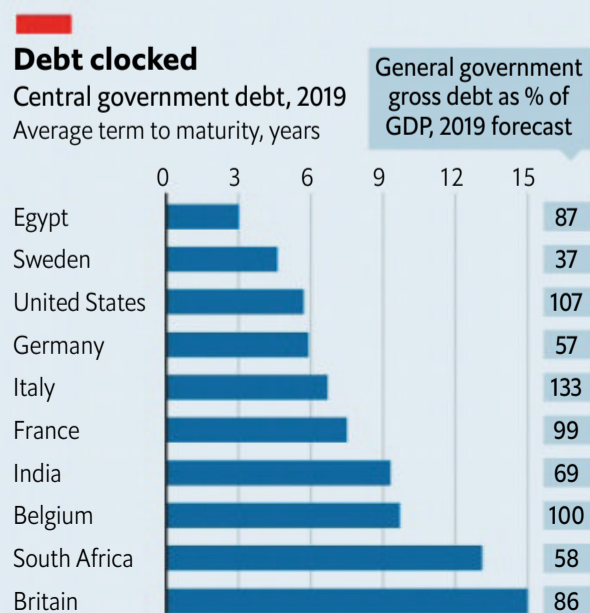
Still, the rule linking high debt to long maturity has many exceptions. America is one. Its debt-to-GDP ratio is above the rich-world average, but its debt maturity is towards the bottom of the scale. As a general rule bond-buyers prefer money-like securities, such as short-term bills, which is why they are cheaper to issue. By their

nature, they are more liquid: they can be readily bought or sold. That makes them ideal collateral in transactions where each party fears the other might default. And because a lot of the world's trade, derivatives and financing are in dollars, demand for America's short-term debt is especially strong. That is why it can issue lots of it safely as well as cheaply.

At the other end of the maturity spectrum, the big outlier is Britain. Despite a modest debt burden by rich-country standards, it has the longest term to maturity of any country in the IMF's database. In contrast to America, it is long-term bonds that are prized in Britain—as outlined in a paper by Stéphane Guibaud, Yves Nosbusch and Dimitri Vayanos of the London School of Economics. Legislation in 2004 obliged pension funds in Britain to match their assets to the long-term promises they made to retirees. That spurred demand for long-dated bonds, driving down yields. Britain's debt-management office responded by issuing lots more of them.

This pension-fund effect is especially marked in Britain, but it is discernible in other countries, too. A recent study by Robin Greenwood of Harvard University and Annette Vissing-Jorgensen of the University of California, Berkeley, shows that countries with larger private pension systems are able to issue long-maturity bonds more cheaply.

There are lessons for the hypothetical debt-managers of Vulgaria and Freedonia. Vulgaria might want to encourage a private pension system to stoke demand for long-term bonds. Freedonia might consider increasing its debt load a little to take advantage of the latent demand for money-like securities. It shouldn't cost much. And the taxpayers of Freedonia might appreciate a public park.



Source: IMF

China's GDP

Growth in train

SHANGHAI

As lending surges in China, an economic rebound is in sight

JUST OVER 25 years ago Shanghai launched its metro with a single, stubby line. Since then it has added 15 lines and some 700km, making it the world's longest metro system. It is far from done. The city recently unveiled plans for another 300km, including overland rail, within five years. Much of the work proceeds unseen as machines bore tunnels beneath the surface. But excavation holes around the city offer clues about the activity deep underground.

They are part of a nationwide push. The Chinese government has, in the words of state media, hit the "fast-forward button" on infrastructure spending, a tried and tested way to pep up the economy. In the first quarter China's GDP grew by 6.4% compared with a year earlier, level with the final quarter of 2018—its slowest in a decade. That would still be enviably fast for most countries. But Chinese officials have been unnerved by the possibility that it could herald the start of a steeper slide.

Last year such fears were widely heard. The trade war with America seemed destined to get nastier. China's stockmarket was slumping. Entrepreneurs complained that state-owned firms, already powerful, were elbowing them aside. A regulatory campaign to rein in debt levels sent tremors through the financial system, making banks much warier about lending cash.

So in mid-2018 China's government shifted gears. It cut taxes on personal incomes and corporate profits. Authorities ordered banks to lend more to small busi-

nesses. And planners cranked up the infrastructure machine again. For months they had held off from approving metro projects, mindful of the campaign to control debt. But in July they started things moving again, with half a dozen cities, including Shanghai, among the beneficiaries. Sales of excavation equipment, a proxy for construction, soared to an eight-year quarterly high in the first three months of 2019.

Yet there are still doubts about how far China will go to juice the economy. Li Ke-qiang, the prime minister, has repeatedly sworn off any major stimulus, fearful of undoing the progress made in slowing the growth of debt. Benefits from cutting taxes have been blunted by efforts to collect them more stringently.

Meanwhile the infrastructure push shows how China has reached such a size that its growth faces clear limits. It aims to build 3,200km of high-speed rail lines this year. That is nearly as much as Spain, the country with the second-largest high-speed rail network, has in total; for China, though, it is down from an average of 3,600km annually over the past five years. Nor need the government worry about a slightly weaker economy causing unemployment: with the labour force shrinking as the population ages, help-wanted ads are popping up in shops across the country.

Given all the reasons for restraint, many observers have therefore been taken aback by the strength of credit growth this year. Total social financing, a measure that consists mainly of bank loans and bond issuance, hit 8.2trn yuan (\$1.2trn) in the first quarter, up by 40% from the same period last year, well above most forecasts. A quarter of the financing has been short-term corporate loans. In China that is usually a sign that pliant state-owned banks are heeding the government's call to pump out credit, ahead of demand from borrowers. Growth could thus rebound by mid-year,

says Larry Hu of Macquarie Securities.

So are expectations of only a limited stimulus wide of the mark? More likely is that the change is one of timing rather than magnitude. The government seems to be front-loading its plans to prop up growth.

Two political calculations may help explain this. The first is the trade war with America. China appeared to be on the back foot last year as its stockmarket tumbled. A rally this year, fuelled by the pro-growth policy tilt, has boosted China's confidence as negotiations enter the home stretch. The second is the 70th anniversary of Communist Party rule on October 1st, which the government will mark with a flurry of festivities. It does not want them marred by grumbles about the economy. The subway-diggers can count on a busy summer. ■

Japan's economy

Still sputtering

TOKYO

A planned increase in sales taxes could snuff growth out altogether

AMONG THE pledges Shinzo Abe made in 2012, as he started his second stint as Japan's prime minister, was to double the sales-tax rate. At 5% it was low by rich-country standards, and Japan's public finances, battered by years of deficits, needed shoring up. But having gone part-way, to 8%, in 2014, he has twice put off finishing the job for fear of choking off a tentative economic recovery. That increase is now scheduled for October, and he is loth to delay a third time—so much so that he has said that only "an event with the magnitude of the Lehman Brothers shock" would deter him.

Everyone agrees that a higher sales tax is needed, but they differ on the wisdom of a speedy move. The previous hike provoked a sharp downturn. Now fresh signs of economic weakness are leading to fears of a repetition.

Just a few months ago the government was congratulating itself on having overseen Japan's longest economic expansion since the second world war (as judged by a panel of experts appointed by the cabinet office). But last month the cabinet office downgraded its headline economic assessment for the first time in three years, blaming foreign factors, including China's slowing economy. Their gloominess is widely shared. Freya Beamish of Pantheon Macroeconomics, a consultancy, points to the purchasing managers' index and machine orders, both indicators of manufacturing activity, as well as the Tankan survey, a measure of business sentiment, and data ►►



Digging deep for growth

▶ on housing and retail sales. All show signs of weakness. First-quarter GDP figures, due out on May 20th, are expected to show a contraction.

Some argue that the sales tax could still be raised on schedule. Koichi Hamada, an economist at Yale University and an architect of Abenomics, as Mr Abe's economic programme is known, notes that the labour market is tight, suggesting an underlying resilience. And in contrast to 2014, points out Takatoshi Ito, a former official at the ministry of finance now at Columbia University, the government plans to mitigate the impact by returning much of the extra revenue to consumers, rather than seeking to reduce the deficit as fast as possible.

The budget for 2019 includes ¥2trn (\$18bn) of offsetting measures. Food, non-alcoholic drinks and newspapers will continue to be taxed at 8%. Poor households will receive shopping vouchers. Customers of smaller businesses will get rebates worth 5% of their purchase, or 2% at restaurants and convenience stores, provided they pay without cash.

But plenty of observers are urging continued caution. Subdued price pressures mean that inflation remains far below the Bank of Japan's target of 2%. If the economy is weak enough to require a negative interest rate (the Bank of Japan charges 0.1% annually to hold some reserves), it is surely too weak to withstand a tighter fiscal stance, they argue. And although gross public debt stands at around 2.5 times annual GDP, rock-bottom interest rates mean that servicing it is affordable.

"Raising the consumption tax is putting the cart before the horse," says Ms Beamish. Japan's economy has long channelled too much cash into the corporate sector, at the expense of households. Tight-fisted managers have been reluctant to raise dividends or wages, and despite the government's attempts to chivy them into openhandedness, change is slow. "If they hike without having redirected income to the household sector, it's a burden [households] can't meet," says Ms Beamish.

Even some supporters think that if Mr Abe has to pause yet again, he will have only himself to blame. He has undoubtedly had a hand in Japan's tentative economic recovery, mainly through monetary loosening, although the comfortable global environment helped. But he has also delayed reforms that would have put the economy on a firmer footing. Mr Ito points to proposals that could boost wages and therefore spending, such as changing tax incentives so that companies stop paying huge sums at retirement and instead increase compensation during workers' careers. Without such measures, Mr Abe finds himself in an odd position for a politician: trying to raise taxes, even at the cost of potentially provoking yet another recession. ■

Imports and exports

Everything to gain by their chains

Is the world economy still slowbalising?

PROTONS POP up in every atom. Proton cars are not quite so ubiquitous. Founded in 1983 by Malaysia's government, the Proton company strove to build a truly "national car", but its parent lost over 1bn ringgit (\$280m) in the two financial years before it sold a stake to Geely, a Chinese carmaker, in 2017. Neighbouring Thailand, in contrast, lacks a national car, but boasts a thriving car industry. Carmaking took off in the late 1980s after Japanese multinationals flocked to the country, importing whatever they could not make or buy within its borders. Foreign parts still account for 56% of the value of Thailand's car exports, according to the most recent data from the World Trade Organisation (WTO). But the remaining home-grown value exceeds the total worth of Malaysia's car exports several times over.

Thailand's cosmopolitan car industry illustrates the potential of "global value chains", which link several countries in the production of a good or service. Unfortunately, these chains declined relative to world GDP between 2011 and 2016, contributing to what has been dubbed "slowbalisation". But a new report by the WTO (and a long chain of partners, including the University of International Business and Economics in Beijing and the China Development Research Foundation, a Chinese government think-tank) finds that value chains recovered a little in 2017.

Ties that bind

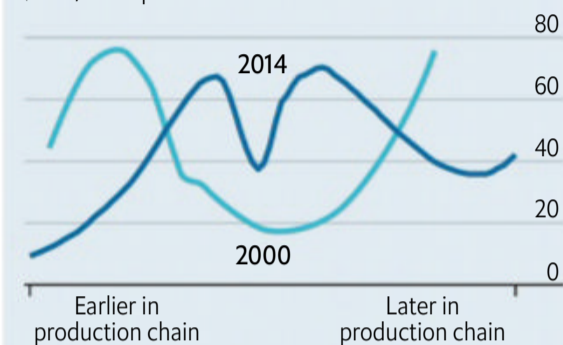
Meanwhile, the political salience of value chains has shot up, thanks to tax battles and trade wars. In tax debates, trade along chains is often conflated with a narrower phenomenon: trade within multinationals (ie, when one of a firm's outposts buys something from another in a different country). As a result, many commentators (including this newspaper on occasion) have claimed that 60% of world trade takes place within multinational firms.

That figure would alarm tax authorities, because multinationals sometimes charge themselves contrived prices to shift profits out of high-tax jurisdictions. But the true percentage is about half that, as Maya Forstater, an independent researcher, and, more recently, Nick Shaxson of the Tax Justice Network, have pointed out. The rest is trade in which a multinational stands at one end of the transaction but not both.

China's position near the end of many

Who's smiling now?

Value added* at different stages of production of Mexico's ICT exports
\$'000, 2000 prices



Source: WTO

*As proxied by compensation per employee

chains has also inflamed the trade war. America's prodigious imports from China contain many parts created elsewhere, including in America itself. This mongrel merchandise quickly penetrated America's markets after China joined the WTO in 2001, inflicting what some scholars call a "China shock" on blue-collar workers. But the new report argues, in effect, that a \$100 manufactured import from China does not represent \$100-worth of Chinese manufacturing competition. Some of that value will have been counted already (if, for example, a phone casing had been imported to America, stuffed with components and returned to China for final assembly). Some represents the non-manufacturing inputs (including services and metals) required to make the product. And some of that \$100 will have been created outside China by its foreign suppliers, including American firms. Properly measured, the report argues, the "China shock" looks less bad, hitting a third fewer jobs and ending in 2008 rather than persisting indefinitely.

China may have had a bigger impact on Mexico. Back in 2000, the lucrative bits of its information and communication technologies industry were clustered close to either end of the value chain: upstream, in components and chemicals, or downstream, close to the customer in retail. The pattern thus resembled the "smile curve" invented by Stan Shih, a Taiwanese electronics magnate: value-added turns up at each corner (see chart). But China's entry into the industry has transformed that expression. Ferocious competition in some of the upstream links of the chain has turned the smile curve into something considerably less cheerful. ■

Free exchange | Hitting the big time

New research asks whether, where growth is concerned, population is destiny



FOR CENTURIES prior to the Industrial Revolution, Asia's massively populous societies made the continent the world's centre of economic gravity. Industrialisation in Europe and North America in the 19th century briefly knocked it from its perch. But now their collective economic might, measured in real output on a purchasing-power-parity basis, is forecast to account for more than half of global production by 2020. Was the West's period of dominance an anomaly, which could only ever have been short-lived? Is population destiny?

It stands to reason that countries with larger populations might enjoy long-run economic advantages. People are the raw material of economic growth, after all. The more there are, the greater the likelihood that one becomes a Gutenberg or a Watt. In a world without much international trade, populous countries offer the largest markets, and comparatively more opportunity to boost economic output through specialisation and trade. Projecting economic growth rates is fantastically hard even over very short time horizons; over centuries, it is as good as impossible. But there are worse strategies than betting on the places with the most people.

Klaus Desmet of Southern Methodist University, Dávid Krizstian Nagy of CREI, a research institute, and Esteban Rossi-Hansberg of Princeton University do just that. In a paper that last month won them the Robert Lucas prize, which recognises excellent research in political economy, they build a model that yokes economic performance to population size, within which they can run time forward by hundreds of years to watch the balance of economic power change. Long-run growth, they suggest, is driven by improvements in technology. And more populous countries should accumulate more innovation than smaller ones do because the return on developing a new technology is higher—there are more people to buy Edison's light bulb and to enrich Edison, and therefore more incentive to invent the light bulb in the first place.

Leaning against this force, however, is migration. Right now, the richest places are not the most populous. Should it become relatively easy to migrate, people will move from countries that are populous but poor to others that are rich. As migration swells the population of rich places, their long-run dominance is assured because of the link between population size and innovation.

But if there is very little migration, then the populous but poor countries will out-innovate the small but rich ones, and make their way up the income league table. The process is not quick; the authors reckon that convergence takes about 400 years. In practice, rich places tend not to allow much migration from poor ones. That could change, but assuming that it does not, the model delivers a striking forecast: half a millennium from now, Asia and sub-Saharan Africa will have become great engines of productivity.

Stranger things have happened. A millennium ago real output per person was significantly higher in China than in Britain. To predict that a European backwater would lead the world into the most transformative economic epoch in history would have seemed like madness. Over very long time horizons the world's poorest places can indeed become the world's richest, even if it does not happen often.

Still, if Britain did not have the upper hand over China 1,000 years ago, it did soon after, at least in terms of real output per person. By 1400 incomes in Britain were meaningfully larger than in China (and higher still in the Netherlands and Italy), according to work by Stephen Broadberry of Oxford University, Hanhui Guan of Peking University and David Daokui Li of Tsinghua University. By 1700 the diverging trajectories of China and north-west Europe were clear (though it was anything but obvious just how much further apart they would become). In other words, population over the past millennium has not been destiny. If China's and India's masses did not raise them to prosperity during the past 600 years, what reason is there to believe the future will be different?

More's the pity

It is possible that population is destiny, other things equal, but other things are never equal. And so a plague here, or a fateful decision by a Chinese emperor there, can set a region down a path that wipes out the advantages of population. Perhaps those advantages must be harnessed by the right sorts of institutions, or an accommodating culture—which take far longer to develop or adopt than technologies do to emerge. There is no academic consensus regarding what determines economic fortunes over long time horizons, important though the question is. Alternatively, one might argue that conditions have changed in ways that amplify the power of population. A billion brains seem a more economically potent force in an era of mass education, in contrast to the mass illiteracy that prevailed in the past.

But crucially, Asia's recent rise has not been the result of a spurt of indigenous innovation given its impetus by the size of its population. Rather, it has happened as part of a wave of globalisation, which aided the transfer of technological know-how. Openness to exchanges of goods and ideas, or indeed to immigration, is not an immutable parameter, but subject to change based on human preferences. Mr Desmet and his co-authors reckon that eliminating all barriers to migration would raise global welfare threefold—an extraordinary figure that reflects yawning differences in output per person between countries, and the unrealised human potential they represent.

As intriguing as it is to consider the directions in which macro variables such as population or GDP are likely to nudge the world in coming centuries, it is human decisions that will determine which places and people are given the opportunity to become rich. National populations matter to the extent that borders do. It is a depressing notion, but a plausible one, that in half a millennium's time they will matter still. ■



Climate change and crop disease

Blocking the road to rusty death

Understanding how crop pathogens and climate change interact is vital. But the link remains obscure

IN THE PAST 150 years, the concentration of carbon dioxide in the atmosphere has risen from 280 parts per million (ppm) to 410 ppm. For farmers this is mixed news. Any change in familiar weather patterns caused by the atmospheric warming this rise is bringing is bound to be disruptive. But more carbon dioxide means more fuel for photosynthesis and therefore enhanced growth—sometimes by as much as 40%. And for those in temperate zones, rising temperatures may bring milder weather and a longer growing season. (In the tropics the effects are not so likely to be benign.) What is not clear, though, and not much investigated, is how rising CO₂ levels will affect the relation between crops and the diseases that affect them.

History suggests that is an oversight. Devastating crop diseases do suddenly emerge from obscurity—often becoming epidemic far from their place of origin. In the 1840s, for example, a hitherto obscure fungus from Mexico devastated the Irish potato crop for several years, bringing about a famine that killed a million people.

It would not be at all surprising if a changing climate led to conditions that caused similar epidemics.

Saskia Van Wees, a botanist at Utrecht University, in the Netherlands, is curious about this question and, with the help of a team of colleagues, set up an experiment to take a closer look at how plants respond to changing carbon-dioxide levels. She placed seedlings of *Arabidopsis thaliana*, a member of the mustard family that serves as a guinea pig of the botanical world, in chambers containing different levels of CO₂. Some were at 450 ppm, the level in the laboratory; some well below this (150 ppm); and some well above (800 ppm), a concentration that, if current trends continue, is

expected to be reached around 2090. After four weeks, when the plants were established and healthy, Dr Van Wees let loose a mix of common pathogens. These included those of two leaf diseases (*Botrytis cinerea*, known to laymen as grey mould, and *Pseudomonas syringae*), and two root diseases (*Rhizoctonia solani* and *Fusarium oxysporum*). After a set number of days, appropriate to each disease, she studied the severity of the infections that resulted.

As she reports in the *European Journal of Plant Pathology*, high CO₂ levels had no impact on the root diseases. The team had expected this because carbon dioxide's levels in the soil are not much affected by its levels in the air. The leaf diseases were, however, affected quite a lot. Specifically, the severity of *B. cinerea* infection was substantially weakened by high levels of the gas and that of *P. syringae* was dramatically strengthened. The reasons for these changes seemed to be shifts in the ways in which the plants defended themselves.

Plants depend heavily on two substances, salicylic acid and jasmonic acid, to drive away agents of disease. In general, plants increase production of salicylic acid when faced with pathogens that feed on living tissue and do likewise with jasmonic acid when fending off agents that kill the tissue first, before feeding on it. Since *B. cinerea* consumes dead tissue and *P. syringae* living tissue, Dr Van Wees speculated that high CO₂ levels were driving the plants to produce jasmonic acid more readily, to

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► keep *B. cinerea* at bay, and to tone down salicylic-acid production, allowing *P. syringae* to flourish. Chemical analysis of the plants proved this theory correct.

Dr Van Wees's experiments are the latest of dozens of trials which make it clear that plant biology is altered substantially by a range of environmental factors. This makes it difficult to predict what effect a changing climate will have on particular bits of agriculture. Carbon dioxide is a case in point. It enhances growth of many plants but, as Dr Van Wees shows, it also shifts the defences to favour some types of disease over others.

To make matters even more complicated, evidence is mounting that changes in temperature and water availability also shift plant immune responses. André Velásquez and Sheng Yang He, at Michigan State University, wrote an extensive review on the warfare between plants and diseases in *Current Biology* last year. They noted that though some valuable crops, such as potatoes and rice, experience less disease as moisture levels increase, this is not the case for most plants. High humidity, in general, favours the spread of botanical diseases. The same can be said for temperature—with some diseases, like papaya ringspot virus, thriving in rising temperatures while others, for example potato cyst, are weakened.

There is also the difficulty of changing insect behaviour. Many disease-causing viruses, bacteria and fungi travel from one plant to another by hitching lifts on insects. Few researchers doubt that a lot of insect species' behaviour will change as the climate does, but precisely what will happen is an open question.

The problems are daunting, then, but there is a way to try to solve them. First, all important crops need to have their responses to various diseases studied under a range of expected climate conditions. Second, genes which grant resistance to diseases that might become severe in the future need to be tracked down. Modern crops have been streamlined by artificial selection to be excellent at growing today. This means that they have the genes they need to flourish when faced with the challenges expected from current conditions, but nothing more. Such crops are thus vulnerable to changes in their environment.

A natural selection

One way to find genes that may alter this state of affairs is to look to crops' wild relatives. Uncossetted by farmers, these plants must survive disease by themselves—and have been fitted out by evolution with genes to do so. Borrowing their DNA makes sense. But that means collecting and cataloguing them. This is being done, but not fast enough. The International Centre for Tropical Agriculture, a charity which works

in the area, reckons that about 30% of the wild relatives of modern crops are unrepresented in gene banks, and almost all of the rest are underrepresented.

Plant collecting is not, perhaps, the most fashionable of sciences. The very word "botany" is redolent of vascula-carrying Victorian parsons on bracing country walks. More plant collectors (with salaried academic positions for them to occupy) would certainly help. But there is a second issue, redolent of a second sort of Victorian plant collector—the pith-helmeted explorer searching foreign lands for interesting specimens—to address.

These days, attitudes to this sort of collecting have changed. Most countries are, rightly, protective of their genetic patrimony. If money is to be made by incorporating genes from their plants into crops, they want to have a share of it. It is therefore incumbent on rich countries to abide by rules that enable poor ones to participate in seed collecting without losing out financially. Poor, plant-rich countries are in any case those whose farmers are most likely to be hurt by global warming. It would be ironic if that were made worse because genes from those countries' plants were unavailable to future-proof the world's crops. ■

Public policy

When will they ever learn?

Memories of natural disasters fade fast. And maybe unnatural ones, too

AFTER HURRICANE BETSY pummelled New Orleans in 1965, causing damage so severe that "Betsy" was retired from the rotating list of names given to Atlantic hurricanes, the Governor of Louisiana, John McKeithen, pledged that nothing like it would happen in his state again. Exactly 40 years later Hurricane Katrina brought even greater destruction to the city, and hazard planners were deemed to have ignored the lessons of the past. New research suggests that far from being an exception, Louisiana's forgetfulness is the rule.

Collective memory for past calamities is of more than just academic interest, precisely because resilience to future calamities is thought to depend on it. Most re-

search on the subject has been conducted by social scientists who have tracked the durability of memories over years—at most a decade—usually by means of questionnaires. Researchers at the Czech University of Life Sciences, in Prague, led by environmental historian Václav Fanta, have approached the problem differently, investigating how memories of disasters shaped decisions over several generations.

In a paper published recently in *Nature Communications*, they analysed data on almost 1,300 towns and villages in the Vltava river basin in central Europe—drawing both on historical records and on archaeological methods such as carbon dating—and compared them with the timings of floods in that basin over the course of nearly 900 years.

The floods studied were defined as extreme, meaning that the river's run-off was in excess of 4,000 cubic metres per second, or almost 30 times its normal rate. Such mega-floods occur, on average, less than once a century, and the researchers recorded seven of them, the first in 1118 and the last in 1845. In each case, new settlements appeared a significantly higher vertical distance above the river's normal level than settlements built in the same area before the flood, and continued to do so for 25 years (about a generation) after the deluge. By the subsequent generation, however—the grandchildren of the flood's survivors—they started creeping downhill again, closer to the river, and encroaching on the zone of flood risk.

Sites close to watercourses have always been prized, and in calculating where to build their homes, people have necessarily weighed the risks of flood damage against ►►



Prague spring-tides

▶ the advantages of being close to a river. That memories of disaster weigh more heavily in this calculation immediately after the flood is not surprising, says Dr Fanta. But that the memory is so short-lived is. He had expected people to heed history's warning for a century at least.

This collective forgetfulness is even more puzzling in light of a central preoccupation of ancient chroniclers, the communication of risk. Writing to preserve their eras for posterity, they recounted harrowing tales of extreme climatic events, fires, famines and plagues. Likewise, there is no shortage of written accounts of Hurricane Betsy or of historical floods in Prague—the maximum heights of many of which are marked along the Vltava's banks.

Such distant secondhand accounts are not enough, Dr Fanta concludes. To be deterred from placing themselves back in danger, people have to hear disaster tales from eye witnesses who can convey the visceral emotion of having lived through them. The group's findings thus suggest that one way of teaching history more effectively might be to bring eye witnesses into the classroom. That approach will not work for ever, of course. Over time, witnesses' own memories fade, and then the witnesses themselves expire.

The forgetting that Dr Fanta sees with respect to historical floods might also explain the recent rise of vaccine hesitancy and right-wing extremism, he suggests, as the survivors of now-preventable infectious diseases and Hitler, respectively, die of old age. Having not experienced those realities, or heard about them first-hand, many people alive today have quite simply forgotten the horror. ■

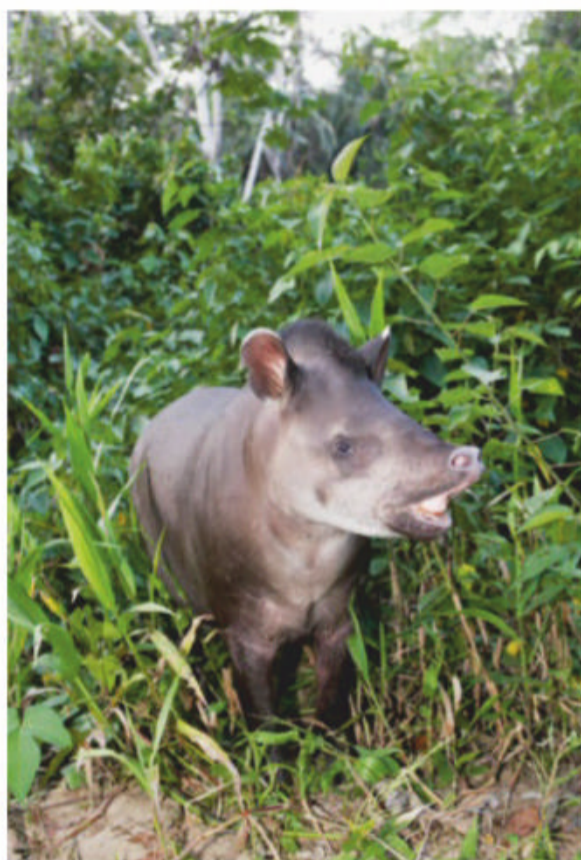
Ecology

Do tapirs defecate in the woods?

It seems they prefer burned-out scrub. And that may help regenerate forests

AN OBVIOUS RESPONSE to deforestation is to plant more trees. But this is no easy task. Sowing the right mix of seeds and ensuring that saplings survive long enough to establish themselves is complicated, time-consuming and expensive. Things can, however, be simplified to some extent by recruiting the local wildlife. And in a South American context, according to a study published in *Biotropica* by Lucas Paolucci of the Amazon Institute of Environmental Research, in Brazil, that means looking after the local tapirs.

The role of bats and birds in reseeded damaged areas is well known. These flying



Just powdering my nose

animals often defecate pips and stones from fruit they have eaten in places distant from where the food were consumed. Much research has therefore been devoted to luring them into damaged areas—sometimes with success. There is a limit, however, to the size of seed that a bat or a bird can carry, and that constrains which plants can be regenerated in this manner.

Lowland tapirs suffer no such constraint. They are the region's biggest herbivores and swallow lots of large seeds. Dr Paolucci thus wondered to what extent tapirs were transporting seeds from pristine to damaged areas. To try to find out he and a team of colleagues set up a study of tapirs' defecatory habits.

The researchers used a mixture of field observations and camera traps to monitor tapirs in three adjacent plots that are part of a larger project to study the effect of fire on Amazonian rainforest. These plots were confirmed at the beginning of the study to be similar in such matters as plant-species richness, the relative abundance of the commonest species, the density and composition of woody stems in the area, and the moisture content of the leaf litter. Each had an area of half a square kilometre, and each was bounded on one side by healthy rainforest and on the other by a soyabean plantation. One plot was then burned every year from 2004 to 2010. A second was burned every three years (2004, 2007 and 2010). The third was left pristine.

Dr Paolucci and his colleagues carried out their study in 2016. In January, April, June and September of that year they searched the plots for tapir dung piles. They collected, cleaned and identified the seeds in these piles, and examined them for damage that might stop germination.

Altogether, they found 163 dung piles. Of these 43 were in the pristine plot, 48 in the triennially burned plot and a surprising 72 in the plot that had endured annual fires. The piles contained, they found, a grand total of 129,204 seeds from 24 species of plant. Fewer than 1% of those seeds were so badly damaged as to suggest that they would not germinate. On the basis of these results Dr Paolucci calculated that tapirs pass an average of 9,822 seeds per hectare per year in degraded rainforest, compared with 2,950 in pristine forest.

The camera-trap data suggested that this might be because the animals preferred to spend time in the burned areas, rather than because they actually preferred to defecate there. The traps observed 306 independent visits by tapirs. (Photos taken within 30 minutes of one another were counted as part of the same visit.) Sixty-one of these sightings were in the pristine plot. A hundred and twenty five were in the triennially burned plot. And 120 were recorded in the annually burned plot.

Why tapirs would gravitate towards disturbed zones is a mystery. But it does suggest the animals play an important, if accidental, role in forest regeneration—and that, if the causes of their preference were better understood, they might be manipulated into sowing yet more seeds in places that need them. ■

Prospecting for minerals

Scoring boundaries

VIENNA

How to narrow the search for ore

AS TREASURE MAPS go, it will be hard to beat. Geologists from Harvard University, Geoscience Australia and the Australian National University are drawing up a map to show where mining companies should focus their search for the ores of metals such as lead, nickel, copper and zinc. The billions of dollars they spend exploring for these minerals (\$8.4bn in 2017) should, the researchers behind the project say, be aimed at the edges of old, thick portions of the continents called cratons.

The map itself will be published soon in a peer-reviewed journal. But the theory behind it was outlined on April 9th by Fred Richards, of Harvard, at a meeting in Vienna of the European Geosciences Union. The project started with an attempt to make a detailed map of the thickness of Earth's lithosphere (its crust and upper mantle). The researchers thought this might have something to do with the distribution of sediment-hosted deposits, a particular ▶

▶ type of ore body. Such deposits are created by water percolating up through consecutive layers of rock that have different chemical properties.

If this water is of the right temperature and passes through layers of rock that contain plenty of oxygen, metals will dissolve easily in it. Then, when the metal-laden water reaches strata where oxygen is scarce, its dissolved contents will precipitate and accumulate. But the temperature range required for this to work is narrow: between 50°C and 200°C. Where the lithosphere is thick, the researchers' thinking was, the temperature difference between the planet's depths and its surface is stretched out, so any percolating water will spend more time at the right temperatures to collect, and then later to deposit, metals.

Once the map was created, however, Karol Czarnota, an Australian member of the team, noticed that this hypothesis was wrong. Almost all the large sediment-hosted deposits in that mineral-blessed country are located not in areas of thick lithosphere but, rather, near the junctions between thick and thin areas. Such junctions often mark the edges of cratons. These are islands of old, thick lithosphere, unaffected by mountain-building, earthquakes and so on, that form the cores of continents.

Prompted by Dr Czarnota's observation, the team looked at the rest of the world. They saw the same pattern. Not all ores are sediment-hosted. Many are created by water scooping up metals in volcanic processes, resulting in a different pattern of distribution. But sediment-hosted deposits, the team found, did indeed tend to be near craton boundaries. Around 85% of those known to science are within 200km of a boundary—far more than chance alone would predict. According to Dr Richards, that shrinks the space worth searching for sediment-hosted deposits by two-thirds.

This may encourage mining firms to try their luck in places that are, at the moment, not much explored, such as central Asia and west Africa. Miners might further narrow their search, Dr Richards says, by looking for faults that enable water to penetrate the rock layers. The need for faults, which tend to occur outside cratons, in addition to thick lithosphere, found in cratons, might explain the pattern they found.

Success in these endeavours would confirm the idea of there being a relationship between cratons and metal deposits. And given that connection, each deposit found would then also add to what is known about cratons. Already, Dr Richards says, the hypothesis that these structures are long-lived, having survived multiple cycles of continent formation and break-up, gets additional confirmation by the great age—up to 2bn years—of a number of the metal deposits nearby. ■

Marine biology

Where there's muck there's brass

DAUIN

The latest diving craze eschews the gaudy for the cryptic

MUCK DIVING sounds the very antithesis of coral-reef diving. Reef divers swim through a world of colourful coral heads populated by strikingly patterned fish, scuttling arthropods and awesome molluscs. Muck divers explore apparently unpromising sand flats and muddy silts devoid of visible inhabitants. Muck divers, though, see reef divers as the lightweights of the scuba world—people in search of the obvious. Muck diving is about searching for the unusual, the cryptic and the rare.

Though enthusiasts discovered muck's attractions less than ten years ago, and the species that live in it were similarly ignored by science, muck diving is now big business. Tallies are not kept, but research conducted in 2014 by Maarten De Brauwer, a marine biologist at Leeds University, in Britain, who is an expert on muck diving, suggests that 100,000 tourists visited the Philippines and Indonesia that year specifically to dive on the muck. This brought \$150m into the region. In the Philippines the fishing villages of Anilao in Luzon, and Dauin in Negros Oriental, have been particular beneficiaries of the growth of this sort of tourism.

Dr De Brauwer thinks of divers who explore these sediments as the marine equivalent of bird watchers, ticking off species in a sort of zoological competition. Top of the list is that master of disguise, the mimic octopus, which evades predators by masquerading as other, venomous, animals—lionfish, sea snakes, even jellyfish. This ability may explain why it remained unknown to

science until 1998. Other popular stars are the hairy frogfish (pictured) and the wonderfully titled colourfully garbed flamboyant cuttlefish.

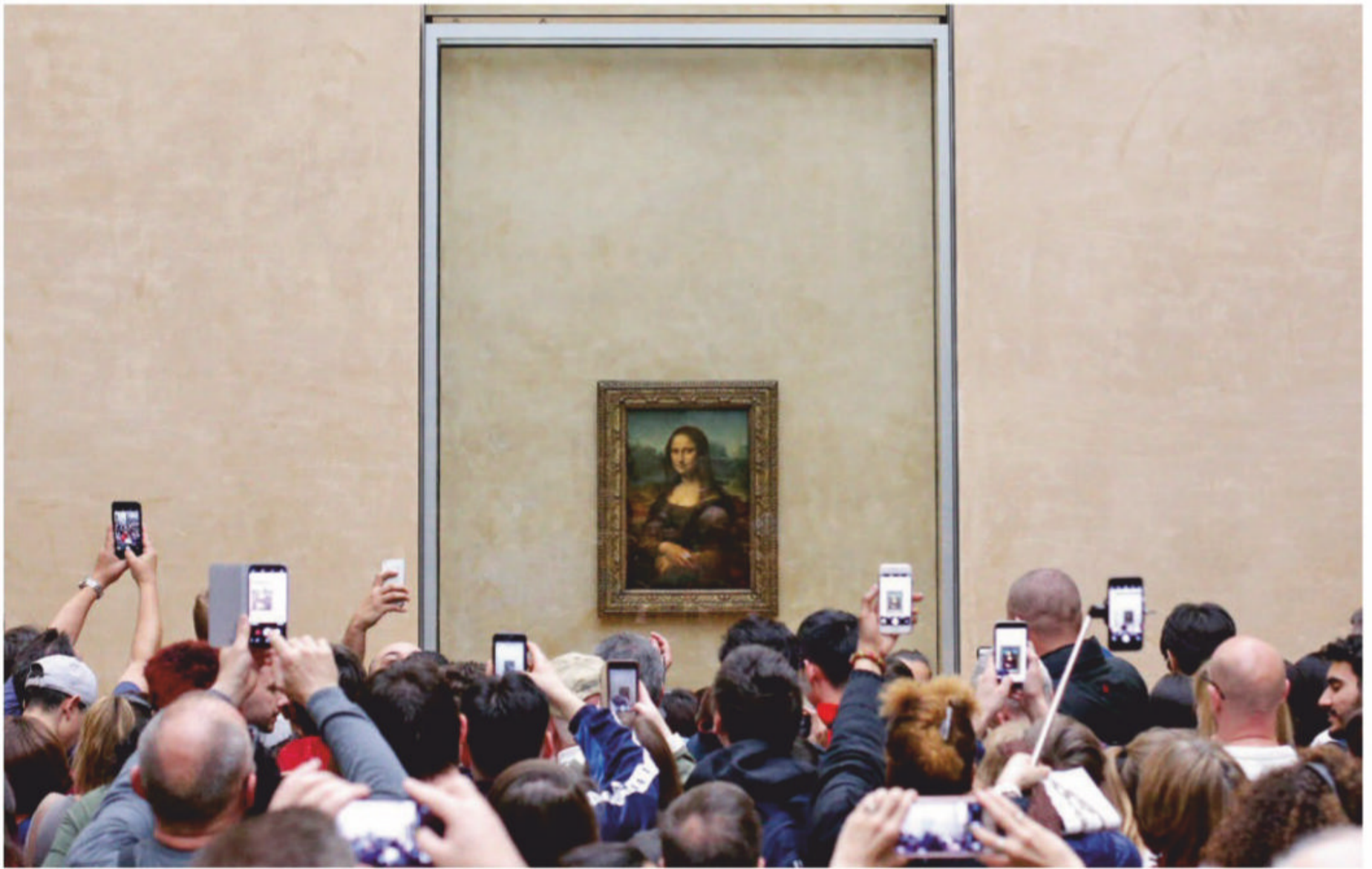
Tourists looking for these beasts bring employment. Spotting the eye of a mimic octopus in the sand, or a frogfish—an ambush hunter so cleverly camouflaged that it blends to invisibility on the substrate it uses as a hunting platform—needs lots of experience. Keen-eyed young Filipinos are therefore finding work in the diving industry as guides, and can earn double a fisherman's wage selling their sleuthing skills to outsiders.

As is often the case with ecotourism, though, there is a risk of the tourists killing the thing they love by turning up in numbers so large that they harm the habitat. Dr De Brauwer believes more study should be directed towards understanding the impact both of divers and of nearby fishing activity on the creatures which make the muck their home. The guides agree, voicing concerns that overcrowding on dive sites could drive the most treasured critters away. Some have already seen evidence of this happening.

Whether the authorities will go so far as to regulate numbers is moot. But at Dauin the proceeds of a fee which divers are charged for each excursion do at least pay for a coastal patrol that watches over marine sanctuaries to prevent illegal fishing. People in the area are certainly aware of the risk of killing the goose that lays the golden eggs. On the other hand, many of them need the gold now.



You looking at me?



Art history

Leonardo and us

FLORENCE, ROME AND TREVISO

Contemporary reverence for da Vinci is more about our age than his oeuvre

IN THE NORTHERN Italian city of Treviso, a Polish pianist, Slawomir Zubrzycki, sits down at an instrument that resembles a harpsichord and starts pumping a pedal with his right foot. As his hands float over the keyboard, the sound reaching his audience is as singular as it is beautiful: simultaneously reminiscent of the harpsichord, organ and a string quartet. The instrument is based on sketches Leonardo da Vinci made in his notebooks of a “viola organista” with the dream of simulating a viola ensemble that could be played from a keyboard. Hitting one or more keys brings the same number of strings inside the casing into contact with one of four bow-wheels spun by the pedal.

Mr Zubrzycki’s concert, sponsored by the Benetton Foundation, was among the more unusual commemorations of the 500th anniversary of da Vinci’s death, which falls on May 2nd. It was also a reminder that, even in an age of polymaths,

the breadth of the Tuscan master’s interests was exceptional. It encompassed not only painting, architecture, mathematics, engineering and numerous branches of science, but music too. “How many specialists would we need today to attempt Leonardo’s researches?” asks Martin Kemp, emeritus professor of the history of art at Oxford University. “At least 13. Maybe more.”

In the Antico Setificio Fiorentino, Italy’s oldest working silk mill, Beatrice Fazzini turns by hand a vertical warper: a cylindrical machine that prepares yarn for weav-

ing. It was constructed in 1786 and is based on a design by da Vinci that Stefano Ricci, the fashion house which owns the mill, says has been used in Florence since da Vinci was alive. If that is indeed so, it was one of his very few inventions that had a practical application.

Like many an autodidact, da Vinci was long on inquisitiveness but short on intellectual self-discipline. He had astonishing powers of observation, an extraordinary talent for making connections between different areas of knowledge, a readiness to challenge contemporary beliefs and an uncanny ability to anticipate future discoveries. But his life yielded an endless succession of untested contraptions, unpublished studies and unfinished artworks.

Anniversaries are normally opportunities for reappraising the legacy of the great man or woman concerned. Da Vinci’s highlights the fact that, outside the field of painting, his legacy—as distinct from his genius—was modest. He had brilliant intuitions in fields as diverse as anatomy and hydraulics, but because he failed to publish his theories and findings, hundreds of years were to pass before they were discovered by someone else.

Even his artistic oeuvre, though sublime, is minute. Fewer than 20 finished works are generally attributed to da Vinci. He failed to complete some of his most im- ▶

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▶portant commissions such as the “Adoration of the Magi”. His ill-fated experimentation with materials ruined others, including “The Last Supper”. Hence the paucity of exhibitions devoted to his art in what should be his year of years. Florence is commemorating him with a show devoted to his master, Verrocchio.

Born out of wedlock in 1452, the son of a notary and a peasant woman, da Vinci had a lonely childhood and—probably left-handed and almost certainly gay—grew up something of a misfit. He spent much of his life outside his native Tuscany in Milan, Rome and finally France as the guest of King Francis I. He died at Amboise in 1519.

Such is the status he has acquired as the definitive, universal genius that the few questions raised in his quincentenary year are being put almost surreptitiously, as in a show at the Scuderie del Quirinale in Rome that largely comprises models based on da Vinci’s designs. It opens with a display of treatises and often exquisite drawings by other Tuscan artist-engineers, including Francesco di Giorgio Martini, that show da Vinci was far from unique in combining technology with painting—and that some of his peers managed to get a lot more built or printed than he did.

Paradoxically, the most direct applications of da Vinci’s researches outside art are to be found within his art. His understanding of physics, botany and geology vastly enhanced his painting. His study of light enabled him to develop *sfumato*, the technique that gives the outlines of his subjects their naturally undefined quality. “And if he hadn’t studied anatomy, he wouldn’t have been able to paint the most enigmatic smile in the history of painting,” says Fiorenzo Galli, the director-general of the Museo Nazionale Scienza e Tecnologia Leonardo da Vinci in Milan.

The “Mona Lisa” has become the world’s best-known painting. Da Vinci’s “Vitruvian Man” is the world’s best-known drawing. Does that make him the greatest artist in the Western tradition? Even Professor Kemp, who has spent a lifetime studying da Vinci’s achievements, hesitates to go that far, stressing instead the Tuscan master’s huge influence on other painters.

“If you were looking for someone who did as much to divert the stream of art, then you would have to keep searching until you came to Picasso,” he says. Da Vinci revolutionised Madonna and Child compositions, and altered the portrayal of narrative subjects and the way portraits were composed. Jonathan Nelson, who teaches art history at Syracuse University in Florence, notes that he was also the first artist to give women realistic bodies “with anatomically identifiable musculatures, but looking soft and feminine”.

The notion that da Vinci stands alongside Michelangelo and Raphael at the very

pinnacle of artistic achievement is nonetheless relatively modern. Until well into the 19th century, he was seen as a genius, but on a level below the others. As Donald Sassoon, a British historian, has recounted in his book, “Becoming Mona Lisa”, published in 2001, it was anti-clerical French historians who initiated the “cult of Leonardo”, seeing in him an ally in the fight against religious obscurantism: “He was not afraid to dissect corpses; he did not paint halos on his religious figures...Unlike Raphael and Michelangelo, he was never the servant of popes. He put Man at the cen-

tre of creation.”

Those and other factors have endeared him to a wider, contemporary public. Da Vinci abhorred the slaughter of animals and was probably a vegetarian. He satisfies the modern requirement for artists to be outsiders with an eccentric streak. And his creative record chimes perfectly with the spirit of an age that tolerates, even venerates, unfinished work—all the more so if it is cryptic. Surveying the events this year to celebrate da Vinci’s genius, Professor Nelson says “I think these shows tell us more about us than about him.” ■



Culture in Uzbekistan

Once were warriors

TASHKENT

An Uzbek film-maker straddles two worlds

GULAIM IS THE Boudicca of the Eurasian Steppe. With her *qyrq qyz*—40 girls—she defended the ancient clans from eastern invaders, leaving an imprint on the collective consciousness of her region. She bequeathed “a memory of a matriarchal society in Central Asia,” says Saodat Ismailova. “If you ask the Iranians and the Afghans, they don’t have the idea of these girl warriors, whilst over the Amu Darya [the river that divides Afghanistan from Uzbekistan], people are very aware of it.”

Central Asia’s history—from the ancient Sogdian language to the soul of the extinct Turan tiger—permeates Ms Ismailova’s art, which ranges from feature films and documentaries to video installations and multimedia performances. Born and brought up in Tashkent, Uzbekistan’s capital, she has lived most of her adult life in Europe; but she feels “an unconditional connection, like the unconditional love for

your parents or children”, with the traditions she inherited.

The production of “Qyrq Qyz”, Ms Ismailova’s retelling of the legend, has proved as epic as its plot. It emerged from a short film she made in 2014, and incorporates an 86-minute film shot partly among the ruined desert fortresses of Karakalpakstan, plus a live element in which seven young women perform an original score of traditional music. It had its premiere in New York last year and is being staged this week at the Centre for Contemporary Art, a new venture in a former power station in Tashkent.

Ms Ismailova spent 18 months casting the seven performers, all of whom are musicians at the beginning of their careers. ▶▶

Correction: Almost as if to illustrate Johnson’s point that African-American English has a consistent internal grammar, last week’s column made a mistake in it: the distant past is “I been did that”, not “I been done that”.

► She collaborated with Séverine Rième, a Parisian choreographer and lighting designer, to ensure that their bodies communicated the same message as the sound. It wasn't easy: as Ms Ismailova puts it, the women had to counteract the weight of "a certain Soviet past which [dictates] how you go on stage, how you sit, and how you perform." But they overcame these constraints, she says, and the result "is a wave like an audio wave, but it is related to their bodies."

This is the first time "Qyrg' Qyz" and the accompanying exhibition "Qo'rg'on Chiroq" (part of which appeared at the Venice Biennale in 2013) have been shown in Uzbekistan. Ms Ismailova's only previous exposure there was on a much smaller scale. She is curious to see how her work will be received. "It is like bringing a child back to its home," she says. "I think it is going to raise questions...What is it about? What is this language of communication?"

Ms Ismailova's apprehension is understandable. Though her themes and the languages she enlists—Karakalpak, Kazakh, Kyrgyz and Uzbek—are familiar to Central Asian audiences, her techniques may not be. "There was no access to information about contemporary culture," Ms Ismailova recalls of her education in Tashkent in the post-Soviet doldrums of the early 2000s. "We were trained in the traditional way." She and her work have become a bridge connecting two worlds.

The lines she draws between Central Asia and Europe run in both directions. As well as introducing the West to Central Asia's heritage, she is using her European experience and network to help develop the arts in her homeland. ■

Espionage

Carousing for the Comintern

An Impeccable Spy: Richard Sorge, Stalin's Master Agent. By Owen Matthews. Bloomsbury; 448 pages; \$30 and £25

WITH ITS clash of grand ideologies and sweeping geopolitical upheavals, the 20th century was a natural setting for espionage. The intrigues cooked up in embassies and drinking holes and secret clubhouses shaped the fates of nations, which made the work of spies of the utmost importance. And of them all, Richard Sorge may well have been the best. He was a "flawed individual, but an impeccable spy—brave, brilliant, and relentless", writes Owen Matthews in his rollicking and moving chronicle of Sorge's life.



From Russia with love

"The Impeccable Spy" is also a story of the era's convulsions, for which Sorge is a fitting avatar. A man of great ego and daring, he was sacrificed to a cause that had long since abandoned its professed ideals.

Born in 1895 to a German father and a Russian mother, Sorge, like many young men of his generation, was dispirited by his experience in the trenches of the first world war. Recovering from his wounds in hospital, he made his way through Marx. The panacea of communism seduced him: the grandeur of the idea matched his vision of himself.

Sorge's activism led him to Moscow and the Comintern, the global wing of the Communist Party, "world revolution's most secret club". He was dispatched to Shanghai, a madcap colonial city where he drank, caroused and acted the "debauched bourgeois expatriate", Mr Matthews writes. "He found the role entirely to his liking."

But it was Japan, where Sorge arrived in 1933, which would host his most fateful exploits. As the tremors of a new war were felt, the question of Japan's alliances and military ambitions became vital to Soviet leaders. Would Tokyo make a move to the south, deeper into Asia, or north—into Siberia? The latter might well spell doom for the Soviets, whose country was young and unsteady, with untested armed forces that would be hollowed out by Stalin's purges. Sorge's bosses in Moscow—his spy ring now reported to the Fourth Directorate of the Red Army's General Staff—made untangling this riddle his main task for the next eight years.

Sorge carried out this mission with a panache that veered toward recklessness. He twirled women around the dance floor at Tokyo embassy parties and made a name

for himself in the drinking dens of Ginza. An American journalist said he "created the impression of being a playboy, almost a wastrel, the very antithesis of a keen and dangerous spy."

Yet that is what he was. Sorge befriended a German military officer named Eugen Ott—after first seducing his wife, a characteristic Sorge move. With time, Ott rose to become Hitler's ambassador in Tokyo. As Mr Matthews points out, what made Sorge such a dizzyingly successful spy was that he didn't so much steal secrets as trade them. Thanks to a member of the ring who was also an adviser to the Japanese prime minister, Sorge had access to the inner sanctum of Japanese politics; he passed this information to Ott, who would share the latest in Nazi strategy from Berlin. All the while, the sum total of this intelligence haul was cabled back to Moscow.

Yet as "An Impeccable Spy" makes clear, intelligence is only as good as those at headquarters who interpret it. And in Moscow in the 1930s, the apparatchiks' priority was self-preservation. Five successive heads of the Fourth Department were shot in the purges. The survivors' only hope to avoid a similar fate was to tell Stalin what he wanted to hear: that Hitler would refrain from invading the Soviet Union, and that any suggestions to the contrary were malevolent disinformation.

Sorge was hearing otherwise from Ott and his other German contacts. His attempts to sound the alarm were greeted coolly by Moscow. He got his hands on the plans for Operation Barbarossa, the German invasion, telling Moscow that war was "95% certain" and specifying where Nazi forces would strike and a date of June 15th. (He was off by a week: the invasion began on June 22nd.) Stalin scrawled on the cable: "Suspicious. To be listed with telegrams intended as provocations."

All the same, Sorge's intelligence may have proved decisive for the outcome of the war—thus saving not just the Soviet Union but perhaps the world. In September 1941 he relayed that Japan was unlikely to target the Russian Far East, which meant that Stalin could bring half the Red Army troops in Siberia to the western front.

A month later, Sorge's luck ran out, and he and other members of the Tokyo *rezidentura* were captured by Japanese police. His arrest barely registered back in Moscow: the man who may have saved the country was quickly discarded. He spent three years at Sugamo prison awaiting his fate, which turned out to be execution by hanging. A German translator who took his last will said he gave the impression of a man "who is proud to have accomplished a great work and is now ready to leave the scene". Mr Matthews has given Sorge a fitting remembrance: audacious, spirited and laced with the madness and tragedy of his age. ■

Life, art and crime

The pages of sin

Murder by the Book. By Claire Harman. Knopf Doubleday; 252 pages; \$25.95. Viking; £14.99

BY ALL ACCOUNTS, Lord William Russell was a harmless old gent. What a horror, then, when he was found in his bed on the morning of May 6th 1840, “his throat cut so deeply that the windpipe was sliced right through and the head almost severed.”

Russell was the youngest son of the Marquess of Tavistock, and although some of his family could not have been grander—his nephew Lord John Russell was the principal architect of the Great Reform Act of 1832, and was to be the last ever Whig prime minister—he himself lived modestly by aristocratic standards. When not abroad he could be found in a terraced townhouse on Norfolk Street, with only a maid, a cook and a valet to tend to him. He had no enemies; he had no great debts. Yet, as Claire Harman writes in her compact and engrossing account of his death and its aftermath, on that spring night “mayhem and murder” came to a quiet Mayfair street.

Ms Harman’s book is not a whodunnit. The circumstances of Russell’s death are not just a matter of public record: the case was one of the most notorious of its day. His Swiss valet (the Swiss were highly esteemed as domestic servants, being “cheap, clean and reliable”), François Courvoisier, was tried, found guilty and hanged at Newgate Prison on July 6th. Ms Harman is concerned, rather, with the way in which the murder, and Courvoisier’s execution, reverberated through literary London.

Both Charles Dickens and William Makepeace Thackeray witnessed the execution, Dickens walking to Newgate late the night before and, towards morning, finding a room to rent that had a good view of the “drop”. His observations would find their way into “Barnaby Rudge”, and, as Ms Harman writes, led him to argue for the abolition of the death penalty. He was horrified by the carnival atmosphere of the hanging, where he saw only “ribaldry, debauchery, levity, drunkenness and flaunting vice in 50 other shapes”.

But the real revelation of the book is the influence of an author whose fame has not survived into the 21st century. William Harrison Ainsworth was “the golden boy of his generation”. Originally a lawyer in Manchester, he moved to London in the 1820s and began writing adventures modelled on those of Sir Walter Scott and Alexandre Dumas. He took advantage of the fashion for

Ian McEwan’s new novel

Who, robot?

Machines Like Me. By Ian McEwan. Nan A. Talese/Doubleday; 352 pages; \$26.95. Jonathan Cape; £18.99

AFTER A SEQUENCE of more or less realistic novels, including “On Chesil Beach” (2007) and “The Children Act” (2014), Ian McEwan is letting himself go. His previous novel, “Nutshell”, was narrated by a fetus; now he tells the story of a love triangle between an online trader, Charlie, an academic, Miranda, and a handsome android, Adam, purchased by Charlie after a windfall. At one point, Charlie hears Miranda and Adam having sex; when he confronts Adam, the robot breaks his owner’s wrist before disabling his own kill switch.

The book is set in London in the 1980s, except with 21st-century technology, and—as Adam’s existence indicates—more besides. A train journey from London to Glasgow takes only 75 minutes. The world is askew: the Beatles are still going strong, and a novel called “Catch-

18” (the manuscript title of “Catch-22”) is mentioned. Margaret Thatcher loses an election after Britain is routed in the Falklands; the IRA assassinates Labour Prime Minister Tony Benn. “I repeat this well-known history for the benefit of younger readers who won’t be aware of its emotional impact,” Charlie says.

Mr McEwan’s game-playing recalls the appendix to “Enduring Love” (1997), a plausible-seeming case report from a non-existent *British Review of Psychiatry*. “It’s always very tempting for a writer to blur the line between fiction and reality,” he later said. “And it was linguistic exuberance, as well—I just wanted to show that I could do it too.” As subplots multiply in “Machines Like Me”, the fun occasionally loses its purpose. When Charlie intervenes to help a small boy who is being shouted at by his mother in the street, Miranda wants to adopt the child. She is later targeted by an ex-convict bent on revenge after she falsely accused him of rape.

Amid all the action, there are sober passages of philosophical discussion between Charlie and Adam. But in parts the novel is funny, too. To Charlie’s disgust, Adam’s encyclopedic recall of Shakespeare makes him seem the better catch to Miranda’s father, a writer, who assumes Charlie is the robot, because he isn’t interested in books.

Late in the story it emerges that other androids around the world are committing suicide in horror at the behaviour of their flesh-and-blood masters. Adam wonders about the “mystery of the self” and his fear that he is “subject to a form of Cartesian error”. Strip away the counterfactual wrapping and “Machines Like Me” is ultimately about the age-old question of what makes people human. The reader is left baffled and beguiled.



“Newgate novels”, salacious and bloody tales inspired by the true-crime accounts to be found in the *Newgate Calendar*.

The first chapters of his novel “Jack Sheppard”, based on the life of an elusive 18th-century criminal, were published in 1839 in the magazine *Bentley’s Miscellany*, alongside the last instalment of his friend Dickens’s story “Oliver Twist”. “Jack Sheppard” became a sensation, and was blamed for contributing to the nation’s moral decline. Courvoisier, at his trial, claimed that Ainsworth’s novel was responsible for his horrid deed.

Ms Harman, who came across this grisly tale while researching her biography of Charlotte Brontë, is too careful a writer to adjudicate on whether Courvoisier’s reading matter really did lead him to a life of crime, or whether, indeed, he was actually responsible for the murder. Nor does she draw explicit parallels with later moral panics, such as the hysteria in the 1980s and 1990s over the supposedly pernicious influence of rap, or more recently over video games. She leaves readers to draw their own conclusions, and her compelling book is all the better for her tact. ■



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	% change on year ago latest	quarter*	2019†	% change on year ago latest	2019†	%		% of GDP, 2019†	% of GDP, 2019†	10-yr gov't bonds latest,%	change on year ago, bp	per \$ Apr 16th	% change on year ago				
United States	3.0	Q4	2.2	2.3	1.9	Mar	2.2	3.8	Mar	-2.5		-4.9	2.5		-29.0	-	
China	6.4	Q1	5.7	6.3	2.3	Mar	2.5	3.8	Q4§	0.2		-4.5	3.2	§§	-25.0	6.71	-6.4
Japan	0.3	Q4	1.9	1.0	0.2	Feb	1.4	2.3	Feb	3.9		-3.4	-0.1		-8.0	112	-4.2
Britain	1.4	Q4	0.9	1.0	1.9	Feb	2.0	3.9	Jan††	-4.2		-1.6	1.3		-26.0	0.77	-9.1
Canada	1.6	Q4	0.4	1.6	1.5	Feb	1.7	5.8	Mar	-2.8		-1.4	1.8		-49.0	1.34	-6.0
Euro area	1.2	Q4	0.9	1.3	1.4	Mar	1.4	7.8	Feb	3.0		-1.1	0.1		-45.0	0.89	-9.0
Austria	2.4	Q4	5.1	1.3	1.5	Feb	1.8	5.0	Feb	2.0		-0.1	0.4		-40.0	0.89	-9.0
Belgium	1.2	Q4	1.4	1.3	2.3	Mar	2.2	5.7	Feb	0.1		-1.0	0.5		-28.0	0.89	-9.0
France	1.0	Q4	1.3	1.3	1.1	Mar	1.3	8.8	Feb	-1.2		-3.4	0.4		-36.0	0.89	-9.0
Germany	0.6	Q4	0.1	1.0	1.3	Mar	1.4	3.1	Feb‡	6.6		0.8	0.1		-45.0	0.89	-9.0
Greece	1.6	Q4	-0.4	1.8	0.9	Mar	0.9	18.5	Jan	-2.5		-0.4	3.4		-70.0	0.89	-9.0
Italy	nil	Q4	-0.4	0.1	1.0	Mar	0.9	10.7	Feb	2.1		-2.9	2.6		78.0	0.89	-9.0
Netherlands	2.2	Q4	2.2	1.5	2.8	Mar	2.3	4.3	Feb	9.9		0.8	0.2		-41.0	0.89	-9.0
Spain	2.4	Q4	2.2	2.1	1.3	Mar	1.2	13.9	Feb	0.8		-2.4	0.9		-24.0	0.89	-9.0
Czech Republic	3.0	Q4	3.4	2.8	3.0	Mar	2.2	2.0	Feb‡	0.2		0.7	1.9		6.0	22.7	-10.1
Denmark	2.5	Q4	3.4	1.9	1.2	Mar	1.1	3.7	Feb	6.3		0.2	0.2		-39.0	6.61	-8.9
Norway	1.7	Q4	1.9	1.9	2.9	Mar	2.3	3.9	Jan††	7.1		6.4	1.8		-13.0	8.48	-8.1
Poland	4.5	Q4	2.0	3.8	1.7	Mar	1.7	6.1	Feb§	-0.6		-2.4	2.9		-22.0	3.78	-11.1
Russia	2.7	Q4	na	1.5	5.3	Mar	4.9	4.9	Feb§	6.5		2.4	8.3		77.0	64.2	-3.1
Sweden	2.4	Q4	4.7	1.6	1.9	Mar	1.8	6.6	Feb§	3.5		0.4	0.3		-38.0	9.25	-8.7
Switzerland	1.4	Q4	0.7	1.8	0.7	Mar	0.7	2.4	Mar	9.8		0.5	-0.2		-29.0	1.01	-5.0
Turkey	-3.0	Q4	na	1.1	19.7	Mar	15.5	14.7	Jan§	-3.8		-2.3	18.3		508	5.81	-29.1
Australia	2.3	Q4	0.7	2.6	1.8	Q4	2.0	4.9	Feb	-2.2		-0.2	2.0		-79.0	1.39	-7.2
Hong Kong	1.3	Q4	-1.4	2.2	2.1	Feb	2.3	2.8	Feb††	4.5		0.5	1.7		-36.0	7.84	0.1
India	6.6	Q4	5.1	7.2	2.9	Mar	3.3	6.7	Mar	-1.6		-3.4	7.4		-10.0	69.6	-6.0
Indonesia	5.2	Q4	na	5.2	2.5	Mar	3.1	5.3	Q3§	-2.8		-2.2	7.6		101	14,085	-2.2
Malaysia	4.7	Q4	na	4.5	-0.4	Feb	0.8	3.3	Feb§	2.4		-3.4	3.8		-18.0	4.13	-5.8
Pakistan	5.4	2018**	na	3.4	9.4	Mar	7.8	5.8	2018	-4.2		-6.0	13.3	†††	431	141	-18.3
Philippines	6.3	Q4	6.6	5.9	3.3	Mar	4.4	5.2	Q1§	-2.2		-2.5	6.1		-63.0	51.8	0.6
Singapore	1.3	Q1	2.0	2.4	0.5	Feb	0.5	2.2	Q4	17.0		-0.6	2.1		-26.0	1.35	-3.0
South Korea	3.2	Q4	3.9	2.4	0.4	Mar	1.6	4.3	Mar§	4.6		0.5	1.9		-70.0	1,136	-5.5
Taiwan	1.8	Q4	1.5	1.8	0.6	Mar	0.1	3.7	Feb	13.1		-1.2	0.8		-26.0	30.9	-4.7
Thailand	3.7	Q4	3.3	3.5	1.2	Mar	0.9	0.8	Feb§	8.8		-2.5	2.2		-24.0	31.8	-1.8
Argentina	-6.2	Q4	-4.7	-0.9	54.1	Mar	46.1	9.1	Q4§	-2.2		-3.4	11.3		562	42.2	-52.0
Brazil	1.1	Q4	0.5	1.8	4.6	Mar	3.7	12.4	Feb§	-1.4		-5.8	7.1		-76.0	3.89	-11.8
Chile	3.6	Q4	5.3	3.2	2.0	Mar	2.2	6.7	Feb§††	-2.8		-1.4	3.9		-50.0	665	-10.3
Colombia	2.9	Q4	2.4	3.1	3.2	Mar	2.9	11.8	Feb§	-3.5		-2.0	6.4		2.0	3,167	-14.0
Mexico	1.7	Q4	1.0	1.6	4.0	Mar	4.1	3.4	Feb	-1.7		-2.3	8.1		68.0	19.0	-4.8
Peru	4.8	Q4	11.4	3.7	2.2	Mar	2.2	9.0	Feb§	-1.6		-2.0	5.6		64.0	3.30	-2.4
Egypt	5.5	Q4	na	5.1	14.2	Mar	12.1	8.9	Q4§	-0.1		-7.3	na		nil	17.3	2.2
Israel	2.9	Q4	3.1	3.1	1.4	Mar	1.2	4.1	Feb	2.7		-3.7	1.9		11.0	3.57	-1.4
Saudi Arabia	2.2	2018	na	1.8	-2.2	Feb	-1.1	6.0	Q4	2.7		-7.7	na		nil	3.75	nil
South Africa	1.1	Q4	1.4	2.2	4.1	Feb	5.0	27.1	Q4§	-3.0		-4.1	8.5		41.0	14.1	-14.2

Source: Haver Analytics. *% change on previous quarter, annual rate. †The Economist Intelligence Unit estimate/forecast. §Not seasonally adjusted. ‡New series. **Year ending June. ††Latest 3 months. ‡‡3-month moving average. §§5-year yield. †††Dollar-denominated bonds.

Markets

In local currency	Index	% change on:	
		Apr 16th	Dec 31st 2018
United States S&P 500	2,907.1	1.0	16.0
United States NAScomp	8,000.2	1.1	20.6
China Shanghai Comp	3,253.6	0.4	30.5
China Shenzhen Comp	1,760.0	-1.3	38.8
Japan Nikkei 225	22,221.7	1.9	11.0
Japan Topix	1,626.5	0.5	8.9
Britain FTSE 100	7,469.9	0.6	11.0
Canada S&P TSX	16,502.2	1.0	15.2
Euro area EURO STOXX 50	3,463.4	1.3	15.4
France CAC 40	5,528.7	1.7	16.9
Germany DAX*	12,101.3	2.1	14.6
Italy FTSE/MIB	21,918.9	1.1	19.6
Netherlands AEX	565.2	1.0	15.8
Spain IBEX 35	9,497.3	1.0	11.2
Poland WIG	61,067.1	nil	5.9
Russia RTS, \$ terms	1,255.5	0.6	17.8
Switzerland SMI	9,579.9	nil	13.6
Turkey BIST	96,809.0	-1.4	6.1
Australia All Ord.	6,372.3	0.9	11.6
Hong Kong Hang Seng	30,129.9	-0.1	16.6
India BSE	39,275.6	0.9	8.9
Indonesia IDX	6,481.5	nil	4.6
Malaysia KLSE	1,629.5	-0.8	-3.6

	index	% change on:	
		Apr 16th	Dec 31st 2018
Pakistan KSE	37,382.0	0.7	0.9
Singapore STI	3,332.0	0.2	8.6
South Korea KOSPI	2,248.6	1.6	10.2
Taiwan TWI	10,927.9	0.7	12.3
Thailand SET	1,660.5	0.2	6.2
Argentina MERV	32,290.2	1.7	6.6
Brazil BVSP	94,333.3	-2.0	7.3
Mexico IPC	45,009.4	-0.3	8.1
Egypt EGX 30	14,973.0	-0.8	14.9
Israel TA-125	1,479.4	2.6	11.0
Saudi Arabia Tadawul	9,139.6	1.0	16.8
South Africa JSE AS	58,902.6	1.8	11.7
World, dev'd MSCI	2,163.1	0.9	14.8
Emerging markets MSCI	1,093.6	nil	13.2

US corporate bonds, spread over Treasuries

	Dec 31st	
Basis points	latest	2018
Investment grade	156	190
High-yield	438	571

Sources: Datastream from Refinitiv; Standard & Poor's Global Fixed Income Research. *Total return index.

Commodities

The Economist commodity-price index

2005=100	% change on			
	Apr 9th	Apr 15th*	month	year
Dollar Index				
All Items	140.2	138.5	-1.1	-10.7
Food	144.3	141.0	-1.8	-10.6
Industrials				
All	135.9	135.9	-0.4	-10.7
Non-food agriculturals	126.7	126.7	1.0	-10.2
Metals	139.8	139.8	-1.0	-10.9
Sterling Index				
All items	195.4	192.0	nil	-2.5
Euro Index				
All items	154.6	152.2	-0.8	-2.5
Gold				
\$ per oz	1,304.9	1,287.3	-1.5	-4.2
West Texas Intermediate				
\$ per barrel	64.0	63.4	7.4	-4.7

Sources: CME Group; Cotlook; Darmann & Curl; Datastream from Refinitiv; FT; ICCO; ICO; ISO; Live Rice Index; LME; NZ Wool Services; Thompson Lloyd & Ewart; Urner Barry; WSJ. *Provisional.

For more countries and additional data, visit Economist.com/indicators

Gaining face

China is using Facebook to build a huge news audience in the developing world

THE CHINESE COMMUNIST PARTY'S approach to Facebook is, ahem, two-faced. At home, to stop citizens sharing messages it cannot read, it blocks the site. Clever users can defy the ban, but only 3m do. It is easier to use WeChat or Weibo, local rivals that the state watches closely.

Abroad, by contrast, China uses Facebook to dish up propaganda. Squillions of foreigners see its posts. The English-language page of CGTN, a state mouthpiece, has 77m fans—the most of any news site. China now runs five of the six media outlets with the biggest Facebook followings. None had more than 3m fans in 2014. If their current growth rates continue, by 2022 China Daily and CGTN will overtake the page of Cristiano Ronaldo, a footballer, who is Facebook's most followed celebrity.

This has given China a loud bullhorn. In 2018 its news pages yielded 370m likes, shares and comments. Russian trolls produced a mere 40m annual Facebook engagements when targeting American elections, according to the Oxford Internet Institute. Among the Chinese pages' most popular posts are Orwellian titles such as "China human rights report notes violations in us" and "Why is Tibet a target for Western countries to pick on China?"

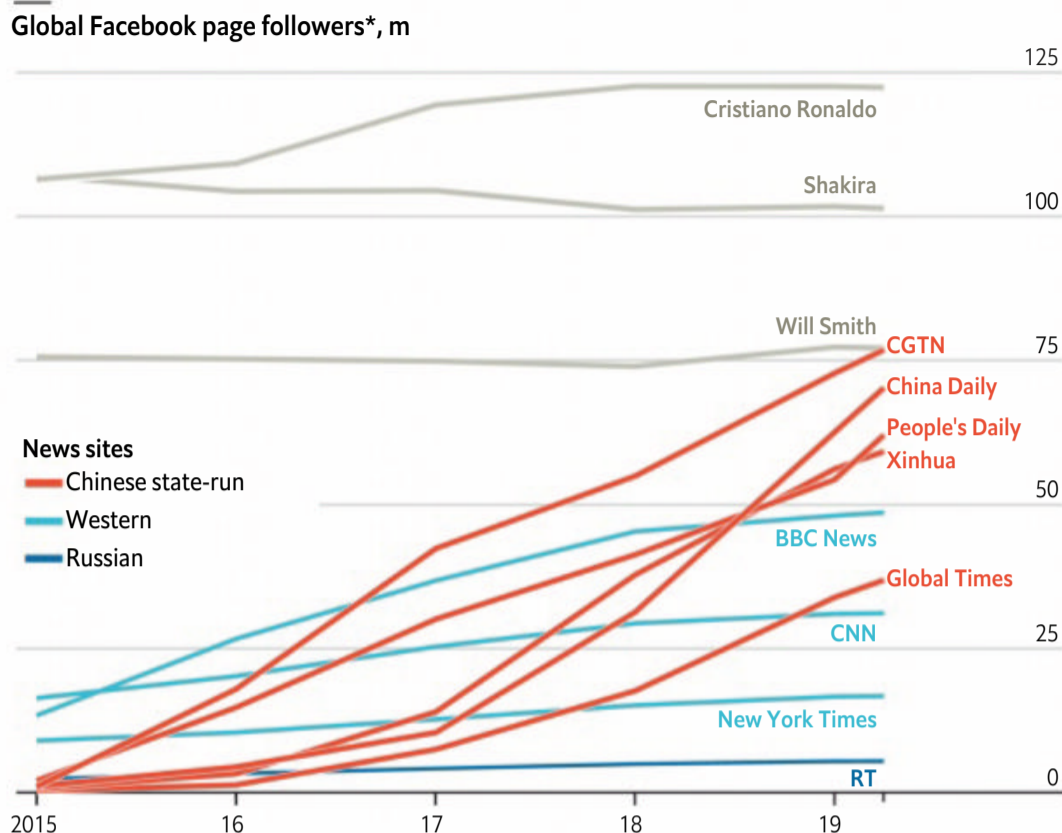
How has such dross gained so many fans? Perhaps because China has opened news bureaus in many poor countries, where most of them live. Yet the outlets' rapid growth looks improbable when compared with the sluggish rates of other Facebook news pages. Many young users have switched to Instagram and Snapchat.

Moreover, Facebook pages usually gain followers when people share posts with their friends. Chinese outlets receive far fewer shares than Western ones do, which implies that they use some other tactic to amass fans. Facebook has already accused Chinese actors of skulduggery. In March it sued four Chinese firms, which it said had sold "fake accounts, likes and followers".

Creating eager, bogus followers—who can fool algorithms into showing posts to more real people—is harder on Facebook than on Twitter. From January to September 2018 the company deleted 2.1bn bots. In response to our findings, Facebook said it would investigate these pages' growth.

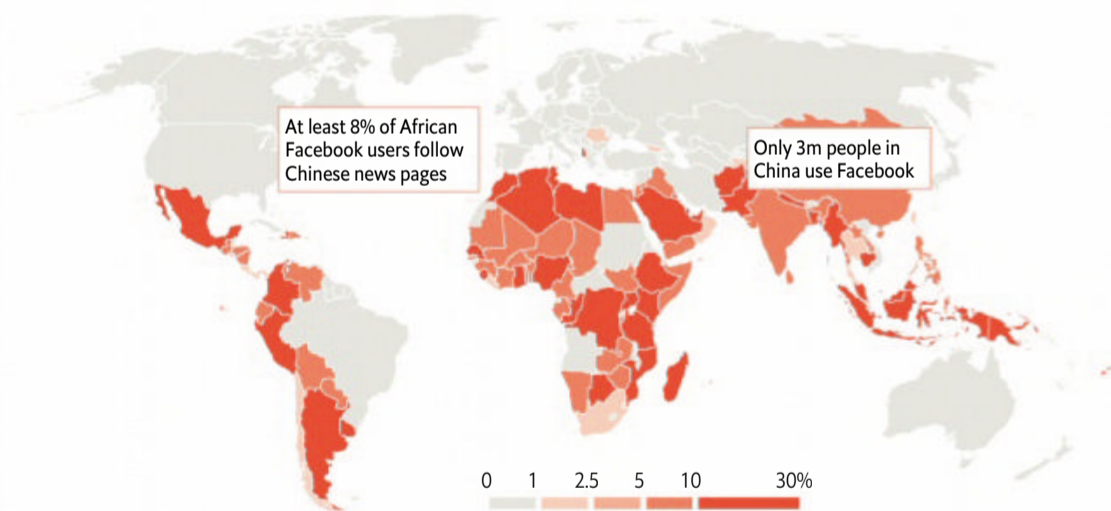
It would take a vast effort to hoodwink Facebook to this degree. But China spends \$10bn a year on soft power. If anyone could do so, it would be the Communist Party. ■

→ Chinese state-run news sites are reaching huge audiences on Facebook



→ The vast majority of these Facebook followers are outside China

Share of Facebook users who follow at least one Chinese state-run news site
Using fan base of the leading Chinese state-run news site in each country, %



→ Engagement with Chinese propaganda on Facebook is conspicuously low

Most popular Facebook stories about "Africa"

Chinese state-run news sites

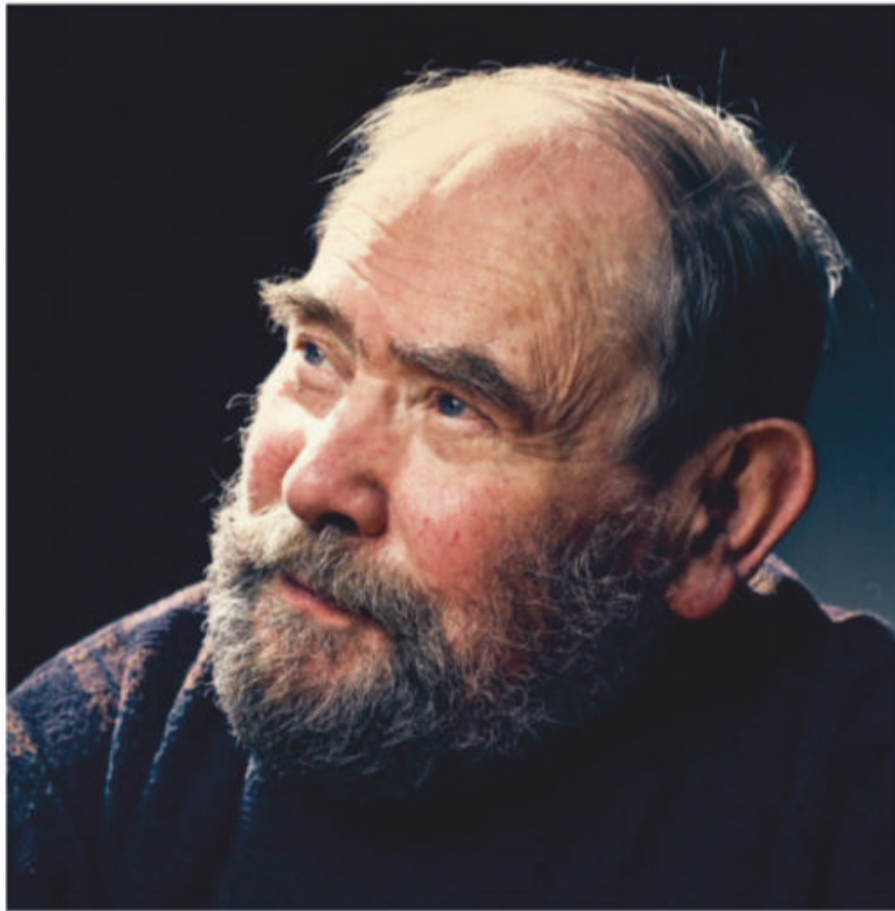
<i>The real situation of African swine fever in China</i> –CGTN	3.7k
<i>Mali arrests five suspects in killing of 157 villagers</i> –CGTN	3.1k
<i>China extends a helping hand to Malawi flood victims</i> –China Daily	2.1k
<i>Africa inches closer to continental trade agreement</i> –China Daily	2.0k
<i>Zambian firm starts importing electric cars from China</i> –Xinhua	1.9k
<i>President Xi congratulates inauguration of China-Africa Institute</i> –CGTN	1.4k

Western news sites

<i>Black leopard caught on camera in Kenya</i> –BBC News	90.9k
<i>Suspected rhino poacher killed by elephant and eaten by lions in S. Africa</i> –CNN	28.4k
<i>Last photos of Kenya's 'elephant queen'</i> –BBC News	26.0k
<i>The richest man who ever lived</i> –BBC News	20.3k
<i>The NBA is launching a professional basketball league in Africa</i> –CNN	8.4k
<i>Rastafarian 'god' gets African statue</i> –BBC News	7.4k

Sources: CrowdTangle; Socialbakers; Internet World Stats

*On January 1st each year and April 1st 2019



Irrepressible

Sydney Brenner, molecular biologist and spirited conversationalist, died on April 5th, aged 92

IT WAS A book, rather than the natural world itself, that made Sydney Brenner want to be a scientist. He was so captivated by “The Science of Life”, by H.G. Wells, Julian Huxley and G.P. Wells, that rather than return it to the public library in Germiston, his South African birthplace, he paid a daunting two-shilling fine for losing it. Purloined in the 1930s, it was still with him in the 1990s.

A precocious boy—a student at the University of the Witwatersrand by the time he was 15—and bullied for it, reading was his connection to the wider world. Courses, he said, never taught him anything. The way to learn was to get a book that told you how to do things, and then to start doing them, whether it was making dyes or, later in life, programming computers. If he thought more deeply than the other great biologists of his age, which he did, it was surely because he read further, too.

Unsurprising, then, that he saw the life he studied as a thing that could be read—and that could read itself. In 1960, during a long conversation with two of the other giants of molecular biology, Francis Crick and François Jacob, he was the first person in the world—by about a second—to understand how cells read genes to make proteins. In the 1970s he suggested a way of turning all the genes needed to make up a human into a “Book of Man”—a precursor to the Human Genome Project that he would go on to champion. The most sustained project of his life was an attempt to learn how a tiny worm read itself into existence from nothing but an egg and a genome.

Which is not to say that he was locked in silent study. Anything but. He was voluble, and mischievous. He joked, and harangued, and seemed rarely to let a thought go unexpressed. The years in which he shared an office with Crick in Cambridge were times of endless talk, of sense and nonsense; nothing, he would say, was too stupid to say. It was not a dictum to which he was true. He made plenty of people think that what they had said was indeed stupid.

He mocked people; he wrote them off, too. But he believed it was true of himself, and of those he chose to respect.

He met Crick in 1953, when on a cold April day he and other young researchers from Oxford drove to Cambridge to see the model of the DNA double-helix structure that Crick and James Watson had assembled at the Cavendish Laboratory. It was, he said, the watershed moment of his life. After spells in America and back in South Africa, he and Crick became room mates, friends and collaborators. They shared their fathers’ trade—both men had been shoemakers, though Harry Crick’s Northamptonshire version of the business had been more comfortable than that of Morris Brenner, an illiterate Lithuanian immigrant. They shared impressive eyebrows, too. Recalling a conversation with Brenner at the high table of Kings College, the historian Horace Freeland Judson noted that some of the hairs in them were a full three inches long.

More to the point, Brenner and Crick developed a shared way of looking at the problem they faced: how DNA told cells to make proteins. Brenner had read papers by the mathematician John von Neumann from which he had taken the lesson that what was necessary for reproduction was a structure that contained within itself an account of how it could be made—the account, the finished structure and the means of its making being logically distinct. Though he did not articulate the ideas straight away, they were to inform both men’s thinking about the genetic code that is written in DNA and how it is read first by being transcribed into “messenger RNA” and then translated through “adaptors” into protein.

By the early 1960s they were looking for new fields. Brenner chose to apply the idea that a life form was a computer reading a program that told it how to make itself at the level of a whole organism, rather than a cell or virus. To do this, he needed an organism to study. Naturally, he looked for it in books. On a day when he was ill his wife May collected one from Heffers, a Cambridge bookshop, that introduced him to a tiny nematode worm called *Caenorhabditis elegans*. It turned out to be perfect; transparent, and thus easily looked into; easily frozen, too, for later use. Normally hermaphroditic, which meant it could be copied; but capable of sex, so mutants could be crossbred when necessary. Simple—just a few thousand cells in all, and with a nervous system (Brenner’s particular interest) of just 300. Quickly bred—a generation every three days. And its development was as deterministic as a programmer could wish; every adult with the same number of cells arranged the same way, every connection between nerves constant and mappable.

Brenner and his colleagues spent decades anatomising the worm’s development, its genome and the fate of all its cells. Increasingly, labs elsewhere followed suit; by one estimate the worm and its workings are now studied by 1,500 research groups around the world. Brenner, his Cambridge colleague John Sulston and Robert Horvitz of MIT were awarded the Nobel prize for medicine in 2002 in recognition of their work on its developmental pathways and the ways that some cells were programmed to die in order for the desired final anatomy to take shape.

Starter for ten

He was, for the most part, a starter, not a finisher, much better at opening institutions than running them. In his early years, he delighted in remembering later on, he was described as an “enfant terrible” of his field; at an age when others would retire (he never did) he re-styled himself as wily old Uncle Syd, dispensing sharp questions and half-formed provocations, surprising young researchers with an ability to know what organism they were working on by reading just a snatch of DNA or protein sequence over their shoulder.

“Inside every animal there is an internal description of that animal,” Brenner told Judson at high table as Judson fixated on his eyebrows. Inside him sat both the reasons for the flamboyant development of those hairs and the reason such internal descriptions so fascinated him. It was a life that read itself. ■



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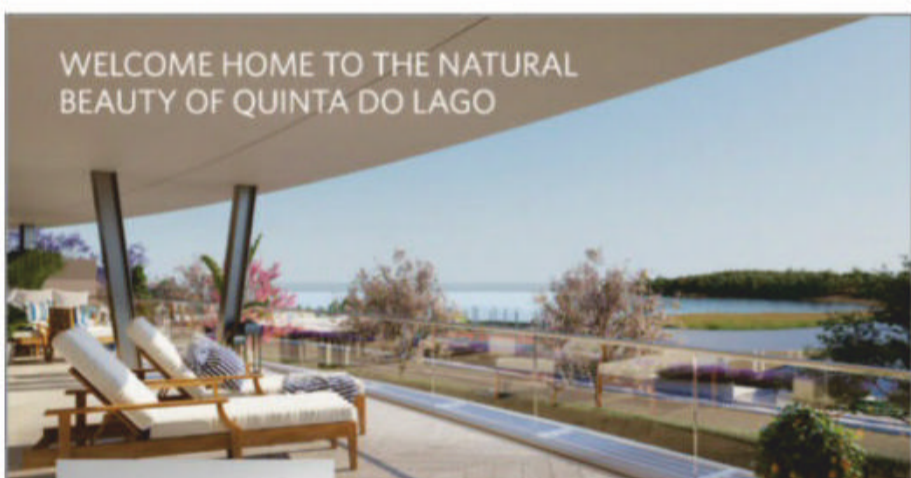
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