The Economist

JUNE 19TH–25TH 2021

Broadbandits

The surging cyberthreat from spies and crooks

The world this week

Politics this week

Jun 19th 2021

Joe Biden and Vladimir Putin met in Geneva for a summit. It lasted less than four hours, but both men described it as constructive. The two sides agreed to return their ambassadors, who were recalled earlier this year, and said they would work on new nuclear-arms-control measures. Mr Biden criticised Russia's human-rights record, but said the topic should be dealt with separately from other matters, such as security and climate change. Mr Putin denied that Russia engages in cyber-attacks.

China rejected criticism made by G7 countries at their summit in Britain. The G7 had called for peace in the Taiwan Strait and asked China to respect human rights, especially in Xinjiang and Hong Kong. A Chinese official said America was sick and the G7 should give it medicine. Meanwhile, 28 Chinese military aircraft flew into Taiwan's airspace, more than had been recorded on any previous day.

China passed a law allowing its government to retaliate against sanctions imposed on it by other countries. Individuals or entities involved in implementing such sanctions could be put on a blacklist and have their assets in China seized. In Hong Kong the editor and four other people associated with the *Apple Daily*, a pro-democracy newspaper, were arrested for publishing articles calling for sanctions against the city's and mainland's governments.

North Korea's dictator, Kim Jong Un, warned that the country faced food shortages, which he blamed on flooding, covid-19 and sanctions.

Myanmar's ruling junta put Aung San Suu Kyi on trial behind closed doors. The army, which took power in a coup in February, has charged the country's former leader with seven crimes, including corruption and possessing walkie-talkies. If found guilty she faces decades in prison.

Tens of thousands of people rallied in Madrid against the government's plan to pardon 12 separatists from Catalonia who were behind an illegal independence referendum in 2017. Nine of the separatists were found guilty of sedition, in what was Spain's biggest political crisis for decades. Some 60% of Spaniards oppose their pardons.

At a referendum in Switzerland, voters narrowly rejected a plan to levy taxes on airline tickets and car fuel to tackle climate change, complicating the government's ambitions under the Paris accord.

Boris Johnson postponed the final lifting of covid restrictions in England for what had been labelled "Freedom Day". Cases of the Delta (Indian) variant are rising. Britain's prime minister hopes that by July 19th two-thirds of the population will be fully vaccinated and restrictions can at last end. Meanwhile, it was reported that care-home staff will have to be vaccinated if they want to keep their jobs.

A judge found that Joe Biden may have exceeded his presidential powers when he stopped issuing licences to drill for oil and gas on federal land, one of his first orders as president. Granting an injunction against the order, the judge said that only Congress could take such action.

Another six opposition politicians were arrested in Nicaragua, bringing the total to 13 in recent weeks. They have chided President Daniel Ortega, who stands for re-election in November and seems determined to do anything to win.

Pedro Castillo, a hard-leftist, claimed victory in Peru's presidential election. He finished 44,000 votes ahead of his rival, Keiko Fujimori, the hard-right daughter of a former president. She claims that the count was inflated by fraud and has promised to challenge the result in court.

Criminal violence in Port-au-Prince, the capital of Haiti, has led 8,500 people, mostly women and children, to flee their homes, according to Unicef. Some 14,000 people have been displaced.

Naftali Bennett was sworn in as prime minister of Israel, ending Binyamin Netanyahu's 12 years in power. Mr Bennett faced an immediate test when Jewish nationalists marched through the Old City of Jerusalem, some chanting racist slogans. Hamas, the Palestinian militant group that runs Gaza, launched incendiary balloons at Israel, which responded with air strikes in Gaza. There were no casualties. It was their first big clash since last month.

Lebanon's currency, which has lost more than 90% of its value since October 2019, hit a new low. The country is mired in an economic crisis that has left it short of basic goods such as fuel and medicine. Efforts to form a new government remain stalled.

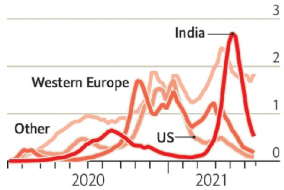
America is considering a plan to send commandos back to Somalia. This would partly reverse a decision by Donald Trump, who withdrew all 700 American troops from the country. The soldiers would train Somali forces battling al-Shabab, a jihadist group.

Tedros Adhanom Ghebreyesus, the head of the World Health Organisation, warned that poor countries needed more vaccines for covid-19, and now, "not next year". The G7 had just promised 1bn doses. At least 11bn will be required if 70% of the world's population is to be vaccinated by the time the G7 meet again in 2022.

Coronavirus briefs

To 6am GMT Jun 17th 2021

Weekly confirmed cases by area, m



Vaccination doses

	Total '000	% of over-11s with 1st dose	2nd
UAE	13,964	99	62
Malta	596	88	65
Israel	10,632	82	77
Mongolia	3,566	78	69
Bhutan	483	78	0
Iceland	327	78	36
Canada	29,918	75	16
Chile	20,657	73	55
Uruguay	3,358	73	43
Britain	72,041	72	52

Sources: Johns Hopkins University CSSE; Our World in Data; United Nations

The Economist

The number of infections continued to fall in India. Tourist attractions, including the Taj Mahal, re-opened to visitors. There are worries that easing restrictions will cause a new wave of cases.

Officials in Moscow told people to work from home, as new daily cases in the city leapt to their highest level since December.

California and New York lifted almost all their remaining restrictions. The number of new infections in both states are at their lowest levels since the start of the crisis.

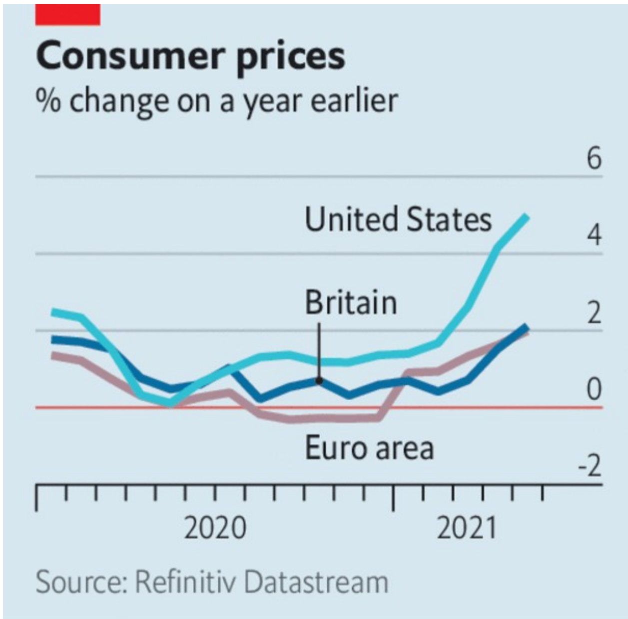
Tanzania said it would release data on covid-19 infections for the first time in more than a year. This would make the IMF and World Bank more likely to disburse funds. Tanzania's late president, John Magufuli, had halted the publication of such statistics. He also denied there was covid in his country, and said that vaccines did not work.

Business this week

Jun 17th 2021

The Federal Reserve left interest rates on hold at its latest meeting, though there was a perceptible shift in the mood music. The central bank's projections now suggest that rates will be lifted twice in 2023, a change from previous guidance that they would remain at record-low levels until the end of 2024. The US economy is recovering from the pandemic more quickly than had been thought.

Inflation sensation



The Economist

The annual rate of change in Britain's consumer price index jumped to 2.1% in May, from 1.5% in April. Inflationary pressures are increasing as economies return to business. Inflation in America also rose again in May, to 5%, the highest reading since August 2008.

With inflation running at 8%, Brazil's central bank raised interest rates for the third time this year, lifting its benchmark rate to 4.25%.

A big factor driving inflation is rising energy costs. The price of Brent crude closed in on $75 a barrel this week after OPEC and the International Energy Agency issued bullish forecasts on demand for oil. The IEA called on OPEC to "open the taps" to keep markets adequately supplied.

The European Union conducted the first funding operation for its Next Generation EU programme, raising €20bn ($24.2bn) through the sale of a ten-year bond, the largest amount the EU has raised in a single transaction. The bloc wants to tap €800bn in capital markets by the end of 2026 to finance the recovery fund.

America and the EU reached a deal to end their 17-year dispute over subsidies for Boeing and Airbus. Tit-for-tat tariffs will be suspended for five years while both sides work out an arrangement to limit subsidies and discuss other issues, such as funding to develop new aircraft.

Five bills were introduced in America's House of Representatives that aim to curb the power of big tech companies by, among other things, prohibiting a dominant platform from promoting its products over others and barring the use of takeovers to smother competition. The most ambitious overhaul of antitrust law in decades would affect all firms, but is directed at Apple, Amazon, Facebook and Google. The bills face a long journey through Congress.

Big tech companies are to face a formidable foe at the Federal Trade Commission, where Lina Khan has been appointed chairwoman. Just 32 years old, Ms Khan is a professor at Columbia University Law School and has written extensively on reforming antitrust law. She was a counsel to the congressional committee that drafted a report forming the basis of the bills in the House.

Satya Nadella took on the role of chairman at Microsoft in addition to his job as chief executive, the first time that both roles have been combined since Bill Gates was in charge.

Didi Chuxing filed papers to list shares on either the Nasdaq or New York Stock Exchange. Expected next month, the IPO of China's biggest ride-hailing firm could raise a reported $10bn.

Emirates reported an annual loss of $5.5bn for the year ending March 31st. With international travel almost at a standstill because of the pandemic the airline carried just 6.6m passengers over the 12 months, down by 88% from the previous year. The government of Dubai will continue to support the company, which has shed almost a third of its workforce since the start of the crisis.

Britain struck a free-trade deal with Australia, the first agreement negotiated from scratch by the British government since Brexit. British farmers are worried that their market will be swamped by cheaper goods from Down Under. They will be protected by a cap on tariff-free imports for 15 years.

Nagayama Osamu said he would consider resigning as chairman of Toshiba, following the publication of a scathing independent report into collaboration between management and the Japanese government, but only after he had fixed the company's problems. The report laid bare the extent to which officials colluded to head off a rebellion at last year's shareholders' meeting, which critics say proves that the government is more interested in protecting cronies than investors' interests.

A court in France fined IKEA €1m ($1.2m) for spying on its staff through a surveillance system between 2009 and 2012. The former head of risk at IKEA France reportedly once inquired how a member of staff could afford a new BMW.

Get off the chaise longue

Bankers in America are being pressed to return to the office after a year of remote working. James Gorman, the boss of Morgan Stanley, told staff that if they felt comfortable visiting a restaurant in New York then they should also come back to the office. Goldman Sachs has taken the toughest approach, ordering all its employees back to their desks.

KAL's cartoon

Jun 19th 2021

Leaders

Computer security

To stop the ransomware pandemic, start with the basics

That will help stop other sorts of cyber-mischief, too

Jun 19th 2021

TWENTY YEARS ago, it might have been the plot of a trashy airport thriller. These days, it is routine. On May 7th cyber-criminals shut down the pipeline supplying almost half the oil to America's east coast for five days. To get it flowing again, they demanded a $4.3m ransom from Colonial Pipeline Company, the owner. Days later, a similar "ransomware" assault crippled most hospitals in Ireland.

Such attacks are evidence of an epoch of intensifying cyber-insecurity that will impinge on everyone, from tech firms to schools and armies. One threat is catastrophe: think of an air-traffic-control system or a nuclear-power plant failing. But another is harder to spot, as cybercrime impedes the digitisation of many industries, hampering a revolution that promises to raise living standards around the world.

The first attempt at ransomware was made in 1989, with a virus spread via floppy disks. Cybercrime is getting worse as more devices are connected to networks and as geopolitics becomes less stable. The West is at odds with Russia and China and several autocracies give sanctuary to cyber-bandits.

Trillions of dollars are at stake. Most people have a vague sense of narrowly avoided fiascos: from the Sony Pictures attack that roiled Hollywood in 2014, to Equifax in 2017, when the details of 147m people were stolen. The big hacks are a familiar but confusing blur: remember SoBig, or SolarWinds, or WannaCry?

A forthcoming study from London Business School (LBS) captures the trends by examining comments made to investors by 12,000 listed firms in 85 countries over two decades. Cyber-risk has more than quadrupled since 2002 and tripled since 2013. The pattern of activity has become more global and has affected a broader range of industries. Workers logging in from home during the pandemic have almost certainly added to the risks. The number of affected firms is at a record high.

Faced with this picture, it is natural to worry most about spectacular crises caused by cyber-attacks. All countries have vulnerable physical nodes such as oil pipelines, power plants and ports whose failure could bring much economic activity to a standstill. The financial industry is a growing focus of cybercrime: these days bank robbers prefer laptops to balaclavas. Regulators have begun to worry about the possibility of an attack causing a bank to collapse.

But just as costly is the threat to new tech as confidence in it ebbs. Computers are being built into cars, houses and factories, creating an industrial "internet of things" (IOT). Insights gleaned from oceans of data promise to revolutionise health care. In theory, all that will boost productivity and save lives for years to come. But the more the digital world is plagued by insecurity, the more people will shy away from it and the more potential gains will be lost. Imagine hearing about ransomware in someone's connected car: "pay us $5,000, or the doors stay locked."

Dealing with cyber-insecurity is hard because it blurs the boundaries between state and private actors and between geopolitics and crime. The victims of cyber-attacks include firms and public bodies. The perpetrators include states conducting espionage and testing their ability to inflict damage in war, but also criminal gangs in Russia, Iran and China whose presence is tolerated because they are an irritant to the West.

A cloud of secrecy and shame surrounding cyber-attacks amplifies the difficulties. Firms cover them up. The normal incentives for them and their counterparties to mitigate risks do not work well. Many firms neglect the basics, such as two-step authentication. Colonial had not taken even simple precautions. The cyber-security industry has plenty of sharks who bamboozle clients. Much of what is sold is little better than “medieval magic amulets”, in the words of one cyber-official.

All this means that financial markets struggle to price cyber-risk and the penalty paid by badly protected firms is too small. The LBS study, for example, concludes that cyber-risk is contagious and is starting to be factored into share prices. But the data are so opaque that the effect is unlikely to reflect the real risk.

Fixing the private sector’s incentives is the first step. Officials in America, Britain and France want to ban insurance coverage of ransom payments, on the ground that it encourages further attacks. Better to require companies to publicly disclose attacks and their potential cost. In America, for example, the requirements are vague and involve large time lags.

With sharper and more uniform disclosure, investors, insurers and suppliers could better identify firms that are underinvesting in security. Faced with higher insurance premiums, a flagging stock price and the risk of litigation, managers might raise their game. Manufacturers would have more reason to set and abide by product standards for connected gizmos that help stem the tide of insecure IoT devices.

Governments should police the boundary between the orthodox financial system and the shadowy world of digital finance. Ransoms are often paid in cryptocurrencies. It must be made harder to recycle money from these into ordinary bank accounts without proof that the money has a legitimate source. Likewise with cryptocurrency exchanges, which should face the same obligations as established financial institutions.

Cyber-insecurity is a matter of geopolitics, too. In conventional warfare and cross-border crime, norms of behaviour exist that help contain risks. In the cyber-domain novelty and confusion reign. Does a cyber-attack from criminals tolerated by a foreign adversary warrant retaliation? When does a virtual intrusion require a real-world response?

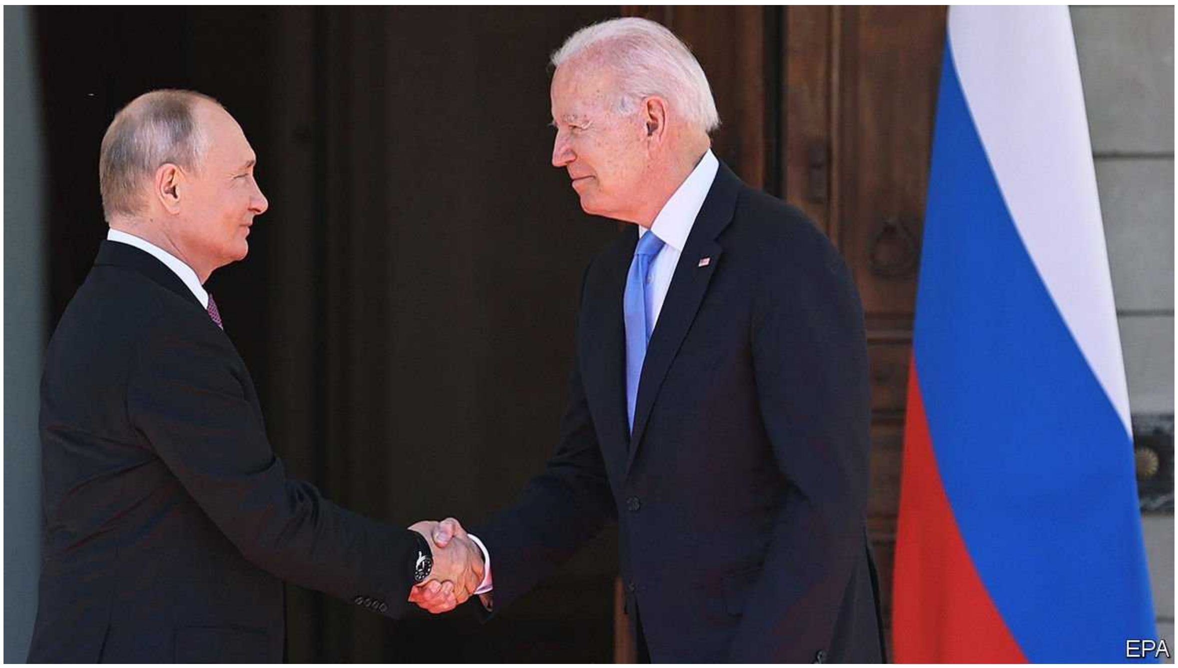
A starting-point is for liberal societies to work together to contain attacks. At the recent summits of the G7 and NATO, Western countries promised to do so. But confronting states such as China and Russia is crucial, too. Obviously, they will not stop spying on the Western countries that do their own snooping. But a third summit, between Presidents Joe Biden and Vladimir Putin, began a difficult dialogue on cybercrime. Ideally the world would work on an accord that makes it harder for the broadbandits to threaten the health of an increasingly digital global economy. ■

Worth the air miles

Joe Biden's summit with Vladimir Putin yielded only modest gains

But it beats the turbulence of the recent past

Jun 19th 2021



THE AIM, President Joe Biden said, before setting off on a European tour that ended in a summit with his Russian counterpart on June 16th, was to "make it clear to Putin and China that Europe and the United States are tight". He achieved that, more or less. After meetings of the G7 and NATO and an EU-American pow-wow, it is clear that the rich countries of Europe and North America (and Japan) share common concerns about the two great autocracies that confront them. Whereas Donald Trump showed a strange fondness for dictators, Mr Biden is doing a fair job of uniting democracies to call the autocrats out.

Mr Putin and Mr Biden arrived in Geneva without much room for manoeuvre. Mr Biden wants to look tough on Russia, but finds himself constrained. He needs Russian help on a range of issues, including climate change, keeping nukes out of Iran, ending the war in Syria, forging new arms-control treaties and, perhaps most of all, avoiding an escalation of the conflict in Ukraine that might suck America in.

Mr Putin is constrained, too. He faces dissent at home, and would gain from a relaxation of economic sanctions. Russia has turned itself into a "fortress economy" to withstand these, but that makes life harder for ordinary Russians. Mr Biden cannot give him such relief, so long as the repression that is necessary to Mr Putin's political survival goes on, and in the absence of a humiliating withdrawal from Ukraine.

Still, they talked for four hours, and both men agreed that it had been constructive. After the summit, Mr Biden put the issues into three buckets. The first is those areas where America and Russia share common interests and can work together. These include climate change, Iran, the Arctic and arms control, where there was an outline agreement to restart stalled talks. Both sides agreed to return their ambassadors, who were recalled earlier in the year, after Mr Biden called Mr Putin a "killer". On these issues grown-up, plodding diplomacy will resume.

The second bucket is trickier. Mr Biden warned Mr Putin that America will protect its own interests and those of allies, over cyber-attacks or the territorial integrity of Ukraine. The trouble is that no one knows how far Mr Biden would be willing to go, and Mr Putin simply denies everything. He insists, for example, that Russia, not America, is the main victim of hacking.

The third area is human rights, where Mr Biden says America will always defend universal values and warned of "devastating consequences" if Alexei Navalny, an opposition leader, should die in prison. However, by putting them in their own bucket, he hinted that human rights are not the reddest of red lines. Critics will call this détente at best, a sell-out at worst. Others will see it as sensible. Relations with Russia are too important to be seen only through one lens.

Mr Putin may welcome a breathing space, especially if he is, more or less, left alone within his borders. If he continues troublemaking, it is unclear how much stomach Mr Biden has for a fight. Like Mr Trump and Barack Obama, he rightly sees China, not Russia, as the urgent challenge. He would love to leave Russia to the Europeans, letting America devote its full attention to Asia. But the Europeans are not up to the task. They are divided among themselves and parsimonious.

What is left if finger-wagging achieves little and it is too hard to restrain autocracies? Mr Biden talks of outcompeting them. Yet the G7 summit missed a chance to show leadership, pledging to donate fewer than 1bn doses of covid-19 vaccine to the less fortunate, a tenth of what is needed. It also failed to add flesh to its grand ideas about a Build Back Better World (an infrastructure plan to compete with China's Belt and Road Initiative). Outdoing Russia economically is not hard, but China is a different matter. Mr Biden's domestic agenda is hobbled by congressional gridlock and deep political polarisation. America will find that contest a more severe one. ■

For more coverage of Joe Biden's presidency, visit our dedicated hub

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Corporate governance

Investors in technology need to pay attention to corporate governance

Investors in technology firms too often put up with ropy corporate governance. They may come to regret it

Jun 19th 2021

Luca D'Urbino

EVERY BUSINESS cycle, as it runs out of puff, reveals problems that seem obvious in hindsight. Twenty years ago, when stockmarkets slumped, accounting frauds came to light at Enron, an energy-trading firm, and WorldCom, a telecoms outfit. Less spectacular were the revelations that many companies had cut corners or behaved recklessly. The actions of titanic bosses ruling over General Electric and Vivendi, a French media group, ended up hobbling them for decades. After 2008, the emperors of Wall Street were revealed to be wearing no clothes, with Lehman Brothers, Merrill Lynch and others collapsing under the weight of huge losses—and their bosses' giant egos.

Guessing where tomorrow's cautionary tale may lie is not easy. But investors seeking to avoid blow-ups should pay special attention to securities, companies and bosses that encapsulate the boom today. One area of financial risk is the thriving high-yield debt market where underwriting standards have slipped. In the corporate world the prime candidate for a governance conflagration is the technology industry.

One reason is the enduring exuberance for anything with the whiff of tech. The recession caused by covid-19 was a hammer-blow to many parts of the global economy. But a side-effect of the pandemic was to turbocharge Silicon Valley and its various offshoots, amplifying an already unprecedented bull run. All manner of sins, from questionable accounting to imperious executive behaviour, tend to be overlooked in good times. As Warren Buffett famously noted, only when the tide goes out can you see who has been swimming naked.

Another reason to watch tech is the plentiful funding for risky ventures. Investors desperate for returns have been shovelling money at businesses with high valuations, but whose prospects are far from proven. Didi Chuxing, a Chinese ride-hailing outfit, may well receive a valuation of over $100bn in an upcoming share sale, despite amassing $13bn of cumulative losses. Further rum has been added to the punch with the proliferation of special-purpose acquisition companies, or SPACs, which are listed pots of money designed to merge with private firms.

The last reason to watch out for tech firms is their bosses. Dotcoms and their corporate cousins are often still run by their founders. Many of them have controlling stakes, thanks to souped-up voting rights. These entrepreneurs tend to have a messianic confidence in their own abilities and a fortune to match. The heady potion of control, wealth and self-belief can lead bosses to brush aside all criticism and to look upon rules as things for other people.

One firm that highlights all of these worries is SoftBank. The world's biggest tech investor, with a market value of over $120bn, it has been instrumental in fuelling today's ebullience. Some of its bets, including Didi and Coupang, a South Korean e-commerce champion, have been great successes. But as well as backing some hits, and its inevitable share of duds, the Japanese firm has also become mired in firms like Greensill, a British lender that collapsed earlier this year; WeWork, a troubled office company; and Wirecard, a fraudulent German fintech firm.

That raises questions about how SoftBank itself is run. Although a tentacular outfit, the firm is best thought of as the Masa show, where all the big decisions are made by its founder and boss, Son Masayoshi. This includes how to allocate oodles of capital—the firm is currently spending over $200m a week backing companies.

Risk control at the firm is patchy. Its internal hedge fund, once dubbed the "Nasdaq Whale", roiled markets last year, sending shares of various companies berserk. The firm has morphed so many times analysts admit struggling to understand what goes on there. Dealings between the firm, its funds, its executives and its affiliates can create the risk of conflicts of interest.

SoftBank is not alone. There is surely questionable corporate governance in other tech firms, too. Disclosure is patchy at best. At the big tech firms, it is far less demanding than at big banks: Facebook's annual report has 129 pages, compared with 398 at JPMorgan Chase. This week executives at Lordstown Motors, an electric-vehicle startup, resigned after the firm made inaccurate disclosures. Those dual-class shareholding structures often let exalted founders keep control.

In tech, activist investors hold relatively little sway. Their arrival would go some way to improve corporate-governance standards by subjecting management to more rigorous scrutiny (as Elliott has at SoftBank). In their absence, conventional shareholders and creditors should be vigilant. When the tide goes out—as one day it will—the investors who paid closest attention during the dizzying days of the boom will be rewarded. ■

After the caliphate

Relative peace gives Iraq a chance to build a functioning state

If it fails, mayhem beckons

Jun 19th 2021

SINCE THE overthrow of Saddam Hussein, a blood-soaked despot, Iraq has lurched from crisis to civil war and back again. Today, as the country prepares for an election in October, many Iraqis say they are too disgusted to vote. What is the point, they ask, when the government they will elect can barely govern, when politicians are useless and corrupt, and when the country is really run by militias, factions, tribal chiefs and foreign powers?

Yet there is cause for hope. The main one is that Iraq is less violent than it was. As recently as 2014, a third of its territory was controlled by Islamic State (IS), a group that enslaved women and burned people in cages. Since the "caliphate" was crushed in 2017, a measure of calm has returned, letting businesses operate and children walk to school without fear of being blown apart by a car bomb. The economy is set to recover from the shock of covid-19. And peace creates an opportunity for Iraqis to build a state that actually works.

An essential step in that direction is to defang the militias. Several of these mostly Shia armed groups were created to defeat IS. Ayatollah Ali al-Sistani, the most revered Shia cleric in Iraq, urged young men to join the fight. However, when the campaign ended, they did not lay down their arms. Quite the opposite: they wangled permanent spots on the public payroll.

The militias' budget for salaries has increased annually, from 1.3trn Iraqi dinars ($1.1bn) in 2018 to 3.5trn Iraqi dinars in 2021. Iraq's government now spends 2% of GDP on its informal armed forces, more than most countries spend on their formal ones. This does not include the money that militias make from smuggling and extortion. And many are anything but loyal to the state. Some take orders from Iran; others from venal warlords.

It would help if Ayatollah Sistani, who has gone silent of late, told the militias that their mission is over. Regardless, the government should seek to take charge of the vast fiefs the militias control. It should also integrate some of their gunmen into the Iraqi army, under the regular chain of command, and demobilise and pension off the rest.

This will be both horribly expensive and dangerous—a vocal advocate of demobilisation was recently murdered. But the alternative is worse. Some militia bosses aim to emulate the Iranian Revolutionary Guard Corps, a force that corruptly dominates the Iranian economy and takes orders only from Iran's top theocrat. A plan to demobilise Iraqi militias was drafted years ago. It should be dusted off and implemented.

Another vital step is for the government to provide services for citizens and not just jobs for civil servants. Pay and pensions for public-sector workers sometimes gobble up more than all the state's oil revenues. Hiring is nepotistic. No private employer pays so much for so little work, so most Iraqis want a government job. This makes it harder for private firms to recruit. It also devours cash that could be used for schools, hospitals and welfare for the truly needy. The finance minister has a plan to slim the civil service, remove ghost workers and invest in things that benefit the majority of Iraqis. It should be enacted.

Third, the government should scrap energy subsidies, which cost a staggering 10% of GDP. Electricity is cheap—or, since bills are seldom collected, entirely free—so users waste it on a huge scale. To generate more, the government imports gas from Iran, but often fails to pay for it.

None of this is necessary. Iraq produces lots of gas, but wastefully flares most of it. The country should capture more and impose a market rate on consumers. This would give them an incentive to conserve energy, public money and the environment.

To help bring all this about, voters need to vote. Although this can be scary in militia-dominated areas, when Iraqis boycott the ballot it only cements the grip of the armed groups and the hated corrupt factions. It would help if the anti-graft protesters who made so much noise in 2019 got themselves organised and offered an alternative. Failing that, voters should pick the cleanest candidate in their district.

The long road back

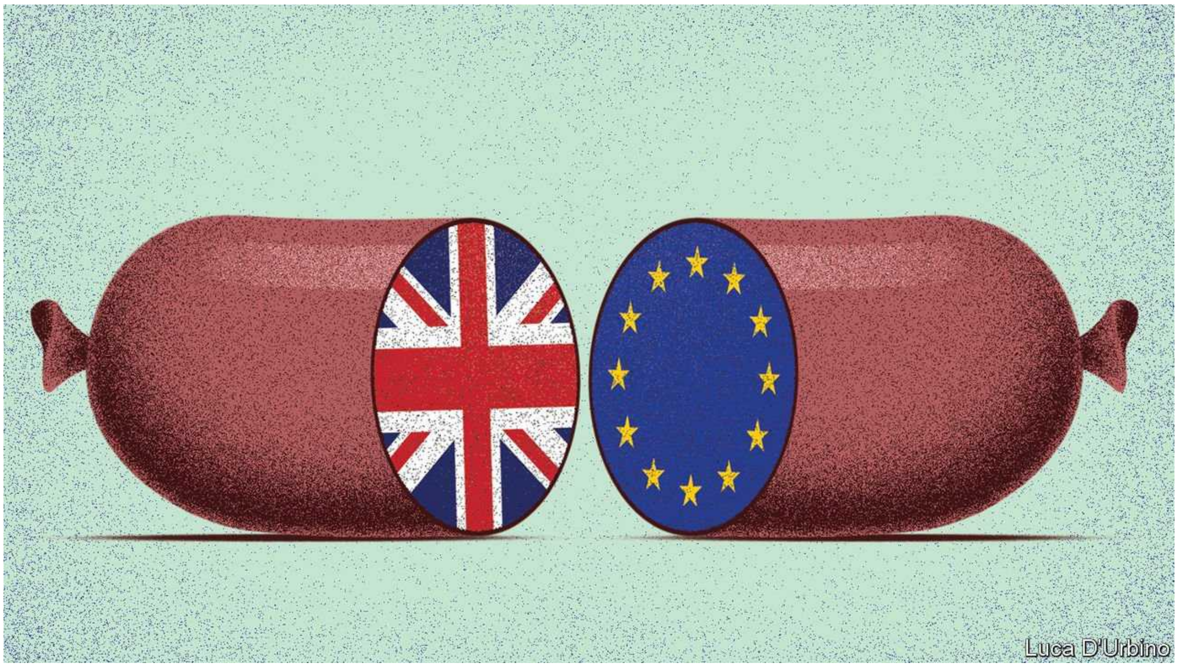
The next Iraqi government will face plenty of opposition to such reforms if it attempts them. All the more reason to agitate harder for them. Building a state is tough, and will take a long time. But it is in Iraqis' interest. Their country's recent experience of chaos should make them aware of the price of failure. ■

Northern Ireland

The quest for a more pragmatic Northern Ireland protocol

Britain and the European Union should seek compromise over Northern Irish trade

Jun 19th 2021



SELDOM CAN a mere treaty_protocol have caused so much fuss so soon after it was signed. Under Boris Johnson's Brexit deal, Great Britain has left the European Union's single market and customs union. But to avoid a hard north-south border in Ireland, Northern Ireland has, in effect, remained in both. That necessitates border and customs checks between the province and Great Britain instead.

The prime minister is now attacking Brussels for its legal purism in enforcing their agreement. His supporters denounce the EU's colonialism and lack of feel for delicate Northern Irish politics. They have even accused EU leaders of treating the province as if it were no longer a full member of the United Kingdom.

Yet it was Mr Johnson who chose to negotiate the protocol as the alternative to the loathed "backstop" engineered by Theresa May, his predecessor. This would have kept the entire United Kingdom in a customs union with the EU. The protocol lays down precisely how this alternative arrangement should work, including rules to block movement of chilled meats such as fresh sausages, after a grace period that expires on June 30th.

Mr Johnson knew all this when he triumphantly ratified the protocol, calling it the best of both worlds. It is disingenuous for him to feign outrage today, when Brussels calls for the rules to be implemented, not broken. However much he relishes the political gains from a fight with the EU, for the sake of peace in Ireland and the health of Britain's most vital commercial relationship, he should compromise—and the EU should go out of its way to help him.

An early sign of the potential costs came at the G7 summit in Cornwall, Britain's post-Brexit coming-out party, which was partly overshadowed by squabbles over the protocol. Mr Johnson signalled that he plans to break the treaty (and, once again, international law) by unilaterally extending the chilled-meats grace period. Brussels meanwhile is insisting that it will invoke its right to retaliate with tariffs.

A tariff war over sausages would be an absurdity. The EU runs by law and it fears that Mr Johnson will gradually undermine the entire protocol. But by pressing its case it is playing into his hands, because his poll ratings rise in line with battles with the EU. Even if the law is on its side, the politics are not.

A compromise is available. The EU could be more creative in assessing whether goods going to Northern Ireland are really about to cross into its single market. It is already easing the movement of guide dogs and medicines, and the single market has just survived six months of free-flowing British sausages.

Although the EU does not trust the British government, Mr Johnson could help by offering a concession of his own by promising to observe, for a limited period, EU food-safety standards, as Switzerland does. That would eliminate 80% of checks in the Irish Sea and, moreover, allow beef, lamb and fisheries exports from Britain to the EU to resume.

Some argue against this, pointing to a British ideological allergy to any alignment with EU rules. Yet the British government is sticking to the EU's veterinary standards—indeed, it is promising to exceed them. Others say that regulatory divergence with the EU may be needed to secure a free-trade deal with America, a big food exporter. Yet at the G7 summit Mr Biden promised that this would not be the case. In any event, there is no prospect of a transatlantic free-trade deal for several years.

Other free-trade deals with, say, Australia would still be possible while sticking to EU rules. Switzerland has a deal with China and, unlike EU countries, can import hormone-treated beef if it is labelled. Tellingly, temporary British observance (avoiding the term "alignment") of the EU's veterinary standards has been called for by all parties in Northern Ireland, including the new Democratic Unionist leader, Edwin Poots.

This scheme would give time for relations with the EU to cool and let negotiators find a more pragmatic approach to Northern Irish trade. That would be wiser than further breaches of international law or the imposition of tariffs. Does Mr Johnson want a fight, or what's best for the United Kingdom? ■

For more coverage of matters relating to Brexit, visit our [Brexit hub]

Letters

- **Letters to the editor: On gold and bitcoin, buses, air conditioning, greenwashing, China**

On gold and bitcoin, buses, air conditioning, greenwashing, China

Letters to the editor

A selection of correspondence

Jun 19th 2021

Letters are welcome via e-mail to letters@economist.com

The nature of gold

Buttonwood's column on bitcoin and the battle between "crypto kids and fiat dinosaurs" (May 29th) made many excellent points, although a couple of them could be qualified. The column stated that "crypto, like gold, is built on a collective belief about its value. But so to an extent are all asset prices." Although we agree with much of this, the argument assumes that gold is solely a financial instrument. It is not. It has a dual nature as a consumer good and an investment. This sets it apart as an asset and is one of the ways gold differs from crypto.

The price of gold is not just driven by how investors view it. It also responds to its uses in jewellery, technology and in myriad other real-world applications. Together, jewellery and technology account for more than 40% of net annual gold demand.

Although there are perhaps a few similarities between crypto and gold, there are more clear differences, and there are many reasons why the value of gold is not solely determined by investors' beliefs.

DAVID TAIT
Chief executive
World Gold Council
London

The suggestion that the price of bitcoin is the latest measure of investor risk appetite reminded me of your article years ago describing my work ("Time to whet investors' appetites", February 24th 1996). The more an asset lacks intrinsic value, the more it is a barometer of shifting risk appetite. We shifted from private to fiat money because the price of money cannot swing wildly. Any seller of products in bitcoin, made with products purchased in bitcoin, would go from bust to boom daily. Modern money is a social construct. Unregulated private money can never be more than a curiosity.

AVINASH PERSAUD
Emeritus professor
Gresham College
London

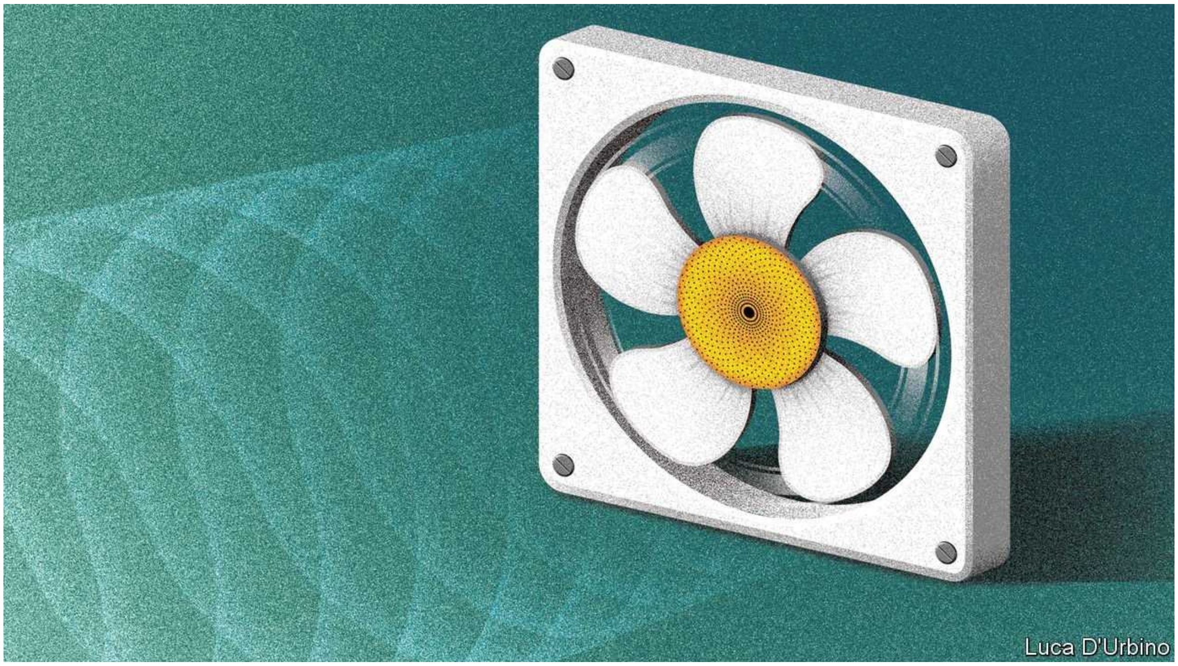
Get on the bus

Your special report on race in America (May 22nd) didn't say much about inequities in transport. I have been a bus driver for 13 years in south-east Michigan. We have many good jobs in my suburb of Livonia, but it has chosen not to participate in the regional bus system, cutting off people of all races in Detroit from the opportunities here.

An extremely low-cost way to support people economically is to reorganise transit systems that serve lower-income areas. This enables easier access to jobs and education in the suburbs. One of my regular passengers works in a suburban nursing home but lives in Detroit. Her home and place of work are seven miles apart. She has to take a Detroit bus to Eight Mile Road (the city's limit) then wait to transfer to a suburban bus, both ways. This should be a 25-minute bus ride. But because she has to transfer her trip takes an hour, if the buses are on time. She cannot work overtime because the last suburban bus leaves at 6:30pm. She doesn't bother with Sunday work because the buses are unreliable at weekends. Going to community college is out of the question because there are no late evening buses. I know of many people who routinely make three-hour commutes, each way, because they have to catch two transfers, and still walk a mile or more.

Safe and efficient public transport will boost the economic lives of everybody, but especially African-Americans who have been locked out of the larger economy for all these generations.

FRANK KALINSKI
Livonia, Michigan



Is the AC working?

"Fresh thinking about fresh air" (May 29th) struck a chord with me. As a ventilation engineer I am constantly appalled at the low priority put on air quality in buildings by regulators. The current code minimum in British Columbia is an American standard published in 2001. It describes how to ventilate "smoking rooms" (smoking in workplaces was outlawed over a decade ago). Building officials are keen to ensure the water pipe serving a toilet is the correct size, but are completely uninterested in the design for adequate ventilation. The air quality inside buildings is largely determined by the whims of individual engineers.

The pandemic has not helped. Rather than implementing science-based solutions, such as increasing ventilation rates or adjusting room air distribution patterns, the snake-oil salesmen are out in force successfully hawking inadequate "air purifier" systems. With a focus on energy efficiency and air tightness in buildings, what could once have been forgivable omissions of proper ventilation may now be creating unproductive or unsafe indoor spaces.

MIKE DIXON
Abbotsford, Canada

Getty Images

Full disclosure

At CDP, the charity running the world's largest corporate environmental disclosure system, we read your leader on "greenwashing" with interest ("Hot air", May 22nd). It is true that the current system of largely market-led environmental reporting comes with a risk that some companies might not disclose full information. However, the CDP system, used by 10,000 organisations a year, mitigates against this by inducing transparent responses through our scoring methodology. Additionally, science-based targets require companies to report their entire value-chain emissions rigorously, the gold standard for climate targets.

Your leader claims that "a better system would force companies to reveal their full carbon footprint." Thousands of companies already do that through CDP. And although the carbon footprint is an important measure, by definition it looks at past emissions and tends to encourage a binary framework of clean versus dirty at any given point in time. It is better to use the carbon footprint along with forward-looking data, such as temperature trajectories, which seek to capture the overall journey and potential for long-term improvement. BlackRock says it will map trajectories this year.

We welcome mandatory climate disclosure, as signalled by the G7, but would emphasise that market-led incentives offer a valuable system. Most companies are not required by law to disclose environmental information, and even in jurisdictions that have mandatory disclosure, the legal requirements are generally more light touch.

PAUL SIMPSON
Chief executive
CDP
London

The encroaching state

China shouldn't tell its people how many babies to have, says *The Economist*, in a year when governments, with a straight face, have told people whom they are allowed to hug and when they may leave their homes ("Procreation myth", June 3rd, digital editions). I fear the golden age of self-determination and freedom is now long behind us.

If we ever emerge from biosecurity tyranny (unlikely) we will have ecosecurity tyranny to look forward to. Restrictions on fertility are a perfectly logical response to the environmental crisis. Not a democratic response, not a response compatible with basic freedoms and probably not a very effective response, but none of that made any difference to the imposition of coronavirus restrictions, did it?

BEN RAPP
Marisule, St Lucia

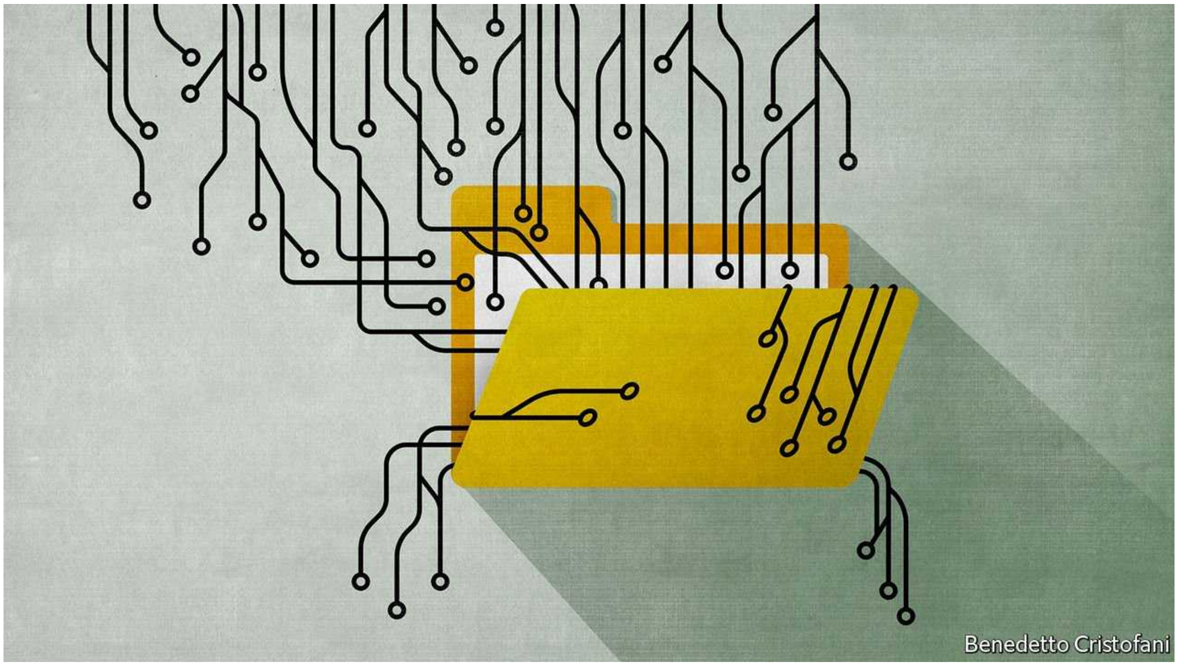
Briefing

Crims and spooks unite and fight

Ransomware highlights the challenges and subtleties of cybersecurity

Governments want to defend themselves—and attack others

Jun 19th 2021



FOR THE past month Ireland's health-care system has been in disarray. On May 14th the Health Service Executive (HSE), the state-funded health-care provider, was hit by a "ransomware" attack which led it to shut down most of its computer systems. The attackers threatened to release stolen data, including confidential patient records, unless the HSE stumped up $20m (€16.5m). It declined to do so. Its staff were reintroduced to pen and paper, its procedures delayed, its patients inconvenienced. By June 14th services had still not returned to normal.

This out(r)age might have attracted greater attention beyond Ireland's shores had it not occurred a week after a similar attack had disabled a crucial oil pipeline on the other side of the Atlantic. On May 7th Colonial Pipeline, a company whose namesake asset delivers nearly half the fuel used on America's east coast, had its systems compromised by a cyber-attack and had to shut down the flow of oil. Some people headed to the pumps in panic.

President Joe Biden invoked emergency powers. The company paid a ransom of over $4m; even so, it took several days for the oil to start flowing again.

The two stories are in some ways par for the course. More and more enterprises are being hit by ransomware attacks, and some of the targets are giants. In recent months attackers have struck JBS, the world's biggest meat producer, and Apple.

In other ways they feel like an escalation. Attacks on core state functions such as health care and crucial infrastructure like pipelines are normally the stuff of war, insurgency or terrorism. They do not lose their capacity to worry governments just because they are being undertaken for cash, especially when the criminals perpetrating them come from unfriendly countries. The gangs responsible for the HSE and Colonial Pipeline attacks both seem, like many of their sort, to be based in Russia. At his summit with Vladimir Putin on June 16th Mr Biden listed 16 types of infrastructure against which he wanted to see no further cyber-attacks.

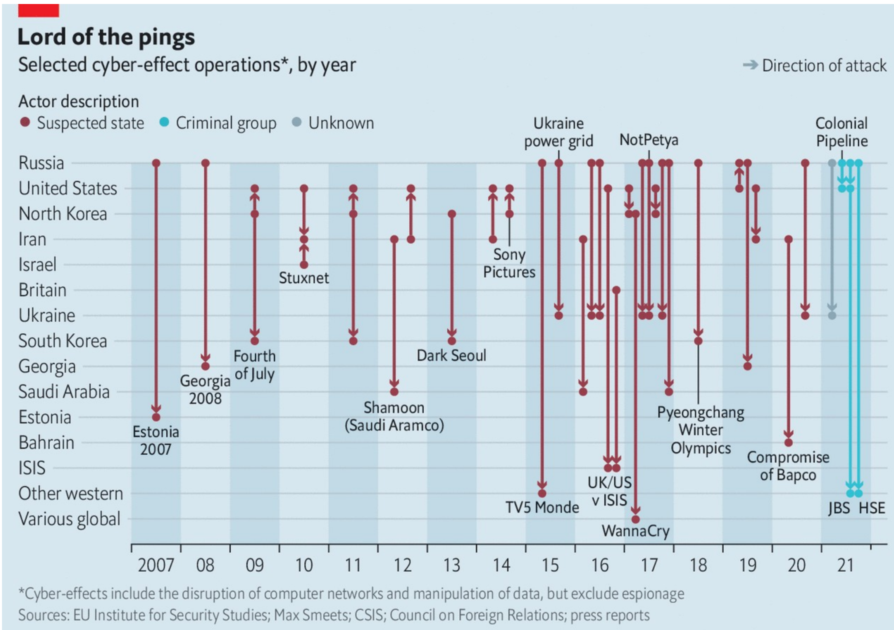
A permissive attitude to cybercrime is unsurprising for a regime led by an old spook like Mr Putin. The covert things that states have always done to each other—spying, propaganda, subversion and violence—are normally crimes as far as at least one of the parties is concerned. Criminals and spies lurked in the same shadows, shared the same methods and occasionally combined their roles long before the dark recesses of the internet beckoned.

For the most part hostile state activity is non-violent, a matter of harvesting information helpful to your national interest—including the commercial interests of your companies—and discombobulating the opposition. "Most activities in cyberspace have little to do with the use of force," writes Joshua Rovner of American University, who in 2018-19 was scholar-in-residence at the National Security Agency (NSA), America's signals-intelligence agency, and Cyber Command, a Pentagon command which conducts cyber-operations. "They are largely an intelligence contest—an effort to steal secrets and exploit them for relative advantage."

But the scale, speed and ease at which that contest can now play out has been transformed. Robert Hanssen, one of the KGB's most productive agents ever, supplied thousands of pages of classified material to his handlers. But he did so over a period of 20 years, from 1979 to 2001. Vasili Mitrokhin, a disillusioned KGB archivist, pilfered an astonishing 25,000 pages of material between 1972 to 1984, hiding reams of documents under the floor of his dacha, but it took him another eight years to get those secrets to Britain's MI6.

By contrast, the Chinese hackers who penetrated America's Office of Personnel Management in 2014 gained access to the records of 21.5m people at a stroke—a haul which, if printed out, would have filled a fleet of lorries. Some see the capacity to steal secrets in such remarkable quantity as qualitatively different from older forms of espionage: not just spying but warfare, or some hybrid of spying and warfare, or something entirely new.

Last year America uncovered a colossal hacking campaign which, by compromising SolarWinds, a software-maker, had penetrated a panoply of government departments. The justifications the Biden administration offered for its subsequent sanctions against Russia, which it blamed for the attack, were telling. One was the sheer scale and scope of the penetration. But there was also a worry that such a capability could pivot easily from wholesale espionage to wholesale sabotage. The scope of the attack was "virtually a declaration of war by Russia on the United States", thundered Dick Durbin, a Democratic senator.



The Economist

Demarcation becomes yet more complicated when non-state actors are added to the mix, either as perpetrators or victims. The Colonial Pipeline attack shows that private ransomware rackets are now ambitious—and, considering the new level of concern, arguably foolish—enough to attack vital state interests. The Sony Pictures attack of 2014 showed that states can seek to destroy private corporations; Sony had incurred the wrath of North Korea by mocking its supreme leader, Kim Jong Un, and had a great deal of dirty corporate laundry exposed as a result.

Sony's good name was not that important to any government; other state action against companies could be. In 2017 Russia launched a ransomware-like cyber-attack, NotPetya, against companies in Ukraine so as to damage the country's economy. The attack spread well beyond Ukraine's borders; it has been blamed for $10bn of damage worldwide. One of the companies affected was Mondelez International, an American snackmaker, which made a $100m insurance claim as a result. But Zurich American Insurance declined to pay out, pointing to an exception for "hostile or warlike attack" in the company's policy. The case has gone to the courts in Illinois, where it is currently pending.

Exceptional thieves

In general, though, there is little indication that the increasing damage done by ransomware is state-directed, as NotPetya seems to have been. It is for the most part merely state tolerated. The extortionists enjoy impunity to the degree that their host countries are indifferent to the harm they do elsewhere—though they may also, on occasion, be required to do their hosts nefarious favours.

The Royal United Services Institute, a think-tank, analysed 1,200 ransomware attacks which mostly took place last year. Two of its findings make the extortionist's incentives clear. The fact that 60% of victims were based in America or had their headquarters there can be explained by Sutton's law: that's where the money is. The fact that there were no victims in Russia or most other post-Soviet countries can be explained by other rules—rules about activities which are inappropriate on your own doorstep, or where you eat.

The rise in the use of ransomware may reflect, and indeed exacerbate, interstate tensions, but it is not directly due to state action. It is mostly down to increased capabilities and opportunities.

The earliest examples of people hacking into computers, encrypting files and demanding payment in return for decryption were penny-ante stuff—a way to extort a few hundred dollars from someone who didn't want to lose treasured family photos. Its growth into a criminal industry preying on large organisations is in part down to the replicability that the digital domain makes so easy; criminals can launch dozens of attacks as easily as one. As the business got more lucrative the technology became better; larger ransoms allow the criminals to buy more sophisticated "exploits" which in turn allow more ambitious attacks. The growth of remote-working has also helped, providing criminals with far more opportunities to worm their way into corporate networks.

The rise of cryptocurrencies, which provide a convenient and discreet way for law-abiding victims to pay, adds to the crime's appeal. Chainalysis, an American firm which examines the "blockchain" databases that power such currencies, reckons that hackers took around $350m in cryptocurrency payments in 2020, up fourfold on the year before. Increasingly the hackers prefer newer cryptocurrencies such as Monero or Zcash, which are designed with privacy in mind, to bitcoin. The fact that its blockchain makes transactions using bitcoin "wallets" public helped American police recover around half of the Colonial Pipeline ransom after it was paid.

The cyber-security industry, whose job is to protect its customers from such attacks, looks increasingly ineffective. Microsoft estimates that annual spending on antivirus software, firewalls and the like was around $124bn in 2020, up 64% in five years. Last year Debate Security, a group of cyber-security experts, published a report pointing out that despite all this the average number of breaches recorded each year by Accenture, a consultancy, has risen. Admittedly breaches might have risen faster if spending had not gone up, but it is hard to see the record as encouraging. Ciaran Martin, who led the creation of Britain's National Cyber Security Centre (NCSC), the defensive arm of its signals-intelligence agency, GCHQ, was one of the report's contributors. He argues that the way the business works is fundamentally flawed.

Poison pills

The report's subtitle—"Is cyber-security the new 'market for lemons'?"—echoes a famous analysis of the effect of "asymmetric information" on the second-hand-car market. George Akerlof, an economist, argued that since buyers cannot reliably identify high-quality second-hand cars, they will be unwilling to pay high prices. The sellers of good cars are thus driven out of the market, ceding the field to those selling cheaper, shoddy "lemons".

Mr Martin thinks that the cyber-security field is mired in a similar asymmetry. Ian Levy, the NCSC's technical director, has said that a lot of the industry operates in much the same way as medieval witchcraft: "Buy my magic amulet and you'll be fine." It is hard for buyers to pick effective defences against the dark arts out of the dross, and they know it. Almost none of the bosses Debate Security interviewed could agree on how to measure the effectiveness of the software they were buying. There was much talk of the need to "cross our fingers" and "accept what we can get". Fixing the problem, says Mr Martin, is likely to require the development of common standards for assessing how well cyber-security software really works.

Given that they are on the hook for ever increasing ransomware losses you might expect insurance companies to be pushing for such standards. In 2020 Munich Re, a reinsurance company, estimated that the cyber-insurance market was worth $7bn and could be worth $20bn by 2025. But Kelly Bissell of Accenture says that insurers frequently conclude that the easiest way to deal with an attack on a firm they have insured is simply to pay up; that may minimise costs on a one-off basis, but it encourages more attacks in future.

France—which according to Emsisoft, a cyber-security firm, suffered ransomware losses of more than $5.5bn in 2020, second only to America—is taking a hard line on this. “Regarding ransomware, we don’t pay and we won’t pay,” Johanna Brousse, a French prosecutor, said at a recent discussion at the senate. In May AXA, a big French insurer, having been lent on by the authorities, said it would stop writing policies that allow reimbursement of ransomware payments.

Clamping down on ransom payments and setting standards for cyber-security—something Mr Martin favours—are two ways for governments to defend their corporate citizens and the infrastructure they control against commercial cyber-attacks. In doing so they may go some way towards protecting themselves from direct attack by other states, too.

Offensive cyber-capabilities are now widespread among states, and commonly used in military campaigns. In their war against Islamic State, Britain and America used cyber-attacks to suppress the group’s propaganda, disrupt its drones and sow confusion in its ranks. They are also used to do physical damage in times where no war is officially taking place. Consider the pioneering American-Israeli Stuxnet worm, which induced Iranian centrifuges to tear themselves apart a decade ago, or Russia’s successful sabotage of Ukraine’s power grid in 2015 and 2016.

Achieving dramatic physical effects is exceptionally demanding and vanishingly rare. But in some cases it may offer the perpetrator advantages. Gary Brown, a professor at America’s National Defence University who was the first senior legal counsel for Cyber Command, argues that states are more tolerant of “kinetic effects” caused by online operations than those which result from armed provocations. Had Iranian commandos attacked

Israeli water plants in April 2020, the result might have been war. An alleged Iranian cyber-attack which sought to increase chlorine levels in drinking water, prompted instead only a relatively tepid Israeli cyber-riposte against an Iranian port. Israeli forces have, though, launched air strikes against sites in Gaza they associate with cyber-attacks by Hamas, a militant Palestinian organisation.

Retaliating against cyber-attacks in kind may become a norm—more assertive than turning the other cheek or lodging a diplomatic complaint, less risky than responding with physical violence. Such a stance may also provide a deterrent. America, which according to a forthcoming study by the International Institute for Strategic Studies, a think-tank, has “offensive cyber-capabilities...more developed than those of any other country”, is widely thought to have used them to fire a warning shot over North Korea’s bow: the dictatorship’s internet suffered an odd blackout shortly after the Sony hack. Mr Biden’s demand that some areas be exempt from criminal attack was paired with a threat to respond with what he described as America’s “very significant cyber-capabilities”.

It is possible that defence, deterrence and attack will blur. In recent years, Cyber Command has embraced a strategy of “Defend Forward”, which involves observing enemy hackers before they enter American networks—

something that, given the absence of unowned buffer zones in computer networks, unavoidably requires intruding on the networks of others. “There are no ‘high seas’ or ‘international waters’ in cyberspace,” writes Erica Borghard, who served on America’s Cyberspace Solarium Commission, a national task force.

Welcome to the party, pal

As more states develop stronger and more active cyber-forces, the idea that the best—perhaps the only—form of defence is something which looks very like an attack points to ever-more intense competition over computer networks. “Perhaps defending forward is necessary to frustrate particularly reckless and brazen campaigns,” argue Columbia University’s Jason Healey and Robert Jervis. “But in the long run it may someday spark a larger conflict.” Because Russia and China scarcely admit to conducting cyber-operations at all, it is impossible to say how far they have trodden the same path.

And as state capabilities grow it seems a sure thing that criminal ones will too. Cyber-capabilities are easily spread and available to those of modest means. A ranking of offensive “cyber-power” created by the Belfer Centre at Harvard University last year put Israel and Spain in third and fourth place, with Iran, the Netherlands and Estonia all placed in the top ten. Private firms like Israel’s NSO Group and Italy’s Hacking Team sell powerful hacking tools which allow states to quickly bootstrap their own cyber-forces. It is hard to imagine all these capabilities being kept out of the hands of criminals who inhabit the same demi-monde. Extortionists demanding ransoms, spies pocketing data and states spreading disinformation will sit alongside one another—multiplexed on the same channels as never before. “Cyber as a domain of military and national-security operations co-exists with cyber as a domain of everyday life,” says Mr Martin. “It’s the same domain.” ■

Asia

The Modi blues

India’s prime minister is down but not out

Narendra Modi’s admirers seem blind to his poor decision-making

Jun 19th 2021 | DELHI

THE STORY of Narendra Modi, India’s prime minister, has been a fable of extraordinary good fortune. From running a railway tea-stall in provincial Gujarat he rose to lead his state and then his country, the world’s biggest democracy. Yet no one’s luck lasts forever. And for Mr Modi the current monsoon season is not the only thing proving that when it rains, it pours.

The full toll from India’s now-waning second wave of covid-19 remains unclear. A reasonable guess is around 2m dead from the virus so far, making this the worst calamity to hit the country since the Bengal famine of 1943. But Mr Modi’s woes go beyond happening to be in charge, and perhaps making some bad decisions, at such a terrible time.

India’s economy, which had been slowing even before the pandemic and then shrank by a dismal 7% in the year to March 31st, has now stalled instead of restarting. Yet even as ordinary folk are squeezed by rising inflation, unemployment, malnutrition and poverty—all made harder by the anxieties of widespread death and disease—the country’s richest are getting ostentatiously richer. The wealth of Gautam Adani, a Gujarati billionaire, increased by $43bn in the pandemic year, before a recent market scare knocked $10bn off his take. With such internal stresses sharpening, and constituencies including farmers, doctors and migrant workers now all bearing grudges, Mr Modi's party has faced unwonted humiliation in recent local elections. In May voters in West Bengal, where the prime minister had campaigned fiercely despite signs that covid-19 was surging back, handed a walloping majority to his rivals (Mr Modi is pictured on the stump).

His government's international stature has suffered, too. Chinese troops refuse to budge from Indian-claimed territory that they occupied a year ago, while India's chest-thumping about being a vaccine superpower swiftly turned embarrassing: Mr Modi's government had procured far too few jabs even for its own people, let alone for foreigners. Despite an invitation to join last week's meeting of the G7 group of rich democracies as a distinguished guest, India's normally photophilic prime minister was conspicuous by his absence.

In short, nearly all the wind of promise that Mr Modi's premiership started with seven years ago has abruptly blown away. His opponents are, for a change, landing hit after hit. The most recent charge is of hypocrisy. His government relentlessly bullies critics and even platforms, such as Twitter, that carry their messages, yet declares itself a champion of freedom. "The Modi government should practise in India what it preaches to the world," was the acid comment of Palaniappan Chidambaram, a grandee in the opposition Congress party, following a video address by Mr Modi to the G7 meeting in which he declared India to be a "natural ally of open societies".

For any other leader such a concatenation of bad news could prove fatal. But Mr Modi is far from an ordinary leader. Despite widening anger not only among Indian elites, but even among loyalists of his Bharatiya Janata Party (BJP), the chances that the prime minister could be unseated before the end of his term remain virtually nil. Indeed, unless his government commits even more blunders, and its opponents somehow unscramble their current disarray, Mr Modi may have the last laugh. India's next general election in 2024 could see him return to occupy the controversial new prime ministerial residence he is having built for himself.

This is because Mr Modi has more than luck on his side. He has charisma, enough to sustain his image as a longed-for strong leader even beyond his Hindu-nationalist fan base. Like followers of Donald Trump in America, Mr Modi's admirers seem impervious to glaring evidence of poor decision-making. Opinion polls, while generally unreliable in India, do reveal clear trends. MorningConsult, which tracks national ratings of the elected leaders of 13 countries, shows a 20-point slide over the past year in the proportion of Indians who approve of Mr Modi. Yet at 66% in early June, he still outperforms all the rest. Another recent survey by Prashnam, an Indian pollster, found that, although 42% of respondents who say they suffered personally from covid-19 blamed Mr Modi's government, a bigger share blamed local leaders or simply fate.

Even sceptics who note that Mr Modi's older, greyer image has lost appeal, and that after so long in power his attacks on rivals carry less sting, admit that he holds another strong card. The BJP remains a daunting political machine. What public records there are in the murk of Indian political finance suggest that the party rakes in more than four-fifths of known contributions to all parties combined. The BJP also enjoys firm backing from the powerful Hindu-nationalist *parivar* or family, a constellation of groups ranging from trade and student unions to vigilante gangs. Despite occasional setbacks, and the wariness of India's periphery about the Hindi-speaking heartland where the party is strongest, the BJP remains the only outfit able to lure political talent and contest elections virtually anywhere in the country.

Mr Modi also holds a powerful joker. For all its point-scoring against his government and even its victory in elections here and there, India's opposition remains as fragmented and vulnerable as ever. Its only hope lies in pulling together to form an unlikely coalition such as the Israeli front, uniting hard-right Zionists with leftists and Arab parties, that recently ended Binyamin Netanyahu's 12-year reign.

The fact is that most of India's political opposition consists of regional parties that are content to reach a modus vivendi with a BJP-ruled "centre". Congress ran India as a virtual fief for decades and still pretends to nationwide influence. But under its current leader, Rahul Gandhi, it lacks both street clout and the tenacity and agility to rally allies. "However embattled Modi may be after getting almost everything wrong in handling the pandemic, Rahul Gandhi, who got almost everything right, is not likely to be the preferred option," is the judgment of Samar Halarnkar, an editor and columnist. It is not just Mr Modi's luck that needs to turn for change to happen. ■

Sausage party

Young men in South Korea feel victimised by feminism

A conservative upstart appeals to them

Jun 19th 2021 | SEOUL

WAS IT MERELY an innocent sausage? Last month a poster promoting camping kit sold by GS25, a chain of shops in South Korea, included an illustration of two fingers reaching out to grasp a steaming banger. Angry young men complained. They said the detail, which resembled an emoji that depicts a hand making a pinching gesture, was a hidden insult planted by feminists. As everyone knows, the symbol is commonly used when mocking the size of a man's penis. One critic was especially outspoken. "Why on earth would the sausage have to be there and who would eat a hot sausage with their fingers?," said Lee Jun-seok. "We deserve an explanation."

On June 11th Mr Lee was elected leader of South Korea's main opposition party, the People Power Party (PPP). At 36 he is the youngest person ever to lead a South Korean political party. His election marks an effort to rejuvenate the conservative outfit ahead of the presidential poll next year, though Mr Lee is not himself old enough to be eligible for that job. Among his biggest fans are men in their twenties who feel victimised by South Korea's increasingly vocal feminist movement.

South Korea scores poorly on measures of equality between the sexes. The "glass-ceiling index" compiled by the Economist Intelligence Unit, a sister company of *The Economist*, rates it the worst rich country in which to be a working woman. Many women suffer discrimination and harassment. Creeps use hidden cameras to snap pictures of them in bedrooms and public toilets. That culture ruins lives, according to a report issued on June 16th by Human Rights Watch, an international monitor.

Many young men take a different view. In a survey conducted in 2019 some 60% of men in their twenties said that discrimination against women was not a serious issue. More than two-thirds said that unfairness towards men was the big problem. They said they felt disadvantaged by South Korea's marriage culture, job market, and the application of its laws. Compulsory military service, which applies only to men, is a particular grievance. "We have to compete against women after sacrificing 22 months for the country," says a 25-year-old surnamed Jung. "We just want compensation for our sacrifice."

Mr Lee has railed against radical feminism. He said the ruling party performed poorly in mayoral elections in April because it focused too much on pleasing female voters and had "underestimated" young males. He has promised to abolish quotas for women in the PPP and wants to restore "fairness" to the political process by using tests to choose his party's candidates. This appeals to many young men, more than three-quarters of whom voted for the conservatives in the recent mayoral election in Seoul. "Most of my friends feel discriminated against in some way and that's why we support Lee Jun-seok," says Mr Jung. "It's not about anti-feminism, it's about fair competition."

Mr Lee graduated from Harvard and worked for an education startup but has never held public office. He may struggle to find more policies that can unite his young fans with his party's older and crustier supporters. These include evangelical Christians with a penchant for conspiracy theories whom many in the PPP find embarrassing. His idea to make party members compete for nominations by taking exams in skills such as drafting power-point presentations is unlikely to fly, reckons Choi Jin-bong of Sungkonghoe University. His ambition to abolish quotas for women and young people will irk other party leaders, some of whom are young women.

Yet Mr Lee's youth and novelty may prove powerful assets. The PPP has changed its name twice since losing power four years ago after a corruption scandal toppled Park Geun-hye, the previous president. Until recently it had shown no appetite to renew itself any more than that. A conservative landslide in the mayoral elections suggests voters are souring on the leftish government of President Moon Jae-in, which has been damaged by scandals of its own and delays to vaccinations against covid-19. Mr Lee's popularity will aid whomever the PPP nominates to run for the presidency next year—among some male voters, at least. Women may find him less impressive. ■

Fever cabins

Singapore’s migrant workers have endured interminable lockdowns

It is taking a toll on their mental health

Jun 19th 2021 | SINGAPORE

IT IS MORE than a year since Mohammad Sharif Uddin leafed through a book at the National Library or wandered beneath Singapore’s skyscrapers, two of his favourite pastimes. Since early 2020 migrant workers such as Mr Sharif, a Bangladeshi who oversees safety on construction sites, have endured lockdowns far stricter and longer than those imposed on the rest of Singapore’s population. His employer ferries him to and from work. But otherwise he must remain in his dormitory, where he shares a room with eight others. He passes the time on a top bunk reading, writing, praying and trying to stay cool amid the heat. “I feel like I am trapped in a cage.”

More than 300,000 of Singapore’s migrant workers live in dormitories (one is pictured). Most are men from India, Bangladesh or China, sharing rooms that accommodate as many as 20 people. These cramped conditions made it easy for covid-19 to spread. Four out of five dorm-dwellers surveyed in April 2020 by HOME, a charity, said it was difficult to keep a distance from others. That month new cases of covid-19 in the dorms peaked at nearly 1,400 a day. Foreign workers living in dormitories account for nearly 90% of all the people who have tested positive for covid-19 in Singapore. Antibody tests suggest that by December nearly half of the workers in dormitories had been infected.

At the beginning of the crisis strict lockdowns prevented many migrants from leaving their dormitory rooms, even to cook meals. By November most were back at work and had been given limited freedom to visit "recreation centres" set aside for them, where they can shop for groceries and send money home. At first the government allowed them to visit these places once a week for three hours; this was increased to three times a week for four hours. But the visits were stopped in May, after a slight rise in infections. Workers must get approval to run essential errands.

HealthServe, a charity that helps provide medical care to migrant workers, says that the restrictions have exacerbated "feelings of isolation, anxiety and despair". Last year journalists reported several cases of migrant workers killing themselves (the government said it had not observed a spike in such deaths). In December HOME said stories reported in the media were the "tip of the iceberg". It says a hotline that it runs has received many more calls related to suicide than in previous years.

The crisis could improve conditions in the long term. Last year the government set up a task force that is seeking ways to improve migrant workers' mental health. Officials thinned crowds in dormitories by moving some residents into former schools and vacant factories. The government says it is building new permanent accommodation blocks that will offer slightly better conditions. It says polls of migrant workers find that most are "coping well". But it says restrictions on their movements will remain tight until more of the people living in dormitories are vaccinated and "the covid-19 situation in Singapore further improves". By early June only a fifth of dorm-dwellers had received all their jabs, compared with a third of the overall population.

Many migrants have gone home. Last year the number of foreigners employed in industries such as construction and shipbuilding shrank by about 16%. Mr Sharif would be on a flight back to Bangladesh if he could afford it. Instead he has made use of his idle hours to write and publish a diary of his days under lockdown. As he puts it: “The government has locked us in invisible shackles.” ■

Dig deeper

All our stories relating to the pandemic and the vaccines can be found on our coronavirus hub. You can also listen to The Jab, our podcast on the race between injections and infections, and find trackers showing the global roll-out of vaccines, excess deaths by country and the virus’s spread across Europe and America.

One-horse race

Mongolia’s ruling party secures a thumping victory

It snatches the presidency from a bickering opposition

Jun 19th 2021 | BEIJING

UNLIKE THE shenanigans that came before it, the result was remarkably clear. Ukhnaagiin Khurelsukh romped to victory in Mongolia’s presidential elections, held on June 9th. He became the first candidate in recent history to snaffle more than two-thirds of the vote. His Mongolian People’s Party (MPP) already holds a supermajority in parliament. After Mr Khurelsukh takes office on June 25th it will have an even stronger hold on power.

Mr Khurelsukh was Mongolia’s prime minister until January, when he resigned suddenly and ostentatiously over something that did not seem to require it: Mongolians had objected to footage of a new mother shivering in the cold while being transferred to a facility for patients with covid-19. Handing the reins to a protégé was not an act of principle, it turned out, but a ploy to tee up a presidential run.

His campaign had to swerve traps laid by the incumbent, Khaltmaagiin Battulga of the opposition Democratic Party (DP). In April the courts ruled that Mr Battulga could not seek re-election (a constitutional amendment passed by the MPP in 2019 limits presidents to one six-year term, though whether that applied to Mr Battulga had previously been unclear). Within days the president declared that he was outlawing the MPP. That pronouncement shocked Mongolians, but had little other effect. The party ignored his decree. The Supreme Court also declined to enforce it.

The election was a disaster for the DP. Its leaders had bickered over whom to nominate as the party's candidate. The man they selected, Sodnomzundui Erdene, secured only 6% of the vote. Even some long-standing supporters of the party chose to cast blank votes rather than endorse him. That is a fresh nadir for an outfit that was already in trouble. It held almost half the seats in parliament before its coalition lost elections in 2016. These days it has less than one-sixth of them.

The opposition's implosion leaves the ruling party unchallenged. Although constitutional changes have lessened the power of the presidency, the job still confers control of the army, among other trophies. Mr Erdene had argued that handing the MPP the presidency in addition to its supermajority would be dangerous. He campaigned under the slogan "Mongolia without dictatorship". But many Mongolians and foreign observers sound relaxed about single-party rule. The MPP is "quite fragmented internally", says Sumati Luvsandendev of the Sant Maral Foundation, a pollster. He is confident that lively factionalism within the party will help moderate its decision-making.

Whatever comes next, the poll has underlined the depressing superficiality of much political debate. Loud personalities and squabbles over electoral rules drowned out useful stuff. Campaigns gave little time to bigger questions such as how to manage relations with Russia and China, reduce unemployment, invest mineral wealth and diversify the economy.

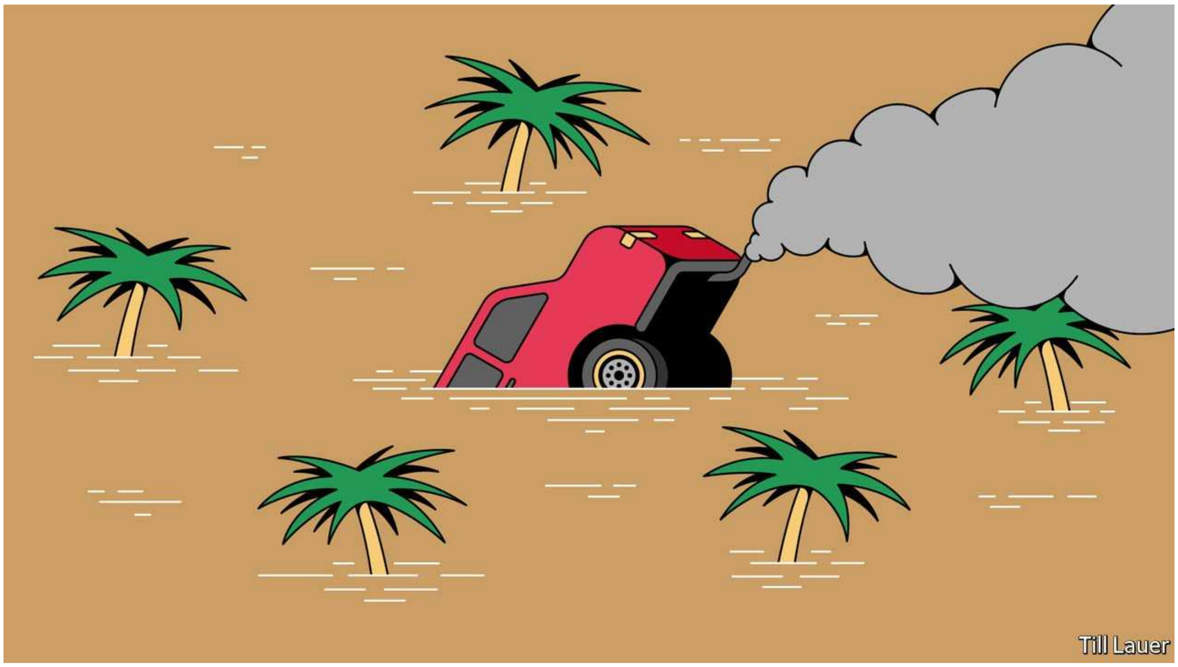
The electorate looks disengaged. The turnout of 59% was the lowest ever. Christian Sorace, who follows Mongolia at Colorado College in America, warns that the country's political class is only storing up problems. "There is no political movement, party, or politician who speaks directly to the massive socioeconomic disparities of Mongolian society.” ■

Banyan

Climate change is remaking South Asia's monsoon

A bad season can cut economic growth by a third

Jun 19th 2021



SINCE ARRIVING two days late at its usual landing point at Thiruvananthapuram in Kerala near India's southern tip, South Asia's annual summer monsoon has made up for lost time. Tearing north, the south-westerly, rain-bearing winds covered four-fifths of the country in the first two weeks of June, reaching even India's north-easternmost states. The monsoon's western arm has yet to reach the states of Gujarat, Haryana and Rajasthan. But Yogesh Patil, head of Skymet, a private weather-forecasting service, predicts that the monsoon will cover the whole country by July 8th, pretty much bang on its average date.

Bangladesh, Bhutan, Nepal and Pakistan are also recipients of the South Asian monsoon. It touches over 1.8bn people, or nearly a quarter of the world's population. Though its circulation is complex, at its heart the summer monsoon is a sea breeze that operates on a season-long, continental scale. A rapidly heating Indian subcontinent causes hot air over it to rise. That draws in wetter maritime air from the Indian Ocean. As this air in turn rises, it cools and falls as rain. The northern wall of the Himalayas amplifies the effect.

The monsoon's arrival is cause for rejoicing. Over 70% of the year's rain falls in just four months. It cools the fierce summer heat and slakes a thirsty earth. The Ganges and other rivers fill and spread rich silt over flood plains. Sown crops put on growth at last. Agriculture supplies nearly half of all India's jobs and accounts for nearly 20% of GDP (most farmers rely on rain-fed crops rather than irrigation). A bad monsoon can cut economic growth by a third, drive farmers into penury and create knock-on effects for government revenues when they are needed most. The remark by a British imperial administrator that the Indian budget is "a gamble in rain" remains true today.

Yet the monsoon is no uniform wave. It is overwritten by "vagaries": bursts of intense rainfall in some parts and dryness in others. Scientists have yet to get to the bottom of these vagaries. But they can have profound effects. A farmer can see his crop washed away in a thunderstorm, or seedlings wither in a drought. In his part of Andhra Pradesh in south-eastern India, S. Ananth, a writer on the monsoon, says that this year the monsoon has delivered just one proper downpour and a few mild showers. A cyclone churned through the Bay of Bengal in May, which was unusually early. Mr Ananth's great-grandfather used to say that after a cyclone in May, the monsoon would fail. Folk myth, perhaps, but local farmers are worried.

Since vagaries can make or break farmers, Mr Patil says, Skymet is using satellite imagery and data from over 7,000 weather stations to make 72-hour forecasts with village-level detail, including storm and drought alerts, which farmers can access on their phones. Millions of rural people use the service which, Mr Patil says, has done much to improve the accuracy of short-term forecasts.

Yet a long-term threat also looms: the effects on the monsoon of climate change. Recent analysis in the journal *Earth System Dynamics* led by Anja Katzenberger of the Potsdam Institute for Climate Impact Research suggests that the monsoon is both getting wetter—by 5% for every one degree Celsius of global warming—and more erratic. In other words, the frequency of extreme downpours is growing. It might be thought that the aerosol soup of dust, exhaust emissions and particulates from stubble-burning that hangs over the vast north Indian plain might absorb solar energy and so counteract somewhat the effects on the monsoon of a warming planet. Yet a paper in *Earth-Science Reviews* led by Qinjian Jin of the University of Kansas argues that Asian dust more generally reinforces an aerial heat pump that also helps render the monsoon hotter and wetter. While the monsoon has long made mankind in South Asia, man is now remaking the monsoon.

Nor is it clear how much can be done about it, short of a global will to reduce carbon emissions. Building resilience helps. Work is being done in India to improve crop selection and management. Improving water storage and lessening the risks from flooding would help, too. Here, however, aquifers are being mined faster than rain can replenish them, while urban development swallows up age-old reservoirs, water tanks and flood plains. Meanwhile, India remains dependent on coal for electricity and on belching lorries and trains for transport. The monsoon will continue to bring relief but also, increasingly, grief.

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China

No news is bad news

Hong Kong’s liberal media are under pressure

The Communist Party in Beijing wants to tighten controls

Jun 19th 2021 | HONG KONG

SINCE CHINA imposed a national-security law on Hong Kong a year ago, restrictions on the city’s media have sharply escalated. The latest clampdown came on June 17th when police arrested Ryan Law (pictured), the chief editor of *Apple Daily*, an outspoken pro-democracy newspaper. Also seized were the tabloid’s publisher and three other bosses associated with it. They have been accused of violating the new law by conspiring to collude with foreign forces. “We value freedom of the press,” a senior officer said afterwards. Many journalists see no sign of that.

Following the arrests, hundreds of police raided *Apple Daily*’s offices. They reportedly searched for journalistic materials, including laptops, notebooks and mobile phones. The government called it a “crime scene”: it says the newspaper’s assets have been frozen. This grim spectacle was little surprise. *Apple Daily* has long been in the sights of China’s ruling Communist Party. Its owner, Jimmy Lai, is rare among local tycoons for his outspoken criticism of the party. He was arrested last year for his involvement in a prolonged series of anti-government protests in 2019 and could face life in prison under the security law. Chinese state television has called *Apple Daily* "a platform for incitement" of troublemakers. Many of the newspaper's staff believe it is a matter of time before it has to close.

Over the past decade, Hong Kong has plummeted from 54th to 80th in the Press Freedom Index published by Reporters without Borders, a campaign group. It still ranks higher than mainland China, which is fourth from bottom at 177th, just above North Korea. The city also lacks the mainland's draconian internet controls. But the political climate in Hong Kong has changed dramatically since the central government imposed the security law.

Editors now worry whether the content they handle could be in breach of the new law. Footage of rallies held on June 12th in dozens of countries to mark the second anniversary of the outbreak of the protests went unaired by big broadcasters, says Chris Yeung, the chairman of the Hong Kong Journalists' Association. The law's ripple effect was also evident in the case of Claudia Mo, a pro-democracy politician who was arrested under the new bill in January. In May the High Court denied bail to Ms Mo, saying statements she had made to foreign journalists disqualified her. That sent a signal to reporters that they could get interviewees in trouble by quoting them. "I didn't become a journalist for my stories to be used in this way," says a reporter who has recently resigned.

Apple Daily has always prided itself on being provocative. But other, less fiery, media have also been suffering. Take the city's public broadcaster, Radio Television Hong Kong (RTHK), which long boasted an independent-minded culture inspired by that of the BBC. In February RTHK's English-language radio station stopped its night-time relay of the BBC World Service. Its Cantonese talk channel ditched a weekly broadcast of an hour-long BBC news programme in that language. This followed China's decision to ban the airing of BBC shows on its territory because of the British broadcaster's coverage of abuses in Xinjiang.

It is clear that Hong Kong's government wants RTHK on a tighter leash. In March it installed Patrick Li, an official with no background in journalism, as director of broadcasting. Since then, several senior editors have resigned, reportedly because of concerns about editorial freedom, and popular programmes that poked at officialdom have been axed. So, too, have television documentaries containing references to the protests in 2019. Their topics included police behaviour during the unrest and mask shortages during the pandemic, as well as subjects far removed from politics: one was about whales, another about hip-hop bands (someone interviewed about the whales had mentioned the protests; one of the bands was anti-government). In May RTHK did not renew the contract of a journalist who is renowned for putting tough questions to politicians. Also that month staff began deleting archived shows from Facebook and YouTube, including investigations about the protests that had garnered millions of views.

The *South China Morning Post,* the territory's main English-language newspaper, still has leeway to criticise the party. In 2015 it was bought by Alibaba, a Chinese e-commerce giant, which said it wanted to combat alleged anti-China bias in the foreign media. That sparked fears it might become a party mouthpiece. But the *Post* still often reports on human-rights abuses in China and other politically sensitive topics. Former staff say it is more cautious about subjects the party considers utterly taboo, such as corruption involving serving leaders and their families.

Journalists in Hong Kong wonder how long it will remain possible to publish anything that is highly critical of the party. The central government is reportedly preparing to set up a department in Hong Kong to run "propaganda". Many reporters fear this could mimic the role of the party's Publicity Department in Beijing, which is in charge of censorship. In March Xia Baolong, China's chief of Hong Kong affairs, lamented that in the media and other spheres, "patriots" were not yet fully in charge in the territory. To China, that means people who love the party.

Hong Kong's chief executive, Carrie Lam, appears unsympathetic to reporters' complaints. She says officials are mulling a law against "fake news", a term they use to describe coverage they dislike. At her press conferences, Mrs Lam increasingly chooses to take questions from China's state media. In an annual survey of local reporters conducted in May by the Hong Kong Journalists' Association, more than 90% of respondents said press freedom had hit a record low. About 85% of them blamed the city's own government.

Some media workers are as gloomy about their readers as they are about curbs on freedoms. They say demand for punchy journalism is diminishing as citizens grow disillusioned with politics. “Many of us now wonder, what is the point?” says one reporter. “The Communist Party is going to do what they want to do.” ■

Try this for size

China and America are borrowing each other’s weapons

They may be less effective than they were in the original owner’s hands

Jun 19th 2021 | HONG KONG

AMERICAN AND Chinese officials often talk of expanding the array of weapons they have to confront one another. China studies its opponent’s moves and responds in kind. America is learning from its adversary, too. On June 12th the White House said that America and members of the G7 would launch a scheme to help finance infrastructure, such as roads and bridges, in poor countries. The plan, dubbed Build Back Better World (B3W), is an explicit counter to China’s Belt and Road Initiative (BRI), a programme that began to take shape in 2013 with many of the same goals.

Competition with China has dominated Joe Biden’s agenda since he took over as America’s president in January. His administration has promised to use “all available tools” to push back against what it describes as China’s unfair trade practices. The B3W plan takes aim at a global initiative closely associated with his Chinese counterpart, Xi Jinping. Although BRI does not have a central planning body, more than 100 countries that are in need of infrastructure have signed up to it. The initiative has been criticised for burdening poor countries with unsustainable debts. But it has helped to strengthen bonds between China and the developing world.

B3W would offer financing for cleaner projects, in contrast to some of those backed by China, which include coal-fired power plants that contribute to global warming. America's vague plan notes that projects will be developed in a sustainable and transparent manner—a dig at the opacity common in BRI contracts. It will also mobilise private capital where China has mainly used state-owned firms.

The idea appears half-baked. It is not clear whether Mr Biden or other G7 leaders will be able to extract substantial additional funding from their governments. The White House says it will work with Congress to "augment our development finance toolkit". Yet Mr Biden is still struggling to get Republican votes for spending on domestic infrastructure. It is not even evident that the plan involves much more than the rebranding of projects that are already being considered. These include numerous green infrastructure schemes in poor countries that were promised as part of the Paris climate agreement of 2015. Easing this backlog will be costly.

Increasingly, China and America are replicating each other's munitions. Days earlier, on June 10th, China's legislature passed a law that allows the government to take action against individuals and companies for complying with other countries' sanctions against China. America and the European Union have hit China with various punitive measures because of its mistreatment of ethnic Uyghurs in the western region of Xinjiang and its demolition of freedoms in Hong Kong. Donald Trump barred investment in several firms with links to the Chinese armed forces. His successor, Mr Biden, has doubled down on those rules by strengthening the legal foundations of the sanctions.

China's new law says the government can seize the assets and block the transactions of firms complying with American or EU measures against China. Unlike the European Commission's statute on foreign sanctions, which prohibits compliance with them, the Chinese law does not explicitly make such activity illegal. Instead it is intended as a deterrent that provides the authorities with a legal means to impose countermeasures, say state media.

The competing regimes put multinational firms in a bind. Fund managers have been attending webinars on how to navigate increasingly complex American and Chinese sanctions, says Kher Sheng Lee of the Alternative Investment Management Association, an industry body. Companies have had little choice but to follow American sanctions. China's new bill could make that choice more difficult.

Likewise, poor countries have had few alternatives to China's BRI project, until now. If executed well, the B3W plan could provide healthy competition to that, says Wang Jiangyu of City University of Hong Kong. But those countries now face a dilemma, he says. They may be "forced to choose between B3W and BRI". ■

Chaguan

China's climate sincerity is being put to the test

Until it stops burning coal for power, foreign firms will be reluctant to invest more there

Jun 17th 2021

TO HEAR CHINA'S Communist Party tell it, the nifty thing about autocracy is that it lets rulers plan for the long term. Apologists for one-party rule hail China's leaders as enlightened technocrats who think in centuries, while decadent Western democracies struggle to see beyond the next election cycle.

By the autocrats' logic, China should excel at tackling climate change. For it faces stark long-term risks. As an arid country that lacks clean water and productive farmland, and where the richest regions lie on the coast, China is exceedingly vulnerable to global warming and rising sea levels. Sure enough, the supreme leader, President Xi Jinping, seems to be taking charge. Last September he decreed that China's emissions of CO_2 will peak by 2030 and that by 2060 the country will become carbon neutral. A China-wide emissions-trading system goes live this summer. Vast wind farms and arrays of solar panels have been built, and more are coming.

In fact, Chinese climate policy is a mess of contradictions. Perhaps time will show that Mr Xi is serious about making the unpopular, expensive changes that are needed to wean his country off fossil fuels, notably the coal that supplies nearly 60% of the country's energy. But it is difficult to be sure. China's coal consumption has risen significantly since it joined the Paris climate agreement in 2015. At home, a ban on new coal-fired power stations was lifted in 2018. The total capacity of such plants approved for construction or being built is larger than America's entire active coal-fired power sector. Overseas, despite pleas from America, the European Union and others, Chinese development banks lend billions of dollars each year to build coal-burning plants, though a state-owned giant, the Industrial and Commercial Bank of China, says it will phase out coal financing.

Provinces and cities, especially in the coal-reliant north-east, are hesitant about publishing carbon "peaking plans". They want more time to pursue growth before curbing greenhouse gases. The rules governing the emissions-trading scheme have been loosened so that only a handful of plants will face real constraints, at least initially. This reflects the leading role apparently granted to the main economic planning agency, at the expense of the environment ministry, in bodies charged with deciding how, and how fast, to tackle climate change. Some big steelmakers have been allowed to expand production again, months after they were caught breaking environmental rules and ordered to cut emissions.

Climate-related efforts in China are not always as mysterious or prone to sudden reversals. Take the China operations of foreign multinationals. Responding to consumers and politicians back home, many such firms have promised to make their global businesses carbon neutral, and to seek big cuts in emissions from their supply chains. As a result, the China bosses of some well-known European companies have told officials, including in the north-eastern cities of Tianjin and Shenyang, that they will find it hard to expand or open new production sites if the electricity or heating on offer locally continues to come from coal. "In an energy-intensive industry, if the electricity is coal-based, you can't build a new plant," says Harald Kumpfert of the European Union Chamber of Commerce's branch in Shenyang, the capital of Liaoning province.

The largest taxpayer in Shenyang is a BMW joint venture that makes 600,000 cars a year at two plants. In 2016 the city had no green electricity to sell. Now a new wind farm in Liaoning—a blustery coastal province with huge potential for green energy—provides about two-thirds of BMW's power. More energy comes from solar panels built over car parks where vehicles await delivery. On a recent visit, Chaguan was shown technologies that have cut carbon emissions per vehicle by 84% since 2016, such as cleverly controlled ovens in the paint shop. In a nicely dramatic touch, freshly baked car bodies emerge on a raised conveyor that carries them on a bridge through an office building, on their way to assembly lines.

Alas, hundreds of BMW suppliers in China have "huge trouble" obtaining renewable electricity, say engineers at the car firm, suggesting that the foreigners have snapped up most green energy on offer. To avoid simply shuffling dirty energy around and to increase demand for renewables, energy-intensive Chinese suppliers, such as steelmakers or aluminium foundries, need to start installing efficient technologies and using low-carbon energy. Progress also requires changing the incentives that guide officials. BMW makes the case to governments that "jobs using renewable energy are sustainable jobs," says Johann Wieland, head of the carmaker's main China business.

Long-term plans, short-term incentives

China's political system, for all its multi-decade plans, is run by officials who may stay in a given job for five years, and whose next promotion depends on economic growth now. Zhang Lei, the chief executive of Envision, a big wind-energy and battery company, is confident that top-down orders can overcome local inertia. "The most important thing is that President Xi has made a huge commitment and continues to push that agenda," says Mr Zhang.

Ma Jun, an environmentalist, sees a role for pressure from above and below. He runs the Institute of Public and Environmental Affairs, an influential Beijing-based organisation that tracks and publishes pollution and emissions data. "It is too much to expect a foreign company to change the energy mix of a city," says Mr Ma. But nudges from foreign and local businesses might push officials to a tipping point. “To change minds we need both market-based and policy-based interventions,” he says.

Multinational corporations are not saints. Many were happy to run profitable but dirty plants in faraway places. Too many are still reluctant to demand transparency from suppliers. But Western voters are growing serious about the climate, and about holding governments and businesses to account. That pressure might just be helpful in China. Pluralism is messy but potent stuff. ■

For more coverage of climate change, register for The Climate Issue, our fortnightly newsletter, or visit our climate-change hub

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United States

Look at Joe not go

After a quick start, Joe Biden's legislative agenda has hit a wall

Factionalism and the filibuster imperil his ambitions

Jun 17th 2021 | WASHINGTON, DC

AFTER HIS first 100 days in office, Joe Biden looked ruthless and Rooseveltian. He had just passed a $1.9trn rescue package despite painfully narrow majorities. His administration was triumphantly preparing future plans to spend trillions more on climate, infrastructure and safety-net expansions. Since then, however, little has happened, and the prognosis looks murky.

When mathematicians confront a system of equations, they sometimes find that there is no possible solution: the equations are simply inconsistent and cannot be resolved. The various constraints on governance—Democratic squabbles over the importance of bipartisanship, the brutal mathematics of thin margins, unrelenting opposition from Republicans—are starting to resemble such a system.

The main constraint on Mr Biden's ambitions has always been the filibuster, a Senate rule that mandates 60 (out of 100) votes to push through most legislation. Democrats hold 50 Senate seats; assuming unanimity among them, the administration thus needs ten Republican votes. Mr Biden will be hard-pressed to find them.

That leaves three plausible options. The first is to negotiate down his proposals, which risks losing the support of the Democrats' left flank. The second is to squeeze the agenda into a "reconciliation" bill that is primarily budgetary, and immune to a filibuster. That would probably require excising some important regulatory provisions, such as a clean-electricity standard or a minimum-wage rise. It also risks losing the votes of moderate Democratic senators hopelessly bent on bipartisanship. The third option—abolishing the filibuster through a simple majority vote—is hostage to moderates' unshakeable belief that ending the filibuster would somehow destroy the Senate.

On infrastructure, Mr Biden seems to be pursuing the first path. Joe Manchin of West Virginia, the Senate's most conservative Democrat, insists on a bipartisan deal. The White House pursued one, negotiating for weeks with Senator Shelley Moore Capito, the Republican senator from West Virginia. Those talks collapsed on June 8th. The White House has now pivoted to negotiating with a separate bipartisan group of senators—which may also prove a long slog with little hope of success.

If there were an obvious path to get his full, ambitious package through Congress, the president would already have taken it. Mr Biden had little compunction about pushing his rescue package through reconciliation and passing it largely unscathed on a party-line vote in the Senate. Moderates acceded during an emergency, but are much less enthusiastic about using reconciliation for ordinary legislating.

Looking at the concessions already forced upon the administration is instructive. Ms Capito's final counter-offer was for $330bn in additional spending—not even 10% of Mr Biden's $4trn package. The president, for his part, had offered to cut proposed spending to $1trn, and suggested taking the corporate-tax rise (from a current rate of 21% to a proposed 28%) off the table. The offer being crafted by the new group, which may yet fail to attract ten Republican votes, is said to be $579bn in extra spending, and mainly limited to "hard" infrastructure—roads, bridges and the like—without any of the welfare-state expansion that Mr Biden included in the second half of his plans.

Even if the negotiations yield a compromise, factional forces loom. Climate-conscious Democrats seem poised to bolt. (Republicans have been adamant that "core infrastructure" ought not to incorporate greenery.) "You can't hand-wave or spin away the scientific necessity that we have to get our climate emissions down to protect public health," says an aide to Senator Ed Markey of Massachusetts, who vows to vote against any bill that is "in denial" on climate change. Progressives in the House of Representatives, where Democrats have only a bare majority, also have sufficient numbers to torpedo any legislation they deem insufficient.

Much of the rest of Mr Biden's agenda looks even more endangered. The For the People Act, also known as HR1, which Democrats see as their answer to state Republicans' tightening of voting rules and to the threat to democracy posed by Trumpism, looks dead. Mr Manchin will not support it (not because of any of its manifest flaws, but because it was too partisan). He also has repeatedly rejected calls to weaken the filibuster. Among the ironies engendered by the filibuster is that a simple-majority vote is sufficient to confirm a Supreme Court justice with the power to strike down legislation, but insufficient actually to pass any.

A mausoleum of ambition

Mr Manchin promised instead to whip up support for HR4, the John Lewis Voting Rights Advancement Act, a more limited bill than HR1 (which devoted much of its space to the somewhat ancillary concern of drawing up a public-financing scheme for elections). Even this strategy is suspect. Earlier introductions of the legislation have been co-sponsored by only a single Republican senator, Lisa Murkowski of Alaska—which leaves the administration nine votes short.

Chuck Schumer, the Senate majority leader, has suggested that he will force a series of votes in the coming month. That may yield political benefits for next year's mid-terms. Substantively, however, he may wind up with little to show for his efforts. Voting-rights legislation is imperilled, and a compromise gun-control bill is looking unlikely after talks broke down between John Cornyn of Texas and Chris Murphy of Connecticut.

That is not to say that nothing will pass. The Senate recently approved a relatively undiscussed $250bn industrial-policy bill aimed at improving competitiveness with China. A $547bn surface-transport bill may soon pass with a smattering of Republican support. Bernie Sanders, who chairs the Senate budget committee, aims to start the reconciliation process soon. But that will get only some of Mr Biden's agenda through, and nothing at all on voting rights, gun control or immigration.

And this may prove the most favourable legislative environment of Mr Biden's term. Parties in power tend to lose seats in mid-terms, though Mr Biden is proving a slippery target for Republicans, and his signature legislative achievement showered Americans with cheques. A successful vaccination campaign and healthy reopened economy may help him when facing that headwind.

But given the Democrats' narrow margins, even small losses would put Congress in Republican control. Herding Democrats is hard enough. The Republican congressional leadership could kill Mr Biden's legislative priorities, leaving him reliant on executive orders, as his two predecessors were in the second halves of their terms. That is a long way from Rooseveltian. ■

A version of this article was published online on June 13th 2021

For more coverage of Joe Biden's presidency, visit our dedicated hub

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Keystone chimera

The death of a totemic pipeline has been greatly exaggerated

Oil from Alberta's tar sands will still flow freely

Jun 17th 2021 | NEW YORK

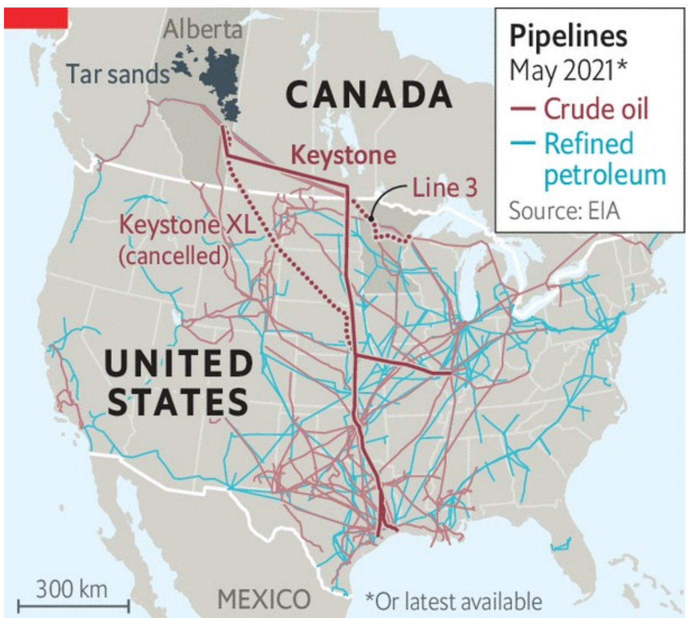
Getty Images

THE WEBSITE of 350.org, an environmental group, screams, "We want to end the fossil-fuel industry within the next decade." The group's *cause célèbre* has been halting the completion of Keystone XL, an $8bn pipeline that was intended to transport oil mined from mucky "tar sands" in Canada's Alberta province over a thousand miles into the American heartland.

To that end, greens joined with native Americans and ranchers, who also opposed the pipeline out of concerns that it would disturb sacred grounds and pollute vital water supplies. They persuaded Barack Obama to revoke an essential permit, which halted construction. But TC Energy, the firm behind the project, and the Albertan government were equally determined. They persuaded Donald Trump to reverse Mr Obama's ruling, allowing it to proceed.

Then in January this year President Joe Biden reversed Mr Trump's ruling, halting construction again. After reviewing its legal options, TC Energy declared on June 9th that Keystone XL is "terminated". Bill McKibben, a founder of 350.org and a noted environmentalist, exclaimed: "[W]hen enough people rise up we're stronger even than the richest fossil-fuel companies."

Perhaps, but greens should not pop the champagne just yet. For a start, the loss of one conduit will hardly dent America's petro-economy, which boasts over 200,000 miles of oil pipelines (see map). Gas-guzzlers will not be affected one whit. John Coleman of Wood Mackenzie, an energy consultancy, puts it bluntly: "Keystone XL was more of a luxury than an absolute necessity for the US oil market."



The Economist

If slaying this pipeline sparks broader anti-oil protests, argued Mr McKibben recently in The *New York Times*, then "much of the rest of the elaborate architecture of fossil-fuel expansion begins to topple". Activists in Minnesota have turned their attention to an alternative oil pipeline running from Canada to America, known as Line 3. But on June 14th an appeals court affirmed that state's approval of the pipeline.

Even if those activists succeed, they will only inconvenience peddlers of Alberta’s carbon-intensive crude, not shut them down altogether. Canadian producers can still send their oil south through other pipelines or via rail, and ship it west to global markets via the Pacific. Chris Midgley of S&P Global, a research firm, concludes that there is sufficient transport capacity “to handle growing oil sands and shale production over the next decade out of west Canada”.

Exuberance over the Keystone XL victory may prove fleeting. Alberta’s government, which has ploughed over $1bn into the pipeline, has indicated that it will try to invoke the new North American free-trade agreement to revive it. On June 15th a federal judge blocked Mr Biden’s attempt to halt new oil and gas drilling on federal lands, ruling that such a decision requires congressional approval. Environmentalists may well find Big Oil to be a hydra-headed beast.

A house divided

America’s largest Protestant denomination holds off an insurgency

But Southern Baptists remain deeply riven

Jun 17th 2021 | NASHVILLE

ANNUAL MEETINGS of the Southern Baptist Convention (SBC), America’s largest Protestant denomination, are usually dull. Church representatives, known as “messengers,” debate resolutions about ecclesiological minutiae and hold referendums about referendums. There is a committee on committees that selects officers for a committee on nominations that nominates members of other committees.

This year was different. The agenda included the election of a new president, a vote on whether to allow an investigation into accusations of sexual abuse, and a showdown over race (the denomination was founded in the pre-civil war South after Northern Baptists refused to appoint slaveholders as missionaries). On most of these issues, the SBC’s more moderate wing held off a right-wing insurgency—for now.

Tensions within the SBC had long been building, particularly around accusations that the convention had shielded sexual predators. In a resignation letter leaked on May 29th, Russell Moore, head of the SBC's public-policy arm and a man broadly respected as a writer and thinker outside the denomination, alleged that the SBC's executive committee "exonerated" churches in a spur-of-the-moment meeting over covering up allegations of sexual abuse.

Mr Moore was also at the centre of the firestorm within the SBC about race. He called for white Christians to empathise with African-Americans over issues such as police brutality, but said some leaders "want to deflect the issue to arcane discussions that people do not understand, such as 'critical race theory (CRT),'" an academic niche more condemned than understood. CRT has become a bogeyman for the American right, and incensed some pastors who consider woke ideologies a grave threat to their churches and the country.

Anti-CRT pastors last year formed the Conservative Baptist Network, whose agitation has led some African-Americans to cut ties with the denomination and has tormented anyone seen as insufficiently conservative. In his resignation letter, Mr Moore wrote, "My family and I have faced constant threats from white nationalists and white supremacists, including within our convention."

The conservative wing's choice for president was Mike Stone, a pastor from Georgia. He ran against Ed Litton, a pastor from Alabama known for his efforts at racial reconciliation. Mr Litton eked out a narrow victory. Soon afterward, messengers charged him with creating a task force to oversee an independent investigation into the SBC's historic handing of sexual abuse. Jules Woodson, who says she was abused by her youth pastor when she was 17, tweeted, "Thank you from the bottom of my heart for hearing our cries."

Some hope that the victory of the less-conservative wing may help staunch the outflow of members. Though more than 14m Americans identify as Southern Baptists, their number has been declined for 14 years in a row: 2020 (when membership shrank by 435,000) was the worst year on record. Southern Baptism is an evangelical denomination, which means that members must choose to be baptised into the faith; according to figures presented at this year’s meeting, the SBC is baptising 40% fewer teenagers than it did in 2000. Churches also struggle to retain young people; half of those raised in SBC churches leave, in part because of how the denomination responds to social questions.

“Either the Southern Baptist Convention rectifies the ways that it has hurt people...or I think that more young people like myself will find new avenues to pursue ministry and denominational affiliations,” says Leah Boyd, a 22-year-old seminary student whose Twitter account is popular among young evangelical Christians. “They told us to read our Bibles and so we did and then we all became...very social justice-minded,” Ms Boyd adds, pointing to Biblical commands to care for the poor and the oppressed.

But the church’s more conservative wing will not simply retreat to lick their wounds in the back pews. Before the vote, Rod Martin, an architect of the conservative resurgence, said, “If we do not prevail today, we will come back next year, and the next and the next.” ■

Yes they Khan

Joe Biden appoints Lina Khan to head the Federal Trade Commission

Big tech firms should start to worry

Jun 19th 2021 | DALLAS

AP

THE EARLY motto of Mark Zuckerberg, Facebook's boss, was "Move fast and break things". Bruce Mehlman, a former assistant secretary of commerce for technology policy, predicts the same maxim may now guide the Federal Trade Commission (FTC), a consumer-protection agency. On June 15th news leaked that Lina Khan, a prominent critic of large tech firms, whom the Senate had just confirmed to be one of the FTC's five commissioners, would chair the agency. Her appointment shows that taking on tech has become a rare bipartisan concern in Washington, and that the White House supports a more activist enforcement agenda.

Ms Khan, who is 32, is best known for "Amazon's antitrust paradox", an article she wrote in 2016 while a student at Yale Law School. She argues that current interpretations of antitrust—which hold that if consumers benefit from free services then no harm is being done—are insufficient to deal with the power of platforms such as Amazon. The tech giants could use predatory pricing and market control to harm smaller firms.

Two more recent works show just how deeply Ms Khan's technoscepticism runs. She contributed to a report last year by the House judiciary subcommittee on antitrust, which suggested that trustbusting needs a reboot. She has argued in the *Columbia Law Review* for "structural separations" at big tech companies. She also goes far beyond conventional wisdom in her interpretation of antitrust law's toolkit.

Breaking up big tech is a popular talking point, advanced by elected officials on both sides of the aisle and by the Open Markets Institute, a once-fringe think-tank where Ms Khan used to work. Perhaps the White House chose Ms Khan in part to please progressives, who are likely to get less from the administration's infrastructure package than they hoped. Yet many of Ms Khan's views are also popular with conservatives, who bash big tech firms for their size and stifling of free speech. "She's a controversial figure within antitrust circles, but a very popular one in political circles," says Blair Levin of New Street Research, an analysis firm.

According to Mr Levin, the agenda to combat the tech giants' power will have four fronts. Ms Khan will work with Congress on bills (which have a degree of bipartisan support) to constrain the power of big tech firms by, for example, banning them from favouring their own services. Second, Ms Khan will collaborate with European regulators, who have led the charge against the tech behemoths. Third, she will launch investigations. And fourth, she will litigate cases against businesses. Here she may be most constrained, says a former FTC commissioner: courts tend to favour business, especially since Donald Trump nominated 234 judges.

Just how aggressively the Biden administration wants to pursue big tech firms should be revealed soon, when the head of the Department of Justice's antitrust division is named. But the selection of Ms Khan shows that Washington's view of tech firms has changed since Mr Biden was vice-president. That was another age, back when BlackBerrys—and tech CEOs—were still popular. ■

For more coverage of Joe Biden's presidency, visit our dedicated [hub]

California teeming

The Golden State is awash in cash

How its leaders plan to use the money says a lot about its politics

Jun 19th 2021

RECENTLY CALIFORNIA has been running a lottery to encourage vaccinations against covid-19. Those who have received their jabs can enter to win prizes, including holidays, gift cards and ten grand-prize cheques of $1.5m each. California has also recently won a windfall of its own. Instead of an expected $54bn budget deficit because of the covid-19-induced recession, a roaring stockmarket combined with a federal stimulus has produced a surplus of more than $100bn.

Politicians, including Gavin Newsom, California's governor, are splurging. On June 14th the legislature agreed to pass a $264bn draft budget—the largest in the state's history, nearly 30% bigger than the previous record in 2019-20.

Dubbed the "California Comeback Plan", Mr Newsom's proposed spending promises to help California "to make a once-in-a-lifetime investment in the future of the state". The budget will devote billions to public education, housing, transport, health care for undocumented immigrants, fighting homelessness and climate change, and more. Though the budget is not yet final, its size highlights politicians' belief that more government spending is the solution to the state's problems, as well as some of their own.

California is so flush with cash that it is launching the largest-ever state tax rebate. Those earning under $75,000 will be eligible to receive cheques of up to $1,100 (in addition to federal stimulus). A law passed by voters in 1979 requires the state to refund taxpayers once appropriations reach a certain level, but California and Mr Newsom are "following the progressive orientation of the state, which is to give back more to the neediest citizens", says Ken Miller of Claremont McKenna College.

The generosity may also be self-interested. Mr Newsom faces a Republican-led campaign to recall him from office, which gained steam during the state's long-running shutdown in response to covid-19. California was one of the last states to lift restrictions; it reopened only on June 15th. Spending on popular progressive causes helps ensure that no Democrat will run against him in the recall, while sending cheques to voters may blunt some of their frustration with him. "It's in Newsom's short-term political interest to spend now, instead of save now," says Mr Miller.

It is striking how little disagreement there is on the budget between Mr Newsom and the legislature, both chambers of which are controlled by veto-proof Democratic supermajorities. The legislature and Mr Newsom agree that the state should start paying for health-care coverage for poor undocumented immigrants. But Mr Newsom wants this to apply to undocumented immigrants who are 60 and older, whereas some legislators want to lower the age to 50. Even that reveals a lack of ideological diversity: no powerful voices are asking whether the state ought to spend as much as $1.3bn a year on the health care of low-income non-citizens.

Californians need a robust social safety-net—the state has America's highest poverty rate when adjusted for the cost of living. But two important questions arise. One is whether expanding the footprint of government without making reforms is likely to help the people the state is trying to reach. The pandemic has laid bare how badly California runs its operations. The Employment Development Department (EDD), which handles unemployment claims, has been bedevilled by ineptitude, technical problems, fraud and lack of oversight. People can wait days to reach someone at EDD, and months to get a cheque. Meanwhile the schools, among the biggest state-run enterprises, have been closed for in-person instruction far longer than in other states because of powerful teachers' unions. As of April 30th, only 13% of public-school pupils were in the classroom five days a week. That burden has fallen disproportionately on the poor and has only widened inequalities.

Another question is whether spending so much now instead of preparing for the next recession is wise. To make the maths of higher spending work, the governor is banking on a further climb for the stockmarket in the coming years, even though it is already near historic peaks. "We're a state, not a SPAC," says David Crane, a lecturer in public policy at Stanford University, referring to the investment vehicles that make often over-rosy assumptions about growth. "We should make reasonable projections about the future."

Because California depends on personal-income taxes and stockmarket gains for revenue, busts are painful. In both 2001 and 2008, the state's net capital-gains realisations declined by a whopping $80bn each time, leading to massive cuts to government programmes and the social safety-net. The governor's own maths in his proposed budget showed the downside risk to another stockmarket fall, yet the state is not setting aside enough in reserves to prepare for it.

California has already withdrawn $8bn from its $16bn rainy-day fund to cope with the pandemic, but is allocating only $3.7bn back into the fund, leaving it with a fraction of the reserves required to insulate against another economic shock. Some legislators sent a letter to Mr Newsom arguing for setting aside more reserves, but their calls have gone unheeded. Politicians are too busy partying as if they have just won the lottery. ■

Checking and balancing

America debates how much power state governors should have

State legislatures want more oversight over their executives in an emergency

Jun 17th 2021 | DENVER

ONE YEAR AGO, America's governors were having a moment. Covid-19 cases were rising, federal leadership was absent and much of the responsibility for fighting the pandemic fell on their shoulders. Before Andrew Cuomo was mired in personal and professional scandals, his daily press briefings were must-see TV. Gretchen Whitmer's star rose in the Democratic Party after she sparred with Donald Trump, who referred to her as "the woman from Michigan"—a phrase her supporters soon had emblazoned on T-shirts.

But many saw lockdowns, mask mandates and other emergency powers assumed by governors as infringements on their civil liberties. Early this year, lawmakers entered new legislative sessions in a power-restricting mood. So far this year, according to the National Conference of State Legislatures, lawmakers in 45 states have introduced more than 300 bills and resolutions concerning legislative oversight of governors' emergency powers, with 14 states enacting such measures.

Most new laws place time limits on governors' emergency orders, and require the legislature's consent to extend them. Ohio's legislature granted itself the power to rescind public-health orders from the state's health department. A law in Utah prohibits the governor from placing stricter emergency limits on religious gatherings than on other meetings.

A national reckoning over gubernatorial power is unusual in American history. Most emergencies are local or regional, but covid-19 affected every state and municipality. Asking how powerful governors should be is welcome, for two reasons.

First, because they have grown far more powerful than they used to be. State governors were at first little more than figureheads. Miriam Seifter, a law professor at the University of Wisconsin-Madison, says that they became more active in the early 20th century, when figures such as Robert La Follette of Wisconsin and Woodrow Wilson of New Jersey pioneered regulatory and electoral reforms; and as the administrative state expanded after the second world war. Today many governors wield powers that even the president lacks, such as the line-item veto, which allows them to delete parts of a bill without rejecting the whole thing.

Second, the question suggests that with the immediate threat of the pandemic receding, Americans are starting to assess how their governments responded to covid-19. "The idea that after a crisis, legislatures and the public would deliberate and reflect on a gubernatorial emergency response, and then follow that with tailored reforms...That's a good thing," says Ms Seifter. "That's part of a healthy system of checks and balances."

Legislatures have been willing to take on governors of their own parties. Ohio's Republican-led legislature overrode a veto from Mike DeWine, the Republican governor, to impose emergency-powers restrictions. In New York, Democrats revoked the emergency powers that they granted Mr Cuomo last year to deal with the pandemic. (Mr Cuomo earned a reputation for being fond of power: after taking office, he modestly declared, "I am the government".)

But the more interesting political battles are taking place in states with Republican legislatures and Democratic governors. In Kentucky, the state supreme court heard oral arguments last week in two cases concerning orders issued last year by Andy Beshear, the Democratic governor. Though most of Mr Beshear's orders have already expired, the court's decision is still important, both for Kentucky as it continues to navigate the pandemic and for precedent in future public-health crises.

In Pennsylvania, because the governor's emergency powers are enshrined in the state's constitution, lawmakers called a referendum on two amendments that would limit emergency orders to 21 days, and give the legislature—rather than the executive branch—the ability to extend, or end, them. Voters approved both measures. Tom Wolf, the state's Democratic governor, called the strategy a "thinly veiled power grab". Governors cannot veto or block ballot initiatives; Republican legislators may use the same approach to reform voting rules.

These new state laws may soon be put to the test. Summer usually sees hurricanes in the south-east. Wildfires already blaze across the West. And although the vaccination drive is going well, the virus has not disappeared. The next disaster could reveal whether the new strictures promote good government or tie governors when expediency is most needed.

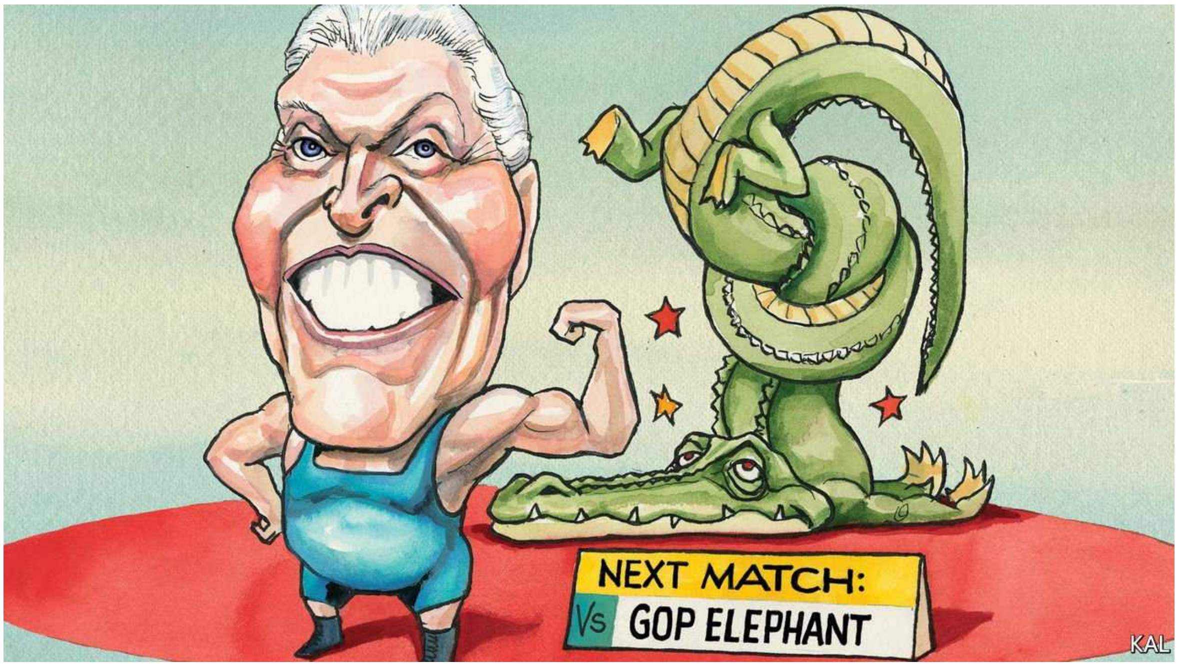
Before the pandemic "governors often seemed like a footnote", says John Weingart, the Director of Rutgers University's Centre on the American Governor. "If nothing else, people have seen that the office of the governor is important—however one thinks their powers need to be adjusted or not." ■

Lexington

Terry McAuliffe and the battle for Virginia

His victory in the state's Democratic gubernatorial primary could be one for the history books

Jun 19th 2021



THE ONLY man to serve two terms as governor of the Old Dominion since the civil war was a courtly "Virginia gentleman" and segregationist called Mills Godwin. Hailing from the rural south of the state, whose large black population and racism recalled the Deep South, Godwin claimed that letting black children attend Virginia's better schools "would be a cancer eating at the very lifeblood of our public education system". It is interesting to wonder what he would have made of Terry McAuliffe, who looks well-placed to match his achievement in November.

Flamboyant, some might even say shameless, "the Macker" is a carpet-bagging native of New York who was governor in 2014-18 and formerly known as a fast-talking Clinton crony and outlandishly good fund-raiser. He allegedly inspired (though he denied it) a scheme to Airbnb the Lincoln Bedroom to Bill Clinton's top donors. He once wrestled a 280lb alligator for a $15,000 gift to Jimmy Carter's re-election campaign. Godwin and the

Macker, who won Virginia's Democratic gubernatorial primary last week in a blowout, have two big things in common.

Both transformed their reputations in office. The segregationist ushered in Virginia's first sales tax and bond issuance, leading to new roads and a community-college system. The Macker, working around a militant Republican legislature, re-enfranchised 173,000 ex-felons, nearly half of whom were African-American. He was also as effective a salesman for Virginia as he had been—as America's youngest-ever bank chairman—in business. He rode in a fighter jet to impress the aerospace industry, played a revolutionary-war general on television to bring in the entertainment industry, and installed a kegerator in the governor's mansion to woo the craft-beer industry. If he didn't wrestle another gator, it was because Virginia already had three zoos. A popular governor with a decent economic record, he was probably denied a second consecutive term only because the commonwealth forbids them.

Through luck as well as judgment, Mr McAuliffe and Godwin were also beneficiaries of Virginia's two biggest political shifts since Reconstruction. Godwin won his first term, in 1965, as a southern Democrat. But as the south lurched to the right after the passage of the Civil Rights Act he won his second, in 1973, as a Republican. Unusually in Virginia, he did so despite being of the same party as the incumbent president. Forty years later, Mr McAuliffe was the next candidate to manage that feat—thereby confirming how sharply Virginia had swung back to the Democrats. The state now has its first Democratic legislature in a quarter of a century, has not elected a Republican to statewide office since 2009, and last November chose Joe Biden over Donald Trump by a ten-point margin.

Comparing those sea-changes is instructive. The voters who left the Democrats over civil rights in the 1960s and 70s were white, mostly working-class and more radicalised than the patrician establishment of either party. By contrast, the left's new voters, in the affluent suburbs of Richmond and northern Virginia, are diverse professionals who are chiefly recoiling from a Republican establishment captured by the wildest spirits of its base.

Mr McAuliffe's opponent in November, Glenn Youngkin, a super-rich political newcomer, was one of the more moderate candidates in the

Republican primary. Yet to win it he was forced to declare fealty to Mr Trump, perhaps the most unpopular politician in Virginia, and tacitly endorse his lie that the general election was stolen. The former private-equity baron has launched an "election integrity taskforce" and called a Trumpist conspiracy theory about voting machines "the most important issue" of the campaign. This encapsulates the handicap Republicans face in every state with extensive suburbs—including Arizona and Georgia, as well as Virginia. They are attempting to win them back while leaning into the extremism that suburbanites loathe.

This is a bigger advantage to Mr McAuliffe than his governing record (which jaundiced voters, in another contrast with Godwin's time, are liable to set aside these days). He has therefore nicknamed his Republican opponent "Trumpkin" and is trying to goad Mr Trump into getting involved in the race—ideally by visiting the state. "Oh my goodness, I'll pay for his gas to come!" the irrepressible Macker told your columnist. "But I'm telling you he's scared of me, he's not coming here, we keep beating them!"

The Democrats' main weakness is also apparent in the race. It is that the voluble left thinks the party's new supporters have come to it in a great awokening, not, as is the case, by default. During the primary, left-wingers suggested that Mr McAuliffe's candidacy was an affront to his three black primary opponents. In giving him 62% of the vote in a five-horse race, Democratic voters dismissed that, and in the process underlined another Democratic advantage. The moderation of the party's new suburban voters is reinforcing the previously underestimated centrism of its African-American base—which in Virginia represents a fifth of the electorate. Mr McAuliffe, who has said relatively little about race while vowing to boost education spending and job creation, thereby won the primary vote in every city and county of the state.

A Macker for all seasons

As a competitive state, which holds one of the first statewide votes after a general election, Virginia has long been an important political straw in the wind. Despite its recent lean towards the Democratic Party, this year will be no different. There is so much on the line. Mr Youngkin will test the Republicans' ability to detoxify themselves now that Mr Trump is off the ballot. The party's anti-democratic drift, perpetuated by Mr Youngkin, will be all the more threatening if they succeed. Opposing them stands the author of "What a Party! My Life Among Democrats: Presidents, Candidates, Donors, Activists, Alligators and Other Wild Animals". Cometh the hour, cometh the Macker.■

The Americas

The other border surge

Many Central American migrants are staying in Mexico

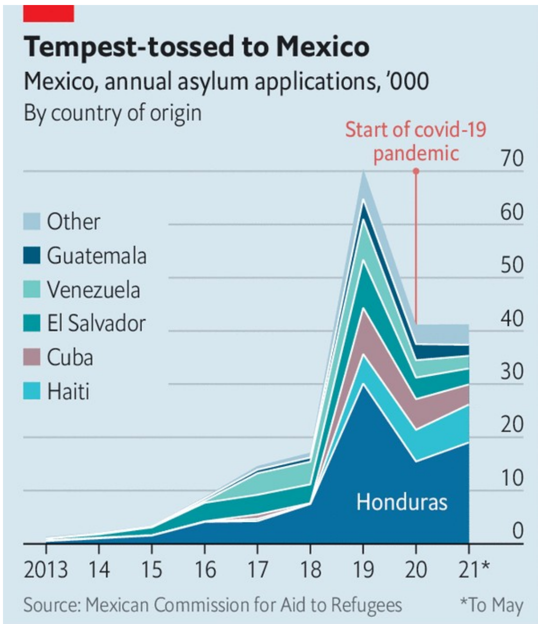
Some join family members, others are drawn by better opportunities to work

Jun 17th 2021 | SALTILLO

FOR YEARS Juan and Marta ran a successful transport company in El Salvador that attracted the attention of gangs. Thugs held them at gunpoint and extorted money from them. In 2019 Juan left to claim asylum in Mexico. He was given permission to stay and found work. In April Marta and their three children were allowed to join him. They are thrilled by the prospect of a quieter life in the northern Mexican city of Saltillo. Nothing is as good as at last feeling secure, says Marta. “It gives you back life.”

Latin American migrants, mostly from the “Northern Triangle” of Guatemala, Honduras and El Salvador, are attempting to cross the border from Mexico to the United States in ever higher numbers. In May 180,000 arrived there, the highest monthly total in more than 20 years. The number of arrivals in April was almost as large.

Most are escaping violence and poverty. The impression that President Joe Biden's administration will be more friendly to migrants than Donald Trump's was seems to have spurred many to make the journey. Kamala Harris, Mr Biden's vice-president, visited Mexico and Guatemala in early June to issue a belated warning: "Do not come."



The Economist

In fact, many migrants are stopping short of the United States, and claiming asylum in Mexico instead. In 2015 there were 3,424 requests; by 2019 the number had increased to 70,302. Some of that may be thanks to Mr Trump's policy of obliging those claiming asylum in the United States to stay south of the border while their applications were processed (Mr Biden ended this policy on coming to office).

Even so, this year looks set to break new records. Mexico had 41,195 requests for asylum, more than half from Hondurans, in the first five months of 2021. Some of these may eventually continue north. Many others, however, seem to want to stay. The country is becoming a destination in its own right, says Mark Manly of UNHCR, the UN's refugee agency. "You can spend years trying to get into the United States, or spend those years building a life in Mexico," says Rafael Alonso Hernández of Colef, a Mexican think-tank and college.

Mexico has a history of accepting immigrants. During the Spanish civil war in the 1930s many refugees fled across the Atlantic. Its laws are welcoming. Its definition of a refugee goes beyond the UN's, to encompass anyone who is fleeing widespread violence. Hondurans qualify almost automatically. Moreover, refugees, once accepted as such, can do everything but vote: they can work, take advantage of state-funded health care and send their children to local schools.

This generosity is tempting, as is joining relatives who have already made the journey. "The United States has two magnets—family networks and high salaries," says Andrés Ramírez, the head of Comar, Mexico's refugee agency. "Now Mexico has the family networks." Mexico may not offer high salaries—even in Honduras, the minimum wage is higher—but it does at least have work and more safe areas. For Spanish-speaking migrants there is no language barrier. Juan and Marta had worked illegally for a year in the United States before returning to El Salvador and then moving to Mexico. Marta says she would "never live there again". It did not feel like home, and was too expensive.

Until a few years ago most migrants were young men on their own. Later families began arriving. By the end of March Mexico hosted 3,500 unaccompanied children, up from just 380 at the start of the year, according to UNICEF. The Mexican authorities are struggling to comply with a law passed last year that bars them from keeping children in detention centres for immigrants. The nationalities of refugees are shifting, too. Hondurans have sought asylum in Mexico in the largest numbers for the past three years. But last year Haitians were the second most likely to claim asylum, followed by Cubans.

All this means that Mexico is at a "moment of transition", says Ximena Escobedo of the foreign ministry. It is likely to have to deal with a lot more migrants in the future. But without some changes it will struggle to cope. Last year Comar's budget increased to 47m pesos ($2.4m), almost double that of previous years. But it needs yet more funds to provide more shelters, argues Mr Ramírez.

Mexican law says that asylum seekers must stay in the state where they arrive as their claims are processed. Yet the states along the southern border, where almost all asylum-seekers show up, are among Mexico's poorest, and offer few jobs. Staying in those areas is dangerous for some migrants; Juan claims that Salvadoran gang members tracked him down there to intimidate him. The concentration of refugees in an already poor place also stokes anti-immigration sentiment.

When given the chance, migrants can integrate well. For over a decade UNHCR has run a programme to move people from the south to areas in the north, such as Saltillo, once they have been granted refugee status. Those who are selected, based on their willingness to stay in Mexico, are helped to find work, a house and schools for their children.

So far, the results are encouraging. Andrés Navarro of CINSA, a company in Saltillo that makes tableware, says firms like his struggle to find and retain Mexican workers. Refugees are both happy to move to take a job, and less likely to quit. According to UNHCR, fully 86% of those relocated, such as Juan and Marta, have stayed where they are a year later. It helps that refugees can earn more in these places. In their first year of work the average refugee earns 1,500 pesos a week in the north, but just 800 in the south.

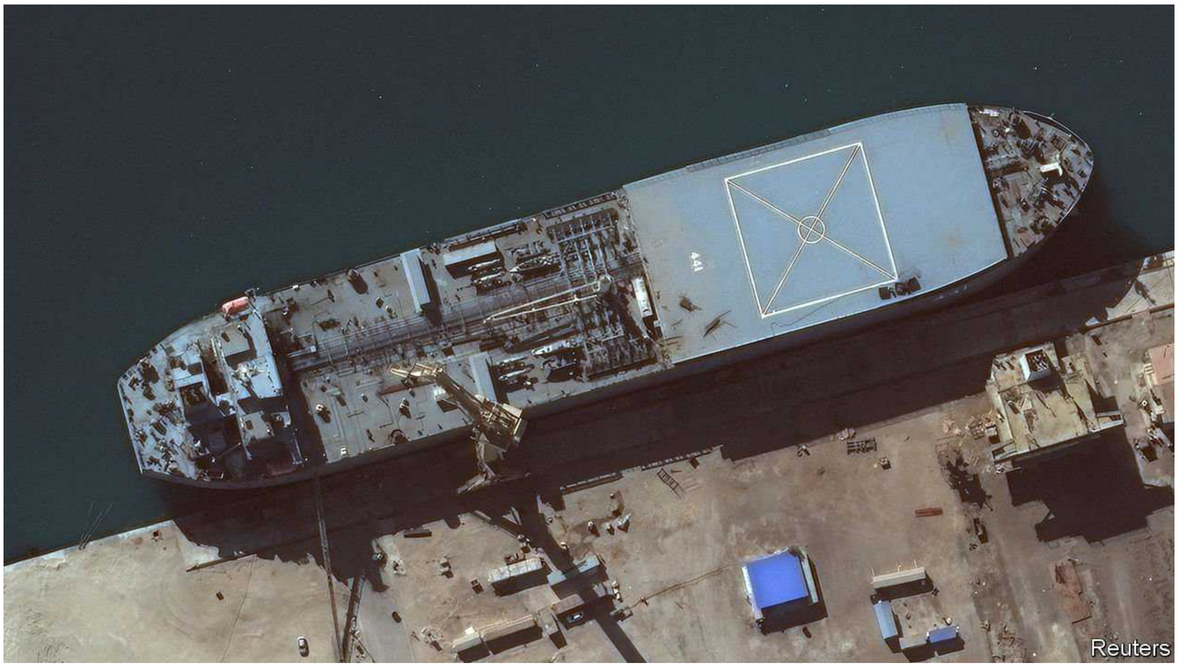
Immigration advocates would like an even more welcoming system. This could help the country more broadly, as attracting and retaining skilled workers remains tricky, too. Legal migrants often have to jump through several regulatory hoops and the system is creaking. But despite the bureaucratic hurdles, Mexico needs more people who are happy to work. Its population is starting to age and many of its own citizens are leaving for other countries. In more ways than one, it is becoming like its richer northern neighbour.■

Gunboat diplomacy

Iranian warships seem bound for Venezuela

Will they get there?

Jun 19th 2021



IT IS NOT exactly the Cuban missile crisis. In early June, a pair of warships rounded the Cape of Good Hope and became the first Iranian naval vessels ever to enter the Atlantic without port stops. The IRINS *Makran*, inching along at the speed one would expect of a former oil tanker, is thought to be carrying fast attack craft—small, agile missile-toting warships—bound for Venezuela. The United States has warned that any arms delivery would be a "provocative act and a threat to our partners in this hemisphere", meriting "appropriate measures".

Iran and Venezuela are united in hostility to the United States, which has imposed tough sanctions on the former for its nuclear programme and on the latter for its repression at home. Last year Iran sent equipment and experts to help Venezuela revive its ailing oil refineries, plus fuel and food to stock an Iranian supermarket, in return for Venezuelan gold.

Since the expiration of a UN arms embargo in October, Iran has also been free to sell weapons to anyone it fancies. Venezuela is a happy customer. In

December the head of the US Southern Command pointed to “growing Iranian influence” and claimed that Iran had sent its Quds Force, an elite expeditionary unit, to support the regime of Nicolás Maduro, Venezuela’s dictator. American officials told Politico, a website, that the deal for weapons was signed last year. Fast attack boats would be a welcome addition to the Bolivarian Navy, which has not covered itself in glory. Last year it lost a patrol boat after ramming a cruise liner in the Caribbean.

The United States has few good options for halting the *Makran* and its accompanying frigate. In October Donald Trump’s administration threatened simply to “eliminate” any long-range missiles sent to Venezuela by Iran (there was no sign that Iran intended to send any). Joe Biden’s administration has stopped short of such threats. A year ago, the American State Department threatened sanctions against Greek-owned tankers to foil a delivery of Iranian fuel to Venezuela. But warships have “practically absolute sovereign immunity”, says Cornell Overfield of CNA, a think-tank, meaning that the United States cannot lawfully seize or attack them. That principle, in force from around 1812, was reaffirmed when international courts blocked America’s attempt to impound an Argentine warship at a port in Ghana in 2012.

In the middle of a heated presidential campaign, Iran is currently negotiating America’s return to the multinational nuclear deal abandoned by Mr Trump. It is therefore eager to project defiance. But Mr Maduro may have less stomach for confrontation. Eager to ease pressure on his regime, he recently let the UN’s World Food Programme resume operations in Venezuela and freed six former employees of an American oil company. There is still time for a change of heart. Some Venezuelans speculate that Iran’s shipment is timed to arrive by June 24th, the 200th anniversary of a famous battle against Spain, traditionally the national day of the armed forces.■

Bello

Latin America’s silent tragedy of empty classrooms

Prolonged school closures are inflicting lasting harm on a generation

Jun 19th 2021

FOR THE first time in more than a year, this month small groups of children with their backpacks and chatter have trooped into some schools in Mexico City. It is a cautious re-opening. It is up to schools whether or not they open, and only a minority have chosen to do so. Only part of the class attends each day. The same goes for 18 of Mexico’s 31 other states; in the others all schools remain shut. With the pandemic far from over, caution may be understandable. But among the living, children continue to be among its principal victims, in Mexico and across Latin America.

The region has been hit especially hard by covid-19 in three ways. With 8% of the world’s population it has suffered around a third of officially recorded deaths from covid-19 (and many more unrecorded ones). Its economies contracted by an average of 7% last year, worse than the world as a whole. Much less discussed is that Latin America’s schools have stayed shut for longer than those in any other region. The effects will be felt long after the pandemic is over and economies have recovered.

Schools closed nearly everywhere in the region in March 2020 and many have remained shut ever since. They are fully open only in six smaller countries. Some countries, such as Argentina and Colombia, began opening their schools earlier this year only to close them again as they suffered a second wave of the pandemic.

The prolonged loss of learning will make dismal educational standards worse. The PISA international tests of 15-year-olds in 2018 found that in reading, maths and science, Latin American participants were on average three years behind their peers in the OECD group of mainly rich countries. With schools closed for 13 months, the World Bank reckons that some 77% of students would be below the minimum performance for their age, up from 55% in 2018. This has long-term effects. Even if only ten months of classes are missed, the bank reckons that the average student could lose the equivalent of $24,000 in earnings over his or her lifetime. The poorest, those in rural areas, and girls are most affected by the school shutdown, aggravating Latin America's already wide inequalities.

Many Latin American countries have made big efforts to organise distance learning during the pandemic. But a sizeable minority of schools lack internet access for teaching purposes. Whereas 98% of the richest fifth of students in the region have internet at home, just 45% of the poorest do. In Brazil mobile phones offer the only internet access for over 60% of black and indigenous students. Many governments are using traditional channels, such as television, radio and printed materials. Mexico has offered distance learning by these means for 25m pupils.

This is no substitute for face-to-face teaching. "Not all students learn at the same pace," says Marco Fernández, an educational specialist at the Technological University of Monterrey in Mexico. "They can't ask questions or get feedback as they would in the classroom." Beyond the loss of learning, school closures have brought emotional costs and a big increase in the number dropping out.

Schools in many countries in other regions re-opened months ago, with social distancing, testing and thorough cleaning. Apart from the severity of the pandemic, there are several reasons this hasn't happened in Latin America. Parents have generally not been keen. In Mexico, until most people are vaccinated "we think that unfortunately the conditions don't exist for a massive return to school," argues Luis Solís of the National Union of Parents, a voluntary group. Teachers' unions have been reluctant, too. In Argentina when the mayor of Buenos Aires tried to re-open schools in March he was opposed both by the union and the national government, its ally. "There's no pressure" on governments to re-open, laments Mr Fernández.

Governments could do much more to promote safe re-opening, through information and consultation. "By now all countries should at least have made a substantial effort to open schools," says Emanuela Di Gropello of the World Bank. "We are not where we should be." Catching up will be a formidable challenge. Schools need quickly to assess each pupil's level, organise remedial teaching, and make up lost time with Saturday classes and longer terms. This will take money as well as effort. Many governments have spent more on health care and emergency aid to families and firms during the pandemic. Education should be an equal priority if Latin America is not to fail a whole generation.

The Latin American dream

Why some people are moving from the United States to Mexico

It is cheaper, warmer—and safer than its reputation suggests

Jun 17th 2021 | AJIJIC

IN THE YEAR and a half since Annette and Mike Thompson sold their house in Texas and upped sticks for Mexico, they have had few regrets. Now they live in Ajijic, a pretty town by Lake Chapala in the western state of Jalisco. Their large house has a spectacular view over the water, where birds glide in the late afternoon breeze. "The only thing we miss is Tex-Mex food," says Mrs Thompson.

The clichéd view of Mexico is that it is poor and crime-ridden. Popular TV series, such as "Narcos: Mexico", do little to dispel this image. The reality has long been more nuanced, as more Americans are realising. The US State Department reckons 1.5m live south of the border, making them the largest group of immigrants in Mexico and the largest group of Americans outside the United States (Mexico counts fewer: around 800,000). The largest single community of non-military American expats in the world is in Mexico's west, close to Guadalajara

In Mexico the cost of living is cheaper and the weather nicer. The Thompsons brought Mrs Thompson’s parents down with them. Her mother has dementia but affordable care frees up her father to go fishing and play cards. And despite Mrs Thompson’s yearning for Tex-Mex, the food is better, too.

Migrants used mostly to be retirees: osteopathy clinics are abundant in Lake Chapala. But thanks to the pandemic, and Mexico’s lax rules over lockdown, younger workers are moving, too. Joyanne Sloan, who works in digital marketing for American companies, moved there with her 12-year-old daughter from Seattle last year. She is not the only one. “You can’t swing a cat around here without hitting someone from the United States,” she says. In well-heeled parts of Mexico City, such as La Condesa, English is heard as much as Spanish.

On the whole Mexicans are welcoming. But some complain that many of the newcomers come without the right visas. The largest group of illegal immigrants in Mexico—by far—is the *yanquis*.

Middle East & Africa

Thirsting for change

Few things are harder than building a state in Iraq

But hints of progress can been detected

Jun 19th 2021 | KARBALA

Reuters

AROUND NOON on June 9th, a sudden hubbub echoed through the Imam Hussein shrine in Karbala. Qassem Musleh, a militia boss who had been arrested two weeks earlier on suspicion of murder, was free and visiting one of Shia Islam's holiest sites. A happy crowd surged around him as he walked out into the blazing sun. Some did not even stop to retrieve their shoes, and scorched their feet on the street. Your correspondent squeezed into the throng for a brief interview. "They had no proof," crowed Mr Musleh.

For many Iraqis, his release was a sad reminder of how weak their state is. Prosecutors had accused him of ordering the assassination of a campaigner against corruption and Iranian influence. When Mr Musleh was arrested, his gun-waving supporters promptly occupied parts of the Green Zone, where Iraq's central government is based. Rather than risk a bloody confrontation, the state released him.

Iraq is preparing for elections in October. It will be "a huge task to ensure they are free", says President Barham Salih. The UN has been invited to supervise. Thirteen main factions are jostling for power. Seven are Shia, four Sunni Arab and two Kurdish. Two broad coalitions of Shias, Kurds and Sunnis will probably emerge from the mix: one leaning towards Iran; the other towards America and the Sunni Gulf states. Mustafa al-Kadhimi, the prime minister (a position more powerful than president), may get a second term if the factions are convinced that he is pliable.

However, Iraqis wonder how much authority the government they elect will actually have. Many fret that, no matter who wins, the shots will really be called by militias, tribes, corrupt factions and foreign powers. Many plan to boycott the ballot. Five young men in a restaurant in Basra, a southern city, sum up the mood. All supported the huge anti-establishment protests that rocked the country in 2019. Two show off scars from having been beaten by militiamen. None plans to vote. “I want a country,” says Nabil, a civil servant with a nasty truncheon injury.

Like many Iraqis, he frets that his motherland is tugged and battered by forces beyond the government’s control. Qassem Suleimani, one of Iran’s top generals, used to visit regularly to help organise Iraq’s Shia militias. America, which still has 2,500 troops in Iraq, killed him with a drone strike last year as he left Baghdad airport. The charred wreckage of his car is now mounted on a pedestal near where he died. It is one of the first things visitors see, along with countless billboards of Suleimani’s face, and that of Abu Mahdi al-Muhandis, an Iraqi militia commander who died with him.

Scores of militias, most of them Shia, are collectively known as the Hashd al-Shaabi (Popular Mobilisation Forces). They played a crucial role in vanquishing the torture-broadcasting Sunni jihadists of Islamic State (IS), who once controlled a third of Iraqi territory. But after IS was defeated in 2017, the militias did not disband. On the contrary, they have won public funding: 2% of GDP last year. Thus, the government bankrolls private military forces of dubious loyalty with a lavishness many formal armies would envy. (Iraq’s gets 4%.)

“We always follow the prime minister’s orders,” says Sheikh Abdul Zahra al-Ghanim, the spiritual leader of the Hashd’s 10th brigade. But the pictures on his wall are of Suleimani and Ali Khamenei (Iran’s supreme leader). Abu Fatima al-Basri, who runs the martyrs’ centre where Mr Ghanim is sitting, lets the mask slip: “On religious matters, we follow Ayatollah Khamenei; on earthly matters, we follow the prime minister.” And if their instructions were to conflict? “Our faith is above the prime minister,” he says.

The Economist

Mr Basri adds that he would like the Hashd to become like the Iranian Revolutionary Guard Corps. For many Iraqis, this is a horrifying prospect. Iran’s elite force answers to the top cleric, not the president, and runs a vast, corrupt business empire.

The Hashd already control some ministries, and make tidy sums from extortion and smuggling. Resentment against Iran and its proxies is widespread. Protesters set fire to the country’s consulate in Karbala last month. Others burned a Hashd office in Nasiriya last year. Soot still daubs the walls. The attacks were “paid for by outside forces”, claims one of the staff there. Such conspiracy-mongering is rife.

The prime minister’s men say they are gradually curbing militia power. Last month Mr Kadhimi issued a report claiming that the government had impounded 1,700 missiles in the past year, but it did not say from whom. A plan was proposed to merge the Hashd with the army and pension off many of its members. It has gone nowhere. One of its more vocal advocates, Hisham al-Hashimi, was murdered last year. Many Iraqis have lost faith in the prime minister. When he visited Nasiriya on June 12th, protesters pelted his motorcade with sandals.

No work and all pay

A state is supposed to serve its citizens. The Iraqi state, however, serves its employees. In a normal year, pay and pensions for public-sector workers gobble up two-thirds of the budget. Last year, when oil prices were low thanks to covid-19, they swallowed an estimated 122% of Iraq's oil revenues, which are the state's only big source of income. Civil-service bonuses and perks are not taxed, so civil servants are mostly paid in bonuses and perks. Police get extra for standing guard in risky areas; professors, for lecturing. The government pays more money, more reliably, for less work, than any private firm. So "everyone wants to work for the government," observes Ali Allawi, the finance minister.

Parties take over ministries and dish out jobs to their supporters and their cousins. Merit barely merits a mention. "When I say I don't belong to a party, they won't even let me apply for a job," says a young oil engineer in Basra. (He plans to emigrate.) When a huge portion of public workers stayed at home during the pandemic, there was "no effect on output", sighs Mr Allawi. And this is not because they were furiously working remotely. Some 10% of them, he says, are ghost workers.

Efforts to trim the public payroll, so that there might be cash left over for schools, roads, hospitals and so on, meet fierce resistance. Iraq's 4.5m public employees and 2.5m pensioners in an adult population of roughly 20m are a gigantic interest group that politicians fear to defy.

The other big drain on the public purse is subsidies, on such things as food and electricity. Energy subsidies (largely in the form of free oil to generate power) run to $17bn a year, or 10% of GDP. This makes electricity cheap; even so, few Iraqis pay their bills. Officials take bribes to overlook this. Politicians are reluctant to upset either group. Because electricity is in effect free, demand is "uncontrolled", says Mr Allawi. "Go to any squatter settlement, everyone has air-conditioning." Except during power cuts, which are common.

If Iraqis had to pay their bills, they would waste less. Iraq would find it easier to keep the lights on. In a pilot scheme in Zayouna, a Baghdad suburb, a private firm collected payments for electricity. Residents and local businesses found they actually saved money, because there were fewer power cuts and they spent less on costly diesel generators. But such reforms may take time to catch on.

Burning money, spreading pollution

To generate more power, Iraq imports Iranian natural gas. Because of American sanctions on Iran, paying for this is complicated: Iraqi dinars must be placed in an escrow account, which can then be used to buy food and medicine. Iran would rather have cash, but this will not be allowed unless international talks about its nuclear programme yield an agreement. Iraq has often failed to pay what it owes, prompting Iran to curb supplies.

Ironically, Iraq produces plenty of gas, which bubbles out of its oil wells. But most is flared (ie, burned on the spot) or released into the atmosphere. This is environmentally irresponsible and economically daft. Were the gas to be captured, it could replace Iranian imports entirely.

Some firms are trying. Basrah Gas Co, a joint venture between the state, Shell and Mitsubishi, has since 2013 gone from capturing gas equivalent to

50,000 barrels of oil a day to 210,000. Work has begun to capture 100,000 barrels more. “Technically none of this is complicated,” says Malcolm Mayes, the managing director. The difficulty has been making sure the government pays what it owes—essential for a project that requires hefty upfront investment. After some hiccups, the firm has worked out a deal whereby payment is secured with oil, and is pressing ahead.

The fossil-fuel industry can never be a big employer. And that irks many Iraqis. The tribes from whose land the fuel is pumped insist that as many jobs as possible are given to their members. The tribes next door tend to miss out. On a tiny island in the marshes near Basra, surrounded by water buffaloes, Noaman al-Salmi grumbles about the blazing flare on the horizon, and the pollution that falls like mist. “We get no jobs,” he says, “only cancer.”

Beset by pious gunmen, some Iraqis have grown disillusioned with religion itself. Imams bemoan their dwindling congregations. The country’s top Shia cleric, Ayatollah Ali al-Sistani, has stopped giving weekly sermons. Iraqis speak of a rising nationalism that eschews foreign interference, especially Iran’s.

Respect for human rights is still lacking. Sunni Arab dissenters are treated as terrorists and have largely been silenced. Shia ones fear assassination. The prime minister promised to arrest the thugs who killed more than 560 protesters last year. But a year of investigations has yet to result in a single prosecution, says the UN.

Some perspective is in order. “This country has seen devastation no other country has seen,” says Mr Salih: dictatorship, genocide, invasion and a blood-drenched “caliphate”. Building a state that can govern Iraq “needs a lot of work”, he says. Still, there are signs of progress.

The main reason for optimism is that the country, though still violent, is less so than at any point since the American-led invasion in 2003. The last big car bomb was in 2017. Tribal feuds are still common, but the sound of gunfire in cities is fading.

Iraq is also opening up. Visas that once took months are now available on arrival. Traffic flows through checkpoints more easily than before. The economy is rebounding from covid-19. Having plummeted by 10% last year, it will grow by 2% this year and 8.4% in 2022, predicts the World Bank. The budget assumes an oil price of $45 a barrel; it is around $70, so the fiscal deficit should shrink from 5.5% of GDP in 2021 to a more manageable 0.6% in 2023.

The state is as corrupt as ever. But optimists note that much of the money that is stolen is now invested locally, rather than spirited abroad. Cranes long dormant are rotating again. Well-tended shrubbery has appeared by roads in Basra. The old city of Mosul, which was bombed to cinders during the war against IS, is being rebuilt with help from the UN. Of the 6m Iraqis displaced by that war, almost 80% have returned to their areas of origin.

Chin up

Covid-19 has spurred innovation. Credit cards are rare, making it hard for homebound Iraqis to order things online. So firms such as Zaincash have built apps to allow digital payments. "Small businesses are working incredibly fast because of covid-19," says Rashwan Shareef, who runs a Basra-based online marketing company.

Meanwhile, ordinary Iraqis are getting on with their lives. Ghayth al-Hillo recalls taking a high-school exam in Baghdad in the turbulent days of 2007. Desks were spaced far apart to prevent cheating. When a gunfight broke out on the floor below, the teacher did not stop the exam. "We were told to sit closer together, away from the windows," recalls Mr Hillo.

Now, aged 30, he seldom hears shooting. He is developing an online startup, Join the Club, to help Iraqis improve their English. He is guardedly hopeful about the future. But still, he scorns the choices at the upcoming election. "I'm going to spoil my ballot," he says. ■

New man in charge

Naftali Bennett's new Israeli government has its work cut out

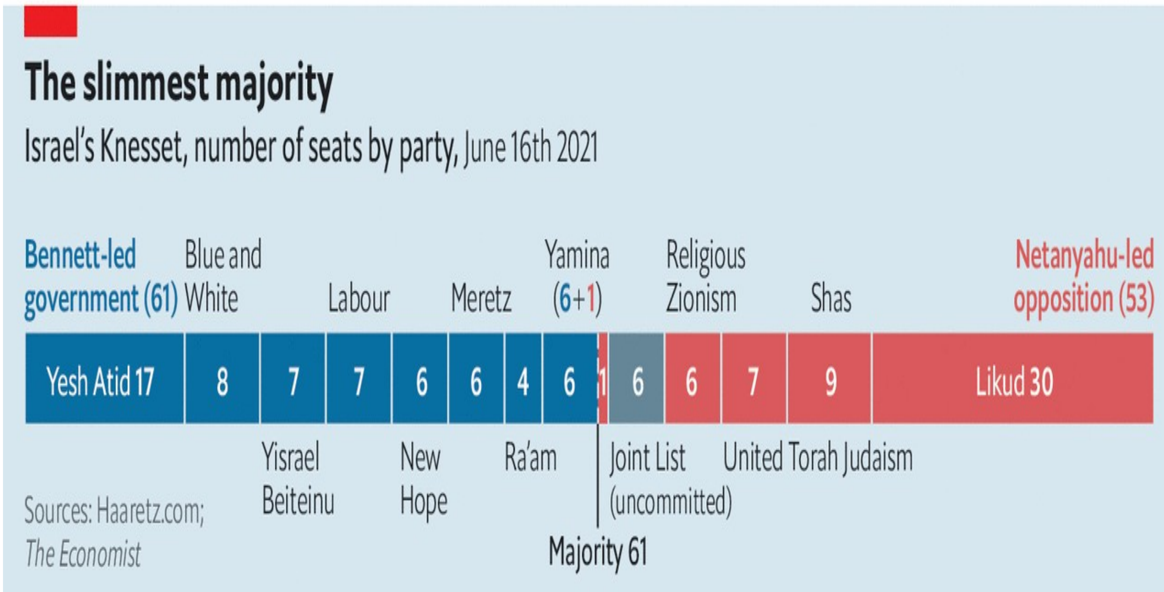
But it may also tackle issues that have long been neglected

Jun 19th 2021 | JERUSALEM

WHEN ISRAEL'S new government, led by Naftali Bennett, holds its first cabinet meeting on June 20th, it is expected to appoint an independent commission of inquiry into the disaster at Mount Meron, where 45 people were crushed to death at a religious pilgrimage in April. Mr Bennett's predecessor, Binyamin Netanyahu, shunned such commissions during his 15 years as prime minister. Mr Netanyahu, who is on trial for corruption, was not fond of pesky investigators looking into his government's actions.

Mr Bennett's government will be different in other ways, too. Whereas Mr Netanyahu led a cohesive coalition of right-wing nationalist and religious parties, Mr Bennett leads an unwieldy one that includes some nationalist parties (such as his own, Yamina), as well as left-wing and secular parties—and, for the first time ever, an Arab Islamist party (Ra'am). The new government was approved in the Knesset, Israel's parliament, by just a single vote.

That has led to low expectations. Just passing a budget would be seen as a success: Israel has not had one in two years. But because of its make-up, Mr Bennett's government is also in a position to tackle issues that Mr Netanyahu long ignored.



The Economist

The commission on the Meron disaster is indicative. The pilgrimage site is the fiefdom of ultra-Orthodox Jewish groups that bristle when the state tries to interfere in their affairs. Mr Netanyahu, who depended on the ultra-Orthodox for votes, let them be. But they are not part of the new coalition, which gives it more freedom to act. It may expand the network of state schools serving the ultra-Orthodox, who are about 12% of the population. That would see more of them studying standard subjects alongside religious ones, and so prepare them for work as well as piety. The government might also curtail funding for schools that refuse to teach the national "core curriculum".

Another area of focus will be Arab Israelis, who are 20% of the population. Their long-held grievances fuelled clashes between Arab and Jewish citizens in Israeli cities last month. The groups are meant to have equal status, but Arab citizens complain of discrimination and neglect. Ra'am's presence in the new government will help. The coalition agreement includes a promise to spend over $15bn on infrastructure and social programmes in Arab towns.

It also vows to tackle a lack of urban planning in these areas, which has led to illegal building and, in turn, demolitions by the state.

The government will probably not do much to address the conflict with the Palestinians. In the past Mr Bennett opposed a Palestinian state and wanted formally to annex much of the West Bank. His government, though, also includes supporters of the two-state solution. So its members have agreed not to make any big moves. Yet the conflict cannot be ignored. After Jewish nationalists marched through the Old City of Jerusalem on June 15th, Hamas, the Palestinian militant group that runs Gaza, launched dozens of balloons bearing incendiary devices at Israel, causing brush fires. Israel responded with air strikes on Hamas positions.

Neither Hamas nor Israel seemed interested in provoking a repeat of the 11-day conflict that killed 269 people (mostly Palestinians) last month. Hamas did not launch any rockets this time. The targets struck by Israel were empty. No casualties were reported on either side.

As big a challenge may come from Mr Netanyahu, who took a moment to adjust to his new post as leader of the opposition. On June 13th, after the government won its initial confidence vote in the Knesset, he had to be told by a colleague that he needed to vacate the seat at the centre of the government's bench. But Mr Netanyahu has since taken to his new role with a vengeance, reminding colleagues that he was opposition leader twice before—and each time toppled the government. Now he promises "to bring down this dangerous left-wing government, this scam government that will fall quickly."

Mr Netanyahu is 71 and, besides his corruption trial, he must contend with fissures in his party, Likud. Still, he is determined to win the top job for a third time. His continued presence, though, will remind members of the new government what brought them together. More than anything, it was their opposition to the former prime minister. That may also keep them together. ■

A coronation

Ethiopia's flawed elections risk dividing the country further

Opposition leaders are in jail and in many areas people cannot vote

Jun 16th 2021

KHALID JEMAL, a merchant from the western Ethiopian town of Agaro, is no stranger to elections. The poll on June 21st will be his fourth as an opposition candidate—and, barring divine intervention, his fourth successive defeat. Since 2010, when the ruling party and its allies won all but two parliamentary seats, Khalid has had the misfortune of standing against Abiy Ahmed, then an up-and-coming party man and now the prime minister. "I'm proud he's from here and I respect him," he told *The Economist* in an interview held not in his office, but in one belonging to the ruling Prosperity Party—and with an attentive official of that party taking notes.

Abiy took office three years ago, after massive protests forced his predecessor to resign. Ever since, government officials have talked up elections (originally scheduled for 2020) as a salve for the country's divisive politics and bitter ethnic cracks. According to the prime minister, this will be the most credible vote in Ethiopian history. Given that the country has never had an election in which the incumbent did not claim victory, that is a low bar. Unfortunately the coming poll may not clear it. In some places the vote will be competitive: notably Addis Ababa, the capital, and parts of Amhara, the second-most populous region. But the overall result is not in doubt. For Abiy, who has said his mother prophesied that he would one day be king, it is less an election than a coronation.

About a fifth of constituencies will not take part at all on June 21st. This includes all of Tigray, a northern region in the midst of a devastating civil war. Fighting between the central government's forces and those allied with the region's former ruling party, the Tigrayan People's Liberation Front (TPLF), is far from over. Indeed, it may well be intensifying. Moreover, millions of people are at risk of starving to death in Tigray because forces allied to the government are not allowing enough lorries carrying aid to pass their checkpoints. In a closed meeting of the UN Security Council on June 15th Mark Lowcock, the UN's humanitarian chief, said that parts of the region are now suffering famine. He added that Eritrean soldiers, who have been fighting alongside Ethiopia's federal forces, "are using starvation as a weapon of war". He also spoke of widespread rape, attacks on civilians, and the intimidation, harassment, beating and killing of aid workers.

The Economist

In short, there is no chance of a free vote in Tigray. But the delay to voting also applies to the Somali and Harari regions, which have been beset by legal disputes as well as mishaps such as misprinted ballot papers. A second round of voting is therefore scheduled for September.

Abiy's vast home region of Oromia, which contains 41% of registered voters, is a one-horse race. The two main Oromo opposition parties have boycotted the vote, citing the persecution of their members and arrest of their most popular leaders (for supposedly inciting ethnic violence). Khalid's party, Ezema, espouses a pan-Ethiopian ideology that stresses individual rather than group rights. This sets it apart from most other parties, which typically champion one of Ethiopia's many ethnic groups. It stands almost no chance of winning seats in Oromia. In the nearby village of Beshasha, where Abiy was born, a hall set up for residents to wait in before they cast their vote is decked exclusively with bunting celebrating the ruling party. "The people believe in the election," says a local official. "They want to show their love for the government."

Many opposition supporters, especially young people, may simply stay at home on polling day. "Why waste my time and energy?" asks a student at Jimma University, in Oromia. Some people complain that officials forced them to register, for instance by withholding state-subsidised rations of sugar or cooking oil from anyone without a voter card. But apathy does at least mean worries about post-election violence have waned. "There's a kind of disengagement," says Geresu Tufa, a peace activist in Oromia. "So in that sense it's safe."

Where it is not so safe is in parts of western and southern Oromia, which are racked by armed insurgency. Fierce fighting in these places, as well as in the neighbouring region of Benishangul-Gumuz, has scotched any hope of voting there proceeding on schedule. "This time [violence] will not be about 'My party didn't win'," predicts a Western diplomat. "It's about discrediting the whole thing." Rebels have attacked electoral posts and assassinated officials from the ruling party. In response local security forces have unleashed terror on civilians. Many have been arrested or killed. In May police tied up and beat a teenage boy in broad daylight—and then publicly murdered him. "There's no mercy at all now," says Ashenafi Dhabate, an opposition supporter in the western Oromo town of Ambo.

Foreign governments are belatedly sounding the alarm. On June 11th America’s State Department said it was “gravely concerned” about the election and called on the government to promise talks with the opposition afterwards. America has already imposed travel restrictions on officials connected to the war in Tigray and has asked the IMF and World Bank to withhold economic assistance. Last month the European Union cancelled its election observation mission, saying that bureaucratic obstacles had made its work impossible.

Abiy has responded by making standing up to the West part of his election schtick. At a large rally organised by the government last month protesters denounced American sanctions. On state television broadcasters warn of foreign plots to weaken Ethiopia. In a speech on June 6th the prime minister called on the public to “eliminate” what he said were foreign enemies and domestic traitors.

Whatever the election’s shortcomings, Abiy is sure to claim a big popular mandate. In theory that might make it easier for him to take bold steps, such as calling a ceasefire in Tigray or releasing opponents from prison. But it will do nothing to fix the problems that brought down his predecessor, such as the federal government’s centralisation of power and the deep mistrust among the country’s 80 or so ethnic groups. “Real dialogue should be the next step to solve the underlying disagreements about what kind of country we want,” argues Geresu. “An election alone cannot bring enough legitimacy to govern.” ■

Taking off

Africa is blasting its way into the space race

Disruptions to the space industry offer a rare opportunity to new entrants

Jun 19th 2021

IN THE HOURS after Hurricane Katrina slammed into America in 2005, destroying large parts of New Orleans, the people co-ordinating the disaster response urgently needed satellite pictures to show them what they were facing. The first images to come in were not from the constellations launched by NASA or the space agencies of other rich countries. They were beamed to Earth by a small Nigerian spacecraft that had been launched from Russia just two years earlier.

The small cube—Nigeria's first satellite and only the second launched by a sub-Saharan African country—did not just watch a storm, it provoked one, too. British politicians and a taxpayers' pressure group called for a halt in development aid, saying Nigeria did not need help if it could afford a space programme. Still, the sums being spent on space by African countries back then were tiny. South Africa's SUNSAT, the region's first satellite, was built by students at Stellenbosch University and hitched a free ride on a NASA rocket. Nigeria's spacecraft cost just $13m.

In the past few years, however, the continent has dashed into space. The most recent orbital enthusiast is Mauritius, which put up a satellite on June 3rd. At least 20 African countries now have space programmes. These include heavyweights such as Egypt, Algeria and Nigeria, as well as smaller countries such as Ghana. In 2019 another five African countries launched satellites, bringing Africa's total in orbit that year to 41.

Space in Africa, a consultancy based in Nigeria, reckons that African governments budgeted about $500m for their space agencies in 2020. That is a sliver of the $23bn spent last year by NASA, but it still marked a big jump from the $325m they spent in 2019. This does not include spending by private investors such as Eutelsat, a European operator, which park communications satellites in orbits so they can beam signals down to Africa.

African governments argue that their investments in space programmes help to build local skills that can attract investment and spill over into other areas of the economy. The Square Kilometre Array, an internationally funded radio telescope being built in South Africa, will pull in almost €2bn ($2.3bn) of investment and is creating thousands of jobs. It is also inspiring youngsters to study engineering.

The satellite programme started on the Stellenbosch University campus has already borne fruit. Several of its graduates went on to work at Dragonfly Aerospace, a firm based in Stellenbosch that hopes to build as many as 48 small satellites a year. In April Max Polyakov, a Ukrainian-born investor, bought a controlling stake in the company for an undisclosed sum.

African countries missed out on the big shift in the world's economy in the 1990s, when manufacturing moved from rich countries to poorer ones in Asia, because they were not nimble enough to open their economies and attract investment. Now they are entering the space industry just as it is being disrupted by new entrants, who are making small satellites that cost a fraction of the price of big ones made by incumbents. That offers a rare opportunity to countries and companies quick-witted enough to grasp it. ■

Europe

A whiff of détente

America and Russia return to traditional great-power diplomacy

Joe Biden's and Vladimir Putin's only concrete gains from their summit were small—but solid

Jun 17th 2021

JOE BIDEN was 12 in 1955 when Dwight Eisenhower sat down in Geneva with Nikita Khrushchev for the first bilateral summit between the leaders of America and the Soviet Union. The current American president was a 42-year-old senator working on arms control when Ronald Reagan sat on a sofa with Mikhail Gorbachev for the first time in the same city, taking what turned out to be the first step towards ending the cold war.

On June 16th it was Mr Biden's turn to encounter Russia's leader, Vladimir Putin, who has undermined many of the achievements of the post-cold-war order and revived some of the worst Soviet practices. But although the location was the same, the plot was different. This was not a summit between two superpowers holding the fate of the world in their hands. Nor was it an attempt to have another reset of the relationship, as Barack Obama tried. Rather it was something a bit murkier.

The purpose of the meeting was to manage an ongoing confrontation by firming up red lines, clarifying the rules of engagement and getting a measure of each other's weaknesses. The only concrete agreements were to start a new round of nuclear talks and to return ambassadors to their posts. These are both small but solid wins. The fact that this return to diplomacy produced a sigh of relief was a measure of how difficult relations have become since Russia annexed Crimea and launched a war in Ukraine in 2014.

The summit was a departure from the psychodrama of Donald Trump's relationship with Mr Putin. American diplomats shudder to recall a press conference in Helsinki at which Mr Trump said he had no reason to distrust Mr Putin. There was no joint press conference this time. But after less than four hours meeting in an 18th-century villa, Mr Putin and Mr Biden knew where the other man stood: cyber-attacks on vital infrastructure were off limits; disputes over Ukraine and Belarus should not be resolved by military means. Killing Alexei Navalny, the jailed opposition leader, would bring devastating consequences but, regrettable as human-rights abuses are, they should be treated separately from security. In cold-war parlance, there was more than a hint of détente.

Mr Biden has recast the relationship in grand terms, as a contest between democracy and autocracy, represented this week by Russia, though principally by China. He put his meeting with Mr Putin in the context of renewed unity within the G7 and NATO. His style and rhetoric were meant to highlight how different he is from Mr Trump. His mantra is "to restore predictability and stability" to America's relations with Russia, to create a basis for relations to be workmanlike if also adversarial, rather as they were with the Soviet Union.

The problem was that the man who sat across from him in Geneva was not a Soviet-style leader constrained by ideology, party hierarchy and, most important, the experience of common victory in the second world war.

He is, rather, a product of the Soviet collapse. He presides over a kleptocratic regime dominated by violent security services. It is a regime that cares more about wealth than ideology, and is preoccupied with its own survival rather than a global contest with America, let alone the interests of the Russian people. It thrives on disorder. It has invaded neighbouring countries, poisoned its opponents, and waged cyber- and information warfare against the West. Mr Putin talks of restoring Russia's greatness while allowing his cronies to loot its resources.

The danger is that Mr Biden's tough-sounding rhetoric will be a substitute for tough action, rather than a precursor to it. The genesis of the summit in this respect may be more illustrative than its outcome.

In March, two months after his inauguration, which coincided with the return to Russia and imprisonment of Mr Navalny, Mr Biden called Mr Putin a murderer. Mr Putin smirked, ominously wished Mr Biden good health and suggested they meet and debate on television. Mr Biden's office replied that the president had better things to do that weekend.

A few weeks later Mr Putin massed a vast army on Ukraine's eastern border. At the same time, he brought down the entire weight of his domestic-security apparatus to crush Mr Navalny's movement and purge Russian politics of meaningful dissent. Some dissidents fled the country. Mr Putin suffocated the few remaining independent media outlets by labelling them "foreign agents", thus scaring off advertisers. To drive home the message to Washington, Russian spooks hacked into American human-rights groups and think-tanks that criticised Mr Putin.

Russia's Ukrainian war-drums got Mr Biden's attention; and he suggested a summit. His team hoped that making a concession to Mr Putin's vanity would incline him to cause less trouble. Meanwhile, they hoped to project a new example of democratic vitality and global leadership.

Mr Biden then gave Mr Putin another win, this time overruling the objections of his top aides by waiving sanctions on one of the firms behind the Nord Stream 2 natural-gas pipeline that Russia is building under the Baltic Sea to Germany, bypassing Poland and Ukraine. Mr Biden meant this as a concession not to Russia but to Germany and to reality (the pipeline is 90% complete). Yet Mr Putin and Volodymyr Zelensky, Ukraine's president, who learned about America's decision only from the media, considered it a big win for Russia.

Mr Putin has signalled that he, too, is interested in a "predictable and stable" relationship—by which he means that America should predictably stay out of Russia's affairs and its backyard. In the hope of drawing his own red lines, he pre-empted the summit by outlawing Mr Navalny's movement as "extremist", threatening to annihilate Ukraine were NATO to move closer, and backing Alexander Lukashenko, the Belarusian dictator, who last month hijacked a Ryanair flight in order to arrest an opponent.

If Mr Biden needs to dial down tensions with Russia so that he can focus on a more pressing contest with China, Mr Putin needs a form of détente with America, so that he can focus on the more urgent business of repressing dissent and rebuilding his empire. "Over the past few years the Kremlin appears to have come to the conclusion that it cannot simultaneously eliminate risks to its rule at home while also fighting against the West at an ever-rising economic cost," says Andrei Kortunov, head of the Russian International Affairs Council, a think-tank.

Whereas Mr Biden, like Mr Obama before him, sees Russia as a distraction, Mr Putin sees America and its values as an existential threat. "If Putin were to fulfil Biden's wish-list, release all political prisoners, withdraw from Crimea and Donbas, [and] concede to the West on other key points, it would result in the collapse of the existing regime," says Dmitri Trenin, the director of the Carnegie Moscow Centre, a think-tank. In his press conference Mr Putin tried to justify his repression by calling his political opponents American agents and pointing to America's own injustices, from gun crime to Guantanamo Bay.

For now, Mr Putin's gambit appears to have paid off. Progress on nuclear agreements and the return of ambassadors lend a veneer of legitimacy to a rogue regime that is prepared to sacrifice lives to protect its wealth and power. But it remains to be seen whether the summit, and the ones to come, will make Mr Putin's regime less dangerous. Fiona Hill, who served on the National Security Council under Mr Trump, argues that Mr Putin's kleptocracy has become one of the biggest security threats for Western governments, along with crippling cyber-attacks. "We have to show that we are prepared to hold the line with action, not just words. Otherwise we are simply inviting Russia to move in." ■

A version of this article was published online on June 16th 2021

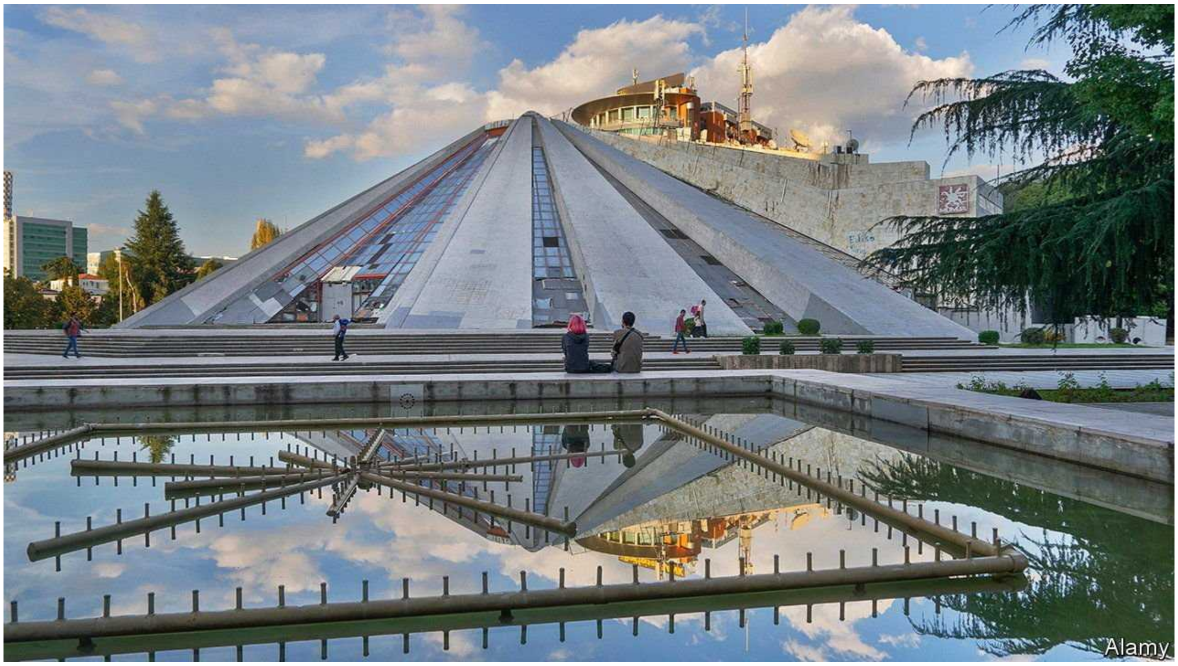
For more coverage of Joe Biden's presidency, visit our dedicated [hub]

Pyramid scheme

A memorial to Albania's late dictator gets a new lease of life

Enver Hoxha's pyramid is becoming a shrine to coding

Jun 19th 2021 | TIRANA



FOR YEARS it has been an eyesore. Stripped of its marble facing and defaced with graffiti, Tirana's pyramid was falling down. Now workmen are busily clambering about on top of it, as work has begun on restoring the Albanian capital's most unusual building. Completed in 1988, the same year as I.M. Pei's Paris pyramid, Tirana's shabbier version is getting a new lease of life.

The building was put up as a museum and memorial to Enver Hoxha, Albania's Stalinist dictator, who died in 1985. It was designed by his daughter and her husband, who said their inspiration was the mountain that rises above the city. Its real significance was obvious to everyone. Mr Hoxha had been Albania's pharaoh and he would be remembered for thousands of years. In private, Albanians grumbled. They were poor, a pyramid seemed rather extravagant and besides, Hoxha was a mass-murdering monster.

When communism collapsed in Albania in 1991, the memorial-cum-museum was promptly closed.

Ever since, no one has quite known what to do with the thing. NATO opened a regional headquarters in it during the war in neighbouring Kosovo in 1999. Sali Berisha, a post-communist leader, started an abortive project to convert it into a new national theatre. The structure became “a Frankenstein”, says Erion Veliaj, Tirana’s mayor.

Last year Mr Veliaj came under fire for demolishing the existing, miniature national theatre, which was built during the second world war by the occupying Italians out of (oddly enough) compacted paper matches. Mr Veliaj shrugs. Leaders sometimes have to go against the flow, he reckons: “Only dead fish go with it.” By contrast, his decision to restore the pyramid is rather popular.

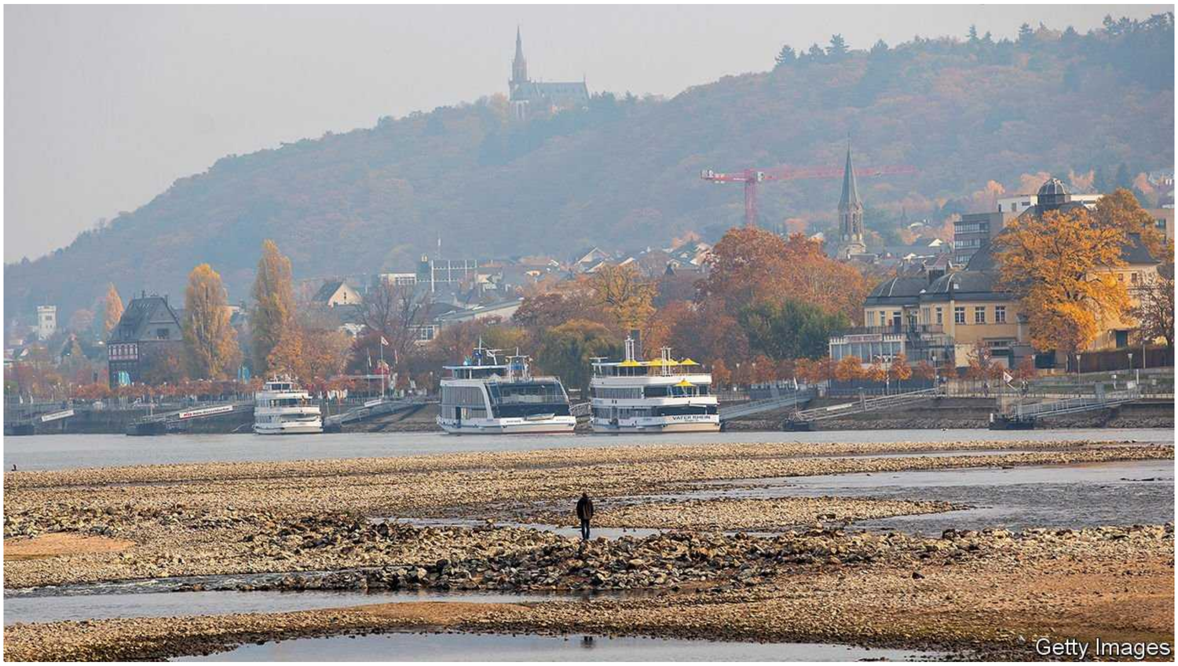
When the restoration is finished the pyramid will be faced with staircases, so people can climb to the top. And an organisation that Mr Veliaj came across in Armenia, which teaches teens how to code, will work inside what was once a shrine to a communist tyrant. There are worse uses.

Grant me greenery, but not yet

Climate change will feature heavily in Germany's election

But the difficult discussions will have to wait

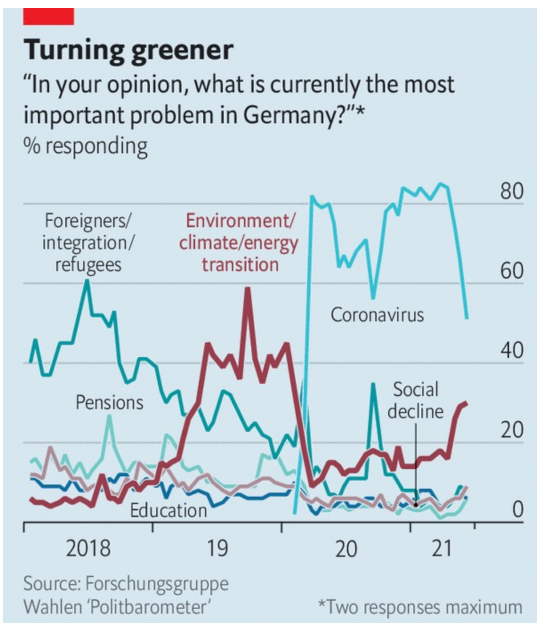
Jun 19th 2021 | Bingen am Rhein



THE FIRST sign of trouble on the Rhine, Europe's busiest inland waterway, was when the river cruises and hotel ships disappeared. Then the cargo vessels got smaller, or simply stopped sailing; goods like coal were shifted to trains. Water levels fell low enough to expose unexploded wartime bombs. These grim scenes, described by Florian Krekel of the Bingen office of Germany's Waterways and Shipping Administration, date from autumn 2018, when a long drought so depleted the waters along this scenic part of the Rhine that navigation became near-impossible. Manufacturers on the river had to slash production, exporters were cut off from world markets and petrol stations in Cologne had to raise prices. The disruption shaved 0.2 percentage points off German GDP, according to the Kiel Institute for the World Economy.

Over two-thirds of Germany's land area was afflicted by the great drought of 2018. Soon afterwards climate change shot up the list of voters' priorities (see chart). And as its effects, potential or actual, on Germany's waterways, forests and farms have become harder to ignore, it has remained at or near the top ever since. Germany's parties, gearing up for an election in late September, are reacting accordingly.

The Green Party, which approved its manifesto at a party pow-wow last weekend, has naturally placed climate policy at the centre of its offer. But the centre-right Christian Democrats (CDU), their Christian Social Union (CSU) allies in Bavaria, and the Social Democrats (SPD), who currently rule in coalition, have also had to put their imprints on it. Parliament is debating a revision to Germany's climate law, spurred by a constitutional-court ruling that made the government tighten its climate goals. In 1990, in the newly reunified country's first election, the Greens boasted, "Everyone is talking about Germany. We're talking about the weather." Three decades on, their rivals have fallen into line.



The Economist

Yet that may not work to the Greens' advantage. Although climate's prominence in Germany's debate is new, the old tactic of tarring the Greens as a bossy *Verbotspartei* ("prohibition party") still looks potent. When Annalena Baerbock, the party's chancellor-candidate, recently said petrol prices would have to rise, the CDU/CSU and SPD hammered her for building climate policy on the backs of poor motorists. Armin Laschet, her

CDU rival, says the Greens threaten Germans' sacred right to an annual jolly in Majorca. "People in the cities telling people in the countryside how to live—it's crazy," grumbles Jochen Ratzenberger, a Green-sceptic Rhineland winemaker. The Greens have slumped in polls.

Their response is twofold. First, to tamp down excesses in their own ranks. At the Green congress the leadership saw off activists who wanted bolder promises to increase Germany's new carbon price. Second, to provide a cheerful narrative for the climate struggle. Robert Habeck, who leads the party with Ms Baerbock, delivered a barnstorming speech linking climate action to heroic themes like freedom and justice. More prosaically, the Greens have a plan to redistribute dividends from carbon tariffs to Germany's less well-off.

But voters distrust such schemes. Nor are they wild about making specific sacrifices, such as paying more for petrol or ditching meat. Germany must now reduce greenhouse-gas emissions by 65% (from 1990 levels) by 2030, in order to reach net-zero emissions by 2045. This will have a dramatic impact on everything from retrofitting housing stock to the speed with which German petrolheads are weaned off the combustion engine. "Most people have no clue what it will take for Germany to achieve its goals," says Anita Engels, a climate sociologist at Hamburg University. Few politicians seem inclined to tell them.

In theory, the CDU/CSU's emphasis on market methods for climate action versus the Greens' penchant for regulation could make for "healthy debate" in the campaign, reckons Ottmar Edenhofer, head of the Potsdam Institute for Climate Impact Research. Some younger CDU MPs, sniffing the political wind, would indeed like to take the fight to the Greens. But others doubt the wisdom of battling on Green turf, and they seem to have Mr Laschet's ear. A leaked draft of the CDU's imminent manifesto offered little detail on climate.

A new report by More in Common, an international group that works on social polarisation, finds a broad consensus across Germany for climate action, alongside concerns about fairness and a sense of personal helplessness. Two-thirds of Germans it polled want binding climate rules.

“Politicians are threatening social cohesion by not acting,” says Laura-Kristine Krause, the outfit’s Germany director.

Should Mr Laschet and Ms Baerbock find themselves yoked in coalition after the election, as many expect, climate will be among the toughest elements of the negotiations. The new targets must be met, and the court satisfied. Postponing tricky conversations carries its own costs. ■

For more coverage of climate change, register for The Climate Issue, our fortnightly newsletter, or visit our climate-change hub

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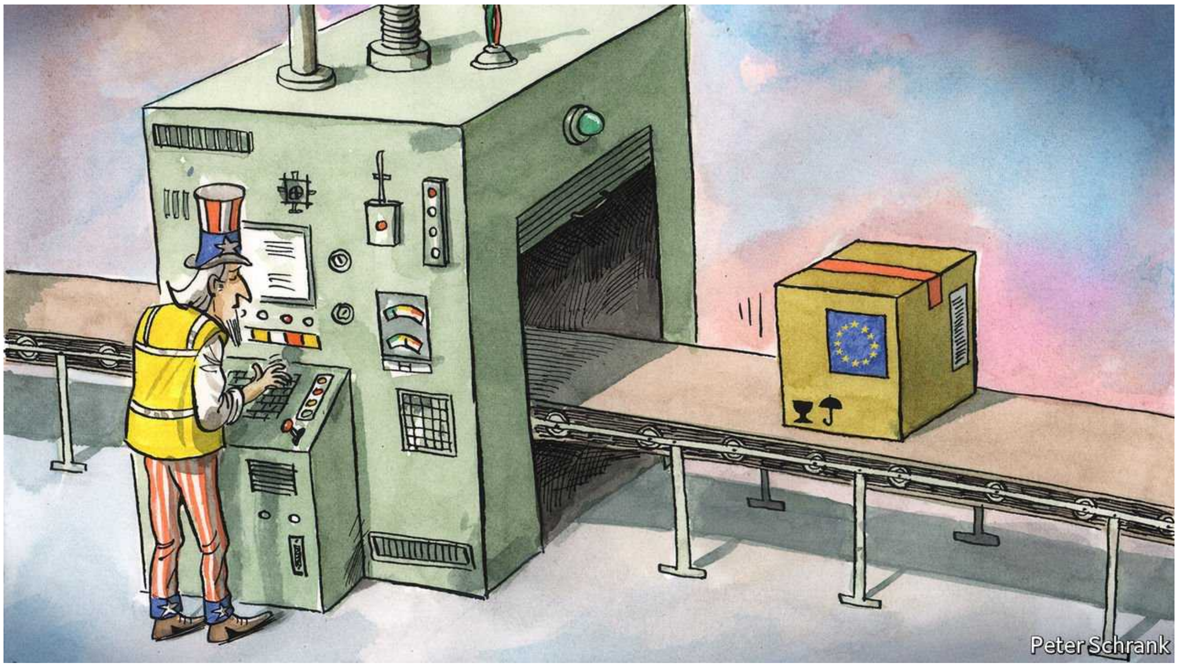
Charlemagne

The EU: Made in America

America is an engine of European integration, intentionally or not

Jun 19th 2021



FROM THE Big Mac to the nuclear bomb, the list of 20th-century America's achievements is long. In a remarkable period of invention, America bestowed human flight, superglue, rock and roll, the Saturn V rocket, Pop Tarts and the internet upon humanity. One American innovation from this era receives much less attention: the European Union.

The EU is an American creation, as much as a European one. In the middle of the 20th century, there were more European federalists in Washington than in Brussels. Senators bashed out resolutions declaring: "Congress favours the creation of a United States of Europe." The Marshall Plan, a torrent of post-war funding for the crippled continent, came on the condition that European countries meld themselves together. George Kennan, an American diplomat, summed up American policy: "We hoped to force the Europeans to think like Europeans, and not like nationalists." Forget Jean Monnet. When it comes to naming founding fathers for the EU, the list should start with President Harry Truman.

When Joe Biden swung by Brussels on June 15th, he reiterated a long-standing American goal. In a festival of back-slapping, the president heaped compliments on the EU and stressed that an integrated club was in everyone's interests. Donald Trump did his best to bury the thing, attacking it at every opportunity and loudly supporting Brexit. With Mr Trump gone, America has returned to its normal role of trying to make Europeans get along.

America has always been the secret ingredient of European integration. In the aftermath of the second world war, unifying Europe made sense for America. A divided continent could hardly resist Soviet domination. Nor would it be able to fix the "German problem" that had resulted in two wars in three decades. Instead, in a novel experiment by a victorious power, America opted to try to unite a traumatised continent, even though it could be a potential rival.

Skip forward 70 years and America is now a more subtle force for European unity. State-building can be a messy business, but American history provides one of the few guides for creating a continent-sized democracy. When discussing whether to issue collective debt, European politicians reach for Alexander Hamilton, one of America's Founding Fathers. When wrestling over who has the final legal say, scholars look to the same debates that played out in 19th-century America. The EU is a unique beast, but American history still provides the best instruction manual for how to handle it.

Sometimes European integration is a byproduct of American policy. Stubbornly national elements of policymaking, such as corporation tax, are slowly being mangled into EU matters thanks to American action. A recent American-led push to set a global minimum tax rate for big business has done more to shunt the EU towards a common tax policy than years of nagging and legal tricks by Brussels. Within the EU, low-tax countries such as Ireland and Hungary wield a veto on its tax affairs. Diplomatic *force majeure* by America overcame that.

If American governments have been an engine of integration, then American companies have greased the gears. The rise of Netflix and other streaming services means that Europeans increasingly watch the same programmes, breaking national siloes. Facebook and Twitter allow for a raucous public sphere, where anyone can share thoughts on Emmanuel Macron. Google Translate makes users feel as if they had weirdly woken up with the ability to read 24 languages, allowing Italians to flick through newspapers in Swedish and Bulgarian, if they have the urge.

At times, America drove Europe closer together by mistake. When the American government tried to tear the club apart under Mr Trump, it ended up accidentally fortifying it. Mr Trump taught EU leaders that America would not always be a helpful ally and that the bloc had to stick up for itself. French diplomats were giddy, blowing the dust off old policy ideas for beefing up European power. In a post-Trump era, their fellow officials actually listened.

The EU still falls far short of the federal mini-me imagined by the likes of Marshall, Kennan and Truman. During the euro-zone crisis, American officials were left perplexed that Greece, an economy just over half the size of New Jersey, might blow up the project. When viewed from 4,000 miles away, the vicious disagreements in European politics that stood in the way of further integration seemed rather small. In this way, says Jeremy Shapiro at the European Council on Foreign Relations, America's take on European integration resembles Gandhi's view of Western civilisation: it would be a good idea.

Nowhere to run ain't got nowhere to go

From an American perspective, a stronger EU is one that can be left alone. Europe was the front line of the cold war, but it is the periphery in America's struggle with China. Europeans may not enjoy isolation. In the shade of America's defence umbrella, difficult decisions could be avoided. It does not matter if, say, Poland or France has different security concerns, as long as America is happy to sit behind all of them. Exit America and these debates become awkward.

On paper, America wants a more capable EU. In practice, it may find such a development unsettling. At the turn of the century, the euro was talked of as a rival to the dollar. The euro's near-collapse a decade later put paid to that idea. A stable euro zone with the ability to issue collective debt at will would be a much stronger potential challenger to the dollar's supremacy.

Where the EU does have power, such as over competition policy or privacy rules, it has delighted in whacking American firms. Such areas are rare but becoming less so. A more unified EU is a more powerful one and, almost inherently, a more independent one. America may, with time, come to regret what it has wrought. ■

Britain

Border trouble

Brexit faces problems at the Northern Irish border

Britain's uneasy relationship with the EU will get worse before it gets better

Jun 17th 2021 | BELFAST AND LONDON

JUNE 23RD marks the fifth anniversary of the Brexit referendum. Even the keenest Brexiteer must feel that the process has been tortuously long. That has been, in large part, because successive British governments have refused to accept the trade-off between untrammelled sovereignty and friction-free access to the EU's single market, a refusal that shapes today's increasingly testy relationship.

Almost six months after Britain finally left the single market, the impact on the economy is hard to unpick from that of covid-19. Yet the effects of new barriers to trade are clear. The Trade Policy Observatory at Sussex University reckons that in the first quarter of 2021 British goods exports to the EU fell by 15%, while EU exports to Britain fell by 32%. The Office for National Statistics finds similarly that total EU-UK trade has shrunk by 20%. And a model constructed by John Springford of the Centre for European Reform, a think-tank with offices in both London and Brussels, concludes that goods trade is 11% lower than it would otherwise have been, on top of an earlier 10% fall since the referendum.

Such numbers suggest that what was once dismissed as Project Fear is now Project Fact. A survey by consultants at EY found that 75% of firms had experienced business disruption from Brexit. Small firms found adjusting particularly hard because the EU-UK trade deal was struck just a week before exit, meaning there was no transition period. Services have been particularly hard hit. A study by researchers at Aston University concluded that, in the first four years after the referendum, British exports of services were more than £110bn ($155bn) lower than they would have been without the Brexit vote. And a report by New Financial, a London-based think-tank, found 440 financial-service firms that were moving part of their business and some staff, along with a shift of over £900bn of bank assets (10% of the total) to the EU.

The economy's bounceback and Britain's successful vaccine roll-out have disguised much of the impact. João Vale de Almeida, the EU's ambassador to Britain, says the most immediate negative effects of Brexit are loss of mobility and damage to the union. Musicians and others in creative industries are complaining loudly about the first, and employers in hospitality also bemoan shortages of EU workers. As for the second, Brexit has clearly boosted the long-term chances of independence for Scotland, which voted strongly to remain in the EU. But the bigger worry is Northern Ireland.

Accommodating its needs was always going to be devilishly difficult, because its border with Ireland is Britain's only land border with the EU. All sides agree that a "hard" north-south border—one with physical infrastructure—could threaten the fragile peace. Theresa May's failed answer was to avoid any border or customs checks with a "backstop" in the protocol that would have kept the entire UK in a customs union and the single market for goods until alternative arrangements were possible. But Mr Johnson came to power having pledged to get rid of the backstop by taking Great Britain out of the single market and the customs union, leaving Northern Ireland alone in both. And although he has often pretended otherwise, that made an east-west customs and regulatory border in the Irish Sea unavoidable.

Just as inevitable were unionist objections. When supermarket supplies were disrupted straight after Brexit, loyalist youths took to the streets to protest. Unionist hardliners even claimed that, just as the decision to avoid a hard north-south border was motivated by fears of nationalist violence, so the threat of loyalist violence might now get rid of border controls in the Irish Sea. The new Democratic Unionist Party (DUP) leader, Edwin Poots, calls for the protocol to be scrapped. Even if it stays, in 2024 the Northern Irish assembly could vote to end its application. A simple majority would suffice.

Arguments over implementation have been stirred by unilateral actions on both sides. The British government first proposed to breach international law in its internal-market bill last autumn, but dropped this plan when it struck a trade deal with the EU. In January the EU threatened to suspend the protocol unilaterally in a bid to stop vaccine exports from the bloc, though it backed down within hours. Mr Johnson has since broken the treaty by extending a grace period for the import of supermarket goods. Now he promises to do the same for the grace period for chilled-meat imports that expires at the end of June. The EU threatens to respond with not just legal action but tariffs, too, as permitted by the terms of the trade deal.

The prospect of a trade war over sausages may delight the pro-Brexit press, which is itching for a fight with the bully on the other side of the channel. It is unpopular, however, with Northern Irish businesses. And getting rid of the protocol would not be straightforward. The assembly election due within 12 months may see Sinn Fein, the main Irish-nationalist party, take the most seats, making it harder to win a majority in favour of removing the protocol. Katy Hayward of Queen’s University and UK in a Changing Europe, a think-tank, points out that voting to remove its trade clauses would merely trigger a negotiation to find some other option. And as Claire Hanna, a Social Democratic and Labour Party MP, observes, the DUP has not suggested any alternative.

Aodhan Connolly of the Northern Ireland Retail Consortium offers one possible solution. Instead of what he calls diplomacy by rival op-eds, he suggests a temporary commitment by the British government to stick with EU food-safety and veterinary standards. That would cut the number of border and customs checks required under the protocol by 80%, he says. The

EU would be happy to agree to such a temporary measure, as would Mr Poots and the DUP.

Mr Johnson, however, is not keen on any alignment with EU regulations. This may seem odd, since he also insists he has no intention of weakening food-safety standards. Other neighbours of the EU, such as Norway and Switzerland, are happy to abide by its food rules in order to avert trade barriers. A more substantial objection is that such a policy would make it harder to negotiate a free-trade deal with America, which always demands better access for its farmers. But at the G7 summit in Cornwall between June 11th and 13th, President Joe Biden, anxious to avert renewed trouble in Northern Ireland or any risk of an intra-European trade war, promised that a trade deal would not be blocked by British alignment to EU food standards. And such a deal would, in any case, take years to negotiate.

The biggest obstacle to a pragmatic solution is lack of trust. The EU believes Mr Johnson signed the protocol intending not to stick to it. Mr Johnson thinks that some within the bloc want to drag Britain back into its regulatory orbit. Most worrying is that both sides have something to gain from playing tough: the EU by demonstrating that those who sign deals with it must stick to what they agreed; Mr Johnson by standing up to an overweening neighbour. Diplomats on both sides expect the relationship to worsen. Sadly, Northern Ireland may be the fall guy. ■

A version of this article was published online on June 15th 2021

The murder of Daniel Morgan

A panel finds that London's police are "institutionally corrupt"

The coppers are having none of it

Jun 19th 2021

IN MARCH 1987 Daniel Morgan, a private investigator, was found dead in the car park of the Golden Lion pub in south London. The axe used to kill him was embedded in his head. Its handle had been wrapped with sticking plasters, perhaps for a better grip, perhaps to avoid fingerprints. A wad of banknotes in his pocket was untouched.

The Metropolitan Police's investigation of the crime was appalling. Its forensic work was lamentable even by the sloppy standards of the time. The investigation was marred by unseemly links between the police and Morgan's associates, and between the police and tabloid newspapers. A detective sent to interview Morgan's business partner, Jonathan Rees (who was later acquitted of the murder) omitted to mention that he knew him well, and that the three men had been drinking together the evening before Morgan was killed.

The most alarming possibility, which the panel can neither prove nor disprove, is that police officers were involved in the murder. Investigating officers heard that story, but discounted it partly because the man who related it had been charged with a crime. Morgan may have been about to reveal corruption in the Metropolitan Police to an officer from another force when he was killed.

All this is described in a long and detailed report released on June 15th by a panel chaired by Lady Nuala O'Loan, a veteran of police investigations in Northern Ireland. But the panel was concerned not only with Morgan's murder (for which nobody has ever been convicted) and the investigation into it, but also corruption in the Metropolitan Police, both past and present.

That corruption was once serious and widespread in London's main police force is indisputable. Officers with memories of the 1980s recalled envelopes filled with money and criminals paying for the right to operate. Ten officers connected to Morgan's associates were later convicted of offences including bribery and supplying drugs. In 1997 the Metropolitan Police commissioner estimated that between one in 200 and one in 100 officers were corrupt.

It is much harder to argue that corruption still flourishes in the Met, given strenuous efforts to root it out since the 1990s. But the panel adopts a broad definition, arguing that failing "to be open and transparent" or "to admit past mistakes" is corruption if the intention is to protect an organisation's reputation. It dubs these "institutional corruption" and says the force still suffers from this. Witness, for example, the Met's tardiness in handing documents to the panel.

The conclusion deliberately echoes the Macpherson Report, which in 1999 dubbed the police institutionally racist. The police eventually accepted that charge. So far they are having no truck with the idea that they are institutionally corrupt as well.

Stonewall stonewalls

A campaigning LGBT charity turns a deaf ear to its critics

Despite a high-court judgment affirming employees' right to freedom of belief and speech

Jun 19th 2021

PEOPLE BELIEVE many things, some sensible, some less so. English law regards it as a right to hold and express those beliefs—within reason. In recent years courts have ruled that beliefs in catastrophic climate change, ethical veganism and "the ability to communicate with spirits via mediums" are all "worthy of respect in a democratic society". In 2019 a tribunal considered yet another, namely "that there are only two sexes…male and female".

The plaintiff was Maya Forstater, a tax expert, who lost her job with an American think-tank for tweeting about her beliefs. She summarised them as that: "Women are adult human females. Men are adult human males," and "sex cannot change". Those beliefs were found "not worthy of respect in a democratic society" by an employment tribunal. On June 10th that ruling was overturned.

The decision matters, both for Ms Forstater and for Stonewall, a large campaigning charity. It says being trans—identifying as other than your natal sex—"isn't about having (or not having) particular body parts", but "something that's absolutely core to a trans person's identity and doesn't alter—whatever outward appearances might be". It describes any other view as "transphobia".

Stonewall spreads this doctrine, widely known as "gender self-identification", through its Diversity Champions scheme, which hundreds of big organisations, including NHS trusts, MI6, the army and the Home Office, are signed up to. The scheme's business model is simple. Companies give Stonewall money; Stonewall checks that their policies align with its ideas and then badges them as diverse and inclusive. Simon Fanshawe, one of the charity's founders and now a critic, thinks employers like it at least in part because "everybody's so terrified that everybody got it so badly wrong with the gays that they've panicked about getting it wrong with the trans people".

But the result has been inimical to freedoms of belief and speech at work. It is as though all major institutions decided that everyone had to be a practising Catholic, says Naomi Cunningham, an employment barrister and co-founder with Ms Forstater of Sex Matters, a campaign group. "And suddenly the rest of us have woken up and realised that we are in the grip of a theocracy [that] requires everybody to pay lip service." Stonewall's insistence that transness is not a physical matter, she suggests, echoes the Catholic belief in transubstantiation: a man may "retain the accidents of a man, but the essence is that of a woman".

There are a few signs that faith in Stonewall may be starting to wane. In May the Equality and Human Rights Commission, an official body, said it was pulling out of the Diversity Champions scheme. Other big organisations are also leaving, and Liz Truss, the minister for women and equalities, says all government bodies should. In an article in the *Times* in May, Matthew Parris, another co-founder of Stonewall, said that "Stonewall has lost its way". What was it doing, he asked, getting entangled in attempts to suppress free speech?

Mr Fanshawe thinks Stonewall's travails are part of a wider malaise in political debate, namely a failure to engage civilly with opponents. The recent judgment, he points out, upheld not only Ms Forstater's right to her beliefs, but also the right of others to believe in the primacy of gender identity over biological sex. True inclusion means, he says, "creating a very broad alliance"—not doing as Stonewall does, which he characterises as "sitting in a corner of a room with a bag over its head shouting 'bigot' at people". ■

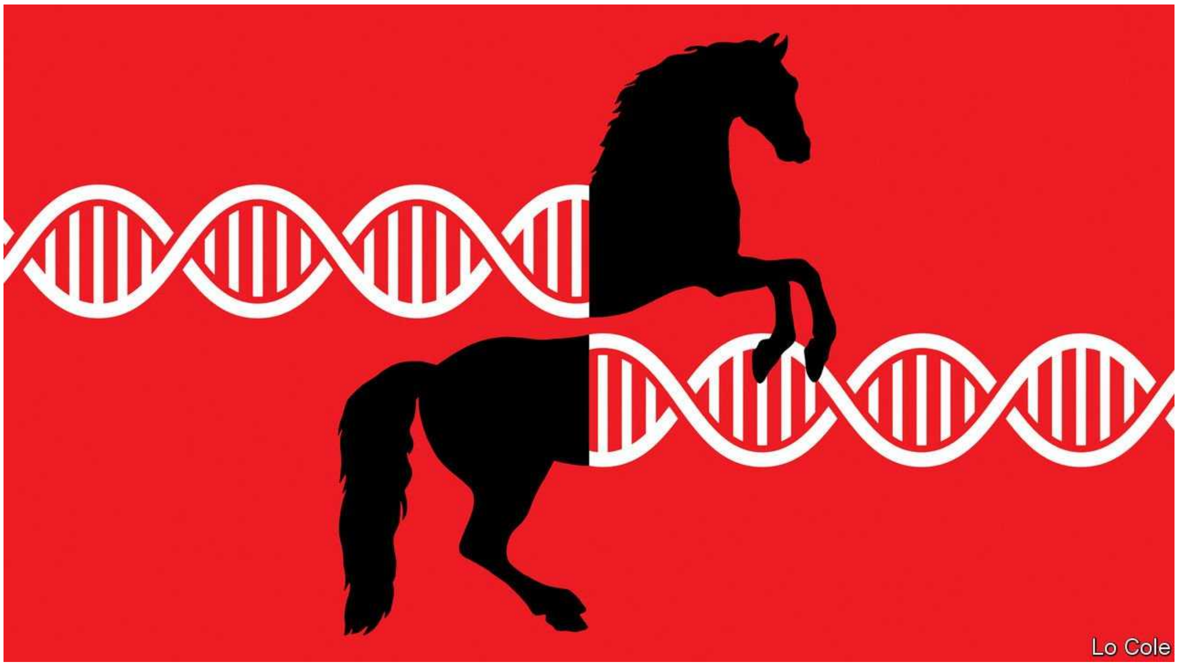
Editor's note: An earlier version of this article incorrectly described Maya Forstater as a "defendant". We regret the error.

Neigh laughing matter

Thoroughbred horses are increasingly inbred

Since its origins in 18th-century England, the industry has prized purity over diversity

Jun 19th 2021 | Newmarket



THE COURSE OF true love never did run smooth. That is particularly true when your lover weighs half a tonne and is wearing steel shoes. At the National Stud in Newmarket, a town in Suffolk widely regarded as the home of thoroughbred racing, it is breeding season. A mare stands in the shade of a stable. Her hooves have been covered with leather boots, to dampen kicks; her head is held by grooms. Tim Lane, director of the stud, calms her. The horses, brushed till they are as shiny as conkers—“they’ve got to look good,” explains Mr Lane—eye each other warily.

Thoroughbreds are the aristocrats of the horsing world: glamorous, subjected to odd mating rituals and more than a touch inbred. All are descended from three Arabian stallions brought to England in around 1700; animals which, Charles Darwin said, had “the commingled blood of Arabs, Turks and Barbs” in their veins. They make the Habsburgs look genetically diverse.

Always closely related, thoroughbreds are getting even more so. A recent study published in *Scientific Reports* found "a highly significant increase in inbreeding in the global thoroughbred population during the last five decades". All but 3% of the 10,000 horses in the study counted Northern Dancer, born in 1961, among their ancestors. Superstar sires "cover", as horsey types call mating, over 200 mares per year, up from 40 in Northern Dancer's day.

At first, horse breeders did not consider inbreeding a problem. On the contrary: horses, like maidens, were better when purer. Within a century of the arrival of those three stallions, it was decided that the job of perfecting the horse had been done so well that the stud book was closed to new entrants. Aristocrats policed the parentage of their horses, listing their dams and sires in Weatherbys stud book. In 1826 Burke's Peerage appeared, allowing aristocrats to do much the same for themselves. Francis Galton, the father of eugenics, recommended that "no time ought to be lost" in instituting a human equivalent to the stud book, to record not class, but fitness and form.

Eugenics has fallen out of fashion. The horsey equivalent has not. Thoroughbreds can earn far more from propagating their race than from running races. At the National Stud, one commands a fee of £25,000 ($35,000) for a cover. Galileo, among the world's finest stallions, is rumoured to command £600,000 a pop.

Such fees make the very best thoroughbred semen one of the world's most expensive substances, at around £6m a litre. Precise sums are difficult as it is not sold by the bottle (horses conceived by artificial insemination cannot be registered as thoroughbreds) and quantities naturally vary, but there is no doubt this is a profitable business. The finest stallions can earn a million pounds in a day.

Fashionable sires are therefore good for breeders. But they may be bad for the breed. As genetic mutations accumulate, health and fertility decline. Such problems have been found in species as diverse as dogs, humans and cows, and it is hard to see why horses would be immune to them. "We don't know yet how much inbreeding is tolerable or whether we've reached a tipping point, or when that point might be reached," says Emmeline Hill of

University College Dublin, one of the authors of the recent report. Genetic problems may be accumulating, unseen.

Back at the National Stud the gleaming horses, cover completed, trot back into the sunlight. Mr Lane, like Ms Hill, considers that what matters is not just appearance, but function. A horse that looks wonderful might not race well, or breed well. Teasingly, he reaches for an analogy with another species. “Not all good-looking women can cook, can they?” ■

Jabs v virus

The British covid-19 warning

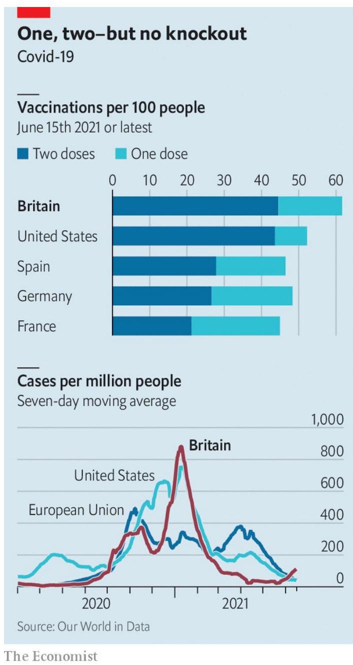
Despite rapid vaccination, rising case numbers force Boris Johnson to delay reopening

Jun 19th 2021

AT FIRST THE government focused support—surge vaccination, wastewater testing and the like—where the covid-19 Delta variant (then known as B.1.617.2) had taken hold. Now, it is everywhere, accounting for 90% of cases, and so the support has spread, too; from Bolton and south London to Birmingham, Blackpool, Cheshire, Chester, Liverpool and Warrington. The battle to defeat the variant has been lost. The aim now is to stop cases spiralling.

Ministers and modellers hold little hope that these measures, and a vaccination campaign that has jabbed more than six in ten Britons, will protect hospitals. So on June 14th Boris Johnson announced that “stage 4” of the reopening, allowing big events and indoor gatherings of more than six people, would be delayed from June 21st to July 19th. The government is also thinking about the long haul, including how to improve public ventilation and whether to encourage people back into offices.

The postponement reflects both bad luck and bad policy. According to Public Health England (PHE), the Delta variant is around 60% more transmissible than the Alpha (formerly Kent) variant, which is in turn more transmissible than earlier ones. The new wave is spreading among younger Britons, who are more likely to be unvaccinated or to have received only a single dose, which another PHE study finds is a third less effective at preventing infection by the Delta variant than by the Alpha one. The extra delay before easing restrictions will mean more second jabs, which are just as good at preventing hospitalisation.



Nadhim Zahawi, the vaccines minister, has said the roll-out would have been faster had the Joint Committee on Vaccination and Immunisation (JCVI) not recommended, in response to rare blood clots, that under-40s be offered jabs other than AstraZeneca. This raises two questions. Was the advice followed correctly? The JCVI recommended other jabs only if it would not "substantially delay" vaccination. And will that advice change? No case-count threshold has been set for reversing it, but the committee is keeping an eye on the risk-benefit calculation as cases rise.

Britain is still better placed than most of the rich world to weather the new variant (see chart). "Countries that have taken a more lackadaisical approach will find themselves with a big problem," predicts Sir John Bell of the

University of Oxford. That there are so many Delta cases probably reflects the fact that lots of people infected with it reached Britain early, he says. Mr Johnson's delay in adding India to the "red list" of countries, with tighter travel restrictions, looks foolish. That vaccines mean the mistake is likely to prove less deadly than previous ones will be little comfort to businesses desperate to reopen, or to hedonists desperate to party. ■

Dig deeper

All our stories relating to the pandemic and the vaccines can be found on our coronavirus hub. You can also listen to The Jab, our podcast on the race between injections and infections, and find trackers showing the global roll-out of vaccines, excess deaths by country and the virus's spread across Europe and America.

Clicks and mortar

Retail parks are well-placed to weather lockdowns

In a post-pandemic world, out of town and out of doors is a winning combination

Jun 19th 2021

TIMES WERE tough for offline retail before covid-19. Rising costs and tepid sales growth had squeezed margins; online shopping was filching market share. According to the Centre for Retail Research, an analytics firm, by early 2020 high streets had around 50,000 fewer shops than a decade before, a drop of 13%.

Then the pandemic struck. During the first lockdown, customer numbers for all retail locations plummeted. In-town shopping centres were the worst hit and slowest to bounce back: data from another analytics firm, Springboard, show that footfall in the first week of June was 22% below that in the same week in 2019. But amid the gloom, there is a bright spot. Visitor numbers for out-of-town retail parks were hit far less hard, and have recovered to 3% below their pre-pandemic level.

The Economist

Property investors have noticed. According to Savills, an estate agent, rental yields on shopping centres and high-street stores were rising before the pandemic, but the pace accelerated during it, meaning that the market is demanding a higher return on assets it perceives as riskier. Yields for retail warehouses have been falling since September 2020. Acquisitions tell a similar story: buyers have spent £900m ($1.3bn) snapping up retail parks so far in 2021, but only £280m on shopping centres.

In part, they reason that retail parks will do better in a world reshaped by the pandemic. Shoppers feel safer in outlets visited by car rather than public transport, and where moving between shops happens out of doors. Outlets in retail parks are larger, which helps with social distancing and ventilation. Moreover, they are stuffed with the sorts of shops that have boomed during the pandemic: supermarkets, pet-supply stores and those selling everything needed for the home, from plants and paint to futons and fridges.

But the pandemic is not the only reason retail parks are outperforming. They are much better placed than their high-street counterparts to survive the rise of internet shopping. People buying white goods, furniture and furnishings want to see and touch them before shelling out cash. Vast shop floors and good road access mean they can double as distribution centres. And they are ideal for “click and collect”, the fastest-growing form of online shopping. Expect investors’ enthusiasm to outlast lockdowns. ■

Not your dad’s army

Britain wants to make better use of civilian reserves

The army will have to be more flexible, allowing reservists to rank-hop—and grow beards

Jun 19th 2021

Alamy

GARY SULLIVAN is the chairman of Wilson James, a security and logistics company. But when covid-19 ravaged Britain last year he shed his suit, donned a uniform and helped build a hospital at a convention centre in east London. For in addition to his day job, Mr Sullivan is also the commanding officer of the British Army’s Engineer and Logistic Staff Corps, a group of senior executives who volunteer their time to the armed forces. His straddling of civilian and military worlds might be a model for the future.

Last month the government published an independent review of military reservists conducted by Mark Lancaster, a Conservative peer and former minister for the armed forces. His recommendations, he says, would constitute the “biggest shake-up of reserves since 1914”.

Britain's Army Reserve has existed in one form or another for over a century. As the Territorial Army, the name used until 2014, its reputation was that of enthusiastic amateurs playing soldiers at the weekends. Reserves were warm bodies used to bulk out an army that had shrunk dramatically after the cold war, training sporadically but to be used only in extremis. In recent years the reserve developed a more "professional ethos", says Patrick Bury of the University of Bath, shedding its old (and unfair) reputation as a "drinking club". Reserves made up 15% of the deployed force in Iraq and Afghanistan.

Now, the idea is that they should play a larger and more routine role in military activity. One spur for change has been the pandemic, during which the armed forces have driven oxygen tankers, built hospitals and delivered vaccines, most recently to combat local outbreaks in the north of England. That response was possible only because reservists brought skills from the civilian world. Mr Sullivan's staff corps also responded to Hurricane Irma in the Caribbean in 2017, the collapse of a dam at Toddbrook reservoir in the Peak District in 2019 and last summer's explosion in Beirut.

Mobilising civilian expertise is nothing new. The staff corps was formed in 1865, to ensure privately owned railways would serve the state in wartime. Military doctors have long worked in the National Health Service to keep their skills sharp. But the renewed emphasis on reservists also follows from a broader shift in the nature of warfare: away from manpower and towards technology and information. During the cold war the cutting edge of technology lay in defence laboratories. Now many advanced military capabilities—cyber-security, space, artificial intelligence and robotics—lie largely in the private sector.

Meanwhile a growing emphasis on propaganda and battles of narrative lends itself to skills found in creative industries. "If you want a good television cameraperson for countering Russian media operations, you're better off recruiting somebody from the BBC to be a reservist than trying to bring them into the army and then expecting them to maintain their skills level," says Paul O'Neill, a former head of "people strategy" at the defence ministry and now at the Royal United Services Institute, a think-tank.

That is precisely what 77 Brigade has done. The army's specialist unit for information operations—in large part, psychological warfare—it has more reservists than regulars. They include journalists, psychologists and executives at social-media firms. Many have the opportunity to use skills such as hacking in a way that would otherwise be illegal.

Attracting such talent will require greater flexibility than is usual in armed forces. Already cyber reserves, who contribute to the new offensive National Cyber Force, need not satisfy the same age and fitness standards that bind other reservists. Mr Sullivan's terms of service allow him to keep a beard. Lord Lancaster's own reserve career involves working two days a week as a brigadier at Britain's Strategic Command, which co-ordinates cyber and special forces, among other cross-service capabilities. Such part-time involvement currently requires special permission, but the armed-forces bill introduced in May would put it on a regular footing. "Being a reservist fits with the gig economy," notes Mr Sullivan. "More and more people now have portfolio careers."

Also being considered is allowing experienced civilians to enter at higher ranks, rather than working their way up. The rank system itself might need to adapt, too. Mr O'Neill gives the example of a hypothetical barrister who wants to "run around Salisbury Plain as an infantry soldier". He or she might be recruited as a junior officer, vaulted to lieutenant-colonel when the army needs legal expertise and dropped back when the need has passed.

That still leaves bigger questions about the reserves' *raison d'être*. Regular forces are now very lean by historical standards, and would need augmenting in time of major war. But using reserves for this purpose would be tricky. Ben Barry of the International Institute for Strategic Studies, another think-tank, who once commanded a reserve-heavy brigade in Bosnia, points out that whereas the army reserve is a microcosm of the regular force—a little of everything—the navy and air-force equivalents focus on niche capabilities. They could not be called up as complete squadrons like America's Air National Guard.

Raw numbers are also an issue, however. In March, as part of a radical defence review, the government said the regular army would shrink to 72,500 soldiers, its smallest in centuries. Lord Lancaster's review envisions not just reservists who are more actively engaged, but alongside them a “largely dormant” pool of ex-regulars, who could provide “surge capacity” in a crisis. Yet the government has given no sign that reserves will grow. Patriotic hackers and bored lawyers will not be enough to make up the numbers. ■

Bagehot

Britain's academic split: problem-solving v problem-wallowing

The intelligentsia is cleft by a new version of C.P. Snow's two-cultures divide

Jun 19th 2021

FEW LECTURES have had as much impact as C.P. Snow's on "two cultures", delivered in Cambridge in 1959. Its thesis was that Western intellectual life was divided into two mutually uncomprehending camps—the sciences and the arts—with arts graduates disdainful of culturally illiterate scientists, and scientists astonished that arts graduates had no clue about the second law of thermodynamics. (Snow, as both a chemist and a novelist, had a foot in both camps.) It provoked a vituperative response from F.R. Leavis, an English-literature don, who described his Cambridge colleagues as being "intellectually as undistinguished as it is possible to be", but was largely greeted with rousing applause as an intellectual landmark and a call to action.

This columnist was reminded of the two cultures by recent goings-on in Oxford, Cambridge's perennial rival. On June 12th a striking number of

Oxford scientists were recognised in the Queen's Birthday Honours list for their role in fighting the coronavirus pandemic. Among those honoured were Sarah Gilbert and Adrian Hill, who were instrumental in developing the AstraZeneca vaccine; and Peter Horby and Martin Landray, who co-led the world's largest randomised tests of treatments. The awards recognised Oxford's commitment to scientific excellence, as well as the dedication of extraordinary individuals.

Days earlier 150 Oxford dons had published an open letter announcing a boycott of Oriel College. They would refuse to teach its students, attend its seminars or help with outreach to applicants, in protest against its decision not to remove a statue of Cecil Rhodes that faces the High Street. What to do with the statue is complicated by Rhodes's dual career as a committed imperialist and great university benefactor. (It is also ugly.) But a boycott is silly. It punishes Oriel's students and potential students, who have no say over the statue's fate. It offends against college self-governance. After agonising over the statue for years, Oriel has opted for a policy of "retain and explain", in part because changing the façade of a Grade Two listed building would be pricey, and the college is already burdened with pandemic-related expenses.

The letter was signed by many of Oxford's noisiest public and would-be public intellectuals. One is Danny Dorling, a professor of geography and the author of "Slowdown", which argues that tepid economic and demographic growth are "good for the economy, the planet and our lives". We need to stop treating "change, innovation and discovery as unalloyed benefits", he argues, and welcome slowdown as salvation from "disaster far worse than a pandemic". Another is Dan Hicks, curator of the Pitt Rivers Museum, author of "The Brutish Museums" and a leading campaigner for the return of the Benin Bronzes to Nigeria. He argues that Western museums "house unending violence, ceaseless trauma, colonial crimes committed again every morning as the strip lights click on". The only alternative he sees to complicity in imperial bloodshed and genocide is to return "the curated spoils of empire" as part of a broader process of "decolonisation". The younger researchers who added their names to the letter are well represented by Sneha Krishnan, a "feminist historical and cultural geographer" who is studying "how childhood and youth are materialised in entanglement with the enduring power of imperialism".

The contrast between the honorands and the letter-writers points to the existence of two cultures in the modern university, and indeed the modern intellectual world: one of optimistic problem-solving and another of pessimistic problem-wallowing. The honorands, confronted by a global pandemic, set about fighting it with every weapon to hand. The signatories are fixated on battles about cultural symbols. The honorands are inventing the future; the signatories are preoccupied with purging the sins of the past. The honorands represent a new-found commitment to commercialising university research, particularly in the life sciences and medicine, and thereby powering the country's economy. The letter-writers represent the latest example of the ancient academic habit of contemplating one's own navel.

It is easy to dismiss such broad-brush generalisations with Leavisite disdain. Isn't the division between problem-solvers and problem-wallowers just another way of describing C.P. Snow's division between scientists and artists? There is a limit to how much you can improve the world by writing another commentary on Chaucer. And isn't the real problem with the letter-writers, and those who think like them, not that they are energy-sapping but that they are irrelevant—fighting about the past because they have no purchase on the future?

Makers and takers

The first objection has merit, but only up to a point. Though it is certainly easier for scientists to invent the future, plenty of scientists are addicted to negativity and plenty of arts graduates relish a challenge. Some within the Royal Society, Britain's premier scientific institution, are notably reluctant to seize the opportunities provided by the twin hammer blows of Brexit and covid-19 to help convert Britain's scientific talent into innovation. The second objection is, sadly, wide of the mark. There are good reasons for acknowledging the sins of the past, particularly if they are celebrated by statues that offend ethnic minorities. But it is ahistorical and anti-intellectual to ignore context and pretend that no other cultures have ever sinned in matters of slavery and imperialism.

For worryingly many intellectuals, this obsession with the past crimes of Western countries is part of a bigger project of deconstructing Western power. This means tearing down structures that, supposedly, continue to oppress everybody other than heterosexual white males. It also means damning capitalism as inherently racist and colonialist. The slowdown that would inevitably follow any such deconstruction would leave Oxford fellows standing, but flatten ordinary Britons. ■

International

- **Poverty: Rich slum, poor slum**

Rich slum, poor slum

Economically, covid-19 has hit hard-up urbanites hardest

This is true in rich and poor countries alike

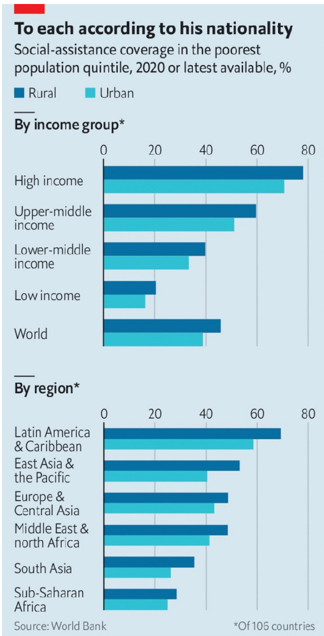
Jun 19th 2021 | Cañada Real and Kibera

WINNIE MUHONJA has faced many difficulties in her life. Covid-19 is just the latest. Having grown up in Kibera, a huge slum with 300,000 residents in the middle of Nairobi, she is used to the presence of disease and the absence of money. Ms Muhonja, who is 25, has lived with her sister since she left school eight years ago. She has two jobs but cannot afford 1,000 shillings ($9.30) a month to rent a mud house for herself and her one-year-old son. “I just hope one day I'll get a chance to get out of Kibera,” Ms Muhonja says.

Almost 4,000 miles away in Madrid, another young woman longs to escape her neighbourhood. In Cañada Real, a shantytown of about 8,000, Douaa Akrikez is in her final year of school and studying hard. Life in Europe’s biggest slum is not nearly as grim as it is in Kibera but it is still precarious. Electricity outages this winter left at least 4,500 people there without heat for months, at a time when Spain was hit by record snowfalls. Without light and unable to charge laptops or mobile phones, children struggled with online learning. “I want to finish my studies, start working and get out of here,” says the 17-year-old.

With so many other problems in their lives, neither Ms Muhonja nor Ms Akrikez has much time to fret about covid-19. But the pandemic means policymakers are concerned about them. Around the world over a billion people live in slums, in rickety homes without property rights or basic services such as running water or reliable electricity. Most of the world’s worst-off slum-dwellers are in poor countries but shantytowns exist in rich ones too. Those who live in them tend to have informal jobs: hawking snacks, for example, or cleaning richer people’s houses. In rich countries, this means they miss out on government support such as furlough schemes. In poor countries, they get little support of any kind. In Nairobi, curfews have been imposed to slow the spread of covid-19. Those who have broken them in their efforts to make enough money to survive have been beaten up by the police.

Before the pandemic, policymakers worried most about poverty outside cities (see chart). Rural places often lack basic infrastructure such as roads and internet connections. But with an airborne virus in circulation, the risk of working outside tending livestock or ploughing fields is lower than cleaning houses. And even when no money is coming in, subsistence farming keeps stomachs full.



The Economist

It is hard-up folks in cities who have been hardest hit by covid-19, both economically and in terms of their health. In May over a third of respondents in Kenyan cities told the World Bank that they had skipped at least one meal in the previous week, compared with 27% of those in the countryside. Among city-dwellers 15% said they were unemployed, almost certainly representing a bigger shock to urban areas. By the end of this year the bank predicts the pandemic will have pushed 150m more people into extreme poverty, defined as living on less than $1.90 a day. The new poor are more likely to be in metropolises than previously.

Covid-19 has forced city authorities to acknowledge slums, both for the sake of their inhabitants and their neighbours. The disease spreads fast when people live at close quarters. One study of Mumbai between June and July last year, before India's second wave hit, found 54% of the city's slum-dwellers had covid-19 antibodies, compared with 16% of those in formal settlements. That quickly spills into other neighbourhoods. Students from Cañada Real pile into buses to get to schools in and around the capital. Kibera is nestled between posh residential areas of Nairobi, where many slum-dwellers work.

Development wonks tend to focus on poor people in poor cities, such as Ms Muhonja, rather than poor people in rich cities, such as Ms Akrikez. That makes sense. The former are much poorer. Kibera is the sort of slum depicted in fundraising letters from charities: huts made of mud and sheets of corrugated iron; rubbish heaped on unpaved streets.

Extreme poverty makes it harder to stay healthy. Ms Muhonja shares her one-room shack with five other people. Social distancing is all but impossible. They have no running water. Instead they buy jerry cans of water for drinking and cooking and pay to use communal baths.

Residents of Kibera complain less about the risks of covid-19 to their health and more about its economic impact. When the hair salon where she works cut Ms Muhonja's hours, a friend hired her to look after his mobile-money stall. But the 6,000 shillings a month she earns there is not enough. And she is one of the lucky ones. Many of her neighbours are jobless. Many residents rent their homes from private landlords. These landlords threaten tenants, removing doors and roofs as penalty for non-payment, according to Joe Muturi of Slum Dwellers International, a network of community groups. "The threat of eviction is always there," he says.

People in Cañada Real are far better off. Many do not pay rent. The settlement sits on public land that was once an ancient drove-road for sheep. The residents include Roma (gypsy) families, poor Spaniards and north African migrants, many of whom worked in the construction industry before the global financial crisis of 2008. As a result parts of the slum look like any other neighbourhood in Spain's capital, with solid roads lined with neat concrete houses. Only the tangle of wires on top of electricity posts gives away that this is an informal shantytown.

Ms Akrikez lives with her parents and four siblings in a sturdy house with clean water and flushing toilets in Cañada Real. Her father makes a steady living on building sites. They can afford to buy face-masks and new clothes.

The thief of joy

But people in Cañada Real are poor compared with those around them. Relative poverty (ie, how poor people's incomes compare with the national median) is painful. The stigma is worse. Most people Ms Muhonja knows struggle just like her to get enough food, a roof and clean water.

Ms Akrikez, by contrast, only recently told her classmates where she lives. She had to build up the courage. Many think the residents of Cañada Real are "different", "delinquents" and "people who don't work", she says. That humiliation, says Sabina Alkire, director of the Poverty and Human Development Initiative at Oxford University, can affect the brain in the same way as physical pain. "People feel excluded and it hurts," she continues. Ms Akrikez goes to school outside Cañada Real. Her friends hang out in the city centre at the weekend. She has no way of getting there. Her only outings are organised by Caritas, a Catholic charity. "It's not a normal life," she says.

Babes reduc'd to misery

When most *Madrileños* think of Cañada Real they imagine not diligent teenagers but drugs. One area, Sector Six, is a hub in Europe's drug trade. At a local church charities hand out food, water and clean needles. "This is the back door of Madrid where people put their trash and don't even look at it," says María de las Mercedes González Fernández, the central government's top official for Madrid and a member of the Socialist Party, who blames the right-wing municipal government for failing to help.

The authorities responsible for Cañada Real have long known how difficult life there is. They signed a pact four years ago pledging to move families from the worst-off parts and upgrade the rest. But progress has been sluggish. Ms Akrikez knows of just one family that has been rehoused.

Reliable utilities and clear property rights are a long way off in shantytowns everywhere. In places such as Cañada Real, where relative poverty is the problem, there is no quick fix. Some residents have formal IDs and receive handouts from the government. But social exclusion persists.

Shifting up a gear

In some of the world's poorest countries, where the problem is extreme poverty, the pandemic is prompting governments to action. Some governments are extending social-protection programmes, like cash transfers, to urban areas. It is not easy. Local authorities do not have complete lists of who lives where or details of their earnings. Few slum-dwellers have the necessary paperwork. But in recent months the Democratic Republic of Congo has used satellite imagery to identify the poorest neighbourhoods by housing density and flood risk to help target its emergency cash-transfer programme. Togo's government has signed up a third of its adult population, 1.6m people, to a new social-assistance programme using radio, television and social media to spread the word. Now it must find more money for them.

Even such minor successes are all too rare. Covid-19 has turned a spotlight on slums, but most governments are still failing their inhabitants. As they did before the pandemic, charities are trying to plug the gap. People in Kibera joke that there is one for every household in the area. They have set up handwashing facilities and education campaigns during the pandemic. But volunteers can only do so much. Overcrowded, unregulated settlements risk becoming a Petri dish for new variants of covid-19. So far, even that threat has not spurred governments to do much. ■

Technology Quarterly

The other environmental emergency

Loss of biodiversity poses as great a risk to humanity as climate change

Technology has a growing role to play in monitoring, modelling and protecting ecosystems, writes Catherine Brahic

Jun 15th 2021

HUMAN SOCIETIES depend on healthy ecosystems. People consume their products in the shape of fish, meat, crops, timber and fibres such as cotton and silk. Medicines may be directly harvested from the natural world or inspired by molecules and mechanisms found within it. The ecosystems that crops depend upon are regulated by living things. Through photosynthesis, trees and other plants take in carbon and pump out oxygen. In doing so they remove roughly 11bn tonnes of carbon dioxide from the atmosphere each year, equivalent to 27% of what human industry and agriculture emits (the oceans absorb a further 10bn tonnes).

The services that ecosystems provide to humanity depend, in turn, on there being a diversity of living things. More than 75% of global food-crop types, including coffee, cocoa and almonds, are pollinated by animals. The complex web underpinning every food chain and ecosystem means that the narrow range of species that humans eat and exploit cannot be sustained without the existence of a much greater diversity of animals, plants and bacteria.

More diverse forests store more carbon than monocultures. Skipjack tuna makes up roughly half of the global tuna catch for human consumption. As young animals, they eat zooplankton, which is to say very small floating animals like tunicates, ctenophores and small crustaceans as well as the larvae of larger animals. As adults, they eat smaller fish, squid and crustaceans. To conserve the skipjack, all this diversity in its food chain must also be conserved.

Since the 1990s, alarmed by studies showing rapid declines in animal and plant species around the globe, ecologists have talked of an impending mass extinction. It would be the sixth in the Earth's history, but one unlike any that has come before. Surveys show that the loss of biodiversity is the result of a combination of factors: climate change, pollution, human exploitation of land, sea, plants and animals, and the displacement of some species into new territories where they play havoc with existing ecosystems. Uniquely in Earth's history, each of these drivers of ecological change is caused by a single species: *Homo sapiens*.

When IPBES (the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, similar to the Intergovernmental Panel on Climate Change) published its assessment of the state of global biodiversity in 2019, it offered a sobering picture. Roughly 1m animal and plant species were deemed to be at risk of extinction, more than at any other point in human history. These included many that are used in farming. At least 9% of the 6,200 breeds of domesticated mammals that humans eat, or use to produce food, had become extinct by 2016, and at least 1,000 more are threatened. More than one-third of continental land area and nearly three-quarters of freshwater resources are used to produce crops or livestock, but environmental degradation has damaged the land's ability to support these activities. And one-third of marine fish stocks were being unsustainably exploited in 2015.

The biodiversity crisis poses as great a risk to human societies as climate change. Yet it has a fraction of the public profile. In part that is because the loss of biodiversity cannot be neatly quantified, as climate change can, into parts per million of carbon dioxide, or degrees above pre-industrial average temperatures. And the webs that link species within and across ecosystems are even more complex than the processes that drive climate change.

Understanding a problem, however, is a necessary step towards solving it. And that is where technology can help. This Technology Quarterly will consider its role in monitoring, preserving and restoring ecosystems and species. Only by measuring the state of ecosystems can their health be assessed, losses be quantified, and the effectiveness of interventions be evaluated.

As well as monitoring biodiversity, technology can also be deployed to protect it. And in some cases it may even be able to reverse losses, by bringing extinct species back from the dead. Ironically, it is humanity's use of technology, whether in simple forms such as chainsaws or dragnets, or more complex ones such as modern agriculture and transportation, that is chiefly responsible for biodiversity loss. The challenge now is to deploy it so that it is not just part of the problem, but part of the solution. ■

Full contents of this Technology Quarterly

Sensors and sensibility

All kinds of new technology are being used to monitor the natural world

Smartphone components have made sensors cheaper, and machine learning can help analyse the resulting data

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Greg Asner, Arizona State University Center for Global Discovery and Conservation Science

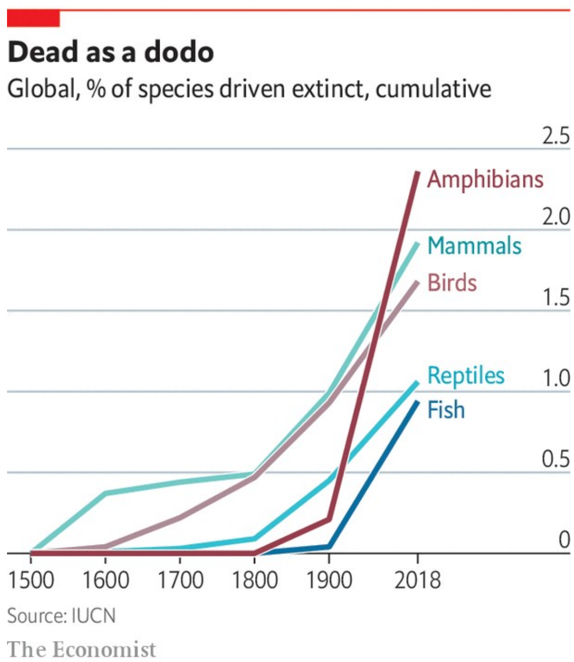
THE NEW FOREST CICADA had not been seen in seven years when it caught the attention of Alex Rogers, an ecologist and computer scientist at the University of Oxford. The insect is the only cicada native to the British Isles. It spends 7-8 years underground as a nymph, then emerges, reproduces and dies within six weeks. During its short adult life, it produces a high-pitched hiss that would make it easier to detect, were it not at the upper limit of human hearing. Its call is audible to children but not to most adults. It can, however, be picked up by smartphone microphones. This led to the invention of AudioMoth, an “acoustic logger” that can be set to listen for a particular sound and record it.

The device takes its name from the fact that moths can hear sounds across a wide frequency spectrum. It is roughly 60mm square and 15mm thick and includes a smartphone microphone, a memory card and a basic processing chip, powered by three AA batteries. Dr Rogers's startup, Open Acoustic Devices, sells them for $60 through a group-purchasing scheme which helps keep costs low. At that price, "you can deploy many more devices, you can post them out to people and if they get lost or stolen, it doesn't really matter," says Dr Rogers. To date, some 30,000 AudioMoths have been scattered around the globe. A smaller version has just been launched and is being incorporated into an experiment to study how African carnivores are responding to warmer temperatures by monitoring the sounds they make, such as panting.

The AudioMoth is just one example of the explosion in the use of sensors to monitor ecosystems that has occurred in the past decade. Such devices are peppered across forests and national parks, attached to trees or the backs of animals. As well as recording environmental data, such as temperature or humidity, they also monitor the nature, number and movement of living things.

Motion-activated camera traps have captured images of the shyest snow leopards. Microphones monitor bat colonies, known to harbour diseases that can jump to humans, and coral reefs, whose crackling sounds are thought to broadcast their location to nearby fish. Radio tags attached to animals capture data about their behaviour as they go about their daily lives. The Icarus project has around 5,000 lightweight tags, weighing just five grams each, attached to animals on all continents. The sensors track the animals' movements to within a few metres, along with the local temperature, pressure and humidity—all of which is relayed back to researchers via an antenna on the International Space Station.

Technologies borrowed from the smartphone industry, including batteries, cameras, microphones and chips, have helped make such sensors smaller, cheaper and more capable. Before the Icarus project developed its five-gram sensors, most radio tags weighed 15-20g. A future version will reduce the weight to just one gram, allowing the tags to be attached to even smaller creatures. Smartphone technology has also reduced the cost and size of camera traps. TrailGuard, a device developed by Resolve, an American environmental group, houses a tiny camera in a package the size of a Sharpie pen, which is hard to spot once it has been hung in a tree.



Another hot technology, machine learning, has revolutionised the task of scanning through the resulting sound recordings, images and other readings, many of which are false alarms. Working with researchers in artificial intelligence, conservationists can rely on algorithms to do the recognising for them. Big tech firms, including Google and Microsoft, are also getting involved. Wildlife Insights, a collaboration of seven large conservation organisations, with support from Google, is trying to create a single space where all camera traps will log their data (its database currently counts 16,652 camera-trap projects in 44 countries). Its machine-learning models can filter out the blank images that make up the majority of camera-trap pictures and identify hundreds of species in the remaining ones. Wild Me, an NGO based in Oregon, has algorithms for 53 species, capable of distinguishing between individual animals based on their stripes, spots or wrinkles.

As sensors get smarter, they are increasingly able to process data themselves—at the network edge, rather than centrally in the cloud—which reduces the need to transmit or store data unnecessarily. If sensors are networked, they can also raise the alarm right away if they spot something important. TrailGuard is different from most camera traps in that it is built to identify poachers, rather than wildlife. During its demonstration phase, it was installed in one of Africa's largest wildlife parks, and detected two humans as they entered the area. Within a minute, images had been sent to the park's headquarters, where staff confirmed that they showed two poachers, who were later arrested. Relaying data back to researchers can be tricky, however, as wildlife surveys are often carried out in remote areas with little or no mobile-network coverage. Sending data via satellite works well, but is expensive—though prices may fall as new constellations in low-Earth orbit become available.

Putting devices on the ground, or attached to animals, is not the only way to monitor ecosystems. It can also be done from the air or from space. Regional, and even global, snapshots can be generated using instruments mounted on planes or by scanning the Earth using satellites. The dozens of Earth-observation instruments orbiting the planet can collect information about land use, detect blooms in oceanic plankton, monitor emissions from forest fires, and track oil spills or the break-up of polar ice sheets. Remote sensing has long been used by environmental groups keen to monitor deforestation rates in remote regions.

But satellite imagery can be flawed. Viewed from above, some tropical tree plantations can look like native forest. And although spotting large areas that have been clear-cut is simple, identifying regions where selective logging, clearing of underbrush or overhunting of seed-dispersing animals is degrading the integrity of a forest is much more difficult. A study published in *Nature* in 2020 found that only 40% of remaining forests have high integrity; the remaining 60% have been degraded in some way. In 2019, an international team of ecologists and forestry experts showed that taking into account the degradation of seemingly intact forests increased estimates of forestry emissions six-fold, compared with just looking at emissions caused by clear-cutting. This research relied on a combination of remote-ensing data with numerical modelling and on-the-ground fieldwork.

Eyes in the sky

New tools to assess forests' health are becoming available, the most important of which is LIDAR—a technique which is similar to radar except that it employs infrared laser light instead of radio waves, and can map out spaces in high resolution and in three dimensions. Pointed at a tree, it can generate a 3 D model of its entire structure, including the position of every branch to within a millimetre. Such data can be used to estimate the volume and mass of a tree, or an area of forest, and hence its carbon content.

The Global Airborne Observatory takes this kind of 3D modelling one step further. The brainchild of Greg Asner of Arizona State University, it combines LIDAR with spectrometers and cameras mounted on a plane. Two high-powered laser beams fired out from beneath the plane sweep over the landscape, creating a detailed 3D model of everything underneath, from the treetops to the ground. At the same time, the spectrometers bounce light of various wavelengths off the foliage. Using a reference library containing thousands of dried and frozen plant samples, the team has worked out how to identify individual plant species from the spectroscopic data and determine their moisture content. The result is a detailed picture of the landscape showing the shape, size and species of individual trees, from which the carbon content and overall health of the forest can be determined.

In May 2021, Dr Asner and his team launched a related tool focused on the oceans. Coral bleaching, caused by warmer seas, damages reefs. Thousands of associated species, from sponges to octopuses, depend on the health of their home reef. The Allen Coral Atlas uses high-resolution satellite imagery and machine learning to monitor bleaching events in real time by detecting changes in the reflectivity of reefs. A trial run, in Hawaii in 2019, identified bleaching that field surveys had missed. The hope is that by detecting it as it occurs, other causes of stress such as fishing can be reduced, giving reefs a better chance of recovery. ■

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[*Bridging the gap: Technology can help conserve biodiversity*](#)

Cracking the code

The sequencing of genetic material is a powerful conservation tool

You can learn a lot from the faeces, skin cells and other traces that animals leave behind

Jun 15th 2021

IN SEPTEMBER AND October 2000, the carcasses of several northern hairy-nosed wombats and some fragments of intestine were discovered in Australia's Epping Forest National Park, apparently left behind by a mystery predator. Cattle farming has shrunk the wombats' natural habitat and consequently their population, which reached a low of just 20-30 animals in the 1970s before land-management policies helped push numbers back up to roughly 100 in the early 2000s. By sequencing DNA extracted from the Epping Forest remains, researchers identified six males and one female. But what had slain 6% of the known wombat population?

Suspicion fell on either dingoes or wild dogs, and the final answer came packaged inside faeces collected in the park. Some yielded the same genetic sequences as the carcasses. They had been left by dingoes. The team had identified their killers, and in 2002 a 20km protective fence was put up around the forest.

Environmental DNA, or eDNA, has emerged as an increasingly popular tool among conservation biologists and land managers, as DNA-sequencing tools have become progressively smaller, faster and cheaper. The field began in the late 1980s, when microbiologists started using it to look for bacteria in rivers and sediment. This had previously involved smearing water or dirt on Petri dishes to grow colonies of the resident microbes and then identifying them under the microscope, based on the shape of the colonies or how they responded to being stained with dye. It was lengthy and error-prone. Extracting DNA from samples instead, and comparing their genetic sequence to reference libraries, was quicker and more reliable.

The same approach was adopted and built upon in the early 2000s by ecologists, who were aware that the animals they studied were constantly shedding DNA in faeces, saliva, blood, scales and sloughed tissue. Gathering and sequencing this material provided valuable information without needing to interact with the animals themselves. The approach found particular favour early on with researchers studying freshwater systems. By simply dipping a test tube into a stream, they could find out if a target species was present and even how abundant it was.

Because trace amounts of DNA can be amplified before sequencing using a method called polymerase chain reaction (PCR, the same method used to detect SARS-CoV-2 in coronavirus testing), eDNA studies can detect species present in low numbers—a useful tool for tracking down rare species, or spotting invasive ones before they wreak havoc on a fishery. Other studies have sought evidence that escapees from fish farms were mating with wild populations, potentially eroding them.

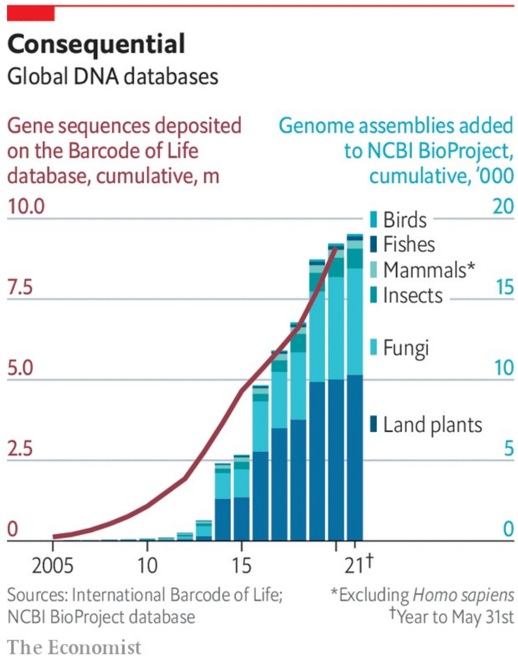
DNA from scat, as wild animal droppings are known, can map out food chains without having to capture and kill animals in order to examine the contents of their guts. Killing large or rare species like whales, even for conservation purposes, poses ethical and practical challenges. But whale scat has the great advantage of buoyancy. Finding a turd floating in the middle of the ocean is made easier with the help of dogs that are trained to sniff out the signature smells of excrement belonging to a range of endangered species.

DNA in the netted excrement can be analysed to determine what the animal ate, or what bacteria live in its gut.

On land, researchers can use eDNA from faeces, urine or hair to see how populations are interacting. In Malaysia, an ongoing project is focused on whether sub-populations of the Malayan tiger are still connected when deforestation has fragmented their habitat. In Britain eDNA is used to monitor a protected newt. Other projects have begun to show that cells left in footprints in snow can yield enough DNA to identify species and possibly sex.

Several groups are attempting to identify all the individuals belonging to a population from footprint DNA, which would transform monitoring of populations, help with the tracking of animals as they roam across wide areas without the need for radiotags, and setting sustainable hunting quotas. Researchers at the US Forest Service are trying this with wolves.

So-called “metagenomic” studies use e DNA to map the genetic make-up of entire communities, such as coral reefs, or the vast, largely unexplored bacterial community that lives deep inside the Earth’s crust and whose biomass is an order of magnitude greater than that of all animals combined. Such studies can offer a genetic snapshot that might take years of field studies to establish.



The field is booming, but there are challenges. It can be difficult to tell when eDNA was deposited. DNA sampled at one point in a river could have come from anywhere upstream. And species identification is only as good as the species-specific genetic barcodes and reference genomes that serve as points of comparison. This has spurred a rush of projects to either identify a unique genetic signature for every species, such as the International Barcode of Life, or sequence the whole genomes of as many species as possible (see chart). The $4.7bn Earth Biogenome Project aims to sequence 1.5m species in ten years. As well as collecting and preserving genomes, such genetic databases can be mined for information on susceptibility to disease, or for potential medicines.

But even though genetic sequencing has become much cheaper since the late 20th century, it remains prohibitively expensive for most researchers outside America, Europe and China. Sequencing technologies are improving rapidly, however. In particular, Oxford Nanopore, a British company, has developed portable technology that allows sequencing to be done in the field, not just in the lab. It relies on nanopore sequencing, a technique in which strands of DNA are drawn through a nanometre-sized pore in a biological membrane. Each of the four letters of the DNA alphabet produces a distinct electrical signal as it passes through the pore, allowing the sequence to be read in real time.

Oxford Nanopore's Min ION, a USB-powered, pocket-sized device, allows every part of the sequencing process to be done in the field. Sequences are produced within an hour. The devices are relatively affordable: prices start at around $1,000, though subsequent recharges are needed to run more samples. They have been used to sequence viruses in Brazil, amphibian DNA in Tanzania and bacteria on the International Space Station.

The technology also opens up new possibilities for investigation and enforcement. Genetic sequencing in the field can be used to identify the nature and origin of illegal bushmeat, fish or smuggled ivory. A paper published in *Forensic Science International: Genetics* in March 2021 compared results obtained by the Min ION with the standard sequencing methods used in wildlife forensics. It found the results to be comparable, potentially paving the way for handheld devices to be used in wildlife-crime prosecutions. ■

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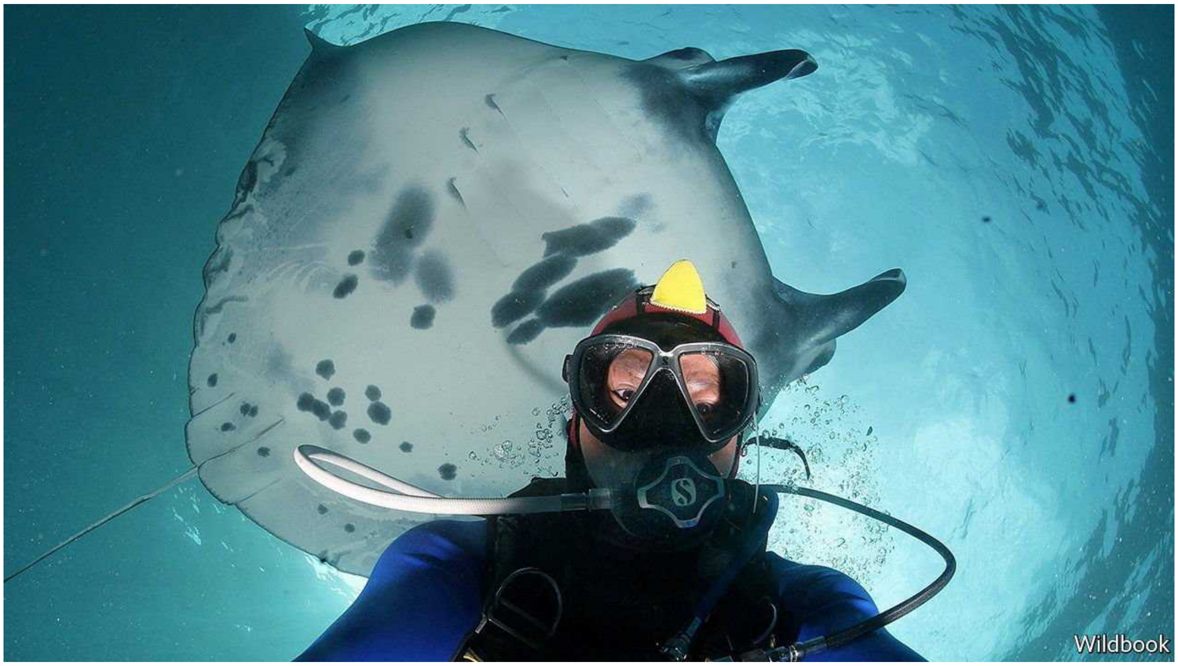
Crowdsourced science

How volunteer observers can help protect biodiversity

Uploading your holiday snaps can make a difference, too

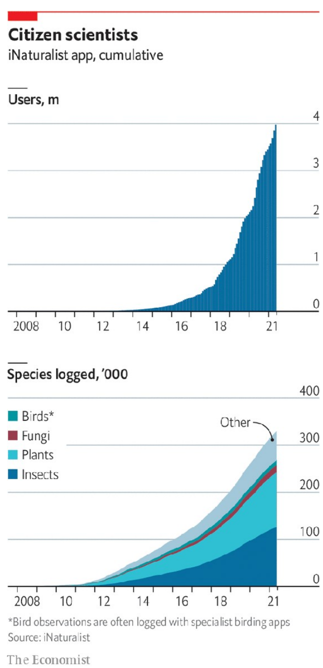
Jun 15th 2021



ECOLOGY LENDS itself to being helped along by the keen layperson perhaps more than any other science. For decades, birdwatchers have recorded their sightings and sent them to organisations like Britain's Royal Society for the Protection of Birds, or the Audubon society in America, contributing precious data about population size, trends, behaviour and migration. These days, any smartphone connected to the internet can be pointed at a plant to identify a species and add a record to a regional data set.

Social-media platforms have further transformed things, adding big data to weekend ecology. In 2002, the Cornell Lab of Ornithology in New York created eBird, a free app available in more than 30 languages that lets twitchers upload and share pictures and recordings of birds, labelled by time, location and other criteria. More than 100m sightings are now uploaded annually, and the number is growing by 20% each year. In May the group marked its billionth observation. The Cornell group also runs an audio library with 1m bird calls, and the Merlin app, which uses eBird data to identify species from pictures and descriptions.

All these data are used to generate detailed maps and forecasts of species distribution, abundance, migrations, and snapshots of how populations are changing and adapting to their environment. They feed into hundreds of academic papers and national conservation assessments such as the 2020 State of India's Birds, the first attempt to classify Indian birds according to their extinction risk. The analysis of 867 species found that many of those that were thought to be widespread were in fact endangered.



There are many other such projects. Nearly 4m amateur ecologists have signed up to iNaturalist, a social network run jointly by the California Academy of Science and the National Geographic Society. Its users have contributed 66m observations of more than 300,000 species (see chart). Such apps engage people in their natural environment, "a really important and overlooked aspect of the interface between technology and conservation," says Joe Walston of the Wildlife Conservation Society (WCS) in New York. Collective interest on public forums can help create new protected areas. In 2016, WCS worked with the Woods Hole Oceanographic Institution, a research institute, to drop hydrophones in the Hudson river to monitor passing whales. The data were made publicly available and the research was discussed in local news. Pressure from New Yorkers, astonished to find that they had a resident whale population, led to changes in shipping lanes and speeds, in order to create less disturbance for the whales.

Elsewhere, researchers faced with having to sift through thousands of hours of images recorded by camera traps have found willing helpers in armchair ecologists. Penguin Watch, for instance, recruits people to go through images collected by camera traps that are trained on Antarctica's penguin colonies.

Increasingly, some of this work is being handed to machine-learning algorithms that are trained to recognise particular species. Wild Me, an NGO based in Oregon, has taken the idea one step further. It provides online platforms where users upload pictures that are then run through image-recognition software. Just like facial-recognition systems, the software can recognise specific individuals belonging to species that have identifying features such as spots or stripes. So far, Wild Me has applied this approach to 53 species, including clouded leopards, skunks and leopard sharks. As pictures are added to the platforms, each individual can be tracked as it develops and moves around its region or the globe.

Facebook for zebras

One of the group’s early projects involved a collaboration with the Grevy’s Zebra Trust in Kenya, which organises an annual two-day rally in the Lewa Wildlife Conservancy to capture as many pictures as possible of the eponymous endangered equine. Participants, including scientists and members of the public, are given guidelines on how to photograph animals, record GPS co-ordinates and feed pictures into the Wild Me algorithm, which uses the animals’ distinctive stripe patterns to identify individuals. With repeated surveys, the zebras’ population structure, movements and evolution can be monitored. The work has shown that lions were killing more young zebras than the group could sustain, leading the park to change its management of the lion population. It is now a key component of the official population assessment of the International Union for the Conservation of Nature.

Images uploaded to Wild Me range from tourist snaps to pictures from camera traps or drones. Researchers can reconstruct the recent history of a species by uploading their entire backlog of camera-trap pictures. The Wild Me team has also been harnessing data generated by inadvertent ecologists in the form of pictures and videos posted on Twitter, Facebook, YouTube or Flickr. “In 2018, just by taking publicly posted videos of whale sharks, there were more sightings than all the human contributors combined from all the other sources,” says Tanya Berger-Wolf, a co-founder.

There is, however, a downside to making reams of GPS-tagged data of endangered species publicly available online. In January 2020, within hours of a picture of an elephant being posted on social media, a poaching attempt was made on the very same animal. On that occasion, the elephant escaped. Aware of the delicate balance that needs to be struck between sharing and protecting conservation data, conservationists have started advocating “privacy for tigers”. Groups like Wild Me and iNaturalist strip or hide geotags from their images. But webcams of nature reserves around the world can be watched, live, by anyone with an internet connection. In the space of 30 minutes, your correspondent jumped between elephants drinking from a watering hole to lion cubs playing in long grass to a herd of elk striding across the Canadian Arctic. The location of each camera was clearly indicated—and was thus available to poachers. ■

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Simulating everything

Compared with climate, modelling of ecosystems is at an early stage

But it will help sustain biodiversity when more mature

Jun 15th 2021

EVERY FEW weeks from June 1963 until July 1968, Robert Paine, a zoologist, made the journey from Seattle, where he taught at the University of Washington, across Puget Sound to the rocky shores of Mukkaw bay. There, he had found virtually pristine tide pools that teamed with life—limpets, anemones, mussels, seaweeds and purple-and-orange seastars known as *Pisaster ochraceus*. The unspoiled landscape offered the perfect setting for what was to become a seminal experiment in ecology. On each visit, Dr Paine systematically removed all the seastars he could find from one patch of rock, lobbing them as far as he could into the waves.

He did this for five years, all the while carefully documenting how the shoreline communities evolved. Very little changed in the untouched areas. But in his seastar-free zone, everything was altered. *Pisaster* is a greedy carnivore that feasts on mussels, barnacles, limpets and snails. Released from their predator, these species began to spread out. The acorn barnacles took over first. Later, they were displaced by goose barnacles and mussels. By removing just one species, Dr Paine had triggered a domino effect. Soon, the number of species in the community had dropped from 15 to eight. By 1968, the mussels had taken over completely.

Dr Paine dubbed *Pisaster* a “keystone species”; remove it and the ecosystem is transformed. Large herbivores like rhinos are keystone species, spreading seeds of the plants they consume across vast areas, thus maintaining or altering vegetation. In the kelp forests of the Pacific Northwest, sea otters play a keystone role by munching on sea urchins. The urchins graze on kelp and, left unchecked, are capable of wiping out entire kelp forests on which fish and seals depend.

Keystone species illustrate the complex webs of interactions that underpin biodiversity. Understanding, let alone predicting, the impact that removing one species can have on the rest of a non-linear system is devilishly complicated. Even if sensors and ecologists could log the identity and location of every living creature on the planet, such data would be worth little without an understanding of how everything relates to everything else.

Computer models are ideally suited to providing just that. General circulation models, for example, simulate the planetary climate, linking the physics that govern the formation and disintegration of ice sheets to the huge currents that push water through the ocean, and oceanic temperature gradients to the formation of storm systems over the continents. These models are so complex that they take months to run, even on the world’s most powerful supercomputers. Climate science and policy would be nothing without them.

Ecology has few equivalents. One reason is that ecosystems are much harder to simulate. “In a physical system, you have a set of atoms or molecules that behave in a predictable way, even if it is complex,” says Derek Tittensor, a marine-ecosystem modeller at Dalhousie University in Canada. Ecology, by contrast, deals in living things, whose interactions are determined by the unpredictable behaviour of individuals.

Added to this is the complexity of the pressures and stresses that modify ecosystems. Carbon dioxide and methane are produced by different processes and behave differently in the atmosphere, but fundamentally they both warm the atmosphere. Burning fossil fuels also produces a mix of particles which cool the climate. These emissions are all very different, but their effects can, to some approximation, be reduced to a single variable known as their "global-warming potential". Ecosystems, by contrast, are affected by warming temperatures and changing water cycles, but also by chemical pollution, urban encroachment, hunting and overfishing. None of this can be reduced to just one or even a handful of quantitative variables.

And so ecosystem modelling remains in its infancy. Statistical models, built on relationships between historical data sets—for example, how the amount of vegetation in a tropical forest tends to grow or shrink as temperatures and rainfall vary—are easier to build, and have progressed furthest. But they cannot capture or predict the dynamic, non-linear ways ecosystems respond to change, including the tipping points at which cumulative damage to an ecosystem suddenly shifts it into a new regime, for example when deforestation tips a region from forest to savannah.

Doing that requires "process-based" or "mechanistic" models, which are harder to build, but can produce non-linearity and emergent behaviour. They are the ecological equivalent of general circulation models, and operate as fully functioning simulations of Earth's biosphere. They are particularly useful for unpicking what is driving change in an ecosystem. If a fish population is growing, is it because rising temperatures have driven predators away, or because deforestation on land nearby is releasing iron-rich dust which is fertilising the local plankton population?

Marine science has produced a number of process-based models, though they are less uniform in their design than climate models. Some are built around food chains and the way they move biomass and energy around ecosystems; others focus on how well-suited different species are to particular ecological niches, or group species and their interactions based on body size, which is a reasonable predictor of an organism's place in the food chain.

Over the past decade marine-ecosystem modellers have formed the Fisheries and Marine Ecosystem Model Intercomparison Project. Its goal is to determine how fishing and climate change are likely to alter marine fisheries around the world, which provide 11% of the animal protein humans consume. “Fish-MIP” develops standardised scenarios that can be run across global and regional marine-ecosystem models. As with climate modelling, the idea is to run the same simulations on different models and combine the results into robust projections that can inform policy decisions. Fish-MIP studies suggest that larger fish species, which make up most of what humans consume, are affected most by climate change, as are the tropics, where people tend to be more dependent on catches and more vulnerable to economic instability and poor nutrition.

But simulating the effects of fishing operations is more complicated than studying the impact of rising temperatures, as assumptions have to be made about a range of variables, from how the industry will redistribute fishing fleets as fish migrate towards the poles, to how fishing technology will change, and whether changing attitudes towards sustainability will mean more marine protected areas. The climate-modelling community handles such uncertainty by drawing up standardised hypothetical scenarios and producing climate projections for each one. But the scenarios do not yet take into account the ways in which humans effect biodiversity, such as by overfishing.

Modelling is far less advanced for land ecosystems. “Dynamic global vegetation models” can simulate human impacts on plants but do not represent non-human animals. And though there are at least eight global marine-ecosystem models that simulate life in the ocean, there is just one process-based model that includes life on land: the Madingley model, first published in 2014, which represents life both on land and in the ocean.

Named after the village in Britain where it was devised, it breaks down land and ocean into grid cells that are up to 200 square km (77 square miles). Climatic conditions are set for each cell, which are also populated with organisms, so long as they weigh more than ten micrograms. To simplify the equations involved, the model groups organisms by size, habitat and function. It therefore cannot distinguish between two species of small songbird that live in the same region, but it does simulate interactions between, say, megafauna and their prey.

All this allows for *in silico* experiments in which all the world's top predators are wiped out entirely, an extension in space of Dr Paine's famous seastar experiment but also an extrapolation of current global trends. An assessment in 2014 of 31 of the world's largest mammalian carnivores found that three-quarters of them were in decline, and 17 occupied less than half of their historical territory. Using the Madingley model, Selwyn Hoeks at Radboud University in the Netherlands, and his colleagues found that removing all carnivores weighing more than 21kg triggered a domino effect in food chains with the net result that the total amount of vegetation on Earth decreased. Their results were published in 2020 in the journal *Ecography*.

Ecologists have long argued that conserving large carnivores has tangible benefits beyond the cuddly feeling of saving tigers. According to the "green Earth hypothesis", no carnivores means more herbivores and thus fewer plants. Vegetation soaks up carbon dioxide, so less plant life would amplify global warming. What of the reverse, where all plant life is gradually removed? Changing landscapes, particularly through agriculture, is humanity's greatest impact on biodiversity, and one that is likely to increase. Expanding agriculture reduces the amount of plant life at the base of food webs. Tim Newbold, of University College London, and colleagues simulated the removal of increasing amounts of vegetation from China, France, Libya and Uganda. They found that once 80% of plant life was gone, entire food chains began to collapse and could not be rebuilt by simply restoring the plants.

As well as predicting outcomes, global ecosystem models make it possible to test policies. What would be the consequence of reintroducing a species from a population bred in captivity? Would the decline of a species be halted or reversed if a percentage of its territorial range were protected, or would it be more efficient to create a corridor between two existing protected areas?

Carbon storage, clean water, clean air, abundant crops and fish are all examples of "ecosystem services" that benefit humanity. The principle is undeniable on a grand scale, but the details are harder to map. "We don't have any frameworks which link biodiversity changes to changes in ecosystem functioning, and on to the services that humans derive from those ecosystems," says Michael Harfoot of the UN World Conservation Monitoring Centre and co-author of the *Ecography* paper.

Statistical models try to infer changes in ecosystem services from, for instance, trends in forest cover. But process-based models need further refinement so that changes in temperatures or land use can be linked to changes in biodiversity—and then, in turn, to the functioning of ecosystems and the services they provide. "That is probably the next big frontier for ecosystem modelling," says Dr Harfoot, "and essentially, also, for conservation."

For now, this remains some way off. Today's ecosystem models are widely compared to where climate models were in their earliest days of development, about 50 years ago. "Given the urgency of the situation, we need ecosystem models to be where climate models will be in ten years' time," says Dr Newbold. ■

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Back from the dead

Reviving extinct species may soon be possible

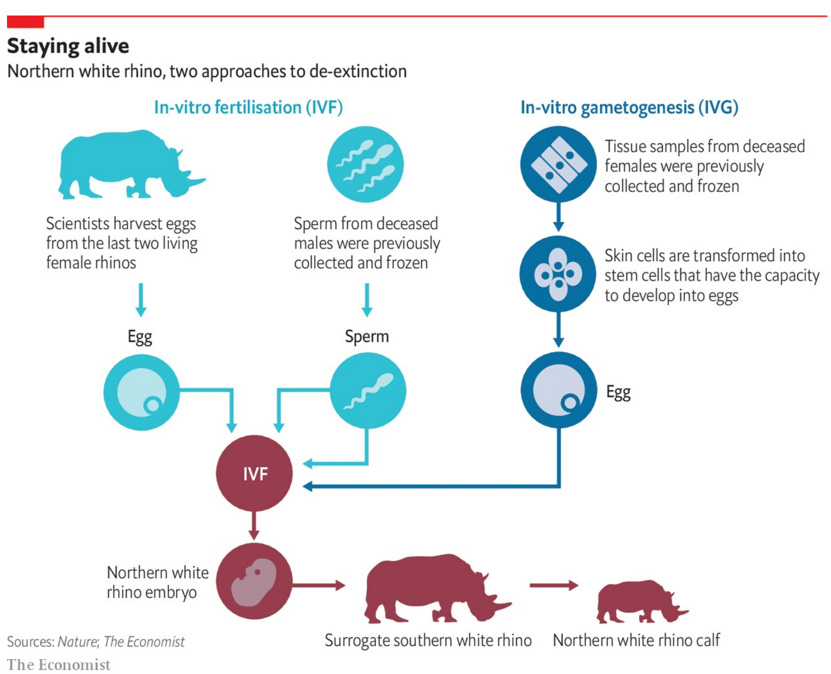
Banking cells from endangered species can help in other ways, too

Jun 15th 2021

LATE ONE day in April 2002, a delicate blue-beige bird with a white collar and black eye mask was released into the dense forest on the Hawaiian island of Maui. The bird, a female, was one of just three remaining po'ouli (pronounced poh-oh-oolee), a species of honeycreeper that had been discovered in 1973. Believing there to be one male among the three, researchers were desperate to arrange a match. The birds, however, did not appear in the least bit concerned about the fate of their species. To help things along, earlier that day a team had caught the female, fitted her with a small radio transmitter and set her free where the male had last been seen. The next morning they set off with aerials to track the female's progress. They soon found her, resolutely making her way back across the island to her own territory.

Conservation is full of such failed romances. When a species is reduced to a few individuals, researchers will go to great lengths to set up arranged marriages. If wild matings cannot be facilitated, they may try to breed animals in captivity and then release them back into the wild. Thus, the California condor was brought back from 22 individuals; the Arabian oryx from just nine. With the po'ouli, the decision was made to bring the reluctant trio in for captive breeding. The male was caught in September 2004. He was old, had only one eye and died a few weeks later. The other two birds were spotted around the same time, then never seen again.

And that, you might think, was the end of the po'ouli's tragic tale. But reproductive and genetic technologies developed in the past decade mean other outcomes are now conceivable, as it were. A cluster of cells from the one-eyed male is held at the San Diego Wildlife Biodiversity Bank, also known as the Frozen Zoo. Banking tissue samples from wild species is not unusual: seed banks have done this since the early 20th century. In the San Diego facility, however, tissue samples are not just stored, but are grown in living cell cultures. Oliver Ryder, director of conservation genetics, remembers peering through a microscope to look at the po'ouli's chromosomes, aware that he was looking at the genetic material of a species that had already expired. "Extinction is, for a lot of people, kind of an abstract concept, but for some of us it has a really visceral feeling," he says.



Dr Ryder and others are developing techniques that might, theoretically, make it possible to create a live newborn long after the last members of its species have died. They are not the first to attempt this. In 2009, a team of researchers announced they had delivered the kid of a bucardo, a species of wild goat that had gone extinct nine years earlier. A skin biopsy taken from the last female had produced live cells. The team removed the bundle of DNA from inside those cells and injected it into the emptied eggs of a domestic goat. Using a zap of electricity, they fused the DNA with the egg's cellular "shell" and produced more than 400 embryos, all carrying the goat's genes. Over 200 embryos were transferred to the wombs of surrogate domestic goats, leading to just one live birth. It was delivered by caesarean section in 2003, but lived for only "some minutes", according to an account in the journal *Theriogenology*.

Not looking swell, Dolly

The technique that produced the short-lived bucardo kid was similar to that used to create Dolly, a cloned sheep, in 1996. Its DNA was primarily inherited from a single individual. Even if it had lived, it could only ever have given rise to a population of clones, the opposite of biological diversity, for which genetic diversity is essential. Efforts to rescue a species from the brink of extinction must begin long before it is reduced to just one individual, or even three.

The po'ouli's frozen cells, therefore, are unlikely ever to give rise to a new population of birds. But alongside them in San Diego are tubes that hold a different promise. They contain the remains of not one but 12 northern white rhinoceroses, five males and seven females. The northern white rhino is what is known as "functionally extinct": the last male, Sudan, died in 2018, leaving behind just two females, a mother-and-daughter pair in Kenya, dubbed Najin and Fatu. Nevertheless, at a meeting in Vienna in 2015, researchers agreed on a twin-track approach to de-extinction.

The first approach, led by a group called BioRescue, uses a version of in-vitro fertilisation involving rather more international travel than most human procedures. Five times since 2019, a team of researchers, conservationists, park rangers and veterinarians have gathered in the park to harvest oocytes (immature egg cells) from the ovaries of one or both females, who are placed under general anaesthetic for the procedure. The oocytes are immediately flown to Italy, where they are fertilised with thawed sperm from a dead male whose cells are banked in Germany. Sperm are injected through a needle directly into the eggs. They are then placed in a specially designed incubator equipped with a camera that allows the team to monitor the cells as they develop. Any embryos that successfully develop in the dish are placed in liquid nitrogen for safe-keeping until such a time as the team is ready to implant them into a womb.

The most recent egg collection was performed on March 28th. A total of 19 oocytes were obtained from Fatu; 14 were fertilised with sperm from Suni, a male who died in 2014. Four developed into viable embryos, bringing the total number of frozen embryos to nine. The next step will be to transfer embryos to a surrogate. Neither Najin nor Fatu is thought to be capable of a safe pregnancy, so the embryos will instead be entrusted to female southern white rhinos, a related species with a healthy wild population. Before implanting them, BioRescue has been testing the IVF procedure using southern white rhino cells. This has resulted in seemingly healthy embryos, but none has yet led to a live birth. The team hopes that doing the embryo transfers in the wild, rather than at a zoo in Europe, will improve the chances of success.

Thomas Hildebrandt of the Leibniz Institute for Zoo and Wildlife Research, who is leading much of the work, says there is a short window for the transfers to happenbecause Najin and Fatu are both quite old. “We can try to preserve biological material very nicely,” he says, “but we can’t preserve social knowledge. And we have only two rhinos which can teach the calf how to behave as a northern white rhino.” Moreover, this IVF approach still faces the fundamental limits of genetic diversity. Fatu’s embryos carry only her and Suni’s genes. But the cells stored at -196°C in San Diego and other frozen stores carry much more, and they hold the key to the second strategy for saving the northern white rhino.

To determine whether they could theoretically build a healthy population, Dr Ryder sequenced the San Diego collection. “We found that there was more genetic variation in those 12 than in the [roughly 20,000-strong] standing population of southern white rhinos,” he says. “If we could turn those cells into animals, there is no reason the northern white rhino shouldn’t be able to recover.”

What is needed now is the means of turning frozen skin cells from long-dead rhinos into viable eggs. A way to do that has been demonstrated by Katsuhiko Hayashi, a reproductive biologist at Japan's Kyushu University, and colleagues. In 2016, the team created baby mice from skin cells and sperm. They did this by taking cells from the tail tips of adult mice, growing them in culture, then flooding them with chemical signals that reprogrammed some of them to become "induced pluripotent stem cells"—special cells that can develop into any other cell found in the body, including oocytes. The oocytes were then fertilised and implanted into the wombs of surrogates, resulting in live mice, which went on to produce their own offspring.

A mouse, of course, is very different to a rhinoceros. Nevertheless, earlier this year, Marisa Korody of the San Diego Zoo Wildlife Alliance and colleagues at the Scripps Research Institute in La Jolla wrote that they had successfully reprogrammed skin cells belonging to nine of the 12 dead northern white rhinos to become induced pluripotent stem cells. BioRescue has had similar success. Not all such cells are truly pluripotent, so it is not a given that the team will be able to make oocytes. Initial tests, though, are promising.

Today, the frozen collection at the San Diego Wildlife Biodiversity Bank contains more than 10,000 cell lines belonging to 1,100 species and subspecies of vertebrates, plus tissue and blood samples that have not yet been cultured. Other biobanks are held by members of the Frozen Ark project, run by Britain's University of Nottingham. Whether or not reviving extinct species becomes possible in the next few years, such biobanks can already be used to improve genetic diversity in endangered species. The American black-footed ferret, for example, was all but wiped out in the 20th century before being rescued through captive breeding of 18 surviving animals. In 2015 researchers showed that inseminating females with frozen sperm from the Smithsonian Conservation Biology Institute could increase the ferrets' genetic diversity.

Similar work could one day restore commercially valuable populations, such as threatened fisheries—but only if cells are banked now for an unknown future. That said, not all tissues lend themselves to being preserved in liquid nitrogen. Cryopreservation is also expensive and energy-intensive. So far, according to a paper published in July 2020 by Joseph Saragusty at the University of Teramo in Italy and colleagues, sperm from just 116 species, or approximately 2% of all mammals, have been preserved, as well as eggs from "just a handful" and embryos from 51 species. Live births produced from frozen mammalian sperm have been reported in only around 45 species. But cryopreservation can hold species in suspended animation while new technologies are invented or existing ones improved. As Kurt Benirschke, who founded the San Diego collection, had the foresight to declare: "You must collect things for reasons you don't yet understand". ■

Full contents of this Technology Quarterly

Bridging the gap

Technology can help conserve biodiversity

But it can only happen in conjunction with action by policymakers

Jun 15th 2021

PROTECTING THE biological, ecological and genetic diversity that sustains life on Earth is the mission of the United Nations Convention on Biological Diversity. But progress has been slow, to put it mildly. A list of 20 conservation targets, known as the Aichi targets, was drawn up in 2010, with a 2020 due date. In the event, not a single one of the goals was met in full (see chart).

In 2020, IPBES (the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, a body created to bridge the gap between biodiversity science and policy) published a global appraisal of the state of biodiversity. Written by 145 experts from 50 countries who reviewed 15,000 research and government sources, it offered a sobering message. "The health of ecosystems on which we and all other species depend is deteriorating more rapidly than ever," said Sir Robert Watson, chairman of IPBES. "We are eroding the very foundations of our economies, livelihoods, food security, health and quality of life worldwide."

According to the 2020 Living Planet Report, produced by WWF and the Zoological Society of London, two conservation and research groups, populations of mammals, birds, amphibians, reptiles and fish shrank by 68% on average between 1970 and 2016. Two years earlier, it had found the decline to be 60% for the years spanning 1970 and 2014, suggesting that losses are accelerating. Human activity is thought to be causing species to disappear around 100 times faster than the natural background rate.

As this Technology Quarterly has shown, an explosion of technology, from nanopore DNA sequencing to global computer models, is expanding human understanding of ecosystems. Yet most biodiversity indicators are still heading in an alarming direction. How can advances in technology be coupled to the policy changes needed to reverse the decline? It will require three things.

The first step is to knit together the various monitoring systems in order to provide a clear picture of what is going on and what needs to be done. The siloed nature of ecological science, in which teams focus on a particular animal, plant or ecological niche, has created a patchwork of initiatives and data rather than a comprehensive, global approach. At the moment it is not even possible to draw up an accurate summary of the number, location and type of different sensors around the world, let alone the species they are monitoring. Wildlife Insights, an online global repository for camera traps, has logged thousands of cameras, but is constantly discovering more. One country recently informed it that it had another 1,000 sensors that had not yet been logged, for example. A survey due to be published later this year by WildLabs, a network of conservation-technology users, found that financing, co-ordination and capacity-building are critical to the development and adoption of conservation technology.

Shared practices, databases and platforms, such as Wildlife Insights, are starting to close the gap. In addition, says Tanya Berger-Wolf, a computer scientist and ecologist at Ohio State University, ecosystem-wide observation networks are needed to measure everything from the structure of a landscape and its climatic conditions, to the location and identity of animal species, and how they interact with each other and with human infrastructure.

The second step is to create more powerful and detailed ecosystem models, so that they can be used to develop and analyse policy changes, for example on land use, fishing rights, farming practices and regulation of pollutants. Computer simulations have been instrumental in deepening the understanding of climate change, projecting future impacts, building public and political awareness, and designing policies. Global ecosystem models are decades behind by comparison. Better models would let policymakers set more specific and effective targets. The 2010 Aichi list was hopelessly detailed in its breakdown of what needed to be done, while remaining vague and qualitative about how targets should be met. Governments are now negotiating a new list, which is due to be signed off at an intergovernmental summit scheduled to take place in October 2021, setting goals for 2030 and

2050. Simple, quantifiable targets and clear methods for measuring success, as exist for climate change, are urgently needed.

Third, once monitoring systems, models and policies are in place, technology can help assess and enforce those policies, and make the case for adjusting or extending them as appropriate. If marine protected areas are expanded, for example, ecosystem monitoring can both measure the impact on fish stocks, and keep an eye out for unauthorised fishing boats.

All this will require funding for monitoring and enforcement. And at the moment, most technology for conservation is developed in rich countries, while most biodiversity is concentrated far away in poorer ones. Even when American or European kit makes it into the hands of researchers, park rangers or land managers, maintenance is a problem. More training, and greater use of open-source platforms that put knowledge in the hands of people on the ground, can help. But ultimately there will need to be broader mechanisms for richer countries to assist poorer ones.

Many of the necessary policies will overlap with those needed to address climate change. But not all of them. Understanding how ecosystems are changing, and measuring the impact and effectiveness of interventions, will be critical to conserving biodiversity. Technology cannot solve the problem on its own. But it is hard to imagine how the problem can be solved without it. ■

Full contents of this Technology Quarterly

Sources and acknowledgments

Jun 15th 2021

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Further reading on the biodiversity crisis

IPBES 2019
Global Biodiversity Outlook 5
Dasgupta review
Living Planet Report

Business

The empire of Son

Hard truths about SoftBank

The world's most important tech-investing group has pulled off a stunning comeback. But some of its flaws remain

Jun 17th 2021

EVERY DAY, from 8am to 10pm, Son Masayoshi sits in his mansion in Tokyo doing what entertains him like nothing else: sizing up technology entrepreneurs and handing out money. Working from home has not slowed down the billionaire boss of SoftBank. At the Japanese group's earnings call on May 12th Masa, as he is universally known, boasted of backing 60 companies in three months. Between January and March he doled out $210m a week.

In the past four years SoftBank has poured $84bn or so into startups. It was the world's biggest tech investor even before complementing a $98.6bn vehicle it runs, the Vision Fund, with a sibling that now contains $30bn. The 224 tech firms it has backed range from early-stage startups to established giants like ByteDance, owner of TikTok, a Gen-Z time-sink. Names such as Plenty, Better and Forward imply missions to transform industries like food, health and banking. Going by the valuations used by SoftBank and other venture-capital (VC) funds, the backed companies are collectively worth a colossal $1.1trn, according to PitchBook, a data provider.

In spring 2020 SoftBank's entire tech edifice nearly came tumbling down. As covid-19 spread and markets convulsed, SoftBank's lenders took fright. Yields on its bonds surged. Investors wondered how—or if—Mr Son's punts might weather the pandemic. His signature approach—big bets based less on spreadsheets than on "feeling the force" of a deal—looked riskier than ever. The initial public offering (IPO) of WeWork, an office-sharing firm, collapsed in late 2019, before the pandemic. Between February and March 2020, SoftBank's share price plunged by over 50%.

"Masa got close to the flame," sums up a person close to SoftBank. But then the markets rebounded. The Federal Reserve was pumping in liquidity by supporting the market for junk-rated corporate bonds (SoftBank's debt is rated below investment grade). SoftBank announced a sale of $41bn of its $252bn in total assets in order to shore up its position.

Now Mr Son is once again looking like a genius. Backing tech darlings proved the perfect strategy in the digitally accelerated coronavirus economy. His hunches have paid off. In just over a year SoftBank has gone from survival mode to spewing out cash like a giant ATM. The listing of Coupang, a South Korean e-merchant, reaped SoftBank $24bn in profits. Several more firms it has backed launched into an IPO market that turned red-hot last summer. Last month SoftBank reported an annual net profit of $46bn, the highest ever by a Japanese company. And more is to come: on June 10th Didi Chuxing, a Chinese ride-hailing firm one-fifth-owned by SoftBank, said it would list its shares at a valuation of around $100bn. Despite a recent dip, SoftBank is worth a cool $126bn, $60bn more than at the trough in March 2020.

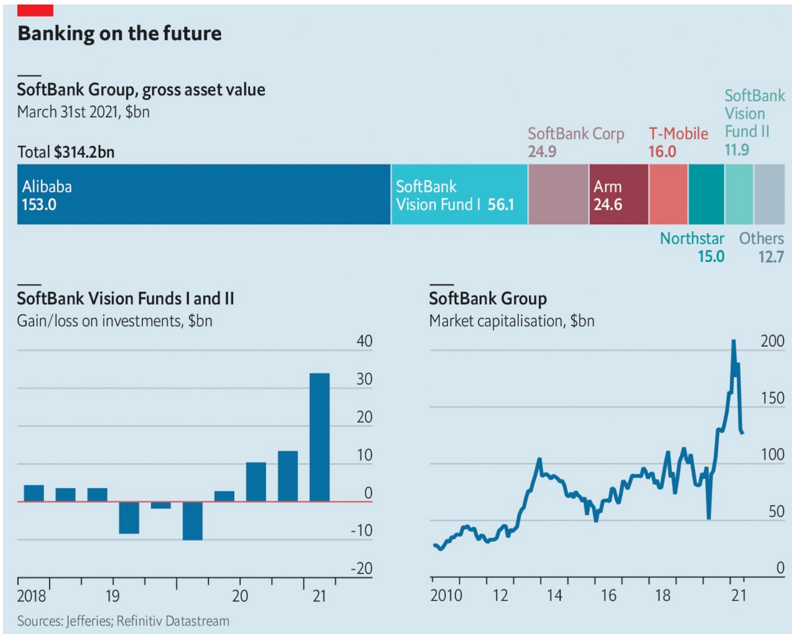
As one big SoftBank shareholder puts it, after a spell like this, "they are untouchable." Forgotten was the fact SoftBank's bumper profits followed one of the largest losses in Japanese corporate history a year earlier. Forgotten, too, was a familiar criticism of recent years: that Masa, who is ultimately responsible for every yen spent by the group, picks hyped investments.

Perhaps most forgotten of all is that SoftBank, having come to epitomise the tech wave, has occasionally acted in what some onlookers regard as questionable ways. It has eschewed common governance standards. It has become entangled in Europe's two biggest corporate scandals in recent years: over Wirecard, a fraudulent German payments processor, and Greensill, a British supply-chain-finance firm now facing bankruptcy. And it has fused ever more closely with its founder.

Created by Mr Son in 1981 to distribute computer programs, SoftBank first delved into internet services in the 1990s before reinventing itself as a telecoms business. It bought the Japanese activities of Vodafone, a British mobile carrier, in 2006. In 2013 it bought Sprint, an American mobile provider. Along the way, in 2000, Mr Son paid $20m for a chunk of Chinese e-commerce upstart called Alibaba. That genius bet—Alibaba is now a global giant worth nearly $600bn—earned Mr Son kudos as a tech visionary. It also inspired him to transform SoftBank into an investment firm.

In 2018 Mr Son spun off some Japanese telecoms assets and unveiled the Vision Fund. Not content with raising a typical $1bn-10bn VC vehicle, with the help of Rajeev Misra, a well-connected ex-Deutsche Bank financier and Mr Son's key lieutenant, SoftBank raised $45bn from Saudi Arabia's Public Investment Fund (PIF) and $15bn from Mubadala, Abu Dhabi's sovereign-wealth fund. The Japanese firm put in $28bn of its own cash and assets, including a slice of Arm, a British microchip designer it had bought in 2016.

Today SoftBank is best understood as having four main parts. The most valuable by far is the 24.85% stake in Alibaba, worth $144bn. The second part contains its remaining mobile businesses and Arm (with Arm heading for disposal). SoftBank's two Vision Funds make up the third portion. Finally comes Northstar, an internal hedge fund set up a year ago. At the centre sits Mr Son. "It's one company, the Masa show, that's it," sums up a former executive.



The Economist

Mr Son has two big ideas for the latest iteration of SoftBank. The first is to combine tech investing with financial engineering. In order to juice up returns, he has taken traditional VC and piled on leverage and complex structures. Second, Mr Son wants to create an over-arching tech "ecosystem" with SoftBank at its heart. Although SoftBank often owns only slivers of companies, he wants them to work together as if part of one group. The model is evocative of, if not identical to, the *keiretsu*—Japanese conglomerates such as Mitsubishi, with tentacles in finance, carmaking and lots besides, all helping each other.

It's complicated

Start with the financial gymnastics. At SoftBank's highest levels, close to Mr Son, is a group of traders who worked at Deutsche Bank at a time when the German lender was famous for its appetite for risk-taking. Chief among them is Mr Misra, who heads SBIA, the part of SoftBank running the Vision Fund. "There are people at the Vision Fund whose entire raison d'être is financial engineering," says a person who knows SoftBank well. "Complexity is their best friend—if they want to get from A to B they will go through all the letters of the alphabet to get there." Mr Son appears to prefer their swashbuckling ways to those of old-school, more conservative VC types.

It was such ways that brought SoftBank into the Wirecard fiasco. In early 2019 the German firm's share price had fallen by half from its peak in late 2018 after reports of accounting irregularities. On March 28th 2019 Wirecard, by then a member of Germany's blue-chip DAX 30 index, said it was suing the *Financial Times* over a series of investigative reports. At that moment another ex-Deutsche Bank trader at SoftBank, Akshay Naheta, chose to back the controversial company with the full weight of his employer's reputation.

On April 24th 2019 Wirecard announced that a SoftBank "affiliate" would invest €900m ($1bn) via a convertible bond. SoftBank also struck a co-operation agreement with Wirecard that opened the way for the payments firm to do business with other SoftBank companies, including those in the Vision Fund. The apparent validation of Wirecard by the world's largest tech investor sparked a 21% rise in the German firm's share price. It also bolstered Wirecard's creditworthiness.

The Wirecard deal had two unusual aspects. For a start, it turned out to be ephemeral. It later emerged that the €900m bond was subject to a refinancing exercise almost as soon as it was issued, reaping an immediate €64m profit. When Wirecard went bust in June 2020, after the *FT*'s reporting proved accurate, it was other investors who lost out.

Another oddity was that SoftBank itself put no money into Wirecard. The "affiliate" fund that did was managed by SBIA, the Vision Fund overseer. Its investors included a small group of individual SoftBank executives aiming to make a personal profit, among them Mr Naheta, Mr Misra and Sago Katsunori, SoftBank's former strategy chief, and one of Abu Dhabi's sovereign-wealth funds. Wirecard publicised its agreement with SoftBank to financial markets, an association that for SoftBank carried reputational risk given the *FT*'s reporting on Wirecard. In the end the bulk of the immediate profit on the bond trade went to the affiliate's individual investors, not to SoftBank or its shareholders. Wirecard's later implosion confirmed the reputational risk that SoftBank had run. A person familiar with the matter also confirmed that the position of the SBIA-managed affiliate fund meant it stood to lose potential gains if Wirecard went bankrupt.

One person in the know describes Mr Naheta and colleagues as putting a team to work to introduce Wirecard to certain Vision Fund portfolio companies, in accordance with a co-operation agreement between SBIA and Wirecard. These portfolio firms included stars of the tech world, whose tacit endorsements could have given the ailing German company a public-relations fillip—possibly boosting the SoftBank executives' returns. In the event, Vision Fund firms avoided Wirecard owing to the *FT*'s reporting.

Northstar is another example of Mr Son's embrace of high finance. SoftBank's newest unit looks like the exact opposite of Mr Son's self-proclaimed desire to back exciting new firms and think in terms of an investment horizon stretching 300 years into the future. Northstar's mandate seems to be to make short-term bets on public stocks that anyone with access to a brokerage account could buy or sell. One reason for this apparent departure from Mr Son's guiding philosophy was that SoftBank had cash lying around. When the financial pinch of the early pandemic eased, some proceeds from the $41bn of asset sales could be reinvested. Most companies park spare cash in dull securities like government bonds. But that is not the Masa way.

Instrumental to Northstar is Mr Naheta, who runs the unit. The 39-year-old was not the obvious pick to head a fund placing some of the world's biggest stockmarket bets. After leaving Deutsche Bank he set up his own stock-picking firm, which seems to have focused on mid-cap stocks. Northstar, by contrast, has deployed huge sums of money, using SoftBank's spare cash magnified by leverage. Last September investors started noticing that one market player's tech-focused bets were so big (and structured in such a complex way) that it single-handedly caused some companies' share prices to rocket. It was not long before Northstar was unmasked as the "Nasdaq Whale". It lost $5.6bn on derivative transactions in the year to March 2021.

In what appeared to be a letter in response to a freedom-of-information request by PlainSite, an investigative news outlet, the Securities and Exchange Commission said in March it was investigating SoftBank. A SoftBank spokesperson says the company is "not aware of any SEC investigation into the company's securities trading and has not been notified of such".

Techno-ecology

If Wirecard and Northstar exemplify Mr Son's penchant for financial gymnastics, the story of Greensill's rise and fall highlights the dangers of its ecosystem. SoftBank touts this as a competitive advantage. It regularly hosts get-togethers for all the founders whose firms it has backed. At its best the ecosystem can be a way for entrepreneurs to share ideas, bolster sales and boost prospects. But it can also lead companies in which SoftBank is a minority shareholder to feel the need to favour other parts of the ecosystem—even if this is not obviously in the interest of non-SoftBank investors or counterparties. SoftBank says its portfolio firms "have full autonomy to decide whether or not to work together".

For SoftBank, Greensill could serve multiple purposes. Its Australian founder, Lex Greensill, had a well-rehearsed story about using tech to transform a stultified industry—Masa's special formula. Greensill could be used for the benefit of SoftBank's ecosystem. Its flagship product involved making loans to tide companies over after they issued invoices to customers but before they received payments. Greensill then repackaged these invoice-backed loans and sold them to investors. Credit Suisse, a bank, offered to pitch funds full of those bonds to clients, including family offices and corporate treasurers.

Mr Son called Mr Greensill the “money guy”. Starting in May 2019 the Vision Fund invested $1.4bn in Greensill, turning its founder into a paper billionaire. Early last year the investment started proving its value. Some companies in the Vision Fund badly needed money. Firms like Katerra, a now-bankrupt American construction startup, found that building houses could not easily be made cheaper and faster with software. Oyo, an Indian hotel group, tried to expand too quickly. After the WeWork debacle potential lenders steered clear of many Vision Fund firms. Greensill could help fill the hole. It lent money to Katerra and Oyo—or, rather, Credit Suisse clients did so indirectly. At times it was not in SoftBank’s interest for some of its portfolio firms to raise fresh equity: a lower valuation might oblige SoftBank to revalue its shareholding, generating a loss. Having Greensill on hand to extend loans to struggling firms proved useful in the end.

This introduced potential conflicts of interest. SoftBank invested in the company that made the loan (Greensill) and in those it lent to (Katerra, Oyo and others). SoftBank invested over $500m in Credit Suisse funds. Greensill’s demise means its erstwhile backer can paint itself as one of its financial victims. A former SoftBank executive familiar with the matter says the situation was complex but that conflicts of interest could be managed. Credit Suisse, for one, is unimpressed. It is preparing for litigation against SoftBank. A SoftBank spokesperson says that “Any potential conflicts were appropriately managed in accordance with existing SBIA policies.”

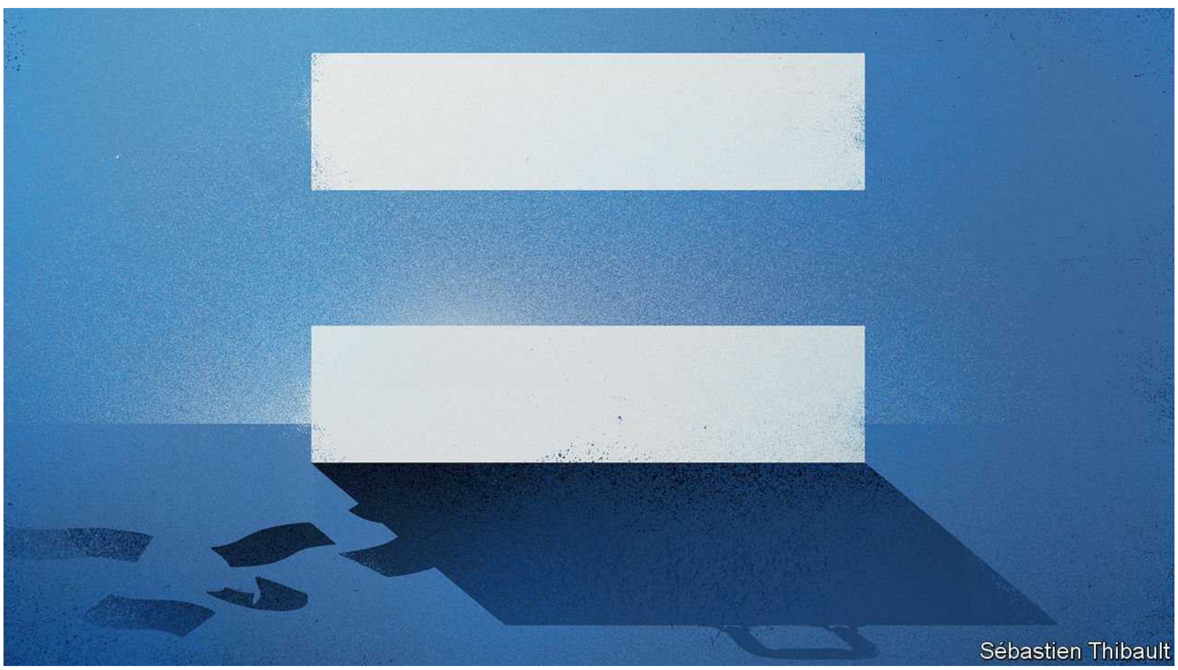
In late 2019 it seemed that SoftBank might take a different, less controversial path. SoftBank’s shares were trading at an estimated 70-75% discount to the value of the company stakes it owned, a historic low on that measure. Elliott Management, an activist hedge fund from New York, spotted an opportunity. Simplifying SoftBank’s structure, improving governance and returning money to shareholders were all time-tested ways to cause the conglomerate discount to narrow. The early-pandemic scare forced Mr Son’s hand. The $41bn of asset sales included most of SoftBank’s remaining American telecoms businesses. It is selling Arm to Nvidia, a bigger chipmaker (the deal awaits regulatory approval). This streamlined the group somewhat. But it accelerated the metamorphosis from a juiced-up telecoms utility into a complex investment holding company.

Elliott's prodding prompted some standard-issue governance improvements, such as appointing a woman to its all-male board and lifting the number of independent directors. As of June 2021, four out of nine board directors count as independents, up from three out of 12 in January 2019. Yet few observers think this resolves all potential problems. Since the start of last year SoftBank has suffered departures of highly experienced senior executives involved in legal affairs and compliance. A shared concern, according to a person close to some of them, was SoftBank's culture. The firm is alleged to be permissive of conflicts of interest. The use of financial intermediaries was another concern.

The latest person to announce her departure was Kawamoto Yuko, SoftBank's first female director and a respected corporate-governance expert. She left after just a year to take a job as a commissioner at Japan's National Personnel Authority, having reportedly disagreed with Mr Son over internal controls. On May 21st she published a description of governance at SoftBank, calling for more internal checks and more dissenting voices. She commented that it would be nice if the "obligation to dissent" or to disagree when necessary was more widespread throughout SoftBank. SoftBank says that "constructive debate is the sign of an effective board" and that Ms Kawamoto agreed with governance changes including the appointment of a chief risk officer, which she had suggested. "She did not leave because of a disagreement, but rather because she was appointed to a government position," a SoftBank spokesperson says.

Under the existing governance arrangements, potentially problematic dealings can crop up. In return for facilitating the SoftBank affiliate's convertible-bond deal, for instance, Wirecard and SBIA paid multimillion-dollar success fees to a German financier, Christian Angermayer, according to the *FT*. In another example, last summer Marcelo Claure, SoftBank's chief operating officer, bought 5m shares of T-Mobile, a mobile operator, for around $500m. The purchase was funded by a loan from SoftBank. T-mobile's share price has risen, and Mr Claure will keep the upside. But had it fallen, SoftBank would have had to find a way to get hundreds of millions of dollars back from its own executive. A SoftBank spokesperson says "the loan to acquire T-Mobile shares further aligns the interests of SoftBank shareholders with management. Under the terms of our merger agreement, SoftBank stockholders will receive over $7bn in T-Mobile equity if the company continues to perform and achieves a stock price of $150."

According to a person familiar with the Vision Fund, in at least one case an executive invested privately in an unlisted firm before SoftBank backed it, resulting in a large valuation increase. Deep Nishar, senior managing partner at SBIA, made a personal investment in Petuum, an artificial-intelligence startup founded in 2016, before leading the Vision Fund's $93m bet on the firm in 2017. SoftBank's policies let Mr Nishar keep the personal investment, which was disclosed to the Vision Fund's limited partners. SoftBank says that "the investments in Petuum were disclosed, complied with the firm's policies, and are relatively common practice in growth-stage investing." Other VC firms call such a practice rare, and typically require executives to sell equity stakes in a company at cost to their firm in such situations.



Another big question governance experts have wrestled with is where SoftBank ends and Mr Son's individual interests begin. The boundaries are seemingly not always clear. Some of the firm's activities are designed so an outsized share of profits flows to Mr Son relative to other SoftBank shareholders. Take Northstar. When it was set up, a third of the money invested was Mr Son's; that brings him a third of the profits generated by the fund. But Northstar—and so Mr Son personally—benefit from belonging to SoftBank, roughly 70% of which is owned by other shareholders. Its trades are either explicitly or implicitly backed by SoftBank's balance-sheet.

An obvious potential problem with a CEO having a personal interest in a particular division of his firm is that such a boss cannot neutrally allocate capital. Diverting cash to Northstar, in this case, can lead to its profits surging—and flowing in part to Mr Son. Northstar's structure, including Mr Son's personal stake in it, was approved by SoftBank's board, which discussed the matter independently of Mr Son.

Not so loanly

SoftBank insists its governance and finances are sound. It has long had a policy of keeping enough money on hand to repay all its bonds that mature in the next two years. The asset disposals after last year's crisis resulted in a less indebted group. SoftBank says it does not want to borrow more than a quarter of the value of the holdings (for example in Alibaba) that are often used as collateral for the loans.

This is only a partial comfort to minority shareholders and other observers. SoftBank's professed leverage cap is high by investment firms' standards. Standard & Poor's (S&P), a credit-rating agency, says it disagrees with how SoftBank calculates the ratio of credit to assets. SoftBank says that S&P calculates the ratio using its own methodology; it has revised its rating outlook for SoftBank from negative to stable. Some of the investment holding companies rated by S&P receive higher ratings than SoftBank even though their ratios after S&P's adjustments are weaker than SoftBank's. A SoftBank spokesman says that as it establishes a record of improvement this will help S&P's ratio level. The company is "continuing our communication with [S&P] for upgrading".

Borrowing pops up across the company. The Vision Fund can borrow against companies it owns, which are themselves indebted. Mr Son is known to have pledged his own shares in SoftBank to fund activities related to the firm. Moody's, another credit-rating firm, describes the resulting capital structure as fluid, complex and having limited transparency. Analysts gripe that disclosure is patchy at best.

Corporate governance, debt, SoftBank's association with Wirecard and Greensill: none is likely to be troubling Mr Son right now. The signs are he feels emboldened after surviving the corporate version of a 100-year flood. This carries risks, warns a SoftBank shareholder: "Masa and the senior team have been so successful, there is a feeling of 'can everyone just leave us alone'…That could be dangerous if they think there is less need to take notice of corporate governance." Investors were surprised by the news in May that instead of continuing to buy back shares, as they would like, Mr Son is tripling the size of Vision Fund 2, from $10bn to $30bn. Unlike the first Vision Fund, where outside limited partners sometimes acted as a brake, the new fund has no external investors.

Masa seems to have been given even freer rein to feel the force. On June 10th the new fund led a $639m investment in Klarna, a Swedish fintech firm. That and other similar-sized bets are much larger than last year's investments of under $100m. SoftBank has set up three special-purpose acquisition companies hoping to raise a combined $1bn or so, and then merge with startups—possibly including, SoftBank has said, some in the two Vision Funds. That would kick up still more potential conflicts of interest.

The bull case for SoftBank is simple. It is an unabashed wager on tech-fuelled firms continuing their meteoric rise. It can thrive as long as investors are on hand to fund loss-making companies in the hope of future riches. For now, they are. But the recent IPO boom is petering out. Much of SoftBank's record profit came with an asterisk: the share prices that helped generate it had already started falling back to Earth. Coupang has lost a fifth of its market value since listing. SoftBank and its shareholders are aware the party in the markets could come to an end, especially if central banks raise the ultra-low interest rates that make borrowing cheap and growth stocks appealing. Masa's rebound last year was swift—but also lucky. The next stress test for SoftBank may not be far off. ■

A version of this article was published online on June 15th 2021

Down and up in lipstick valley

Hit by covid-19, Italian makeup-makers are looking pretty again

Cosmetics firms clustered around Milan stand to benefit from long-term trends in the industry

Jun 19th 2021 | Milan

TWENTY YEARS ago Leonard Lauder, the heir to the Estée Lauder beauty empire, observed that during economic downturns consumers liked to sweeten belt-tightening with small indulgences. He called it the "lipstick effect", after one common pick-me-up. Disappointingly for Italy's "lipstick valley", a part of Lombardy that, according to Cosmetica Italia, an industry group, produces 55% of the world's eye shadows, mascaras, face powder and lipsticks, consumers mostly shunned these little luxuries amid the pandemic recession. Whether because *maquillage* is less meaningful on grainy Zoom calls or contoured lips invisible behind face-masks, sales of Italian makeup-makers fell by 13% last year.

Luckily for Italy's beauty firms, shoppers are desperate to show their faces in public again. "When the masks come off in June people will go crazy," predicts Dario Ferrari, who founded and runs Intercos, the valley's biggest firm and the world's largest contract manufacturer for makeup. Denizens of lipstick valley also stand to benefit from two longer-term trends: the rise of the image-conscious Asian shopper and of direct-to-consumer makeup brands that need contract manufacturers to bring their Instagram feeds to life.

Lipstick valley is the latest industrial cluster to emerge in northern Italy. Although France makes more cosmetics, including skincare and body lotions, Italy has carved out a niche in makeup. The environs of Crema, a medieval city an hour's drive to the east of Milan, in particular attracted such companies starting in the late 1990s, with proximity to the creative ferment of the Milanese fashion scene as well as the technical expertise of an earlier cluster of chemicals firms. Intesa Sanpaolo, a bank, reckons that around 350 cosmetics startups were created between 2012 and 2017, mostly in lipstick valley.

Today the area is home to more than 1,000 companies in the makeup sector, which generate annual revenues of €12bn ($14.5bn). In the few years before the pandemic they were benefiting from the bright and brash beauty trends rewarded on social media. Lipstick valley was in expansion mode. Ancorotti Cosmetics, a family firm which makes one-fifth of the world's mascaras, acquired and repurposed a factory near Crema once owned by Olivetti, a defunct industrial giant.

Mr Ferrari is confident that his company will recover swiftly from the slump. Sales in March were already higher than in the same month in pre-pandemic 2019, he reports. He is particularly bullish on custom from upstart brands. Luca Solca of Bernstein, a broker, says that the combination of social media and digital distribution has led to greater fragmentation of the beauty business. Two decades ago the vast majority of Intercos's sales went to traditional beauty firms such as Estée Lauder or L'Oréal. Today only half do; direct-to-consumer brands account for about a third (the rest is bought by retailers like Sephora for their private labels). "You can come to us and we can make a brand in six months," Mr Ferrari boasts.

He is also eyeing Asia. Goldman Sachs, an investment bank, expects sales of cosmetics in China alone to double between 2019 and 2025, to $145bn. Last year Intercos took full control of a joint venture with Shinsegae, a South

Korean retailer, which allows Intercos to manufacture Shinsegae’s popular brands—and also tap into K-beauty trends, which have conquered the world. It already manufactures products for Perfect Diary, an Instagrammable Chinese brand whose parent company, Yatsen Holding, listed in New York last year.

Mr Ferrari’s fellow lipstick-valley bosses are likewise looking east. Investors—including eastern ones—are in turn looking at them. In December GIC, Singapore’s sovereign-wealth fund, bought a minority stake in Mr Ferrari’s family holding company. Giovanni Foresti of Intesa Sanpaolo calculates that Italian cosmetics-makers’ retained earnings are higher than for the average domestic manufacturer and they spend much more on research and development. Before the pandemic Mr Ferrari was planning to list Intercos on Milan’s bourse. No wonder bankers are nagging him to revive the idea. ■

Short circuit

A strange news report briefly rattles the Adani Group

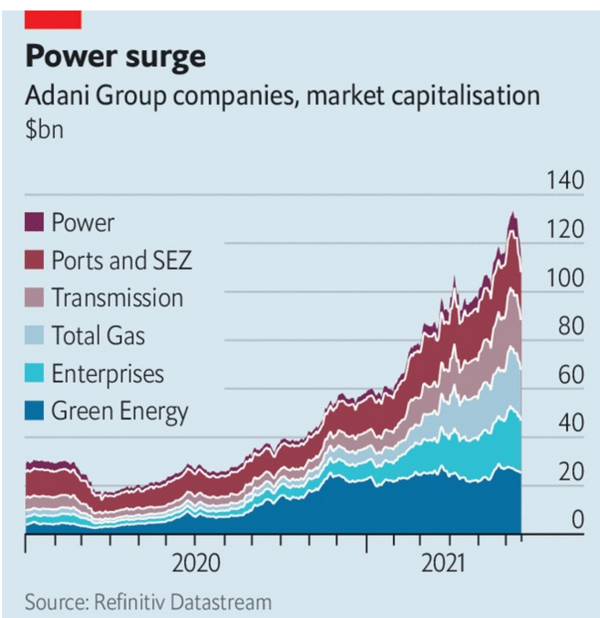
The episode also throws light on a quirk of Indian corporate ownership

Jun 19th 2021

THE ADANI GROUP underpins swathes of India's economy. The family-controlled conglomerate's businesses include airports, energy and natural resources, among other critical infrastructure. Its founder, Gautam Adani, is the world's 14th richest man, worth some $72bn, according to Bloomberg. In terms of perceived ability to navigate India's treacherous legal landscape and impenetrable red tape, he is in the same league as a fellow (slightly wealthier) billionaire, Mukesh Ambani.

So when the share prices of the Adani Group's six listed entities plunged on June 14th, heads spun. That day the *Economic Times*, an Indian newspaper, reported that the National Securities Depository, which clears stockmarket trades, had frozen the shares held by three funds based in Mauritius owing to insufficient information about their underlying investors. All three funds were registered at the same address and appear to have a combined $6bn or so in Adani Group assets. The news that a substantial chunk of the free float in Adani Group companies could no longer be traded triggered wild trading in the portion that still could be. Share prices of the companies fell by between 5% and 25%.

The Adani Group immediately issued a statement calling the story "blatantly erroneous". It was vindicated after the clearing house cleared up that the funds were not in fact frozen. The affected shares largely recouped their losses. Securities firms rushed to put out reports underscoring that the odd movements in share prices did not reflect a change in the group's prospects, which appear bright. Mr Adani's companies have recently won big contracts to run airports and exploit energy fields. The group counts giants like Total, a French oil supermajor, and Qatar's sovereign-wealth fund as junior partners in various joint ventures. The combined market value of the Adani Group's six listed subsidiaries has more than quadrupled in the past year, to $115bn (see chart), propelling Mr Adani past Chinese moguls into second spot on Asia's rich list, behind only Mr Ambani.



The Economist

That was not the end of the confusion, however. In a regulatory filing on June 15th the Adani Group noted that some trading in the three Mauritian funds had in fact been suspended because of an order issued several years ago. It gave no details of the suspension. That in turn set tongues in India's gossipy business world wagging. Some wondered if this is a sign of a regulatory crackdown on plutocrats of the sort now under way in China. Others recalled a report published in April by the *Morning Context*, a business-news site, about the three Mauritian funds' high exposure to the Adani Group.

The episode also brought renewed attention to a quirk of Indian corporate ownership—and its uncertain future. To cope with India's extensive, bewildering and intrusive tax regime, foreign investors have for years invested in the country through Mauritius, which has a tax treaty with India. That pact has been amended over time. In February 2020 a new change enabled the Indian authorities, concerned that Indian citizens were using the island to evade Indian taxes, to gain access to Mauritius-registered funds' lists of investors. This time the story of a trading freeze may have been bunk. Another time, for some company or another, it might not be. ■

Bartleby

How to pick the best days to work from home

Timing is everything

Jun 19th 2021

HYBRID WORKING may be the future but that raises the question of how it will actually be organised. Will companies let their employees choose which days they come in to the office, and which days they are at home? And what about working hours? If employees do get a choice, they clearly need a strategy to maximise their visibility and minimise the stress. So this columnist has a few tips about which days you should opt to work from home.

Monday: Too obvious. You might as well say, "I've been drinking all weekend and I'm too hung over to come in." In the 18th and early 19th centuries, when people were paid on Saturdays, absenteeism on the first official day of the working week was so common it was known as "Saint Monday", because it felt almost like a second sabbath.

From the working point of view, Mondays are usually a day when some sort of team meeting is held and the priorities are set for the rest of the week. It would seem best to head in to the office on that day and postpone the time for solitary working until later in the week. Showing your enthusiasm to the boss by turning up on the first day of the week is probably a good idea as well.

Tuesday: Some people might not like the pattern created by spending Tuesdays at home, as it breaks the working week into two unequal chunks. Not Bartleby, who used to work from home that day before the pandemic struck, completing the column (taking out the typos, axing the non sequiturs and polishing the puns). Still, besides breaking up the week, home working on Tuesday also seems likely to be a day few others might choose. And then there is nothing more satisfying than looking out of the window and watching everyone else heading off to work, while you sit in your slippers, sipping a coffee.

Wednesday: Remote working on this day would appeal to Hercule Poirot, Agatha Christie's detective who was fond of symmetry and order. Two days of working in the office, a day at home, two more days in the office and then a two-day weekend. It doesn't fit with *The Economist*'s schedule (Wednesday is deadline day). It is nevertheless a good one to pick. Ignore the "Wednesday's child is full of woe" propaganda. Companies will probably be happy to allow employees to choose this day, as Mondays and Fridays will be the most popular options.

Thursday: Although it breaks up the working week in a similar way, this seems a less satisfactory remote working day than Tuesday. That is because, having avoided the commute on Thursday, you will have to go through the process all over again on a Friday. There is something to be said for this option, however, as it means you can start thinking about the weekend on Wednesday night.

Friday: Like Monday, this is too suspicious a choice. Colleagues will smile knowingly and use their fingers as inverted commas when you say you are "working from home" on Fridays. Managers will take to calling you at various moments in the day to listen out for tell-tale signs of the beach or golf course.

There is no need to risk experiencing this managerial suspicion. Slackers have long learned that Fridays tend to be more relaxed at the office;

colleagues may disappear for long lunches (or early drinks) and no one will ask too many questions if you are not at your desk after 3pm. So if you genuinely want to bunk off work, go in on Fridays and sneak in your leisure time on a different day. And if you are a diligent employee who wants to maintain a reputation for hard work, don't choose Friday for remote working.

Of course, many companies may allow two days of remote working, which leads to another ten possible combinations. To avoid suspicion, don't pick Monday/Friday or Thursday/Friday as your remote combination. Tuesday and Thursday might be a good selection, as it means you will be at the office (and thus visible) every other day.

And then there is the possibility of flexible hours. Early risers may relish the chance to start the day at 8am, finish by 4pm and have the rest of the day to themselves. But in many companies the boss is up at the crack of dawn, so the early bird may be landed with all the work. Start at noon, and finish at 8pm, and you may find there is nobody around to bother you after 6pm, and you can safely have dinner and watch Netflix. The rules are changing and so is the potential to exploit them. To flourish in the era of remote working, employees will need the cunning of Machiavelli and the tactical brilliance of Napoleon.

Dig deeper

All our stories relating to the pandemic and the vaccines can be found on our coronavirus hub. You can also listen to The Jab, our podcast on the race between injections and infections, and find trackers showing the global roll-out of vaccines, excess deaths by country and the virus's spread across Europe and America.

Schumpeter

Once a bonanza for sponsors, the Olympics are becoming a drag

Track and minefield

Jun 19th 2021

Brett Ryder

FROM CUISINE to carmaking, the Japanese way is meticulous. Yet with just over a month to go, the Tokyo Olympics remain anything but. Thanks to covid-19, and Japan's sluggish vaccinations, it is unclear whether the games, originally due to be held last summer, will let spectators in—if, that is, the event takes place at all. Organisers insist it will. This is nerve-jangling for those hoping to peak at the right moment: the athletes, of course, but also the games' financial muscle, its corporate sponsors. Though no backers have pulled out, some are privately calling for another delay. *Asahi Shimbun*, the games' official media partner, has called the decision by the International Olympic Committee (IOC) to plough on "self-righteous". What was supposed to be a golden opportunity to burnish brands has turned into a reputational minefield.

Olympic commercialism has deep roots. Kodak advertised in the official results book of the inaugural modern games in 1896. Then, in 1984, the Los

Angeles Olympics ushered in a new era. It was the first to be largely bankrolled by big business. Organisers bet that brands from McDonald's to Buick would splash out for exclusivity in their product segments. And splash out they did: the LA games turned a profit. Since then profits have been rare for host cities, which splurge billions on venues and transport links.

For corporate sponsors the financial wins are nebulous. Still, they keep coming back, so must feel it is worth it. They can flaunt brands, push new products to a global audience—3.2bn people tuned in to the Rio de Janeiro games in 2016—and be associated with a globally admired symbol, the Olympic rings. The Tokyo organisers touted all this plus, for domestic sponsors, a chance to partake in a celebration of Japan's emergence from decades of economic stagnation, just as the 1964 games marked its post-war "coming-out party", says Andrew Zimbalist, a sports economist. Tokyo raised over $3bn from 47 mostly domestic "partners"—more than twice the previous Olympic record. It is also getting around $500m from the IOC's 14 "TOP" sponsors: global firms like Coca-Cola, Visa and Airbnb that sign multi-games tie-ins.

Corporate involvement always carries risks for the firms. When people look back at Rio, they are just as likely to recall crime, white-elephant projects and the Zika virus as sporting glory. But the disintegration of a mega-event is something else entirely. There are few precedents in sport; the collapse of Allen Stanford's annual cricket Super Series in 2009, when he was charged with running a Ponzi scheme, hardly compares (with all due respect to cricket fans). This time a last-minute cancellation, or a spike in covid-19 cases a few days in, cannot be ruled out. Parts of Japan remain under a state of emergency. Over half the population opposes the games going ahead.

That puts domestic partners, such as Japan Airlines and NTT, a telecoms firm, in a bind. What was sold to them as a once-in-a-generation opportunity now risks alienating consumers in their home market. They doubled down last year, signing contract extensions and adding a combined $200m to the pot. Some, fearing a summer PR disaster, are reportedly offering even bigger sums if the games are moved to October, when more people will have jabs and public disquiet may have abated. The TOP sponsors, whose contracts may span a few summer and winter games, can shrug off one dud Olympics. Regulars like Coke and Visa are already looking beyond Tokyo. The 2022 winter games will, pandemic permitting, kick off in just over seven months. Yet there, too, corporate backers face a problem: the choice of host, Beijing, has led to ever louder calls for a boycott over China's human-rights record.

Such pleas are not new—they rang loud before the Beijing summer games of 2008. Firms have mostly shaken them off. They are more willing to withdraw endorsements from misbehaving individuals (think Lance Armstrong or Tiger Woods) than to desert tainted hosts and organisers, from China to FIFA, football's corruption-plagued governing body, because of the vast TV exposure they offer. That may not be so easy this time. Global outrage over China's mistreatment of its Uyghur Muslim minority is mounting, as is pressure on companies to find "purpose"—which in practice often means taking a stand on hot-button issues.

In the run-up to Beijing, global brands will thus find themselves squeezed between calls to disengage and fear of retaliation from a huge market. Pulling back from one Olympics, let alone two, could shut them out for longer, as firms from China and elsewhere take their place. Undemocratic regimes are happy to splash out for sports-tournament hosting rights; Qatar is hosting the 2022 football World Cup. Local companies are waving money. Russia's Gazprom is a sports-advertising giant. Chinese firms are spending heavily to boost their global image: Hisense, Alipay and Vivo are among the top ten sponsors of the European Championship in football that kicked off last week. Alibaba is unlikely to be the sole Chinese firm on the IOC's TOP roster for long.

Champion prevaricators

Back in Tokyo, some sponsors have hired consultants to assess the possible impact on their brands of sticking with the programme or withdrawing. Marketing campaigns are "in disarray", says one adviser. With no spectators, there will be no promotions at venues or corporate hospitality. Merchandise sales will be limp; mountains of Tokyo 2020-branded gear will gather dust. As for advertising, sponsors are unsure what the message should be, or whether to flaunt their ties to the Olympics. Just in case, many are not, instead telling athletes' stories while emphasising unity, resilience and other admirable traits that imply an awareness of the pandemic. Some sponsors are working on dual campaigns, one more Olympic-themed than the other. For

Western brands, the ideal competition would always take place in a world of happy, healthy democracies. But most aren't above donning their face masks or holding their noses, if that is what it takes to stay in the race. ■

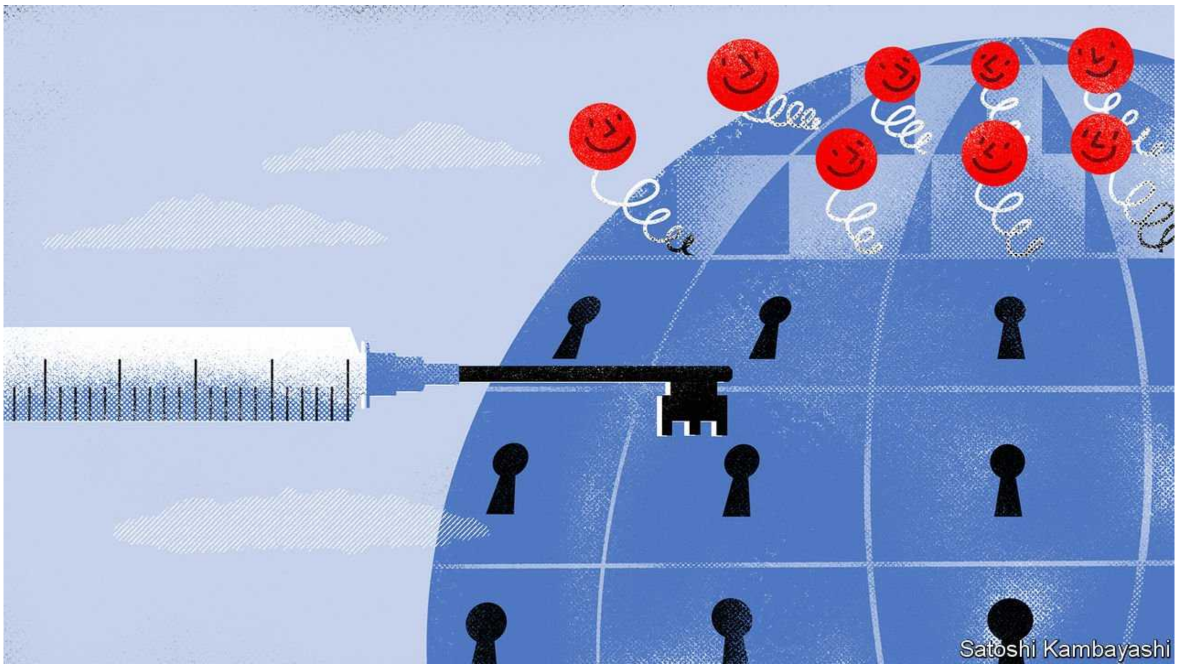
Finance & economics

The jabs and the jab-nots

Uneven vaccination rates are creating a new economic divide

They may also stoke fears of a new taper tantrum

Jun 17th 2021 | HONG KONG

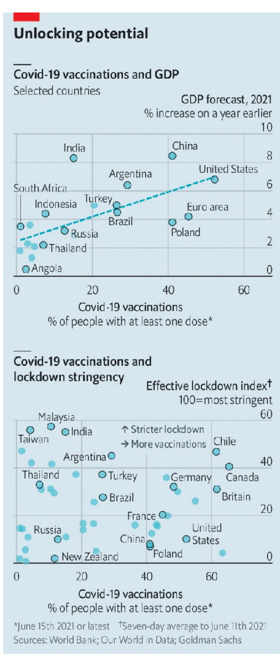


IN THE 1970S the fortunes of the world economy, in all its unfathomable complexity, seemed to turn on one product: oil. Exported by a narrow clique of countries, this vital input was hostage to ferocious political forces. Today the world's economic prospects similarly depend on another all-important input, vaccines, which are also narrowly produced, delicately political—and unevenly distributed. Widespread vaccination is helping America to boom, pushing core inflation to its highest rate since 1992. But delays in buying, making and deploying shots have left much of the world vulnerable to new virus outbreaks and economic setbacks.

On June 16th America's Federal Reserve raised its forecast for growth, inflation and interest rates, noting the country's vaccine progress. The median Fed official now expects two rate hikes in 2023. The change of tone was enough to increase bond yields both in America and in economies on the other side of the vaccine divide.

The global economy should grow briskly this year: by 5.6%, according to the World Bank, which also updated its forecasts this month. But it is a "tale of two recoveries", says the bank's Ayhan Kose. Rich countries, many of which have vaccinated people relatively quickly, are enjoying, in Dickensian terms, a spring of hope and so on. But where vaccination has lagged, especially in poor countries, some economies seem to be going direct the other way.

The divide between the jabs and jab-nots is visible even in a simple comparison of vaccination rates and growth forecasts (see chart). Among the big economies highlighted by the World Bank, the ten with the highest vaccination rates are forecast to grow by 5.5% this year on average. The ten with the lowest are set to grow by just 2.5%. The divide also shows up in forecast revisions. Thanks to America's pace of inoculation (as well as the scale of its stimulus), its projected growth for 2021 was revised upwards from 3.5% to 6.8% since the World Bank last released its forecasts in January. Emerging economies that have vaccinated faster than their peers have also enjoyed large upgrades.



On the other side of the divide, the picture is far more chequered. In the world's poorest 29 economies (including 23 countries in sub-Saharan Africa), only 0.3% of the population has received even one dose of vaccine.

This group’s growth prospects have deteriorated. Their combined GDP is set to grow by 2.9% this year (not 3.4% as forecast six months ago). That would be their second-worst performance in the past two decades. Their worst was last year.

Vaccination helps growth in at least two ways. It allows countries to relax lockdowns or any other restrictions on social interaction that are still inhibiting the economy. And in places like New Zealand that have already lifted such measures, it reduces the risk of a future outbreak, making growth more resilient. Goldman Sachs, a bank, has calculated an “effective lockdown index” that combines a tally of policy measures with data on mobility drawn from mobile phones. It shows that social hustle and bustle has returned to many countries with high vaccination rates. As the pace of inoculation picks up, others will join them. Indeed, the countries most likely to outperform over the next few months, says Goldman Sachs, are those that are simultaneously making rapid progress in achieving immunity yet still labouring under social restrictions. They have yet to feel the benefit of relaxing restrictions, but will soon do so.

In this kind of country timely economic data are still depressed by social curbs that will ease given the pace of vaccination. In other countries, however, such as Taiwan, new outbreaks of covid-19 have yet to show up fully in mainstream economic indicators, which remain strong. The “nowcast” model of JPMorgan Chase, which uses monthly data to predict where the economy is today shows Taiwan growing at an annual pace of about 9% in the second quarter. But the bank thinks that Taiwan’s economy will in fact have shrunk over that period. In the euro area, by contrast, JPMorgan expects vaccinations to have lifted growth this quarter to over 7% at an annual pace. The bank’s nowcast model, however, is predicting growth of less than 3%.

Given the importance of the global vaccine gap, it is worth asking how quickly it is closing. Japan, South Korea, Brazil, Turkey and Mexico will each get at least one shot into the arms of half their population by August, reckons Goldman. South Africa and India will not reach that benchmark until December. In both of those countries, however, many people have already recovered from the virus, giving them some level of natural immunity. Michael Spencer of Deutsche Bank thinks that India, for example, could reach a 70% immunity level in less than nine months, counting everyone who has had either a past infection or a first shot of a vaccine.

An uneven recovery is better than none. But the strength of some countries' growth could create problems for other parts of the world. America's boom, for example, has pushed its own consumer prices up by 5% in May, compared with a year earlier, and could also add to price pressure elsewhere, forcing central banks to respond.

Brazil, for example, has raised interest rates sharply this year. On June 11th Russia's central bank also tightened for the third time since March. Its governor, Elvira Nabiullina, cited both vaccination rates and "extremely loose monetary and fiscal policies in major economies" as reasons behind the increase in Russian prices. She worries that higher inflation in Russia and elsewhere may prove more persistent than "perceived at first glance".

Even temporary inflation could unsettle financial markets, making investors doubt the Fed's commitment to easy money. That could increase the risk premium emerging markets pay on their borrowing. "We are not necessarily worried about inflation," says Mr Kose, whose team forecasts a rise in global inflation from 2.5% last year to 3.9% in 2021. "But we are worried about how these inflationary pressures can complicate policymaking" in emerging markets, especially those with large amounts of foreign-currency debt.

Policymakers in these countries fear a repeat of the "taper tantrum" in 2013, when the Fed's talk about reducing (or "tapering") its asset purchases led to an abrupt rise in American bond yields and a painful sell-off in emerging-market assets. At its meeting on June 15th-16th, the Fed began discussing an eventual tapering, but the timing of such a move remains uncertain.

Global inflation this year will remain a far cry from the double-digit rates experienced in the stagflationary 1970s. But just as the oil crisis back then forced policymakers into awkward dilemmas, obliging them to raise interest rates in the face of economic weakness, this year's vaccine shortage could create similar discomfort for them. The price of uneven vaccination may be premature austerity and monetary tightening in some unprotected parts of the world. Countries that jab too late may have to hike too soon. ■

Dig deeper

All our stories relating to the pandemic and the vaccines can be found on our coronavirus hub. You can also listen to The Jab, our podcast on the race between injections and infections, and find trackers showing the global roll-out of vaccines, excess deaths by country and the virus's spread across Europe and America.

A version of this article was published online on June 13th 2021.

A prettier picture

Will America’s housing boom lead to another financial crisis?

It is hard not to feel uneasy, but lending standards are much higher

Jun 19th 2021 | BEND, OREGON

A FAVOURED PASTIME for city dwellers on holiday to quainter towns and villages is to peruse the windows of local property firms and dream of swapping their cramped two-bedroom flat for an entire house and garden. Your correspondent is not immune to the appeal: she gazed wistfully at a pretty house near the Deschutes river in Bend, Oregon, situated among the lakes and peaks of the Cascade mountains (pictured). She dutifully checked the listing price on Zillow, a real-estate platform, only to face grim reality: the three-bedroom house was worth $1.25m, a 44% increase from a year earlier, yielding a price per square foot higher than Queens and most of Washington, DC.

It is hard not to feel unease at the spectacle America’s housing market is making of itself. House prices have risen 13% on the year, the biggest jump since before the 2007-09 financial crisis. Inventories of homes for sale have plummeted: there are so few on offer in America that there are currently more agents than there are listings. The typical home sells in 17 days, a record low, for 1.7% more than its asking price, a record high. When Redfin, another property platform, conducted its annual survey of around 2,000 homebuyers, 63% reported having bid for a home they had not seen in person. The last boom in house prices was followed by a deep and painful recession. Is history likely to repeat itself?

Consider the mixed news first. The average loan to value of a new mortgage in America is a reasonable-sounding 83%. On the reassuring side, this figure has not crept higher even as prices have soared. The worrying aspect is that borrowers are bifurcated. If a homebuyer can put up 20% of the value of a property, they do not have to buy private mortgage insurance. As such around 40% of borrowers make a 20% or greater down-payment. Most of the rest—more than half—put down less than 10%. Given how rapidly prices in some markets have soared, a house-price slump could leave some of them underwater.

And yet compared with the past, borrowers are in much better financial shape. Just a quarter of mortgages originated between 2004 and 2007 were for people with "very good" credit scores (above 760). An eighth of borrowers were "subprime", with scores below 620. Standards are higher now. In 2019 60% of mortgages were made to those with scores above 760. This share climbed further during the covid-19 pandemic as banks, fearing losses, tightened lending standards: 73% of mortgages made in the first quarter of 2021 went to borrowers with very good credit scores. Just 1.4% went to subprime borrowers.

There is anecdotal evidence of caution from mortgage bankers, too. They are reputedly calling up workplaces to ensure that employees relocating out of the big, high-cost-of-living cities will be allowed to work remotely indefinitely. One bank reports that its busiest lending businesses have been those catering to the well-heeled: mortgages for second homes and "jumbo" mortgages (those bigger than $550,000). If the roaring housing market of the mid-2000s was the product of reckless lending to unreliable borrowers, the boom now is made of different stuff: large loans made to wealthy borrowers with long credit histories in search of greener pastures. ■

Buttonwood

Why China has learned to relax about its currency

In a sign of tolerance, it has not slammed the door on capital inflows

Jun 19th 2021

IN A WORLD in which transparency has become a fetish, it is refreshing to try to get a read on the People's Bank of China (PBOC). Its various nods and winks give market analysts something to interpret—or over-interpret. On May 31st it announced that it would increase the proportion of foreign-currency deposits that commercial banks must keep on reserve at the central bank, from 5% to 7%. After some chin-scratching, PBOC watchers came to a conclusion: China was sending a signal that the yuan had been rising a bit too quickly.

China used to intervene directly—by buying and selling dollars—to get the exchange rate it wanted. As recently as 2016 it ran down its foreign-exchange reserves from \$4trn to \$3trn to support the yuan. But for the past four years or so its reserves have been stable; there has been no large-scale intervention to either put a floor under the yuan or to check its rise. The surprise is not that China has thrown a little sand in the gears of its currency market. It is that it has become so tolerant of some fairly big swings in the yuan's value.

The yuan began its recent ascent a year ago (see chart), as China's factories reopened and demand for goods surged in the locked-down rich world. Chinese exporters took a greater share of world manufacturing, says Mansoor Mohi-uddin, of Bank of Singapore, which in turn increased the trade demand for yuan. Some headwinds became tailwinds. The yuan had traded at a discount to reflect fears of an escalation in the Sino-American trade wars. Exporters worried about a further hit to their revenues were inclined to hoard dollars—in part as security against their dollar debts. The prospect of Donald Trump's electoral defeat changed the picture. The chances of further tariffs on Chinese goods were much reduced. Moreover, monetary conditions favoured speculative flows out of dollars and into yuan. In contrast to the Federal Reserve, the PBOC did not slash interest rates when the pandemic struck. The seven-day reverse-repo rate, one of China's benchmarks, was trimmed by just 30 basis points to 2.2%, while the Fed funds rate was cut to 0.1%. The higher interest on offer in China's money markets favoured its currency.

The Economist

That is not all. China has been opening its markets to overseas investors. Non-residents can more easily buy and sell stocks and bonds on the mainland’s markets. China’s government bonds and “A” shares have qualified for inclusion in global benchmarks, such as the MSCI equity indices and the Bloomberg Barclays bond index, which are tracked by huge pools of capital. A steady flow of foreign purchases has pushed up the yuan. China has not stood in the way. Tellingly on May 31st the PBOC picked a tool that does not interfere much with portfolio inflows.

Still, there is a paradox. China has relaxed its hold on the yuan at a time when the ruling Communist Party has sought to exert greater control on private-sector businesses and on Chinese life in general. If China-watchers know anything, it is that control is prized in Beijing. Being in control does not mean that everything has to be nailed down, though. In the eternal trilemma between monetary autonomy, openness to capital and currency stability, something has to give. China has chosen to forgo a stable currency. That allows it greater traction over the domestic money supply and credit growth, which its regulators are more fretful about.

China’s global ambitions for the yuan also influence its policy choices. It has the world’s second-largest bond market and third-largest stockmarket. Yet foreigners still own fairly few of its assets. Even central banks, which have had access to China’s bond markets for a while, keep only 2% of their reserves in yuan. That is barely more than they hold in the Canadian dollar. Four years ago there was a vigorous internal debate about the merits of freer capital flows, says Eswar Prasad of Cornell University. But for the past two years the consensus has shifted in favour of them. If the yuan is to be a global currency, it needs first to be set free.

Even so, no one is confusing the yuan with a free-floating currency. There are ways—including all that subtle central-bank semaphoring—for China to exert influence. It is still far from transparent about where its tolerance bands begin and end. Such ambiguity is wise: give the markets a number and they will test it. Perhaps surprisingly China has not stood in the way of a much stronger yuan. But its policymakers reserve the right to keep currency markets guessing.

The junk heap

America's high-yield debt is on ever-shakier foundations

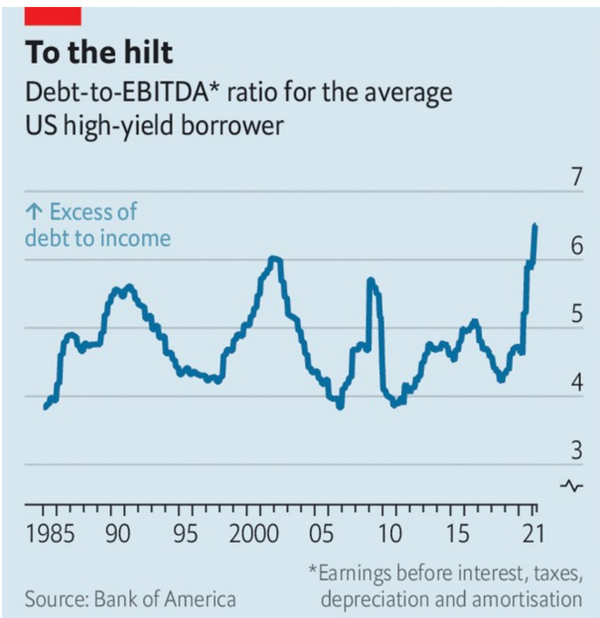
Defaults may be heading lower but the market has become much riskier

Jun 19th 2021

INVESTORS IN COMPANIES issuing high-yield or "junk" debt have had a relatively benign pandemic. Usually such highly leveraged borrowers are stung by economic hardship. During the global financial crisis over a decade ago around a seventh of such firms in America defaulted on their debt in one year. Yet according to Moody's, a rating agency, less than 9% of them went into default in the year to August 2020, and the rate has continued to drop since. By the end of 2021, a booming recovery should put it back below its long-term average of 4.7%

It may be too soon for high-yield investors to congratulate themselves, though. The low default rate masks a market that is much riskier than it was before covid-19 struck. Take high-yield bonds, the market for which is worth $1.7trn. Issuers have record levels of debt relative to their earnings, increasing their vulnerability to higher interest rates or a disappointing economic recovery. Cash-strapped borrowers are taking advantage of less restrictive loan contracts to rough up their creditors. And for the companies that do default, loans that used to be associated with high levels of protection and security are turning out to offer lenders anything but.

Start with the sheer amount of debt. Last year $435bn-worth of junk bonds were issued. As a result, the average high-yield borrower now has debt equivalent to an unprecedented six-and-a-half times their trailing 12 months' gross operating profits, or EBITDA (see chart). Oleg Melentyev, of Bank of America, cautions that the low default rate may have merely deferred the pain. "Companies are carrying the baggage of capital structures that should have been restructured, but weren't," he says. "We will pay the price of elevated defaults at a later point in the cycle."



The Economist

Meanwhile, borrowers with liquidity problems have the upper hand over their lenders. Evan Friedman and Enam Hoque of Moody's describe how investors' hunger for returns during more than a decade of low interest rates has loosened loan agreements. Maintenance covenants, or restrictive clauses that allow lenders to seize the reins if the borrower's financial position deteriorates, are now mostly absent. Worse, incurrence covenants, which place limits on borrowers' ability to issue new debt and pay dividends, have lost force over time. "When you go covenant-lite and make your incurrence covenants toothless, you give all the flexibility to the borrower to run the show," says Mr Friedman.

Running it some of them are. Serta Simmons Bedding, a mattress manufacturer, gained notoriety last year for raising $200m by swapping its debts to some lenders for new ones with a higher level of security. Without their consent, the non-participating creditors were exposed to higher losses in the event of a default. A lawsuit seeking to unwind the transaction was dismissed by the courts, paving the way for similar deals in the future.

What happens to loans that do turn sour? Lenders are used to the idea that so-called "first-lien" debt grants them priority over the borrower's assets should it go bankrupt. But Moody's analysis of defaults during the pandemic shows that first-lien lenders are losing nearly twice as much of their capital as they used to: the average recovery rate in 2020 was 55%, compared with a long-term average of 77%.

This is the result of deteriorating debt structures, another decade-long trend. In the past, first-lien loans had high recovery rates because a significant portion of the remaining debt was subordinated—ie, behind them in the queue in the event of a default. But in 2020 over a third of first-lien loans had no junior debt sitting beneath them to absorb losses. If all of a borrower's debt has a first claim over its assets, the value of that claim is lower, and lenders lose more protection.

None of this necessarily means that America's high-yield market is heading for catastrophe. Interest rates remain low, and a rapid recovery should restore earnings. But a nasty surprise on either front could quickly spell trouble. The covid-19 default cycle may yet have a sting in the tail. ■

Cyber-heists

The methods and menace of the new bank robbers

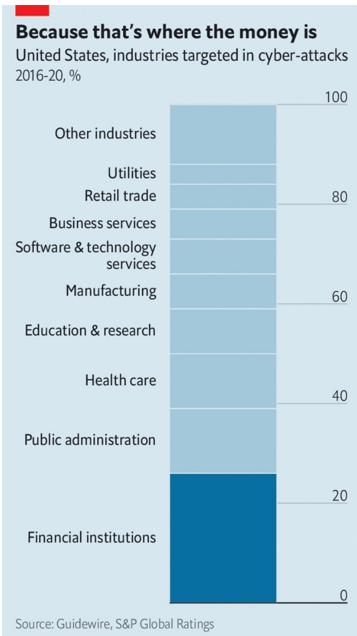
Hacker gangs go after the money—and the data

Jun 16th 2021

TALK TO BANKERS and some will tell you that when it comes to cyber-crime, they are second only to the military in terms of the strength of their defences. And yet trawl the dark web, as Intel 471, an intelligence firm, did on behalf of *The Economist* in May, and it is obvious that attempts to breach those walls are commonplace. One criminal was detected trying to recruit insiders within America's three biggest banks, JPMorgan Chase, Bank of America and Wells Fargo, offering a "seven-to-eight-figure" weekly payment to authorise fraudulent wire transfers. Another was auctioning the details of 30m accounts at Bank Mellat in Iran (a country of 83m).

Such activity represents the handiwork of a new breed of bank robber. Forget the hold-ups of yore. Today's smartest hackers are likely to be backed by rogue states, such as North Korea and, to a lesser extent, Iran, or tolerated by countries such as Russia and China. They benefit from unprecedented resources and protection from law-enforcement agencies. As well as attempting to empty accounts, they also target data for insider trading.

As one of the first industries to offer online transactions, banks have been fending off hackers since the dawn of the internet. They spend more on cyber-security than any other sort of firm—$2,691 per employee—and manage to foil a lot of the attempted thefts. Nonetheless, since 2016, no industry has suffered more from attacks than banks (see chart).



The Economist

Speaking to Congress in May, Jane Fraser, who runs Citigroup, a Wall Street giant, called hacks the biggest threat to America's financial system. Jamie Dimon of JPMorgan Chase has said they could become "an act of war". The result is that banks are under constant pressure to prepare for the worst. "It's not a matter of 'if', it's a matter of 'when'," says the head of cyber-security at a central bank. The bankers need to know the methods and motives of their enemies. What have they learned and can they remain a step ahead?

As in other industries, attempts to rob banks online generally start with "phishing", or tricking an employee into downloading a benign-looking software, known as a "Trojan", that, once installed, creates a backdoor for other viruses to infect the company's systems. The ruses can be elaborate. In 2019, when hackers infiltrated Redbanc, an interbank network connecting Chile's ATM system, they faked a lengthy hiring process, complete with rounds of video interviews, just to fool one victim into downloading and running a Trojan.

Once the backdoor is installed, the hackers have numerous modi operandi. These have evolved over time. In the early to mid-2010s a popular tactic was to alter banks' databases to inflate balances on existing accounts in order to drain them with fraudulent online transfers. Another was to steal the names and passwords of employees authorised to access SWIFT, the interbank messaging system that banks use for international transfers, in order to make fraudulent transfers to the robbers' own bank accounts. In the world's biggest cyber-heist, in 2016, thieves transferred funds from an account the Bangladeshi central bank held at the Federal Reserve Bank of New York to banks in the Philippines, Sri Lanka and other parts of Asia. They stole $81m.

Ransomware attacks, such as those common elsewhere in business, are on the rise. But banks are exposed in other ways, too. One example is "jackpotting", where malware manipulates ATMs into spitting out lots of cash, accessible to fake cards, even if no funds exist. Thieves then hire packs of money mules, typically from local mafias, to stage multiple withdrawals at once. Using such methods, in 2018 criminals got away with $13.5m from India's Cosmos Bank through 15,000 cash-machine withdrawals in just two hours.

Another tactic is to turn websites that banks visit regularly into poisoned "watering holes", most infamously in 2017 when criminals successfully targeted 104 mostly financial firms in 31 countries, including seven banks in Britain and 15 in America. In this case the websites of central banks in Poland, Mexico and others were booby-trapped so that banks would download malicious files and infect themselves with malware. These could be used to spy on the banks, steal their data and ultimately make fraudulent transfers (though in most cases the intrusion appears to have been discovered before money was stolen).

Sometimes it is data, not money, that the robbers are after. The latest trick is to steal financial-market data from within banks in order to facilitate insider trading. A survey by VMware, a cyber-security firm, of 126 financial firms worldwide found that 51% saw a rise in such attacks last year. Portfolio managers in America and Britain that were recently breached saw suspicious activity whenever they were about to trade, says Tom Kellermann, the firm's strategy boss.

The multiplicity of methods is compounded by the malevolence of those involved. Originally heists were mostly conducted by private thieves from former Soviet states. They included Carbanak, a notorious syndicate that stole over $1bn from 100 banks after 2013 (its masterminds were arrested in 2018). But since America cut North Korea out of its financial system in 2017, the hermit state has doubled down on its relationship with criminal gangs as a way of “making profit and evading sanctions”, says Michael D’Ambrosio, a top investigator in America’s secret service. Variously named Lazarus, Bluenoroff or BeagleBoyz, such state-sponsored entities have access to vastly more resources and personnel than mere criminals. Their members often live under cover in Russia and China, says Mark Arena of Intel 471. An indictment by America’s Department of Justice published in January accuses two individuals, linked to a North Korean military intelligence agency, of attempting to steal more than $1.3bn via cyber-enabled bank heists and ATM raids, as well as extorting cryptocurrency companies.

Moreover, rogue states often form joint ventures with private gangs. One of them, a Russian-speaking outfit that operates an infamous Trojan-for-hire called Trickbot, provides access to many infected computers. Some cyber experts were shocked recently when they found that it had been used in conjunction with North Korean malware in recent attacks.

It is not clear how much money drains out of the back door. Numbers crunched by Advisen, a consultancy, suggest banks have lost about $12bn to cybercrime since 2000, around three-quarters of which have come from data breaches. Studies suggest every hour of business interruption costs a bank $300,000 on average; a typical data breach causes losses of $6m.

But banks usually forbid staff from discussing such attacks, and the reported numbers dramatically understate the problem. Though many institutions are obliged to report serious hacks to regulators and, sometimes, customers, rules change frequently and vary across jurisdictions, meaning disclosure is haphazard.

Moreover, initial losses can be dwarfed by second-order effects. The average incident puts 27% of customers at high risk of closing down their accounts at a targeted firm, and sinks companies’ share prices by 5-7% on average, says John Meyer of Cornerstone Advisors, a consultancy. A Supreme Court case in Britain this summer could make class-action lawsuits by customers affected by cyber-breaches easier, exposing banks to hundreds of millions of pounds in potential damages.

Not everything is going the criminals' way, though. Forensic firms are doing a good job of attributing attacks to specific hacking groups, and intelligence agencies at linking web handles to real people. Some gangs are neutralised or caught. In September the American army launched a cyber offensive that weakened TrickBot, the North Korea-backed Trojan. In January Ukrainian police, in an operation with European and American counterparts, arrested the thieves running Emotet, another botnet allegedly responsible for at least $2.5bn in theft since 2014.

Banks strive to build nimbler fortifications and hire friendly "white-hat" hackers to probe their own defences. The biggest are spending more: in June Bank of America said it would invest $1bn annually to counter mounting threats. A survey by Deloitte found that financial firms spent an average 0.48% of their revenue on cyber-security last year, up from 0.34% in 2019. Applied to the industry's total revenue in 2020, that would make for $23bn-worth in spending in America alone.

But things may get worse because, firstly, banks' networks are becoming costlier to secure. "We recognise that we're never going to prevent everything," says the cyber chief of a top American bank. "So we have to have layered defences that assume multiple defences will fail." The multiplication of internet-connected devices, the digitalisation of banking, and remote working are offering new points of entry for attackers. Akamai, a security firm that serves eight out of the world's top ten banks, witnessed 736m attacks against financial firms' web-based applications last year, a two-thirds increase from 2019. The expansion of fintech firms without consistent regulation is creating blind spots. And banks' migration to the cloud, on paper deemed more secure, could backfire if it ends up concentrating risk on just a few platforms, says Jano Bermudes of Marsh, an insurance broker.

Secondly, the criminals have more resources—both technological and financial—at their disposal. According to security experts, they mainly focus on expelling intruders before they have time to loot. Yet, says one, soon hackers are likely to use artificial intelligence to shorten an attack from start to finish—the “kill chain” in the jargon. Cyber-gangs are also growing rich. Maze, one of them, announced its “retirement” in November after pocketing over $100m in ransoms in a year. Moreover, up-and-coming criminals are attempting to surf on the top tier’s success. Last autumn, hackers posing as Lazarus and Fancy Bear (an infamous Russian group) threatened over 100 financial firms with distributed denial-of-service attacks, in which “botmasters” mobilise vast networks of infected machines to flood their targets with internet traffic if they do not pay a ransom.

Such hackers can count on thriving secondary markets to monetise their loot. On ToRReZ, an eBay lookalike that *The Economist* recently visited via an ultra-private browser, credit-card details go for $25 a pop—or four for the price of three. For $4.99, a tutorial offers help in building phishing websites copying those of Barclays, a British bank. Purchases are paid in cryptocurrencies that can be cashed out in bank accounts opened with fake IDs (a driving licence from Tennessee costs $150, for instance). The new bank robbers are as criminally entrepreneurial as ever.

Free exchange

Is the pandemic accelerating automation? Don’t be so sure

The pessimists could, of course, eventually be proven right

Jun 19th 2021

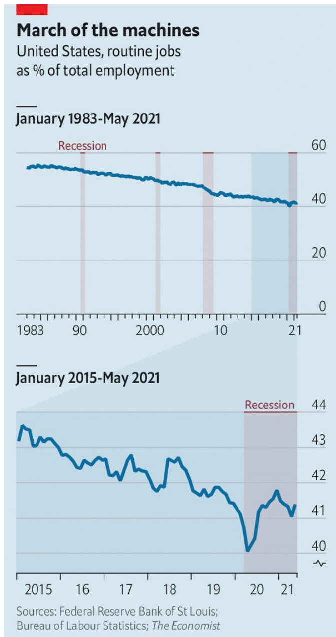
AS ECONOMIES REOPEN, labour shortages are still worsening. In America the number of unfilled vacancies, at 9.3m, has never been so high. Job postings in Canada are 20% above pre-pandemic levels. Even in Europe, slower out of the post-lockdown gates, a growing number of employers complain of how hard it is to find staff. Debates over labour shortages have focused on welfare policy and economic disruption. But the phenomenon has a deeper lesson. It tells us something about the myths of automation.

Economists have confidently asserted that a wave of job-killing robots was sweeping the labour market. The IMF says the pandemic is “hastening a shift in employment away from sectors more vulnerable to automation”. In a recent co-written article Joseph Stiglitz, a Nobel prizewinner, says the extra costs of covid-19 are “accelerating the development and adoption of new technologies to automate human work.” In congressional testimony last year Daron Acemoglu of the Massachusetts Institute of Technology suggested that more firms were "substituting machines for workers". But can pandemic-induced automation really be creating an army of surplus workers if employers are complaining of a deficit?

The economists had good reason to believe that job-killing automation would surge. Recessions often lead firms to adopt more robots, in part because labour gets more expensive as revenues but not wages decline. In a pandemic bosses have an extra incentive to automate jobs, as research by the IMF has shown. Robots do not need to socially distance. Nor do they get sick. Thanks largely to government stimulus programmes, firms have also accumulated spare cash, which they may now be able to deploy on robotics or on artificial-intelligence software.

Those who believe that automation is speeding up can point to many examples. In Ohio Lee's Famous Recipe Chicken, a restaurant chain, has installed automated voice systems to take drive-through orders. Pittsburgh's international airport recently became America's first to use ultraviolet robots for cleaning. British farmers boast of using ever more machines to pick strawberries and kill weeds. The number of news stories mentioning both "pandemic" and "automation" is growing at an annual rate of 25%.

The automation debate is heavy on speculation and anecdote. It is light on evidence. The citation from one prominent wonk to justify the claim that automation was "already" happening included a *New York Times* article and a theoretical microeconomics paper. According to some research, last year automatable jobs vanished in large numbers; but it is hard to disentangle the effect of technological change from lockdowns. It is true that America's GDP is nearly at its pre-pandemic level even as the level of employment is 7m lower. This, some say, shows that the economy can get by with many fewer people. But it could just mean that productivity per worker has risen, perhaps because of poorly understood things like remote working. Many of those on the sidelines will get jobs as fear of the virus fades and they find something which suits them, in turn raising output above pre-pandemic levels.



The Economist

It is not only labour shortages which undermine the story of a growing wave of job-killing robots. In America the wages of the worst-paid workers, who are thought to be especially vulnerable to automation, are rising more quickly than the average, in contrast to the aftermath of the financial crisis. Borrowing a methodology from the Federal Reserve Bank of St Louis, *The Economist* has divided America's labour market into "routine" and "non-routine" roles. Routine jobs involve patterns which are easier for robots to learn: say, data entry or checking out goods in a supermarket. For four decades routine jobs have slowly declined as a share of the total, as robots have improved (see chart).

Sticking with the routine

So far, however, the covid-induced downturn is bucking the trend. Had the pre-pandemic rate continued, we estimate that in May 2021 routine jobs would have accounted for 40.9% of overall employment. In fact they now account for 41.4%, meaning that America now has in the order of 1m "extra" routine jobs than expected. Perhaps the uncertainty over variants is deferring some investment in robotics. The mere act of installing new machinery is also more difficult in a world of travel bans and quarantine. American imports of industrial robots fell by 3% in 2020.

Australia may be a better place to look for signs of a job-killing wave. After some strict lockdowns the country has been under fairly loose domestic restrictions for over a year, giving a glimpse of what may lie in store elsewhere. Adapting the results of a government study in 2015, we gave 335 occupations (from "hotel and motel managers" to "complementary health therapists") a score from zero to 100, reflecting how automatable they seem.

Automatable jobs were in relative decline before the pandemic, falling to 57% of the workforce by 2019. The trend has continued, with evidence of a covid-19 acceleration: 55% of Australians are now employed in vulnerable occupations. (We found similar trends in New Zealand.) Yet Australia's unemployment rate is nearly as low as before the pandemic. Howls from employers about labour shortages are even louder than in America. Automation is not, it seems, putting people on the economic scrapheap.

The pessimists could eventually be proved right. But even if they are not, predictions of a world without work will continue. This is because the enduring fear of the march of the machines is not really the result of a dispassionate analysis of the evidence. It could hardly be so, when centuries of technological improvement have never led to widespread structural unemployment. Countries with more robots tend to have less joblessness, not more.

Worries about technological unemployment are instead the expression of something else. They reflect a deep-seated fascination with and fear of technology. And they reflect many economists' concern to get policymakers to pay more attention to the job prospects of people with the least marketable skills, who are always most vulnerable to economic shifts and shocks. These are perfectly understandable motivations. But next time you hear a warning about job-killing robots, think twice. ■

Dig deeper

All our stories relating to the pandemic and the vaccines can be found on our coronavirus hub. You can also listen to The Jab, our podcast on the race between injections and infections, and find trackers showing the global roll-out of vaccines, excess deaths by country and the virus's spread across Europe and America.

Science & technology

Let the drones fly high

Business is booming as regulators relax drone laws

Uncrewed aerial vehicles get more freedom to fly

Jun 17th 2021

ALTHOUGH DRONES, or uncrewed aerial vehicles (UAVs) as they are also known, were originally developed for military target practice and surveillance, the civilian versions that have emerged over the past decade have created a thriving new industry. Commercial UAVs, especially the hovering type, are used for jobs ranging from inspecting power lines, buildings and crops, to aerial photography, transporting medical supplies and even delivering pizzas. The value of this market reached $22.5bn last year, according to Drone Industry Insights, a German research firm with its eye on the business. By 2025 that figure is expected to exceed $42bn.

Something helping to accelerate this growth is a gradual relaxation of the strictures that aviation authorities, being naturally cautious about all these newfangled flying machines taking to the sky, have imposed on the industry. In most countries, drones may not be flown near people or over built-up areas, and must be kept within view of their operator. Exemptions may be sought for specific flights, but this can be a long-winded process, hedged with restrictions. For instance, regulators have usually insisted on ground observers being used to follow flights beyond an operator's visual line-of-sight, or BVLOS as it is known. This means extra staff have to be hired and trained, which pushes up costs.

However, as companies build up their flying experience, things are starting to change. In January, for example, a firm called American Robotics became the first operator approved by America's Federal Aviation Administration (FAA) to fly automated UAVs at specific sites without any pilots or observers being present. Staff at the company's base near Boston oversee these flights, even though the drones operate as far away as Nevada and Kansas.

To infinity and beyond

At the moment, American Robotics' flights take place in rural areas. Their purpose is to survey farmland. The company's quadcopter Scout drones wait, charged up and ready to fly, in boxes located on customers' farms. At the beginning of a mission the box lid slides open and the drone, sitting on its landing pad, is raised for take-off. Once flying, it scans the customer's fields with a variety of sensors, gathering data on crops and growing conditions. When done, it returns to its box, the lid closes, the data are processed and passed to the farmer, and the drone is recharged.

To avoid aerial collisions, the Scout system employs ground-based acoustic sensors which can hear the engines and propellers of approaching planes from a distance of several kilometres. This allows the position of an incoming flight to be plotted and, if necessary, the drone is instructed to keep clear. The company also plans to survey buildings and other infrastructure. Up to this point, says Reese Mozer, its chief executive, the industry has been "scratching the surface of autonomous drone use".

Something similar is happening in Britain. In April the Civil Aviation Authority (CAA) authorised a firm called sees.ai to carry-out routine BVLOS flights, albeit at specified locations. These include a large construction site in Surrey, to the south-west of London. "It is a big step forward and allows us to fly as often as we like without prior authorisation," says John McKenna, the firm's chief executive. For the time being, an observer is required on site, but that person need no longer be in constant contact with the flight-monitoring team at the company's base near Chichester, on the south coast. The firm hopes that this requirement will soon be lifted.

As its name suggests, sees.ai relies on artificial intelligence to operate its UAVs. To navigate, the craft employ several cameras and also other systems, including GPS, radar and lidar (which uses light instead of reflected radio waves) to build up three-dimensional images of their surroundings. The drones' software is trained to recognise structures and obstacles, including other aircraft, and to take evasive action if needed. This also lets the craft fly inside tunnels and under oil rigs, where GPS and radio-control signals are easily lost.

Although the covid-19 epidemic has delayed some projects, it has spurred others along—especially the delivery of medical supplies. Antwork Technology, which in 2019 received the first licence granted by China's Civil Aviation Administration for urban UAV trials, moved quickly from dropping off orders from Starbucks and KFC around its home town of Hangzhou to ferrying blood supplies and samples.

Antwork placed automated drone "ports" that resemble small shipping containers in the car parks of some of the region's hospitals and laboratories. Medical staff post samples and supplies through doors in the sides of these ports. They are then loaded automatically into a drone sitting on top of the container. At the end of its journey, a drone lands on another port and deposits its cargo, which can then be picked up from the door.

Antwork's drones, which navigate using GPS and cameras, are governed by a computerised scheduling and monitoring system. Two people at a flight-control centre keep an eye on up to eight drones simultaneously, though for the time being the company also uses some ground observers. Antwork says its drones have cut to a few minutes the time taken to make hospital deliveries that once took half an hour or more by road.

Several big outfits in the West are also keen on the drone-delivery business. Amazon, UPS and Alphabet, Google's parent, all have projects in development. Often these are based in remote areas, where there is little manned aviation to worry about bumping into. UPS Flight Forward, for instance, works with local groups delivering medical supplies in Rwanda and Ghana.

Some Nordic countries, where the skies are also relatively clear, have been especially drone-friendly. Alphabet's drone-delivery subsidiary, Wing, has begun its third year of flights in Helsinki, dropping off groceries and food to homes and some public sites, such as picnic areas. Wing's drones employ a hook on a cable to pick up goods from merchants and deliver them to customers. The drones fly at an altitude of 30-40 metres, which is well below that at which crewed aircraft typically operate. But just in case, the team overseeing the operation is plugged into a ground-based radio that monitors transponders broadcasting the positions of any aircraft in the area. Wing is also investigating the use of miniature transponders on its drones.

Over in Iceland's capital, Reykjavik, one of the longest-established drone-delivery businesses is also still going strong. This is a partnership between aha, a local company, and Flytrex, an Israeli drone-service firm. Together, they have been delivering groceries and meals by UAV since 2017. Flytrex is now trying to get something similar off the ground in America, with a delivery service from a local Walmart to homes in Fayetteville, North Carolina. On May 25th it was given permission by the FAA to fly above people. For now, its remote pilots still have to keep their craft in view, but ground observers are no longer required. "This is a large step forward and allows us to significantly expand the number of front and backyards we can service," says Yariv Bash, Flytrex's boss. The firm's drones navigate using GPS receivers and other sensors—but not cameras, because of fears that Americans might consider them to be intrusive.

Heaven sent

Four days earlier than Flytrex, on May 21st, Manna, an Irish drone-delivery company, obtained a new type of European Union operating certificate. Within certain limits, it allows the firm to authorise UAV operations on its own recognisance. Manna has been delivering food and groceries in suburban Galway for the past year, carrying out more than 35,000 flights, and now aims to set up operations in other cities.

For such progress to continue, operators will have to prove their UAVs have as good an ability as crewed aircraft to detect and avoid one another. “The levels of safety are not going to change between piloted aviation and remotely piloted aviation,” says David Tait, head of innovation at the CAA. Mr Tait is open to alternatives about how drones might do that, but thinks it will involve a mixture of technologies, including some that firms like sees.ai and Wing are developing.

One difficulty is that light aircraft flying in uncontrolled airspaces sometimes operate under so-called Visual Flight Rules. These absolve pilots of the obligation to carry transponders and other instrumentation as long as the journey is being made in conditions of clear visibility and they keep their eyes peeled.

Iris Automation, in California, thinks it has a solution to this problem, which is to give UAVs the equivalent of a sharp pair of eyes. These come in the form of five small cameras that create a 360° view around a drone. This panoptic image is scanned constantly by AI software which has been trained to recognise different types of aircraft from several kilometres away. The system can calculate an incoming aircraft’s range and heading, and automatically adjust the drone’s flight path if a collision looks likely.

Costing from $9,000, this is a reasonably inexpensive piece of kit in aviation terms. It is already fitted to some drones, but John Damush, Iris’s boss and himself a pilot, is also testing it on a two-seater Piper Cub. He thinks drone-tech like this could help crewed flight too, because, unlike Iris’s drones, pilots don’t have eyes in the backs of their heads. ■

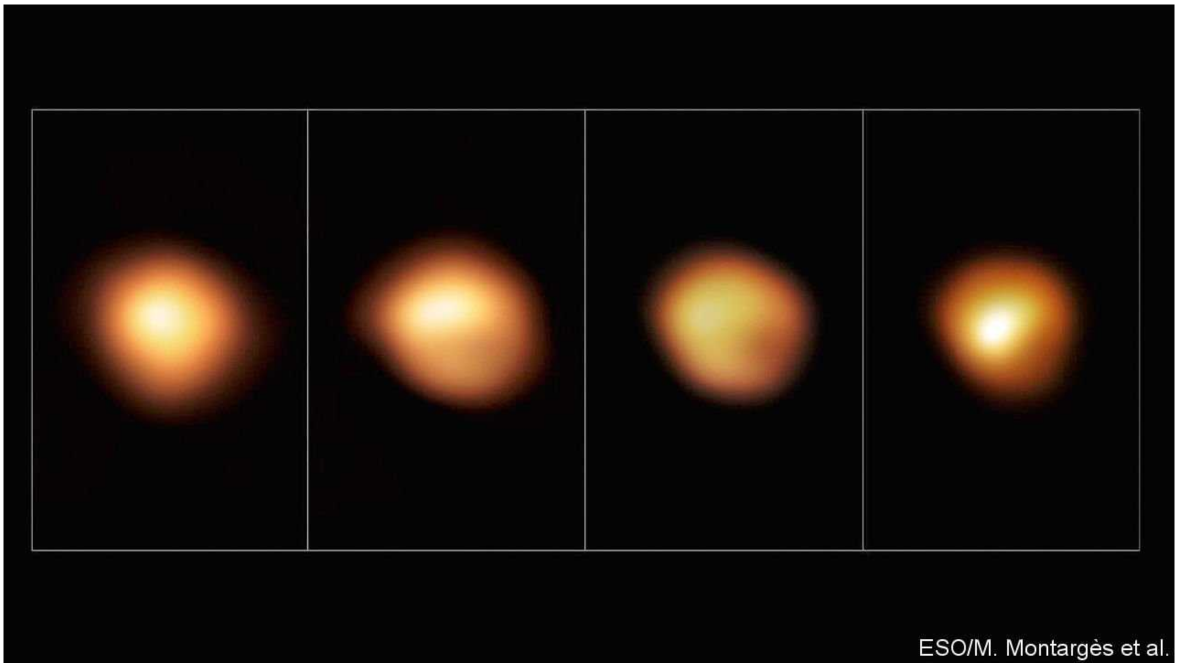
A version of this article was published online on June 14th 2021

Astronomy

Betelgeuse’s great dimming

Last year’s supernova false alarm explained

Jun 17th 2021



THESE IMAGES show Betelgeuse, a star that marks one of Orion’s shoulders, as it was in January and December of 2019 and January and March of 2020. They were assembled from data collected in those months by the Very Large Telescope, an array of four instruments in northern Chile. Between November 2019 and March 2020 there was excitement among astronomers when a rapid dimming of this, the second-closest red supergiant to Earth, suggested that a supernova might be about to happen. Regrettably for those who enjoy watching notable astronomical phenomena, it did not, though one is expected within the next 100,000 years or so. Studying these images, as they write in *Nature*, Miguel Montargès of the Paris Observatory and his colleagues suggest the most likely cause of the diminution was a local cooling of part of the star’s southern hemisphere, associated with an ejection of mass. The much bigger ejection of mass that is a supernova will have to wait.

A version of this article was published online on June 16th 2021

Living fossils

Coelacanths live for as long as people

And their young have a five-year gestation period

Jun 19th 2021

ON DECEMBER 23rd 1938 Marjorie Courtenay-Latimer, a curator at the East London Museum, in South Africa, dropped by her local fish market. While there, she spotted the most beautiful fish she had ever seen. It was pale mauve, nearly two metres long, and had silvery markings. Though she had no inkling at the time, it turned out to be part of a group called the coelacanths, hitherto believed to have died out with the dinosaurs.

This find, called *Latimeria chalumnae* in Courtenay-Latimer's honour, showed coelacanths are still very much alive. It was hailed as the most important zoological discovery of the century. Now, work just published in *Current Biology* by Kélig Mahé of the Fisheries Laboratory, in Boulogne, France, suggests that besides having lasted collectively for more than 400m years, coelacanths also hang around for a long time as individuals. Dr Mahé's study indicates they have similar lifespans to human beings, putting them among the world's longest-lived vertebrates.

The excitement at *Latimeria*'s discovery was not just because of the curiosity of its survival. It was also that coelacanths belong to a group which have lobe-shaped fins of a sort thought to have been precursors to the limbs of terrestrial tetrapods. Many experts have therefore sought to study *Latimeria* more closely. That is, however, hard. *Latimeria* is reclusive, nocturnal, lives in depths below 100 metres, and is known only from the south-western Indian Ocean and from a second, smaller population, *L. menadoensis*, near Manado Tua, an island in Indonesia.

In particular, Dr Mahé wanted to know how long *Latimeria* lives. Previous work, which looked at annual growth rings in its scales, suggested a maximum of 20 years. That does not square with the animal's slow metabolism and low fecundity, both traits characteristic of long-lived species.

Rather than using standard microscopes, he and his colleagues employed polarised light to study the scales. This revealed extra growth rings so thin that previous work had missed them. Of 27 individuals studied, six turned out to be in their 60s and one was 84.

This was a finding Dr Mahé and his colleagues had more than half expected. What truly surprised them was a discovery made by looking at two unborn youngsters—for *Latimeri*a females bear live young rather than laying eggs. The fetuses' scales suggested they were five years old, a remarkably long gestation period given the previous vertebrate record of three-and-a-half years, held by the deep-sea frilled shark.

Though interesting, in some ways Dr Mahé's discovery is bad news. An already-rare, slow-growing animal with a gestation period of half a decade has just about the most extinction-prone profile it is possible to imagine. *Latimeria* is legally protected, in as much as such protection pertains at sea, and is not a particular target for fisherfolk. But it is already classified as critically endangered by the International Union for Conservation of Nature. It would be both ironic and tragic if, having survived the asteroid impact 66m years ago that did for the dinosaurs, coelacanths were to disappear for good on humanity's watch. ■

Antibody of evidence

A new weapon in the war against SARS-CoV-2 has been found

It is expensive, though, and in short supply

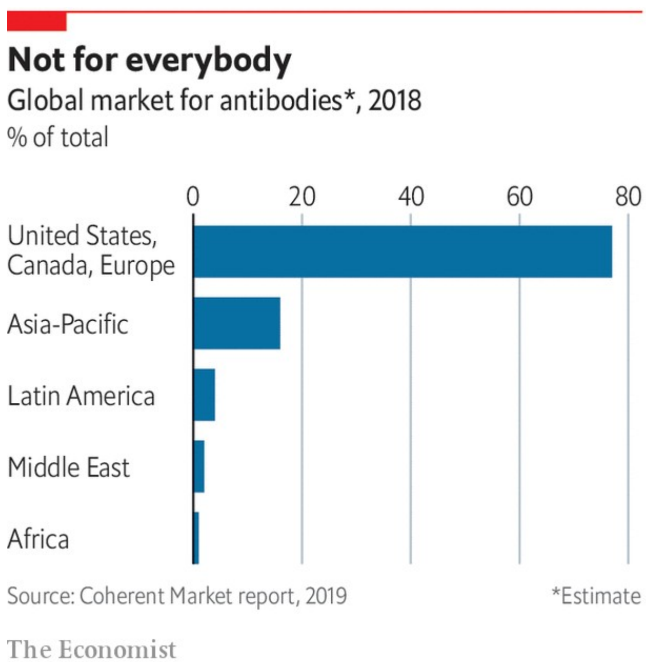
Jun 16th 2021

AN ANTIBODY THERAPY from Regeneron, a firm in upstate New York, improves the survival of patients with covid-19 and offers renewed hope for the treatment of those most seriously ill with the disease. A study in British hospitals found that Regen-Cov saved the lives of many of those unable to make their own antibodies in response to SARS-CoV-2. Such "seronegative" individuals constituted about a third of the 9,785 hospital patients in the study. As compared with a control group given standard treatment (either a steroid called dexamethasone or, for the sickest, an anti-inflammatory known as tocilizumab), 20% more patients survived. Regen-Cov also reduced the median length of hospital stays from 17 to 13 days.

Regen-Cov is a combination of two monoclonal antibodies, known as casirivimab and imdevimab. Antibodies are immune-system proteins that disable pathogens by locking specifically onto them. Both casirivimab and imdevimab bind to different sites on the coronavirus's "spike" protein, preventing the virus from infecting cells. Using two antibodies instead of one reduces the risk of the virus evolving resistance to the treatment.

Until now, trials have not made a convincing case for the widespread use of antibody therapies for covid-19. One problem has been a failure to identify a clear group of patients who can benefit from these costly treatments. This is the first study large enough to show that such a therapy reduces mortality in patients admitted to hospital with severe covid-19. A year ago, the same Recovery trial run by British scientists also discovered that dexamethasone would save patients' lives.

Regen-Cov already has emergency authorisation for use in America, Brazil, Canada, the European Union and India, but remains an investigational drug in Britain and elsewhere. Even if authorisation follows in many other countries, though, access to it is likely to remain extremely restricted.



Soumya Swaminathan, the chief scientist at the World Health Organisation, said the result was good news, but warned that access to monoclonal-antibody drugs was "limited globally". A recent study by the Wellcome Trust, a British medical charity, and IAVI, the International AIDS Vaccine Initiative, showed just how unavailable these drugs are in various parts of the world (see chart). More than three-quarters of the market for them is in

America, Canada and Europe. So far, two countries, America and Germany, have bought large supplies of Regen-Cov. In January, America agreed to purchase up to 1.25m doses for $2.6bn. In the same month, Germany spent $487m on 200,000 doses. (Donald Trump was treated with Regen-Cov when he fell ill with covid-19.)

The reasons for this geographical concentration are twofold but related: quantity and price. Production facilities for monoclonal-antibody therapies are few. And, in general, only wealthy countries can afford them. Regen-Cov costs many thousands of dollars a dose.

Dr Swaminathan says more monoclonal-antibody factories need to be established around the world so that such treatments become accessible and affordable. Lack of availability of Regen-Cov will probably become a topic of interest to those who argue that intellectual property in covid-19-related technologies should be waived by the World Trade Organisation.

So far, trials for covid-19 antibody-therapies have generally been disappointing, but news of Regen-Cov's success is likely to reinvigorate interest in them. Eli Lilly's antibody therapy, LY-CoV555, failed to provide benefit to hospital patients in a trial reported last December, while on June 15th a similar drug from AstraZeneca also disappointed when given to those who had been exposed to the virus. These drugs might, however, turn out to be beneficial if they are given to the narrower patient group identified by the Recovery trial.

Should demand for Regen-Cov now increase, though, it is not clear how quickly supply could be improved—even in countries that have the money to pay for it. Monoclonal-antibody production lines are currently used to make cancer and arthritis drugs, which are also badly needed. Moreover, supplies of much of the equipment required, including biobags (giant disposable plastic bags used to make drugs), filters and sterilisation gear, are already stretched thin by demands from vaccine manufacturers. Earlier this year, two pharma companies complained that their ability to make monoclonal antibodies was hampered by shortages of equipment, thanks to the global push to make vaccines.

Any attempt to increase the supply of monoclonal antibodies in coming months could thus compete with vaccine manufacturing. America currently has a lock on much of the supply of equipment and raw materials needed to make vaccines, a hold it maintains through the use of the Defence Production Act. If America chose to use the DPA to support monoclonal antibody production, that might have an impact on vaccine production in countries such as Brazil, Britain and India.

The Recovery study also seems to settle a scientific debate about whether it is worth giving antiviral therapies to covid-19 patients when they arrive in hospital. It is. It had been thought that, by the time a patient arrived, only anti-inflammatory drugs, which treat damage already done by the virus, were relevant. Knowledge that patients who are seronegative are able to benefit from antiviral therapies opens up further lines of investigation for antiviral drugs. In the Recovery trial, untreated seronegative patients were twice as likely to die as those who were able to mount an antibody response.

For doctors, the trial raises an intriguing question. If they have patients languishing at home with covid-19, might it be worth offering a cheap lateral flow test to try to identify those who are not mounting an immune response? If it is possible to spot those most likely to end up in hospital, and stop that happening, it would help to weaken the virus's hold on patients, and on society at large.

Dig deeper

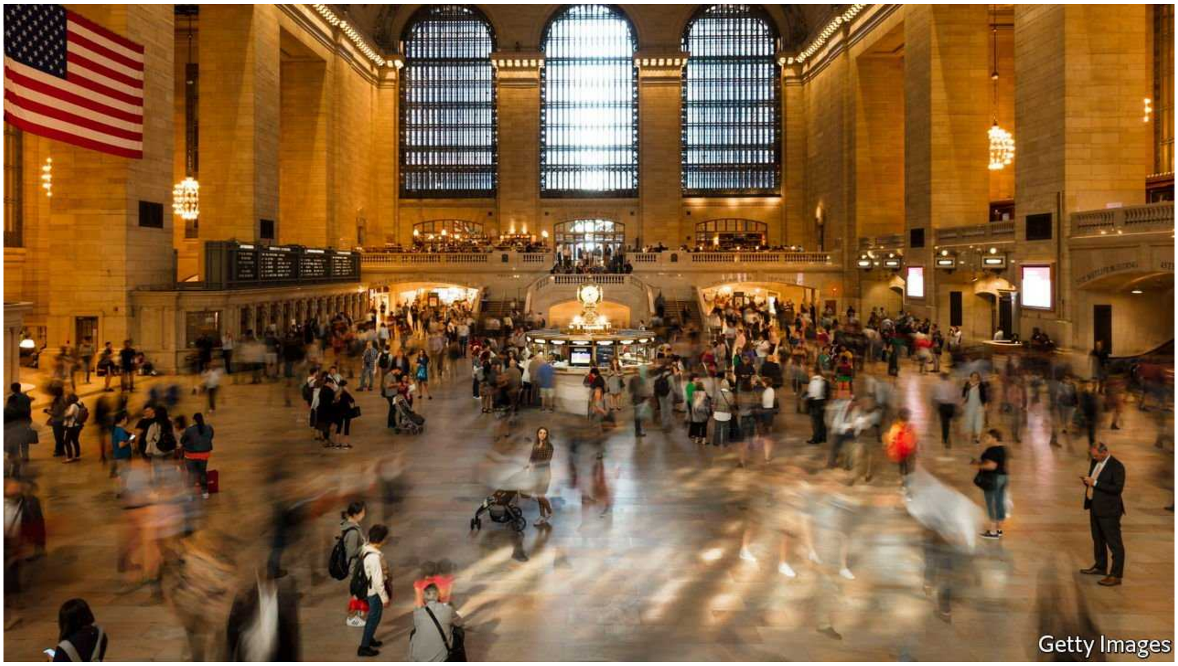
All our stories relating to the pandemic and the vaccines can be found on our coronavirus hub. You can also listen to The Jab, our podcast on the race between injections and infections, and find trackers showing the global roll-out of vaccines, excess deaths by country and the virus's spread across Europe and America.

Microecology

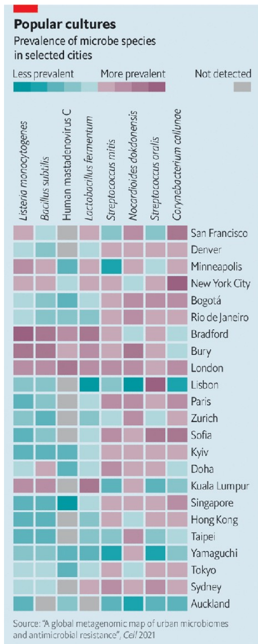
A midsummer bug hunt

Every June 21st sees a census of the world's urban microbes

Jun 19th 2021



DEPENDING ON WHERE you live, June 21st is either the summer or the winter solstice. For some, this is a moment of celebration, accompanied by strange rituals. And among the celebrants are members of the International Metagenomics and Metadesign of Subways and Urban Biomes Consortium (MetaSUB). If, in Bogotá, Doha, Kuala Lumpur, London, Minneapolis or any other of some 60 cities around the world, you see on that day someone furtively swabbing a ticket counter, handrail, turnstile or seat in your local underground-railway station, be not afraid. It is just one of MetaSUB's volunteers gathering samples of the local microbes.



The Economist

MetaSUB’s purpose is to understand the invisible complexes of bacteria, archaea, fungi and viruses that are life’s smallest representatives. Every year, on June 21st, it co-ordinates an army of small-game hunters who have the task of sampling their city’s public transport. The swabs are then tagged with time of collection, local temperature and humidity, and the nature of the sampled surface, and sent off for genetic sequencing and statistical analysis.

The consortium’s latest findings, published recently in *Cell*, are based on 4,728 samples collected in 2015, 2016 and 2017. These show that each city has a microbial ecosystem distinctive enough (see chart) to serve as a fingerprint. An algorithm trained on the data could identify the origin of a randomly chosen sample 88% of the time. A few species are ubiquitous. Thirty-one (all bacteria) were found on almost every swab, and a further 1,145 (also, bar brewers’ yeast, bacteria) turned up in over 70% of samples. The vast majority of the 4,246 identifiable species were, however, much more narrowly distributed.

On top of these identifiable organisms are the unknowns. Around half of the critters sequenced had no match in the world’s public genetic databanks, says Daniela Bezdan, a former executive director of MetaSUB who was one of the study’s leaders. She estimates that more than 1,000 of the bacteria collected, and 10,000 of the viruses, remain unidentified.

Ill met by moonlight...

Unidentified organisms are common in such microbiological fishing expeditions, for a proper understanding of microbial biodiversity remains a long way off. But, though intriguing, such hidden neighbours are unlikely to be dangerous. “We know there aren’t any pathogens because people don’t get ridiculously sick,” says David Danko, another of the paper’s authors.

The identities of this dark microbiome’s members are just one of the mysteries that remain to be solved. Another is what regulates a city’s microbial ecology. Strikingly, the pattern observed reflects the more familiar ecology of plants and animals in that equatorial cities have richer ecosystems than those nearer the poles (microbial diversity declines at a rate of seven species per degree of latitude). No one knows for sure why this pattern pertains for macroscopic creatures. That it is also true for microbes may add insight.

On top of latitudinal variation, three other patterns stood out. Coastal cities share characteristics that inland ones lack. So do those at high altitude, compared with those which are low-lying. And so do cities with higher human-population densities.

At the moment, MetaSUB is still in the position of the early botanists and zoologists, gathering information about what, exactly, is out there. As the underlying patterns become clearer, though, such surveys could have practical benefits. They should, for example, enable public-health bodies to monitor and map the spread of diseases, and identify harmful new species. They could also permit the monitoring of bacteria carrying genes that confer resistance to antibiotics. MetaSUB has found such genes to be widespread, but unevenly distributed. They were less common in Oceania and the Middle East. Why, is so far impossible to say.

The current paper looks only at DNA from the samples, but MetaSUB has now started surveying RNA as well. This is particularly pertinent to viruses, many of which, such as the coronavirus currently sweeping the world, store their genes as RNA, not DNA. As the team gears up for its next collection day, it hopes the data it gathers will grant a more accurate portrait of the role of viruses in cities, and provide insights into the spread of covid-19. ■

Books & arts

Covid in America

A veteran journalist explains America’s devastating pandemic

Lawrence Wright blames China’s opacity, faulty testing—and appalling leadership

Jun 19th 2021

The Plague Year. By Lawrence Wright. *Knopf; 336 pages; $28. Allen Lane; £20*

IN APRIL 2020 Lawrence Wright published a novel, “The End of October”, about a global pandemic and the political meltdown and mass fatalities it causes in America. Health officials struggle to enforce lockdown rules in the face of conspiracy theorists, feuding rivals, outraged libertarians and a useless president who, washing his hands of the calamity, foists it onto his deputy, a former governor and radio-show host. Then Mr Wright set about writing the true story of America and covid-19. It is not that different.

A veteran journalist at the *New Yorker*, who wrote a bestselling account of the origins of the 9/11 catastrophe, Mr Wright makes no great claim for his prescience. Plagues, after all, have been common throughout history. And a two-year pandemic of the deadly SARS disease, which emerged in China in late 2002 and spread to several other countries, had raised the threat warning. It was only a matter of time before an even deadlier virus, taking advantage of teeming human populations, ravaged wildlife habitats and opaque government, jumped between species or escaped from a laboratory. According to a study published in 2019 by the Economist Intelligence Unit and others, no country was ready for it.

Still, the study's authors considered America at least better placed than the rest. Its public-health institutions, especially the Centres for Disease Control and Prevention (CDC), were the world's best. And under Barack Obama, who worried a lot about pandemics, the federal government had taken extra defensive steps. During the transition to the Trump administration, Mr Obama's team handed over a long guide to combating a "pathogen of pandemic potential". It included a breakdown of relevant capabilities across the federal agencies, and the order in which they should be brought to bear. So why, when Mr Wright submitted his manuscript in late 2020, had America performed so badly?

At the time, its death toll from covid-19 was 375,000; now it is 600,000. Among the most affected countries, only Italy and Britain had then lost a higher proportion of their populations, at least by the official counts (more recent modelling suggests death rates have been a lot higher in numerous other places). "The Plague Year" is Mr Wright's account of how this happened.

He identifies three main reasons. First, China's evasiveness and opacity mitigated America's technological prowess. Had the CDC got the early access to the outbreak in Wuhan that it had requested, it would have pinpointed a crucial difference between the viruses that cause SARS and covid-19: the new one could be spread asymptomatically, which made it far more dangerous. As it was, the CDC did not understand that until late February 2020, by which time the virus was already raging in America.

Not that the CDC fully grasped its prevalence even then, having failed to develop an effective covid-19 test. This was the second reason for America's plight. Weeks after many rich countries had launched mass testing, the CDC was still investigating why its test kit didn't work. Many of the kits, it turned out, had been contaminated with the coronavirus at the “filthy” CDC laboratory where they were made. By the time South Korea had tested 65,000 people, America had managed to test only 500.

Having thereby lost control of the virus, America also failed to implement adequate social distancing and, in particular, mask-wearing. This ensured it fared worse not only than South Korea and other well-organised Asian countries, but also some European ones. The cause of this third fatal glitch was one Mr Wright had foreseen in his novel: the malignity of Donald Trump and incompetence of his administration.

Even Americans who are not in denial about that reality may struggle to remember the many proofs of it; the bloody insurrection on Capitol Hill that Mr Trump engineered in January has come to dominate the memory. Moreover his response to the crisis—the biggest test of his presidency—was often so unconscionable and bizarre that, as time passes, it seems almost incredible. In his characteristic style, Mr Wright provides many small sketches of people touched by covid-19—from whizzy scientists like Barney Graham (“six-foot-five, with a grey goatee and a laconic manner”), to victims like 96-year-old Jim Miller, a D-Day veteran who died of the disease in a cruelly mismanaged home for old soldiers. But the book’s main character is Mr Trump, and its main service is in weighing his responsibility for the disaster.

Devil take the hindmost

His efforts to purge Mr Obama’s legacy and his predilection for sycophants put America at a disadvantage from the start. The pandemic plan was ditched; the heads of the CDC and the Department of Health and Human Services, Robert Redfield and Alex Azar, were both inadequate. There was nonetheless a moment when it seemed Mr Trump might conceivably rise to the historic occasion. In a televised address on March 11th 2020 he acknowledged the pandemic’s gravity, recommended social distancing and called on the country to “put politics aside”. In Mr Wright’s telling, that moment lasted about five days.

Instead of taking charge of the crisis, Mr Trump told state governors they were on their own—and must fight it out in the red-hot global market for ventilators, masks and other kit. It was an unprecedented abnegation of federal authority, guaranteeing needless wastage and chaos. “Price is always a component,” Mr Trump told Charlie Baker, the governor of Massachusetts, after he complained that the federal government kept gazumping the state’s orders of masks and other equipment.

The unmasked man

Having cut the governors loose, Mr Trump began undermining their public-health efforts, in an almost psychopathically self-serving bid to politicise the pandemic. He talked up the miraculous properties of hydroxychloroquine, a quack cure peddled on Fox News. He denounced state lockdowns. By tweeting “LIBERATE MICHIGAN!” and “LIBERATE VIRGINIA!”, he launched vigilantes onto the streets of those states. Some plotted to kidnap Michigan’s governor, Gretchen Whitmer, in what now looks like a dress rehearsal for the insurrection in Washington.

Mr Trump’s opposition to mask- wearing—he thought it made him look unmanly—made it a litmus test of partisan identification. This led to many needless infections and deaths. In Mr Wright’s view, he was even more directly responsible for some of them. Since all the guests were tested, he thinks Mr Trump the likeliest infection source of a “superspreader” event at the White House in October.

His leadership did not merely undercut America's strengths. It also exacerbated its weaknesses. Partisan division was among the many pre-existing national conditions that the virus laid bare—a list that includes the hollowing of American manufacturing supply-chains; the disproportionate suffering of black Americans; chronic obesity; and extreme disparities in health-care quality. Of course, America's encounter with covid-19 continues. Perhaps the most glaring deficiency of Mr Wright's book is that it concludes just as America was on the brink of launching, from a faltering start, one of the world's most impressive mass vaccination campaigns (an effort that owes much to the Trump administration's stimulation of the development and supply of vaccines). Yet even with that hindsight it is hard to be optimistic about the country the pandemic exposed.

In his most hopeful moment, Mr Wright speculates that "perhaps covid-19 was the force that America needed—to be humbled, to reckon with itself, to once again attempt to create the democracy it had always intended to be." But even before those words were published 74m Americans had voted to give Mr Trump another four years at the helm. And among the Republicans now jostling to succeed him are many lesser covid incompetents—such as Kristi Noem, the governor of South Dakota, whose opposition to lockdown measures led to thousands of unnecessary deaths. Covid-19's terrible cost to America is not only measurable in jobs and lives. Its other great toll is accountability. ■

Dig deeper

All our stories relating to the pandemic and the vaccines can be found on our coronavirus hub. You can also listen to The Jab, our podcast on the race between injections and infections, and find trackers showing the global roll-out of vaccines, excess deaths by country and the virus's spread across Europe and America.

Victim, complex

In “Animal”, Lisa Taddeo’s narrator exacts revenge on men

The follow-up to “Three Women” again uncovers experiences that are rarely discussed

Jun 19th 2021

Animal. By Lisa Taddeo. *336 pages; $27.99. Bloomsbury Circus; £16.99*

IN “THREE WOMEN”, Lisa Taddeo’s first book (published in 2019), she recounted the often disturbing sexual histories of three American women whom the author had spent years interviewing. Her decision to write from the perspective of her subjects—but in the third person, traditionally a novelistic approach—made it hard to gauge the extent of her creative licence. But the main criticism of her mostly well-received book involved its focus on characters who seemed to have little or no agency. A middle-aged restaurateur is coerced by her husband into sleeping with other men. A young woman goes to court to accuse her former teacher, a married father, of having groomed her for sex.

As if by way of balance, Ms Taddeo has now swung to the other extreme, with a compulsive debut novel narrated by a wronged woman out to avenge the abuse of male power. Joan is 36 and on the run from New York after the gory death (in mysterious circumstances) of Vic, her older, married lover. Lying low in California, she falls in with Lenny, a widower suffering from dementia. In his confusion, Lenny mistakes Joan for the wife he ill-treated; the crimes to which he confesses boost her resolve to find redress for the miseries she has endured.

So begins a provocative psychological thriller that sets out to subvert #MeToo-era notions of victimhood, at the same time portraying men as almost uniformly vile. The story sags in places, not least during the novel's midsection, when Joan recalls her girlhood experience of desire in conversation with a yoga teacher, a sequence that resembles an offcut from "Three Women". Joan's narration runs melodramatically hot and can be overly portentous ("sometimes it's better to kill someone than to leave them"). Yet teasing hints about "the thing that I would end up doing" build tension, as do allusions to the death of Joan's parents when she was a child, an event clarified in an explosive climax.

Ms Taddeo's lurid and relentless focus on horror, from child abuse and rape to suicide and miscarriage, might be taken for relish. Yet as in "Three Women", her determination to tear the veil from experiences that normally remain hidden makes this startling writer valuable. ■

The fire this time

A precious African-studies collection burns in Cape Town

For scholars, the loss recalled those of the libraries of Alexandria, Timbuktu and Rio

Jun 19th 2021 | CAPE TOWN

THE VIEW from the steps of Sarah Baartman Hall at the University of Cape Town (UCT) is a reminder of the city's natural beauty and difficult history. The shadow of Table Mountain looms over the neoclassical building, renamed in 2018 to commemorate Baartman, a Khoisan woman who in 1810 was shipped to Europe to appear in freak shows. She replaced Leander Starr Jameson, a lackey of Cecil Rhodes who staged a calamitous attempt to start a war on behalf of his patron. Until 2015 a statue of Rhodes stood at the bottom of the steps, gazing out at the Atlantic Ocean and the city he made his own, the headquarters of his southern African empire.

"And there", says Ujala Satgoor, director of UCT's libraries, looking to her right, "is the famous Jagger library." Or rather, there it was. On April 18th fireballs from a conflagration on the mountainside engulfed the building and nearby halls of residence (the cause of the blaze is unclear). The contents endured the twin effects of flames and, once firemen arrived, hosepipes, leaving thousands of works charred or sodden.

Because they were held in a basement, some books of the highest monetary value were spared. These were mostly from the Western canon. But in a bitter twist for a library that may have done more than any other to enhance scholarship of Africa, the most extensive damage was to its African-studies collection. Almost 100,000 of its roughly 130,000 books were destroyed (the count is ongoing). “It was truly a disaster,” says Ms Satgoor.

The African-studies collection dates back to 1953, five years after the introduction of apartheid in South Africa, and four years before Ghana catalysed decolonisation by gaining independence. At the time, “African studies” was dominated by white male authors. But a succession of quietly radical UCT librarians travelled extensively to acquire materials by African scholars, using funding from the Oppenheimer family, founders of Anglo American, the mining giant. Slowly they built the largest store of research materials for African scholars on the continent.

Ms Satgoor recalls stumbling through the rubble and finding only covers of rare dictionaries, their pages incinerated. Gone were early translations of local languages from countries such as the Gambia, Sierra Leone, Gabon and South Africa. Soon after the fire, a number of San and Khoi scholars (two groups indigenous to the area around Cape Town who, over time, were termed Khoisan, like Baartman) noted that the blow is particularly painful for their field, as much of their oral traditions was lost during the colonial era. “This devastation reminds us of when the great libraries in Alexandria, Timbuktu and Rio were destroyed,” the scholars wrote.

Also thought gone are thousands of official documents. Over several decades librarians collated copies of parliamentary debates, political-party minutes, inquiries and so on, to help African historians. The material included many papers related to underground activities during apartheid. The fire severely damaged a complementary audiovisual archive, which included rare footage from political protests.

Then there was a unique collection of nearly 3,500 African films. One of these, wrote Jeremy Seekings and Chris Saunders, academics from UCT, in a recent article for the *Daily Maverick*, a South African outlet, was the pioneering “Afrique sur Seine”; it was made in 1955, when Africans in France’s colonies were not allowed to make films in their home countries. Others were banned works sent to Cape Town in secret—a film about the Gukurahundi massacres in Zimbabwe in the 1980s was dispatched in an envelope labelled “Auntie Flo’s home movies”.

Ms Satgoor began the salvage operation before the embers cooled. Some books will be saved with the help of cold storage and moisture-sucking fans. She has received dozens of offers of help, including from universities with copies of lost books and films. But it will take time to rebuild a resource that had an importance greater than the sum of its parts. Walking through the ash-strewn warren of the library, an incongruous smell of charred damp in the air, Ms Satgoor talks of her admiration for earlier librarians who built such a “provocative” collection. Restoring it falls to her. ■

Car trouble

The rise and fall of Carlos Ghosn

A new book explains the spectacular implosion of his relationship with Nissan

Jun 19th 2021

Collision Course. By Hans Greimel and William Sposato. *Harvard Business Review Press; 256 pages; $30 and £22*

THE MAIN events of the scandal that brought down Carlos Ghosn, whose restless energy made other globetrotting bosses look work-shy, are appropriately book-ended by flights on corporate jets. The drama began with grainy television footage of Japanese prosecutors boarding the plane that delivered an unwitting Mr Ghosn to his arrest in Tokyo in November 2018. It culminated in his skipping bail on several charges of financial impropriety around a year later. Stripped of his leadership of a giant conglomerate, he was smuggled out of Japan on another private jet, this time hidden in a box.

Because of that clandestine escape, “Collision Course” by Hans Greimel and William Sposato, two Tokyo-based journalists, at times reads like a spy thriller. But their main aim and achievement is to give the clearest account yet of the deep-rooted causes of Mr Ghosn’s predicament. Underpinning the entire tale—and Mr Ghosn's status as a corporate superstar—was Renault's rescue in 1999 of near-bankrupt Nissan, an alliance, later joined by Mitsubishi, which he built into the world's biggest carmaker.

The terms of Nissan's bail-out gave Renault, in which the French government has a large shareholding, control of the Japanese firm, but Nissan got no say over Renault in return. The alliance stopped short of a full merger, which, in the car industry, had usually ended in disaster. This arrangement led to seething resentment at Nissan, which gradually became the bigger company and the main source of profits. Mr Ghosn kept a lid on the tensions between the two carmakers—their engineers rarely agreed on anything—through the force of his personality.

But they boiled over as Mr Ghosn sought, at the French government's behest, to make the alliance "irreversible". Nissan read this as code for a full merger that would cement Gallic dominance. This, claims Mr Ghosn, led some in Nissan to manufacture charges in order to get rid of him. Nissan's version is that he was a greedy tyrant who regarded the Japanese firm as a personal bank account. This claim gained more credence when French prosecutors also began an investigation of Mr Ghosn, including into the funding of a lavish party thrown for his wife's birthday at the palace of Versailles—a far cry from his Japanese prison cell, where a bowl of rice gruel counted as luxury.

The authors point to a clash of corporate cultures as the reason he may have sought to circumvent pay disclosure using a deferred-pay scheme, which Nissan claimed broke the law. In Japan and France CEOs are paid far less than equivalent American bosses; doubtless he thought his skills should be properly rewarded by global standards. The competing narratives were never aired in court, though, after Japan's criminal-justice system—which relies on prolonged incarceration and intense interrogation to obtain a confession—collided with Mr Ghosn's stubborn refusal to admit any wrongdoing. Eventually released on bail, he fled in the belief that he would not receive a fair trial and would remain under house arrest for years.

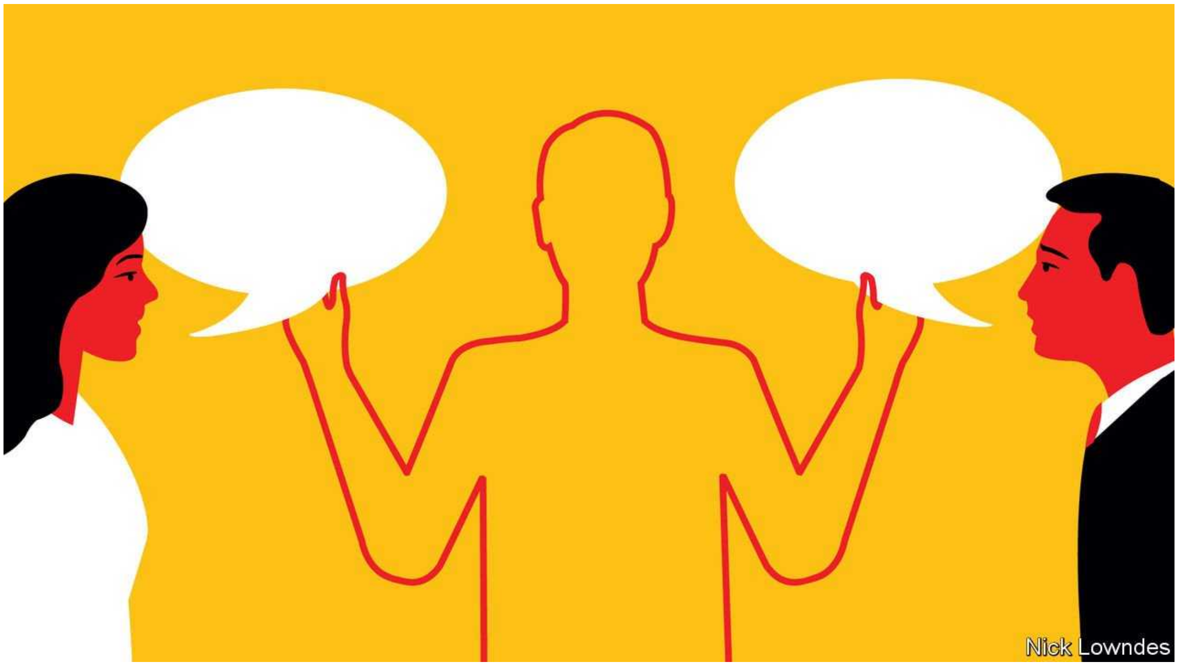
Some readers may be dismayed by the authors' reluctance to speculate on the verdict should the trial have gone ahead (they conclude that, given the "arcane" accusations of financial irregularities, a "ruling is likely to be just as abstruse”). But the end result is that Mr Ghosn remains trapped, these days in Lebanon, where he is safe from the international arrest warrants that might be executed should he board any more corporate jets. Meanwhile the alliance he created, languishing without its leader, may yet break apart. ■

Johnson

Translators are the unacknowledged facilitators of the world

But they and interpreters rarely get their due

Jun 19th 2021



DID A MISTAKEN translation put rovers on Mars? In 1877 Giovanni Schiaparelli, an Italian astronomer, used his then state-of-the-art telescope to view and describe what he called "*canali*" on the planet. English translators leapt on the discovery of what they rendered as "canals". There followed a frenzy of speculation that Mars might be inhabited, which left a deep mark on the human imagination. To this day "Martian" is a synonym for alien life.

But the Italian word could also have been translated as "channels". Which did Schiaparelli mean? In some writings he was careful to discourage firm conclusions about life on Mars; in others, he encouraged exactly those conclusions. It is almost as though *canali* let him have both "channels" and "canals" in his mind at the same time.

The story is told in "Dancing on Ropes", Anna Aslanyan's new book about translators' and interpreters' roles at critical moments in history. It is full of lively stories like that of Schiaparelli's canals. Ms Aslanyan is herself both a translator and interpreter (in the argot of the profession, the former works in writing, the latter in speech), and enlists both practical experience and archival history. She leaves the reader with an awed respect for the translator's task.

Ideally, interpreters are invisible, and two people who do not share a language will feel they are conversing directly. But this ideal is virtually unachievable. Speakers cut off their own interpreters. Listeners are rude to them, as if they (not the actual interlocutor) had said something objectionable. The poor linguist in the middle can thus be tempted to clean up or soften a rude remark; Ms Aslanyan relates some enjoyable tales from the Russian interpreter for Silvio Berlusconi, Italy's bawdy former prime minister.

The job is draining. In "The Language Game", Ewandro Magalhães, a Brazilian interpreter, described how, at the Nuremberg trials, small booths hooked up with telephone wires were first used for interpretation into several languages. Staff got one day off in three, and shifts were capped at 45 minutes. Even so, an interpreter said, four months in Nuremberg made her feel ten years older. Perhaps only the Ottomans, who made "dragoman" a powerful job—the grand dragoman was simultaneously deputy foreign minister—gave interpreters the respect they deserve.

Translation is different: usually solitary, seemingly more leisurely, but now under tremendous economic pressure. In the digital era, everyone competes with everyone and buyers often simply take the lowest bid (or Google Translate). The literary work that cannot be done by a faceless contractor or a machine may not always pay the bills, but it at least provides stimulation. Ms Aslanyan recalls trying to transpose a Russian spoken in rural Ukraine into an English that carried the same tones; after she and a collaborator considered and rejected a Scottish inflection, they went with snatches of West Country English. Since 2016 the overseers of the International Booker Prize for fiction have split the prize-money equally between authors and their translators.

Ms Aslanyan says a mistranslation also played a role in America's atomic bombing of Japan in 1945. An official statement said that the Japanese would "*mokusatsu*" the Potsdam Declaration that called on Japan to surrender. The verb can mean things including "to offer no comment on" and "to kill with silence", but also "to treat with silent contempt". The Americans leaned towards the latter interpretation—a defiant insult—helping seal Hiroshima's fate.

Devotees of Esperanto, an artificial language, have long hoped that understanding would promote peace between peoples. Douglas Adams, author of "The Hitchhiker's Guide to the Galaxy", satirically took the opposite stance. In his fantasy, the Babel Fish—which, once stuck in your ear, instantly provides perfect translation of all languages—is responsible for more wars than anything else in history.

But the most eloquent comment on translation may come from José Ortega y Gasset, a Spanish philosopher whom Ms Aslanyan cites. Two words in two languages are never exact translations of each other, he said. More than that, though, no two people mean the same thing by the same word (with the possible exception of some scientific terms). Translation, therefore, is a "utopian" endeavour, an impossible act of perfect mind-reading. That does not mean it should not be attempted—but those who try should be "good utopians" who know they can never succeed.

Economic & financial indicators

Economic data, commodities and markets

Jun 19th 2021

Economic data

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	Gross domestic product % change on year ago: latest		quarter*	2021†	Consumer prices % change on year ago: latest		2021†	Unemployment rate %	
United States	0.4	Q1	6.4	6.0	5.0	May	2.7	5.8	May
China	18.3	Q1	2.4	8.5	1.3	May	1.6	5.0	May‡§
Japan	-1.6	Q1	-3.9	2.2	-0.5	Apr	-0.2	2.8	Apr
Britain	-6.1	Q1	-5.9	5.8	2.1	May	3.0	4.7	Mar††
Canada	0.3	Q1	5.6	5.4	3.6	May	2.2	8.2	May
Euro area	-1.3	Q1	-1.3	4.2	2.0	May	1.5	8.0	Apr
Austria	-5.5	Q1	-12.6	3.0	2.8	May	2.2	5.6	Apr
Belgium	-0.6	Q1	4.2	3.9	1.5	May	1.5	5.3	Apr
France	1.2	Q1	-0.4	5.4	1.4	May	1.3	7.3	Apr
Germany	-3.1	Q1	-7.0	3.5	2.5	May	2.5	4.4	Apr
Greece	-1.4	Q1	18.9	5.4	0.1	May	nil	15.8	Dec
Italy	-0.8	Q1	0.6	4.1	1.3	May	1.0	10.7	Apr
Netherlands	-2.8	Q1	-1.8	2.9	2.1	May	2.0	3.4	Apr
Spain	-4.3	Q1	-2.1	5.9	2.7	May	1.5	15.4	Apr
Czech Republic	-2.4	Q1	-1.0	3.7	2.9	May	2.2	3.4	Apr‡
Denmark	-1.3	Q1	-5.1	3.0	1.7	May	0.7	4.6	Apr
Norway	-1.4	Q1	-2.5	2.6	2.7	May	2.9	4.6	Feb‡‡
Poland	-1.3	Q1	4.5	4.1	4.7	May	3.2	6.3	Apr§
Russia	-0.7	Q1	na	3.2	6.0	May	5.5	5.2	Apr§
Sweden	-0.1	Q1	3.4	3.3	1.8	May	1.4	9.4	Apr§
Switzerland	-0.5	Q1	-2.0	3.0	0.6	May	0.3	3.0	May
Turkey	7.0	Q1	na	3.9	16.6	May	14.5	12.9	Apr§
Australia	1.1	Q1	7.3	4.4	1.1	Q1	2.1	5.1	May
Hong Kong	7.9	Q1	23.5	4.9	0.7	Apr	1.6	6.4	Apr‡‡
India	1.6	Q1	6.0	10.4	6.3	May	5.2	11.9	May
Indonesia	-0.7	Q1	na	3.9	1.7	May	2.5	6.3	Q1§
Malaysia	-0.5	Q1	na	4.4	4.7	Apr	2.4	4.6	Apr§
Pakistan	4.7	2021**	na	1.7	10.9	May	9.0	5.8	2018
Philippines	-4.2	Q1	1.2	5.1	4.5	May	4.2	8.7	Q2§
Singapore	1.3	Q1	13.1	4.5	2.1	Apr	1.8	2.9	Q1
South Korea	1.9	Q1	7.1	3.6	2.6	May	1.9	4.0	May§
Taiwan	8.9	Q1	12.8	6.0	2.5	May	1.6	3.7	Apr
Thailand	-2.6	Q1	0.7	2.9	2.4	May	2.2	1.5	Dec§
Argentina	-4.3	Q4	19.4	6.2	48.8	May	46.8	11.0	Q4§
Brazil	1.0	Q1	4.9	4.8	8.1	May	6.8	14.7	Mar§‡‡
Chile	0.3	Q1	13.4	6.2	3.6	May	3.6	10.2	Apr§‡‡
Colombia	2.0	Q1	11.9	6.0	3.3	May	3.0	15.1	Apr§
Mexico	-3.6	Q1	3.1	5.9	5.9	May	4.5	4.7	Apr
Peru	3.8	Q1	8.3	10.5	2.5	May	2.6	9.7	May§
Egypt	2.0	Q4	na	2.9	4.8	May	5.7	7.4	Q1§
Israel	-1.1	Q1	-6.2	3.8	1.5	May	1.3	5.4	Apr
Saudi Arabia	-4.1	2020	na	2.9	5.7	May	2.4	7.4	Q4
South Africa	-3.2	Q1	4.6	2.4	4.5	Apr	3.7	32.6	Q1§

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.

The Economist

Economic data

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	Current-account balance % of GDP, 2021†	Budget balance % of GDP, 2021†	Interest rates 10-yr gov't bonds latest,%		change on year ago, bp	Currency units per $ Jun 16th	% change on year ago
United States	-2.9	-13.5	1.6		82.0	-	
China	2.8	-4.7	3.0	§§	41.0	6.40	10.6
Japan	3.0	-8.8	nil		-8.0	110	-2.4
Britain	-4.5	-11.5	0.8		53.0	0.71	12.7
Canada	-2.0	-8.9	1.4		89.0	1.22	11.5
Euro area	3.1	-6.8	-0.3		18.0	0.83	7.2
Austria	3.2	-7.4	nil		15.0	0.83	7.2
Belgium	-0.8	-7.5	0.1		10.0	0.83	7.2
France	-1.8	-9.0	0.1		16.0	0.83	7.2
Germany	6.8	-3.6	-0.3		18.0	0.83	7.2
Greece	-5.8	-5.8	0.8		-40.0	0.83	7.2
Italy	3.0	-11.9	0.8		-58.0	0.83	7.2
Netherlands	10.8	-3.4	-0.3		6.0	0.83	7.2
Spain	1.3	-8.7	0.4		-20.0	0.83	7.2
Czech Republic	2.1	-5.5	1.7		81.0	21.0	12.7
Denmark	7.4	-1.3	0.1		37.0	6.14	8.1
Norway	2.5	-1.0	1.4		92.0	8.38	14.6
Poland	2.0	-6.9	1.8		36.0	3.72	6.5
Russia	3.7	-1.7	7.3		152	71.9	-2.9
Sweden	4.1	-2.6	0.4		37.0	8.37	12.3
Switzerland	7.4	-4.0	-0.2		21.0	0.90	5.6
Turkey	-2.2	-2.8	17.3		558	8.55	-19.9
Australia	1.6	-5.9	1.5		58.0	1.30	12.3
Hong Kong	3.6	-4.1	1.2		61.0	7.76	-0.1
India	-1.0	-7.0	6.0		20.0	73.3	3.9
Indonesia	-0.3	-6.4	6.4		-67.0	14,238	-0.9
Malaysia	4.7	-5.9	3.3		22.0	4.12	3.6
Pakistan	-1.7	-6.9	9.8	†††	121	157	4.9
Philippines	-1.1	-7.6	3.9		55.0	48.1	4.1
Singapore	17.5	-4.3	1.4		52.0	1.33	5.3
South Korea	4.6	-4.7	2.1		67.0	1,117	8.0
Taiwan	15.5	-0.6	0.5		-3.0	27.7	7.0
Thailand	4.5	-6.6	1.6		40.0	31.2	-0.3
Argentina	1.7	-6.0	na		na	95.3	-27.0
Brazil	-0.2	-7.3	9.0		221	5.02	3.4
Chile	-0.2	-7.2	4.3		169	728	7.3
Colombia	-3.4	-8.9	7.0		103	3,698	1.3
Mexico	1.4	-2.8	6.7		74.0	20.1	10.8
Peru	-0.3	-5.6	5.4		151	3.92	-11.2
Egypt	-3.3	-8.1	na		na	15.7	3.4
Israel	3.7	-7.9	1.2		45.0	3.24	6.8
Saudi Arabia	2.8	-2.6	na		na	3.75	nil
South Africa	1.5	-9.2	8.8		-59.0	13.8	25.4

Source: Haver Analytics. §§5-year yield. †††Dollar-denominated bonds.

The Economist

Markets

In local currency	Index Jun 16th	% change on: one week	% change on: Dec 31st 2020
United States S&P 500	4,223.7	0.1	12.4
United States NAScomp	14,039.7	0.9	8.9
China Shanghai Comp	3,518.3	-2.0	1.3
China Shenzhen Comp	2,332.4	-2.7	0.1
Japan Nikkei 225	29,291.0	1.5	6.7
Japan Topix	1,975.9	1.0	9.5
Britain FTSE 100	7,185.0	1.5	11.2
Canada S&P TSX	20,231.0	1.1	16.0
Euro area EURO STOXX 50	4,151.8	1.3	16.9
France CAC 40	6,652.7	1.4	19.8
Germany DAX*	15,710.6	0.8	14.5
Italy FTSE/MIB	25,767.5	0.1	15.9
Netherlands AEX	733.5	1.5	17.4
Spain IBEX 35	9,202.2	0.5	14.0
Poland WIG	66,180.2	0.1	16.1
Russia RTS, $ terms	1,679.0	0.3	21.0
Switzerland SMI	11,982.0	1.6	11.9
Turkey BIST	1,431.3	-1.2	-3.1
Australia All Ord.	7,633.4	1.5	11.4
Hong Kong Hang Seng	28,436.8	-1.1	4.4
India BSE	52,502.0	1.1	9.9
Indonesia IDX	6,078.6	0.5	1.7
Malaysia KLSE	1,578.3	-0.2	-3.0
Pakistan KSE	48,480.9	1.5	10.8
Singapore STI	3,139.6	-0.4	10.4
South Korea KOSPI	3,278.7	1.9	14.1
Taiwan TWI	17,307.9	2.0	17.5
Thailand SET	1,624.8	-0.1	12.1
Argentina MERV	67,575.6	-0.8	31.9
Brazil BVSP	129,259.5	-0.5	8.6
Mexico IPC	50,579.1	-0.3	14.8
Egypt EGX 30	9,880.5	-1.6	-8.9
Israel TA-125	1,773.7	1.1	13.1
Saudi Arabia Tadawul	10,856.0	0.6	24.9
South Africa JSE AS	67,310.6	-0.5	13.3
World, dev'd MSCI	3,008.5	0.4	11.8
Emerging markets MSCI	1,370.0	-0.2	6.1

US corporate bonds, spread over Treasuries

Basis points	latest	Dec 31st 2020
Investment grade	115	136
High-yield	346	429

Sources: Refinitiv Datastream; Standard & Poor's Global Fixed Income Research. *Total return index.

The Economist

Commodities

The Economist **commodity-price index**

2015=100	Jun 8th	Jun 15th*	% change on month	% change on year
Dollar Index				
All Items	188.2	188.7	-3.0	71.3
Food	138.6	132.8	-4.8	46.1
Industrials				
All	234.6	241.0	-2.0	88.0
Non-food agriculturals	164.0	156.4	-6.8	76.0
Metals	255.5	266.0	-1.1	90.2
Sterling Index				
All items	203.0	204.5	-2.1	52.8
Euro Index				
All items	171.3	172.6	-2.2	58.7
Gold				
$ per oz	1,893.2	1,860.7	-0.4	7.7
Brent				
$ per barrel	72.4	74.0	7.5	80.7

Sources: Bloomberg; CME Group; Cotlook; Refinitiv Datastream; Fastmarkets; FT; ICCO; ICO; ISO; Live Rice Index; LME; NZ Wool Services; Thompson Lloyd & Ewart; Urner Barry; WSJ. *Provisional.

The Economist

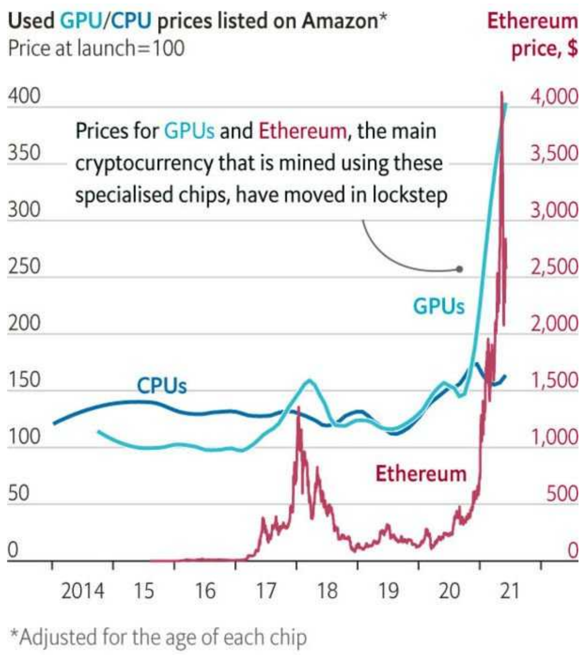
Graphic detail

ETH and chips

Crypto-miners are probably to blame for the graphics-chip shortage

Secondhand graphics-card prices move nearly in lockstep with those of Ethereum

Jun 19th 2021



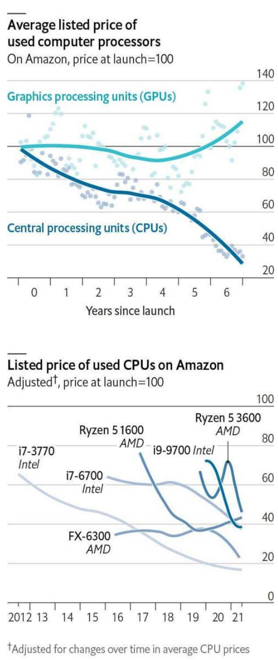
THE PAST year has been rough for gamers. Just as covid-19 brought in-person entertainment to a halt, the cost of graphics processing units (GPUs) needed to run computer games soared. Graphics cards like Nvidia's RTX 3080, with a suggested price of $699, have fetched up to $2,400. When bricks-and-mortar stores get a few in stock, buyers queue up overnight.

Prices for all types of chips have risen of late, for myriad reasons. Silicon wafers are scarce. Manufacturers have suffered disruptions. Scalpers use bots to buy up inventory. Chinese-made chips face American tariffs. And demand for personal computers is the highest since 2010.

Nonetheless, data from Keepa, a website that tracks Amazon listings, show that asking prices for GPUs have risen faster than have those for central processing units (CPUs). The data also suggest that miners of Ethereum, the second-largest cryptocurrency, are to blame for gamers' woes.

GPUs and CPUs both perform calculations, but they are used for different purposes. GPUs are specialised chips that excel at matrix algebra, which is required for 3D graphics and machine-learning tasks like translating languages. They are also the best tool for mining Ethereum (though not bitcoin). In contrast, CPUs are more versatile, and handle most everyday operations.

In general, chips lose value over time as new, more powerful ones are developed. Technological gains have slowed since the 1990s, but CPUs still obey this trend. For example, a nine-year-old CPU like Intel's Core i7-3770 sells for a third of its release price.



However, prices for GPUs have risen so much that even geriatric graphics cards, such as AMD's RX580, have gained value. It was released in 2017 at a suggested price of $229, and is now listed at more than $700.

In theory, such appreciation could reflect the growing popularity of gaming and machine learning. However, secondhand market data suggest a different cause.

Since 2015 asking prices for six GPUs tracked by Keepa have moved in lockstep with Ethereum's value. In late 2017 the currency's first big rally coincided with a surge in listed GPU prices. Once the crypto bubble burst, GPU costs fell back to earth.

Another boom began last year. As Ethereum's price rose from $107 in March 2020 to $4,400 last month, the value of mining hardware once again followed suit. In six months, the six GPUs' listed prices climbed by 150%. Those of CPUs barely budged.

The GPU shortage has hurt data scientists and computer-aided-design users as well as gamers. Some relief may be on the way. Ethereum's price is now 40% below its record high. GPU prices have yet to fall, but if history is any guide, they probably will soon. Moreover, Nvidia has tried to cripple its GPUs' mining power, while promising to sell new cards targeted at miners. It is also cutting back on its output of older products to focus on newer ones.

However, without greater production, customising chips will not end the shortage. Nvidia's RTX 3080 Ti, one of its first cards with reduced mining power, is listed on Amazon at double its suggested price.

Meanwhile, Ethereum's overseers said in May that they will rejig its blockchain to require less computation, and thus less electricity. If implemented, this might lower GPU prices. However, as long as other cryptocurrencies, such as Monero, rely on power-hungry protocols that reward good GPUs, miners will pivot to different coins—and gamers will once again cry foul.■

Sources: Amazon; Keepa; Coindesk; *The Economist*

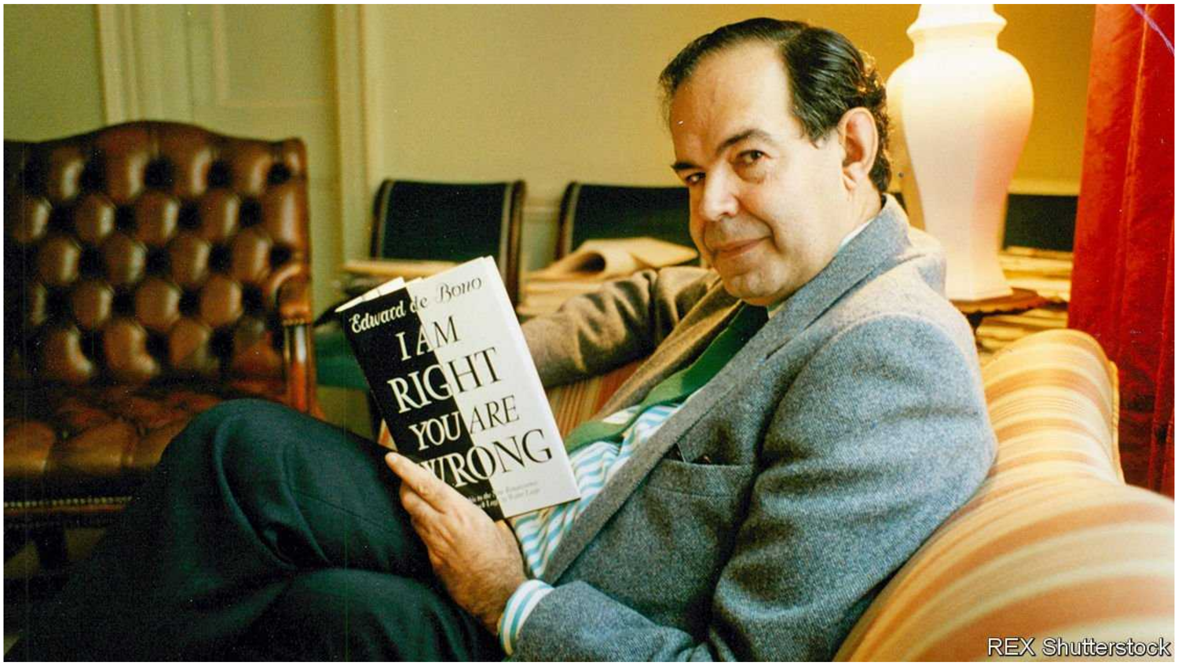
Obituary

- **Edward de Bono: Sideways on**

Edward de Bono died on June 9th

The father of lateral thinking and "Six Thinking Hats" was 88

Jun 19th 2021



THE LETTER was unexpected, but not undeserved. It contained an invitation to a Symposium in Athens. Over the years Edward de Bono had been to hundreds of these affairs. Some were seminars, some consultations or lecturing, all based on his much-acclaimed books. He had produced 70 of them, including "How To Be More Interesting", "How To Have a Beautiful Mind", "Edward de Bono's Textbook of Wisdom" and "Think! Before It's Too Late". That last was the message he carried loud and clear as he jetted from city to city and boardroom to boardroom. He was teaching the world a new way of thought, the most important for 2,300 years.

A gathering in Greece was alluring. He was a man of the Mediterranean himself, born in Malta to a family boasting seven generations of doctors. On his mother's side, he was possibly descended from Napoleon. It was at school that he was first called "Genius" and allowed to skip years. From there he sailed into both Oxford and Cambridge, to do two doctorates and several years of research into physiology and psychology. His study of selforganising systems such as the kidneys and the glands convinced him that the brain, too, could be organised differently. It could be taught to operate creatively, surprisingly and “outside the box”. His preferred term was “lateral thinking”. With that, he had made the most important discovery since the time of Socrates, Plato and Aristotle, the infamous Gang of Three, as he called them. It was they who had sent the invitation. They were eager, like all the rest, to consult him.

And he had much to say to those gentlemen. Centuries since, they had imposed on Western brains the tyranny of vertical thinking. That method proceeded by pure logic. At every step, one had to be right. It was characterised by conflict, argument, arrogance and rejection of unusual ideas. In schools, it wasted two-thirds of society’s natural talent. The concepts it laid down hardened into inadequate or over-complex ways of doing things. There was nothing inherently wrong with logical thinking, as there was nothing inherently wrong with the forward gears on a car. But reverse gear was needed too, to rearrange the pattern or get out of a blind alley. An example: waste from a factory is polluting water for people downstream. You could install expensive filtration, or rehouse the people. Or you could require the factory to take its own water from downstream. Simplicity itself, and perfect sense.

As soon as he proposed his method, in “The Mechanism of Mind” (1969), it caught on like wildfire. Lateral thinking was taken up by Siemens, DuPont, Goldman Sachs, BT, BA and Federal Express, among many. (At Siemens, product-development time fell by half.) It was adopted in schools from Venezuela to Australia to China. In Britain he was brought in in 1998 to shake up the hidebound and exclusive civil service. During the Soviet Union’s *perestroika*, his books were top reading in Moscow. A seminar on his system for the Australian cricket team led to the total thrashing of England in the Ashes series. His detractors, silly little idiots, held that nothing in his method was new and most of it obvious. The brilliant results spoke for themselves. So did the flow of seekers to his online Effective Thinking course, his Practical Thinking Training courses (with, in 1995, more than 400 instructors in 27 countries) and his World Academy of New Thinking in Malta. He made a very decent living from it all.

Nonetheless, it might be hard to impress the Gang of Three with them. Pupils at the original Symposium had been overwhelmed by the vertical thinking of Socrates. “Absolutely”, “Of course”, and “Naturally not”, they had answered, not daring to risk the put-down of a “No”. The de Bono method, by contrast, proposed “Po”. This was a language laxative, a provocation thrown into a discussion to loosen things up. It might even be nonsense on its face, such as “Po: Why are wheels round?” Or it might put two things side by side, a caterpillar and a horse, or food and a shoe, to see what thoughts arose from this rearranging. All would be assumed to have value. There was no “No”. Another example might occur in a discussion about picking apples. Rather than arduously reaching up to pick, why not attract the apples to the ground? Or remove the trees from the apples? Well worth exploring.

All things considered, though, his best bet for this new Symposium was a talk on his Six Thinking Hats. He could take a set along, six toppers in good strong colours. The thinking behind the hats was to make meetings quicker and more productive by taking ego out of them. Instead, those attending wore hats to grasp other points of view. A black hat stood for caution and realism. White meant facts. Green was for creativity, red for feelings, blue for process. Yellow signalled optimism. Trivial, said the idiots again. But major corporations the world over found it shortened meeting times by half. Thousands of schools used it to make debate civilised. In the platinum mines of South Africa, illiterate workers from 14 different tribes learned from it to get on together. In Pakistan, Pervez Musharraf was moved by it to talk peace with India. No doubt it had uses, too, in the Middle East, though his neatest lateral solution in that case was to ship out Marmite yeast extract to both Arabs and Israelis, to increase the zinc in their diets and thus make them less irritable with each other.

The thought of the coming Symposium was now much jollier. Socrates, Plato and Aristotle would soon be lounging in their hats, eager to hear him. The wine, too, would be flowing, and the flute-girls playing. He might even intrigue them with some of his more speculative lateral thoughts. For example: why not reduce awkward conversations to simple numerical code? So that “This relationship is long dead, we both know it, but we hang on for fear of the unknown” would become “14/4”? Or why not save wine from spoiling by decanting each large jar, on purchase, into smaller screw-top containers? Or (ignoring the gang's full beards) had they ever thought, while shaving, of keeping the razor still and moving their heads instead? In fact, it worked rather better. Before the evening was out, they too would be toasting his genius. ■

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