The Economist

Britain's new political geography

How to reduce homelessness

Boeing's bet backfires

Our country of the year

DECEMBER 21ST 2019–JANUARY 3RD 2020

Holiday double issue

Gallivanting planets * Displaced Cockneys * The ironies of Siberia
Enigmatic eels * Hot-metal type * Liberal Ireland * Essay: Beware the Borg
The $17bn chip factory * Death-row sleuthing * China's pianists
Africa's melting-pot * Surrealism's sorceress * Our quiz
and much more...

Contents

The world this year

Print | The world this week Dec 18th 2019

An attempt to amend **Hong Kong's** extradition law triggered the worst crisis in the city since its handover to **China** in 1997. Amid concerns that the changes could result in dissident Hong Kongers facing trial in mainland China, millions took to the streets in what morphed into an ongoing pro-democracy movement, the biggest challenge to the authority of China's leaders since the handover. The government in Beijing, which in October staged huge celebrations to mark 70 years of communist rule, has warned the protesters not to push it.

I wear the chain I forged in life

Protests against autocratic rule also broke out in other countries, leading to the ouster of Omar al-Bashir in **Sudan** and the resignation of Evo Morales in **Bolivia** after a contentious election there. Mass demonstrations caused **Ecuador's** government to reinstate fuel subsidies and **Chile's** president to promise a new constitution. **Algeria's** octogenarian leader, Abdelaziz Bouteflika, called it a day in the face of huge protests. **Iraq's** prime minister, Adel Abdul-Mahdi, did the same. But there was no sign of **Iran's** mullahs loosening their grip in response to people power. A crackdown on protests there left as many as 450 people dead.

The **trade war** between America and China rumbled on, deploying arsenals of tariffs. In December both sides pulled back from the brink by reaching a "phase one" agreement that stopped America from imposing more penalties. The IMF reckoned the trade dispute could cost the global economy $700bn. America restricted its companies from selling technology to **Huawei**, a Chinese maker of telecoms equipment. See article .

Warnings about a slowing world economy were a consideration for the Federal Reserve when it decided to cut **interest rates** for the first time since the financial crisis. Two more reductions followed. Mr Trump quarrelled openly with the Fed for not cutting sooner, calling it a "stubborn child".

The **European Central Bank** launched a new round of stimulus, much to the chagrin of the German finance minister. It was one of Mario Draghi's last acts as ECB president before handing over to Christine Lagarde, who is launching only the second strategic review of monetary policy at the ECB. Jean-Claude Juncker, the bogeyman of British Brexiteers, retired as president of the **European Commission** and was replaced by Ursula von der Leyen, who was the longest-serving member of Angela Merkel's cabinet in Germany.

A horrified world watched on TV as a fire destroyed the roof and some of the interior of **Notre Dame cathedral** in Paris. A vigorous debate ensued about the extensive refurbishment works. The general overseeing the rebuilding told the chief architect to "shut his mouth" for resisting a modernist plan to replace the spire.

It's all humbug I tell you!

Two years in the making, the report into Russian meddling in American politics was at last completed by **Robert Mueller**. Donald Trump's critics were disappointed by a lack of evidence tying him to the Russian provocateurs. After all the fuss over the Mueller report, it was Mr Trump's request to Volodymyr Zelensky, the **Ukrainian** president, to "do us a favour" and dig up dirt on the Bidens that led to **impeachment** proceedings. Mr Zelensky won office by trouncing Petro Poroshenko in an election.

Some of the runners in the **Democratic presidential race** fell before reaching the first hurdle. Kamala Harris, one of the early favourites, pulled out after spending all her money.

In **Venezuela** Juan Guaidó, the leader of the opposition-controlled national assembly, proclaimed himself interim president, declaring Nicolás Maduro's regime to be illegitimate. Mr Guaidó was recognised by 60 Western and Latin American countries, but Mr Maduro clings on to power. See article .

Dead as a doornail

Iran moved further away from the deal limiting its **nuclear activities**, saying it would no longer abide by the agreement unless the EU provided it with economic aid. Attacks on commercial shipping and Saudi oil installations were blamed on Iran. America sent more troops and weapons to the region to deter Tehran.

Long-awaited IPOs from a host of tech unicorns turned out to be damp squibs, mostly. **Uber's** was the biggest. Its share price went into reverse and is now some 30% lower than on its first day of trading. A spectacular fiasco at **WeWork** saw it pulling its IPO and being rescued by SoftBank. **Saudi Aramco's** IPO took place in Riyadh. It was the world's largest ever, raising $25.6bn.

Among the year's big takeovers, **Occidental**, supported by Warren Buffett, acquired **Anadarko** for $55bn. **AbbVie** issued one of the biggest-ever bond offers to finance its $83bn purchase of **Allergan**. And the **London Stock Exchange** struck a $27bn deal to buy **Refinitiv**. **Fiat Chrysler** and **Peugeot** agreed to merge, after a proposed tie up between Fiat and Renault hit the skids.

Boiled with her own pudding

In January Theresa May's hapless government lost a crucial vote on her **Brexit** withdrawal agreement in the House of Commons by 230 votes, the largest government defeat on record. It went downhill from there. Three requests were made to extend the Brexit deadline, and Britain still remained in the EU.

Mrs May crawled on as prime minister until July. Her replacement, **Boris Johnson**, sparked a constitutional crisis when he **prorogued Parliament** in order to limit opposition manoeuvring on Brexit, but the Supreme Court said this was unlawful. Fed up Britons trekked to the polls for yet another **election**, and gave the Conservatives their biggest majority in 32 years. Mr Johnson took this as a mandate to "get Brexit done".

Argentina's presidential election brought the Peronists back to power, when Alberto Fernández defeated Mauricio Macri. Cristina Fernández de Kirchner became vice-president, spooking investors who remember her reckless spending when she was president.

In other elections Justin Trudeau's Liberals were returned to power in **Canada**, but with a minority government following a political scandal. The first election in **Thailand** since the coup in 2014 saw pro-military parties scrape together a majority, with help from the courts. **Spain** held two elections; the Socialists remain the biggest party. Narendra Modi won a second term as prime minister in **India**. Joko Widodo secured five more years as **Indonesia's** president. The African National Congress claimed victory in **South Africa**, though its 58% share of the vote was its smallest ever. The Liberal Party defied the pollsters to win in **Australia**. In **Denmark** the centre-left came to power, as did the centre-right in **Greece**.

Israel held two inconclusive elections and is heading for a third poll in March 2020. Binyamin Netanyahu was boosted by America recognising Israeli sovereignty over the Golan Heights and describing the settlements in the West Bank as lawful. In November the prime minister was indicted for bribery and fraud.

Italy got a new government formed by the Democratic Party and Five Star Movement. Matteo Salvini, the hardline leader of the Northern League, was shut out of the coalition.

The collapse of a dam in the **Brazilian** state of Minas Gerais unleashed a wave of mud that killed 270 people. The dam's metal waste could affect local ecosystems for decades.

Media streaming took a leap forward with the release of new services from Disney, Apple and others to try to eat into **Netflix's** market. Netflix got its first Oscar nomination for best picture with "Roma", though "Green Book" won the award.

Mankind is my business

The Business Roundtable, representing America's top bosses, redefined the **purpose of a company** away from shareholder primacy and towards the interests of customers, workers and communities. Mark Zuckerberg proclaimed "a privacy-focused vision for social networking". But **Facebook's** boss found himself at odds with global regulators about his ambitions for **Libra**, a cryptocurrency that he wants to launch in 2020.

In the worst crisis in its history, Boeing eventually suspended production of its **737 MAX** jetliner, after it was grounded worldwide following a second crash within six months. Airlines are still rejigging their flight timetables. See article .

After a terrorist attack killed 46 paramilitary police in the Indian-controlled portion of Kashmir, Indian fighter jets struck targets inside Pakistan for the first time since 1971, claiming to hit a jihadist camp. India's central government later revoked the special status of its part of **Kashmir** and split it into two territories.

A massacre in March of 51 people at two mosques in **Christchurch**, New Zealand, was linked to a rise in global white nationalism. Five months later a gunman who murdered 22 people at a Walmart in **El Paso**, Texas, was influenced in part by the Christchurch shootings.

In **Sri Lanka** a series of bombings on Easter Sunday targeted Christians and tourists, killing 253 people. A claim that the jihadists were seeking revenge for the murder of Muslims in Christchurch was doubted by intelligence services. The attacks in Colombo bolstered the strongman campaign of Gotabaya Rajapaksa in the presidential election. After his victory he appointed as prime minister his brother Mahinda, a former president who had overseen the brutal crushing of a Tamil-separatist insurgency.

Turkey invaded northern **Syria** to fight **Kurdish** forces allied with America, after Mr Trump withdrew his troops from the area. Although widely condemned, Mr Trump defended his decision on the basis that the Kurds "didn't help us with Normandy". The American president also unilaterally ended peace talks with the **Taliban**. Afghan negotiators are struggling to get them back to the table.

Mr Trump was able to brag about one success: **Abu Bakr al-Baghdadi**, the murderous rapist who led Islamic State, blew himself up when he was cornered by American forces.

An undigested bit of beef

Although **vegetarian food** seemed to be offered everywhere in 2019, Greggs, a purveyor of cheap bakery treats in Britain, was derided for selling a vegan sausage roll. But it was its critics who were left with egg on their face: its share price is up by 75% since January.

Could **Greenland** become a flashpoint in 2020? Donald Trump's offer to buy the Danish territory was mocked in Copenhagen, causing him to cancel a state visit. Now America wants to open a consulate in Greenland for the first time since the second world war. Its staff may get a chilly reception.

KAL’s cartoon

Print | The world this week Dec 18th 2019

Technology and society

Pessimism v progress

Contemporary worries about the impact of technology are part of a historical pattern

Print | Leaders Dec 18th 2019

FASTER, CHEAPER, better—technology is one field many people rely upon to offer a vision of a brighter future. But as the 2020s dawn, optimism is in short supply. The new technologies that dominated the past decade seem to be making things worse. Social media were supposed to bring people together. In the Arab spring of 2011 they were hailed as a liberating force. Today they are better known for invading privacy, spreading propaganda and undermining democracy. E-commerce, ride-hailing and the gig economy may be convenient, but they are charged with underpaying workers, exacerbating inequality and clogging the streets with vehicles. Parents worry that smartphones have turned their children into screen-addicted zombies.

The technologies expected to dominate the new decade also seem to cast a dark shadow. Artificial intelligence (AI) may well entrench bias and prejudice, threaten your job and shore up authoritarian rulers (see article). 5G is at the heart of the Sino-American trade war. Autonomous cars still do not work, but manage to kill people all the same. Polls show that internet firms are now less trusted than the banking industry. At the very moment banks are striving to rebrand themselves as tech firms, internet giants have become the new banks, morphing from talent magnets to pariahs. Even their employees are in revolt.

The *New York Times* sums up the encroaching gloom. "A mood of pessimism", it writes, has displaced "the idea of inevitable progress born in the scientific and industrial revolutions." Except those words are from an article published in 1979. Back then the paper fretted that the anxiety was "fed by growing doubts about society's ability to rein in the seemingly runaway forces of technology".

Today's gloomy mood is centred on smartphones and social media, which took off a decade ago. Yet concerns that humanity has taken a technological wrong turn, or that particular technologies might be doing more harm than good, have arisen before. In the 1970s the despondency was prompted by concerns about overpopulation, environmental damage and the prospect of nuclear immolation. The 1920s witnessed a backlash against cars, which had earlier been seen as a miraculous answer to the affliction of horse-drawn vehicles—which filled the streets with noise and dung, and caused congestion and accidents. And the blight of industrialisation was decried in the 19th century by Luddites, Romantics and socialists, who worried (with good reason) about the displacement of skilled artisans, the despoiling of the countryside and the suffering of factory hands toiling in smoke-belching mills.

Stand back, and in each of these historical cases disappointment arose from a mix of unrealised hopes and unforeseen consequences. Technology unleashes the forces of creative destruction, so it is only natural that it leads to anxiety; for any given technology its drawbacks sometimes seem to outweigh its benefits. When this happens with several technologies at once, as today, the result is a wider sense of techno-pessimism.

However, that pessimism can be overdone. Too often people focus on the drawbacks of a new technology while taking its benefits for granted. Worries about screen time should be weighed against the much more substantial benefits of ubiquitous communication and the instant access to information and entertainment that smartphones make possible. A further danger is that Luddite efforts to avoid the short-term costs associated with a new technology will end up denying access to its long-term benefits—something Carl Benedikt Frey, an Oxford academic, calls a "technology trap". Fears that robots will steal people's jobs may prompt politicians to tax them, for example, to discourage their use. Yet in the long run countries that wish to maintain their standard of living as their workforce ages and shrinks will need more robots, not fewer.

That points to another lesson, which is that the remedy to technology-related problems very often involves more technology. Airbags and other improvements in safety features, for example, mean that in America deaths in car accidents per billion miles travelled have fallen from around 240 in the 1920s to around 12 today. AI is being applied as part of the effort to stem the flow of extremist material on social media. The ultimate example is climate change. It is hard to imagine any solution that does not depend in part on innovations in clean energy, carbon capture and energy storage.

The most important lesson is about technology itself. Any powerful technology can be used for good or ill. The internet spreads understanding, but it is also where videos of people being beheaded go viral. Biotechnology can raise crop yields and cure diseases—but it could equally lead to deadly weapons.

Technology itself has no agency: it is the choices people make about it that shape the world. Thus the techlash is a necessary step in the adoption of important new technologies. At its best, it helps frame how society comes to terms with innovations and imposes rules and policies that limit their destructive potential (seat belts, catalytic converters and traffic regulations), accommodate change (universal schooling as a response to industrialisation) or strike a trade-off (between the convenience of

ride-hailing and the protection of gig-workers). Healthy scepticism means that these questions are settled by a broad debate, not by a coterie of technologists.

Fire up the moral engine

Perhaps the real source of anxiety is not technology itself, but growing doubts about the ability of societies to hold this debate, and come up with good answers. In that sense, techno-pessimism is a symptom of political pessimism. Yet there is something perversely reassuring about this: a gloomy debate is much better than no debate at all. And history still argues, on the whole, for optimism. The technological transformation since the Industrial Revolution has helped curb ancient evils, from child mortality to hunger and ignorance. Yes, the planet is warming and antibiotic resistance is spreading. But the solution to such problems calls for the deployment of more technology, not less. So as the decade turns, put aside the gloom for a moment. To be alive in the tech-obsessed 2020s is to be among the luckiest people who have ever lived. ■

Johnson's northern strategy

To help England's north, link it up

Public spending on transport in the north is barely half what it is in the south-east. That must change

Print | Leaders Dec 18th 2019

HAVING WON scores of former Labour strongholds across the north of England in 2019's general election, Boris Johnson is determined to offer his new voters something in return. "We will repay your trust," he promised on a triumphant visit to his new turf on December 14th. Northerners have heard this kind of talk before. David Cameron's government promised a "northern powerhouse" economy—only for the idea to fall by the wayside under Theresa May. After the Brexit referendum of 2016 there was much talk of the need to look after "left-behind" places that had voted Leave—instead the government spent three years focusing on its battles in Westminster. Yet with his newly remade Conservative Party, Mr Johnson relies on the north like no recent Tory leader (see article). If he is to keep his promise to improve life in the region, how should he go about it?

The north of England has been in economic decline relative to the south since the late 19th century. That is not something any government can reverse in five years. But Mr Johnson means to make a start. His fiscal plans allow him to spend up to £80bn ($104bn), 3.8% of GDP, on capital projects in northern constituencies over the next five years.

His first task is to jettison the idea, common in London, that the north is an economic monolith where everything is grim. Prosperous cities like Manchester, Liverpool and Newcastle are almost unrecognisable from two decades ago. In 2017 (the most recent year for which data are available) Newcastle and Liverpool enjoyed faster growth in gross value added, a measure of output, than the capital. In 2018, according to IBM, a computing giant, Manchester and Liverpool were among the top ten cities in the world for inward foreign direct investment.

The left-behind parts of the north are not its cities but its towns. Many have still not recovered from deindustrialisation under the Conservative governments of the 1980s. Their labour markets lag behind the rest of the country, with poor employment rates and lower wages. The clearest sign of this economic failure is that young residents are leaving. Towns like Redcar and Scunthorpe have seen the number of resident 18- to 24-year-olds fall by more than 20% since the 1980s, while the number of over-65s has risen by 30% or more. Ageing populations have cut local spending power and put pressure on stretched local-government budgets as the demand for social care rises.

Northern towns are stalling even as their neighbouring cities are doing well partly because dire transport links make the likes of Manchester or Newcastle seem a world away from Wigan or Hartlepool. The transport infrastructure of the north has suffered from decades of underinvestment. In 2018-19 government transport spending per person was £903 in London, against less than £500 in the north. In the past five years the government has spent more on transport infrastructure for 9m Londoners than England's 15m northerners.

The consequences are clear. In the south, Brighton has weathered the decline of its tourism industry by becoming an attractive place to live within easy reach of the capital. Blackpool, a once-lively seaside resort in the north-west, is a byword for decline. Although it is closer to Manchester than Brighton is to London, the trains take 20 minutes longer and are a quarter as frequent. Inter-city connections in the north are a mess. By train, it is quicker to travel 250 miles (400km) to Newcastle from London than it is to get to Newcastle from Liverpool, just 120 miles away. Buses are slow and pricey. And pity anyone without a ministerial helicopter if they need to get to Scotland. North of Newcastle, the A1 (a "strategic national road", no less) in some places narrows to a single carriageway that is often blocked by tractors.

Rail is just the start. According to firms surveyed by EY, a consultancy, ropy infrastructure, including power, internet connectivity and transport, is the largest reason for not investing in English towns. Better vocational training would mean that once residents of Blackpool arrive in Manchester, they would have more chance of getting a job. A comprehensive deal with the EU would be better for the north than the skimpy effort that Mr Johnson seems intent on dashing off by the end of 2020.

Giving more powers to English city mayors would help them draw up integrated regional-transport plans. Although improving railways would be a long-term project, buses could rapidly be made better—perhaps in time for the election in 2024, when northerners will get to decide whether to cement their relationship with the Conservatives. The north does not need or want to rely on London to get back on track. If the government would only stump up the cash, the north will help itself. ■

After the crashes

Boeing's misplaced strategy on the 737 MAX

Time for Dennis Muilenburg to go, and for the planemaker to adopt a new approach

Print | Leaders Dec 18th 2019

Editor's Note (December 23rd): *After publication of this article, Boeing sacked its chief executive, Dennis Muilenberg, on December 23rd. He will be replaced by David Calhoun, the company's chairman, who will take up the post in January.*

IN MARCH A Boeing 737 MAX aircraft crashed in Ethiopia, just six months after a similar accident in Indonesia. Nearly 350 people were killed in the two disasters, which revealed a flaw in the MAX's flight-control system and put into question a vast industrial enterprise. Airlines are relying on the delivery of thousands of MAX planes over the next decade or so. Boeing was expected to make up a large share of its future profits from the MAX. The firm is one of America's biggest exporters and at least a million people work for it or for its suppliers.

Since March Boeing's response has been an ugly mixture of remorse, evasion and swagger, as it has gambled that it can get the MAX, and its business, rapidly back in the air. On December 16th that strategy ran out of runway when the firm announced it would suspend production of the stricken plane.

Boeing's defiance began with its decision to stick with its chief executive, Dennis Muilenburg (although he was replaced as chairman in October). There has been no public, comprehensive, independent investigation by the firm into what went wrong. In its place there have been leaks galore and reports about software problems and corners being cut.

Even though the MAX is not allowed to fly, Boeing's factories have continued to churn out new planes that sit on the tarmac while customers are unwilling or unable to take delivery of them or make full payment. The firm signalled to Wall Street that business would return to normal soon enough and it continues to pay a dividend, despite burning up $3bn of cash last quarter. Boeing had indicated to investors, suppliers and customers that the MAX would be flying by the end of 2019, even though this is a decision it should not be able to determine.

Boeing no doubt wants to protect its workers and defend itself from a barrage of lawsuits. But the industry's lack of competition lets it get away with poor behaviour. In the short run the other half of the passenger-jet duopoly, Airbus, cannot increase output so as to offer customers an alternative source of aircraft. There is a queasy sense that Boeing has played a game of chicken with regulators. In stoking expectations that the MAX will be airborne again soon and keeping production humming, it has presented regulators with an unenviable choice: either to let the MAX back in the air whether or not it is ready, or to damage the industry and the American economy.

Boeing's strategy has backfired. America's Federal Aviation Administration (FAA), the tarnished regulator which at first declined to ground the MAX, has found its backbone under new management and said that it is not yet ready to rule that the flight-control problem has been fixed. In the past foreign regulators have followed the FAA's lead, but a majority of Boeing's sales are now made outside America and authorities abroad no longer want to play wingman to the FAA. Both China and the EU have indicated that they are not yet happy. The number of idle, new MAXes piling up has grown to 400. Boeing's strategy has strained its balance-sheet, with its inventories reaching $73bn and gross debts $25bn.

It is time for a different approach. Mr Muilenburg should be removed and the firm's board of directors beefed up. If Boeing does not do this voluntarily, its owners and regulators should insist. Production of the MAX should resume only when the firm has received approval from regulators around the world. Boeing needs to shore up its balance-sheet, so that it has the resources to invest and to help tide over crucial suppliers—which means eliminating its dividend. And lastly it needs to come up with a medium-term plan for life after the MAX, in the form of a next-generation aircraft, perhaps one that relies on hybrid-electric propulsion. Over the past decade Boeing has skimped on research, development and capital spending, investing only 7% of its sales on average, compared with around 10% at Airbus. Once the 737 MAX was the future. It is time for a new pilot and a new course. ■

Mean streets

How to cut homelessness in the world's priciest cities

Above all, governments must tackle outrageous housing costs

Print | Leaders Dec 18th 2019

"I HAVE SLEPT on the Embankment," wrote George Orwell in 1933, adding that, despite the noise and the wet and the cold, it was "much better than not sleeping at all". Under the nearby Charing Cross bridge, Orwell reported that "50 men were waiting, mirrored in the shivering puddles." Nine decades on and Charing Cross and the Embankment are once again full of rough sleepers, even during the coldest days of December. Across London their numbers have more than tripled since 2010.

It is a pattern found in much of the rich world. Almost every European country is seeing a rise in the number of homeless people, including those who live in temporary accommodation, as well as the smaller number who live on the streets. Homelessness across America is in decline, but it is soaring in its most prosperous cities. Roughly 5,000 people live on the streets of San Francisco, a 19% rise in just two years.

It does not have to be this way. In post-war America there was little rough sleeping, and homelessness was falling so fast that sociologists predicted its imminent disappearance. Even today, some rich, successful cities, including Tokyo and Munich, have few people living on the streets.

These places offer lessons on how to reduce homelessness. One is that tough love can sometimes work. Conservatives argue that softer policing tactics in the 1970s, including lax attitudes to public drunkenness, were in part responsible for the rise in homelessness. The world could learn something from Greece, where strong family networks ensure that those down on their luck find someone to take them in. Many experts argue that it is counterproductive to give money to someone begging on the street. Better, they say, to donate to a charity.

Yet tougher tactics will ultimately do little if housing costs remain high. This is the underlying reason for rising homelessness—which is perhaps one reason why America's Supreme Court on December 16th affirmed that lawmakers may not criminalise rough sleeping. Few Americans lived on the streets in the early post-war period because housing was cheaper. Back then only one in four tenants spent more than 30% of their income on rent, compared with one in two today. The best evidence suggests that a 10% rise in housing costs in a pricey city prompts an 8% jump in homelessness.

The state can do something to help. Cuts to rent subsidies for Britain's poor are probably the biggest reason why Charing Cross has so many people sleeping on the streets once again (see article). Making such subsidies more generous might actually save governments money in the medium term—after all, demands on health-care services and the police would decline. People would also be more likely to find a job.

Another option is for the state to build more housing itself. In Singapore, another place where there is practically no homelessness, 80% of residents live in government-built flats which they buy at knock-down prices. While many countries have been privatising their stock of public housing, Finland has been building more of it, giving the government the wherewithal to put homeless people in their own apartments rather than warehousing them in shelters (see article). It has embraced an approach originally pioneered in America, which does not demand that homeless folk quit drinking or drugs before giving them accommodation. Instead it gives them a home first, and then offers intensive support to help them cope with their problems. In Finland the homeless numbers are moving in the right direction.

The most effective reform, however, would be to make building more homes easier. In many countries NIMBYist planning rules vastly inflate the market price of shelter. Such rules should be slashed. The problem of rough sleeping in Germany and Switzerland, two countries with minimal real-house-price growth in recent decades, is less acute. Japan has used its fair share of strong-arm tactics to deal with the homeless, but then it introduced a big urban reform in the early 2000s.

Up and inside in Tokyo and Singapore

Japan loosened planning rules, prompting residential construction to jump. Since then, housing costs in Tokyo have fallen in real terms and the number of rough sleepers has fallen by 80% in 20 years. Until cities elsewhere let the buildings go up, more people will find themselves down and out. ■

The Economist's country of the year

Which nation improved the most in 2019?

The winner is a place that abolished slavery

Print | Leaders Dec 21st 2019

OUR ANNUAL "country of the year" award celebrates improvement. Each December, therefore, we give a hostage to fortune. The places that climb furthest are often those that started near the bottom: poor, ill-governed and unstable. Freshly won democracy and peace do not always last, as Aung San Suu Kyi, the leader of Myanmar (*The Economist*'s country of the year in 2015) ended up reminding the world when she appeared recently at the International Court of Justice in The Hague and glossed over the ethnic cleansing of the Rohingyas, a Muslim minority, by her country's soldiers.

In 2019 the most striking political trend was a negative one: belligerent nationalism. India has been stripping Muslims of citizenship, China has been locking up Muslims in camps, America has taken a wrecking ball to global institutions. So strong was the global tide that it was a relief to see some countries paddling the other way. **New Zealand** deserves an honourable mention for its response to a massacre in mosques by a white nationalist. Jacinda Ardern, the prime minister, put on a headscarf and declared that an attack on Muslims was an attack on all New Zealanders. Her government banned semi-automatic weapons and bought thousands of them from the public.

Even more impressive was **North Macedonia**, which changed its name to promote peace with its neighbour. Greece had objected that its former moniker, Macedonia, implied a claim to the Greek region of the same name. Greek intransigence prevented the Macedonians from joining NATO or starting negotiations to join the European Union. So lawmakers in Skopje swallowed their pride and voted to rename their country; the change took effect in February. Relations with Greece are now much warmer. A source of discord has been removed from a tetchy region. North Macedonia is on track to join NATO. Alas, Emmanuel Macron, the president of France (country of the year 2017) is blocking its candidacy for the EU, fearing that welcoming another Balkan state into the club would irk French voters.

Two countries became notably less despotic in 2019. In **Sudan** mass protests led to the ejection of Omar al-Bashir, one of the world's vilest tyrants. His Islamist regime had murdered and enslaved so many black Africans that a third of the country broke away to form South Sudan in 2011. Mr Bashir was convicted of corruption in a Sudanese court on December 14th (see article) but seems unlikely to be extradited to stand trial for overseeing genocide in Darfur. A new power-sharing government vows to hold elections in three years, is negotiating peace in Darfur and has eased the dress code for women. However, the risk that thugs from the old regime may scupper democratic reforms is still worryingly high.

So the winner is a country Herman Cain, an American presidential candidate, once dismissed as "Ubeki-beki-beki-stan-stan". Three years ago **Uzbekistan** was an old-fashioned post-Soviet dictatorship, a closed society run with exceptional brutality and incompetence. Its regime allegedly boiled dissidents alive, and certainly forced legions of men, women and children to toil in the cotton fields at harvest time.

When Islam Karimov, the despot for 27 years, died in 2016, he was succeeded by his prime minister, Shavkat Mirziyoyev. At first, little changed. But after dumping the head of the security services in 2018, Mr Mirziyoyev began reforms that have accelerated over the past year. His government has largely ended forced labour. Its most notorious prison camp has been closed. Foreign journalists are let in. Bureaucrats are banned from calling on small businesses, which they previously did constantly, to bully them for bribes. More border crossings have opened, helping unite families divided by Central Asia's crazy quilt of frontiers. Foreign technocrats have been invited to help overhaul the state-stifled economy.

Uzbekistan is to hold parliamentary elections before the new year (see article). Although it is far from a democracy—all of the parties support Mr Mirziyoyev and some critics remain behind bars—some of the candidates have offered mild criticisms of the government, which would previously have been unthinkable. Ordinary Uzbeks, too, feel free to lampoon the campaign and grumble about the political class, without fear of being dragged off in the middle of the night. Uzbekistan still has a long way to go, but no other country travelled as far in 2019. ■

Letters to the editor
On purposeful firms, aircraft-carriers, dogs, ice-skating, Singapore, Oxford, "Macbeth"

On purposeful firms, aircraft-carriers, dogs, ice-skating, Singapore, Oxford, "Macbeth"

Letters to the editor

A selection of correspondence

Print | Letters Dec 21st 2019

The British Academy on firms

Your article on encouraging purposeful business failed to convey or address what the British Academy report on the "Future of the Corporation" is saying (" On purpose ", November 30th). Our report suggests that a firm should establish a purpose, act according to it and have regard to its consequences for the interests of its shareholders and stakeholders. It says that a company should not profit from inflicting harm on others and should seek to provide profitable solutions to problems. What part of this does *The Economist* object to?

I was disappointed that you did not cover our extensive discussion of the need for judicious leadership; nor the case for shareholders playing the role of stewards rather than owners; nor the complexity of the challenge faced by companies grappling with global issues that both private and state actors have failed to resolve.

The Economist has missed the point. This is a subject that merits serious informed comment and debate.

PROFESSOR COLIN MAYER
Academic lead on the British Academy's Future of the Corporation programme
London

The 1979 Iran hostage crisis

The vulnerability of American aircraft-carriers (" Sink or swim ", November 16th) is the reason why the rescue of hostages in Iran failed 40 years ago. The navy absolutely refused to send a carrier to the Gulf for fear of Iranian missiles. They knew that the first carrier sunk would be the last ever built. So we had to launch from the Arabian Sea. Only cumbersome anti-submarine warfare helicopters had adequate range. Flown by attack chopper pilots in the marines who were unfamiliar with them, one got lost in a sandstorm, another marine threw his flak jacket on a vent and burned the motor, and after another helicopter failed for mechanical reasons a fourth stumbled into a refuelling aircraft and exploded, which is when the mission had to be scratched. However, during the first Gulf war, when the air force flew from the United Arab Emirates, the navy drove those carriers right up in there.

The problem is that almost the entire surface navy is built around the Carrier Task Force. Without carriers the navy has no strategy and doesn't know what else to do.

AMBASSADOR DAVID AARON
Former deputy national security adviser to Jimmy Carter
Washington, DC

Man's best friend

Regarding Lexington's column on America's obsession with dogs (" Impoochment ", November 23rd), Plutarch tells us that when Caesar saw wealthy Romans fawning over their pets he wondered whether they had children, and reflected on people "who spend and lavish upon brute beasts that affection and kindness" which is reserved for mankind. But Plutarch's response to this was:

"With like reason may we blame those who misuse that love of inquiry and observation which nature has implanted in our souls, by expending it on objects unworthy of the attention either of their eyes or their ears, while they disregard such as are excellent in themselves."

If only our dog-loving might remind us not just of our declining concern for humanity, but also how technology and scientific realism has occasioned the unfortunate disregard of moral philosophy.

ROBERT SHAPIRO
Chicago

Ice-skating in Africa

West Africa's first ice-skating rink was indeed located in the Ivory Coast, albeit not in Yamoussoukro but in the Hôtel Ivoire in Abidjan (" Crocodile fears ", November 23rd). Built in 1963, the Hôtel Ivoire was the plush place in western Africa to go for

ice skating, enjoy first class food or watch a film. *The Economist* once called it possibly the most beautiful hotel in the world ("Steady does it", July 17th 1965).

PETER STEIN
Stockholm

Free speech in Singapore

Contrary to your report ("False alarm", December 7th), our Protection from Online Falsehoods and Manipulation Act should be looked at in the same context as our belief in the right of reply, which in our view enhances rather than reduces the quality of public discourse, and strengthens and safeguards proper public accountability that must necessarily underpin democracies. Online posts that have been corrected remain available in full, but with links to the government's response appended. Readers can see both and decide for themselves which is the truth. How does twinning factual replies to falsehoods limit free speech?

You also misrepresented the falsehoods that the government corrected. One post not only accused the government of rigging elections and conspiring to convert Singapore into a Christian theocracy, but also made false claims that it had arrested specific critics. Another did not only question the "investment nous of Singapore's sovereign-wealth funds", but based this on false allegations of losses that never occurred. *The Economist* itself recognises how serious a problem online falsehoods are, for example in "Anglichanka strikes again" (April 21st 2018). Fake stories have influenced British politics, notably in the Brexit campaign. Legislatures around the world have been grappling with this problem.

Singapore, a small English-speaking, multiracial, multi-religious city-state open to the world, is more vulnerable than most to this threat. Having observed in Britain and elsewhere the cost of doing nothing, we decided to act. Singapore's laws are designed to meet our own context and needs. We have no ambition to set any example for other countries, but neither do we make any apologies for defending our own interests.

FOO CHI HSIA
High commissioner for Singapore
London

Oxford jazz nights

Your obituary of Jonathan Miller was excellent except in one detail: you said that he teamed up with three Cambridge friends to produce "Beyond the Fringe" (December 7th). Miller and Peter Cook went to Cambridge, but Alan Bennett and Dudley Moore were Oxford men. In fact, when I was steward in 1960 of the junior common room at New College, Dudley Moore's jazz group occasionally used a room to store their instruments. I once engaged Dudley to play for one of our dances, for £5 and open bar privileges.

RICHARD MIDDLETON
Salt Lake City

Nightmare before Christmas

The caricature of Jo Swinson on your cover of December 7th reminded me of the witches I saw portrayed once in a production of "Macbeth". Now that Ms Swinson has lost her seat in the British election, one could imagine her thinking in your illustration, "Is this a dagger which I see before me?" But with the Tories getting a huge majority, my concern is "Something wicked this way comes."

RICHARD ROBINSON
London

Borderline disorder

Donald Trump's wall will irrevocably change America's south-western border

Is it worth the cost?

Print | United States Dec 21st 2019

ON A CRISP clear morning in November Fidel Baca, a Customs and Border Patrol (CBP) agent in El Paso, was driving west on Cesar Chavez Highway, which runs alongside the Rio Grande. Mexico was just yards away, behind a few mesh fences and the reddish-brown trickle of river. An alert came on the radio telling him that a surveillance camera had caught four people emerging from the river's concrete channel on the American side. Stopping by the side of the road, he pointed first to a couple of fresh footprints, and then, just behind them, to fresh wet sand atop the highway barrier: someone had just jumped it. The chain-link border fence behind the barrier showed a fresh cut.

Less than a mile away from where Mr Baca patrolled, a new wall is rising, and it will not be so easily sliced through. America's new border wall is made of 30-foot-tall (18 in some places) steel bollards filled with concrete, sunk six feet deep into a concrete foundation and topped with five-foot slabs of solid steel designed to impede climbing. Though American taxpayers rather than Mexico are paying the bill, and it is far from "beautiful", Donald Trump is honouring his promise to build a wall along America's border with Mexico.

Some Democrats argue that Mr Trump is merely replacing walls that already exist. That is not true. When a 30-foot wall, impenetrable to wildlife and surrounded by a network of roads and lights, replaces a low fence, it really is a new structure, in much the same way that replacing a garden shed with a ten-storey office block would be. A journey from El Paso to San Diego makes clear just how deeply the wall will change the character of America's south-western border. Emma Lazarus's poem on the Statue of Liberty welcomes to America the world's "huddled masses yearning to breathe free". Mr Trump's wall sends the opposite message.

On a map, El Paso appears to sit directly across from Ciudad Juárez. But in many ways the two cities are really one, separated by the border. Parents in Juárez send their children to America each day to private schools in El Paso, while professionals who work in Juárez often prefer to live in El Paso. Each day an average of around 80,000 people cross into America from Juárez by bus, car and on foot.

As of early December 2019, 27.5 miles of new wall have been built in El Paso, with contracts for another 24 miles expected to be signed soon. The CBP argues that the wall is particularly important in urban areas such as El Paso because it buys them time. When someone crosses a border in a remote area, Mr Baca explains, CBP has hours, perhaps even days, to catch him before he reaches a place where he can blend in. He recalls that when he was seconded to a mountainous region in rural West Texas, "by the time you apprehend someone, they've been walking for three days, maybe five. If we were tracking someone, you could smell them before you saw them."

In cities, says Mr Baca, "we have seconds to minutes...People can just blend in once they reach the city." Of course, no barrier is completely impenetrable. Smugglers have reportedly sawn through Mr Trump's wall. But slicing through a chain-link fence is quick and easy; cutting through concrete-filled steel bollards takes energy, probably multiple motorised saw blades and most importantly for the border patrol, a long time. Gloria Chavez, the acting chief of CBP's El Paso Sector, which includes all of New Mexico's largely rural frontier, argues that "There's a misconception that the wall was built to stop the flow. It was built to manage the flow. It's a tool."

What comes next for the wall builders? The next completely new sections will be in south-eastern Texas, and progress there might be difficult. Much of America's border lands are public, but in Texas, land is mostly privately owned. The government will have to buy it from landowners, which can be a tricky process.

A CBP official points out that records in south Texas are spotty, and ownership of many parcels unclear. During the last big wall-building fit in 2008, the official said they found one parcel in South Texas with 86 possible claimants ("we've introduced cousins to each other," says the official). In some cases, the government has to seize land. That is unpopular everywhere, but especially in rural Texas, where distrust of the federal government runs deep. The government's use of eminent domain in 2008 led to hundreds of lawsuits, some of which are still ongoing.

Farther west along the border, in Arizona, many are concerned about the wall's environmental impact. Along the new sections of wall in Organ Pipe Cactus National Monument lie massive, fallen saguaro cactuses in sections—bulldozed for the barrier. Saguaro, with their chubby upturned arms, have a vaguely human look; the Tohono O'odham, the local native population, consider them embodiments of their ancestors. They can live for centuries. Some of those cut down were probably standing before Arizona was a state.

But the wall's potential environmental harms extend well beyond fallen flora. Activists worry that water used in mixing concrete for the wall's foundation will deplete precious desert aquifers, imperilling not just an endangered species of fish whose sole American habitat is Quitobaquito Springs, in Organ Pipe, but all desert life (a CBP official contends that his agency is not using any groundwater within five miles of Quitobaquito). The lights planned for the wall could disrupt the bats that pollinate the saguaro. The new wall, with its deep foundation and closely built bollards, could act as a dam and worsen floods.

Such concerns seem remote in downtown San Diego. Yet Jerry Sanders, the city's former mayor and police chief, fondly recalls bird hunting along the border decades ago, when the only barrier was "a cable, just so you couldn't drive straight across." That was more or less the state of fencing along much of America's southern border until surprisingly recently. The first border fence designed to stop illegal immigration started going up just south of San Diego in 1990. Security fears spurred a fit of construction under George W. Bush.

Frontier psychiatrist

No president has made a barrier—or hostility to immigration—as central to his political platform as Mr Trump. CBP says it has funding for 509 miles of construction. From Mr Trump's inauguration until October, Congress provided nearly $3.1bn to replace or upgrade border fencing. Mr Trump redirected billions of dollars from defence funding to wall construction, endangering dozens of military-construction projects—though on December 10th a federal court blocked Mr Trump from using that money on his wall. Many have raised concerns over how much the wall costs, and who is building it. The Defence Department's inspector-general will audit a $400m construction contract given to a North Dakota firm whose boss has repeatedly sung Mr Trump's praises.

In total the wall could cost as much as $25m a mile just to build, not including maintenance. And it is far from clear what it will achieve. A wall will certainly make life harder for fence jumpers. But the number of people trying to evade immigration controls to come to America to work has fallen for years. Most of the increase in arrests at the border has come from families and unaccompanied children who want to be caught by CBP officers because they intend to claim asylum, which they have a legal right to do. For such people a wall is much less of a deterrent.

That is why Nancy Pelosi, the House Speaker and Mr Trump's most effective political opponent, called the wall "an immorality". Fortifying a border is not inherently immoral. Doing it this way, however, may be unwise. America's global success derives not from its military might or power projection, but from its shaping of the world's multilateral institutions, its openness, and its ability to constantly redefine itself as it assimilates and is changed by successive waves of immigrants. A wall tells the world that America is turning away from those values.

A more effective way to stop illegal immigration coming from Central America might involve increased foreign aid for political stabilisation there. Fixing America's overwhelmed asylum system may require more funding for the officials who assess claims. On remote stretches of the border surveillance technology would probably be cheaper and just as effective at stopping migrants as a physical barrier. But a wall is easier to explain, and for a president who prides himself on his reputation as "a builder", politically irresistible.

A plaque honouring Mr Trump gleams from a bollard in Calexico, about two hours east of San Diego. Not far from that plaque, directly on the Californian side of the border, is an outlet mall that seemed designed to attract Mexican shoppers. Mexicali, Calexico's twin city in Mexico, attracts American medical tourists who zip across the border for procedures that cost a fraction of what they would in America. Such enterprises are a reminder that—wall or no wall, and though Mr Trump may wish otherwise—the fates of Mexico and America are and always will be entwined. ■

From our cold dead hands

Rural Virginians rail against gun controls

They are in a minority

Print | United States Dec 18th 2019

RALPH NORTHAM, the governor of Virginia, has no plan to wrest guns from their owners. His proposed gun-control measures are far more modest. But the Virginians who gathered this month at a meeting of the board of supervisors of Augusta County, in the state's rural west, were not buying that. The meeting included a vote on whether the county should declare itself a "Second Amendment sanctuary". It was held at a high school to accommodate the crowd that was expected to show up. In the end, so many people came to protest against supposed Democratic plans to disarm them that they could not all fit in, and loudspeakers had to be set up outside for the latecomers.

At least 60 of Virginia's 95 counties have declared themselves Second Amendment sanctuaries in recent weeks. They follow counties in states such as Colorado and New Mexico. They have borrowed from the left the rhetoric of the "sanctuary cities" movement, where local governments limit their co-operation with federal immigration authorities in an attempt to protect illegal immigrants from deportation. But, in practice, for a county to declare itself a Second Amendment sanctuary is little more than a howl of rage from rural gun owners.

In Virginia the movement began in November, when Democrats took control of both houses of the state's legislature for the first time in over two decades. Gun control was a big issue in that election. After a gunman killed 12 people in Virginia Beach in May, Mr Northam called a special legislative meeting on gun control. The Republicans, who at the time had a majority in both chambers, put a quick end to it. Gun-control groups responded by pumping money into the election. When they take office in January, the Democrats plan to introduce tighter background checks and a ban on the purchase of some types of guns.

Yet what is popular in Virginia's fast-growing cities and suburbs, where well-educated and immigrant newcomers have settled, is anathema in rural areas like Augusta County. According to Terry King, a 66-year-old retired welder, the Democrats' measures were "opening a door you can't close". What started with background checks would surely end with the confiscation of the guns he had been using to hunt deer and rabbits since he was a child. Like others in the predominantly male crowd, he wore an orange "Guns save lives" sticker on his plaid flannel shirt. The stickers had been handed out by the Virginia Citizens Defence League (VCDL), a gun-rights outfit which helped draft the county's resolution.

"The problem is the people who have moved into the cities," said Gary Colvan, a 60-year-old former carpenter on disability benefits who stood in the cold for two hours to show his support. City dwellers did not understand, he went on, that it was not just a question of culture: rural Virginians needed guns to defend their families. "Out here a police officer can be half an hour away," he said. Mass shootings pained him, of course, but armed citizens made America safer, not more dangerous.

Fired up by organisations like the VCDL, elected officials have exploited such feelings. But whether they add up to much more than a protest is unclear. Sanctuary cities are a practical proposal; they do not involve breaking the law. If Second Amendment sanctuaries are to mean anything, though, local police have to refuse to enforce state laws that local leaders think are unconstitutional. Augusta County's sheriff, Donald Smith, told a local newspaper he would refuse to collect guns from citizens if the state asked him to. Later he moaned that the media had reported that he "wouldn't enforce the law", when actually what he meant is that "the constitution is the law". As legal defences go, it seems a shaky one. ■

Help for the help

A court rules au pairs must be treated on a par with other workers

That will make them pricier in many states

Print | United States Dec 18th 2019

"IT WAS CREEPY. I avoided any contact with the father...there were always periods where [I] didn't get paid for a few weeks", said an au pair quoted in a 2018 report on problems in the au-pair industry. The report, written by the International Human Rights Law Clinic at the American University, revealed that many au pairs endured illegally low wages and abuse. One au pair interviewed was forced to sleep in a dog's play area. Another developed a bladder infection because she wasn't permitted enough bathroom breaks.

In America au pairs occupy a curious legal space. A State Department programme allows 20,000 young foreigners to spend a year or two in America to attend college classes while living with an American host family. In exchange for providing up to 45 hours of child care, they are paid a stipend of at least $195.75 a week, or $4.35 per hour. Critics say that the programme, which has little oversight, is rife with abuse. In early December, an appeals court in Massachusetts struck a blow for au pairs when it upheld a ruling that in a number of north-eastern states and Puerto Rico, they must be covered by the same protective laws that apply to other workers.

Culture Care Au Pair, an agency that sponsors au pairs, had sued the state, hoping to exempt au pairs from rules for domestic workers passed in 2014. It claimed that au pairs are not typical workers as they are participating in a cultural and educational exchange programme. That argument was thrown out. In Massachusetts, that means au pairs must now be paid the minimum wage (soon to be $12.75 per hour), as well as guaranteed set meal breaks and the like. The court's decision is the second defeat for the au pair industry. Earlier this year 10,000 au pairs were awarded $65.5m in a class action suit in Colorado.

A large part of the appeal of employing an au pair is how much cheaper it is than other child care options. Nationwide, nannies cost on average $596 a week in 2018. In states like Massachusetts and New York they earn far more. The federal government defines "affordable" child care as no more than 7% of a family's income. Over 40% of families spend more than 15% of income on care, according to Care.com, a website which helps people to find carers. Monique Tú Nguyen, head of Matahari Women Workers' Centre, which protects low-wage earners, says the ruling is a "huge win for au pairs". Parents might resent it, but they will have to stump up.

Going ballistic

Missile-testing

America has big plans for new mid-range ballistic missiles

Print | United States Dec 18th 2019

IN THE EARLY morning of December 12th a missile streaked into the sky above Vandenberg air force base north of Los Angeles. It looped up into the blackness of space and then hurtled down into the Pacific—crucially, over 500km away. That makes it America's first test of a ballistic missile that would have been forbidden under the 1987 Intermediate-range Nuclear Forces (INF) treaty, which banned both conventional and nuclear land-based missiles (but not air or sea-launched ones) with ranges of 500km to 5,500km.

The pact died in August after Donald Trump walked out, having accused Russia of illegally testing and deploying several battalions of an intermediate-range cruise missile known as the SSC-8. Proponents of the move argue that land-based missiles are useful because mobile ground launchers are cheaper and can be replenished with fresh missiles more easily than ships, subs and planes, which can then be freed to do other things.

The test is a signal that America is serious about pursuing this idea. It follows an earlier test on August 18th of another hitherto-banned ground-launched cruise missile fired from San Nicolas Island in California (cruise missiles use jet engines and fly low, whereas ballistic missiles are rocket-powered and arc through the sky). Both tests recycled existing systems: a 1980s-vintage Tomahawk in the summer, and what resembled a target-practice missile for the latest test.

Turning old hardware into INF-range missiles is a quick and dirty way to turn out new weapons. Building 400 Tomahawks—which are currently fired only from ships and subs—and 50 ground launchers would cost $1.4bn, small-change for the Pentagon, according to a study by the Centre for Strategic and Budgetary Assessments (CSBA), a think-tank. But state-of-the-art weapons are also being considered.

The army tested its new Precision Strike Missile (PrSM) for the first time on December 10th in New Mexico. The missile, which can be fired from existing launchers, had previously had its range capped at 499km; unencumbered by the INF treaty, it may now go as far as 800km. An even longer-range hypersonic missile is also in the works. The CSBA says that 400 brand-new ballistic missiles with 100 launchers would require $9bn or so. The Pentagon says that, unlike Russia's SSC-8, its new missiles would not have nuclear tips.

The political ground is now shifting in the Pentagon's favour. On December 9th the two houses of Congress reconciled their duelling versions of the National Defence Authorisation Act (NDAA) after months of wrangling between missile-shy Democrats, who deplore Mr Trump's withdrawal from the treaty and argue that new missiles are unnecessary fripperies, and Republicans, who want America to respond to China's unconstrained build-up of about 2,000 missiles. In a sop to Democrats, the NDAA bans the Pentagon from buying or fielding new INF-range missiles before October 2020. But it is not much of a constraint: research and testing can continue, and new systems would take years to come to fruition anyway. A defence appropriations bill published on December 16th allocates $56m for missile research.

The bigger hurdle is diplomatic. The NDAA obliges the Pentagon to submit a report on where new missiles would be deployed and how consultations with allies are going. Those are harder questions to answer. Mark Esper, the secretary of defence, said in August that he wanted to put new missiles in Asia "sooner rather than later". But several of America's best friends in the region immediately demurred.

South Korea's defence ministry said it had "not internally reviewed the issue" and had "no plan to do so". Scott Morrison, Australia's prime minister, said he could "rule a line under" the idea of such deployments: "It's not been asked of us, not being considered, not been put to us." On October 31st Japan's defence minister insisted that "we have not been discussing any of it".

Europeans are also cagey. NATO squarely sided with America in blaming Russia for the collapse of the INF treaty, and some countries, like Poland, would welcome new missiles. But the alliance has generally preferred to emphasise defensive measures, rather than retaliatory deployments like those which provoked big protests in the "Euromissiles" crisis of the 1980s.

In August Jens Stoltenberg, NATO's secretary-general, argued that a Russian proposal for a moratorium on new missile deployments was "not a credible offer"—what was the point when Russia had already deployed missiles? But in November Emmanuel Macron, France's president, broke ranks to say that Russia's offer could serve as "a basis for discussion". Even if a moratorium could be agreed on, it would probably cover only deployments in Europe, not those in Asia.

Eric Sayers, a former special assistant to America's Indo-Pacific Command, suggests that, as China's power—and missile arsenal—grows, the diplomatic situation in Asia is likely to move in America's favour. Japanese officials "understand the military case and know this will be a future ask", he says. Any deployments there will probably be badged as rotational, rather than permanent, and might focus on anti-ship missiles rather than on those which target Chinese soil. Some American officials view this as leverage to force China into arms-control negotiations. Others just want to shore up a military balance that has been tilting in China's favour. Either way, many more tests will have to come first. ■

Lexington

Fahrenheit Wisconsin

A state once known for stolid German virtues is now the main battleground in America's political war

Print | United States Dec 21st 2019

IT IS SOBERING to enter a school in middle America and find students and teachers frightened for their lives. It was also understandable that those at Wauwatosa East high school should feel this way when Lexington accompanied the local state representative, Robyn Vining, there. Eight high schools in Wisconsin had just experienced a real or suspected shooter incident in a three-day period. One in another school in Waukesha, a suburban area on the edge of Milwaukee, had led to its school cop shooting a pupil.

"It happened there, it can happen here," said one 16-year-old, at a meeting of Wauwatosa East's Democratic Society. Several of the 25 students present said they avoided going to the bathroom in class time for fear of the school corridors. When asked who was scared to come to school, all raised their hands. So did their teacher. The blame the students attached to the conservative gun lobby for this catastrophe is one reason their society has 75 members and is growing. The school's conservative club is defunct.

The violence America's gun fetish has wrought is polarising everywhere. Democrats consider unconscionable Republicans' refusal to recognise that gun control makes schools safer; Republicans fear Democrats' harping on the subject presages a wider assault on liberty. But in Wisconsin such partisan issues have become especially bitter. When the state's Democratic governor, Tony Evers, called a special session of its Republican-led legislature in November to debate two gun controls—including a "red-flag" bill to help relatives report unhinged gun owners—the Republicans quashed it. The mutual suspicions such rows are giving rise to, seeping through the communities of a state once known for good governance and neighbourliness, make Wisconsin acutely illustrative of America's broader political divide.

That makes the state look like an augury of the political year ahead. So does the related fact that Wisconsin is especially likely to determine whether Donald Trump is re-elected. This is because, all else remaining equal, he needs to win only one of the three rust-belt states he took from the Democrats in 2016. And with Michigan and Pennsylvania looking fairly Democratic, he and his opponents have made Wisconsin, the whitest and most conservative of the trio, their priority. Last month the Democrats—who will hold their national convention in Milwaukee in July—knocked on 54,000 doors in the state in a weekend. Mr Trump's campaign, which has fewer volunteers but more money, is meanwhile bombarding Wisconsinites with ads, including many lambasting his impeachment. Both parties say their activities in the state are eight months ahead of where they would normally be at this point in the cycle.

Wisconsin's rancorous politics are in part due to the tightness of its political contest—Mr Trump won the state by 0.7% of the vote. Democrats were shocked by that. But though Wisconsin had voted for their presidential candidates since 1984, in recent times only Barack Obama won convincingly. John Kerry and Al Gore both won Wisconsin by less than 1% of the vote. As elsewhere in the Midwest, the rightward shift this denoted was driven by working-class whites and flagging union membership. In 2011, Governor Scott Walker therefore pushed through legislation to smash collective bargaining. In the process he destroyed the Democrats' main source of campaign finance and, his opponents believed, interparty fair play. That is another reason for the rancour.

Republican voter-registration laws aimed at depressing Democratic turnout have caused more bad blood, on both sides. Wisconsin Democrats decry their opponents' tactics; Wisconsin Republicans, without proof but with no less certainty, accuse the Democrats of what they themselves stand accused of. Encouraged by the state's 81 talk-radio stations, many believe Mr Walker was beaten by Mr Evers last year because of electoral fraud by black voters in Milwaukee (for which there is no evidence). Meanwhile, following a court ruling this week, conservative activists appear to have succeeded in an effort to scrub 230,000 names from the electoral roll, mostly in Democratic areas. The fact that Democrats have more ground for complaint is at once provable and practicably immaterial, given how equally wronged both sides feel.

There are three strands to the 2020 augury this offers. First, the state—and therefore the country—is likely to be close-run. With only 10% of Wisconsinites considered persuadable, there is no reason to expect a breakthrough for either party. And their base-rallying tactics make that even less likely. The Democrats are focusing on registering and turning out non-whites in Milwaukee, while eroding the Republicans' grip on suburban areas such as Waukesha, where Mr Trump is not loved. The president's campaign is trying to boost his support further among working-class whites. Wisconsin will be an election for partisans—and therefore nasty.

The early campaigning is already raising tensions in the state. At the weekly gathering of an anti-Trump group known as the PerSisters—a stone's throw from Wauwatosa East—its middle-aged activists said they no longer shared Thanksgiving and Christmas with pro-Trump relatives: politics was too fraught. "In their violent hatred of the president, the Democrats have raised the bar in terms of potential violence and nervousness in the state," claimed Terry Dittrich, the Republican chairman in nearby Waukesha county.

Wisconsin not so nice

The third warning from Wisconsin is that the social damage done by such partisan enmity may be long-lasting. Almost worse than their fear was the desperation the kids at Wauwatosa East expressed at the mess their elders were making of their state and country. "You deserve not to be terrified," lamented Ms Vining, who narrowly won Mr Walker's old Wauwatosa seat last year in one of the Democrats' standout successes of the mid-terms. But she will do well to retain it. Although both parties dream of Wisconsin moving towards them, America's most contested state looks stuck, between their respective anger and fears, for some time yet. ■

Correction: The original version of this article referred to a school shooting in Wauwatosa. The school is actually in Waukesha. This has been corrected.

Sign up to receive Checks and Balance , our new weekly newsletter on American politics

Venezuela
Turning the taps on—a bit

Durable Maduro

More dollars and fewer protests in Venezuela

Sanctions have led the regime to retreat from socialism, but not dictatorship

Print | The Americas Dec 18th 2019

THE HUMBOLDT, a pencil-shaped luxury hotel overlooking Caracas, has long symbolised broken promises by Venezuelan governments. Built in 1956, during the military dictatorship of Marcos Pérez Jiménez, it has been empty most of the time. The cable car to its mountaintop location keeps breaking down. The current regime, a socialist dictatorship led by Nicolás Maduro, promises that the Humboldt will soon be relaunched as Venezuela's first "seven-star" hotel.

On December 14th it threw a party. Christmas lights twinkled. A DJ pumped out reggaeton hits. Models cavorted around the empty swimming pool. *Enchufados* (plugged-ins), made rich by their connections to the regime, sipped imported vodka at tables with panoramic views while two green laser lights beamed down upon the capital of a country that is suffering from the world's deepest recession. "Caracas has become like something out of 'The Great Gatsby'," said Karina González, a young secretary, as she looked up at the light show. "Decadence alongside penury."

The Humboldt bash is a sign of change. It is not a return of prosperity, which does not spread beyond the party-goers and their sort. Nor is it the democratisation demanded by the opposition and by the 60-odd countries that back it. Rather, it points to the regime's growing confidence that it will survive international pressure aimed at toppling it, which has been led by the United States.

Its policy of "maximum pressure" on the regime began last January, after Juan Guaidó, the head of the opposition-controlled legislature, proclaimed himself Venezuela's interim president on the grounds that Mr Maduro had rigged his re-election in 2018. Most Western and Latin American countries recognise Mr Guaidó's claim. The Trump administration banned purchases of Venezuelan oil by the United States—once Venezuela's biggest customer. It widened sanctions on individuals to include almost everyone in Mr Maduro's inner circle.

The oil sanctions have been porous. Venezuela has found non-American customers, such as Russia's Rosneft. Production by PDVSA, Venezuela's state-owned oil company, is showing signs of recovery after plunging by three-quarters since 2015. It has signed an agreement with an Indian company to help boost it further and repair refineries. Venezuela gets extra money from selling gold (both from illegal mines and from its reserves) and narcotics.

The sanctions have had unintended consequences. Officials whose travel is restricted and whose foreign bank accounts are frozen spend more of their time and money at home, one explanation for the Humboldt blowout. More important, the oil sanctions were enough of a shock to force the government to retreat from socialism. Mr Maduro has lifted nearly all the economic controls first imposed by Hugo Chávez, the charismatic leader of the "Bolivarian revolution", who died in 2013. Sanctions have "made the government more flexible", says Luis Oliveros, an economist.

It has stopped trying to dictate the exchange rate and control prices. Private firms can now import whatever they choose and set their own prices. Supermarkets in Caracas, nearly empty for much of 2017 and 2018, are again stocked with food. It is not just the rich who can afford it. Perhaps a third of Venezuelans have direct access to remittances from relatives living abroad. Since Mr Maduro took office in 2013 at least 4m people, 12% of the population, have left the country. Venezuelans abroad send back $4bn a year, roughly 3% of GDP, according to Econoanalitica, a consultancy. This supplements the government's distribution of food, disproportionately to its supporters, and a discreet aid programme managed by foreign NGOs.

Dollars are elbowing aside Venezuela's bolívar, the world's most inflation-prone currency. Taxi drivers and cleaning ladies quote prices in dollars, even if they accept payment in bolívares. McDonald's pays burger-flippers in Caracas a bonus of $20 a month, which is more than treble the minimum wage of 300,000 bolívares ($6). Prices at the Traki department store in central Caracas are in dollars, though the dollar sign itself does not appear on tags. Spaghetti (from Egypt) costs 50 cents for a 400-gram (14-ounce) pack. Queues at the tills suggest that ordinary shoppers can afford it. The value of dollar notes in circulation now exceeds that of bolívares.

The Venezuelan currency itself, in which most people are still paid, is not depreciating quite as fast as it was. The government has tightened banks' reserve requirements. According to the national assembly, the annual inflation rate has dropped from nearly 3m% at the beginning of 2019 to 13,475% in November, which is still the highest in the world by far.

"Things are a little better than they were last year," says Héctor Márquez, a mechanic. Outside Caracas few Venezuelans would agree. People continue to die needlessly in hospitals that lack equipment and drugs. The UN estimates that 7m Venezuelans urgently need humanitarian aid.

That has led to internal migration. Many people are fleeing provincial cities for Caracas, where traffic jams are back after disappearing last year. El Chigüire Bipolar (the Bipolar Capybara), a satirical website, has Mr Maduro declaring: "The Republic of Caracas cannot continue receiving Venezuelan refugees."

Quiescence in Caracas is what Mr Maduro most wants. A Venezuelan with access to dollars is less likely to protest against the government, points out Mr Oliveros. That complicates the task of Mr Guaidó, who has promised repeatedly that the Maduro regime will fall "soon". His main hope had been that the armed forces would switch sides, but there is little sign of that. Mr Guaidó's new focus is a push for reform of the electoral authority, which the regime counts on to help rig elections in its favour.

Its next opportunity will be in the national-assembly election, which is due in December 2020. The regime may hold it earlier. If the opposition loses that vote, Mr Maduro will control all branches of government. "The conditions for any political change in 2020 are getting ever more remote," says John Magdaleno, a Caracas-based consultant.

Publicly the Trump administration still backs Mr Guaidó against the "former" regime. "We're not out of sanctions," said Elliott Abrams, Washington's point man for Venezuela, in October.

But recent reports by news agencies suggest that President Donald Trump may be looking for new ideas. One is to work with Russia to put pressure on Mr Maduro. Another is to talk directly to the regime. In November Erik Prince, an ardent Trump supporter who founded Blackwater Security Consulting (now called Academi), dined in Caracas with Delcy Rodríguez, Venezuela's vice-president. That prompted speculation that the two governments are setting up a back channel, which would bypass Mr Guaidó. That would not be happening if the regime were on its way out. ■

Down from a high

Canada's legal cannabis market gets off to a slow start

The country's cautious legalisation has made investors glum

Print | The Americas Dec 18th 2019

COLOURFUL CANS labelled Pink Kush, Moon and Trail Blazer are arranged invitingly in the glass-doored cooler at Superette, a cannabis store in the trendy Westboro area of Ottawa. But they are just models for marketing purposes. A sales clerk, wearing a white Superette toque and matching T-shirt, explains that cannabis-infused drinks and edibles, like chocolates, biscuits and sweets, will probably not go on sale until early January, even though the government finished its review process by December 16th. "Wheels of bureaucracy," the salesman explains.

In October 2018 Canada became the second country in the world, after Uruguay, to legalise cannabis for recreational use. But it has proceeded with caution. Sales of the plant, oils and seeds were legalised right away. Drinks, edible confections and vaping products followed a year later. This, plus slow approvals of retail outlets by some provinces, turned an expected bonanza into a bit of a bust. The industry is hoping that what it calls "Cannabis 2.0" will revive its fortunes. It may not.

The government said that legalisation would help keep cannabis out of the hands of children and put criminals out of business. Progress has been slower than it wanted. Just 28% of consumers bought only from legal sources in the third quarter of 2019. The rest presumably are still buying on the black market, where prices are lower. Many of those smokers are no doubt under age. In the first year after legalisation legitimate sales were a disappointing C$907m ($690m).

That is partly because finding one of Canada's 407 legal pot shops is not easy. As of July this year Ontario had 24 stores for its 14m residents—two fewer than Newfoundland & Labrador, with a population of 530,000. In nine of the ten provinces distribution from growers to retailers is a provincial monopoly. The distributor's extra paperwork is what slowed Superette down.

Such problems have sobered Canadian firms, which had heady dreams of leading a growing global industry. The share price of Canopy Growth, the largest Canadian cannabis firm by market value, dropped from C$57 on the eve of legalisation to C$27 this week. That of Cronos Group, the second-biggest, has fallen from C$12 to C$7.

These companies are counting on drinks and edibles to improve their fortunes. So are some big international booze firms such as Constellation Brands, which has invested in Canopy Growth, and Molson Coors, which has a joint venture with Hexo, a smaller cannabis firm. In American states where cannabis is legal, edibles accounted for 11% of the market in 2018, according to Deloitte, a consultancy. It estimates that edibles and drinkables could add C$2.1bn to sales in Canada.

They could also draw in multinational consumer-goods companies that have so far stayed out of the market. Cannabis-infused beverages and biscuits are not so different from products they know how to make and sell. The big brands might push Pink Kush out of the cooler. ■

Ice and no

Disarmament talks between America and North Korea are in jeopardy

The looming breakdown heralds a dangerous start to the new year

Print | Asia Dec 18th 2019

STEPHEN BIEGUN sounded like a jilted spouse pleading with an errant partner. North Korea's recent statements about its relationship with America were "so hostile and negative and so unnecessary", America's special envoy lamented in South Korea on December 16th. Mr Biegun was on a last-ditch mission to revive stalled disarmament talks with North Korea, in which the North has said it is no longer interested. Towards the end of his remarks, Mr Biegun directly addressed his North Korean counterparts: "We are here. You know how to reach us."

North Korea responded to the envoy's entreaties with icy silence. This leaves the Korean peninsula in a precarious position as the year draws to a close. Negotiations have faltered ever since a summit between Donald Trump, America's president, and Kim Jong Un, the North's dictator, collapsed in February over the two sides' irreconcilable expectations. America says North Korea must begin disarming before sanctions can be lifted or America's military footprint in South Korea scaled back in any significant way. North Korea insists it has already taken notable steps towards dismantling its nuclear-weapons and long-range missile programmes, for which it demands some recompense before it will make any further concessions.

The stalemate could give way to escalation. Though America says it wants to keep talking, the North seems to have decided that it has nothing more to gain from the talks. Following the failure of the summit, which many observers believe Mr Kim found deeply humiliating, the North set a deadline. If the Americans did not become "more flexible" before the end of the year, its negotiators said, it would abandon talks. In October, after a lower-level meeting between the two sides ended in acrimony, North Korea reiterated the threat. It would not return to the table without a "complete and irreversible withdrawal" of America's "hostile policy".

The tough talk has been accompanied by a string of provocations, which have grown more flagrant in recent weeks, along with lots of martial symbolism. North Korea has tested new short-range missiles on 13 occasions since May. In the past month it has conducted two engine tests at a site in Sohae that it had showily dismantled when negotiations first began. Analysts say the tests are consistent with preparations for the launch of a long-range missile, which would end Mr Kim's self-imposed moratorium on such tests, the basis of Mr Trump's claim in 2018 that there was "no longer a nuclear threat from North Korea".

Mr Kim has also taken two well-publicised trips on horseback up Mount Paektu, the mountain hailed as the birthplace of communism in North Korea, preparing his people for "hard times" and a "new path" ahead. At a plenum of North Korea's Workers' Party planned in the next few days, he is expected to describe the path in more detail. Kim In-tae of South Korea's Institute for National Security Strategy thinks he may formally renounce the moratorium. "That," he says, "will demolish any hope of getting assistance from America."

Mr Kim may be willing to risk that, since the North does not appear to be in a desperate situation economically. Several regions are in the midst of a construction boom, says Cheong Seong-chang of the Sejong Institute in Seoul. Tourism from China has grown into an important source of revenue, bringing in tens of millions of dollars a year by some estimates. Moreover, China and Russia have put forward a resolution at the UN advocating the lifting of some sanctions, including a reversal of the decision to compel all North Koreans working abroad to return home by December 22nd. Russia, which hosts many such workers, claimed the move was aimed at encouraging further talks between America and North Korea.

North Korea may be imagining that it can force America's hand with further provocations, says Bob Carlin of Stanford University. "If they think escalation puts pressure on America to make a deal they're wrong. They're just backing themselves ever further into a corner." That leaves a return to the high tensions and aggressive rhetoric that preceded the pivot to diplomacy in early 2018 as the most likely outcome. On December 16th Mr Trump said ominously that America would "take care of" any hostile step by North Korea. ■

The most democratic ever

Uzbekistan holds a semi-serious election

But the former dictatorship still lacks any opposition worth the name

Print | Asia Dec 18th 2019

FOR THE past 100 years, first under communism, then under an exceptionally vicious dictatorship, Uzbekistan's parliament has been toothless, always pandering to the man in charge—in Moscow or, since independence in 1991, in Tashkent, the Central Asian state's capital. But as Uzbeks go to the polls on December 22nd, Bobur Bekmurodov, a candidate who has been running a government-backed movement to promote reform, says it is time for the parliament to "grow teeth". If he wins a seat, he says, he will try to make local government more accountable and let civil society breathe more freely. That is fighting talk in a country that long trembled under the lash of Islam Karimov, who, after serving the Kremlin loyally for many years, tyrannised the independent country until his death in 2016. Since then his successor, Shavkat Mirziyoyev, has astonished and delighted his citizens with his enthusiasm for reform. The question now is how far and how fast he will dare to go.

Mr Mirziyoyev's reforms have so far centred on the economy, which he has set about liberalising with gusto. The main political change to date has been to lock up far fewer people for their opinions, although life remains difficult for some journalists and bloggers. Mr Bekmurodov, who is 34, would "absolutely not" have stood for parliament in the old days, but sees an opportunity for change. He is not, however, a member of an opposition party, because no such thing yet exists in this country of 33m people, and independents are barred from standing. Mr Bekmurodov is on the ticket of the Uzbekistan Liberal Democratic Party, the outgoing parliament's largest force and the closest thing Uzbekistan has to a ruling party. Mr Mirziyoyev, supposedly above the political fray, says he supports no candidates and no party.

The other four parties that are taking part in the election espouse minor variations on the government's themes. None of them truly criticises the powers that be. The People's Democratic Party of Uzbekistan, the Justice Social Democratic Party and the National Revival Democratic Party advocate improved social welfare for various groups. The Ecological Party backs government plans to build a nuclear power station. Voters on the streets of Tashkent have little idea of what these parties really stand for. One market trader says he will tick the People's Democratic Party on his ballot paper because he likes the word "people" in the name.

The government is depicting the election, the first national ballot since Mr Mirziyoyev won the presidency three years ago with an implausible 89% of the vote, as Uzbekistan's most vibrant and competitive ever. That is true, but the previous, sham elections set an extremely low bar and the absence of any opposition parties remains a glaring flaw. Officials insist Uzbekistan is democratising, but in a manner more evolutionary than revolutionary. It has passed a new election law, which monitors from the Organisation for Security and Co-operation in Europe say follows some recommendations to improve the administration of the ballot, but ignores others pertaining to "fundamental freedoms".

The campaign featured live television debates which, although staid, subjected candidates to a new level of scrutiny. Parties have been wooing voters more vigorously than in the past, even though their rhetoric is "superficial and artificial", according to Nazima Davletova, a civic activist, and "their programmes are basically the same." Some have voiced timid criticism of officialdom. After hospitals in his constituency lost power 50 times in three days, Mr Bekmurodov took to social media to complain.

Mr Mirziyoyev enjoys popularity for bringing change after 25 years of stagnation, but recent protests over energy shortages reflect disillusionment with the state of basic public services. Double-digit inflation is another gripe. Commentators on social media lampooned the leader of the Liberal Democratic Party after he blamed a 20% rise in meat prices this year on Uzbeks' insatiable appetites. Mr Mirziyoyev has loosened the screws on the press, whose coverage of the campaign has been livelier than before, though there are red lines: criticising the president remains a no-no.

Dilfuza Kurolova, a human-rights lawyer, harbours cautious optimism that the new parliament can be more "impactful". Many voters are more sceptical. "The parties do nothing for us," says a health worker dismissively. Mr Mirziyoyev has ordered parliamentarians to spend more time with their constituents to get a better sense of their concerns, and claims to desire a more robust debate in parliament. He has beefed up its limited powers to call ministers to account, although the mood remains more consensual than confrontational.

"We are not an enemy to the government," says Eldor Tulyakov, an MP in the outgoing parliament from the National Revival Party, but "we do criticise." He believes the greater freedom of expression Uzbeks enjoy under Mr Mirziyoyev will eventually lead to the emergence of a proper political opposition. Even the optimistic Ms Kurolova has her doubts about that. Although there are technically no legal impediments, she says, "we don't have much freedom to create political parties."

For all Mr Mirziyoyev's talk of transforming parliament into a "true school of democracy", there is little proof he is willing to tolerate genuine opposition. Then again, says Mr Bekmurodov, a great deal has changed in the president's three years in power: "I've learned not to rule anything out, because a great deal that seemed impossible to us is now reality." ■

The 20-year itch

Bougainville has voted for independence, but may not get it

The restive province of Papua New Guinea has waited since 2001 for a referendum

Print | Asia Dec 18th 2019

THE INTENDED destination is not in doubt. Fully 97.7% of voters on the Pacific island of Bougainville opted for independence from Papua New Guinea (PNG) in a referendum held in late November and early December. But how—and how fast—the island will get there remains far from clear. The outcome of the poll is not binding on the government, which inherited Bougainville, part of the archipelago that includes the Solomon Islands, as a quirk of colonial map-making. There will now be a lengthy consultation between the island's autonomous administration and the national authorities. The ultimate say rests with PNG's parliament.

There are many reasons for delay. Bertie Ahern, a former Irish prime minister who oversaw the referendum, says the island's 300,000-odd people are not ready for independence. James Marape, PNG's prime minister, argues that Bougainville's economy is too weak and has promised greater spending on infrastructure. The region's main powers, Australia and New Zealand, fear the creation of a mendicant state on their doorsteps, susceptible, in particular, to Chinese bribes and blandishments. Nearly all of Bougainville's revenue comes either from the central government or foreign aid.

That was not always the case. Bougainville once boasted the third-largest copper mine in the world. It delivered close to half of PNG's export revenues in the 1970s. But arguments about the distribution of revenue and jobs from the Panguna mine sparked an insurgency in the late 1980s, which forced the mine to close. PNG's armed forces struggled to establish control over the island's mountainous terrain and hostile population. They withdrew in 1990, and blockaded the island by sea instead. When PNG hired mercenaries from a firm called Sandline International to restore order, its own soldiers mutinied, prompting the government of the day to fall and Australia and New Zealand to step in to broker a peace deal.

The agreement, signed in 2001, promised a referendum on independence by 2020 and self-government in the meantime. But the mine did not re-open, leaving the autonomous administration starved of cash. Other big mines and oil- and gasfields were developed on the mainland, diminishing the central government's incentive to make autonomy work. National leaders' main concern these days is that Bougainville might inspire other secessionist rebellions, given PNG's diversity (its 8.5m citizens speak 839 languages), poverty, isolating terrain and dire infrastructure.

The leader of the autonomous government on Bougainville, John Momis, once supported greater autonomy within PNG—the other option on the ballot in the referendum. But the stinginess of PNG's fiscal transfers and its broader neglect of Bougainville drove him and other voters towards independence instead. Few islanders have confidence in Mr Marape's promise to fix these problems, having heard such pledges before.

In fact, there is a risk of lack of leadership on both sides. Mr Momis is 81 and must step down by June because of term limits. He has no obvious successor. Bougainville's people, having voted so emphatically for independence, presumably expect speedy change. The politicians seem unlikely to gratify their desires. The chances of further discord are high. ■

Roo pall

An Australian drought is killing millions of kangaroos

Some think treating them as livestock would reduce suffering

Print | Asia Dec 18th 2019

WELL BEFORE the current spate of bushfires started ravaging eastern Australia, they were already dying in droves. Lachlan Gall has seen "several thousand" kangaroo corpses splayed under trees or bogged in the mud of dried-out reservoirs on his 54,000 hectares (134,000 acres) in outback New South Wales. "It's distressing for the animals," he says. "And it's distressing for us to see." Across Australia's most populous state, at least 5m kangaroos are thought to have died gruesome deaths since one of the country's worst droughts began nearly four years ago. The crisis has prompted calls for changes to how Australia manages a national emblem.

"Roos" once shared the landscape only with Aboriginals, who hunted them for food and revered them in rock art. The arrival of white settlers, and their sheep and cattle, sparked a competition for space and resources that remains unresolved. Aerial surveys indicate Australia has more than 40m kangaroos, nearly twice the number of humans. That marks a decline of about 16m in recent years, largely due to drought. Rangelands in eastern Australia, home to millions of kangaroos, have just had their driest three-year period on record. On a recent drive Geoff Wise, a veterinarian from Dubbo, says he spotted a kangaroo dead of hunger or thirst or killed by a passing vehicle roughly every 200 metres.

Mr Wise chairs a body that recently convened a symposium about managing the kangaroo population better. State governments allow "commercial harvesting" of four kangaroo species for meat and hides. The kangaroo industry contributes about A$250m ($170m) a year to Australia's economy. George Wilson of the Australian National University reckons it could be more if farmers could see kangaroos as livestock, not as competitors for the grass and water consumed by cattle and sheep. Expanding the industry this way would bring better controls over roos' welfare, and help the environment. Kangaroos can survive on about 1.5 litres of water a day, a fraction of what cattle and sheep consume. They emit far less methane, a greenhouse gas, than cattle and sheep do. And their meat has less fat and more protein than beef or lamb.

The states typically permit licensed professionals to kill up to 15% of the total kangaroo population. Last year, for instance, the limit across the four states with the biggest number of roos was set at 7m. But for some time, the kangaroo cullers have used only a fraction of their quotas, sometimes killing just 3.5% of the population. That is because demand for kangaroo meat and hides has been falling. A campaign by animal-rights activists prompted California, once a big market, to halt imports three years ago. Mr Wilson says this has made skins "worthless", without bringing any improvement in kangaroo welfare.

Sussan Ley, the federal environment minister, attended Mr Wise's symposium and tut-tutted about the problem. Farmers complain that the federal government and the states are shirking responsibility for animal welfare. As Mr Gall notes, there is "inherent animal cruelty in allowing drought to be the main population management tool for kangaroos". ■

Keeping caps out of hands

China once stressed the importance of setting minimum wages

As the economy slows, some officials are becoming lukewarm about the policy

Print | China Dec 18th 2019

XIANG JINGUO works as a security guard in the industrial city of Shijiazhuang, 300km (185 miles) south-west of Beijing. He has long been living on just 1,700 yuan ($237) a month. He grumbles about the rising cost of food, especially the soaring price of pork. "I've become an unwilling vegetarian," he huffs. Happily for him, however, the monthly minimum wage in his city was raised to 1,900 yuan on November 1st, up from 1,650 yuan. "Now I can try going back to my normal diet," he says.

Minimum wages have long been a feature of most advanced democracies. America introduced a national minimum wage in 1938. Japan did so in 1959. China caught up in 1995 when it revised its labour law to require local governments to set a wage floor. The central government stressed the "importance and urgency" of this as a way of "protecting workers' rights".

In recent years, however, the mood has changed. Despite the rising cost of living, Mr Xiang had to endure a three-and-a-half year gap between adjustments of the minimum wage in Shijiazhuang. The law used to say that local governments must revise them every two years. In 2015 this was extended to three years, but the authorities in Shijiazhuang still dawdled. Provincial governments set different floors for each city within their jurisdiction based on such factors as the local cost of living and unemployment rates. In 2019 just eight provinces raised minimum wages, down from 15 the year before. In 2010 all but one of China's 31 provinces raised them.

To ensure that firms do not squeal, officials have tried to keep minimum wages low. Most employers observe them—a good indication that they are not too onerous. Yanan Li of Beijing Normal University estimates that only about 5-10% of Chinese workers earn less than the minimum, a smaller proportion than in most developing countries that have such a system. By taking an average of the highest minimum wages in each province, Jing Wang of York University in Canada has calculated a notional national minimum wage. She finds that the ratio of the minimum wage to the average wage has fallen sharply since 1995 (see chart), from 40% to just 26% in 2018. In the OECD, minimum wages were 42% of average wages in 2018, up from 35% in 2000.

The central government appears to want localities to use changes in the minimum wage as a way of indicating how much they would like wages in general to rise. Since China's economic growth began slowing early in the 2010s, provinces have parted company in their enthusiasm for raising the level. Inland spots such as Hebei, which are poorer than coastal areas, want to compete using their abundant cheap labour. The manpower-rich south-western region of Chongqing, where growth slowed from 11% in 2016 to 6% in 2018, waited until the last day of the three-year window before modestly increasing its minimum wages in January 2019.

Richer areas with a shortage of labour have gone the other way. Shanghai, for instance, has raised its minimum wage every year since 2010. It now has China's highest monthly wage floor, at 2,480 yuan. That is a sign it wants to move up the value chain and attract higher-wage workers.

Initially the central government stood back when local officials failed to punish companies for ignoring the rules, perhaps reckoning that strict enforcement might deter at least some firms from hiring. But in the early 2000s it grew more worried that fast-rising income inequality would cause unrest. In 2004 it began demanding tougher enforcement. The fine for firms that misbehave was raised from a fifth of the accumulated shortfall in wages paid to five times the arrears. "Full implementation" of the minimum-wage rules was needed to reduce "excessive income inequality", said the Ministry of Commerce.

In 2011 the government unveiled a new five-year plan that set a target of increasing minimum wages nationwide by at least 13% annually. The goal was achieved, but some firms, especially in poorer provinces, complained (the rises were far higher than inflation each year). In the north-eastern province of Liaoning, a leader of the chamber of commerce says his organisation tried to convince the local government to "slow down a bit". As growth slowed, companies in backward areas grumbled that big and frequent increases in the minimum wage were harming competitiveness.

In the latest five-year plan, adopted in 2016, the central government appears to have accepted this argument. The document sets no minimum-wage targets. Central officials have refrained from berating provinces for foot-dragging. In July *Economic Daily*, a state-controlled newspaper, said that those setting minimum wages should not only take into account the interests of "low earners" but also "the actual burden on enterprises".

Officials still talk about a need to reduce income inequality. But they no longer suggest that increasing the minimum wage frequently is a good way of achieving this. Mr Xiang, the security guard, says he understands why his wages are not rising faster. "The reality is that there are still too many unskilled people like me," he says. ■

Party poopers

Video blogs by critics of China's Communist Party attract many fans

Though mainly based in North America, the vloggers have audiences in China, too

Print | China Dec 18th 2019

BOOKISH AND soft-spoken, Wen Zhao never expected to become a celebrity. In Toronto, where he lives, Mr Wen is often asked for selfies by adoring fans (female ones are especially keen, he says bashfully). He owes his fame to a video blog, updated every two or three days, in which he talks in Mandarin about current affairs, often very critically of China's ruling Communist Party. His viewers are mainly ethnic Chinese living outside China. But Mr Wen, who is 45, reckons many are in China itself, where he was born and grew up.

In recent years party-controlled media have been trying to extend their influence abroad by buying up Chinese-language newspapers or reaching deals to provide them with news. But vloggers such as Mr Wen (pictured in his typical on-camera garb) are attracting huge audiences among overseas Chinese with commentary that does not follow the party line. They also appear to be penetrating the great firewall of China, as the country's system of online censorship is often known.

In one of his recent 20-minute monologues, published on YouTube, Mr Wen discussed a demonstration in late November in the southern Chinese town of Wenlou, over the building of a crematorium. Mr Wen noted that some participants had chanted "revolution of our times". This is a popular rallying cry in neighbouring Hong Kong, which has been roiled for months by pro-democracy unrest. He speculated that similar sentiment may have begun to spread to parts of the mainland.

Such views cannot be aired in China, where YouTube is blocked (as is Mr Wen's personal website, wenzhao.ca). But tech-savvy netizens in China can access Mr Wen's vlogs by using a virtual private network. Mr Wen's videos have attracted about 175m views since the launch in 2017 of his YouTube channel, or about 300,000 views per recording. He says a fifth of the audience could be in China, a belief reinforced by messages he gets from mainlanders and analysis of traffic to his site. His vlog often has more than 100 times the viewership of news items posted on YouTube by China's main state broadcaster.

Mr Wen says politics in China has boosted the vlog's popularity (except among trolls who bombard him with online abuse—possibly, he suspects, at the instigation of the Chinese government). Not long after the vlog was launched, China's leader, Xi Jinping, abolished the presidential term-limit, fuelling speculation that he would never retire. China then entered into a protracted trade war with America. The shock of both events appears to have fuelled demand among Chinese speakers for independent analysis. Other vloggers have piled in, too. There are at least a dozen people whose YouTube channels in Mandarin relating to current affairs boast more than 100,000 subscribers. Most are based in North America. Among the best-known is Guo Wengui, a Chinese businessman (also known as Miles Kwok) who fled to New York in 2014. His vlog, with a following of more than 300,000, is filled with unverified titbits of political gossip.

Party sympathisers use YouTube, too. One is Han Mei, a Canadian resident who sings the Chinese government's praises in her vlogs. In a recent recording Ms Han argued that the Chinese army had "responded appropriately" to the Tiananmen Square protests of 1989 (it massacred hundreds, if not thousands, of people). Her channel has 92,000 subscribers.

A Chinese couple in New York who go by the names Stone and Lexie run a joint YouTube channel. Stone describes it as the centre ground between Mr Wen and Ms Han. In the 20 months since its founding, the vlog has picked up 130,000 subscribers. At least some are likely to be in China. A young fan in Beijing says the couple are credible because the China they present "is neither as good as state media claim nor as bad as some foreign media suggest". Stone, however, says he is sure he would be arrested were he to return to his native country. ■

Chaguan

Communism is not what worries the world about China's Communist Party

The problem is China's actions, not that it has a politburo

Print | China Dec 18th 2019

WHAT DOES China want from the world? Some things are obvious: natural resources, foreign markets and nifty stuff, from high-end computer chips to top-notch airliners, that China cannot yet make. Then there is China's ambition, at once reasonable and terrifying, to become so strong that no other power will thwart its core demands. China has less obvious wishes, too. A surprisingly pressing one is a demand for foreign powers to recognise the "legitimacy" of its Communist Party. Though it may baffle outsiders, when Chinese grandees meet foreign visitors the question of legitimacy comes up, time and again. The words vary, but their meaning is something like: will America and the self-righteously democratic West ever accept that the party provides the best and most fitting government for China, with a mandate strengthened by the country's rising global stature, economic growth and domestic stability? Chinese diplomats voice the same grievance whenever they hear international criticism. China, they protest, is being singled out for suspicion because it has a different political system, led by a communist party.

If this seems an obscure fight to pick, history teaches the world to beware. A well-connected Chinese scholar who lives and teaches in Europe, Xiang Lanxin, has written a book ascribing centuries of East-West tensions, including several crises in relations, to Westerners who condescendingly dismiss China's rulers, whether imperial or communist, as "oriental despots". He says they have failed to grasp how Chinese leaders must earn their right to rule through deeds and accomplishments, at the risk of overthrow if they are truly tyrannical. Mr Xiang is no apologist for today's party leaders. Though an avowed Chinese patriot, he is scathing about the corruption enabled by one-party rule. He believes that modern-day income inequalities make a nonsense of claims by party bosses to be reviving traditional, Confucian ethics. In a vivid passage, he compares Beijing's political scene to the last days of the Russian tsars, "with charlatans and sycophants running amuck". Still, his book, "The Quest for Legitimacy in Chinese Politics, A New Interpretation", is an invaluable guide to the feelings of hurt and injustice that consume those same ruling classes now.

A political scientist and historian at the Graduate Institute of International and Development Studies in Geneva, Mr Xiang devotes many pages to a crisis three centuries ago. Then the consensus view of China changed among European elites, just as dramatically as it is changing now in Washington and other Western capitals. The cause was an arcane theological dispute known as the "Chinese rites controversy". To simplify, this was an argument about whether Chinese converts could be good Christians if they continued to pay solemn respects to their ancestors and to Confucius, a sage particularly revered by scholars and officials. Mr Xiang praises Jesuit missionaries who travelled to China in the 16th and 17th centuries, painstakingly learning Chinese and studying Confucian classics in a spirit of cultural "accommodation".

Those Jesuit scientist-adventurers reported to Rome that China was a brilliant civilisation whose traditions of ancestor worship and Confucian ethics were not pagan religious rites, but customs compatible with Christian monotheism. With disastrous results for those envoys, hawks back in Europe disagreed. Mr Xiang draws explicit parallels between religious hardliners back in Europe who attacked those Jesuits for being overly tolerant of Chinese traditions, and modern-day critics who chide China for falling short of values that the West calls universal. In 1692 the Kangxi emperor was so impressed by his Jesuit guests that he issued an edict of toleration, blessing the presence of Christian Europeans in his empire. But within half a century Christianity had been banned and most missionaries expelled. The rupture was provoked by papal rulings that ancestor worship and Confucian rites were pagan idolatry. It was an unanswerable charge: the crime of Confucius-revering Chinese converts was to be un-Christian, as defined by the church in Rome. Mr Xiang argues that those taxing China with being undemocratic are using a similar trick: defining legitimacy in a way that makes it unattainable by rulers who are not Western-style democrats.

That does not make Mr Xiang or grumbling Communist Party officials correct, though. They urge the world to judge China's rulers by their achievements, not their political system. But that is exactly what most foreign governments do, to a fault. Even in the immediate aftermath of the murderous suppression of pro-democracy protests in 1989, America's then-president, George H.W. Bush, secretly wrote to assure China's leader, Deng Xiaoping, that his aim was to preserve close ties, adding: "I am respectful of the differences in our two societies and in our two systems." If Western leaders were really unable to abide communists, America and its allies would not be investing in and even helping to arm Vietnam, as a strategic partner in Asia.

Engage with the sinner, hate the sin

Today, it is true, hawks in Washington charge previous American governments with wishing away China's authoritarianism and resistance to change. To quote the secretary of state, Mike Pompeo: "We accommodated and encouraged China's rise for decades, even when that rise was at the expense of American values, Western democracy, security and good common sense." But his boss, President Donald Trump, does not deem China's rulers illegitimate. He says he does not blame them for taking advantage of America's past stupidity and calls President Xi Jinping an "incredible guy".

Chinese demands for respect are in part a ploy, a passive-aggressive bid to browbeat foreign critics into silence. But to meet officials in Beijing is to hear a regime talking itself into a funk about how America and its allies cannot bear to let a system like theirs succeed. That is mostly bogus. The problem is China's actions, not the fact that it has a politburo. But the risks of a rupture are real. ■

Making up is hard to do

The Gulf states reconsider their feud with Qatar

The threat of Iran is leading to some newfound realism

Print | Middle East and Africa Dec 18th 2019

WALKING ONTO a football pitch hardly seems an act of high diplomacy. But two and a half years into the embargo of Qatar by three Gulf neighbours—Bahrain, Saudi Arabia and the United Arab Emirates (UAE)—it may count as progress. The three had planned to boycott the annual Gulf Cup because it was being held in Doha, the capital of Qatar. In November, though, they changed their minds, and on December 2nd the Emiratis took the field against the Qataris. The Emiratis lost 4-2. Adding insult to injury, the defeat came on their national day, which marks the unification of several emirates into the UAE. Still, the match ended amicably enough, a far cry from an Asian Cup tilt in January, when the victorious Qatari squad was pelted with shoes and bottles by the crowd in Abu Dhabi, the capital of the UAE.

The embargo, imposed in June 2017, has divided families, diverted planes and caused a deep rift in the six-member Gulf Co-operation Council (GCC). Qatar refuses to comply with a list of demands from the Saudi-led camp, such as cutting ties with Islamist groups and closing Al Jazeera, a satellite news channel. But there are growing signs that some of the blockading states want to end the feud anyway. Apart from the football diplomacy, Saudi Arabia and Qatar have held quiet talks about a resolution. On December 10th Qatar's prime minister flew to Saudi Arabia for a GCC summit, the emirate's highest-level representation in two years. No one expected it to produce a deal, but Qatar's foreign minister said it broke a long "stalemate".

To understand why, look across the Gulf to another intractable conflict, the one between Iran and its Arab neighbours. Their long cold war has escalated into overt hostilities. President Donald Trump's economic sanctions, meant to bludgeon Iran into softening its regional policies, have instead made it more belligerent. The feud with Qatar seems more and more a needless distraction, one that has forced the Qataris to deepen their political and economic ties with Iran. There is no newfound love between Qatar and its Gulf neighbours, but there is a newfound realism.

A turning-point came on September 14th, when missiles rained down on two oil facilities in Saudi Arabia's eastern desert. Half of the country's oil output—5% of the world's total—was briefly knocked offline. America and Saudi Arabia saw Iran's hand behind the attack (though a United Nations panel said in December that it found no definitive link). Yet it passed without an overt American response.

In public, Saudi officials insist they still trust their longtime friend. "We don't see this concept of America as receding. Quite the contrary," says Adel al-Jubeir, the minister of state for foreign affairs. America did deploy an additional 3,000 troops to Saudi Arabia after the attack. Whether Mr Trump would use them to defend the kingdom is another matter. Privately, Saudi officials fret that the American security umbrella seems full of holes. Worried that further attacks might spoil the initial public offering of Saudi Aramco, the state oil giant, they began talking to Iran through intermediaries this autumn. They are also trying to wind down a war in Yemen against Iranian-backed Houthi rebels that has cost the kingdom dearly and left Yemen even less stable than before.

If the Gulf states feel vulnerable, they believe Iran feels the same way. A rise in fuel prices triggered a week of fierce nationwide protests in November. Hundreds of people were killed in the ensuing crackdown, the bloodiest unrest since the birth of the Islamic Republic in 1979. Abroad, Iran looks overstretched. The protests sweeping across Iraq and Lebanon are not, as hopeful American and Saudi officials insist, simply a revolt against Iranian influence. Citizens of both countries have a long list of grievances. But they have directed some of their anger at Iran's closest regional allies. Iraqi protesters want an end to Iran's meddling in their politics. Many Lebanese are bitterly disappointed in Hassan Nasrallah, the leader of Hizbullah, the Iranian-backed militia and political party, who has smeared protesters as foreign-funded agents.

Sometimes it's personal

Talking is one thing; making deals is another. For a start, the Gulf states are not a monolith. Saudi Arabia may be willing to forgive Qatar its transgressions. The UAE is less keen to: it views political Islamists (whom Qatar supported for years) as a grave threat. The Emiratis insist there is no daylight between them and the Saudis. Anwar Gargash, the minister of state for foreign affairs, says any talk to the contrary is Qatari disinformation meant to "split the ranks". Again, though, officials take a different tone in private. Diplomats also point to personal animus between the leaders of Qatar and the UAE.

Hopes for a deal with Iran are even more fanciful. Faced with dissent at home, the Iranians are likely to see any concessions abroad as a show of weakness. Qassem Suleimani, the architect of Iran's regional policy, spent weeks in Iraq this autumn helping to co-ordinate a ruthless crackdown on protesters. Nor is Mr Trump likely to ease his "maximum pressure" campaign,

despite a prisoner swap between the two countries in December. “See, we can make a deal together,” Mr Trump tweeted afterwards. Then his administration imposed sanctions on Iran’s largest shipping company and airline.

The next year or so could bring a change of leaders in America and, perhaps, Saudi Arabia. The Iranian president, Hassan Rouhani, will be a lame duck in his final full year in power. Football matches and furtive messages are a start. But it will probably take deeper political changes to break the Gulf’s years-old impasses. ■

Mercy for the mighty

Two years in a rest home for Sudan's former tyrant

Accused of genocide, Omar al-Bashir is found guilty only of corruption

Print | Middle East and Africa Dec 18th 2019

FOR NEARLY three decades Omar al-Bashir's regime butchered and plundered. Since 2010 the former Sudanese president has evaded an arrest warrant from the International Criminal Court (ICC) for war crimes and genocide in the Darfur region. In Khartoum his Islamist government would flog women for wearing trousers and kill protesters in the streets. After he was ousted in a coup in April, leaving behind an economy in crisis and a country awash with armed groups, many hoped he would spend the rest of his life behind bars.

On December 14th a Sudanese court convicted Mr Bashir, aged 75, of money-laundering and corruption after $130m was found in suitcases in his home. But he was sentenced only to two years in a "reform facility" after the court said he was too old to go to prison. One commentator in Sudan said it had, in effect, put him in a nursing home. Residents of Darfur dismissed the verdict as the work of a "political court", says Mohamed Haggar of the region's human-rights commission. The Sudanese Professionals Association (SPA), a civil-society coalition that spearheaded the protest movement leading to Mr Bashir's fall, welcomed the ruling but said it was "certainly not the end of the day".

In Sudan the task of bringing powerful people to justice is an especially fraught part of a delicate democratic transition. For now, says Jonas Horner of the International Crisis Group, a think-tank, the interim government appears to be "trying to avoid rocking the boat". In his verdict the judge noted that Mr Bashir's regime had in the past executed someone for the same crime. By contrast, institutions including the judiciary have acted with restraint since Mr Bashir's overthrow, notes Harry Verhoeven, the author of a book on Sudan. Respecting a law that prohibits jailing people over 70 is one sign of this. So is the government's decision to put Mr Bashir on trial for corruption before dealing with graver charges, such as crimes against humanity.

The former president will soon find himself in the dock again. He has been charged with ordering the killing of protesters and recently appeared in court over his role in the coup that brought him to power in 1989. Sudan is also pondering whether to hand him over to the ICC in The Hague, as survivors of the genocide in Darfur demand. Abdalla Hamdok, an economist who now leads the government, has signalled that he would like to do so. But Lieutenant-General Abdel Fattah al-Burhan, who heads the 11-member Sovereign Council which oversees the largely civilian administration, has refused.

The disagreement reflects a tug-of-war between generals and civilians in the transitional government. The civilians think that Sudan's judiciary is ill equipped for such a complex and expensive case. They also want to mend Sudan's relations with the wider world, which would be helped by its co-operation with the ICC. But many of the generals would prefer to keep control of the judicial process for fear that, abroad, their former boss might reveal information that would damage them. General Burhan, for instance, is accused of co-ordinating army and militia attacks in Darfur at the height of the conflict in the early 2000s.

Equally hard will be holding anyone accountable for the slaughter of more than 100 protesters in Khartoum in June by the Rapid Support Forces (RSF), a paramilitary group. An inquiry set up in September is due to report its findings this month. The RSF's leader, Muhammad Hamdan Dagalo (known as Hemedti), is General Burhan's deputy on the council and is widely believed to be responsible for the bloodshed. "Everybody knows Hemedti was in it with all his ten fingers," says a foreign diplomat. But many question the independence of the committee leading the inquiry and expect it will stop short of blaming Mr Dagalo.

That may be because Mr Dagalo commands about 40,000 armed men and could derail the transition if threatened. "In government there is a preference for stability over divisive, if just, verdicts," says Mr Horner. For now the old regime's many victims may have to put up with Mr Bashir spending a few months in a rest home. They will not be satisfied. ■

Trial and errors

A warlord's trial aims to end impunity in Congo

Ntabo Ntaberi Cheka is accused of mass rape and other atrocities

Print | Middle East and Africa Dec 18th 2019

THE SMALL figures hidden under green cloaks shuffle forward and give their testimony through a voice-distorting funnel. "We were taught how to take a woman by force," says one boy who was abducted while walking home with his mother. Another says he was recruited at the age of nine and given medicine to enable him to rape women. All are giving evidence in the trial of Ntabo Ntaberi Cheka, a warlord from eastern Congo who faces charges of recruiting child soldiers, mass rape and other atrocities.

The trial has been hailed as a step towards reducing violence and ending impunity for warlords in a part of the Democratic Republic of Congo that is still largely overrun by militias. Yet it also highlights the difficulties of bringing justice to a weak state in which conflict rages.

Witnesses are too frightened to testify openly in the trial, which is taking place in Goma, a city just 130km from Mr Cheka's former stronghold. Many of his troops are still at large. The UN is trying to help by putting witnesses up in safe houses or by regularly checking in on them. But not all have been well protected. One woman, who was raped by three of Mr Cheka's soldiers in front of her young children, says that shortly after she appeared in court a stranger turned up at her door and asked why she would want to "talk badly" about her "brother Cheka". Too frightened to go out, she has stopped selling vegetables and now has no income.

One former child soldier says that days before he was supposed to appear in court he received a menacing phone call, allegedly from Mr Cheka himself. That is less implausible than it sounds: the warlord has easy access to a mobile phone in jail. He has other surprising privileges, such as being allowed to have his wife visit to cook for him over a portable stove in his cell.

The former child soldier decided to testify anyway. But he is one of a brave few: only 14 witnesses have dared to show up in court. The boy who was taught to rape at the age of nine told the judge that he had come to testify because: "I want justice to deal with the person who mistreated us during our childhoods and to encourage other children like me to leave armed groups."

Slouched on a bench in his cell, Mr Cheka denies doing any wrong and says that the witnesses are lying. Yet prosecutors and human-rights groups have assembled a long list of charges. Among them is the allegation that in a days-long raid in 2010 his men, along with those of two other militias, raped 387 women, men and children. UN investigators said the violence was to punish locals for supporting government forces.

Despite the trial's flaws, the mere fact that Mr Cheka is in the dock is a victory. Warlords in Congo are rarely punished. Most are given senior positions in the army if they agree to switch sides. Five rebel leaders have been sent to the International Criminal Court in The Hague. Last month one of them, Bosco Ntaganda, who is known as "The Terminator", was sentenced to 30 years in prison for war crimes and crimes against humanity. He is appealing against the conviction and sentence.

Crucially, Mr Cheka's trial is being held before a Congolese judge in a city close to the villages where his troops once paraded severed heads on poles and hung women's insides from trees. News that he has been locked up and is facing justice has already trickled back to those he terrorised. It may also deter other militia leaders from committing crimes. "Cheka was one of the most feared warlords in the country," says Elsa Taquet from Trial International, an NGO that is supporting the victims' lawyers. "We have seen him crumble." ■

Adventurous spirit

Elephant dung is fuelling South Africa's gin boom

Sales have jumped by 54% in a year

Print | Middle East and Africa Dec 18th 2019

YOU MIGHT think that elephant dung is best kept far away from gin, which most people find tasty enough served with tonic water and a slice of lime. Not so, say Paula and Les Ansley, South African distillers who infuse theirs with pachyderm poo to capture "the textures and flavours of the African bush" and sell it for 659 rand ($46) a bottle. Indlovu gin may be aimed primarily at those with an "adventurous spirit", but it is only the latest splash of ethanol on a market that has caught fire. In 2018 South Africans sipped 54% more gin than the year before, reckons IWSR, a research firm.

Meeting this demand are dozens of new firms. At the inaugural SA Craft Gin Awards in August there were 110 entries. "For decades we have been drinking many imported British gins," says Jean Buckham, who runs The Gin Box, a subscription service that deals exclusively in South African craft gin. "Until recently, we had never really South Africanised it." In 2015 there were fewer than a dozen gin distilleries. Now there are 50, of which 30 are in the Western Cape. Part of the region's attraction is its wealth of "botanicals", or natural flavourings, which make each gin taste different. Inverroche, one of the pioneers of South Africa's craft industry, uses fragrant fynbos shrubs. It makes 18,000 bottles a month and exports to 17 countries.

Three factors explain South Africa's boom. The first is that gin is becoming more popular everywhere. Consumption increased by 8% around the world and 52% in Britain in 2018. Another was a liberalisation of licensing laws after the end of apartheid in 1994 that made it easier to start a distillery and for non-whites to consume the same types of alcohol as whites. (Under the racist regime it was hard for black South Africans to go to liquor shops to buy "white" booze; instead they went to informal boozers called *shebeens*.)

The last is that producers of South Africa's more famous drink, wine, are struggling. A gin distillery can be set up in a warehouse; a vineyard needs sun, water and land. Across the Western Cape vintners are wrestling with recent droughts, contested land claims and weak prices. BDO, a consulting firm, reckons that only half of vineyards are making money.

Even as posh new craft gins generate a buzz, most South Africans stick to the cheaper stuff. Gins that cost more than 225 rand a bottle account for just 6% of sales. But for those who can afford to splash out, the delights of elephant dung and tonic await.

Oh give me a home

Finland has slashed homelessness; the rest of Europe is failing

Giving the homeless shelter is cheaper than dealing with the consequences of rough sleeping

Print | Europe Dec 18th 2019

TUYA'S COLLECTION of bongs occupies an entire bookshelf in her immaculate little flat, though she does not smoke marijuana—she just likes the way they look. Her weaknesses, alcohol and pills, landed her in a homeless shelter in Helsinki for three years. But since 2018 she has had an apartment of her own, thanks to a strategy called "housing first" with which Finland has all but eliminated homelessness.

Akbar has no such luck. Last month the Afghan migrant stood in the mud of a camp outside Paris, brushing his teeth at a hose that served as a communal shower. For two months Akbar had been living in a tent city of 3,500 Asian and African migrants, hoping to apply for refugee status.

Tuya and Akbar are at opposite ends of Europe's growing homelessness problem. Finland is the only European country where the numbers are not rising. In other rich welfare states, escalating housing costs are pushing more people into homeless shelters. In countries with weak social services, many end up on the street. And everywhere, migrants with the wrong papers fall through the cracks.

Statistics on homelessness are patchy, but dispiriting. In 2010-18 the French government doubled the spaces in emergency accommodation to 146,000, yet cannot meet demand. In Spain the number in shelters rose by 20.5% between 2014 and 2016. In the Netherlands homelessness has doubled in the past decade. In Ireland, the number in shelters has tripled. The German government estimates homelessness rose by 4% in 2018 to a record 678,000, most of them migrants. All this has thrown a spanner into governments' plans. For years, they have been trying to shift from providing beds for the night to housing-first strategies like Finland's. Instead they are struggling to keep people off the streets.

The housing-first approach got its start in North America in the 1990s. Previously social-service agencies used a "staircase" model: to qualify for a subsidised flat, homeless people first had to control their behavioural problems (such as addiction, petty crime or mental illness). In the meantime they had to sleep in shelters.

But being homeless makes it hard to quit drugs or crime. Shelters are often dangerous, because they are full of desperate people. Some homeless folk prefer to sleep rough, though that is risky. Street sleepers are often robbed and often get ill. When American and Canadian cities tried first giving homeless people a place to live and then working on behavioural problems, the approach saved more money on police, jails, shelters and health care than it cost.

In 2008 Finland became the first European country to embrace housing first. The number of long-term homeless has since fallen by 21% to about 5,500. (This includes those in shelters; the number sleeping rough in Finland is negligible, as they would die of cold.) Chronically homeless people were shifted from hostels to flats with contracts under their own names. They pay rent with the help of government benefits. The government saves €15,000 ($16,500) per year in overall spending on each homeless person it houses. Hostels can be counterproductive, says Juha Kaakinen of Y-Foundation, the country's biggest social-housing group: they "create a kind of culture of homelessness".

The complex where Tuya lives, run by the Salvation Army, is classified as "supported housing". There are 20 staff for the 87 residents. Each flat has a kitchen, and there is a jolly communal café. Social workers keep track of each resident's problems and run work activities. Every year a few graduate to less dependent housing, but expectations are modest, says Antti Martikainen, the complex's director. Persuading a troublesome resident to stop dropping rubbish out of the window is a win.

All this takes resources. Finland has hired hundreds of new social workers. In 2017 it built more subsidised public housing for low-income renters (over 7,000 units) than England, with a population one-tenth the size. Still, in a small, wealthy country to which few poor people move, it appears that homelessness is solvable.

Can big countries do the same? In France, the national emergency shelter hotline (number 115) gets 20,000 calls per day. Paris's annual "solidarity night", when volunteers systematically scour the city to count everyone sleeping rough, found 3,622 people in February this year.

The poor face rising rents and precarious employment, says Bruno Morel of Emmaüs Solidarité, a housing organisation. Each year from November 1st to March 31st France bars landlords from evicting tenants, and this year the Paris region created an extra 7,000 temporary winter shelter places. But Mr Morel says it needs 10,000.

Another problem is the split between native homeless, for whom municipalities are responsible, and migrants, who fall under the national government. Dominique Versini, Paris's deputy mayor for solidarity, blames the state for the migrant camps:

when the city tried to set up a reception centre to house them, she says, the government blocked it. (In November it closed the camps and moved the migrants to temporary shelters farther out.)

Anne Hidalgo, the Socialist mayor, converted the reception hall of Paris's Hôtel de Ville into a shelter for 39 homeless women. Visiting dignitaries brush shoulders with women recovering from addiction and abuse. Ms Hidalgo has also strengthened Paris's rent controls. The move keeps current homes cheaper but may discourage private firms from building new ones. The city is building 7500 new social-housing units a year, but Mr Morel says too few are for the very poor.

Germany is more proactive at sheltering migrants than France. But its public housing stock has shrunk dramatically: houses built with government aid can be freely sold or rented out after 30 years. Berlin, which had 360,000 social-housing units in the 1990s, now has just 100,000. Rents have doubled in the past decade. As in Paris, the city government has capped rent increases.

Europe's homelessness problem combines two issues. Public-housing construction has slowed, and rents are rising fast, because red tape makes it so hard to build in many cities. Meanwhile, illegal immigration creates a homeless population many countries are unwilling to house. That is sabotaging the shift to housing first. France, Germany, Italy, the Netherlands and others have all committed to the policy. But their programmes remain a patchwork of local initiatives and pilots. "Why pilot it when you know that it works?" asks Mr Martikainen, the director of Tuya's building in Helsinki. In most of Europe, things are not so simple. ■

iSpyware?

Russia presses Apple to install Kremlin-approved apps

Can the iPhone maker stand up to Vladimir Putin?

Print | Europe Dec 18th 2019

WHO WILL win the tussle between Apple, the world's biggest company, and Vladimir Putin, an autocrat with nuclear weapons? On December 2nd Russia's president signed a controversial law that will prohibit the sale within Russia of devices that do not come pre-loaded with locally produced applications. The legislation, which will come into force next July, has been dubbed the "law against Apple", as it disproportionately affects the tech giant, known for its insistence on keeping tight control of the apps it allows on its devices.

The law's sponsors have described it as a way to protect Russian internet companies, as well as to help elderly citizens who may find smartphones difficult to use, though it is not yet known which Russia-made apps will have to be installed. Local digital-rights activists like Artem Kozlyuk are worried, saying that these apps could "secretly collect information: location, tools and services being used and so on". The apps can be deleted, but only if users know to do that—and there are suspicions that they might leave behind backdoors into users' phones after they are gone.

The legislation follows another recent law promoting a "sovereign internet"; from November 1st the government has awarded itself the power to sever the Russian internet (known as the "RuNet") from the rest of the globe. This is worrying for many local internet activists and experts, even though there are doubts that current network infrastructure could support it. Even before that, in the name of data protection, websites that refuse to build data servers on Russian territory, including LinkedIn, have been blocked. And this week the Russian authorities alarmed techies by raiding the Moscow offices of Nginx, an American-owned web-server company in dispute with a Russian one. The Apple showdown may be intended as a lesson to other giants, particularly Google (which owns YouTube) and Facebook; these companies present grave challenges to the Kremlin's monopoly on information.

Apple officials may think the Russian market too small to be worth the policy change, but the company has recently proved willing to make another controversial concession. Starting in late November, Apple's maps and weather apps, when used inside Russia, have denoted the Crimean peninsula, Ukrainian territory illegally annexed by Russia in 2014, as Russian. Even when used outside Russia, the weather app shows Crimean cities without (unusually) stating which country they are in, while Apple maps introduces a mysterious dotted line dividing the peninsula from the rest of Ukraine.

Apple may have offered this olive branch in the hope of smoothing relations with Moscow, but its actions have contributed to a growing sense of insecurity in Ukraine, where the foreign minister, Vadym Prystaiko, has accused Apple of "not giving a damn" about his country. A spokeswoman for Apple says that it is "taking a deeper look at how we handle disputed borders". But a group of European parliamentarians has lodged a formal complaint and damage has already been done to the company's reputation.

Unlike Facebook and Google, Apple had mostly avoided political scandal until now. It has six months to decide whether or not to quit the Russian market. The world, and Ukraine, will be watching to see if it caves in to the Kremlin's demands. ■

A useful stick

Christians are persecuted in many places. Autocrats exploit this

Viktor Orban and Vladimir Putin blame liberals in Europe

Print | Europe Dec 18th 2019

"OUR CRIES have not been heard by many," said Ignatius Aphrem II, patriarch of the Syriac Orthodox Church, in November. He was at a conference in Budapest on the persecution of Christians, and he spoke for those in the Middle East who had been pushed from their homes, forcibly converted or killed. Despite such suffering, he lamented, "very few tangible steps have been taken." There was an exception to the general apathy, however: Hungary, the conference's host, which he praised for its "unwavering commitment" to Christians in need.

The Hungarian government declared this year that it is "taking responsibility for all of the world's Christian communities". Since 2016 it has created a high-level position dedicated to Christian-persecution issues; set up Hungary Helps, a foreign-aid agency that has reportedly given 90% of its assistance to Christians; and founded the International Conference on Christian Persecution, which representatives from 40 countries attended in late November. Driving the push is Viktor Orban, the prime minister, who bills himself as a defender of Christianity both at home (by rejecting Muslim people and Western liberalism) and worldwide (by sending aid to Christians abroad). His closest ally in this crusade is Russia's president, Vladimir Putin, who has said that Russians watch the plight of Christians in the Middle East "with tears in our eyes".

Christians are undoubtedly at risk. The Pew Research Centre found that, in 2017, they were harassed in every Middle Eastern country, either by the state or by other groups. Increasingly, strongmen are using persecuted Christians as "instruments in a larger political conflict", says Marie Juul Petersen, a researcher at the Danish Institute for Human Rights.

For nationalist leaders, the cause has much appeal. To stir up Hungarian voters, Mr Orban likens European Christians facing the "muzzle of political correctness" to Middle Eastern ones facing death. Internationally, meanwhile, he and others blame Western liberal democracies for failing to stand up for oppressed Christians. Some suggest that liberal leaders are too cowardly to do so. Others hint at something darker. Mr Orban speaks of "a mysterious force" that "shuts the mouths of European politicians and cripples their arms" to act on the issue. Sergei Lavrov, the Russian foreign minister, says Europe "shamefully renounces its Christian roots". And in September, at a UN panel on Christian persecution, co-hosted by Brazil and Hungary, the Philippines' foreign secretary asked ominously: "Hear anything from Wall Street? Nothing. Lombard Street? Even less."

According to these men, couching Christian rights in broader religious-freedom language, as is common in Western countries, does not count. Central to their argument is a widespread refrain, repeated not just by Mr Orban but also by Germany's chancellor, Angela Merkel: that Christians are the most persecuted religious group in the world. This statement is hard to verify, according to Katherine Marshall of Georgetown University. Varied definitions of persecution, hard-to-reach populations and overlapping religious and ethnic identities all complicate data-gathering.

Anyway, there is little evidence that Hungary's style of Christian-centric aid is especially helpful even to Christians. Much of it has gone towards individual building projects—about $1.7m to restore churches in Lebanon, and another $450,000 to a school for displaced children in Erbil, the Kurdish capital. The overall amount of aid Hungary gives to persecuted Christians is "meagre", says Balazs Szent-Ivanyi ofAston University. The government has claimed it totalled a modest $40m over three years.

The most serious harm that Mr Orban and his ilk do to the Christians they claim to champion is to corrode the idea of religious freedom itself. Helping illegal immigrants in Hungary can get you imprisoned for a year, and being a Jehovah's Witness in Russia can get you tortured. Christianity's loudest defenders are not very Christian. ■

A nice cuppa taxpayers' cash

Why Turkey subsidises organic tea

It costs more and uses more land, but maybe foreigners will buy it

Print | Europe Dec 18th 2019

THERE IS SO little Turks agree on these days that even settling on the country's national drink is hard. Secularists pick *raki*, a tipple best had with grilled fish and music. Religious conservatives, including President Recep Tayyip Erdogan, insist on a milky and non-alcoholic drink called *ayran*.

A good thing, then, that there is tea, around which all can unite. An average Turk gets through about 3.5kg (7.7lb) of tea every year, or almost four glasses a day, ahead of every other country including Britain, India, China and Russia. Turkey is also the world's sixth-biggest producer of the leaf. No one has ever entered a house or a government office in Turkey without being offered a glass. (Cups are for coffee, or for tourists.)

Now change is brewing in an ancient industry. The government is offering subsidies to tea farmers who go organic, hoping that well-heeled foreigners will then pay more for Turkish tea. The state tea company, Caykur, the country's largest producer, will convert entirely to organic farming by 2023, modern Turkey's centenary.

At one of the company's factories near Rize, a drab city bordered on one side by the sea and by mountains draped in green carpets of tea on the other, the manager, Koksal Kasapoglu, says the policy has already yielded results. Organic production at Caykur has shot up from under 100 acres a decade ago to about 10,000 today, about 5% of the total area under cultivation, he says.

Tea owes its popularity in Turkey largely to price. In the second half of the 19th century, when tea arrived in the Ottoman empire, the economy was in decline. Many Turks chose the new drink over coffee, which they had been sipping for centuries, but which had become hard to afford.

Price is just as important today. Partly because organically grown tea requires more land to produce the same amount of crop, it costs roughly twice as much as the standard kind. Taxpayers' cash can no doubt persuade many farmers to go organic. But with the economy sputtering, convincing Turkish tea-drinkers to buy the stuff will be harder.

Charlemagne

France's complicated relationship with Christmas

Carols and nativity scenes are barred from public property—except in Strasbourg

Print | Europe Dec 21st 2019

STRUNG ACROSS the cobbled street, between half-timbered Alsatian houses, the festive white lights pronounce: "*Strasbourg, capitale de Noël*". In the run-up to Christmas, every façade of this town tucked up against France's border with Germany seems to sparkle. The sweet smell of gingerbread and cinnamon-tinged *vin chaud* hangs in the air. In the courtyard of the 18th-century Palais Rohan, now a municipal museum, a life-size wooden *crèche* (nativity scene) has been installed, complete with real bleating sheep. The town hall has illuminated giant angels with trumpets above the narrow street that leads to the cathedral.

Strasbourg at Christmas captures Europe's festive enthusiasm as well as its diverse heritage. The town blends the Catholic tradition with the Protestant. It is as proud of its many *crèches*, whose pre-Reformation roots reach back to medieval times, as it is of its Christmas trees, which legend says Martin Luther introduced in the 16th century. Indeed Strasbourg is said to be the birthplace of the first decorated tree, in 1605, adorned then with roses, apples, wafers and sweets. Closer to Munich than it is to Paris, annexed by Germany in 1871 and 1940, Strasbourg reflects the Germanic. Locals call the Christmas market, founded in 1570 and one of the world's oldest, *Christkindelsmärik*. With its Provençal clay *crèche* village figures (*santons*), and Scandinavian bearded gnomes (*tomte*), the market embraces the Mediterranean and the Nordic too.

These days Christmas time in this town, as elsewhere in Europe, also has a strong secular pull. Strasbourg in the festive season in reality mixes the commercial and the spiritual, as tacky plastic ornaments and winking Father Christmas figures compete for attention with the crucifix and holy child. A massive 2m visitors, of all faiths, crowd into the town in December every year. One of the five people murdered in a terrorist attack near the Christmas market a year ago was a local garage mechanic of Afghan origin, who had been visiting the market with his family.

Strasbourg's unapologetic embrace of Christmas, in other words, locates it at the intersection of many of Europe's traditions. Yet if there is one country in which the town's relaxed approach to religion feels in reality distinctly odd, it is France. Elsewhere in the country, French town halls hang lights that wish their citizens a secular *joyeuses fêtes*, or happy holidays. No French state school is allowed to hold a nativity play or carol service, just as no French town hall can display a nativity scene. When the far-right mayor of Béziers, Robert Ménard, installed a *crèche* in his town hall, it was ruled illegal and he was ordered to take it down. This weekend, after a nativity performance outside a church in Toulouse was disrupted, the archbishop deplored the fact that "a simple reminder of the birth of Jesus…is no longer respected in our country."

France's strict form of secularism, known as *laïcité*, was enshrined in law in 1905 after a long struggle with the Catholic church. Today 54% of the French say they are Catholic. This doctrine protects their private right to religious expression. But it also keeps religion separate from public life. It was these principles that led France to ban the Muslim headscarf from state schools, as well as the crucifix and other "conspicuous" religious signs.

Strasbourg, by contrast, like the surrounding Alsace region, enjoys a derogation under the Napoleonic Concordat of 1801, which survives to this day. Four faiths—the Catholic, Lutheran and Reformed churches and Judaism—are established religions in the region. Public schools teach religious studies. Religious ministers are paid by the state. The town hall contributed to the financing of the city's grand mosque. The French president even officially appoints the archbishop of Strasbourg.

For those in the rest of France brought up on *laïc* law, Strasbourg's relaxed approach to religion, like its town hall's involvement in Christmas, is startling. For France is periodically consumed by a divisive row of one sort or another about religious expression. If it is not over a municipal nativity scene then it is about an attempt to ban a parent from accompanying a class trip while wearing the Muslim veil. The line between the secular and the sacred in France is a constant source of contest and conflict.

It does not automatically follow, of course, that Strasbourg is spared religious trouble. On the contrary, the terrorist responsible for the attack in December 2018, Chérif Chekatt, was Strasbourg-born. A local network actively recruited jihadists to head to Syria to fight for Islamic State. The region has rooted extreme-right and neo-Nazi fringe groups, and periodically suffers anti-Semitic acts. Officials are particularly concerned about overseas Turkish influence in the town. "There are many hidden tensions in Strasbourg," says Hakim El Karoui, author of a report on French Islam for the Institut Montaigne, a think-tank. He argues that part of the problem is precisely that Islam, unlike other faiths, does not enjoy the same status as the (locally established) religions.

O come, o come, Emmanuel

Yet the tie between Strasbourg's town hall and its religious authorities points to a less abrasive link between the political and the spiritual. Officials and clerics talk often, and know one another. To mark Ramadan, the town hall hosted an *iftar* dinner on its premises—unthinkable elsewhere. Christophe Castaner, the interior minister, who attended another *iftar* dinner, called such events "an inspiration for the whole of France".

Elsewhere in the country, a nativity scene built by a far-right mayor constitutes provocative identity politics. Strasbourg's version, by contrast, is regarded as "normal and natural", says Murat Ercan, a leader of Turkish origin at the regional Muslim council. "We shouldn't be naive, there are real difficulties," says Nicolas Matt, in charge at the town hall of the link with religious leaders. "But we believe in celebrating difference. The fact that we talk to each other means that we know how to talk about religion, and that gives us a common language." *Joyeux Noël*. ■

What's the story, northern Tories?

Who are the Conservatives' new voters in the north?

And how can the Tories keep their loyalty?

Print | Britain Dec 18th 2019

AFTER SECURING the biggest Conservative majority in a generation, there was only one place for Boris Johnson to take a victory lap: Sedgefield. The seat, a former mining community with a mixture of market towns and well-off suburbs on the edge of Teesside, had been Labour since 1935. It came with the added bonus of once being held by Tony Blair. "I know that people may have been breaking the voting habits of generations to vote for us," said Mr Johnson, managing to speak soberly while dancing on Mr Blair's political grave. "I will repay your trust."

About 1m habitual Labour voters backed the Conservatives in the election on December 12th, according to Datapraxis, a data-analysis company. The upshot was that a wall of seats across the north and the Midlands that had not voted Conservative in decades—or ever—fell to Mr Johnson's party. Redcar, a Teesside town whose steel mill shut down four years ago under the Conservative government, swung by 15 points from Labour to the Tories. The Black Country turned blue, with Mr Johnson gaining seats in Wolverhampton and West Bromwich. In all, the Conservatives won 54 seats from Labour. Now comes the trickier task: keeping them.

The first step is to work out who these new Tory voters are. An area of 25,000 square miles (65,000 square km) with more than 25m people is not homogenous, but a few common threads emerge. Most gains came from Leave-voting towns on the edges of more successful cities. The Conservatives cleaned up among blue-collar workers. There was a direct relationship between the size of the swing to the Tories and the number of people in blue-collar jobs. Many of the gains came in places that are poorer than typically Tory areas. Going into the election, the average hourly wage in a Tory-held seat was £15.40 ($20.30); in the seats it won it is around £13.70, according to the Resolution Foundation, a think-tank. Before the election 17 Tory seats were among the most deprived 25% of English constituencies, according to Alasdair Rae from Sheffield University. Now they have 35 (see chart).

Many of the seats where the Conservatives broke through are ageing. The number of over-65s in Bishop Auckland, which the Conservatives won for the first time, has increased by a third since 1981, while the number of 18- to 24-year-olds has fallen by a quarter, according to the Centre for Towns, another think-tank. This is good news for a Conservative Party that won 57% of the vote among over-60s and 67% among over-70s, according to YouGov.

At the same time Mr Johnson made inroads among younger voters. The age at which someone becomes more likely to vote Conservative than Labour dropped from 47 in 2017 to just 39 this time round, according to YouGov. Mr Johnson also cleaned up among men. After a campaign spent glad-handing chaps in hi-vis jackets and, at one point, driving a digger through a fake wall, the prime minister notched up a 19-point lead over Labour among men, compared with a six-point lead among women. "Blue-collar men think [Labour] are dreadful, sponging, effete wasters," says Simon Clarke, the Conservative MP for Middlesbrough South and East Cleveland. "It is just contempt." The Tories may have a woman problem, but they seem to have a bloke solution.

The government thus rests on an unfamiliar electoral coalition living in parts of the country that the Conservatives do not know well. Mr Johnson's strategy to keep hold of these new voters has three parts: more money, more power and more attention. The prime minister's fiscal plans allow him to spend up to £80bn (3.8% of annual GDP) on capital projects over the coming parliament. Much of it will be on high-profile projects outside the south-east, such as "Northern Powerhouse Rail", which will better connect the north's cities and surrounding towns. The hitch is that these take time. So projects that can be done quickly will be favoured and shouted about. Whereas a new railway can take decades, bus services can be improved within a few years, under existing laws. Likewise, legislation to turn Teesport into a "free port" with its own customs arrangements could be tabled in 2020. Expect a visit from a hard-hatted Mr Johnson if it is.

Handing power to local politicians is also on the agenda. Mr Johnson's allies like reminding people that he is the first prime minister to have also been an elected mayor (of London, in 2008-16). But plans to devolve power are often resisted most fiercely by those whom they are supposed to empower. Gateshead refused to join a devolution project centred around Newcastle, on the other side of the Tyne. A plan for Sheffield and its environs was watered down. David Cameron, whose government tried to get more English regions to adopt elected mayors, was half-right when he grumbled: "We just thought people in Yorkshire hated everyone else. We didn't realise they hated each other so much."

There are reasons for the Conservatives to believe that the new electoral map may last. Sedgefield nowadays has plenty of swanky suburbs, where a Tory life of home- and car-ownership can be lived cheaply. Given their demography, many of the seats that went blue in the recent election should have had a higher Tory vote in the first place. For many years people in the

Labour-held north and Midlands were less likely to vote Conservative than people with identical characteristics who lived in the south, points out James Kanagasooriam, a Tory pollster. A mixture of history and habit helped to keep the Labour vote artificially high in these regions. In 2019, thanks to Brexit and a deeply unpopular Labour leader, the spell broke.

Yet the twin tailwinds of Brexit and Jeremy Corbyn will not always be there to help the Tories. Once they are removed, the new Conservative alliance may prove unstable. The days of lifelong party loyalty are over, says Will Jennings of the University of Southampton, who has researched the growing political gap between Britain's cities and its towns. "Are these voters going to stick around?" he asks. "That is the big question." Unless the Conservatives can come up with a positive answer, another party leader might end up giving a victory speech in Mr Johnson's old seat. ■

Agony Auntie

Britain's election fallout spells danger for the BBC

The broadcaster is under attack from all sides

Print | Britain Dec 21st 2019

PUBLIC-SERVICE broadcasters always come under fire during and after election campaigns, and the BBC more than any. On the campaign trail Boris Johnson threatened the licence fee, the charge on viewers from which it gets most of its funding. Labour is now accusing it of bias against its leader, Jeremy Corbyn. The BBC's defenders argue attacks from both sides mean it must be getting things about right. In normal times, tempers calm and the corporation sails on to its next generous licence-fee settlement.

But things look dangerous for the BBC this time. The Tories' anger is deep. Their ire stems not only from their view of it as the Brexit Bashing Corporation (as Mr Johnson calls it) but their leader's treatment by Andrew Neil. A week before the election, in a to-camera monologue that was widely shared, the BBC's most feared political interviewer goaded and chastised the prime minister for avoiding a grilling.

That has put the corporation in the sights of Dominic Cummings, Mr Johnson's revolutionary strategy chief. His plans to shake up the civil service are well known. The BBC has apparently become another target. In November Mr Cummings had a meeting with the BBC's director-general, Lord Hall, according to people close to the broadcaster. Mr Johnson has reportedly banned cabinet ministers from appearing on the flagship "Today" radio programme. This week the government ordered a review of whether non-payment of the licence fee (currently set at an annual £154.50, or $203) should cease to be a criminal offence. Decriminalisation would cost the BBC £200m a year, it says. It would also signal that the government sympathises with those who have long attacked the licence fee as an unfair, anachronistic tax.

Another unwelcome change from the Conservatives, decided in 2015 in order to achieve Treasury budget cuts, is about to hit. In a few weeks' time, well over 1m grannies and grandads will be hearing from Auntie. A letter will spell out that for the first time in nearly two decades, over-75s must cough up for the licence fee (people with incomes of less than £167.25 a week will be exempt).

In deciding which over-75s get free licences and enforcing the system, the BBC is in effect being obliged to take on the job of the Department for Work and Pensions. "There will be confrontations with millions of people and that will deeply hurt the BBC's brand," says Claire Enders of Enders Analysis, a media-research firm. The government could decide to keep free licences for the over-75s and make the BBC pay for them. That would mean a big cut—hundreds of millions—to its licence-fee income of £3.8bn, in addition to the cost of decriminalisation of non-payment.

"The risk is that the walls close in on the BBC," says Ed Williams, a former director of communications for the broadcaster who runs Edelman, a public-relations firm, in Europe. A mix of a big shift in politics, ageing audiences, the rise of video-streaming services like Netflix and the threat of public indifference is putting huge pressure on the corporation, he says. Persuading young people to watch and listen to the BBC has long been a problem. The average age of a BBC1 viewer is now 61. The most recent annual review from Ofcom, the media regulator, found that for the first time, fewer than half (49%) of people aged 16 to 24 tuned in to BBC TV channels every week.

As for the broader public, the BBC commands wide support. Three-quarters of adults told Ofcom that the corporation's public-service broadcasting purposes are important to society. Yet Netflix, the American entertainment behemoth, is now almost as trusted a brand in Britain as the BBC, research from Edelman shows. And a Brexit-dominated election has dented the BBC's standing. A YouGov poll this month showed that people trusted its journalists significantly less than they did in October.

Those who argue that the Beeb's troubles will blow over point out that its licence fee is protected by royal charter until 2027. But it will need to reach another fee settlement in 2022. Mr Cummings and the prime minister were willing to prorogue Parliament; they might well countenance legislation to change the BBC's funding. Changing the BBC's leadership could be another approach. In the past the corporation could count on allies on both sides of politics. Just now it is looking rather friendless. ■

***Clarification (December 19th 2019)**: this article was updated to make clear that the meeting between Lord Hall and Dominic Cummings took place before the election, not after it.*

No crib for a bed

On any one winter night, around 5,000 people in Britain sleep rough

The number of rough sleepers has risen sharply in the past decade

Print | Britain Dec 18th 2019

VERY DIFFERENT journeys have brought the guests at the Soup Kitchen on London's Tottenham Court Road together. Craig, a 34-year-old decorator from Swansea, was left by his wife, sold his house and spent the money on crack so that she couldn't get her hands on it. Nick, a 37-year-old from Grimsby, ran away from his debts. Deyan, a 40-year-old from Bulgaria, with a master's in economics, has struggled to find work in London that covers the rent. Paul, a 53-year-old also from Swansea, travels around looking for work.

Most are sleeping rough, either full-time or intermittently. Their attitudes to this vary. Craig celebrates it: "If you don't have anything, you have total freedom. That's something you can't buy." Nick longs to return to Grimsby to see his son, the thought of whom makes him tear up. But first he would have to pay his debts, for which he would have to get a job, for which he needs access to his bank account, for which he needs to pay off his debts. Paul seems resigned, but regards Craig's view as "very naive: the street is a chaotic place. Violence can come out of nowhere."

Mortality statistics support that idea. In 2018, an estimated 724 homeless people under the age of 75 died, most of whom were sleeping rough or in shelters. The average age is 45. The number of deaths has increased by half since 2013.

According to Crisis, a charity, around 170,000 households are homeless. That includes sofa-surfers and people in hostels. Less than a tenth are regular rough sleepers. Numbers fell in the first decade of this century, thanks to a Labour government's efforts to deal with the problem, but have increased sharply over the past ten years.

Rough sleeping is a complex problem, in that it is associated with relationship breakdown and addiction. But it is also a simple one, in that the main driver is the cost and availability of housing. In 2011 housing benefit was cut from half of average local rents to 30%. For people in London, income reductions were particularly sharp. According to Thiemo Fetzer, Srinjoy Sen and Pedro Souza of Warwick University, in Camden the average loss to households was £1,924 ($2,530) a year.

With a continued net decline in social rented housing, privately rented accommodation covered in part by housing benefit is the main source of subsidised housing these days, so the cut in housing benefit had a big impact. Crisis says that evictions from the private rented sector were the main reason for the increase in homelessness in 2010-18. The savings to the public sector were minimal: lower spending on housing benefit by central government was mostly offset by higher spending by councils on shelters and suchlike.

A new law designed to bring numbers down that came into force last year required councils to take "reasonable steps" to help all homeless people. That may be why numbers across the country dipped last year, though campaigners point out that "reasonable steps" can be interpreted as giving rough sleepers a list of hostels. The decline may also be to do with localised efforts such as that in Manchester, which is trialling a version of the Housing First policy that has worked in Finland (see article). Rough-sleeping numbers in Manchester are down by 37% this year.

But in London, numbers continue to rise (see chart), and not only among Britons: the fastest-growing group is from eastern Europe. They now make up nearly half of rough sleepers in Westminster, the borough with the biggest problem. It has "ample accommodation" for them, says Ian Adams, the councillor responsible, but since housing benefit was withdrawn from unemployed European migrants in 2014, the government will not pay their bills, and since a High Court decision in 2017 they cannot be deported for sleeping rough. "It's really frustrating," says Mr Adams. "We have our hands tied behind our backs."

With London's streets awash with rain, the city's rough sleepers look like having a dank Christmas. But some look on the bright side. Paul stopped drinking 30 years ago and has managed to stay sober by going to Alcoholics Anonymous at 7.30am most days. "I just have to walk past some people on the streets, off their heads on drink or drugs, and I think how lucky I am." ■

Bagehot

Britain's Tories are the world's most successful party. Here's why

How the Conservatives dominated the 19th, 20th and—so far—21st centuries

Print | Britain Dec 21st 2019

THE CONSERVATIVE PARTY has been in the business of winning elections since the 1830s. In the 19th century it vied with the Liberals as Britain's dominant political party, but it was the Liberals who eventually found themselves beached on the shores of modernity. In the 20th century the Conservatives held office for longer than any other party. In the 21st century they are on course to hold power, either in their own right or as the dominant partner in a coalition, for 14 of the first 24 years. Not bad for an outfit that John Stuart Mill dismissed as "the stupid party".

To be sure, the Tories have had more than their fair share of Chris Grayling-style dunces and time-servers. They have also suffered long periods in the wilderness, particularly after the repeal of the Corn Laws in 1846 and during their long flirtation with imperial preference after 1906. During Tony Blair's ascendancy the Conservatives were so enfeebled that Geoffrey Wheatcroft wrote a book entitled "The Strange Death of Tory England", a deliberate echo of George Dangerfield's rather more enduring "The Strange Death of Liberal England" (1935). But unlike the Liberals, the Conservative Party has always managed to revitalise itself.

Another helping

Evelyn Waugh once complained that the Tories had never succeeded in turning the clock back for a single minute. But this is exactly why they have been so successful. The party has demonstrated a genius for anticipating what Harold Macmillan once called "the winds of change", and harnessing those winds to its own purposes.

In the 1840s Robert Peel recognised the rise of industrial capitalism and championed the repeal of the Corn Laws, which had kept the price of grain unreasonably high. This split the party but allowed it to incorporate the new "men of business" in the longer term. In the second half of the 19th century, Benjamin Disraeli and Lord Salisbury recognised not only that democracy was the coming thing but also that, thanks to the conservative instincts of the middle and working classes, it could be used to extend rather than undermine the party's power. In the 1970s Margaret Thatcher reached the future first in recognising that the post-war consensus was about to give way to a new world of free markets, privatisation and what Peregrine Worsthorne, an old-school Tory, called "get your snouts in the trough with the rest of us" Conservatism.

The Tories have three other great weapons in their arsenal. The first is highlighted in the title of one of the best books on the party, John Ramsden's "An Appetite for Power". The Conservatives have always been quick to dump people or principles when they become obstacles to the successful pursuit of power. Theresa May immediately sacked her two chief advisers, Fiona Hill and Nick Timothy, after the party's poor performance in 2017, whereas Jeremy Corbyn is still clinging on to Karie Murphy and Seumas Milne after Labour's devastating failure last week.

The second is patriotism. The Tories have always played this card better than any other party, whether in the form of imperialism in the 1870s or retaking the Falkland islands in the 1980s. They have been much aided in this by those radical intellectuals who admire any institution or cause so long as it is not British.

No one should underestimate the party's third weapon: jollity. The Conservatives have always been the party of "champagne and women and bridge", to borrow a phrase from Hilaire Belloc, whereas the Liberals and Labour have been the parties of vegetarianism, book clubs and meetings. Conservatives are never happier than when mocking the left for its earnestness.

Boris Johnson fits perfectly into this great Tory tradition. He was one of the first members of his political generation to spot the rising tide of nationalist populism and recognise that it was about to reshape the global landscape. This earned him the hatred of the metropolitan class into which he was born, which is convinced that the future lies with multilateral institutions and globalisation. But it put him at the front of Britain's Eurosceptic movement, which could have degenerated into a narrow faction under Sir William Cash or a noisy fringe under Nigel Farage, but which entered the Tory mainstream because of Mr Johnson.

He succeeded in this where Mrs May failed because he possessed the other great Tory weapons. He has been willing to sacrifice anything in the pursuit of office. Beneath the bumbling exterior lies a ruthless, power-seeking machine. His withdrawal of the whip from 21 colleagues (some of them close friends) in September made Macmillan's "night of the long knives" in 1962 look tame. Mr Johnson has never missed an opportunity to wave the flag—even when it has made him look absurd, as when he got stuck on a zip-wire clutching two little Union Jacks. Predictably, the left has played into his hands. Some Remainers have gone out of their way to give the benefit of every doubt to the EU, and Mr Corbyn has devoted his life to supporting anti-Western causes.

Above all, Mr Johnson has embraced the women-and-champagne side of Toryism, if not the bridge. He made his career as a Eurosceptic not by agonising about sovereignty but by making fun of the EU's (imagined) imperial ambitions to regulate the shape of bananas or the size of condoms. He cracked jokes that were calculated to rile the guardians of political correctness

as much as to delight the masses (post-mortems on the election have underestimated the role of these guardians in turning working-class voters against Labour).

The hunt is on to discover the meaning of Johnsonism. How will he flesh out the sketchy promises in his manifesto? What can he do for working-class voters in Blyth Valley? How will he reconcile the free-marketeer and big-government factions of his party? The best way to answer these questions is not just to engage in the British version of Kremlinology by interrogating every ministerial leak. It is also to study the long history of a party that Mr Johnson now leads with such a resounding mandate. ■

Seize the memes

Teenagers are rewriting the rules of the news

That will affect both the industry and society

Print | International Dec 18th 2019

THE PRESIDENT of El Salvador gets it. Addressing the UN General Assembly in September, Nayib Bukele paused to take a self-portrait at the rostrum. "Believe me, many more people will see that selfie once I share it than will listen to this speech," he said, adding, "I hope I took a good one."

Marianne Williamson, a New-Agey type running for the Democratic presidential nomination in America, gets it. Asked after a debate in July whether it went well, she replied that she would only know for sure "later, when I see the memes". So does Andrew Yang, another Democratic no-hoper. His first big interview was with Joe Rogan, an internet-famous comedian with 6.96m subscribers on YouTube. After it was viewed 1m times over the course of two days, Mr Yang wrote that his campaign could be divided into "BR (Before Rogan) and AR (After Rogan)".

These minor politicians provide a pithy summary of how teenagers and those in their early 20s consume news today. It is almost entirely on social media. It is almost entirely visual. And the content of the news—"President Makes Speech at UN"—is less important than how it is packaged. It is often filtered through humour or comment. Or, just as often, it is mediated by personalities who command huge followings among young people but are little known to the general population.

These principles hold true around the world, even if the specifics and platforms differ. Between 2009 and 2018 the share of teenagers who read newspapers declined from around 60% to close to 20%, according to the Programme for International Student Assessment (PISA), an educational league table of 15- and 16-year-olds in the OECD, a group of mostly rich countries. Young Indians are half as likely to visit timesofindia.com, India's biggest English-language news site, as older ones; they are also far more interested in videos and Bollywood news. In Britain, younger teens are far less familiar with the BBC's brand than they are with those of YouTube or Netflix. The public broadcaster "will face a threat to its future sustainability if it cannot engage young people sufficiently" according to Ofcom, the country's media regulator.

Some 80% of Arabs aged 18-24 years old now get their news from social media, up from 25% in 2015. They favour Facebook, though the Gulf states, particularly Saudi Arabia, are captivated by Snapchat. Two-thirds of South Korean teenagers go online to find out what is happening in the world, and of them, 97% turn to Naver, a portal and search engine. According to Pew Research Centre, 95% of American teens have access to a smartphone and 45% are online "almost constantly". A study of American and British teens commissioned by the Reuters Institute for the Study of Journalism in Oxford argues that when it comes to news, young people are most concerned with "what it can do for them as individuals—rather than society as a whole".

It can be tempting to dismiss teenagers' news-consumption habits. Most cannot vote, have limited spending power and are probably incapable of finding El Salvador on a map. Such sneers are misplaced. A third of the planet is under 20. More than half the world is now connected to the internet. The young are a proxy for the future. That is especially the case in media businesses, where their habits drive billion-dollar decisions, such as Facebook's acquisition of Instagram in 2012 and its failed attempt to buy Snapchat the following year.

Teenagers understand that technology gives them outsized power. Greta Thunberg, a teenage activist in Sweden, started the global "school strike for climate" which has now spread to 150 countries. Protests led by students, some still in high school, have erupted across the world, from Hong Kong to Chile. Politicians, policymakers and media executives should pay attention: how news is made, spread and consumed by teenagers today will determine what happens to their countries and businesses tomorrow. As one 13-year-old told Alexandria Ocasio-Cortez, an American lawmaker, "I'm not old enough to vote yet, but I can follow you on Instagram!"

To best understand this future, look to America. It has the world's most vibrant media ecosystem and is home to most of the platforms used by youth around the world, including Instagram, WhatsApp, Facebook, YouTube and Snapchat. (TikTok, wildly popular with younger teens, is Chinese and strictly moderated for political content.) American media wield influence around the world and are widely aped: the *New York Times* boasts readers everywhere; websites such as BuzzFeed have inspired similar clickbait sites in dozens of countries. And America's political and cultural vocabulary is pervasive. A meme that starts there has a good chance of spreading throughout the world.

The arena for those memes has changed. Since the 2016 presidential election in America Facebook has come under intense scrutiny for its role as a platform for news distribution. But to many Western teenagers the social network is deeply uncool. It is for old people. Nor do many of them hang out on Twitter, which plays an outsized role in journalism and politics only because it is full of journalists and politicians (and Donald Trump). They have little time for youth-focused websites such as BuzzFeed

either. "It's clearly adults trying to relate to young people," says Victoria, a 16-year-old in Kentucky. Teenagers deride outlets that just a few years ago were hailed as the next big thing: Griffin, a 16-year-old from the Chinese city of Wuxi, dismisses Jinri Toutiao ("Today's Headlines"), China's most popular news app with 120m daily users, as clickbait for adults.

The action has shifted to Instagram (owned by Facebook), WhatsApp (ditto) and YouTube (owned by Google), each of which has well over a billion users. (Snapchat is popular in America but less so elsewhere.) Pew reports that 85% of American teenagers use YouTube; more than 70% use Instagram. Common Sense, an American non-profit group, found in a recent study that 69% of American teens watch online videos every day, mostly on YouTube. They spend nearly seven and a half hours a day looking at screens of all kinds.

Instagram is an odd destination for those seeking the news. Users post pictures to their "grid", mostly pretty ones. The app allows only one link per account—in the bio. And it has no formal reposting mechanism. But the introduction of "Stories" in 2016, which allowed its users to post short-lived images with annotations, added text to a largely visual platform, made sharing and reposting easier and supercharged its growth. Stories also allow those with more than 10,000 followers to share links to other material. Where users went, so did those who hope to influence them: advertisers, marketers, politicians, propagandists and miscellaneous mischief-makers have all piled into Instagram.

Consider the Amazon. By late August, anyone with an Instagram account anywhere in the world would have known that "the Amazon rain forest—the lungs which produces 20% of our planet's oxygen—is on fire," as Emmanuel Macron, France's president, put it in a post on August 22nd that was liked by nearly 200,000 people. On the same day *National Geographic*'s account, the 11th-most followed on Instagram (126m followers), posted about fires in the Amazon, as did Leonardo DiCaprio (an American actor, 38m); Prilly Latuconsina (an Indonesian actress, 32m); and Malaika Arora (an Indian model, 10m). Two days later NASA (51m) fanned the Instagram flames with a fresh satellite image.

This is fine

Posts about Amazonian fires were soon inescapable—as were allegations that big news outlets were ignoring it. "It's the only thing I saw for weeks," says Dylan, a 17-year-old pupil in Lexington, Kentucky. "Whatever I saw about the Amazon I would share it," says Stacy, a 15-year-old Bostonian. Unscrupulous accounts tried to take advantage of the disaster, asking for donations or promising to plant a tree for every "like". The world's press subsequently ran articles, many of which debunked falsehoods on Instagram, such as Mr Macron's assertion that the Amazon produces 20% of the world's oxygen. In interviews conducted by *The Economist* with two dozen teens in Lexington, Kentucky and Boston, every one of them mentioned the fires unprompted. "The fires in the Amazon were not getting very much coverage," says Olivia Seltzer, a 15-year-old Californian who two years ago started The Cramm, a newsletter for teenagers that goes out on Instagram and via email and text message. There is "a lot of frustration that these kinds of stories aren't heard about. A lot of young people are taking it on to themselves to inform their peers."

News outlets native to Instagram are also springing up. Not everything they cover is serious. @nowthisnews (2m followers) combines text overlaid on brief video clips about everything from political protests in Hong Kong to a dog with a tail on its head. (It also publishes on other platforms such as Facebook, Twitter and YouTube.) @houseofhighlights (15m) is dedicated to clips of American sports. In 2015 it was acquired by Bleacher Report, a large sports news website. Both accounts are in the top ten on Instagram for engagement, as measured by the number of likes and comments accrued, according to Axios, another news website. "We've had the distinct advantage that we've never tried to take something that worked in a legacy medium and force fit it into the digital age," says Howard Mittman, Bleacher's CEO. Other outlets, he says, are like the "divorced uncle who bought the right convertible in the wrong colour, who has cool clothes, but they just don't look good on him".

Another hugely popular Instagram-native outlet is @theshaderoom (17m), which deals mostly in celebrity news and gossip (though it also posted about the Amazon fires). If TMZ upended traditional celebrity reporting in the era of the blog, @theshaderoom is doing it again on social media. Sometimes the streams cross. "I was scrolling a post about Cardi B"—a singer with 56m followers—"and the comments were like, 'Why aren't you talking about the Amazon?'" says Jaliyah, a 15-year-old in Boston. Young people are "very complicated in how they're consuming media", says Samhita Mukhopadhyay, the executive editor of *Teen Vogue*. "They can kind of toggle between Justin Bieber and they want to know exactly what Greta Thunberg is doing and they will show up to the rally."

In the Arab world memes use cartoons or screen grabs from old movies to make light of political grimness. Elsewhere thousands of accounts changed their profile pictures this summer to a deep blue or striking red—the former to raise awareness about protests in Sudan and the latter to tell people about the political situation in Kashmir. "Activism has become one of the easiest ways to project yourself as cool," says Sadie, another Lexington teen. It is not uncommon to scroll through Instagram and find out about a high-profile divorce and a roiling protest in some remote corner of the world within the span of one second.

This weird mix of celebrities, politics and activism is another feature of modern news on social media: "news" now comes not only from accounts and outlets dedicated to the dissemination of journalism, but could be anything from a meme to the opinion of an online personality, such as PewDiePie, the world's most influential YouTuber, who mostly makes silly videos about video games and online culture. For five years he had the largest number of followers on the video-sharing platform, until he was overtaken by T-Series, an Indian record label, in April 2019. He is now second, with 102m subscribers. The combined print and digital circulation of every newspaper in America is about 30m. Daksha, a 13-year-old in Kentucky, spends her spare time making memes and posting them to a PewDiePie-themed community on Reddit, looking for the "satisfaction that Lord PewDiePie reacted to my meme" on his channel, she says.

You love to see it

Sarah, 16, from Kentucky, says that "every boy on the debate team is into Ben Shapiro," a conservative controversialist with

876,000 subscribers on YouTube. In Germany a YouTuber called Rezo (1.16m subscribers) went viral with a rant against old and rich people and particularly the Christian Democratic Union, the party of Angela Merkel. Felipe Neto, a Brazilian YouTuber (35m) earns 30m reais a year ($7.5m). He started out telling jokes to adolescents but has evolved into a fierce critic of Jair Bolsonaro, the president. In September he made headlines for distributing 14,000 gay-friendly books at Rio de Janeiro's book fair after the city's evangelical mayor censored a graphic novel that featured a gay hero. Teenagers are, in short, getting their news from other young people who largely express their personal opinions and are barely any better informed than themselves.

As Mr Mittman puts it, teen news consumers are looking for "a level of authenticity that allows you to know that they're speaking to you". Other teenagers say they get their news from clips of late-night TV hosts, such as Trevor Noah or Stephen Colbert, or from stand-up comedians like Hasan Minhaj, who has a popular show on Netflix. Personalities are replacing news organisations. "I feel like it's boring if it's an article. But if it's a video it's super engaging," says Dioneilys, 16, in Boston.

That opens the door to partisanship and misinformation. The Amazon-fire posts from the summer were riddled with errors. Personalities like PewDiePie and other YouTubers are routinely accused of making inflammatory comments or pulling tasteless stunts. Memes often bear little relation to fact. Many teens say they know all this but are sanguine about the dubious origins of their news. Sheer repetition is enough to convince some. "I don't believe anything I read on social media," says Jaliyah in Boston. "Unless it keeps coming, then maybe." Others believe information if it comes from verified accounts. But many trust it as long as it comes from their friends.

Many Brazilians "immediately believe in the authenticity of audio sent via WhatsApp by someone they know", while furrowing their brows at a tape leaked to *Folha de S. Paulo*, a major newspaper, says Joel Pinheiro da Fonseca, a 34-year-old columnist for *Folha*. Realising that few young people were reading his column (or indeed any other section of his newspaper), Mr Pinheiro started a YouTube channel, where fans comment on his shaggy hair or home furnishings as often as on his political analysis. "To them, the rudimentary quality makes it more authentic," he says. "Young people want to establish a relationship with their sources of information."

One consequence of a reliance on personalities is that the platforms on which they appear rather than publications become the sources of news. "When your starting position is social—WhatsApp, Instagram, whatever—your loyalty to any given publisher is much lower," says Satyan Gajwani, who runs the digital arm of the Times Group, India's biggest media conglomerate. More than half a billion people visit its digital properties every month; more than 100m do so every day. "How do we build enough confidence and trust in them that they become brand-loyal?" he asks. Manvi, a 15-year-old in Delhi, exemplifies his worry. Her family subscribes to two Times Group newspapers but online she reads whatever "pops up on the phone when I open Chrome". Asked where the news comes from, she says, "I don't know anything about that."

A report from Ofcom found that "when people consume news in this way, their engagement is typically fleeting." Moreover, "they are also less likely to be aware of the source of news content. Some younger people we spoke to didn't have a close association with the BBC, regarding it as just 'one of many' online news providers."

checks notes

For businesses, this presents both opportunities and challenges. Upstarts such as @houseofhighlights and @theshaderoom will spawn imitators around the world, just as BuzzFeed did for a previous generation. Media organisations such as the BBC, India's Times Group or America's Turner, which owns Bleacher Report, will be forced to invest and acquire their way to relevance. The big risk is that they could do that and still fade as trust in big brands declines. Either way, young people will continue to spend enormous amounts of time online. "Social media basically controls every aspect of our lives," says Stacy, a 15-year-old Bostonian.

For societies, that is more worrying. YouTubers and Instagram personalities sign no editors' code of conduct, are uninterested in traditional practices of fairness or objectivity, and their motives are untainted by antiquated notions of public benefit. That gives information insurgents tremendous power. Governments and institutions cannot simply wish it away. Indeed, some already seem to feel they have little choice but to join the fray. In his speech to the UN Mr Bukele said: "Although we might not want to accept it and we might kick against it, the internet is increasingly becoming the real world." ■

Setting type

How the world's old printing presses are being brought back to life

Digital printing almost wiped out the world's letterpresses 40 years ago, but the art refuses to die

Print | Christmas Specials Dec 18th 2019

A FEW YEARS ago Russell Maret, a New York artist, found himself puzzling over a question. In the 1920s and 1930s some preindustrial fonts were revived by Stanley Morison, a great British typographer. They transformed the quality of book-printing. But in the process of reviving them, Morison changed them. When he created the Poliphilus font from the great printer Aldus Manutius's edition of "The Dream of Poliphilus" (1499), for instance, he corrected the alignment.

Mr Maret is critical of these corrections. "Aldus's types weren't misaligned because he was some old-timey printer. He was getting exactly what he wanted." Was it, Mr Maret wondered, the inherent technological limitations of the early 20th century that led the revivalists to want to standardise old typefaces? Or some broader mechanical mindset?

The only way for him to work that out was to create his own font. The problem was that the Monotype Corporation, which employed Morison and dominated book-printing in the English-speaking world for much of the 20th century, went bust in 1992, so Mr Maret had to cast about for the equipment he needed.

His search led him to a small street in south London where, at the end of a mews, lies a two-storey building that a century ago was home to two baby elephants. The elephants had been imported from India by the *Daily Mirror* newspaper, which wanted one as a mascot but was told it would need company so bought a pair; the building in Stockwell was a veterinary surgery for circus animals and was, therefore, regarded as a suitable place to house them.

The fate of the elephants is not known, but the building, whose floors had been reinforced to carry the animals' heft, has found a new purpose as the home of another weighty cargo. It now accommodates most of the remains of the British letterpress printing industry, thanks to the efforts of the 84-year-old Sue Shaw.

Mrs Shaw, who left school at 16 and has worked in the book business all her life, has a passion for beautiful printing. "You can't read Trollope in Times Roman," she says in the course of a conversation about typographical *faux pas*. "It's an outrage! It has to be Baskerville or Fournier." Her objection is not merely that it is anachronistic—Times Roman was created in 1932, half a century after Trollope's death—but also that the font was produced not for beauty but to maximise the number of readable letters that could be crammed on to the front page of a newspaper. The ascenders and descenders are consequently short; in her view that gives the font a clinical, businesslike air unsuited to fiction.

These days commercial printing is dominated by offset—in which an inked image is transferred onto a smooth surface and thence onto paper—and digital—in which ink is sprayed directly onto the page. Letterpress printing, in which metal type presses ink on to paper, is treated as obsolete. But it is letterpress that stirs the aficionado, particularly in its hot-metal form, in which molten metal is poured into letter-shaped apertures called matrices to create fresh slugs of type as they are needed, rather than relying on shuffling around pieces of movable type cast in advance.

Mrs Shaw set up her own hot-metal press in the 1970s, just as the business was dying. She got a little work, but increasingly found that her efforts went into preserving the artefacts that she loved. "All London's typesetters were collapsing, and there I was buying up all these gorgeous typefaces." She bought, with help from the National Heritage Memorial Fund and the Science Museum, the remains of Stephenson Blake, into which many of the old English typefounders had been folded; of Robert DeLittle, a wood-letter printer; and of the Monotype Corporation's British operations.

Monotype is Mrs Shaw's great enthusiasm. Patented in 1897, it mechanised the composition of printers' type, thereby greatly accelerating the whole process. A keyboard operator would input a text by punching holes into a paper ribbon which was then fed into a casting machine, allowing entire passages to be composed at once, in order and ready to print from. Mrs Shaw loves Monotype for its complexity, and for the vast machines required to produce each letter. "That's why it's such fun. Only fanatics are interested in it."

There are perhaps eight million items in the Type Archive she has created, the earliest probably dating back to the 16th century. Nobody really knows, however, because it has not been catalogued. Doing so would be a huge and difficult task. The Monotype collection alone contains 5,700 drawers of patterns (large metal plates engraved with the shape of a letter) and 22,000 containing matrices. The former are made of a thin layer of copper backed with lead. Many of the drawers in which they are stored, though only a few inches deep, are too heavy for one person to lift.

Every stage of the process is there. Alongside the patterns and the matrices are thousands of boxes of punches—small metal letters which are derived from the patterns and used to stamp their shape into a matrix. And there are thousands of varieties of type, in different fonts, sizes and alphabet: Roman, Cyrillic, Sinhala and the 20 Indian languages the Monotype

Corporation once serviced.On the upper floor are 79 of the machines used in the different stages of the hot-metal process. Some are collecting dust, but most—like those used to set the title for this article in Albertus, created for Monotype in the 1930s by Berthold Wolpe—are clanking away. This year, as a result of Mr Maret's curiosity, they have been making the first new Monotype hot-metal font for 40 years.

Temples of print

Letterpress printing hung on longer in poorer countries than in Britain, but now its near extinction is global. "Letterpress has been wiped out completely in India," says Aurobind Patel, who designed the font, called Ecotype, that this newspaper used from 1991 to 2018 (we now use Milo). It is "like the backdrops of the Alps that photo studios used to have, that are photoshopped in these days."

Thousands of tonnes of metal type must have been melted down. But some has been bought up by collectors like Ahmad Matar, a Saudi Arabian artist. His biggest haul was from an Armenian library in Cairo, but he reckons that Beirut may have the greatest potential, for it was the centre of the Arabic printing industry. "There is an Arabic saying," he says from his studio in Jeddah, where the walls are lined with wooden cases full of type. "Cairo writes. Beirut prints. Baghdad reads."

The most enthusiastic conservators are former printers. The employees of dying industries often feel a powerful nostalgia for the machines with which they have spent their lives. The feeling is perhaps magnified among those whose business was disseminating human culture. When Izumi Munemura was looking for material for the Printing Museum he opened in Tokyo in 2000 he was approached by former employees of Toppan, a printing company, which had largely stopped using letterpress by 1985. They had been storing some of the company's hot-metal type. "They opened the door to the warehouse and said, 'Here you go: we have been waiting for this moment.' It was like a scene from Indiana Jones."

Not all the old fonts and machines were consigned to museums or melted down. In a few corners of the world, such as Kazui Press in Tokyo, they continue to operate. Kazui was run by Juzo Takaoka from 1956 until his son, Masao, took over in 1995. The younger Mr Takaoka still runs the firm.

Letterpress is a far more arduous business in Japanese than in English; it takes 3,000-4,000 characters to print a book or newspaper. It is also expensive—Kazui business cards are ¥20,000 ($185) per hundred. But Mr Takaoka still has plenty of customers. In explanation, he points to a grey ceramic cup into which he has poured tea. "You can serve or drink tea in a plastic or paper cup. The process would be the same: you bring the cup to your mouth and you drink tea. But it's more tasteful to drink from a ceramic cup, no?"

Nobody knows the size of the letterpress industry, but there is an agreement that, in at least some places, it is rebounding. "When I got started, old presses were practically scrap metal," says Harold Kyle, who founded Boxcar Press in Syracuse, New York two decades ago. "Now they go for anything from $3,000 to $25,000." Even in China, where letterpress poses the same challenges as in Japan, there are signs of a revival among graphic designers.

In America Martha Stewart, a homemaking guru, must take some credit for the boom: she popularised letterpress wedding invitations. At the other end of the scale, in terms of cost and complexity, sit Mr Maret and his fellow book artists. They create beautiful volumes in tiny runs, often writing the text, drawing the illustrations, designing the fonts and printing the books. These works belong to a different discipline from books which showcase art made in some other medium. For Mr Maret and other great book-artists, such as Veronika Schäpers and Didier Mutel, the book is its own medium, a uniquely satisfying combination of the intellectual, visual and tactile.

Beyond its creators, dealers and collectors, book art is known to few, because it cannot satisfactorily be exhibited. Leaving a book open at a single page in a gallery would not allow visitors to appreciate it; letting visitors leaf through it would ruin it. But although the world of book art is small, it is flourishing.

In 2005 Peter Koch, a book artist, and Susan Filter, a paper conservator, decided that there was an appetite for a fine-printing show on America's west coast. In 2019 Codex, their biennial fair, had 240 exhibitors. In 2015, $1.4m-worth of work was sold at the fair; in 2017, that rose to $2.3m. Books on show, says Ms Filter, sell for anything from $10 to $50,000.

This is not the first time that old printing techniques have been reborn. In the late 19th century William Morris, a reactionary socialist aghast at the effects of the Industrial Revolution, founded the Kelmscott Press to revive the skill of hand-printing, spawning a movement that thrived in the early 20th century. Today's revival is not dissimilar. "Digital printing is too easy," says Mrs Shaw. "The computer does it all for you." In Tokyo Mr Takaoka echoes her feelings: "There's something special about things that are inconvenient." Perhaps the skill and effort that goes into letterpress printing answer a human need. The view of work in neoclassical economics as something that people will do only in exchange for money was always crude: skilled labour demands effort but also brings joy.

The connection with history is also important. "I realised that ever since we were children, we've been told printing is one of our four great inventions," says Wei Diming, who has opened a letterpress shop in the Chinese city of Xian. "But no one has really seen what letterpress printing is like and how to use it. So I spent over two years to revive it so that people would be able to experience this cultural tradition." Mr Matar, in Jeddah, is similarly moved: "Type represents a revolution in the human mind: as an artist, when I touch the letters, it's a very big thing."

Touch is something workers in a digital age often need more of; staring at a screen all day leaves many with a sense that something is not quite right. "Humans are haptic animals," says Ms Filter. "People want to pick up a stone and make a tool of it."

Consumers like the feel of things, too. In the age of the digital download growth in the sales of vinyl records, which can be held and treasured, is accelerating. Their devotees find that vinyl gives a different quality to the sound; similarly, with printing, people like the fact that letterpressed paper has a distinctive feel.

This causes wry amusement to some printers. In the past the embossing of a letter was regarded as a sign of bad workmanship. "What printers were after", says Bob Richardson, a former BBC graphic designer who works at the Type Archive, "was a 'kiss impression', where the type touches the paper lightly enough just to ink it. If you embossed one side of the paper, it made it difficult to print on the other side." Mr Takaoka is outraged by the fad for clumsy letterpress products. "The over-pressing and over-inking…it's an insult to us craftsmen. For 500 years, people have worked hard to maintain the art of letterpress printing. To be honest, I just want this 'resurgence' or 'boom' to go away."

If it fails to, that will be in part because of people like Mark Storey. He expresses his love for beautifully printed books not by making them but by buying them—an activity for which his job as chairman of a private-equity company equips him comfortably. In a cavernous room, Mr Storey has an astonishing library of the ancient and the modern that includes several Doves Press volumes, numbers of which were limited by the decision of one of the founders to throw the entire stock of type into the Thames to ensure that it was never used in a mechanical press; a 1935 Lectern Bible in the Centaur font designed by Bruce Rogers for use in churches; and a number of Mr Maret's books.

Mr Storey handles his books with great delicacy; part of their appeal is tactile. But his enthusiasm for hand-printed books is also elegiac. "There's a sense of things not quite lost, hanging on only because people are willing to commit their lives to them."

People like Duncan Avery. When he first joined Monotype in 1945 at the age of 17, Mr Avery was set to work machining parts for Bren guns, for that was the way things were at the end of the war. He stayed with Monotype all his working life. At 91 he is the oldest of the crew of former Monotype workers who have been volunteering at the Type Archive for a quarter of a century. He drives up from Sussex two days a week, collecting 81-year-old Douglas Ellis, who looks after the matrix machines, on the way.

On a recent November morning, Mr Avery was dealing with an American order for a set of 24-point Centaur matrices: "Lovely font." The archive's commercial side is not extensive. But revenues are no longer declining, and indeed, thanks to Mr Maret's inquiry into the technology and the mindset of early-20th-century printing, there has been an uptick.

It was not just intellectual curiosity, Mr Maret admits, that led him to try to create a new Monotype font. "I've always wanted to make a typeface that could be set in paragraphs." Why? "Because it would be fun. There's no practical economics in this. I wanted a complete typeface that I could write a book in and send to a typecaster, for no other reason than it would cause me joy." Now that it is an art not an industry, hot-metal printing is no longer bound by economic logic. Those who practise it do not have to seek the most efficient solution to every problem.

In the spirit of inquiry and enjoyment, Mr Maret adapted one of the fonts cut in the 17th century by Peter de Walpergen for Bishop Fell. He called his version Hungry Dutch: de Walpergen was Dutch, and the font was originally intended for a book called "Hungry Bibliophiles". Then it was over to London, for the old gang plus some younger apprentices to turn it into a Monotype font.

Parminder Kumar Rajput, at 71 the youngest of the old gang, is the only man left in the world who can operate all the various Monotype machines needed to produce a typeface from scratch. Because the business was highly specialised, most workers mastered only one short slice of the long and complex process. Mr Rajput's first foreman, eager to promote him, encouraged him to learn how to master the whole process. Mr Rajput happily learned how to use all the machines; but he declined promotion, staying on the shop floor for all his working life.

Richard Ardagh's route into type production has been different to Mr Rajput's. A 38-year-old graphic designer, he got interested in letterpress at art school. Mrs Shaw showed him round the archive, and he was hooked. "The employees being so long in the tooth heightened my sense that I should get involved as soon as I could." Having studied under Mr Rajput, he cut around two-thirds of the punches for Hungry Dutch.

This work does not contribute directly to his earnings, but may do so indirectly: "Your cup has to be full of inspiration, wherever you get it from." On the same day that Mr Avery was processing the Centaur order, Mr Ardagh ran up the rickety stairs from the vault to Mrs Shaw's office in a state of high excitement. In one of the cast-iron Stephenson Blake safes he had found the punches for an Irish font cut by Joseph Moxon in the 1680s. Mrs Shaw was jubilant. "We've been looking for our mislaid Moxon's Irish for 15 years!"

Making a new Monotype font was quite a challenge. The equipment needed for the beginning of the process—transferring a drawing onto a metal pattern by means of a glass plate, wax and electrolysis—had been lost. The Type Archive workers tried making the pattern through etching instead. After trial and error, a computerised milling machine did the job.

But the main difficulties with the process concerned the question at the centre of Mr Maret's investigation. The Monotype workers redrew his Hungry Dutch letters according to the Monotype protocols, which require the characters to conform to 15 common widths, with standardised weights, height, slope and axis. That was the way it was done in Monotype; but that was not what Mr Maret wanted. So when the long tail of the upper-case Q was shortened, he insisted that it should be lengthened. Since Mr Maret was the customer, he won the day. Some regard the font which the process produced as a little uneven, but to the untrained eye it is lovely.

Thus Mr Maret got both his font and his answer: although some of the changes to the Poliphilus font were imposed by the technology, not all of them were necessary. The historical font could have been given more freedom. "The machinery embodies a system with certain rules…but it was neither the system nor the rules that resulted in the look of late-industrial typefaces. They might have suggested it, but it was the people who used the machines who took that suggestion as fiat."

Mr Ardagh has also gained from the project. He has been experimenting with making fonts through 3D printing, and has learned far more about the old way of making type by doing it himself than he could have by reading about it.

At the Type Archive, aside from a flurry as a bunch of young people arrive from the Science Museum to digitise some of

the material, things go on much the same. Mrs Shaw continues to try to rustle up money to display her treasures. Mr Avery continues to drive up from the countryside to keep the business side afloat. And Mr Rajput continues to cajole vast old machines into producing tiny gems of shining type. ■

The sleuth of death row

What does it take to become a death-row detective?

Richard Reyna, one of the last of his kind, has spent decades working the cases of those on America's death row

Print | Christmas Specials Dec 21st 2019

IN 1944 Raymond Chandler described the ideal character of a fictional private eye as a man comfortable on mean streets, but "who is not himself mean, who is neither tarnished nor afraid." He is:

To meet a real-life version of Chandler's private eye, drive 40 miles (60km) north from Houston to Conroe, a fast-growing Texan city strung along either side of Interstate 45. Settle into a booth at Taqueria Jalisco, a Mexican breakfast joint in a low-slung strip-mall. It is summer, early morning, and already feels hot. A battered Nissan pulls up; a thickset man steps out. He wears black boots, pressed silver-grey trousers and a blue, short-sleeved shirt. A Rolex glints on one muscular arm. He carries himself with a slight swagger. Heads turn as he makes for his usual seat.

Richard Reyna is handsome. He has an open, convivial face behind gold-rimmed glasses. He appears young for someone who just drove his grandson to college—and he wants to keep it that way. He neither smokes nor drinks. His hair has the slick, uniform blackness that comes only from a bottle. He doesn't want his age published. Is he vain? He chuckles. Clients expect a youthful man in his line of work.

Mr Reyna stands out among the 90,000 inhabitants of Conroe. He also stands out among America's private eyes—who also happen to number about 90,000. Mr Reyna has a speciality. He is a death-row sleuth.

He is hired, usually, as a late dice roll by the condemned, after their trial "went wrong" at state courts and as federal appeals and eventual lethal injection loom. His paymasters tend to be defence lawyers, the federal public defender, or European donors eager to expose America's misuse of its death penalty.

The Taqueria is his favourite spot in a city still divided by race. Not every place would be welcoming: "This is the middle of red-neck country. Lots of Klan, hell yeah." He calls the café "my rat-hole", pressing his fork into a grease-soaked omelette until a small oily puddle appears. "Usually I go home and think of getting my stomach pumped," he says. But he spends several hours there, returning early the next day for more eggs and conversation.

On first meeting the detective, some people ask if he is Native American, a question he finds puzzling. He is Hispanic with roots in Mexico. He grew up in a government housing project in Houston's Second Ward, where migrants flocked as whites fled for the suburbs. His father died "when I was a little bitty guy"; his mother single-handedly raised nine children in a tiny apartment, relying on handouts—rice, cheese, powdered milk—from a nearby hospital. For fun he and friends sniffed lighter fluid from handkerchiefs in back alleys or devised ways to steal from ice-cream vans. "Our idea of the Olympics was how fast we could strip a car," he says.

Fifty years on, little has changed in the ward, where "macho men all beat their wives before the neighbours." At reunions there, he finds that his siblings, and some of his old friends, "still don't understand what I do." They have preserved a way of walking, instilled in childhood, that he has mostly dropped. "People come in doing that duck walk, wearing pointed shoes, still blaming society for all their woes," he says. Suddenly he bobs his head and rocks his shoulders in demonstration, a waddle from another time and place.

He got hooked on crime as a child—in part by roaming the mean streets of the ward, but also by reading true-crime paperbacks. Their tales left him with an abiding urge to unpick a grisly story. "It bothers me that people aren't interested in the truth." When his mother called his books "disgusting", he retorted he was "learning how stupid people are". He still relishes real-life examples of "dumb" or venal criminals, such as a case he worked on in which a man convicted of rape and double murder was arrested only after turning in his own accomplices in an attempt to scoop a $5,000 reward.

Mr Reyna's reading habits have not changed. In his office at home a whole wall is hidden by shelves, four rows high, stacked with true-crime books. The rest of the office is crammed with files, souvenirs, newspaper clippings and photos of him with big-hatted Texan Republicans.

As he serves eclairs and pours tea into fine china cups, he is clearly pleased to be settled in a neat bungalow with a white fence and a large garden, shared with his wife Peggy, two cats and a dog. However, he still keeps in touch with his past. The witnesses he deals with are mostly poor. They are more at ease when they see his 1990 Nissan Stanza with 280,000 miles on the clock and observe his shadow of a duck walk.

How did he escape? "You have to want to get out. To realise there's some more to life." He enlisted, got posted to West Germany as others fought in Vietnam, and then became an army photographer. Discharged, he met a Hispanic sheriff at a Houston barbecue who needed help identifying corpses. That meant long hours in a morgue, often at night, taking fingerprints and photographs. He has hated photography since.

In the sheriff's office he picked up skills, such as when he attended an advanced FBI course in how to manage and photograph a crime scene. A few years later he transferred to Conroe. However, like Chandler's lonely, proud figure, he says he bridled against authority. "Conroe has a barrage of crimes. They chase some small stuff. But the real shit is white-collar corruption." He talks of politicians and officials who illegally cut themselves profitable property deals, and speaks repeatedly of how the

powerful get away with awful deeds. In a late-afternoon drive around Conroe, he points out housing blocks in Little Mexico, a poor Hispanic area, where he and other officers broke up a child-abuse ring. He tells of unearthing a labour camp where illegal migrants made creosote in dire conditions. The owner, "a real prick", he says, had been untouchable because of big donations to politicians.

In the early 1980s he got what seemed to be his big break. Fired from the sheriff's office for supposedly leaking stories to a newspaper, he was hired in 1984 by a private eye to look into a notorious capital case in Louisiana. Jimmy Wingo, a jail escapee, had been convicted of murdering a couple in their home on Christmas Eve. Wingo's brief trial rested on a witness who later recanted. Mr Reyna dug up ample proof, he says, of a crooked cop and flawed prosecution. Nonetheless, after three years Wingo was killed in the electric chair. "It was awful, I cried. I knew he was innocent, it got to me," says Mr Reyna. "Why do everything the right way if it's going to end like this? I had the evidence. It should have worked. It proved Wingo had no shit to do with this." Afterwards he spoke several times to Wingo's mother. "I didn't want to carry on."

After the disappointment of that case started to become less acute, he realised that he had found meaningful work; indeed, that he had a calling. Now it is "what I'll do until I drop dead." By his reckoning, in 33 years he has helped win outright freedom for seven death-row prisoners and assisted many more in commuting death sentences. He has spent decades visiting death row, largely in Texas, mostly in the squat grey buildings in Livingston, a short drive from Conroe. He speaks to inmates as they wait for death, often up to the night before they are killed, though if they ask him to be there when they are killed he declines. He has seen tears, heard elaborate lies, and been asked by inmates about how to find peace. He has also seen how individuals respond when hope expires. Some refuse to leave their cells and must be dragged away to die.

At the same time as Mr Reyna was working on the case that nearly broke him, he also took on the one that he considers his biggest success. Clarence Brandley was a black janitor wrongly convicted of raping and strangling a white teenager in a Conroe school. His case was prejudiced from the start: through false testimony from racist witnesses, destruction of exculpatory evidence by police and collaboration between prosecutors and judges. In 1981 an all-white jury sentenced him to death.

Mr Reyna, recruited by the defence team in 1985, eventually found two white janitors who had been present when the murder happened. Neither of the white janitors was prosecuted, but by speaking to them separately, Mr Reyna got each to accuse the other one. He cajoled each to offer up intimate details of the crime. One of the men had admitted to the killing to his girl-friend, after coming home with blood on his shoes, though he later retracted his confession.

Both witnesses, on video, said Brandley was not involved. He had come within just days of two scheduled execution dates, in 1985 and 1987. It took until December 1989 for the Texas Court of Criminal Appeals to overturn the conviction. On Mr Reyna's office wall is a framed front page of the *Houston Chronicle* from 1990. It bears a large photo of Brandley and the detective marching together from prison. The publicity led to plenty of work.

Trouble is his business

Some of it was controversial. In 1995 he was hired by the defence team of Timothy McVeigh, a terrorist who killed 168 people by blowing up a federal building in Oklahoma City that year. It was not a successful collaboration. Mr Reyna clashed with the lawyers, angry that they would not focus on how other far-right figures—such as extremists he tracked to the Arizona desert—conspired with McVeigh. The lawyers fired the detective after a row about an alleged confession by McVeigh to the detective.

Currently he is working on five cases. One involves Cesar Fierro, convicted of murdering a taxi driver in Texas in 1979. Mr Fierro, who is Mexican, has been on death row for 39 years, most of that time in solitary confinement. By tracing informers, on either side of the border, Mr Reyna has tracked down a "kid, in a washeteria" over in Juarez. The kid, then a teenager, was reportedly present at the murder and bragged about it. Mr Reyna also traced the gun used. He hopes Mr Fierro could be cleared of the charges any day now.

Much of his skill can seem small-bore, old-fashioned in retelling. He stakes out homes, offices or bars for days at a time. He shuns technology and online sleuthing. "I have no Facebook page. I almost never respond to texts. I have a flip phone. I'm happy being old school," he says. Nor does he advertise. Once he had business cards made. He left them in a drawer.

Steady demand for his services suggests his old-school methods work. Any case begins with poring over police and autopsy reports, witness statements and other trial papers—these are stacked in manila folders on his office floor, on shelves and between the memorabilia. He looks for inconsistencies. Then he talks to the condemned man (or occasionally the condemned woman) and their wider family.

Trudging through paperwork can expose dubious details missed by hasty defence lawyers. One case involved fabricated bar receipts which put an individual near the scene of a murder where he supposedly drank, alone, $3,000-worth of beer in one evening. Then there was the time a district attorney had scribbled on a legal report that "Texas Rangers lied to me to get me to file charges."

Most common, he claims, are clues implying that prosecutors illegally withheld evidence that might have helped the defence. "Prosecutors, including federal ones, don't give two shits about it." Some witnesses' testimony in court also proves very different from their initial reports to police. "I find people, their statements, are all horseshit," he says. Getting such witnesses to talk is vital. He knows to knock on doors between 5pm and 7pm, soon after work ends. Like a salesman, he looks to see if twitching curtains prove someone is at home, and places a foot in a doorway once ajar.

Typically he is active years after the crime happened. To loosen tongues, he begins with reminiscence: if a witness has moved from the area, he breaks the ice by bringing printed photos of their old home, or of a loved bar. Such gestures can kindle gratitude, maybe even trust. He tries to get people to laugh; many relax when persuaded to share a meal. To the poor—and most of those in the orbit of death-penalty cases are very poor—he talks about his own past (he first removes his Rolex). In the summer months he offers ice-cold beer from a cool box in his car.

“I like to make people think they’re smarter than me, they tend to loosen up a lot,” he explains. He listens to check if a witness’s vocabulary differs from their written statement, potentially a sign that the police worked up a false record. He tells informants early what he knows “so it limits the bullshit and lies they tell”. Witnesses don’t usually like owning up to false testimony. But he finds most, eventually, grow eager to talk, to admit their misdeed. “It’s been eating them a long time.” He has no badge or uniform, and even his occasional threat to get a subpoena to force someone to talk is empty. Rather he must win them over through charm.

His ultimate appeal, though, is moral. “I try to put the witness in the shoes of the accused. I ask, ‘Can you allow somebody to die, if you could do something about it?’” He says, “If you can live with yourself after [the condemned] is killed, you’re stronger than I am.” Tears often flow when witnesses give up long-held secrets.

Why does he do it? Mr Reyna needs the fees, typically several thousand dollars for 100 hours of sleuthing. There is his wish to see truth exposed. Principles play a role, too: he is not dead against capital punishment, but hates how it is applied. “If you have to kill a guy, execute a guy, you better be goddamn sure,” he says. The process leading to execution cannot be trusted, he thinks, because prosecutors and judges worry about being seen as tough enough to get re-elected. He believes too few care about the truth, especially when it concerns the poor, dark-skinned and badly represented.

The long goodbye

Mr Reyna is also wary of some campaigners against the death penalty. He thinks they romanticise the condemned. Brandley was unusual, he says, as truly innocent. Most of those who are wrongly sentenced to die are, nonetheless, not angels. “There are some very bad people, even if they didn’t kill,” he says. “Often people are not all that innocent. Maybe you were present when your buddy killed someone.”

In time his sleuthing may not be needed. Fully 65% of Texans still favour the death penalty, compared with 54% of all Americans. Texas carried out eight of all the 20 executions in America between January and November 2019. But rates are dwindling. Courts in the Lone Star state handed down only two death sentences in the same period. Such hesitation is at least in part because reinvestigations have shown up so many serious flaws.

Mr Reyna will not retire. More than he loves the fees, or even justice, he loves the work itself: “I love it. The challenge. The battle of the wits. I want to find the answers to things.” Blunt-spoken, stubborn, he refuses requests to lecture on his methods and remarkable list of cases. He wonders if the end might come when somebody, angry at his snooping, one day pulls a trigger. “People often said they would kill me, but I never took anything as credible,” he scoffs. More likely, “I’ll drop dead one day with my files in my arms.”

Mr Reyna, no reader of fiction, claims never to have heard of Raymond Chandler. Chandler would have recognised him on sight. ■

Semiconductors

A look inside the factory around which the modern world turns

How one Taiwanese firm uses unrivalled technology to dominate the world's chip-making industry

Print | Christmas Specials Dec 18th 2019

ACCOMPANIED ONLY by the night-time striddling of cicadas and the squeaky pedal on your borrowed bicycle, you head west through cabbage and sugarcane towards red neon signage on the horizon. By the time you reach the fields' end, the hum of air-filtration systems drowns out the insects. Five factory buildings loom in the darkness behind steel fences. Stray dogs roam between parked cars; sprinklers water the sumac trees planted at the edge of the facility. High-tension wires dive down into a substation from steel pylons, bringing with them enough megawatts to power a small city.

Some of the water evaporates from warm concrete walkways, wafting an artificial petrichor scent over entrance D2, the gate in the north-west corner of the compound which leads to a sixth factory as yet only half built. Construction workers are trailing out of it, mounting scooters and heading away into the night. But even now, an hour before midnight, the work has not ended; heavy construction clangs out over the car park. The building is vast; cycling around it would take ten minutes or so, on foot it might take an hour. Not that this is a possibility. Security guards emerge from their huts as you approach, some rushing and shooing, others merely placing themselves pointedly in your line of sight.

Unless you are in the semiconductor business, or some allied trade, the letters on the neon signs on the factory roofs—TSMC—probably mean a lot less to you than the names of most of the other 29 of the world's 30 most valuable public companies. But Apple (the second most valuable on average over the past six months, at $1trn), Alibaba (seventh, $458bn), Visa (9th, $380bn), Disney (21st, $249bn) and many of the others would be nowhere without the Taiwan Semiconductor Manufacturing Company (26th, $228bn).

Unlike most of those other megacorps, TSMC does not sell products or services to the public, but its fabrication plants—or "fabs"—provide many of the high-performance chips which make those products and services possible. Phones, online marketplaces, smart cards, streaming video and much more all depend on them. With up to 90% of the market for the third-party manufacture of advanced chips, TSMC dominates the production of the infrastructure on which the modern world relies by manipulating matter with a precision no other company can match.

That unique capability makes TSMC important in a way that goes far beyond the commercial. Vital to the advanced industries of both the United States and China, its unmatched capabilities in the realm of the nanoscule have implications at the highest levels of geopolitics.

Semiconductors are mazes of circuitry consisting of components such as transistors carved into silicon. The exponential increase in computer capabilities known as Moore's law (named after Gordon Moore, one of the founders of Intel, a chipmaker) is possible because making a chip better and cheaper requires little more than making those components smaller. But creating extraordinary shrinking circuits requires an extraordinarily increasing physical infrastructure.

Not just fab: the fabbest

Next year TSMC's Fab 18, that half-finished sixth building currently being worked on at all hours in the corner of the campus outside Tainan, will start making chips for Apple's new iPhone. These chips will cram more than 170m transistors onto each square millimetre of silicon, creating structures with features as small as five-billionths of a metre, or five nanometres (5nm). That is 1,000 times smaller than a red blood cell, 100 times shorter than the wavelength of visible light, well under a tenth the size of a virus like HIV.

More or less the only things of consequence smaller than 5nm are individual molecules—and some of them are not all that much smaller. Biotechnology companies make such molecules all the time, to be sure, but they start from the bottom up, borrowing nature's machinery to build their wares atom by atom. Semiconductor manufacture works from the top down, cutting things away. Needing to do so at a just-more-than-molecular level of detail is what makes Fab 18 the most expensive factory ever built, with a capital outlay of some $17bn. The state of the art Tesla factory in Shanghai cost just a fifth of that amount.

The fab's raw material is the most common element in the Earth's crust: silicon. Quartz sand is refined into molten silicon with a purity of 99.999999999%. Then it is drawn into cylinders about two metres long and 30cm across before being sliced into circular wafers. Perhaps that doesn't sound too hard. But because any imperfections would mess up the circuitry that the silicon must bear, the whole block has to be one continuous latticework of atoms, a single crystal. It is the equivalent in silicon of what, in carbon, would be a diamond taller than a man.

Once you have your silicon, you need to know what to do with it. The ability to design multi-billion-transistor circuits is the product of software development almost as impressive as Fab 18's hardware. The circuitry is not as complex as, say, a human mind; but it is far more complex than any human mind could fathom. Chip-design teams with centuries of experience in their art minutely specify the operations their circuitry needs to undertake; suites of programs break it all down into a stream of

logical statements and back up into a physical design. Further programs take the design and precisely simulate its workings, looking for flaws and new possibilities.

And then you need the machinery with which to impose the digital expression of that final design—the core—onto the silicon of the wafer. Fab 18 does this with light, as the industry has for decades. But to get that light it requires bus-sized machines built by a Dutch company called ASML.

In each machine a microscopic fleck of molten tin is dropped in front of a laser beam powerful enough to cut metal 50m times a second. The atoms of tin are instantaneously heated to 1m°C, which smashes their outer electrons from their nuclei. Interactions between the newly free electrons and the atomic nuclei pump out what is called "extreme ultraviolet" light with wavelengths of just 13.5nm.

Mirrors made by Zeiss, a German company, focus that light onto the waiting silicon wafer. Just before it arrives at the wafer the light hits a mask which protects some parts of the wafer and leaves others exposed. The exposed sections are eaten away, leaving the structure of the transistors beneath the masked areas. The mask is an inverse of the pattern needed in the chip, so its shadow is the pattern of the required circuit.

A world's worth of technology has been assembled into a vast inverted pyramid in order to stamp out patterns just a few hundred atoms across. And then, nanoseconds later, it does so again.

It is TSMC's ability to assemble and manipulate this inverted pyramid which makes it the world's market leader. It is an ability that would-be competitors can hardly dream of matching. The huge capital costs of building fabrication plants make time spent learning how to make all that equipment work perfectly together ferociously expensive. Without prior expertise you are lost. And even if you could match TSMC's current capabilities, the company will already be on to the next frontier, widening the base of the pyramid, increasing its mass, sharpening its point.

When TSMC was founded in 1987, it was the only chipmaker-for-hire around. But as smaller circuits required ever more capable and expensive fabs, the number of companies which could afford their own shrank and the contract-manufacture business grew. Then came smartphones.

The best phone companies wanted to optimise their chips' performance and integrate it with the rest of the phone's circuitry, rather than buy general-purpose chips from the likes of Intel. But not being chipmakers themselves, they needed someone to manufacture their demanding designs. Thus TSMC became a vital supplier to two of the world's largest tech companies, Huawei and Apple; both contribute over 10% to its total revenue.

Success on such a global scale brings with it a new problem. As Morris Chang, TSMC's founder and former boss, acknowledged at a company sports day in early November: "As the world is no longer peaceful, TSMC is gaining vital importance in geostrategic terms." Being the unmatched supplier of a world-shaping technology relied on by two great powers squaring off for a serious fight would be worrying under any circumstances. When one of those countries claims sovereignty over your country and the other is pledged to protect it—and may expect favours in return—the worry is correspondingly greater.

In Asia's tech industries there is much talk of the world being divided into two technospheres, one American, one Chinese, with the industry's supply lines multiplying and bifurcating accordingly. But there is no easy cloning of TSMC. Each side will want access to the real thing—and, ideally, to deny the firm's cutting edge to the other. Balanced on a 5nm point, the world could fall either way.

Turn your back on the fabs, and soon you hear the cicadas again. Pedal on and the neon dims to a glow. There are miracles of co-ordination and precision in the world. There are frightening uncertainties, too. ■

Eels

The mysterious life and times of eels

No-one knows exactly how eels reproduce. That matters for the future of the species

Print | Christmas Specials Dec 21st 2019

"ALL THE important questions...have been settled," Max Schultze, a German biologist, opined on his deathbed in 1874. "Except the eel question."

Few outside biology would have understood what vexed him. Fishermen had no trouble finding eels: records of eel fisheries went back centuries, and the fish made up a third of Europe's freshwater catch by value. Chefs had no shortage of answers on how to cook them. In the early 20th century, "Larousse Gastronomique", the definitive guide to French cooking, listed 45 different ways to prepare them, from marinated to poached in onions.

Biologists, though, were not interested in the eel's availability or utility. They were interested in its reproduction. No one had ever seen one mate. No specimen had ever been spotted after giving birth or laying eggs. Nor had any spawn been seen.

In antiquity, Aristotle opined that eels must spring spontaneously from river-bottom mud, and for most of the subsequent centuries that sounded sensible enough. By the 19th century such beliefs were no longer tenable. Life came only from life; animals were produced by sex. But eels were not just never observed having sex. They did not even seem equipped for it. In 1876, not long after Schultze's death, a budding scholar dissected some 400 of them looking for testicles: nary a one. Young Sigmund Freud, discouraged, turned his attention to the dissection of brains. When he returned to matters of sex, it was on a less anatomical level.

A century and a half on, progress has been made. How and where European and other eels reproduce has been discovered. They are freshwater fish which go out to sea—a long way out—to breed, a piscine antithesis to salmon. But it is still the case that no-one has seen them at it, or been able to reproduce the process in the lab—let alone in farm. And this matters. Although they are not the near staple they once were, people still like to eat eels, especially in Asia. But there are fewer and fewer to catch in the wild, and the wild is the only place they come from. The European eel is now listed as critically endangered. Depleting its numbers yet further by smuggling its young to Asia by the suitcase-full has become a lucrative criminal trade.

As a result, their very survival as a species is far from certain. Today's "eel question" is whether the species has a future.

At their smallest, eels are translucent, worm-like creatures that give only the faintest hint of what they will later become (eels grow about 5cm a year in the wild, mature ones are about a metre long).

In Europe, most of these tiny "glass eels" are found in the Bay of Biscay. From there, they find their way to rivers, creeks and ponds anywhere from the Baltic to the Mediterranean. Some have been known to slither over damp earth to reach inland waters. Many get eaten along the way. For those who make it, not much happens: once settled, eels are a sedentary lot for up to 20 years. Then, in the run-up to autumn, they dash for the sea. They are never seen again. One can only assume it is their offspring that later land in the Bay of Biscay.

A seminal paper in 1923 by Johannes Schmidt, a Danish researcher, resolved to find what happened between the time when mature eels disappear and baby ones arrive. Chasing mature eels as they dash westward is not practical. Schmidt opted instead to track the larvae that hatch into glass eels, which can be found drifting eastward in the Atlantic each spring.

Schmidt's mission was only a partial success. He never found mating eels. But what he was able to establish was nonetheless startling. The smallest larvae, and so the most likely spawning ground for all European eels, were to be found nowhere near their habitat. Instead, the eels and their offspring could all be traced back to the Sargasso Sea, a remote bit of the northern Atlantic Ocean nestled between Bermuda and the West Indies—6,000km from Europe's western coast. Eels found in North America also spawn in the Sargasso (a dozen other anguillid species spawn in other locations, some of which remain unknown).

Eel be damned

Why eels travel such great distances is not clear; how they do it barely any more so. Scientists suspect a geomagnetic sense guides their migration, which can take over a year. In their last months flitting about in Europe's rivers and streams, the eels' gut dissolves into fat to store energy for the voyage. Their eyes enlarge to adapt to the gloom of the ocean floor. Their colour changes from yellow to dark silver, better to bypass predators as they embark on their journey to sex and death.

Not, though, if Hans Inge Olofsson has his way. On a late summer day in 2019, 114 eels that had hoped to start their exodus to Sargasso ended up in the bottom of Mr Olofsson's boat instead.

Tousle-haired with a raspy voice and a pouch of *snus* tobacco permanently lodged under his upper lip, Hånsa, as his friends call him, makes no effort to deviate from the affable Swedish fisherman of central casting. This year marked his 33rd season on the waters of the *Ålakust* (eel coast), a 30km stretch at the southern tip of Sweden's Baltic shoreline. By his reckoning, 114 eels in three traps is a good catch these days.

There are many ways to catch an eel. The fleet-of-hand and sure-of-grip can snatch them out of the water. Others dangle hooks in rivers. Commercial fisheries like Hånsa's use time-tested traps. One visit every couple of days is enough. A three-man

crew is needed: Hånsa, a sprightly 68-year-old, the undoubted captain; his grandson Carl, in his 20s, who helps out as deckhand; and Stefan, a friend whose heft suggests a sideline as an oligarch's bodyguard, steering the boat.

Waist-high waders protect the trio not from water but from fish. Eels can survive out of water for long periods, and once the nets are emptied, the eels are like a moving rug absorbing whatever they come across. A few try to hide in the boat's hidden crannies. One manages to jump back into the sea—113 eels will have to do.

Historians trace organised eel fishing in southern Sweden back to the early 16th century. Hånsa's grandfather first started plying the waters in 1923, the year Johannes Schmidt tracked the larvae to the Sargasso. His father took over in 1959, then Hånsa in 1987.

About 100 crews once fished for eel off the *Ålakust*. No longer. "There are only six or seven of us left nowadays," says Hånsa. Eel fishing has become an old man's game (even in egalitarian Sweden, women are rare in fishing). Some 70% of the fishermen are over 55; Hånsa is well beyond the legal retirement age of 61.

The ageing of the Swedish eel gang ties back to the mysterious nature of their prey. Starting in 1980, the numbers of glass eels arriving on Europe's shores started falling precipitously. For 30 years, their number fell by 15% a year; by 2010 annual arrivals from Sargasso to all Europe's rivers and creeks had collapsed to just 1% of historical levels.

Overfishing is an unlikely culprit: catches of grown eels were fairly stable before and after the drop started. In Europe, eel is now rarely eaten. But humans harm eels in other ways. The turbines of hydroelectric power plants slice up migrating eels into something for which only Larousse Gastronomique might have a use. Pollution has caused a loss of habitats. Climate change has probably swayed currents to transport eel larvae away from where they can thrive.

Whatever the cause, the European eel was deemed "critically endangered" by the IUCN, a conservation group, in 2008. It now sits with the Beluga sturgeon and black rhinoceros on its "red list", just one step above "extinct in the wild". In 2007 the countries of the European Union committed to ensuring the migration to Sargasso of at least 40% of the number of eels that would escape in the absence of all humans, roughly double the current figure. Ireland and Scotland banned eel fishing entirely.

In 2007 Sweden also banned the capture of eels. But the authorities made derogations for the likes of Hånsa, who could prove they had derived a living from eel fishing before the new rules came into force—literally a case of being grandfathered in. Across Sweden, a caste of about 140 old-timers is what remains of what used to be a proud industry.

The march of time means the *Ålakust* crews are being whittled away naturally: a heart attack here, a stroke there. Hånsa had a health scare last year. The rules are clear that he who holds the fishing licence must be in the boat when the traps are emptied. Grandfather and grandson jokingly wonder if a corpse in a coffin might pass muster with the authorities.

The fishing season is now limited to three months, starting in late July in Hånsa's case. But emptying traps and mending nets is a small part of what being an eel fisherman is about these days. In and out of season, afternoons at Hånsa's are spent smoking eels. For six hours 30 eels at a time are left hanging, like so many neckties, over smouldering logs of elder wood from a local ridge. Drawn in by the earthy smell, punters from a local campsite happily pay 395kr ($40) a pop, double the price for fresh eel.

A more boisterous sideline is the eel party. Three nights a week, paying guests visit Hånsa's cottage and its hotch-potch of nets, hulls and rusting anchors. His wife, Maria, serves up eel in every which way: boiled, fried, smoked, smoked then fried. The captain, donning a stripy jumper and a cap he did not need on the boat, brings out a guitar and belts out tunes such as "Eelvis Presley".

Between songs, as revellers drink their schnapps, Hånsa regales them with tales of the eel's libido-enhancing powers—how Freud missed this is not clear—and pins any blame on the falling catches on hydropower dams. Having the eel listed as "critically endangered" has kept some punters away from the parties, Hånsa says, but others wonder if this might be their last chance.

Not all scientists agree the European eel is endangered in any conventional way. Best estimates are that well over 1bn glass eels still land on European shores every year. "It's a seriously unusual situation for a population of fish that numbers in the billions to be declared an endangered species," says Michael J. Miller, a researcher at Nihon University in Japan. But the remarkable drop in adult numbers needs to be addressed.

Europe's conservation measures have also worked. Glass eel arrivals are no longer falling and have seen a small increase in recent years. Eels captured young and grown up in aquaculture tanks, mainly in the Netherlands and Italy, represent two-thirds of all European consumption.

But fish farms have to start with glass eels as their raw material. This hardly matters in Europe, where enough larvae still drift in from Sargasso to satiate the appetite of devotees. In Japan, on the other hand, *unagi kabayaki*, eel that is grilled after being dipped in a teriyaki-style sauce, is an enduring staple. Demand is greater than can be supplied by catches of *Anguilla japonica*, a relative of the European eel which is also listed as endangered.

China has stepped into the breach. Since 1990 eel farms have proliferated there, mainly near Hong Kong. There are now at least 900 of them, and they increasingly sell to China as well as to Japan. As China receives few glass eels of its own, it has scrambled to find some for its farms. Rare Japanese glass eels can fetch up to $30,000 a kilo. But European eels can be procured for around €300 a kilo in France or Spain. Given a kilo of glass eels contains 3,000 fish that, once grown, will yield fillets worth a total of over €25,000, the result has been a predictable boom in eel smuggling.

According to Europol, the EU police agency, around 100 tonnes of live glass eels are exported illegally from Europe to China every year. That is 300m baby fish—roughly a quarter of the entire stock of eels that makes it from the Sargasso to the coast of Europe. By numbers trafficked, there is no bigger wildlife crime.

Chinese gangs, aided by locals, establish pop-up aquariums in garages and warehouses. One den raided by the Spanish authorities in 2018 had a wall lined with 364 suitcases. Each could be loaded with 10 bags of 10,000 wet baby eels each, weighing about 30kg in all. The eels smuggled from Europe to China yield fish sold for over €2bn says Andrew Kerr of the Sustainable

Eel Group, a lobbying outfit in Brussels. Eel busts are now happening across Europe. In the year to June, Europol said it had seized over 17m eels and that 154 people had been arrested in Europe on eel-smuggling charges.

Assuming demand from Japan and China will not abate, the long-term prospects of the eel look murky unless Schultze's "eel question" can be answered once and for all, and eels can be convinced to go through their whole life cycle in captivity.

Given its continued appetite for the fish, Japan is now where the eel-research action is taking place. The spawning ground of the Japanese eel was finally discovered in 1991 (it lies off the coast of Guam, a mere 2,000-3,000 km away from where grown eels end up). Researchers there have come tantalisingly close to making eels spawn. Specimens in captivity have been made to produce larvae. But no one has yet cracked what food those larvae will eat.

Eel defined

Such a world of international smuggling and cutting-edge research feels like a world away at M. Manze in the south-east of London. A blue plaque on the wall designates it as the oldest surviving eel-and-pie joint in the city, dating back to 1892.

Until a few years ago, eels lived in an aquarium inside the restaurant, from which the chef would grab them. The Cockney dish of "jellied eels" involves boiling thick slices of fish, then allowing them to set in its own translucent stock. They go for £3.90 ($5) a bowl, to be eaten with lots of pepper and vinegar.

Jellied eels lack the crunchiness and bacon-like texture of Hånsa's smoked eels and the flavour of *unagi*. To a modern palate, they are the culinary equivalent of a gramophone: a relic from another era. Most customers on a recent visit were tucking into meat pies. "The older clientele still go for them," a waitress claims.

Only a handful of eel-and-pie shops still remain. At one in Walthamstow the restaurant is turned into "The Jellied Eel", a pop-up cocktail bar, at the weekend. A website reassures potential patrons "there thankfully won't be a single jellied eel in sight". Even from its own menu, the eel has learned to slink away. ■

Keyboards of the world

How China made the piano its own

Once an instrument unheard of in much of the country, the piano has flourished in China over the past century

Print | Christmas Specials Dec 18th 2019

ONE LOVE story began in the 1930s, on a road of magnificent Western-style villas on the tiny Chinese island of Gulangyu. Cai Pijie, a lad in his 20s, walked daily past the open window of a young lady he had admired from afar. She regularly practised the piano, an instrument then unheard of in much of China, and the notes floated out in the warm southern air. Entranced, Cai wrote her a letter. "Please play Ignace Leybach's 'Fifth Nocturne' if you love me." Weeks passed before one day her piano answered, and their courtship began. They married. As Cai grew old in the 1980s, his son, Cai Wanghuai, played the nocturne to comfort him. It was the last piece of music he heard before he died.

The younger Cai had by then become deputy mayor of Xiamen, the city of which the island is a part, and helped found Gulangyu's music school, which opened in 1990. Political grandees have visited, including Xi Jinping, the current Communist Party leader. Jiang Zemin, a classical-music fan who was one of his predecessors, asked students to strike up "O Sole Mio" when he visited, singing it in the original Neapolitan.

This summer more than a third of the school's graduates entered top overseas conservatories in America, Germany and Russia. The rest joined the growing number of Chinese ones. They are all part of another relationship that has flourished in the decades since Cai heard the strains of Leybach's nocturne: a love affair with the piano that has spread all across the nation.

Of the 50m children learning the instrument worldwide, as many as 40m may be Chinese. Shanghai alone has over 2,700 music schools, by one estimate. The government lavishes money on orchestras, which now number over 80, and new concert halls. Grizzled bureaucrats, fastidious parents and cool young things fill them to hear the latest *wunderkind*—among whose number, in recent decades, have been Lang Lang, Li Yundi and Yuja Wang (pictured)—play some beautifully judged Bach or fiendishly hard Rachmaninov.

Musical missionaries

The piano on which Mr Cai's mother played her serenade in the 1930s was a rare foreign import; now four in five are made in China. No country buys more. And much of this can be traced back to Gulangyu.

After Britain defeated China in the first opium war in 1842, foreign powers forced the emperor to permit their residents to live in several "treaty ports". One of those was Xiamen (then known as Amoy). Up until 1943 Gulangyu, which lies just a five-minute ferry ride offshore, was an international settlement run by 13 nations and guarded by a Sikh regiment from British-ruled India. It held in its hilly two square kilometres an American consulate, a British school, a Japanese hospital and a Danish telegraph office, among other institutions. The missionaries' music filled the island's churches, whose number grew to six, and converts picked up the strange new melodies.

Mary Doty Smith, the daughter of one of the early American missionaries there, wrote of tea merchants who stopped by their home in the 1850s to hear her mother play what was, for a time, the island's only piano. They brought new scores: "Blue Bells of Scotland" and "Auld Lang Syne". "The Chinese women seemed spellbound at the instrument, as well as the voice, producing such sweet sounds," Smith wrote. Though the wives of missionaries taught locals to play, it was expatriates who, missing the music of home, popularised the piano as an everyday amusement. There was soon hardly a family on the island that did not host or go to hear an evening recital.

It is hard to imagine a lovelier setting for this musical Shangri-La, filled with coconut palms, pink bougainvillea and sub-tropical plants carried home by overseas Chinese merchants enriched from trade in the East Indies. A Westerner writing in the 1920s said the island would surely vie for the distinction of being the "wealthiest square mile in the world". For decades it has also claimed another distinction: the largest number of pianos per person in China. By the 1950s it had 500 pianos for some 20,000 people.

The result was a stream of outstanding musicians. At the turn of the 20th century Zhou Shu'an, an islander whose father was a priest, rose to fame singing "The Star-Spangled Banner" to welcome an American navy ship. From 1928 she helped run what became the Shanghai Conservatory of Music, the first Western-style conservatory. Chen Zuohuang, born in 1947, became the conductor of China's Central Philharmonic Orchestra, and led its first American tour in 1987. Fei-Ping Hsu, a pianist and the son of a Christian pastor, was playing with China's national orchestra at the age of 18.

But the island's most celebrated musician is Yin Chengzong. Though Mr Yin has lived in New York for decades, he regularly returns to China to perform and to stay in the family's 1920s villa on Gulangyu. On a hot autumn day, the 78-year-old pianist points out the longan, papaya and starfruit trees in the villa's garden.

In the 1940s Mr Yin was a boy soprano at one of Gulangyu's churches. He began playing the piano aged seven, taught by the pastor's wife. He spent half his pocket money on classes and the other half on sheet music. He was 12 when he left the island to attend the preparatory school for the Shanghai Conservatory.

He describes how 100 people once squeezed into the Yins' elegant living room for a family recital. In a corner is modern China's first Steinway, obtained by the government of Mao Zedong for Sviatoslav Richter when the Soviet pianist came to perform in 1957. Seven more pianos are strewn about the house. A photograph of Mr Yin taking tea with Mao in 1963 hangs above the mantelpiece. In an exhibition hall nearby is a photo of him with Richard Nixon in 1976, during Nixon's second visit to China.

As the Richter Steinway shows, Western music still flowed in the early years of Mao's rule. The most promising pianists were sent to participate in competitions in other communist countries. In 1955 Fou Ts'ong, a translator's son from Shanghai, won third place in the Chopin Competition in Warsaw. In 1962 Mr Yin came joint-second in the International Tchaikovsky Competition in Moscow, where he stayed on for further training.

Soon after his return, the ravages of the Cultural Revolution began and anything Western or cultured was attacked. In 1966 Mao's Red Guards tormented China's musicians, tore up Western scores and took their axes to any pianos they found—those "black boxes in which the notes rattled about like the bones of the bourgeoisie", in the (perhaps apocryphal) words of Jiang Qing, better known as Madame Mao.

Tragedy in red

Li Cuizhen, a missionary-trained pianist who knew all 32 of Beethoven's sonatas by heart, was declared a counter-revolutionary. Red Guards hounded her and she killed herself in 1966. Fou's parents hanged themselves soon after (he had already defected to London).

Lu Hong'en, the conductor of the Shanghai Symphony, was thrown into a cell. He continued to hum Beethoven there. After he tore up a copy of Mao's "Little Red Book", he was sentenced to death. Lu told a fellow prisoner: "If you get out of here alive, would you do two things? Find my son, and visit Austria, the home of music. Go to Beethoven's tomb and lay a bouquet of flowers. Tell him that his Chinese disciple was humming the 'Missa Solemnis' as he went to his execution." Lu was shot within days. His cellmate reached the Viennese grave three decades later.

On Gulangyu the Yins were thrown out of their villa, as were many others. But the cosmopolitan enclave—perhaps because of its remoteness, perhaps because it was shielded by local officials with an attachment to music—was spared the worst of the brutality. Still, the island fell silent. Some found ways to play clandestinely, and others rehearsed the motions soundlessly with their hands, says Zhan Zhaoxia, a local historian.

In the 1960s Mr Yin had, despite all this, begun to compose. "The piano needed to be made Chinese," he says, "and for all Chinese." He had known only church music and the likes of Mozart and Chopin. Now he burnished his Maoist credentials by playing revolutionary ballads to workers in factories. In May 1967 he and three friends carried a piano, along with a banner reading "Mao Zedong Thought Propaganda Team", into Tiananmen Square. There he played in the open air for three straight days. "We had no idea what would happen," he says. By the third day over 3,000 had gathered to listen.

The young pianist caught the ear of Madame Mao, who saw the possibility of using his talents for propaganda purposes. He became part of a group of favoured musicians working on her state-approved model operas. In 1969 he arranged an earlier revolutionary cantata into the "Yellow River Piano Concerto". It remains China's most famous orchestral composition.

Mr Yin performed his concerto with the Philadelphia Orchestra when it visited in 1973, the first from America to tour communist China. Less than four years later, soon after the death of Chairman Mao in 1976, Beethoven's "Fifth Symphony" rang out from radios and televisions across China. It was taken as evidence by many, write Jindong Cai and Sheila Melvin in their book, "Beethoven in China" (2015), that the Cultural Revolution was finally over.

Slowly, what had been suppressed—bright clothes and capitalism, Confucius, Christianity and more—re-emerged. So did the piano. Far from being killed off, love for it had grown. When in 1978 the Central Conservatory of Music in Beijing reopened, 18,000 people applied for 100 places in its composition department. "Where did all those musicians come from?" asks Jindong Cai, the author (who is unrelated to Cai *père* and *fils* of Gulangyu). "Many had been practising Bach and Beethoven in secret."

Jindong Cai was moved to become a conductor when he first heard Beethoven performed in Beijing in 1979. He went on to lead China's best orchestras, and now teaches at Bard College Conservatory of Music in America. He recalls heady days when securing a piano required a long wait. In 1980 Mr Cai got his hands on one through a contact. "I remember that time with great excitement," he says. "There was such a thirst for classical music." Soon even members of the Politburo were professing their love for it.

Though capitalism, political reform and religion have, at times, stumbled since then, Chinese pianists have only soared, emerging into a nation, and a world, that is happy to fete them.

Mr Yin, though, could see his future in China would be difficult after the fall of Madame Mao. Eventually, in 1983, he left for America—though his music was hardly loved there. In the *New York Times* Harold Schonberg sniffed that Mr Yin's concerto was "one of those awful ideologically approved pieces of socialist-realism propaganda, but it was so bad it actually had kitsch value".

But so what? The piece had helped secure a place for the piano in China. It had rescued companions, too. Mr Hsu, the fellow pianist from Gulangyu, was among the first musicians who, having been banished to work on a farm, was rehabilitated after agreeing to perform the "Yellow River Concerto" to army units.

It is today part of every serious repertoire in China. Young idols have recorded renditions. In 2007 Lang Lang—once a student of Mr Yin—hammered out its final movement for the one-year countdown ceremony of the Beijing Olympics. It was recently performed at Carnegie Hall by Zhang Haochen, a rising star.

Means of production

Chinese factories have become attuned to the needs of this booming market. In 1956 the state had directed a group of piano-fixers to start building the instruments in Guangzhou, but for years Pearl River Piano could not muster even one a month. In the

1980s foreign advisers were flown in. Today the state-run company makes more than any other producer worldwide. It builds for Steinway, maker of the world's finest pianos. Inside the factory, hissing machines make a music of their own, stamping and spitting out their wooden parts. Last year 150,000 pianos rolled off its assembly lines, almost a third of global production. Two in five stayed in China. The company also revived Ritmüller, a defunct German piano brand, and bought Schimmel, another languishing producer.

Where once Western classical music flowed into China, pianists and their renditions are pouring out. China is poised to deliver world-class compositions, says Mr Cai. In 2018 the US-China Music Institute that he began premiered six new Chinese symphonic pieces in Carnegie Hall. The Juilliard School in New York opened its first overseas campus this autumn in Tianjin, a northern Chinese city.

Some misgivings remain, abroad and at home, about whether Chinese technical brio is yet matched by imaginative brilliance. Cao Huanyu reflects on this, too. Like many learners he came from a small town with no top piano teachers. Yet he stood out and made it to Gulangyu's music school. In his final year there, he is applying for Juilliard and the Colburn School.

Mr Cao spends hours practising, but he also wanders the gardens. He worries that China's musical world is too rigid. Students have beautiful technique, he says. "But in practising those long hours, something is lost. The smell of the air, the colours of the trees...I try to put them into my music."

The solar system

How the planets got their spots

The story of how the planets ended up where they are is part detective tale, part violent family history

Print | Christmas Specials Dec 21st 2019

IT IS HARDLY surprising that in the 17th and 18th centuries scientists likened the movements of the solar system to the ticking of well regulated machinery. The clockwork of orreries, mechanical models of the solar system, neatly encapsulated the apparently clockwork nature of the heavens, each planet following its designated course just as it always had, world without end.

The beginning, though, was much less orderly. Wind the clock back far enough and the clockwork goes awry. When the solar system was in its infancy, it now seems, planets changed their orbits with feckless abandon, swinging in towards the sun and out again, sometimes swapping places, possibly leaving the solar system altogether. These peregrinations seem to explain long-standing mysteries about why the solar system is the way it is.

The solar system formed from a cloud of gas and dust which collapsed into the Sun and a disc of dust and gas from which the planets grew through accretion and collision, with smaller things merging into bigger ones until there were no mergers left to be had. The end result was a neat arrangement of four inner planets—Mercury, Venus, Earth and Mars—and four outer ones—Jupiter, Saturn, Uranus and Neptune—all in nearly circular but in fact elliptical orbits that kept them strictly separated. The inner ones were made mostly of rock and relatively small: the Earth is the largest. The outer ones were bigger and made mostly of gas. Disc material that did not get swept up into planets formed a belt of asteroids between the inner and outer quartets and a belt of small, icy bodies beyond them.

In the absence of other planetary systems to study, this orderly arrangement was considered likely to be typical. Its division was taken to be the result of a "snowline" in the original disk. Sunwards of this snowline it was too hot for volatile compounds like water, methane, carbon dioxide and ammonia to condense, and so the planets were mostly bare rock and iron, with some atmosphere added later on. Beyond the snowline, these volatiles condensed into giant gas-balls.

In the mid-1990s, though, astronomers started to discover planets around other stars—and they were arranged very differently. The most easily detected were "hot Jupiters", gas giants circling their stars in orbits much tighter than that of Mercury, the nearest planet to the Sun, and thus far inside any conceivable snowline. Other systems featured giant planets in curious, elongated orbits inexplicable in terms of a coagulating disk. Either that model of how the planets formed was particular to the solar system—unlikely—or planets could change their orbits.

The idea that planets might migrate was not entirely new. In 1984 Julio Fernández and Wing-Huen Ip, then working at the Max Planck Institute for Solar System Research in Germany, used a computer to study the interactions between the outer planets and smaller leftover bodies, known as planetesimals, which took place in the solar system's early days. When a planetesimal passes close to a planet it gets flung into a new orbit. On average the three outer giants flung planetesimals inwards, towards the sun. Jupiter, though, threw its prey outwards. These encounters changed the orbits of the planets, too—infinitesimally, case by case, but cumulatively quite a lot. As Jupiter flung things out, it moved in towards the sun. As the others flung things in, they moved out.

In 1993 Renu Malhotra, now at the University of Arizona, suggested that this idea might explain the orbit of Pluto, a dwarf planet. Pluto has a high eccentricity (it is considerably farther from the sun at some times than at others) and a high inclination (the plane of its orbit sits at a marked angle to the disk in which the other planets travel). On top of that, Pluto makes exactly two orbits of the Sun for every three orbits made by Neptune, an arrangement called a resonance; such resonances make it easy for momentum to move from one body to another, giving bigger planets a lot of influence over the orbits of smaller ones. Dr Malhotra proposed that Neptune had pushed Pluto into its odd orbit as it migrated outwards from the Sun, and speculated that it might have done the same to other bodies it came across as it migrated. Within a few years a number of other "trans-Neptunian objects" (TNOs) in 2:3 resonant orbits obligingly got themselves discovered.

But it was the weird exoplanets that started people thinking that the solar system might not be what it used to be. "Something big had happened in those systems, and that made it easier to think about the possibility that something like that might happen in our system," says Bill Bottke of the Southwest Research Institute (SwRI) in Boulder, Colorado.

To observe these possible pasts needed something beyond telescopes: computer simulations. In the late 1990s Dr Bottke's colleague Hal Levison wrote a program called SWIFT which could follow the orbits of bodies interacting with each other over billions of years. Together with his colleagues Kleomenis Tsiganis, Rodney Gomes and Alessandro Morbidelli at the University of Côte d'Azur in Nice, Dr Levison used this software to model the evolution of the planets' early orbits.

Their results, published in 2005, dramatically illustrated a point made by Dr Malhotra: interactions between the migrating planets might matter a lot. As Jupiter moved inwards and Saturn was pushed out, they passed through a 1:2 orbital resonance which kicked off all manner of mayhem. Uranus and Neptune were suddenly flung outwards into far more distant orbits like baubles in a storm; in about 50% of the program's runs they swapped places, too.

The Nice model, as it became known, explained the outer planets' final distances from the sun, the eccentricities of their orbits and their inclinations. The effects of the migrating giants on the planetesimals in the disk at the time also explained why TNOs have the orbits they do, and why the orbits of the Trojan asteroids associated with Jupiter are highly inclined. "The Trojans, I think, were the smoking gun," says Dr Bottke. Before, no-one had an account of why they were as they were; after the Nice model, they did.

Nice as it was, the Nice model left something to be desired. The starting position of the planets was highly specified, and did not look like the arrangements seen in planetary systems observed in the act of formation around other stars. "So we decided to redo everything," says Dr Morbidelli. Nice II was published in 2011, and was yet more dramatic. It showed Jupiter throwing one of the other giant planets out of the solar system entirely, which seemed like a problem. But David Nesvorny, one of the authors, suggested that it might not be.

Dr Nesvorny found that a five-planet version of Nice II reproduced various characteristics of the modern solar system ten times more often than a four-planet version of the model did. And the idea that Jupiter might have thrown a smaller sibling into outer darkness was not unprecedented; models of the more dramatic migrations needed to produce hot Jupiters showed exoplanets being flung from their stars with reckless abandon. The galaxy may contain more such nomads than it does stars.

Some wondered, though, if the prodigal had stuck around, like a banished dog that stays in sight of the campfire. In 2016 Michael Brown and Konstantin Batygin, at the California Institute of Technology, proposed that the orbits of some very oddly behaved TNOs might be explained by a ninth planet a bit smaller than Neptune that had been flung between 10 and 40 times farther from the sun. Dr Morbidelli is having none of it. But if Dr Brown is right and such a planet does exist, it will have to have come from somewhere.

There is another problem that the migrants might explain. Venus is 90% as big as Earth; Mars only 10%. But models of the way that rocky planets form from a disk of dust which successfully produce a couple the size of Earth and Venus have a strong tendency to produce a third big planet farther out, rather than a runt.

One possibility is that, beyond the Earth, there was a dearth of raw material. In 2011 Kevin Walsh of SwRI, with Dr Morbidelli and others, proposed that giant-planet migration was again to blame. They suggested that very early on in the history of the solar system, before the orbital ballet of the Nice models, interactions between Jupiter and the Sun-centred disk in which it was embedded drove the giant planet towards the Sun. This is the same process thought to be responsible for pushing the hot Jupiters in other systems so close to their stars.

In this system, though, around the time when Jupiter got to where Mars orbits today, it changed its mind and headed back out—a manoeuvre the scientists dubbed the "Grand Tack". They think it came about because Saturn was following Jupiter inwards. Inward-moving planets create gaps in the disk of dust through which they travel. When the gap created by Saturn reached Jupiter, it changed the way the planet interacted with the disk, leading Jupiter to swing back outwards—and take Saturn with it.

This was a lucky escape for the inner solar system; had Jupiter plunged through it, Earth and Venus might never have formed. But by getting as close as it did, Jupiter cleared out the disk around the orbit of Mars—thus stunting its development. Had it never strayed sunwards, the inner solar system might boast another planet as large as the Earth—one which might have done a better job of holding on to an atmosphere and even an ocean than cold little Mars did. The Grand Tack may have spared the Earth; but it may also have cost it a habitable, perhaps even inhabited, neighbour.

Fanciful, perhaps. But as Dr Morbidelli says, "It's clear that the history of planetary systems is very dynamic." And where there is dynamism, there is luck and chance. Before there was a celestial clockwork, there was, it seems, a celestial roulette wheel. ■

Essay

Can technology plan economies and destroy democracy?

How algorithms could someday be used to optimise the ballot box

Print | Christmas Specials Dec 18th 2019

ABOUT A CENTURY ago, engineers created a new sort of space: the control room. Before then, things that needed control were controlled by people on the spot. But as district heating systems, railway networks, electric grids and the like grew more complex, it began to make sense to put the controls all in one place. Dials and light bulbs brought the way the world was working into the room. Levers, stopcocks, switches and buttons sent decisions back out.

By the 1960s control rooms had become a powerful icon of the modern. At Mission Control in Houston, young men in horn rimmed glasses and crewcuts sent commands to spacecraft heading for the Moon. In the space seen through television sets, travellers exploring strange new worlds did so within an iconic control room of their own: the bridge of Star Trek's *USS Enterprise*.

A hexagonal room built in Santiago de Chile a decade later fitted right into the same philosophy—and aesthetic. It had an array of screens full of numbers and arrows. It was linked to a powerful computer. It had futuristic swivel chairs, complete with geometric buttons in the armrests to control the displays. Unlike the Johnson Space Centre and the *Enterprise*, it even had a small bar where occupants could serve themselves drinks after a hard day's controlling.

The operations room of "Project Cybersyn" (short for "cybernetics synergy") was created by Chile's president Salvador Allende in the early 1970s as a place from which the country's newly nationalised and socialised economy could be directed. To build it, Allende had hired Stafford Beer, a British consultant, who requisitioned a mainframe computer and connected it to telex machines in factories. Industrial managers would input data which would then be centrally analysed; instructions for any necessary changes would be sent back.

Ironically, the socialist system's most notable success was in outmanoeuvring lorry drivers whose strike threatened to bring down Allende's government in 1972. After Chile's generals stormed the presidential palace on September 11th 1973 and Allende killed himself, Cybersyn was destroyed: a soldier is said to have stabbed all the screens in the operations room with a knife.

It was a bloody reprisal of a then half-century-old debate about how best to run an economy. Allende had thought that, with state-of-the-art 1970s communications and computers, it would be possible for government to optimise an industrial economy. The Chicago-school economists advising Pinochet in Chile thought that the far greater information-processing capacity of the market would do better. In Chile their opinion was imposed by force.

The success of market- and semi-market-based economies since then has made the notion of a planned economy seem like a thing of the past. But were a latter-day Allende to build a Cybersyn 2.0 it could now gather data via billions of sensors rather than a few telex machines, and crunch them in data centres packed with tens of thousands of servers. Given enough power, might it not replace the autonomous choices on which the market is based?

Already a sense of technological control is spreading through society. The control room has given way to the cloud as the site where decisions are made. There is no central headquarters at Uber sending out drivers, no Borgesian library at Google where things are looked up. Just algorithms that seem to manage more and more of the world's work, and make more and more decisions. Sometimes they run the software of the market, as when serving ads on your screen to the bidder who most wants your attention. But they could also run the software of the *polis* or the state.

As Jack Ma, until recently the executive chairman of Alibaba, a Chinese online conglomerate, put it at a conference in 2017: "Over the past 100 years, we have come to believe that the market economy is the best system." But in the next three decades, "because of access to all kinds of data, we may be able to find the invisible hand of the market." Find it and help it? Anticipate it? Disable it? That was not clear.

Rock me Homo Deus

And if technology can outperform the invisible hand in the economy, might it be able to do the same at the ballot box when it comes to politics? If computer systems can divine what voters want and help those in power deliver it, the mandate they have for that power may come to matter less.

One of the great arguments for democracy is what Fritz Scharpf, a German scholar of politics, calls "input legitimacy". Even if a system does not give people what they want, the fact that those running it reflect a democratic choice is legitimising. Undemocratic governments have to develop some mixture of "output legitimacy"—giving the people what they want—and frank repression. Today's information technology can help with both. It can provide not just data on what people want and will tolerate, but also the means to manipulate those desires. When such means are available to actors within or outside a state the struggle to gain, or for that matter retain, a democracy which reflects a genuine popular will might become even harder than it is.

This is the sort of idea that leads thinkers like Yuval Harari, an Israeli historian, to suggest that ever more capable information technology means that not just free-market economics but also liberal democracy might "become obsolete" over the

coming century. He argues this is particularly likely if information technology is partnered with biotechnology, allowing its algorithms to access and act on human thought. This does not necessarily have to entail tyranny. It might mean something even stranger.

On some of their adventures Star Trek's various starships encounter the Borg, a more-than-species which uses nanotechnology and computers to assimilate all those whom it encounters into its own collective. Its members all hear what each hears, all see what each sees, all will what each wills: there are no individuals; there are no aims but those of the collective. The demands of television drama mean that the Borg's shared will may be represented by a leader—a queen for the spacefaring ant hill. The logic of the idea says otherwise, suggesting a truly equal, truly efficient hive that might persist with neither central control nor overt oppression, optimised only for assimilation.

The Borg are a fantasy of totalitarianism, not a technological prediction. But as data processing pervades more and more of human life, displacing and recasting all sorts of processes, experiences and relationships, is it really inconceivable that they might begin to impinge on the processes of choice central both to market economies and liberal democracy? All-pervading information technology of the sort the world is embracing does not have to lead to strict economic and political control. But the possibility needs to be examined to be avoided.

2. Costs and calculations

The industrial states which fought the first world war brought their economies under centralised control to a degree Europe had never seen before. And many observers thought it had worked rather well. In 1919 Otto Neurath, an Austrian-born economist who in his youth had studied the pre-monetary economy of ancient Egypt, argued that there were lessons from this success. If the state was able to calculate how many uniforms and munitions were needed in wartime—which he knew it could, because he had been in charge of efforts to that end—it could surely do so for other goods in peacetime.

Thus began what became known as the "socialist calculation debate", a now obscure episode which changed the way people thought about the economy. The thinkers who went on to shape the new market liberalism of the second half of the century were on the side of the debate which held that control by planners could not work. In making this case, they introduced the idea of the economy as an information-processing system. And it is precisely that idea which opens the possibility that Mr Ma of Alibaba invokes. If markets are a success because of the way they process information, the fact that the other ways of processing information developed over recent decades are now so incredibly powerful must surely have implications for their role in the future.

The calculation debate was not a matter of dry academic tit-for-tat. Soviet Marxism-Leninism was dedicated to the idea that an economy could be planned, and Russian industrialisation of a basically agrarian state seemed to many socialists in the West to bear the idea out. The Soviet Union made at least one theoretical contribution, too. In the 1930s Leonid Kantorovich, a Russian economist, saw how to manipulate a mathematical model of the economy so as to optimise its outputs through a technique called "linear programming". The idea earned him the only Nobel prize for economics ever won by a Soviet citizen. In 1937 Oskar Lange, a Polish economist who later taught at the University of Chicago, but also served communist Poland at the United Nations and on the council of state, proposed a mathematical way of importing some of the virtues of markets into such planned economies by using "shadow prices" for basic inputs to calculate the optimal allocation of resources.

In their responses to Neurath and Lange, respectively, Ludwig von Mises and Friedrich von Hayek, two Austrian economists, argued that using machinery for such calculations would never be able to beat the results achieved by markets, because markets were also machines—and vastly better ones. They ceaselessly crunched through all the data an economy had to offer in order to calculate what was available and what was wanted; the output of their calculations was what things cost. The processing power they embodied was of a different order from that available through calculations or the rules planners used to control things.

When Glen Weyl, an economist who works for Microsoft, characterises the calculation debate as "basically an argument about computational complexity before Alan Turing formalised the concept 20 years later" he is hardly being anachronistic. By the time Hayek wrote his seminal essay, "The Use of Knowledge in Society", in 1945, he was able to write about the market in terms that directly evoke information technology: it was a "machinery for registering change…a system of telecommunications which enables individual producers to watch merely the movement of a few pointers, as an engineer might watch the hands of a few dials."

But this machine, Hayek went on, did not just register change. It generated new information—information which made the world intelligible, and thus informed the activity within it. What would happen was not merely unknown before the market got to work: it was unknowable. And an economy which cannot be predicted cannot be controlled.

There was another key difference between the market's calculation-in-the-world and the planners' calculation-in-the-calculator. The engineer looking at the screens in Hayek's analogy is not a member of the technocratic elite locked up in a control room. It is anyone with access to price data. As a calculator, the market is essentially decentralised and accessible to all: that is why, in the view of Hayek and his followers, it fits so well with liberal democracy. Everyone is free to make their own decisions.

For a period of time planning still seemed to work. During the post-Stalin "thaw" of the 1950s America saw its nuclear arsenal matched and was beaten into orbit, prompting real questions about which system worked better. Though the Soviet economy was never as strong as it hoped to look, that was a time when new ideas and the first computers allowed Kantorovich and his disciples to believe they might truly be able to turn the Soviet economy into "its own self-victualling tablecloth". Francis Spufford's book "Red Plenty" (2010), a blend of history, economics, science and fiction, reimagines that optimism—and shows how it fell apart in the complexity, criminality and unintended consequences of Soviet life. Democratic and market processes act to even out human fallibility and explore all sorts of possibilities. Planned dictatorships narrow choices and amplify error.

The Soviet Union collapsed in 1991, and China's subsequent decision to diminish the role of planning and embrace markets

in much of its economy saw an unprecedented global boom. The market side of the debate seemed conclusively proved right. Some saw the Soviet collapse as making an allied point about politics; that decentralised freedom worked better. In 2012 Henry Farrell and Cosma Shalizi, of George Washington University and Carnegie Mellon University, respectively, put this argument in a way that made it formally similar to the calculation debate. Democracy, they argued, has a "capacity unmatched…in solving complex problems".

To understand why this may be, consider the informational challenges faced by centralised or authoritarian regimes. They lack what Mr Shalizi calls a "feedback channel". Just as markets generate information about what people want, so does open discussion. In autocracies, citizens have no interest in openly discussing problems or experimenting with solutions, lest they end up in jail or worse. As a result, an unelected government has a limited capacity to understand what is going on in its polity—and thus tends to make bad decisions. Dictators maintain extensive security apparatuses not just to repress the people but to understand them; they serve as the feedback channel through which dictators get the information which they need to govern.

Such measures are not just an affront to human rights. They are politically destabilising. The head of an effective security service can easily become either a rival for the top spot or a self-censoring information block, neither of which bodes well for the boss. And for the dictatorships of the early- and mid-20th century, snooping was expensive. In 1989, the last year East Germany functioned as a state, more than 260,000 people worked full- or part-time for the Stasi, its security service. That was nearly 2% of the population.

3. The intoxications of technology

Despite its advantages, both in terms of economic growth and problem solving, 21st-century free-market liberal democracy has not enjoyed quite the apotheosis that some expected at the beginning of the 1990s. The setbacks to democratic norms at the level of the state have been well documented. The persistence of planning goes unnoticed because it is so familiar: it is the way that companies are run.

Around the time the cold war ended Herbert Simon, another Nobel-prize-winning economist and a pioneer in the field of artificial intelligence (AI), argued that talking about economies purely in terms of market transactions left a huge amount of what actually goes on in the world unexamined. To make his point he offered up a thought experiment. Suppose an alien intelligence—or, for that matter, the USS *Enterprise,* going into orbit, as is its wont, around an M-class planet—were to study a strange world with "a telescope which reveals social structures". Pointed at the Earth, Simon argued, that telescope would show lots of solid green areas with faint interior contours linked by a network of thin red lines. Both colours would be dynamic; new red links would form and old ones perish; some green blobs would grow, others shrivel. Now or then one blob might engulf another.

The green blobs in Simon's vision were firms and other organisations in which people work; the red lines, market transactions. And if asked what the long-range scanner revealed, the observer would reply "large green areas interconnected by red lines" not "a network of red lines connecting green spots". By concentrating only on the red lines representing market transactions, Simon said, classical economics misses out a great deal of what happens in the world. And in that missing part of the world, decisions are routinely subject to a great deal of planning, the information processing for which takes place in management hierarchies. Simon would not have been at all surprised to find that, 30 years on, those hierarchies were increasingly enabled by, and dependent on, computers processing reams of data.

"Internally, firms are planned economies no different to the Soviet Union: hierarchical, undemocratic planned economies," write Leigh Phillips and Michal Rozworski, two leftist activists, in "The People's Republic of Walmart" (2019), a highly readable romp through the history and possible futures of planning. The management, marketing, logistics and manufacturing functions of big companies all exhibit huge amounts of planning (some of which, in areas like the layout of factory floors or the design of supply chains, may well use linear programming and related techniques). Amazon and Walmart display levels of planning that Gosplan, the Soviet Union's central planning agency, could never have hoped to match.

Today, applied within firms, such planning is used to maximise profit—and the tendency of such centralisation to produce corruption and other adverse effects is kept at bay through all manner of law and corporate-governance mechanisms. Messrs Phillips and Rozworski argue that if similar tools were applied more widely in an economy under democratic control other goals could also be taken into account and optimised: health; the environment; leisure time. It is a message that resonates with at least some on the left who are embracing anew the idea of a post-scarcity "Fully Automated Luxury Communism", to borrow the title of a book by Aaron Bastani, a left-wing media entrepreneur.

Democratic centralism

Actual existing communism, such as it is, is neither fully automated nor, for most people, luxurious. It is also little interested in putting the power to plan under democratic control. Indeed in pursuing its goal of actively managing a "harmonious" society, the Chinese Communist Party shows every sign of wanting more or less the reverse: not the democratisation of planning, but the sort of planning that permits democracy to be minimised. As Rogier Creemers of Leiden University explains it, the party (which, it should be noted, includes many engineers in its high ranks) thinks that, like the natural world, social reality is underpinned by objective laws. If a government understands these laws, it can predict how society will work, which will allow society to be controlled. "It's a pure rejection of Hayek," says Mr Creemers.

With the tools at their disposal today, planners and controllers would seem to have no hope of competing with organically grown information-processing systems such as markets and democracy. But the power and reach of the tools available grows all the time. More than half the people on Earth already carry a hand-held sensor-packed computer. Many millions can make things happen just by speaking into thin air, thanks to the fact that computers are always listening for their command—and thus for anything else which may be going on. Few doubt that, barring some derailing catastrophe, the amount and variety of data gathered, processed and transmitted around the world will continue to grow. Let a thousand satellites bloom, a trillion

sensors sense. There are already a thousand times as many transistors etched on to silicon every year than there are grains of rice and wheat grown in fields. Why should that multiplier not be a million?

It is not only the quantity of data that has changed since the days of Soviet planning and Stasi snooping. There have been huge qualitative changes, too. Gosplan had to make do mostly with production data, which were often wrong because factory managers had many reasons to over- or under-report.

Today's digital information comes in real-time streams, not static statistics, taken directly not just from machines but from people, for instance by tracking subconscious eye movements. And the programming techniques—including self-programming techniques—now bundled up under the catch-all term AI can derive all sorts of meaning from them. Such systems embody that with which Kantorovich and his planners could not cope: effects related to their causes in complex, non-linear ways.

Red intractability

Yet none of this means either efficient or effective planning is possible in the near term, or perhaps ever. For a start, a wider qualitative range of data does not equate to higher quality data; each new way of looking at the world through machinery is likely to bring its own biases, and in a data deluge these could become harder to spot.

It is also worth keeping in mind that, though Messrs Phillips and Rozworski are correct that companies do a lot of planning, they do it suboptimally; indeed, many of them do it so badly they go out of business. Competition assures you that when this happens other companies will keep going. But that redundancy would be hard to come by if planning took on more and more of the economy.

And economic planning really is hard. Inspired by Mr Spufford's "Red Plenty", in 2012 Mr Shalizi published a fascinating mathematical exegesis of Soviet planning online. If Gosplan had been given a good modern computer and today's snazziest linear-programming software it would have taken a few minutes to solve the equations needed to optimally allocate resources over the 12m products the Soviet Union was making in 1983. But factor in a range of further relevant variables—quality, technical specifications, delivery locations and the like—for each product and the calculations get much much harder. If there are a thousand variables associated with every product, the computing power needed goes up by a factor of 30bn.

Suresh Naidu of Columbia University thinks such calculations may, from a planner's point of view, be overly pessimistic. You do not need to model the whole economy. Some entities—industrial sectors, labour markets—could be optimised separately, allowing separate planning problems to be solved in parallel. "We're never going to plan the economy like the Soviets, with a giant matrix with every good in it," explains Mr Naidu, "but we could get it right on average."

But could you plan a moving target? If the role of AI within the economy increases, so will the economy's complexity. As Alex Tabarrok, an economist at George Mason University, puts it: "The problem of perfectly organising an economy does not become easier with greater computing power precisely because greater computing power also makes the economy more complex."

And there is the problem of Goodhart's Law, named for Charles Goodhart, an economist: data known to be used for planning purposes cease to be good measures of the way the world is. Yu Yong-ding, a Chinese economist, saw this in action during the Great Leap Forward. Chairman Mao decreed that China should produce more steel: as a result, much of the country's existing stocks of the metal were melted down in backyard furnaces which produced poor quality pig iron. Mr Yu is now an adviser to China's National Development and Reform Commission, which is in charge of developing the country's five-year plans, a reasonably broad-brush endeavour he supports. He is utterly sceptical about microeconomic planning. "If you are not God, you cannot foresee everything," he says with a smile. Hayek could not have put it better.

4. A screen pressed up against a human face forever

China's leadership may be as convinced as Mr Yu that fine-grained economic prediction, and thus control, remain impossible. But when it comes to using computers for social and political control it seems, predictably, much more keen.

A lot of this is relatively straightforward repression, seen in its most extreme form in Xinjiang, a region in western China where most of the citizens are Uighurs, a Muslim minority. In cities, cameras are everywhere, as are checkpoints where residents must show ID cards and allow their faces to be scanned. They are also required to install a smartphone app that allows police to track them and access their data. This is not an alternative to the internment camps in which hundreds of thousands of Uighurs are confined. It is an extension of them.

There also are softer, but perhaps more far reaching, applications of information technology. To police public conversation, as China's censors are tasked to do all across the country, means listening to it. What people talk about on social media shows what they care about. It thus describes what the state needs to do to achieve "output legitimacy". Active manipulation of the public conversation provides another avenue for control. So does the "social credit system", which is meant to use a range of data to give citizens a trustworthiness score, though it is still a fragmentary work in progress, at best.

For a catastrophising imagination, it may seem only a few steps from here to the Borg. Add a few biological implants, AI which hears everything and draws conclusions about potential instabilities and an ability to provide for the basic needs of all, and you have your cybernetic ants' nest. But that is quite a stretch. Ultra-wired dictators would run into similar problems as economic planners. Even in relatively small countries it is exceedingly difficult, not least because of social media, to predict what will drive change where. Hong Kong is an excellent worked example. And social engineering via AI risks going badly wrong, as Mr Shalizi's sometime co-author Mr Farrell points out in a recent blog post. AI systems make mistakes and develop biases. If the people the AI is being used on suffer as a result, that is bad for them; but it might be even worse for a government relying on the AI's insights for control. "Machine learning ... may turn out to be a disaster for authoritarianism", writes Mr Farrell.

Beyond aithoritarianism

When it comes to eroding an existing democracy, rather than shoring up a dictatorship, there are somewhat similar technologies on offer. Some are destructive. Social media, driven as its commercial interests are by the desire to "go viral", offers ways to inject the equivalent of computer viruses into the public's political information processing, degrading and distorting its output through misinformation, emotional incontinence and cognitive sabotage.

Some are less obviously abhorrent. Neither scoring for some sort of social credit nor sophisticated surveillance tools are the sole preserve of authoritarian states. Online, people happily allow firms to follow their every move—where they are, what they buy, what they like and even what they think—and build up profiles of them scored for any number of characteristics. State surveillance can gel with the self-administered form. More than 400 American police departments have agreements with Amazon that allow them to access the cameras associated with the company's video-doorbell service, Ring. The "surveillance-based economic order", as Shoshana Zuboff of Harvard Business School calls it, is not identical to what is growing in China. But the two systems have clear similarities.

A visit to the heart of one of Earth's greatest green splodges reinforces a sense of what is afoot. In many ways, Apple is on the side of the angels when it comes to surveillance; no other big tech company takes privacy so seriously. Employees are no longer as afraid of error as they were when the late Steve Jobs still ran the place. Even senior executives sport a relaxed untucked look, a faint echo of Apple's countercultural origins.

The great glass torus which houses the company's headquarters is bright, clean and beautiful, its processes hyper-efficient and environmentally friendly. But from within it feels more than slightly sect-like. The transparency is amazing—the floors curve away into the distance, workers on the other side of the building can be seen across the central garden. But transparency does not mean openness. Doors let you through when you swipe the right badge. Cameras are everywhere, albeit well hidden. In 2017 an employee was fired after his young daughter took a video of him in the Apple cafeteria using an iPhone that had not been released and posted it online.

Designed by Norman Foster, an architect besotted with flight, the building is often likened to a spaceship—an impression reinforced by the fact that its foundations are decoupled from Earth's crust by a system of 700 steel disks which allows it to move back and forth during an earthquake. But is it a flying saucer readying itself for launch? Or has it just touched down, the beachhead of a courteous, almost welcome invasion from the fully networked, algorithmically optimised and increasingly well controlled future?

5. Welcome to Planet Platform

One of the interesting things about the socialist calculation debate was the degree to which the two sides agreed. They shared the desideratum of machine-like efficiency; they differed about how to get it. It is harder to see the common ground between outrages such as the suppression of Xinjiang and busy people surrendering data and decisions to Alexa and Siri. But the desire for control and predictability in your own life shares some characteristics with the notion of controlling others. Thoughtlessly pursued it may open up similar possibilities. And thoughtlessness is the whole point of automation.

If you care about values, though, you can design systems with room for thoughtfulness—systems which provide room for discussing the whys and to-what-ends that the how-wells of efficiency tend to silence. Consider again Chile's Project Cybersyn. Yes, its operations room was a place for control. But it was also a place for debate. As Eden Medina of MIT explains in "Cybernetic Revolutionaries" (2011) it was designed to bring humans and machines together in a way that promoted the discussion of ends, means and values. It was a platform for economic democracy that its creators wanted to replicate across the country, providing workers, managers and officials with the opportunity to understand their situation and decide what to do. Hence its use of big geometric buttons instead of traditional keyboards: working men with fat fingers would be able to use them as well as managers whose secretaries normally did the typing.

The concept of providing a platform for choice and for discussion is a crucial one, not least because carving up the world into platforms on the one hand and the things which run on them on the other is a near ubiquitous feature of tech-talk. The platform in question may vary—it may be an operating system, an online marketplace, a social network. But it is always something on which other stuff sits, and which determines what that other stuff can do.

If planners—or regulators, for that matter—want to intervene in something, it is with the platform that they are best advised to start. It is the place where code becomes law, where the mechanisms by which a market works are specified. The canonical example is the early web. No startup had to ask if it could put up a website. But if it did not follow certain technical standards its offering simply would not work.

This way of thinking of things allows a new insight into the calculation debate. In treating both the planning system and the market as what might now be called computer programs it made them comparable. Take the next step of seeing the type of program in question as a platform, though, and they become very different. The market is a platform that can run lots of very different processes; the planned approach is much stricter.

Platforms are already a source of huge and increasing power, commercial and otherwise. Politics needs to catch up with this, not just in terms of regulating commerce—where the issue is already a hot one—but also by opening up discussion of the values that platforms embody and encourage. In a recent paper entitled "Digital Socialism?" Evgeny Morozov, an American writer and researcher, calls on the left to push governments to take back control of the "feedback infrastructure" of the platform economy; Trebor Scholz, a researcher at the New School in New York, wants a lot more platforms run by co-operatives. Some will see problems with both approaches. But expecting a market that lacks both foresight and oversight to produce platforms fit for civic purpose on their own would be very optimistic.

Like most things, the platform world should be pluralistic. Some basic platforms, such as digital identity and digital currency, perhaps, should probably be owned by governments, or at the very least open to policing by them. Other platforms need to allow oversight by their users and civil society to ensure an absence of bias (the besetting sin of AI) and privacy in-

fringements. A further set, such as the internet, Linux, an open-source operating system, and Wikipedia are best looked after by standards bodies or groups of volunteer developers. And many should be allowed essentially to own themselves, perhaps encoding what they are there for and how they are to be used in blockchains like those used by cryptocurrencies.

Mr Weyl, the economist at Microsoft, thinks a healthy federation of platforms will provide new ways to make decisions. That might allow new ways of planning; but it might do so on platforms that require democratic consent (Mr Weyl has a geeky new voting system he is itching to try out in such a world).

To see everything in terms of platforms is not a necessarily sunny outlook. An all-encompassing platform which required applications to embody a single set of values would be headed in a decidedly Borgish direction. Mr Weyl's healthy federation of platforms, like the mostly amiable and high minded United Federation of Planets which is responsible for the USS *Enterprise*, is a hope, not a certainty—one that needs an engaged political process to bring it into being if it is to set off in search of new life, and new civilisation. ■

Yeoville

Hard times and hotplates in the most diverse district in Africa

Few tourists or locals visit Yeoville in Johannesburg. They are missing out

Print | Christmas Specials Dec 18th 2019

ONE MORNING in October Sanza Sandile zigs and zags his way through Yeoville market. He hollers at Ghanaian seamstresses, waves at Nigerian apothecaries and sniffs at the stews bubbling in front of Zimbabwean cooks. Finally he finds what, or rather who, he is looking for: Lydia Luiki, the Congolese queen of cassava.

Ms Luiki sits on a small wooden stool. Between her feet is a sack of green leaves from the shrubby cassava tree, which came in from Mozambique this morning. She processes it with three other Congolese women, who nimbly wash, pluck, blend and pack the leaves. The resulting mulch is sold for 10 rand (60 cents) per bag.

Mr Sandile (pictured above) has tried other cassava-sellers but their produce is far inferior to that of the Congolese queen. Hers is a staple of the dinner club he hosts five days a week in Yeoville, a district in central Johannesburg which is home to 20,000 people from at least 30 African countries. His "cassava three ways"—Angolan, Congolese and Mozambican—is one of a dozen dishes that mix the cuisines of the area's diasporas.

The 44-year-old chef grew up in Soweto, a township on the outskirts of Johannesburg. During the 1970s and 1980s it was the wellspring of resistance to apartheid, South Africa's brutal system of white rule. It was also a place of "dry sandwiches", recalls Mr Sandile. By contrast, Yeoville, to which he moved in 1994, the year of Nelson Mandela's election, was a cornucopia of flavour. It still is.

Few tourists come to Yeoville. Nor do many residents of the rest of Johannesburg. And though its high crime rate might make that choice seem sensible, they are missing out. The diverse tastes that inspire Mr Sandile reflect a fascinating present and past.

Once a place where Europeans washed up, today most of its residents are from other African countries. No other place on the continent has so many different communities in such proximity, and for all its violence and poverty it remains a place of sanctuary. "Yeoville", says Mr Sandile, "is still the headquarters for people who know what it means to be the Other."

Johannesburg is a city built on mining and migrants. A few years after the first big discovery of gold in 1886, Thomas Yeo Sherwell, a developer from Yeovil, England, bought a plot of land to the north of the main seam and named it after his hometown and himself. He touted it to the rich as an oasis away from the dirt, dust and noise.

In the end Yeoville proved still too close to the mines for the newly monied. But it became popular with migrants, many of them Jews from eastern Europe. In the decades after the second world war, when the South African economy boomed, new migrants from authoritarian and communist Europe flocked to Yeoville. The streets were dotted with vendors selling falafal and German-style sausages, Italian cafés and Greek tavernas.

Kristina Gubric was born in Yeoville in 1973. Her parents were ethnic Hungarians from Yugoslavia who had paid for the move by smuggling cigarettes and tights. Ms Gubric recalls a childhood buying shawarma and *Wurst*, and watching her father play chess in cafés. She observes that by moving from Josip Broz Tito's Yugoslavia to apartheid South Africa, her parents "swapped one form of oppression for another".

But in Yeoville oppression was frequently discussed, and often resisted. The area has always had a radical streak. Mandela and Mahatma Gandhi both lived there briefly. It was home to many members of the South African Communist Party. Diasporas today keep up the area's tradition of politicking. "When you see Congolese in Yeoville they're probably discussing politics," smiles Gilla Botaka, a security guard.

In the late 1970s and 1980s Yeoville stood out amid the starched wickedness of apartheid. Gay-friendly clubs such as Casablanca sprang up. Under the Group Areas Act, first passed in 1950, South Africans of different skin colour were segregated, with non-whites forcibly removed to peripheral townships. But in Yeoville authorities sometimes turned a blind eye to "greying". There was probably more mixing in the area than anywhere else in the country.

The mixing increased as apartheid neared its end. The Group Areas Act was repealed in 1991. Exiled members of the African National Congress (ANC), the party of Mandela, returned home. Progressive South Africans of all colours imagined what a democratic version of their country would be like. A lot of that dreaming—and a lot of drinking—went on in Yeoville.

"You left white South Africa at the door when you arrived in Yeoville," remembers Laurice Taitz, who grew up in Benoni, an affluent white town outside Johannesburg. "You left all the conformity, the evil dullness of it all." She recalls a heady time of parties and politics. "It was a coming of age for a lot of people…the first hint of what a new South Africa might be."

Thanks for the memories

Some of Mr Sandile's recollections of that time seem still to be glimpsed through a hedonistic fug. Did he really see Paul Simon on stage with Thabo Mbeki at a jazz club? Was he actually sent to help Mick Jagger find some "really nice stuff"? Either way, Yeoville was where he first saw blacks and whites mixing together, and, just as unusual, black people drinking chardonnay. Here were the "smart blacks" who had been suppressed and squandered under apartheid. Here, he continues, "We were free."

Looking back, though, Mr Sandile also sees the eve of democracy as a missed opportunity. "We could have created an alternative suburb in Yeoville. We could have all co-existed." It is hardly a feeling unique to the area. A quarter of a century after the end of apartheid, many all over South Africa feel that the country has squandered its democratic dividend. But the Yeoville residents who lived through the heady days of the early 1990s feel an especially acute sense of regret.

In 1991 Yeoville was 79% white. By 1998 it was more than 84% black. "It's like I've lived in two different countries," says Gabrielle Ozynski, one of the few white South African residents to have stayed. But Yeoville's story was not just one of "white flight". It saw "black flight", too. The ANC cadres who had partied and plotted in Yeoville got government jobs. Many moved to Pretoria, the administrative capital.

In the late 1990s and 2000s the South African middle classes were replaced in Yeoville by migrants from the rest of Africa. Under Mandela, South Africa welcomed refugees. Under his successors that was coupled with a spotty approach to illegal immigration; the army was removed from border patrols in 2004, replaced by a small, ineffective police contingent.

One of the largest communities in Yeoville is from the Democratic Republic of Congo. A former synagogue has become the "Congolese mall", complete with hair salons, Pentecostal churches and a courier service ("Much cheaper than FedEx", says the owner). The Congolese are hard to miss. Their elegant clothes are a sign of "sapology": an elegant protest against stifling poverty that began in the dictatorship of Joseph Mobutu, who banned Western clothes. Mr Botaka, the politically active security guard, insists he is dressed casually while sporting a diamanté earring and a tuxedo.

But if the Congolese stand out, they know they are but one group among many. "I didn't travel before coming to South Africa," says Joris Bondo, who moved to Johannesburg in 1996 from Congo. "But in Yeoville I travel across Africa every day."

The smell of frankincense burning in coffee shops is testament to the number of Ethiopians who have left behind ethnic conflict, too. Zimbabweans are targeted by multiple adverts offering low-cost remittance transfers back home. Smaller communities from west African countries such as Liberia and Sierra Leone have also found a haven in Yeoville.

Many are fleeing civil strife. Some are escaping a more pervasive persecution. "I'm gay," says Richard, from Ghana, who came to Yeoville in 2003 and never left. "I'm not very welcome back home. I would have had to have led my whole life for other people, as a lie."

Most migrants to Yeoville, like newcomers anywhere, start by seeking out compatriots. But over time there is cross-pollination. Laye Kamara, from Liberia, is dating a Zimbabwean woman, whose level of education impressed him. At a local primary school a Zimbabwean and Cameroonian couple explain that their son speaks Lingala in the playground so he can fit in with Congolese pupils.

Food, like education, is a catalyst for mixing. Blessings Café, one of the many diners in Yeoville, is manned by Lucky Olabode, a former fork-lift truck driver from Delta State in Nigeria. He has learned to cook pap (maize), meat and stew for his southern African clientele, as well as traditional fare such as pepper soup and jollof rice for Nigerians. Sharing meals is one reason why "we have a strong community here," he says.

It is a sentiment that Mr Sandile is trying to foster with his own dinner club. On a recent visit your correspondent sampled the famous cassava three ways; jollof rice, Senegalese-style; "Nigerian cow leg"; Ethiopian ladyfingers; Mozambican pickle smeared on steamed fish; pumpkin dishes galore; poached guavas; and fried *magwinya* (doughnuts). All of it was washed down with a savage blend of Egyptian arak and Ghanaian herbal bitters.

When Mr Sandile first moved to Yeoville he worked as a radio journalist. He would also act as a fixer, doing odd jobs. The cooking came later, as a way of showing that Yeoville still had much to offer. "I embraced multi-African food," he explains. "I don't want to go to Melville [a mostly white, hipster suburb] for a pizza. Fuck it."

Yet Mr Sandile is the first to recognise that Yeoville is far from a cosmopolitan paradise. "Yeoville is the pan-Africanism of the streets," he argues. If there is a shared identity it is one born of mutual hustle, rather than any kind of ideology. More than 70% of workers in Yeoville earn less than 6,400 rand ($432) per month. "Here in Yeoville I think we are all friends. The reason for any problem is hardship," says Mr Olabode, the Nigerian chef. His 3,000 rand rent is three-quarters of his monthly salary.

Many migrants use Yeoville as a starter suburb before moving out of the city, in the same way as white Europeans once did. But saving is hard when rent takes up most of your pay. Not that one gets a lot for the money. The demand for accommodation is so high that two-bedroom flats can rake in more than 20,000 rand per month, about the same as more salubrious parts of Johannesburg. In this case, though, the flats may have ten or more residents. Opposite the Yeoville market a brick wall is festooned with signs looking for "a woman to share a bed" or "a man to share a sitting room".

Nor does the South African state make it easy for Yeoville residents. A common complaint is sluggishness in processing asylum claims. Mr Bondo has still not been formally classified as a refugee, which would make it easier to work, despite having arrived from Congo 23 years ago. He has had to renew his status as an asylum seeker more than 40 times.

The city government has long neglected the area, perhaps because most foreigners cannot vote. It is more likely to sweep informal traders off the pavements than sweep litter off the streets. That makes enterprise hard for people who often have no other way to make money. A Zimbabwean woman flogging chunks of cabbage by the roadside explains that she would like to sell higher-value goods but cannot risk the confiscation of more expensive stock.

And it is not just the state that is hostile. In September cities including Johannesburg saw spasms of xenophobic attacks on foreign-owned shops and property. Such was the violence that a Nigerian airline sent a plane for dozens of citizens to leave the country.

In Yeoville, because of the safety of numbers, there were relatively few attacks. When vigilantes got close, warnings were passed in person and on WhatsApp. ("The Zulus are coming" was a common message.) But the violence has still caused a sense of unease among residents. Richard, from Ghana, says South Africans' "Afrophobia" stems from their own plight, though that is no excuse. "Don't blame me for you not getting a job."

And a bitter aftertaste

For Mr Sandile the "giant elephant in the room is the way we Africans treat each other." Even though xenophobic attacks are rare in Yeoville, crime is not. There were 27 murders in 2018 and the tally was higher in 2019. Every night before his supper club opens he ensures the toilets are washed then locked. Otherwise they are spoiled and items are stolen. "We are left here as Africans robbing each other and hating each other."

Like many residents, he has a passionate ambivalence for Yeoville. He loves what it ought to represent, but laments the day-to-day reality. It is not unlike his feelings towards contemporary South Africa as a whole: great in theory, less so in practice.

For now the remembrance of the heady idealism of the early 1990s, the joy of a shared meal and the need to make a living keep the plates coming. "I'm staying here and doing my table," says Mr Sandile. "Because my memory is my weapon. And I remember that we used to live nicely here." ■

Route setting

For Olympic climbing's route-setters, a blank wall is a canvas

Climbing will make its debut at Tokyo 2020. But first, the sport's courses must be artfully designed

Print | Christmas Specials Dec 21st 2019

IT IS 8AM on a September Sunday in Kranj, a half-hour drive from Slovenia's capital, Ljubljana, and Christian Bindhammer is staring at a blank wall. It is his canvas. In a few hours it will be transformed from 182 square metres of drab beige and grey into a fever dream of Kandinsky colours. A week later it will be unveiled to 1,300 spectators. Within a month, another 180,000 will have beheld it on YouTube.

Mr Bindhammer is not an artist, as such. But there is a beauty to what he does. With plastic "jibs" no bigger than two £1 coins stacked on top of each other, bigger amorphous blobs made of resin or fibreglass and brightly coloured "volumes"—cubes, cylinders, tetrahedrons and stranger, compound shapes—that might be the size of a sofa, he will make this featureless, overhanging wall into a sublime physical challenge for some of the world's best sportsmen and -women.

The competitors in the "lead climbing" world cup arranged by the International Federation of Sport Climbing (IFSC) need things up which to climb. This year, in Kranj, it is Mr Bindhammer's task to provide those things. Every stage of the competition will require a unique route, never seen before, which tests the different facets of a multifaceted sport: strength, endurance, flexibility, footwork, mental fortitude. Because climbing is one of the rare elite sports not to favour a specific body type, the routes must be equally challenging to diminutive featherweights and towering beefcakes. Ideally, there will be points that require the sort of crowd-pleasing leaps that thrill aficionados and casual viewers alike. The walls ought to look stunning, too.

There are further demands. In other sports where athletes face obstacle courses the competitors are expected to make it to the end, either as quickly—downhill skiing, kayak slalom—or showily—freestyle snowboarding—as possible. Show-jumpers are expected to finish their rounds, too, though with points deducted for faults. Lead climbing is not like that. What matters is how far you get before falling. So Mr Bindhammer's walls have to be hard enough that few, if any, will top them, but not have any specific passage so hard that everyone falls at the same point, effectively making the competition a draw. It is like designing a slalom in which each skier crashes out at a different gate.

Mr Bindhammer is part of the IFSC's elite group of 31 "route-setters". Of that group, nine are from France, a reminder of that country's dominance of sport-climbing in the 1990s. The rest are a mix of Germans, Italians, Poles and other Europeans, as well as a few Japanese. Only two of the 31 are women. In recent years, female participation in the sport has grown—men and women now compete in roughly equal numbers—but in their gender as in their Frenchness the route-setters reflect an earlier time. The IFSC is looking to do something about this.

The venue in Kranj, a municipal sports hall which on weekdays teems with pupils taking their PE classes, has hosted climbing world cups since 1996. Its wall is steep, which in climber-speak means not vertical but severely overhanging: 13 metres high and jutting out by 10 metres, for an average incline of negative 36 degrees. This basic architecture has not changed in 23 years. The style of routes charted on it has. So have climbing competitions, and the sport itself.

Next year, climbing will reach what is often seen as a sport's pinnacle when, in Tokyo, it makes its Olympic debut. The International Olympic Committee (IOC) wants to attract younger audiences to its ageing franchise, and climbing has the vibe they are looking for. Tokyo was keen; climbing is popular in Japan.

The games will involve two other disciplines as well as lead climbing. "Speed climbing" is where competitors race each other up a standardised sequence of holds, the same in each tournament, on a 15-metre-high wall with a five-degree overhang. "Bouldering" involves climbing up a low rockface, usually no more than two metres off the ground. How all this will grab the public, young and otherwise, remains to be seen. But creating all the lead routes and boulders will mean a great deal of high-pressure work, on a vastly public stage, for Mr Bindhammer and his colleagues.

Poles and rockfaces

Your correspondent started rock-climbing as a student in Poland 20 years ago, when an early commercial climbing gym opened in the bowels of the Warsaw University library. Since then the once-niche pursuit has gone mainstream. Indoor climbing walls have mushroomed around the world, including in some unlikely places: 22 Bishopsgate, a snazzy new office tower in London's financial district, has installed one between the 25th and 26th floors. Britain's capital has around 30 commercial climbing gyms, twice as many as in 2012. Tokyo is said to have more than 100. Stefano Ghisolfi, a star of Team Italy, recently modelled for Intimissimi, an underwear firm. Shauna Coxey, a top British climber, is sponsored by Aldi, a grocer. In March the Oscar for best documentary was awarded to a film, "Free Solo", about a ropeless ascent of El Capitan, a 1km-high hulk of granite in Yosemite Valley, California by Alex Honnold, a leading American climber.

The film brought to the masses not just the physicality and the raw courage of the sport, but also its subtler grace and its knottily intellectual side. Marc Le Menestrel, an accomplished climber and author, who also teaches decision theory at the INSEAD business school in Singapore, talks of the sport's quest for "movement and beauty" as well as its "intellectual *casse-tête*". The job of the route-setter is to make that experience possible and bring it out in its highest form. They are not just sculptors

of walls; they are choreographers, forcing athletes into a vertical ballet in which they have to think on their fingertips and on their tippytoes.

Route-setters have much in common. They are lean, with Popeye forearms, callused palms and finger joints gnarled from years of squeezing tiny edges. Like everyone, they are prone to bias. No one can stop being French, or flexible, or tall, says Mr Le Menestrel. They have personal styles and imbibe national ones ("French style" is elegant and static, Japanese fearless and dynamic). And they are sturdy.

A few hours of setting and testing competition-style bouldering routes at the Climbing Works in Sheffield, a gym part-owned by Percy Bishton, the IFSC's British head of route-setting, left your reasonably fit correspondent with scraped forearms, scuffed shins, skinless fingertips, and a whole body of aches with which to come into work the next day. Mr Bishton was undoubtedly in better shape as he boarded a plane to Qatar to set bouldering routes for the World Beach Games.

The routes he sets now are much harder than those tackled at the first international sport-climbing competition, held in the Italian Alps in 1985. Back then, the routes were set by nature, in that the competitors climbed up a natural outdoor cliff near the town of Bardonecchia. That approach gives an unfair advantage to people familiar with the host crag, which is one of the reasons that the sport now favours unique creations indoors; they can be kept under wraps. Unlike natural stonescapes, which climbers frown on tampering with, indoor routes can also be fine-tuned. The first indoor competition took place in Vaulx-en-Velin near the French city of Lyon the following year. The route-setter's craft was born.

Like all experts, route-setting teams are inclined to groupthink. A certain "intersubjectivity" is required in order to curb this, says Mr Le Menestrel philosophically. Mr Bindhammer's Kranj crew included two other IFSC-certified colleagues—Yann Genoux, a full-time French route-setter living in Britain, and Martin Hammerer, a software engineer from Austria—and three apprentices. They vary in size—from Mr Genoux, who is 172cm tall (5ft 6) and weighs 60kg (130lb), to Luke Brady, an American who is 15cm taller and 22kg heavier—and expertise. What old-timers like Mr Bindhammer, a multiple world-cup finalist who has repeated some of the world's toughest rock climbs, and Mr Bishton lack in raw power they make up for in cunning. You don't need to be as strong as the competitors—"If we were, we would be competing," quips Mr Genoux (who himself used to). You must, though, be strong enough to understand what they are capable of—and, critically, what they are not.

The subtleties of their art have been enriched by a growth in the forms available to them. In the 1990s all the holds they would stick to the wall resembled fist-sized lumps of rock. Screwed onto flat panels, that made for "two-dimensional" climbing, says Mr Bindhammer. Today's panoply of jibs, blobs and larger volumes makes things much more three-dimensional. Today's routes are thus "much more fun to climb", says Adam Ondra, a Czech climber crowned men's world champion in August. Many of the boulders Mr Bishton and his team put up in Sheffield used bulky, featureless volumes. Climbing them can feel more like wrestling a fridge than scaling a ladder.

The Olympics will bring fresh challenges. Broadcasters are demanding more predictable schedules. The IFSC has already cut the time athletes have to complete their lead attempts from eight minutes to six, putting slower-paced competitors at a disadvantage. Including all three formats—speed, boulder and lead—for a combined score makes it harder to get the difficulty just right. Speed climbers and boulderers, who often lack stamina, may fall early from a lead route; some lead specialists may struggle with difficult boulders. Route-setters may need to rethink their plans in light of the eventual finals line-up, though new design software to help them rework routes on screen is being tested. TV's insistence on "tops" means route-setters may err on the side of simplicity, putting off many seasoned climbers. "When I see a top, unless it's the last climber, I lose interest," says Mr Ondra.

The hope is that these constraints won't erase the human element. If they ever did, says Mr Le Menestrel, you would have "perfect rules, no judgment, no beauty". And, ultimately, "no fun". Sometimes the climbers are more creative than the route-setters could have imagined, surprising them with unexpected sequences. "There is no formula," says Mr Bishton, any more than there is an algorithm for the perfect "Swan Lake".

Wrestling the fridge

In the Kranj sports hall there are several dozen "volumes" of different sizes and 20 boxes of smaller holds. The flashiest were used on the final round, which was set first. The men, it was decided, would climb on a set of regular geometric shapes in black and white. The women would negotiate a series of bulbous blue and red "slopers" (curved surfaces with little or no edge to them, held by skin friction alone) and "pinches" (which climbers squeeze with their hands like a vice). Jibs were affixed here and there to the big features, as thumb catches or footholds.

Mr Bindhammer and a colleague clambered up a wonky scaffolding to the top-left corner of the wall, the end of the women's final, and worked down. They hoisted up volumes from the floor using ropes, one or two at a time, and attached them to the wall with handheld power drills. Mr Genoux and Mr Hammerer started on the bottom of the men's final in the opposite corner, working upwards. Four hours later the basic skeleton of both routes was ready. Fortified by a lunch of cured ham, cheese and rye bread, the crew then crept up their creations to test them out.

Any move that seemed off kilter was carefully analysed. Holds deemed too far apart for short climbers were brought closer together. Those too near for taller competitors' larger frames were placed farther apart. This finicky work—sometimes transposing a hold by an inch, or rotating it by a few degrees, turning a move from undoable to easy—lasted into the night and continued the next morning. When Mr Bindhammer was content, the holds' precise placement was carefully documented and the wall was stripped bare again. The process began anew for the competition's earlier rounds.

More fiddling happened once the event got going. Routes in later rounds can be tweaked depending on how climbers fare in earlier ones. In Kranj, the men's final went to plan. Only Mr Ondra reached the top. The women's route was simplified after the semi-final proved more challenging than the route-setters had expected and the favourite, Slovenia's Janja Garnbret, failed

to make the final eight. Despite the last-minute tweaks none of the women got within ten moves of the top. Four fell at the same move barely half way up. Route-setters are human. So are climbers. ■

Deepest England

The Cockneys of Thetford

What happens when you take thousands of working-class Londoners and rehome them in the middle of nowhere?

Print | Christmas Specials Dec 21st 2019

MANY OF THE headstones in Thetford's cemetery are modest. "Dearly beloved" or "In loving memory" they begin, before stating the bare facts: name, spouse, birth, death. Such stones tend to mark the graves of people born in or around this small Norfolk town, roughly halfway between Cambridge and Norwich in eastern England. A quiet, understated sort, buried in simple coffins. "They pass without much fuss," says Lydia Turner, who runs a funeral parlour nearby.

There is another kind of headstone in Thetford's cemetery, which is beginning to outnumber the modest variety. This is made of shiny black granite. It contains so many effusive, gold-lettered words that they sometimes spill onto the back of the stone. Mum (seldom "mother") was always there when you needed her; Dad was a king; Nan will be missed for ever. The headstones have lots of images—not just angels but dartboards, fancy cars and the logos of Chelsea and Tottenham Hotspur football clubs. Underground, the coffins have brass handles. Many arrived at the cemetery in carriages filled with flowers, pulled by beautiful horses. These are the graves of working-class Cockneys who left London half a century ago and made new homes in a town in the middle of nowhere.

As they die and are buried, so their descendants live. Although Thetford is 110km (70 miles) from St Mary-le-Bow in London—the centre of the Cockney heartland, according to Cockneys—many of its 25,000 inhabitants belong fully to that flashy, gravel-accented tribe. In many ways Thetford resembles a 50-year-old East End transported to the flat rural landscape of East Anglia. Frozen in time and overlooked by outsiders, it is a bit like the mythical Scottish village of Brigadoon. This makes it an excellent place to go if you want to understand a crucial figure in modern society and politics: the white, southern, working-class Brexiteer.

The seat of the bishops of East Anglia in the Middle Ages, by the early 20th century Thetford was in a sorry state. It had hitched its fortunes to a single company, Charles Burrell & Sons, which made steam-powered traction engines. The rise of the internal-combustion engine killed it. Thetford was barely able to keep its population from falling below 5,000.

In 1957 the town's leaders decided to do something drastic. The British government was trying to push factories and workers out of London; Thetford offered to take so many that its population would at least triple. Using money from London County Council, it began to build social housing for people known then (and now) as "overspill". Factories rose on industrial estates, separated from the houses by strips of woodland.

The Londoners loved their new homes, which were larger than their digs in the capital and had private indoor toilets. And some of the locals were pleased to see them. "There was a bit more talent," remembers Teresa Mead, who married a Londoner. Unfortunately, the work was a let-down. Jobs were easy enough to find: in 1964 there were said to be just 20 unemployed people in the whole town. The problem was the pay, especially for men. In 1971 Malcolm Moseley, a social scientist, conducted hundreds of interviews in Thetford. Although 57% of the people he spoke to described their houses as very good, just 4% said the same of men's wages. The migrants had chosen quality of life and made themselves poorer.

And there was no getting away from it—the new settlers were a loud, lairy bunch. Danny Jeffrey, who moved from east London to work at Jeyes, a maker of cleaning products, eventually stopped drinking in the Londoners' pubs because of all the fights. Stuart Wright, a councillor from a Norfolk family, says that some of the new arrivals dug up his grandfather's potatoes. When challenged, they were affronted. Spuds just grow naturally, don't they?

At first, the new settlers went back to London by coach every month or so to visit their relatives. As they settled down, the trips became less frequent. But they did not really blend in to the quiet Norfolk life. After six decades, they still have not. Instead they boiled down the working-class London culture they had brought with them into a concentrated broth. Whether they came from east, south, west or north London, they adopted the East End funeral. Many still shun Norwich City, the local Premier League team, in favour of London clubs—some of which, like Queens Park Rangers, are no better than Norwich.

Talk of the town

Above all, you can hear old London in their voices. Young working-class Londoners of all races now speak a dialect known as Multicultural London English, or MLE, which mixes Cockney words and sounds with Caribbean and South Asian ones, stirring in a few inventions of its own. Popular culture helps it spread: grime stars such as Dizzee Rascal and Stormzy rap in, and speak, MLE. But on the council estates that ring Thetford, you hear one of MLE's ingredients in its pure form. The town's name begins with an F sound and has a glottal-stop in the middle. A Thetford poet could rhyme "arrow" with "Mo Farah". "Oi oi" is fine as a greeting; to tell someone off you "give them grief". People in other parts of south-east England, such as Essex, speak similarly. But there is something peculiarly urban and old-fashioned about Thetford Cockney. Your correspondent grew up in north London in the 1970s. No current accent reminds him so strongly of his childhood as the Thetford one.

Susan Fox, who studies English speech at the University of Bern in Switzerland, suggests that the authentic Cockney voice may have endured in Thetford because Londoners overwhelmed the locals, then remained dominant. In Milton Keynes, a new

town established not much later, you hear nothing of the kind—but in Milton Keynes, Londoners were only one incoming group among many.

Another possibility is that speech reflects aspiration as well as history and geography, and Thetford has remained intensely working-class. In 2011 when the last census was conducted, manufacturing was by far the largest industry, employing 24% of the town's workers, compared with 8% in Britain as a whole. Many of those factory jobs are unskilled or semi-skilled. One Thetford firm that employs skilled engineers is Warren Services, which makes things like props for pop concerts. Richard Bridgman, the founder, spends half an hour walking the factory floor trying to find a worker who moved from London or is descended from someone who did. He fails. His engineers all seem to come from Norfolk families, or from somewhere other than the capital.

Something else arrived with the Londoners—an attitude to family and labour that seemed exotic in mid-20th century Norfolk. In April 1959 the *Thetford and Watton Times* reported that 40 or so "housewives" from London had travelled to Thetford to see their almost-finished homes and examine "the factory in which the husbands will soon be working". When the factories opened, though, London women rushed in.

It was part of their culture. As early as 1961, 37% of workers in London were female. They did not just work in offices, hospitals and shops; a quarter of metal-manufacturing jobs in the capital were taken by women. The married couples who moved to Thetford often both worked, alternating shifts so that one partner could watch the children.

Occasionally it was the wives who took jobs in Thetford factories and their husbands who came along. That was true for Brenda Canham, now Thetford's mayor, who moved from east London to work in a factory that made insulated Thermos flasks. "I got married at 16 and I've always worked," she says.

Just as London's accent has changed, leaving the Cockney Thetfordians with an antique, so has London's work culture. Since the 1970s the capital has gone from having the highest rate of female employment in Britain to the lowest rate. Two sorts of British women are less likely to do paid work: immigrants from countries where it is frowned upon, and the wives of extremely wealthy men. London now has lots of both.

Thetford also resembles 1970s London in a less fortunate way. State schools in London used to be terrible. A government survey in 1978-79 found that 24% of London children left school with no qualifications, not even a Certificate of Secondary Education. The national figure was 14%. The situation had become so dismal that some universities required lower exam marks from applicants who attended inner-London state schools.

London's state schools now post better exam results than schools in any other region of England and Wales (those immigrants again)—but Thetford's state schools look like those of the capital half a century ago. In 2019 the average 16-year-old in every one of London's 32 boroughs got better exam results than the average pupil at Thetford's only state secondary school. There could be many reasons: there is a private school in the town and higher-achieving state schools nearby, all of which may cream off the ambitious. But one of the reasons appears to be social pressure. One Thetford woman says that when her daughter won a scholarship to the private school, she turned it down. She could not face walking through her estate in a private-school uniform.

Working it

Culture is not just something you have. It is also something you do. If they had wanted to, the Londoners who moved to Thetford could have adopted local habits. They could have switched allegiance to Norwich City. They could have settled for modest funerals. Although the migrants were probably stuck with their speech patterns, their descendants could have dropped the Cockney dialect. Instead, many speak it more strongly than their parents do.

Frankie Dean has done more than most people to define and shape Thetford culture. He grew up in the town, as the son of migrants from north and west London. He now lives a few doors down from the very first council house built for a London migrant. When not working for British Telecom, Mr Dean (pictured below) is a rapper known as Franko Fraize. He raps about ordinary things such as a checked shirt he really likes and the agony of supporting the England football team. The video for one of his songs, "Hand Me Downs", shows him going out to buy a pint of milk. "Oi Oi!" is a hymn to Thetford council-estate life with all the trimmings: white trainers, Adidas threads, boxing gloves, satellite dish.

It is hard to rap in Cockney, which is less precise and percussive than MLE. But Mr Dean is determined to sound different from other rappers. He wants to represent his home town, of which he is immensely proud. He also wants to remind Londoners of a world that they have lost. "When I go to London, it's like I'm bringing their culture back to them," he says. His Cockney accent is authentic. But it is also a badge and a sales pitch.

Working-class ex-Londoners often feel that they are keeping up old urban traditions like those described (and romanticised) in Peter Willmott and Michael Young's influential 1957 study "Family and Kinship in East London". For Ms Canham, a key aspect of East End life was not locking your door. By the time she left, that had become impossible in London, but it could be done in Thetford. She describes the estate where she lives as "a bit of the old London"—especially in summer, when impromptu ball games break out and toddlers run around in loose nappies.

Sometimes these sentiments come across as resentment and despair about modern London, which has changed staggeringly since the migrants left it for Thetford, becoming both richer and less white. Local feelings about the capital are intertwined with negative feelings about immigration and the European Union.

In the 1990s Portuguese immigrants began to arrive in Thetford to take jobs in packing houses and factories. Then came eastern Europeans, and half a dozen shops selling the food they love (most of which are now run by Iraqi Kurds). In the town centre, though not on the estates, English is now one language among several.

In 2004 the English football team played Portugal in the European Championship. After England lost on penalties, a Portuguese pub in the middle of Thetford was attacked by irate natives. Politics began to change, too. The town's working-class

residents had made Thetford a Labour redoubt in a Conservative region. At the local elections in 2015, though, the nationalist United Kingdom Independence Party won the most votes in two of Thetford's four wards. A year later the parliamentary constituency that includes Thetford voted to leave the EU by 67% to 33%. That made it keener on Brexit than nine-tenths of Britain.

But Thetford does not want to be a xenophobic, little-England sort of place. That would contravene another Cockney ideal—the spirit of mongrelism. Carla Barreto, who was born in Portugal, draws a distinction between immigration and diversity. The ex-Londoners are hostile to the former but comfortable with the latter, she suggests.

In May 2019 she was elected to the town council as an independent. Knocking on doors, she listened to people complain about the EU, then declare that she seemed all right. "We don't get much grief these days," avers a Portuguese-speaking teenage boy who has acquired a flawless 1970s London accent.

Was all of it—the factories, the estates, the Cockneys, the fights—really worth it? At a meeting of the local history group in Thetford's library, two dozen people, most of them from Norfolk families, argue that it was not. Thetford was just fine before the expansion, they say. It could have chosen a much quieter path, staying small and preserving its old buildings and shops. Over time, it might have become a pretty dormitory village for commuters to Cambridge and Norwich. Perhaps that is true. But those who love the crooked timber of humanity should be grateful that Thetford went a different way. ■

Quiz

Try your hand at our Christmas quiz

Test your knowledge of ten economists and their worlds

Print | Christmas Specials Dec 21st 2019

THIS YEAR'S quiz is based on ten famous economists. Four questions are loosely linked to each one, and a fifth requires the connection between the four. Send answers to xmasquiz@economist.com by January 6th 2020. Three winners, chosen at random, will receive copies of "Uncommon Knowledge", *The Economist*'s new book.

John Maynard Keynes

1.Keynes made his name after the first world war with a book called "The Economic Consequences of the Peace". He wrote a book with a very similar title about which famous British politician?

2. In later years, Keynes visited that politician at which well-known London address, whose last private owner was a Mr Chicken?

3.Which well-known economist of the Keynesian school coined the term "monopsony" in her famous book "The Economics of Imperfect Competition"?

4.Keynes published his General Theory in 1936. Due to a constitutional crisis in Britain, 1936 was also known as "the year of three whats"?

5.What theme (apart from Keynes) links these answers?

Answers: Winston Churchill, 10 Downing Street, Joan Robinson and Kings. The theme is Cambridge colleges: Churchill, Downing, Robinson and King's.

Milton Friedman

1.Friedman taught at which university for 30 years? A school of economic thought was named after it.

2.Friedman was awarded the Nobel prize for economic thought in 1976. Which baseball team, the most successful in the sport's history, lost the World Series that year?

3.The year 1976 also saw the death of Bobby Hackett, a famous American cornetist. With which style of music was he associated?

4.In 1950 Friedman was a consultant to the American government, helping administer the Marshall Plan in Paris, home of the Moulin Rouge. What sort of shows, from the word for "wooden structure" in old French, were held at the club?

5.What theme (apart from Friedman) links all these answers?

Answers: Chicago, New York Yankees, Jazz, and Cabaret. The theme is shows directed or choreographed by Bob Fosse: "Chicago", "Damn Yankees", "All That Jazz" and "Cabaret".

Adam Smith

1.What type of establishment did Smith use to illustrate his belief about the benefits of the division of labour?

2.Smith wrote his works in the aftermath of great 18th-century speculative events such as the South Sea Bubble. In which narrow London passage, from Cornhill to Lombard Street, did much financial trading occur?

3.Smith died in 1790, the same year as Benjamin Franklin, who invented a device to protect against what meteorological phenomenon?

4.In the Bible, Adam was the name of the first man. What was the title of a well-known feminist magazine, named after the way Eve was supposedly created?

5.What theme links all these answers?

Answers: Pin factory, Change (or Exchange) Alley, Lightning strike, "Spare Rib". The theme is tenpin bowling: pins, alley, strike and spare.

Karl Marx

1.In a manifesto published in 1848, what did Marx say was haunting Europe?

2.Marx thought that communist revolution would occur only in a highly industrialised country. But which less-developed nation actually had the first successful communist takeover?

3.H.L. Mencken, an American journalist said, "Communism, like any other revealed religion, is largely made up of prophecies." He was more enthusiastic, however, about his favourite drink, describing it as "the only American invention as perfect as the sonnet." What was it?

4.Fritz Lang, the Vienna-born film director, was briefly blacklisted in the 1950s for his supposed association with communism. What was the title of his 1931 masterpiece about a child killer?

5.What theme links all these answers?

Answers: The spectre of communism, Russia, martini and M. The theme is James Bond: Spectre is the organisation he fights; "From Russia With Love" was the second film; a vodka martini is his favourite drink; and M is the codename of his boss.

Irving Fisher

1.Fisher's economic output included works on the quantity theory of money and debt deflation. But his reputation was spoiled by his remark in October 1929 that stocks had a reached a "permanently high" what?

2.Fisher was a great enthusiast for Prohibition. Two states failed to ratify the 18th amendment that passed prohibition into law: Connecticut was one. Which was the other? (Hint: it is the smallest state in the union.)

3.Another famous Irving, whose surname was Berlin, wrote "God Bless America", which called on divine blessing "from the mountains" to where?

4.Another namesake, Washington Irving, wrote which book, featuring a headless horseman?

5.What theme links all these answers?

Answers: Plateau, Rhode Island, Prairies, and "The Legend of Sleepy Hollow". The theme is geographical features: plateau, island, prairies, hollow

Paul Krugman

1.What is the title of Mr Krugman's column in the *New York Times*?

2.In 1991 Mr Krugman was awarded the John Bates Clark medal for outstanding American economists under 40. In the same year, the sixth film in the "Star Trek" series was released. What was the film's subtitle?

3.Mr Krugman won the Nobel prize for economics in 2008, the year that Barack Obama was elected. What was the title of the memoir Obama wrote in 1995?

4.Mr Krugman was born in 1953, the same year that a famous film musical, starring Doris Day, was released. What was the film?

5.What is the theme (apart from Mr Krugman) linking these answers?

Answers: Conscience of a Liberal (though we must apologise, this is the *former* title of Mr Krugman's blog), "The Undiscovered Country", "Dreams from My Father", and "Calamity Jane". The theme is Hamlet's soliloquy: "Thus conscience does make cowards of us all"; "The undiscovered country, from whose bourn, No traveller returns"; "For in that sleep of death what dreams may come"; and "There's the respect, That makes calamity of so long life".

Janet Yellen

1.Ms Yellen was the first female chair of the Federal Reserve. Whom did she succeed?

2.Ms Yellen graduated from Brown University in 1967. Which American tennis player won the Wimbledon women's singles, women's doubles and mixed doubles that year?

3.Ms Yellen received her PhD from Yale in 1971, the year that Muhammad Ali was defeated for the first time, by Joe Frazier. Ali and Frazier fought for the third time in Asia in 1975, in a brutal bout which was given which rhyming nickname?

4.Ms Yellen took charge of the Fed in 2014, the same year as the death of which comic actor, who won an Oscar for "Good Will Hunting"?

5.What theme (apart from Ms Yellen) links these answers?

Answers: Ben Bernanke, Billie Jean King, Thrilla in Manila, Robin Williams. The theme is Michael Jackson hits: "Ben", "Billie Jean", "Thriller" and "Rockin' Robin"

Alfred Marshall

1.Alfred Marshall was noted for bringing mathematical rigour into the subject of economics. He came second in his year studying mathematics at Cambridge. What title, also accorded to James Clerk Maxwell and Lord Kelvin, did this earn him?

2.Marshall's great textbook "Principles of Economics", was published in 1890. Three years later, a new type of engine was built for the first time in Augsburg, and was named for its inventor. What was it called?

3.Marshall died in 1924. That year saw the birth of an heiress who would become the mother of Anderson Cooper, a CNN anchor. What was her name?

4.Also born in 1924 was a tough-guy actor who had an unlikely hit single, "Wandrin' star". Who was he?

5.What is the theme (apart from Marshall) that links these answers?

Answers: Second wrangler, Diesel, Gloria Vanderbilt, Lee Marvin. The theme is brands of jeans: Wrangler, Diesel, Gloria Vanderbilt and Lee

Elinor Ostrom

1.Elinor Ostrom was the first woman to win the Nobel prize for economics, awarded to her in 2009. Much of her work was on the problems of collective action, an issue often referred to as the tragedy of what?

2.Ostrom was born in 1933, the same year as which team lost baseball's World Series?

3.In 1973, Ostrom founded a workshop in political theory at Indiana University, where she taught, and to which she later donated her Nobel prize money. Also in that year, the spotted owl was listed as an endangered species. What is the collective name for a group of owls?

4.Ostrom died in 2012, the year of the London Olympics. The archery contest was held at which stadium, known as the home of cricket?

5.What is the theme linking these answers?

Answers: Commons, Washington Senators, Parliament and Lord's. The theme is representative bodies.

David Ricardo

1.Ricardo is best known for a law which Paul Samuelson, another economist, cited when asked for a proposition in social sciences that was both "true and non-trivial". What is the law called?

2.Another of his laws, which has entered into common parlance, relates to the consequences when businesses keep adding factors of production (like workers or plant and equipment). What is this law called?

3.Ricardo entered Parliament in 1819, and died in 1823. In the year of his death, which body ruled that Native Americans could not own land?

4.Lucy and Ricky Ricardo were a fictional TV couple, played by Lucille Ball and Desi Arnaz. What was the name of the show, which ran from 1951 to 1957?

5.What is the theme linking these answers?

Answers: the law of comparative advantage, the law of diminishing returns, Supreme Court, "I Love Lucy". The theme is tennis: advantage, returns, court and love

We are pleased to announce that this year's winners, chosen at random from those who submitted all answers correctly. They are David Atherton, Erik Feng and John Sykes. Each of them will receive a copy of *The Economist*'s new book, "Uncommon Knowledge". Congratulations to them and thank you to all who took part.

Eucalyptus Road

The long and tangled history of California's eucalyptus trees

What happens when a dream grows and then falters on foreign soil?

Print | Christmas Specials Dec 18th 2019

THE NIGHT of the fire, my father called us to the top of the driveway to watch the smoke plume above the eucalyptus forest. He warned us that the flames were hardly a mile away. But my siblings and I couldn't see them so we didn't really care. We were too busy playing on our new front lawn, laughing as ash from the burning trees tumbled onto the windshield of our mother's Chrysler minivan. The burnt flakes fell white like a snow we had never seen before in California.

Within weeks, my father had chopped down all the eucalyptus trees in our front yard. He surrounded our home—a 3,549-square foot, five-bed, four-bath wonder boasting a Spanish-style terra-cotta roof—with a moat of fire-retardant succulents and yucca. For a man like my father, who grew up in a small tract home nearby, and a woman like my mother, who had emigrated from South Korea when GDP per person was less than $200 a year, this house was a dream. And for a few years in the early 1990s my parents lived it. They hosted dinner parties with fondue and sushi. My Korean grandmother, who lived with us, wowed the ladies from church with bowls of *bibimbap* and sitting-room prayer sessions that lasted so long I used to think even Jesus must have tired of them. But in 1996 that ended. We fell out of the middle class.

The California of glossy dreams is the California of palm trees reflected in Ray-Bans—tall, slender, glamorous and heading right up into the sky. The California of the enlightened spirit is the California of majestic sequoias in the Sierras, sentinels older than history, icons of the environment. The real California, though, the California of immigrant dreams that break and get reborn, of lives as they turn out not as they are planned, is the California of the eucalyptus.

In 1904, nearly 90 years before we played under an orange-glazed sky on the night of that fire, a man arrived in the town where I grew up, Nipomo, with a plan to make a fortune by improving the world. Theodore Lukens, twice mayor of Pasadena, travelled the 170 miles (280km) up the coast from Los Angeles County to see if a stretch of land not far from where our house later stood might be a suitable place to plant a lot of trees.

Like his friend John Muir, Lukens believed that California desperately needed more forests. Since the mid-19th century forests, and their loss, had been the principal focus of conservationist thought in America. According to Jared Farmer, who traces the history of the eucalyptus in California in "Trees in Paradise" (2013), Lukens and Muir were particularly keen on growing forests as a way to provide water—always a key to power in the state. Trees brought rain and captured fog and moisture; without forests, the men feared the state's great cities would dry up.

The forests were diminishing because people were cutting them down at an ever-increasing rate—which still seemed unable to keep up with demand. America's aspiring middle class longed for wooden houses filled with wooden appliances, and to travel in trains with wooden coaches that sped over thousands of miles of rails that rested on wooden ties. As a result there were concerns about an impending "hardwood famine"—that America was hitting what might be called today "peak wood". In 1907 a widely circulated report by the Forest Service claimed that America could run out of hardwood in just 15 years.

The solution was to grow more forests, and quickly. The eucalyptus came to be seen as the tree for the job. Evergreen hardwoods native to Australia, they were first brought back to Europe in the 1770s by Joseph Banks, the greatest British naturalist of the 18th century. In 1788 Charles Louis L'Héritier de Brutelle gave them their systematic Linnaean name, derived from the Greek roots *eu* (well) and *kalyptos* (covered). The covering in question is not that which the trees' fallen leaves and seed pods provide to forest floors, but the discreet cap which conceals their flower buds.

Since then, by some estimates, over 100m acres (40m hectares) of eucalyptus trees have been planted around the world. You can find them in the hills above Lisbon, in massive plantations throughout China and in the fields of India. But nowhere have they thrived more readily than in California.

Nobody quite knows how they got to the state—or, indeed, whether it was a state when they arrived. Most accounts point to an arrival by ship from Australia sometime in the mid-19th century, when a traveller could get to San Francisco more quickly from Sydney than from New York. Horticulturalists prized them as an exotic novelty, beautiful additions to the gardens making the best of the young state's lovely climate. Medical professionals recommended their planting as a way of absorbing the noxious miasmas thought to cause malaria—an idea that may have been influenced by the trees' astringent smell.

As well as these niche applications, the trees also had a broader claim on human attention, a facility that has always stood immigrants in good stead: they could thrive where others could not, and with minimal assistance. The Californian climate, not unlike that of the parts of Australia they came from, suited them well. They far outstripped the state's native species in productivity. A black oak, the eucalyptus boosters said, took 50 years to put on a foot in diameter, a white oak a century. A eucalyptus could do it in a decade.

It's gonna get a hold on you

In Nipomo, Lukens thought he had found the perfect place to put this capacity to use. For thousands of years, winds off the Pacific had blown beach sand in Nipomo's direction, forming a flat-topped mesa of around 12,400 acres which was home

to scrawny oaks, scrub brush and little else: "a desert waste of sand", as a local newspaper put it, that sold for extremely low prices. But Lukens was taken by the mesa's soils—deep if poor—and cold mists. He deemed it better for eucalyptus than any other spot in California, as long as the young saplings were offered some sort of windbreak (rows of barley worked well). It could also be reached by the railroads.

In 1909 Lukens and two businessmen from Iowa put $150,000 into creating the Los Berros Forest Company and started planting 8,000 acres they had acquired at the north end of the mesa. It was both a timber business and a property venture. Land with trees was worth more than land without. In 1910 William Brintnall, who had served as the president of Drover's National Bank in Chicago for more than 30 years, paid over $20,000 for 687 acres on the Los Berros tract—which at $30 an acre was fetching as much as ten times what had been paid for it five years earlier.

"EUCALYPTUS PROMISES TO BE GREAT INDUSTRY", announced the front page of the *San Luis Obispo Daily Telegram*, later claiming that what the speculators following where Lukens had led were planting "will be the largest artificial forest in the world when completed". Land on the fringes of a tiny town that had once been called worthless now brought in what the newspaper called "fancy prices". In 1912 the paper told the story of George Munger, "an eastern eucalyptus man", who rolled into town and spent nearly $50,000 dollars on 200 acres. The area enjoyed some of the largest property transactions the county had seen in years.

An advertisement in the *Omaha Sunday Bee* promised that the tree's timber would produce a value of up to $5,000 an acre ($130,000 in today's dollars) in just ten years. Hopeful investors were welcome to a free 1,600-mile trip—no obligation, at least on paper—aboard a Pullman railcar from Omaha to California to scope out eucalyptus opportunities. Some companies promised "forests grown while you wait" or even the "absolute security and absolute certainty" of investing in land speckled with eucalypts.

It wasn't just greasy salesmen buying in. Jack London, who was to become one of America's first writers of world renown, studied endless pamphlets about the promise of eucalypts. "I know of no legitimate investment that will compare," he wrote. He cited his eucalyptus investments as a financial justification for an advance of "a couple of thousand dollars" in a letter to his publisher. "I don't want to write short stories," he told him. His eucalypts were to afford him time to write meaningful novels instead of commercial bestsellers, to get him out of debt, to change his life.

I remember standing in the shade of eucalyptus trees wishing life were different, too. In 1996 1.15m Americans got divorced, including my parents. A wave of hospital closures—23 in California between 1995 and 2000—shuttered the one where my mom worked as a dietician. We started getting free lunches at school. My mom sold her van and bought a used car; she brought home McDonald's hamburgers for dinner, 29 cents on Wednesdays. We moved into a house off a dirt street which led into the depths of the forest Lukens had created. It was called Eucalyptus Road.

I could see the trees across the vacant lot next door from my bedroom window. I could hear them creaking as I lay awake in bed. One afternoon when I was about nine, looking out of the window, I decided things had to change, and that the first step was to find my grandmother, who had vanished after my parents' divorce. I looked up the number of her Baptist church in the phone book. The pastor's wife answered. I asked her—my Korean terrible—where my grandmother was. She held the line for a while as if she were thinking what to do. Then she said she couldn't tell me anything about where my grandmother had gone.

I crossed the vacant lot and walked into the forest. Eucalyptus trees are messy, especially blue gums, *Eucalyptus globulus*, the sort Lukens planted in Nipomo. They shed their bark like divas change clothes: dramatically, peeling back layers and switching colours for all to see. As they get old and massive, their branches and leaves twine like the columns of a baroque cathedral. I waited under one until it got dark, ripping the leaves so they stained my hands as I prayed. I wish I could say that I prayed for my grandmother. But at that age, I just prayed that I might move somewhere different.

The blue gums I hid among were not meant to have grown that old. They had been planted for harvest. But the eucalyptus bubble burst in 1913, when the government's Forest Products Laboratory concluded that blue-gum wood grown in California was worthless as timber. No matter how it was cut or cured, the wood warped, cracked and twisted. Staff at the American consulate in Melbourne asked the conservator of forests for the state of Victoria what might be happening. They were told that however quickly they might put on girth, eucalypts needed decades to mature into the sort of wood that could be used for anything but pulp or mine props. Australia's lumber industry relied on old-growth forests, not green logs like those from California's young plantations.

The news was devastating. The industry imploded. Lukens, almost alone, kept the faith, arguing that the bust had simply exposed honest dealers from shysters. But losing its job did not stop the eucalyptus. Ordered plantations turned into untended groves. Native species adapted to them. The monarch butterflies that find shelter in California each winter could cling more easily to their spear-shaped leaves than those of native trees.

Many humans were less keen. The eucalyptus is a tree that positively relishes burning. California's native flora are quite capable of burning on their own—but adding trees that think they are candles hardly helps. In October 1991 a fire in eucalyptus-covered hills in the East Bay killed 25 people. That aside, today's conservationists tend to think that plants from elsewhere are always a bad idea. They want some areas cleansed of all trace of the eucalyptus.

But most families that consider themselves Californian have spent less time in the state than the eucalypts. To the native-born Californian a state without them is hard to imagine. The move to get rid of the trees as an invasive species has prompted a range of pro-eucalyptus demonstrations. As Chris Thomas, an ecologist, suggests in his book "Inheritors of the Earth" (2017), the flourishing of the eucalyptus and its attendant butterflies in California goes some way to offsetting the dire prospects that some species of the genus could have faced in their ancestral home down under.

California soul

We eventually found my grandmother. She had moved to a trailer park on the edge of a nearby town. Spear-shaped leaves

and dried seedpods littered the asphalt outside her white trailer. It took her a few years to rebuild a relationship with my mother, but now they are closer than at any point in their lives. I don't think I will ever completely understand how my grandmother felt about what happened in Nipomo or why she stayed away for so long. But I do know that sometimes the dreams that bring people across oceans and the lives they end up leading are very different, and that there are gains to be had amid disappointment. ■

Leonora Carrington

Searching for Britain's most important surrealist

To find traces of Leonora Carrington requires a journey to to what some call Mexico profundo

Print | Christmas Specials Dec 18th 2019

THE WHITE-WASHED concrete walls of number 194 Calle Chihuahua, in Roma, a fashionable district of Mexico City, do not give much away. The façade is as plain as it comes. The windows are shuttered. Bang loudly on the wooden door and a security guard within answers: "There's nobody here." Ask why the house is described online as a museum and his answer is: "Fake news. There's nothing here at all."

For more than six decades until her death, aged 94, in 2011, 194 Calle Chihuahua was the home of Leonora Carrington, a British Surrealist painter and writer. When Edward James, a British ex-pat in Mexico who was both her patron and friend, first visited her there in the 1940s, he found her studio bursting with life: "Small in the extreme, it was an ill-furnished and not very well-lighted room...The place was a combined kitchen, nursery, bedroom, kennel and junk-store. The disorder was apocalyptic. My hopes and expectations began to swell."

James was right to be hopeful. Carrington became one of the most accomplished Surrealist artists of the 20th century. But not in the way many people of that time understood the genre.

Instead she took Surrealism to a place that was centred on women, not as muses or *femmes enfants*, but as domestic goddesses, cooks, sorceresses, witches. Her paintings depict women instinctively in touch with the natural and supernatural worlds, and the half-real, half-mythical animals and birds that roamed within them. A critic visiting her first solo exhibition in New York in 1948 found the 27 pictures on display "hopping with demons...feathery, hairy, horny, half-luminous creatures merged imperceptibly into birds, animals and plants...[and] painted with cobweb delicacy."

Few give Mexico, her adopted home, credit for influencing this fantastical, half-feral dreamscape. Though her art flourished there, it was the place inside her mind, shaped by childhood fan-tasies and fears, mental illness, womanhood and motherhood, where she found inspiration. Nor did Mexico initially cherish her in the way it celebrated its best-known home-grown artists, such as Diego Rivera and Frida Kahlo, who created a brand of *mexicanidad* (Mexicanness) that was integral to the creation of national identity after the revolution in 1910-17.

But Carrington tapped into a deeper layer of Mexico's psyche. And, increasingly, she is appreciated not just by the country's connoisseurs—"The Giantess (The Guardian of the Egg)", (pictured overleaf) sold for $1.5m a decade ago, and is now in a private collection—but by ordinary Mexicans. More than 300,000 people flocked to a retrospective of Carrington's work in Mexico City's Modern Art Museum in 2018, more than the numbers who queued to see "Frida Kahlo: Making Her Self Up" at the V&A in London that same year.

The publicity-shy Carrington would have found the adulation bemusing. "She didn't care the fuck about museums," her eldest son, Gabriel Weisz, says. Yet she did care about deeper, more spiritual matters, and in many ways Carrington and these aspects of the country naturally blend into each other. To find the congruence requires a long, and at times frustrating, journey, to what some call Mexico *profundo*—the country's ancient roots.

Carrington's own route to Mexico, and to intellectual and artistic freedom, was fraught with difficulties. She met Max Ernst, a German Surrealist painter, in London when he was 46 and she was 20, a dazzling but reluctant debutante from Lancashire in northern England. After living in Paris together, they moved to southern France where, under his love and tutelage, her painting and writing flourished. Her cousin, Joanna Moorhead, describes the awakening in "The Surreal Life of Leonora Carrington" (2017).

They were still living in bliss when the French arrested Ernst as an enemy alien in 1939. Fearing for him, and facing potential internment herself, Carrington fled to Franco's Spain. There she had a nervous breakdown and was hospitalised in an asylum for four months. Salvation, of sorts, came in the form of a marriage of convenience to a Mexican diplomat who led her to safety first in New York then in Mexico City.

President Lázaro Cárdenas had opened up Mexico to those fleeing the Spanish civil war and fascism in Europe. Carrington shared a house with some of them in Calle Gabino Barreda, in a scruffier neighbourhood closer to the city centre than her later home in Roma. The group included Remedios Varo and Kati Horna, two fellow female Surrealists with whom she struck up lifelong friendships. On the walls they hung artworks by Pablo Picasso and Salvador Dalí. But decades ago the house was replaced by a clinic. There is no memory of its inhabitants or the pictures they hung on its walls, just queues of people struggling with aches and pains. "Famous artists?" says a man hawking sweets and cigarettes from a blue trolley outside. "Not here. Only famous physiotherapists, I'm afraid."

Carrington divorced the diplomat, married another immigrant, Emerico "Chiki" Weisz, and was soon marooned in her first house in Roma with no money, a new husband and two small boys, juggling motherhood with painting. "Dalí is very lucky to be able to knock them off as he does," she wrote sardonically to James, who had been one of Dalí's biggest backers.

Carrington and James were made for each other. Their friendship was deep, funny, occasionally fraught and, it seems, platonic. They had much in common. Carrington, the daughter of a textile tycoon and his Irish wife, spent much of her

childhood in Crookhey Hall near Morecambe Bay with ten servants, a chauffeur and a nanny. In her paintings she portrays the hall as a prison of the mind. James, heir to several large fortunes, grew up in West Dean, a baronial pile in Sussex, where he was starved of both playmates and his mother's affection.

James also had a chequered love life. In the 1930s he married an Austrian ballerina, but the relationship dissolved into a divorce case that was covered in lurid detail in the press.

Both James and Carrington venerated animals. Her short stories such as "The Debutante" brought forth from her psyche the hyenas, horses and other creatures that would populate her art for the rest of her life. As Mr Weisz puts it, James had "a special communication with Leonora's inner animal".

In their letters, preserved at James's family home, they both moan about Mexico. Carrington was suspicious of aspects of the country, says Mr Weisz, such as the sacrificial violence that she saw simmering beneath the surface. But she also adored much else: the markets, the variety of food, the *curanderos* (healers) and their ancient witchcraft rituals. Like the Celtic myths that she was told during her childhood, Mexico is full of stories of ancient sorcery, plumed serpents, jaguar gods and the like. The country that André Breton once called "the Surrealist place *par excellence*" served her well.

She did not often return the favour directly by choosing Mexico as a subject; it was its spirit, not its fauna, flora, landscapes or people that seeped into her work. But there are exceptions. It is easy to while away a morning in front of her mural "El Mundo Mágico de los Mayas" (on previous page) which depicts Mexico's Mayan south-east, the syncretism of indigenous and Catholic faiths, flying serpents, rainbow-coloured quetzales, Blakean visions of heaven and hell, and the Virgin of Guadalupe, carried aloft by worshippers, with the face of a monkey.

If, that is, you can find it. It sits not in an art gallery but in the city's anthropology museum. When your correspondent asks staff there where it is to be found, he is told, "The mural is not here. It's on loan." As if it were easy to pick up part of a wall and carry it off.

It is only through the intervention of an astute security guard that he is set right and sent up a flight of stairs to a rarely visited corner of the museum. There it is, luminous on a panel several metres long. No doubt Carrington would have chuckled at the haphazard journey to find it.

There is one place in Mexico, though, where enthusiasts are trying to give Carrington's memory a home, even if, bizarrely, it is a place that she hardly visited.

Xilitla, in the mountains of central Mexico, is the essence of Mexico *profundo*. On a sunny afternoon, young men and women practise heel-stomping dances in the main square. Coffee farmers in pickup trucks hold up traffic as they chat. Indigenous women hawk lemons in the local cafés. During the regular fiestas, men dress up in bull costumes, terrorising the young girls as they grasp at their skirts.

Carrington first came to a house there called *El Castillo* (The Castle) to visit James, who stayed there whenever he came to Xilitla. He had first done so in 1945, looking for somewhere to plant his collection of orchids. He went on to become the town's biggest benefactor, building a sculpture garden into which he sunk millions of dollars from the mid-1960s until his death in 1985. Called *Las Pozas* (The Pools), it is now considered one of the strangest architectural follies in the world. During its construction, James tried to lure Carrington to visit, describing the bliss of bathing in the pools. He promised her a dose of LSD in her orange juice. His Mexican right-hand man (some say lover), Plutarco Gastélum, settled and married in Xilitla.

In 2018 the Leonora Carrington Museum opened there. Alongside the museum, a jolt of modern architecture near the cobbled town square, Carrington fans can also visit a mural standing two and a half metres high in a corner of *El Castillo*. The painting, completed in the 1960s, is of a long-necked satyr-like woman, with spiral breasts and an aristocratic arm draped elegantly on a ledge, her fingers long and slim, like those of Carrington herself. It could be a self-portrait, in human-cum-animal drag.

Female human animal

That the town now has a museum for Carrington, who was only ever a visitor there, may seem odd, even a little out of line. Some people resent Xilitla's adoption of Carrington. Gastélum's family, who still live there, fear the work of their beloved "Tio Eduardo" (Uncle Edward) will be overshadowed by his more talented friend. Yet it seems fitting that these two should be reunited there. Far from England, both Britons had a lifelong yearning for a home. They found one among the animals and plants of the Mexican rainforest.

Kako Gastélum, Plutarco's son, imagines a conversation between "Saint Leonora and Saint Edward", as he calls them, looking down from on high. He would be slumped in an armchair, as was his wont, while she would be smoking. "He says to her: 'Look Leonora, they have built a museum for you in Xilitla.' She would reply, 'In Xilitla? What on earth for?'" ■

Dubbing

Dubbing is coming to a small screen near you

Once associated with poor quality and foreigners too lazy for subtitles, the art form is having a comeback

Print | Christmas Specials Dec 21st 2019

YOUR CORRESPONDENT is ready for his close-up, of sorts. In a Los Angeles sound studio, a television monitor is showing a scene from a new Brazilian thriller series in which a headmaster is chasing away a loitering ne'er-do-well. Words stream across a purple band running below the action: "Get out of here! You graduated two years ago!" Reading them out at the precise moment they arrive at the centre of the frame, at just the right speed, takes several takes. Getting the emotion and voice right—the director wants something hard-boiled and urban—takes a couple more. Finally, no doubt keen to flatter a visitor, he pronounces it a triumph.

The show is "Spectros". Made by Netflix, a video-streaming company, it was conceived by an American showrunner and filmed in the Japanese-Brazilian São Paulo neighbourhood of Liberdade by a Brazilian director. Its potential audience, though, is spread all around the world. And very little of it speaks Portuguese.

Netflix has moved heavily into "international originals": programmes shot in languages other than in English. It is a strategy that has various attractions. Producing locally set shows no one has seen before helps the company conquer new territories. Film-making in much of the world is considerably cheaper than it is in America. Talent is widespread. And a lot of people are culturally curious, intrigued by stories from elsewhere.

But it also has an obvious disadvantage. That rich pool of talent telling new stories does so in a wide range of languages. If those stories are to be spread around the world then they have to be intelligible to all. Netflix has decided that means dubbing them with translated speech. Competitors such as Amazon, now producing video of its own as well as distributing the video of others, are pushing into the field.

In its infancy, cinema was international—a silent film made in Moscow could be watched in Manchester quite easily, its intertitles translated if need be. But then cinema learned to talk, and all was Babel.

In English-speaking countries, the problem of watching a film made in a foreign country was mostly solved either with subtitles or by not bothering to do so. With the world's largest film industry in America, an English-speaking audience wanting to be entertained rarely troubled itself with foreign languages.

In countries where productions in the mother tongue were not so copious, various other approaches were tried. In Poland and Russia, the preference is for lectoring, an unsettling experience (for those unused to it) in which the original voices are audible but low and a single voice emotionlessly speaks a translation. Some small Kenyan cinemas employ a live version of the same idea: a "DJ" who vividly interprets and even explains the film as it plays.

Another approach is to make the film twice; first do the original version of a scene, then do a re-take in translation. Hollywood used to do this for some films. Bilingual actors could make this easy: Marlene Dietrich was a natural. Sometimes a new actor would be brought in to perform the role in the desired language. Some film buffs consider "Drácula", the Spanish-language version of Tod Browning's "Dracula" in which Carlos Villarías replaces Bela Lugosi, better than the original.

This is still done here and there. A recent Indian blockbuster, "Baahubali" (2015), was made simultaneously in Telugu and Tamil, two related southern languages, with a cast bilingual in the two. It was the highest-grossing film of all time in both languages. "Baahubali" was also a huge hit in northern India, where it was dubbed into Hindi. But with many films from southern India Bollywood does not bother with dubbing; it just buys the rights and remakes them from scratch. America does this, too, and very occasionally it works. Martin Scorsese won an Oscar for "The Departed" (2006), a remake of "Mou Gaan Dou" (Infernal Affairs), a Hong Kong thriller made by Andrew Lau and Alan Mak in 2002.

But the heart of Europe, film-making's home, belongs to dubbing. Cheaper than employing bilingual casts or remaking from scratch, more accessible to mass audiences than subtitling, the technique had in the early days of the talkies an extra bonus: censorship. Don't like the opinions voiced in a film? De-voice them. While that is no longer an issue, the desire to see American and British films while hearing your own language remains.

There is also a desire for known quantities. In dubbing-dominated markets, voice artists stay with the same actor, often across decades. This makes stars out of those who voice the stars, or at least provides them with steady work. Take the recently retired Thomas Danneberg. Germany dubs more films than any other country, and over his career Mr Danneberg worked on some 1,500 of them. He played funny men, such as John Cleese and Dan Akroyd, and tough ones, such as Nick Nolte and Sylvester Stallone. One of his mainstays was Arnold Schwarzenegger, whom he voiced from "The Villain" (1979) to "Aftermath" (2017).

This might seem strange. If Marlene Dietrich could play herself in German, surely the Austrian-born Mr Schwarzenegger could, too. But German dubbing has a reputation for consistency over artistry—or authenticity. Mr Schwarzenegger's Austrian accent would have been far too distracting to audiences accustomed to a high German accent. (In his first film, "Hercules in New York" (1969), the then-bodybuilder had the distinction of being dubbed in both his native and his acting language, with an American actor re-recording his English-language dialogue.)

Voicing a range of actors has an obvious drawback; sometimes they may appear in the same film. When Mr Schwarzenegger and Mr Stallone bantered with each other in "The Expendables" (2010) Mr Danneberg rose to the challenge by subtly changing his voice as he switched between them. Now he has retired, though, the roles have been reassigned; in the German-language version of "Terminator: Dark Fate" Mr Schwarzenegger was voiced by Bernd Egger.

There are other reasons for foreign-language voices to change. In the third of the eight "Harry Potter" films the voice of the actor playing the hero, Daniel Radcliffe, had begun to break; that of his first German to dub the role, Tim Schwarzmaier, had not. Mr Schwarzmaier was replaced by Nico Sablik, two years older, who finished out the series. It was a good break. Mr Sablik, at 31, now has 738 credits to his name.

Part of the scorn with which dubbing is treated in the Anglophone world is down to the fact that dubbing into English has rarely been done well. In countries more invested in the art, it is done with care and skill.

Dubbing Brothers in Saint-Denis, just outside Paris, is a large and well-appointed complex with 14 studios which are typically all in use. French catchphrases from English-language films adorn its walls ("Cours, Forrest, cours!"). In the dub for "The Knight Before Christmas", a straight-to-streaming Netflix production made in English, the actors work in pairs, reading from a "rhythmoband" which carries the dialogue across the bottom of the monitor. The rhythmoband's cursive font stretches words out when actors should slow, compresses them when they should move quickly. Now digital, it used to be a transparent layer of celluloid on which the dubbed lines were written by hand.

If the rhythmoband is computerised, though, the words on it are most definitely not. Computer translation is not yet anywhere near good enough for such applications. When two Argentinian films were released on Amazon Prime's video service in France with computer-translated French dialogue performed by auto-generated voices that made Siri and Alexa sound like Helen Mirren and Meryl Streep, they were greeted with derision and ridicule. Amazon explained embarrassedly that it was not responsible for the productions; the films have now been geoblocked and can no longer be watched in France.

In Saint-Denis the director adjusts lines on the fly. At one point, a mother calls out to her daughter and a friend playing outside not to go "far away, please". The line is translated literally in the French on the rhythmoband, but feels wrong. A French mother should not wheedle her children. The "s'il vous plaît" is cut. From the mouth of the middle-aged actor playing one of the children comes a surprisingly high-pitched voice entirely appropriate to little Lily. Between takes it becomes clear that that is simply her normal voice. She is a specialist in dubbing children.

Adapting the script for a new language offers both technical and aesthetic challenges. A crucial first step is to annotate the film in terms of the mouth movements, so the new voices look as though they come from the existing faces. It is not just the number of mouth-movements—Joe Lynch, director of the "Spectros" dub, calls them "flaps"—which matters. So does their type. A b-sound, with the lips together, in the original should ideally correspond to a similar-looking sound (which might be p or m) in the dub.

On top of this, information may have to be added or lost. Languages convey roughly the same amount of information per period of time, but some (like Mandarin or English) do so with a small number of complex syllables, and others (like Japanese) do so with a rapid flow of simpler ones. Synchronising mouth and meaning is hard to do at the same time between any two languages; dubbing between languages at opposite ends of this spectrum poses an extra challenge.

Then there is the matter of altering foreign films to local tastes. Irene Ranzato of Sapienza University in Rome describes a particularly elaborate example. In "Sleeper" (1973), Woody Allen's character fantasises that he is Blanche DuBois in the film of "A Streetcar Named Desire" (1951); Diane Keaton's character becomes Marlon Brando's Stanley Kowalski. "Streetcar" was not well known in Italy, though, so the dubbed version transposes the dream sequence to Bernardo Bertolucci's "Last Tango in Paris" (1972), which was just out in Italy. Diane Keaton is still in a Marlon Brando role, but now his middle-aged character from "Last Tango". Mr Allen becomes Maria Schneider's character, complete with a French accent. The scene even works in a crack about censorship, not present in the original, referring to judicial bans on "Last Tango" in Italy.

Such creative solutions have led dubbing to be treated as more than a craft in the countries where it is common. Italy even has an Oscar-style awards ceremony, the *Gran Premio Internazionale del Doppiaggio,* for dubbing (the statuettes look like microphones). Well done, the faceless art might yet catch on in the Anglophone world. Indeed, to some extent, it already has.

Netflix's in-house data show that, in America, 36% of viewers watched its most popular non-English show, "Money Heist" from Spain, with dubbing only, and 48% with a mixture of dubbing and subtitles. This probably has something to do with setting. Those who have paid to go to an art-house cinema for the latest French arrival might not mind reading subtitles; indeed, it may be part of the experience that they cherish. But it is harder to "Netflix and chill", in any sense of the phrase, if you have to keep your eye on the screen to know what is going on.

If it is what more than a third of the American market wants, dubbing makes a lot of sense. A third of the American market is worth more than most other markets in their entirety. Netflix dubs from many languages and into many languages—it is working with 165 dubbing studios globally—but dubbing into English probably matters most to it.

At the Los Angeles studio where "Spectros" is being dubbed, the actors do not have the luxury of working in pairs or groups, as they do in Saint-Denis. Efficiency demands that they come in, do the job and get out. Mr Lynch tries to have the best actor record first, to coax better work out of the others. The French rhythmoband is replaced with VoiceQ, a software some in the studio credit with making sprawling international productions easier, faster and cheaper. It includes a lot of "inhale" and "exhale" and "mouth smack"; in the recording booth Ren Holly Liu, playing the lead character, deftly does what they say.

Mr Lynch and Ms Liu both describe the job the same way: like making their own film without the camera. Ms Liu says she would enthusiastically recommend the work, and not just because the pay is surprisingly generous. Netflix has signed an umbrella deal with America's Screen Actors' Guild (SAG), the biggest actors' union, guaranteeing pay and other conditions for work on its dubbing projects. (The deal required that your correspondent be paid $200; the money was donated.) Netflix hopes

that the SAG partnership will make dubbing jobs seem not like drudgery that actors do to pay the bills, but a challenging acting role in its own right.

Despite all this care, some Netflix shows never quite manage to shed the obviousness of having been re-recorded. It may be that more technology will help: syncing flaps and sound is an obvious application of the nascent technology that produces "deep fakes", in which still pictures of a face are used to create nearly-real-looking computer-generated video. Synthesia, a company that specialises in just that, released a video this year in which David Beckham, a footballer, seems to deliver an anti-malaria message in nine languages. Victor Riparbelli Rasmussen, the company's CEO, confidently predicts that "photo-realistic" lip-syncing is just two years away.

Another use for AI might be heard, not seen: in making the dubbing actors sound more like the actors in the original language. Mr Lynch says he sometimes has to choose between a talented dubbing actor with a voice which does not fit the face and a lesser talent with a better voice. "Voice-cloning" could obviate that problem, giving a German dubbing artist's recording and the timbre of, say, Sylvester Stallone—potentially making it harder for an actor like Mr Danneberg to lock up a star's voice for decades.

For now, though, it is actors who take on the biggest role in making dubbing seem authentic. Ms Liu, asked what surprised her about voice-over work, describes "vomiting", heaving in sync with her character on the screen, and screaming, which must be kept until the end of her sessions, in order to preserve her voice. She talks about the possibility of "kissing" her "Spectros" co-star (she has never met the actor who does his English voice), and laughs at the possibility of making out with her hand to get the required sounds.

Mostly, she says, it is fun. She too hopes a new wave of artistry will remove the "cringey" reputation clinging to dubbing. Watching the poor-quality products she grew up with, Ms Liu, 24, says she would think, "Who is doing this? I could do a better job." "And now," she adds, "I am." ■

Clarification (December 21st 2019): Netflix has clarified for us that the characterisation of Voiceq in this article is not an opinion which it holds as a corporation. The article has been amended accordingly.

Siberia

Siberia is an empty land filled with contradictions

Russia's limitless expanse is home to art, freedom, history and many, many trees

Print | Christmas Specials Dec 21st 2019

HALFWAY BETWEEN Moscow and the Pacific Ocean sits the city of Krasnoyarsk. At its heart, on the banks of the mighty Yenisei, stands a brutalist building encased in granite. Built in 1987, it was the last of the Lenin Museums that the Soviet Union bestowed on deserving provincial cities to showcase the achievements of socialism. It is now an art museum. And when night falls, giant letters are projected onto one of its stark walls: SVOBODA.

Svoboda, or freedom, is not the first thing which springs to Western minds at the mention of Siberia; the vast region is more readily associated with fetters, exile and suffering. Nor is it a word much associated with present-day Russia. But it is a word that fits.

The projection on the side of the Krasnoyarsk museum is at least as much about geography as politics: a tribute to Siberia's limitless expanse, its high skies and rivers that flow so fast and so deep that their water will steam rather than freeze. It is a historical statement, too—Siberia has been seen for centuries, by visitors and inhabitants alike, as a place of freedom. But by the same measure it is also an ironic one: Siberia was a place of punishment and exile long before the Soviet Gulag.

Inside the museum you will find a lot more irony. An artistic movement called "Siberian ironic conceptualism" is well represented. "Irony and self-irony is a mode of survival in Siberia," says Vyacheslav Mizin, an artist from Novosibirsk. He and his partner, who style themselves "The Blue Noses", produce pieces which populate the Siberian landscape with American rock stars, poking fun at state propaganda and liberal fetishes alike. If you are incapable of irony, Mr Mizin says, "you turn beastly. The harder the conditions, the more you need it." Whether the conditions are climatic, political or spiritual goes unsaid.

This Siberian school is less intellectual than the conceptual art you find in Moscow. It is more coarsely grotesque and openly mocking. It embodies a Siberian belief held far beyond the world of art galleries: that Siberia is both the essence of Russia and separate from it.

The movement's most famous piece is called "United States of Siberia". In the early 2010s Damir Muratov, an artist from Siberia's ancient capital, Tobolsk, some 1,500km west of Krasnoyarsk, took an old wooden door and painted it with green and white horizontal stripes, a field of snowflakes in the top left corner. It was a homage to the American painter Jasper Johns, who in the 1950s first posed the question of whether a painting of a flag was something different from the flag itself—and if so, what, if anything, such somethings symbolised.

Mr Muratov's painting was similarly not a flag. It did not represent a country—merely suggested one—and it did not fly free in the wind. For Mr Muratov, the wind is the essence of a flag. "The most important thing is the movement of air," he says. "Where there is a wind, there is a flag." But because the windless wooden painting still looks like a flag, it is clearly asking to be taken as a symbol: of a non-state, of artistic freedom, of an anarchy free from any authority other than the endless horizons of the Taiga forests and the patterns of falling snow.

New worlds

The symmetries between Siberia and North America date back centuries. Russia's colonisation of Siberia began in the reign of Ivan the Terrible—roughly at the same time as Elizabethan England began to explore its new world. Siberia's Walter Raleigh was an audacious Cossack called Yermak. Previously a raider on the Volga river, he was hired by the Stroganov family in a bid to expand its fur trade by taking on the Khanate of Sibir. In 1582, accompanied by about 800 men, he crossed the Urals and established a foothold in Siberia. He drowned three years later, but Russia's expansion continued at a breakneck speed, pushing aside Mongolian Buryats, Turkic Yakuts, Samoyedic Nenets and other indigenous, or at least established, peoples. By 1648 the territory under their sway stretched all the way to the port of Okhotsk on the Pacific coast.

Much less is known of Yermak than of, say, Raleigh or Sir Francis Drake. But a lack of detailed biography is no obstacle to becoming a folk hero. In the romantic mythology of the 19th century he came to embody the energy and enterprise of the free settlers who had moved east into a land where serfdom was never imposed, fighting, mixing and assimilating with those who the cossacks had displaced as they did so. As Nikolay Yadrintsev, a 19th century historian who did much to create the region's founding myths, wrote: "Siberia, in its origin, is a product of an independent, rather than state-driven, movement and of the creative forces of the people…that was later hijacked and regimented by the state."

Regimented—and exploited. Its claim on the lands taken by Yermak and his Cossacks transformed Muscovy, a second-tier duchy, into the world's largest continental empire. Over the following centuries the bounty of Siberia sustained the Russian, Soviet and post-Soviet empires. A source of valuable furs and salt in the 17th century, precious metals and gold in the 19th century, and oil and gas in 20th century, the vastness of Siberia was to Russia something akin to what the west was to America. It felt similar, too. "My God, how far removed life here is from Russia," Anton Chekhov wrote as he travelled across Siberia. "I really felt I wasn't in Russia at all, but somewhere in Patagonia or Texas."

A key difference, though, is that Russia has not moved beyond the extraction of riches from these empty lands. Up to three-quarters of what the country exports comes from Siberia. The rents extracted from these various trades still allow Russia to deal with economic crises without modernising its economy or renouncing autocracy and state monopoly, just as they did in centuries past.

In a book published in 2003, Clifford Gaddy and Fiona Hill (more noted, recently, for her testimony to Congress during the hearings on the impeachment of President Donald Trump) call this "The Siberian Curse". Siberia's size, its extreme climate and its misdevelopment by Russian rulers, they argue, hold all of Russia back. "In essence," they sum up, "to become competitive economically and to achieve sustainable growth, Russia needs to 'shrink'. It must contract not its territory, but its economic geography."

The trade across the Urals was not all one way: in return for its resources, Siberia was sent criminals, prostitutes, dissidents and revolutionaries. In "The House of the Dead", a history of Siberian exile, Daniel Beer notes that "the metaphors changed over time, but the basic conviction remained that Siberia was a receptacle for the empire's own disorder."

This was meant to cleanse Russia, not change Siberia. But some exiles could not help but bring change—none more so than the Decembrists. Young men who had been greeted as liberators across Europe during the Napoleonic wars, they had returned home to Russia infused with the ideals of liberty, nationhood and republicanism. On December 26th 1825 they mounted an armed revolt in St Petersburg. It failed. Five were hanged; 121 were sent east.

Instead of oblivion, they found hope. Nikolai Basargin, a 26-year-old Decembrist, wrote in his diaries, "The further we travelled into Siberia, the more fetching it seemed in my eyes. The common people seemed freer, more lively and more educated than our Russian peasants, especially the serfs." The locals were, he thought, rather like Americans. "There is no doubt," Basargin wrote, "that Siberia would stand its own in comparison to the American States, this young republic whose rapid growth in material and political significance is so striking both in terms of its attitude to dignity and to human rights".

A spring from December

The legacy of the Decembrists survived the fall of the Russian empire and the Bolshevik revolution. In the 1970s one Decembrist family home in Irkutsk became an atmospheric museum and a place of pilgrimage for the Soviet intelligentsia. In an act of dignity and defiance, a Siberian publishing house brought out a series of Decembrist memoirs. If you see that legacy in Mr Muratov's snowflakes and stripes, too, you might not be wrong.

When, in 1861, serfdom was abolished in the rest of Russia, millions of the newly free but landless flocked there, assisted by the Russian state. The Trans-Siberian railway, second only to St Petersburg itself as a tsarist imposition of modernity on the landscape, spread them between newly thriving cities and settlements in between. The elegant classical architecture of 19th-century Irkutsk and the delicate ornamentation of wooden Art Nouveau houses in Tomsk still survive among grey Soviet apartment blocks and eclectic post-Soviet monstrosities, testament to the tastes, money and energy that turned frontier forts into prosperous and cultured cities.

Rich as it was in resources and talents, Siberia lacked a wide range of freedoms. It saw itself as a colony and did not like that status, especially when the word was preceded by the modifier "penal". Siberian intellectuals, students and journalists fostered a new regionalism. They did not want independence. They wanted Siberia to live up to its potential as the best part of Russia—as what Russia might become. As Yadrintsev argued in "Siberia as a Colony": "The views and horizons of Russian people widen along with the Russian border...Whatever the history of this land, it cannot be deprived of its future." America was, once again, the model.

On July 4th 1918, in the aftermath of the Bolshevik revolution, Siberia claimed its sovereignty. It could not hold it, and eventually fell to the Bolsheviks, many of whom had spent time imprisoned in the region. They went on to do unto others as had been done unto them on an industrial scale. Tsarist-era exile settlements were turned into slave-labour camps.

Yet even as the country descended into Stalin's great terror, Siberia retained its romantic allure; its sense of being a place of shelter. Osip Mandelstam, one of Russia's most significant 20th century poets, who would soon perish in the Gulag, described this paradox in 1931. In Vladimir Nabokov's translation:

After Stalin's death in 1953 new hope arose. Novosibirsk, about 800km west of Krasnoyarsk, was chosen as the site for a new, scientific town, or *Akademgorodok*, that would accelerate the Soviet Union into the communist future. It brought together, among others, nuclear physicists working on thermonuclear fusion and linguists considering how to communicate with aliens in the cosmic future Yuri Gagarin had opened up.

Other futurisms were less welcome. The 1970s saw huge new industrial projects in the region carried out under the aegis of the communist youth league. One of Siberia's earliest chroniclers had rejoiced that "the air above is cheerful". Not once the smelters started. The air was poisoned and the rivers dammed, engulfing whole villages. People were enraged and the 19th-century notion of a separate identity resurfaced, notably in the work of the Siberian "village writers". In 1987 Irkutsk, the city where Alexander Kolchak, the Imperial Army admiral recognised by many countries as Russia's head of state, was executed in 1920, staged the first mass anti-government demonstration in the history of the Soviet Union. It was aimed at a barbaric plan to dump waste from a paper-processing plant on the shores of Lake Baikal into the river which supplied the city's water.

When the Soviet empire finally collapsed, Boris Yeltsin, Russia's new president, promised the country's regions "as much sovereignty as they could swallow." Siberia was to get 10% of all the revenues raised from its natural resources. The region's affinity for the wild West returned with a vengeance as oligarchs, local criminals and chancers tussled for dominance. Tomsk, home to a university that had served as an intellectual hub for regionalism in the 19th century, grew into one of Russia's most politically vibrant cities, with a critical, independent television channel—TV2—and competitive politics.

All this stacked up against Tomsk when President Vladimir Putin started to consolidate his power. Mikhail Khodorkovsky, the boss of Yukos, Siberia's largest company, was imprisoned. So was the mayor of Tomsk, his fate a warning to uppity regional

politicians. Yukos was dismembered. TV2 was taken off the air in 2014.

The monstration mash-up

In 2004, the year of Mr Khodorkovsky's first trial, Artem Loskutov, an artist, saw a Soviet-style May Day procession in Novosibirsk in which workers marched under the portraits of their factory bosses and logos of their produce. A poster for a strip-club painted in the style of Great Patriotic War propaganda demanded "capitulation" from its clients and promised a "victorious" shot of vodka. "The whole thing was absurd," Mr Loskutov recalls. Enthused and amused, he and his friends joined in, carrying posters with slogans such as "Something like this" and "Oh!". Thus did Novosibirsk's "Contemporary Art Terrorism" group come into being, deconstructing a demonstration until it was just, as they put it, a "monstration" instead.

At first it was just playful. But as Russia descended deeper into authoritarianism—and with it, state intervention in art—the monstrations grew in size and in substance. "Don't teach us how to live, or we shall teach you" read their main slogan in 2008. Two years later: "If everyone starts walking like this, what kind of anarchy will it be?!" Other cities started to copy Novosibirsk's example. Mr Muratov began to paint his "flag".

Responding to the everyday surrealism of Putin's Russia, Vasily Slonov, an ironic conceptualist from Krasnsoyarsk (whose heavy-metal crown, poking fun at Western pop culture, is pictured), inverted one of the slogans from Paris in 1968: "Be impossible, demand reality." Before an exhibition in Moscow in 2018, he displayed a toy bear carrying the slogan in Red Square. The bear was subsequently detained by the police, and has not been heard from since.

In a small, packed Novosibirsk bar ironically (of course) decked out as a Soviet-era *pivnaya* (beer hole), what strikes you about such artists and their intellectual partners in the resurgence of Siberian regionalism is their self-confidence. They do not debate whether Russia belongs in Europe or in Asia or whether it could ever become a "normal" country—the sort of questions fretted over in trendy Moscow cafés. As far as they are concerned, theirs is a normal country: one called Siberia which is populated by "spontaneous Eurasians", people who listen to their own common sense rather than the agenda pushed by the Kremlin or Moscow liberals.

When, after the invasion of 2014, Russia's state propaganda whipped up patriotic hysteria under the slogan "Crimea is ours", the monstrators responded with "Hell is ours". When the Kremlin demanded the federalisation of Ukraine, the artists called a march for the federalisation of Siberia and "the creation of the Siberian republic within the Russian Federation". Its slogan was "Stop feeding Moscow". The Russian authorities banned the march and blocked the internet page that advertised it. Predictably, this generated a far greater resonance from the media than the march itself would probably have done: conceptual politics born from conceptual art, and all the more powerful for it.

"All Siberian cities have different problems, but they have a common grievance against Moscow," explains Mikhail Rozhansky, a historian and sociologist in Irkutsk. Yet while on paper Siberia is no different from any other Russian region, in reality it has retained some autonomy. And the harder the Kremlin tries to unify the country, the stronger the sense of separateness becomes. It is perhaps simply a function of size. In a land this large, people rely on themselves and each other; they do not have high expectations of any politician and reject authority as a matter of principle. This gives them the country's strongest streak of Russia's most distinctive contribution to political discourse: anarchy.

In 1898 Prince Peter Kropotkin, the father of anarcho-communism, wrote that in Siberia he "understood that the administrative machine [of the state] can do no good for people…In Siberia I lost any faith in state discipline and was ready to become an anarchist". In the last days of the Soviet Union *Grazhdanskaya Oborona* (Civil Defence), an iconic punk band from the Siberian city of Omsk, inspired their fans by singing: "Kill the state within yourself" and "Our truth, our faith, our deed is anarchy".

Protest is currently easier in Siberia than in the rest of Russia, and politics freer, too. For the most part this liberty is exercised only locally. But in 2019 Alexander Gabyshev took it on himself to expand it in a very Siberian way. Though some indigenous Siberians converted to Christianity after the Russians arrived, and some practice Buddhism, some still follow Shamanism. Mr Gabyshev styles himself a shaman warrior. In the spring he set off from his native Yakutia dragging a cart, a dozen followers in his wake. His destination was Moscow, "the heart of evil"; his goal was to exorcise the dark forces embodied by Mr Putin by lighting a fire in Red Square and performing a ritual with a tambourine.

As he went along, his following grew, both on the road and online. "From now on Putin is not a law to you. Live freely. That is the law," he preached—part Kropotkin, part Aleister Crowley, an occultist. Then one night a SWAT team descended on his camp and packed the shaman back on a plane to Yakutia. There he was briefly incarcerated in a psychiatric ward before being ordered not to leave Yakutia again. Amnesty International declared him a prisoner of conscience.

Mr Gabyshev compares himself to a caterpillar which "knows that what will come out of this cocoon will be faster, stronger and wiser." The idea of a shaman liberating Russia has a surrealism all of its own.

A valour undreamed of

But he is not the only one to believe that a cleansing can come from the east to the west. In 2013 Vladislav Inozemtsev, a liberal economist, and Valery Zubov, a former governor of the Krasnoyarsk region, wrote a response to "The Siberian Curse" called "The Siberian Blessing". They argue that, "in a vast and over-centralised country such as Russia, [modernisation] cannot come from the centre, because the centre is the main beneficiary of the rent-seeking system." Siberia—"the awakening colony that frees itself"—is not an eastern province of Russia. Rather Moscow is a city west of Siberia in dire need of reform and anarchy, cheerful skies and irony, and perhaps a touch of shamanism, too.

As Sergei Kovalevksy, the curator of the museum in Krasnoyarsk, puts it, "In Siberia anything is possible."

A similar thought occurred to Chekhov when he stopped in Krasnoyarsk. "On the Volga a man started with valour and ended with a moan, which is called a song. On the Yenisei, life started with a moan and will end with valour of a kind we can't even

dream of. This is what I thought standing on the bank of the wide Yenisei: what a full, clever and brave life will light these banks with time!"

Most of the Krasnoyarsk that Chekhov would have seen in the 1890s is long gone. But something of that thought remains, projected every night onto a building that was once Lenin's Museum. ■

Personal and political

The liberalisation of Ireland

How Ireland stopped being one of the most devout, socially conservative places in Europe

Print | Christmas Specials Dec 18th 2019

THE RADIO'S chatter of voices and music is briefly stilled; instead the sound of Angelus bells, peeling out an invocation to prayer, chimes out, slightly overlain by static. Agnes McKenna, an 83-year-old grandmother, pauses for a moment. When she was a child, she says, growing up with four siblings on a farm in western Ireland, at the sound of those bells everyone would stop what they were doing. Ploughs would halt in the middle of a field; farmhands would stand still and pray.

With the bells dying out in the background, Agnes resumes bustling about her kitchen, filling up the teapot and buttering slices of brown bread. As her 27-year-old granddaughter, Síona Cahill, lays the table she looks bemused at Agnes's description of an Ireland where the Roman Catholic church did not just delineate the seasons of a year, or the stages of a person's life, but was present hour by hour.

Much of Agnes's life in Longford, a small town in central Ireland, still revolves around the church. She goes to Mass each day. Sister Pauline, a nun, is one of her closest friends. If Síona goes to Mass at all—which she might at Christmas or on other special occasions—she will not take the sacrament; she says her religion is in "people". She lives with her girlfriend in Dublin, and spends much of her time campaigning for LGBT and women's rights. "I'm not sure if I totally understand the present," Agnes says. "It is going too fast for me." For Síona, who takes up one social cause after another, it isn't going nearly fast enough.

But when Síona came out as a lesbian six years ago, she told her grandmother before her parents, and found her to be utterly supportive. During the referendum campaign to liberalise Ireland's abortion laws in 2018 Síona travelled down to Longford every weekend to canvass voters. Agnes once came out canvassing with her. She remains worried that young girls might use abortion "willy nilly", but she still voted for liberalisation. She voted for same-sex marriage in 2015, too.

Síona's values are perhaps not surprising. Agnes's highlight a profound shift that has taken place in Ireland over the past four decades. The country was once one of the most conservative places in Europe. Now it is one of the more socially liberal. When Síona was born in 1992, homosexuality and abortion were illegal, divorce was prohibited and oral contraception was available only on prescription for married couples or for women with painful periods.

In 2015 62% voted to make same-sex marriage legal, despite most of those preaching from the pulpit expressing disapproval at the idea. Three years later, a whopping 66% voted with Agnes and Síona to repeal the eighth amendment to the constitution, which had valued the life of mother and fetus equally, and make abortion available to women in the first 12 weeks of a pregnancy. Both referendums had high turnouts: 60% for same-sex marriage and 64% for abortion. Divorce, which became legal only in 1995, was liberalised further in 2019. When Fine Gael, currently the governing party, chose a gay politician, Leo Varadkar, as its leader the country had no trouble accepting him as taoiseach.

"I do not think it is dramatic to call it a social revolution," says Una Mullally, a journalist at the *Irish Times* who campaigned for both same-sex marriage and Repeal the 8th, the pro-choice campaign. Yet this revolution, as such, happened while 78% of the population still consider themselves to be Catholic, and while 91% of children attend a church-run school. How?

One reason is exposure to the outside world. Ireland is a small island with a large diaspora. When she was 15 Agnes left Leitrim, where she had grown up, to go to London to work as a hospital attendant. She encountered another world: one of dance halls, mostly, but also central heating and a secular health service. When she returned with her husband, Paddy, in the 1970s, her sister, who had stayed in Britain, would send them condoms in the post with the inscription "Happy nights!" (Condoms were banned until 1979, and available only on prescription until 1985.) This meant that, unlike a neighbour who was "forever pregnant all her life" with 15 children alive and several dead, Agnes had just two children. "I said this to the priest," she recalls, with Síona looking on proudly, "What's the point in having them if you can't afford them?"

Diarmaid Ferriter, a historian at University College Dublin, points out that when Pope John Paul II visited Ireland in 1979—seemingly at the point where Ireland was still very devout—he warned in his Mass, given to over a million people in Dublin's Phoenix Park, of "alien" influences turning people away from the church. He did not have in mind the cheap flights that Ryanair began to offer in the 1980s. But they did some of the trick.

Increasingly, Irish people have taken a more "pragmatic" approach to their faith, says Mr Ferriter, by separating it from other aspects of their life. Susan McKay, a journalist in Dublin, sees it as "a new kind of Catholicism—a kind of Protestant relationship, just with God." By the time Pope Francis made his own visit, in 2018, only around 150,000 people went to his Mass in Phoenix Park.

The process was undoubtedly speeded up by the scale of clerical abuse revealed in the 1990s and thereafter. That some clergy could be cruel was not news. Agnes remembers one priest, in her primary school, caning a girl over her knuckles to watch her cry ("Aw, it's thawing," he would say). Women, who supported the church in greater numbers and who gave more of their time to it, were also often degraded. After giving birth Agnes's mother had to be "churched": blessed by the priest before she could take the sacrament again, as if she were unclean. She remembers another woman, when she asked a priest for advice

about how to stop having so many children, being told to "do her womanly duty". "They said jump and you said how high," she says.

In the early 1990s Irish newspapers and television stations started to run stories of widespread abuse by clerics, some powerful and hitherto popular. For Bernie Coen, a mother of four in Mayo, western Ireland, the church's diminishment started with Bishop Eamonn Casey. In 1992 it emerged that the supposedly celibate bishop, who had stood at John Paul II's side in 1979 and who was, according to Mrs Coen, "as big as Bruce Springsteen", had fathered a boy with an American woman and subsequently refused to have any contact with him. "I'm glad my mother wasn't around for that," Mrs Coen says. "It was a real kick in the teeth."

In the mid-1990s individuals started to speak publicly about their rape as children by paedophile priests. The government scrambled to set up a series of inquiries. Just short of 100 priests were found to have sexually assaulted children between 1975 and the mid-2010s (campaign groups say the actual figure is much higher). The cases were horrifying, sometimes involving extreme acts of abuse, frequently involving multiple victims. The church sometimes moved the guilty around from parish to parish, with earlier complaints ignored or hushed up. "I had never thought of priests doing anything like that," says Agnes.

In 1996 the last Magdalene laundry closed. The laundries had been places where "fallen" women were sent to work in servitude. They were run, as were mother-and-baby homes for the pregnant and unmarried, by religious orders. The institutions fostered their own horrors. In 2015 a commission looked into 14 mother-and-baby homes after human remains were found at one at Tuam in western Ireland. It uncovered more death and cruelty. The bodies of more than 950 children had been sent to various medical schools for anatomical research between 1920 and 1977. Others had been buried in unconsecrated ground.

The scandals had an immediate effect. According to David Farrell at University College Dublin and colleagues, trust in the church fell from 50% in 1981 to 20% in 2008. Mass-attendance figures dropped sharply.

Not all the scandals were in the past. In 2012 Savita Halappanavar, an Indian dentist, died in hospital after she was denied an abortion while undergoing a miscarriage. Because the fetus still had a heartbeat, the doctors would not end its life, and so she lost hers. "We are a Catholic country," the midwife was reported to have said to her. "That frightened me," says Mrs Coen. "It felt unsafe to be a woman in Ireland." For Síona, at university at the time, the death of Mrs Halappanavar marked the point at which she started to feel that she needed to act.

For decades, disparate women's groups had agitated for reform to laws on sexual conduct and reproductive rights dictated by the church. In the 2000s they began to coalesce into a larger movement. The appetite for change was not all down to a turning from the church; other things contributed to a sense that Ireland was not the country it had told itself it was. Ms Mullally points to the recession of 2009-13 and the centenary of the Easter Rising of 1916 as moments of reflection. In 1966 the 50th anniversary of the Rising focused on martyred men and their Catholicism, says Mr Ferriter. The years leading up to 2016 saw the "reclaiming [of] hidden histories"—of women who were Republicans, of children who died in the fighting.

Only say the word

In 2012, sensing the public's mood, Enda Kenny, Mr Varadkar's predecessor, set up a constitutional convention. It was to discuss ten issues, including various voting reforms, the representation of women in politics and public life, and same-sex marriage. It was made up of 66 citizens, randomly selected, and 33 parliamentarians. Finbarr O'Brien, a 64-year-old postman in rural Cork, initially declined the invitation to join. "I had no interest in politics," he says. But after his eldest son encouraged him to take part, he became one of the more enthusiastic members of the group. "It is one of the best things I've done in my life. It opened my eyes to a lot of things."

Mr O'Brien was sexually abused as a child and had tried to commit suicide as an adult. For years, when he was growing up, homosexuality was "a very touchy subject with me, regards two guys or two girls being together...I hated every guy who stood on two feet because of it." Although his abuser was a layperson, not a priest, the crime was still covered up in his local community. He equated homosexuality with paedophilia for many years until he got help from a therapist.

As part of the convention's discussion on same-sex marriage he heard a church representative defend the institution as a sacrament between a man and a woman. "I just couldn't take what he was saying...I was sweating. My knuckles had gone white, I was closing my fists so hard." After a lifetime of repressing his abuse, and after decades of wrestling with his sense of shame, it took all his courage to speak up. He got up, briefly told his story, and said he felt the biggest problem was ignorance, and that "the gay people—whether they are man, or women, or whatever... They can provide a home as good as any."

This was not a private summoning up of courage in a closed room—the meetings were streamed online and much discussed. When Mr O'Brien went to the bar for a nerve-steadying drink after saying his piece, two teenagers who had been brought up by a gay couple came and shook his hand. "That made me feel a thousand times better," he says. "It meant something to them."

When, in 2013, the convention was asked whether constitutional reform to allow same-sex marriage should be recommended to the government, 79% agreed. Less than two years later, the same-sex marriage referendum took place.

And I shall be healed

In 2016 Mr Kenny set up a citizen's assembly modelled on the previous convention to discuss further topics, including abortion. Its recommendation was radical: women should have the right to have an abortion up to the 12th week of pregnancy. "We were genuinely surprised at how far we'd gone," says Louise Caldwell, a 42-year-old from County Meath, who participated in the assembly. The process did not change her mind on abortion but it "filled in the gaps" and challenged her preconceptions. "We learned that the largest proportion going to Britain to have an abortion were 35- to 45-years old, and had already had children."

Informed at first by legal and medical experts, the assembly soon asked to hear from women who had undergone abortions. "What we felt was unrepresented was voices," says Ms Caldwell. During the referendum campaign which followed those voices were amplified. High-profile women such as Tara Flynn, a comedian, talked in public for the first time about going to the

Netherlands for an abortion. Ordinary people spoke up, too: to their neighbours, their colleagues, even to strangers. "You can talk about theological arguments until the cows come home, but you cannot deny people their experiences," says Ms Mullally.

This emphasis on personal stories partly stemmed from the success of the same-sex marriage referendum. That campaign tried not to be divisive. "It wasn't Gays versus God," says Tiernan Brady, a LGBT-rights campaigner. Instead it was about "Margaret, Peter", he says; the campaign tried to appeal to people because of their faith, and its emphasis on charity and kindness, not despite it. The effect of this was even more powerful in a referendum in which the topic—abortion—was far more contentious.

Síona remembers marshalling her gang of Repeal volunteers in Longford. She told them to dress as if they were going to Mass (clean blouses or shirts, blazers). Some of the people whose doors they knocked on were receptive. Others were hostile. Occasionally, a pugnacious reaction gave way to a covert, sympathetic nod—in one instance, a seemingly anti-abortion woman whispered "I'm with you," after checking her husband could not hear her.

Many of the pro-life campaigners, by contrast, fell back on old tactics. Enlarged pictures of fetuses were put up on billboards and on lampposts. Such campaign imagery mostly scared off all but the most hard-core voters, and remains distasteful to many moderate Catholics. "Even pro-life people were saying Jesus, will they just sod off," says one mother of three. Of the third of voters who voted against both same-sex marriage and abortion, many are still unhappy. "The first referendum you can understand, it's an emotive thing," says Father Richard Gibbons, the parish priest of Knock, a shrine visited by around 1.5m pilgrims each year. "But the abortion referendum knocked us for six."

Breda O'Brien, a conservative pro-life columnist with the *Irish Times*, has an explanation for how people who had thought themselves in the majority found themselves not to be. "There is a conformist streak in Irish personality...When it was the thing to be Catholic we were incredibly Catholic, and now it is [the thing] to be liberal." David Quinn, of the Iona Institute, the main pro-life lobby group, notes that "Ireland has this huge ambition to be modern."

That suits Katherine Linnane, a 14-year-old whose mother was active in the abortion campaign. She lives in a country where she can feel at ease. "For all of my bisexual life I had the right to marry a girl. All of my life as an adolescent I had the right to have an abortion." Mrs Coen says: "I think Ireland is safe in the hands of this generation growing up."

"In an angrier world Ireland has a lot to teach people," thinks Mr Brady. It is an education which starts at home: the place of private reckonings, and personal revelations. In Longford, Agnes listens intently as Síona describes how tough she found it when seminarians at her university told her, week in and week out, that gay people should not get married and should not have children. "You've been through more than I realised," Agnes replies, softly. Midway through the conversation, she also says to her granddaughter, as if to remind her: "It never bothered me that you were gay...You were you, you were Síona Cahill to me." ■

Boeing going wrong

Boeing will halt production of its troubled 737 MAX

The crisis may force a significant strategic rethink

Print | Business Dec 21st 2019

Editor's Note (December 23rd): *After publication of this article, Boeing sacked its chief executive, Dennis Muilenberg, on December 23rd. He will be replaced by David Calhoun, the company's chairman, who will take up the post in January.*

COMMERCIAL AVIATION makes up the bulk of Boeing's revenues. Military-minded top brass of its large defence arm would be excused for seeing that business as a case study in tactical and strategic failure. After two crashes of its 737 MAX airliners, which killed 346 people and were linked to a defective flight-software system, the bestselling model was grounded around the world in March. Yet Boeing continued to make the plane even though it could no longer deliver new ones to customers. Now it is in retreat. On December 16th, with around 800 new and used flightless jets lying idle, the firm decided to halt production in January until the MAX is permitted back in the air. The upheaval may at last force a rethink at Boeing—and at Airbus, its European rival.

For months Boeing seemed to treat the MAX's travails as a brief spell of turbulence that passengers forget as soon as the drinks trolley arrives. It continued to pay a handsome dividend even as it converted employees' car parks into storage space for undelivered planes. It repeatedly reassured airlines that the aircraft would be back in the air in no time—and was proved wrong again and again. Dennis Muilenburg, criticised for his handling of the crisis and relieved of his role as Boeing's chairman in October, remains chief executive.

Mr Muilenburg's decision to keep the MAX supply chain up and running, reportedly hoping to ramp up production from 42 to 57 planes a month by 2021, will torch $4.4bn of cash this quarter, according to Jefferies, a bank. Calling a halt should save half of that. Boeing promises to provide financial details regarding the suspension in January, when it next reports quarterly earnings. Those results are sure to be grisly. Boeing has around 5,000 orders for the troubled aeroplane, which Goldman Sachs, an investment bank, reckons would account for a third of the company's revenues over the next five years. But it will not be fully paid until these can be delivered.

In the first nine months of the year revenue fell by 19% relative to 2018 and free cashflow turned negative (see chart). Gross debts ballooned to $25bn from $14bn at the start of the year. After raking in profits of over $5bn from January to September 2018, its airlines division lost nearly $4bn in the same period in 2019. Boeing as a whole eked out a small profit courtesy of its defence and services arms. In July it set aside $5.6bn to cover compensation to suppliers and airlines. That figure is now likely to double, says Jefferies. Since March Boeing's market capitalisation has shed a quarter, equivalent to $65bn.

The date for the MAX's return to service remains up in the air. The crisis revealed a cosy relationship between Boeing and the Federal Aviation Administration (FAA), the regulator responsible for certifying its planes in America. That has turned frosty. Boeing may have thought that it could speed the return of the MAX by publicly putting forward a timeline. In the summer the firm talked of recertification in September and a return to service soon after.

The FAA is instead taking its time. In a letter to congressmen it complained about the "perception that some of Boeing's public statements have been designed to force the FAA into taking quicker action". The likelihood now is that the plane will be recertified in February. Regulators elsewhere are in no hurry, either. Recommissioning and delivering planes will take more time, as will retraining pilots. On December 12th American Airlines said that it would put the MAX back in its schedules in April.

The crisis notwithstanding, in November Boeing booked its first firm orders since the grounding, for 30 planes. More are sure to follow. Airbus hopes to increase production of its rival A320 to 65 planes a month by 2022. Even if passengers are reluctant to board the MAX, airlines clamouring for new planes have little choice but to continue to buy Boeing.

The company is nonetheless on the back foot. Plans to develop a new jet to replace ageing 757s have been put on hold. That has left the field to Airbus, whose A321XLR does a similar job. In December United Airlines, a loyal Boeing customer, ordered 50 of them. Problems with the engine have delayed the first flight of Boeing's newest 777X long-haul airliner until next year. And despite leading Airbus in long-haul jets, the American firm trails its rival's 6,200 A320 orders.

All this has led to speculation that Mr Muilenburg may not hold on to his job for long, whether or not the MAX returns to the skies in the next few months. Should he go, a new broom may conclude that it is time to retire the 737 series, which has been in the air for over 50 years.

That prospect worries Airbus, which prefers a straight fight between the MAX and A320 for as long as possible. If Boeing opts to build a more modern plane, Airbus will have to do so, too—just as Airbus's launch in 2010 of the fuel-efficient A320neo

forced Boeing to upgrade its ageing 737. Back then Boeing was contemplating an all-new design that would take six or seven years to enter service. Fearing a loss of sales, it chose instead to put a new engine on the 737. That decision eventually gave rise to its current woes.

A brand new plane would require both firms to invest billions—and could lock them into technology that forecast developments in electric-hybrid short-haul aircraft may render obsolete in a few years' time. Airbus would rather not take that risk. If the MAX timeline slips again, Boeing may have no choice but to do so. ■

Dancing with the state

Bytedance teams up with a state-run Chinese publisher

The move is unlikely to endear TikTok's parent company to Western critics

Print | Business Dec 21st 2019

TIKTOK, A CHINESE-OWNED short-video app no Western teenager can do without these days, stresses its independence from the authorities in Beijing. Its parent company, less so. Bytedance, whose $75bn valuation makes it the world's biggest unlisted startup, has just teamed up with Shanghai Dongfang Newspaper Company, a state-run publisher. Bytedance will own 49% of the joint venture. An official filing made by the joint venture states it will, among other things, develop technologies such as artificial intelligence (AI), although a spokesperson for Bytedance denies that this will actually be the case.

It is not Bytedance's first jive with the state. Since its founding in 2012 it has worked with most news organisations in China, many of them state-run, which it needs to feed Jinri Toutiao, its news app—all the more so since the launch two years ago of "New Era", a channel that reports chiefly about government goings-on. In 2018 it hired a former anchor at CCTV, China's state television, as vice-president. In April it signed a strategic partnership with Beijing Time, a news platform linked to the Beijing Municipal Party Committee.

Toutiao is periodically chastised—by the government and users alike—for a dearth of serious content. The joint venture is looking to fill that gap. Shanghai Dongfang owns the *Paper*, a serious outlet which does proper investigative work (even if state censorship can dull its edge).

Nor is Bytedance the only big Chinese tech firm that works closely with state-owned enterprises, especially in areas such as AI that the Communist Party regards as strategic. In 2016 Baidu, China's biggest search engine, agreed to develop technology with a state-owned telecoms firm. In June Jack Ma, the founder of Alibaba, an e-commerce behemoth, met with SASAC, a government body which oversees state firms, to discuss tie-ups to promote digital innovation. Tencent, another internet giant, has been urged to do the same.

Natural though it may appear in China, the joint venture comes weeks after America's government opened a national-security review of TikTok on worries that it gives Beijing access to data on millions of Americans and censors content the regime does not like. Bytedance insists that data on non-Chinese users sit on non-Chinese servers and what Americans are or aren't shown is decided in America. It adds that its new Chinese initiative will "focus on digital rights of short videos". Such assurances are unlikely to impress its critics. ■

Clarification (January 1st 2020): This piece describes a Chinese joint venture between Bytedance and a state-run firm. An official filing says that, among other things, it will develop technologies such as artificial intelligence. However a Bytedance spokesperson denied that this would be the case. The article has been amended to include Bytedance's comment.

Two is traffic

Chinese carmakers may soon own a fifth of Daimler

BAIC, a state-owned firm, reportedly wants to double its stake to nearly 10%

Print | Business Dec 18th 2019

AT DAIMLER'S ANNUAL meeting in May, one shareholder captured the mood. "Don't replace the Mercedes star with a Chinese dragon," implored Deka Investment, a big asset manager, referring to the purchase in 2018 by Geely, a Chinese firm which also owns Sweden's Volvo, of a 9.7% stake in the German car giant. Daimler now faces the rise of a second dragon. Beijing Automotive Group (BAIC) is reportedly poised to double its holding in Daimler to almost 10%. This would put it ahead of Geely as the firm's biggest shareholder.

If Geely's manoeuvre was a surprise, BAIC's is not. In July the state-owned company grabbed 5% of Daimler. Though the dragon is not yet on the bonnet, it has long been under it: engines, powertrains and other parts that go into Daimler's Mercedes-Benz cars sold in China are made under two joint ventures with BAIC set up since 2005. With Chinese car sales down in 2018 and 2019 after years of steady increases, domestic manufacturers are banking on premium cars for growth. So is Daimler, whose financial performance has been less inspiring than that of its cars. Its share price has nearly halved since 2015.

For BAIC, the relationship with Daimler is "of existential importance", says Robin Zhu of Bernstein, a research firm. In 2018 sales from Beijing Benz, one of its ventures, grew by 16% year on year and accounted for 90% of BAIC's total revenue. Mr Zhu notes that BAIC has long sunks profits from Beijing Benz—a tidy 10bn yuan ($1.5bn) in 2018—into "the bottomless pit" of BAIC's domestic brands, which lost 6.5bn yuan.

A bigger stake in Daimler may be an attempt to restore the perception that BAIC, not Geely, is the Germans' main partner. A spokesman for Daimler says it welcomes long-term investors, especially those it knows well. The German firm owns 9.6% of BAIC Motor, the Chinese company's Hong Kong-listed subsidiary, and 3% of BluePark, another BAIC affiliate that makes electric cars and batteries.

Many Germans nevertheless worry. With another 5% or so the Chinese duo could block some strategic decisions, says Marc Tüngler of DSW, an organisation which represents the interests of German private investors. The pair could easily join forces. Geely may be privately owned but, Mr Zhu says bluntly, "both ultimately represent the Chinese state."

Geely and BAIC may shun separate holdings above 10% to avoid triggering a review by BaFin, Germany's financial regulator. But Daimler is apparently already worried that an enlarged Chinese stake may invite scrutiny from an American government body which vets foreign deals, including those between foreign firms with American subsidiaries. Another of Daimler's Chinese joint ventures, with BYD, a maker of electric cars, may come under strain as Congress tries to bar federal money from paying for Chinese buses, which BYD sells to America. On December 15th China's ambassador to Germany threatened to retaliate against its car industry if the country bowed to American demands to bar Huawei, a telecoms-equipment giant, from its networks. For Daimler, this requires some deft handling. ■

Bartleby

An inspiring holiday message

A few newfangled words from the chief executive

Print | Business Dec 18th 2019

DEAR PARTNERS, colleagues and (dare I say it) close personal friends. As the new boss of Multinational United Subsidiary Holdings (MUSH), I am proud to look back on another year of success at our great company. Our performance is largely down to you and your efforts, and we hope that next year those efforts will be rewarded with the end of our long-running pay freeze.

Under my tenure, CEO does not stand for Chief Executive Officer but for cheerleader extraordinaire. I feel passionate about reaching out to as many of you as possible (if not quite as passionately as our Chief Technology Officer, who is still on suspension until the employment tribunal makes its decision). The door to my office is always open, especially now that we are in an open-plan building. When it comes to 360-degree feedback, I have unlimited bandwidth.

What was my highlight of the year? It has to be the arrival of cultural facilitator (and part-time rapper) Monica Strutt, aka the "monster". We all remember how we felt when we heard her first freestyle slam: "Use your energy/to create more synergy/our transformation/will be a corporate sensation/all your learnings/will boost our earnings". Inspirational at the meta-level.

I am also excited about the reorganisation that saw the appointment of our first Chief Diversity Officer, who ticks all the boxes—as should you when the latest employee-satisfaction survey hits your email address. The revamp also saw the creation of two new senior roles: Corporate Responsibility Advance Principal and, pushing the envelope, our Thinking Outside the Silo Head. I expect plenty of both CRAP and TOSH next year. They will be cascading memos down the corporate waterfall as they try to define their roles.

Admittedly, 2019 has had its share of painful experiences. My predecessor's decision to centralise all group functions did not work, resulting in some exceptional and extraordinary losses for the fifth year running. This forced us to close a few factories. On the bright side, our carbon emissions fell considerably as a result. Just doing our bit for the planet. I plan to return more power to the remaining staff by delegating control to the individual business units. Going forward, we will be moving backwards.

This means that now more than ever we need your input and inspiration for 2020. Please ideate 24/7. We need greater granularity and more thought leadership. Let us create a snowstorm and see what lands. If we architect successfully and get our ducks in a row, we can blitzscale MUSH and impact the market via a paradigm shift.

Business is getting a bad press at the moment for prioritising shareholders above all else. As our results make clear, we have managed to avoid this. What's more, our company has a purpose, and next year we intend to find out precisely what it is. Those of us in the C-suite have been kicking around some ideas, starting with the creation of a cross-disciplinary taskforce. Does becoming part of that winning team fit into your wheelhouse? If so, let our HR department know and someone from the staff interface community will circle back to you.

Where will our corporate journey take us in 2020? Hopefully, to the sunlit uplands where a thousand flowers bloom amid blue-sky thinking. For that to happen, we must join the dots and create a toolkit that will do the heavy-lifting to allow us to leverage our collective skillset. Forget the doomsters and the naysayers, and the investment-bank analysts with their tricky questions about balance-sheet strength and cashflow. Our management consultants say that we are one of the best clients they have ever had and they look forward to seeing us again next year.

As well as a cheerleader, a chief executive needs to be a chef. At MUSH we have wonderful ingredients. With the right mixing, we can create a soup-to-nuts banquet that will have consumers and investors salivating. Does this vision speak to you? Then speak to me in January when I return from my Bhutanese meditation retreat.

In the meantime, have a great holiday season. Many of you are entitled to annual leave. I like to think we are all members of the MUSH community, even those of you on zero-hours contracts. Remember that, in 2020, all your hard work can pay dividends to our shareholders.

All the best to anyone in the group's employment space.

Stay awesome. Buck Passer

The data sheriffs

Companies should take California's new data-privacy law seriously

The state's sweeping online regulations come into force on January 1st

Print | Business Dec 18th 2019

HISTORY DOES not repeat but sometimes it rhymes. So, it seems, do efforts to protect netizens' privacy. The European Union led the world with its General Data Protection Regulation (GDPR), which came into force in May 2018. That law shook up internet giants and global advertising firms, both of which had previously used—and at times abused—consumer data with little oversight. On December 11th India's government introduced a bill that would force firms to handle data only with consumer consent and give the authorities sweeping access to them. The same day Scott Morrison, Australia's prime minister, promised a review of privacy laws and said the competition authority will monitor how advertising is done on digital platforms. But the most important piece of legislation rhyming with GDPR right now is the California Consumer Privacy Act (CCPA), which comes into force on January 1st. To online businesses, it jars.

The Californian law copies some of the GDPR's provisions. It gives consumers the right to know what online information is collected about them and how it is used, permits them to demand that their data be destroyed and to sue companies for data breaches. In some ways, the CCPA is looser than its European predecessor. It does not, for instance, insist that firms have a "legal basis" for collecting and using personal data or restrict the international transfer of data. It also stops short of demanding the appointment of corporate data-protection officers and assessments of projects' data-protection risks. And whereas the GDPR lets individuals demand that private information about them be removed from the web under certain circumstances, the First Amendment makes this "right to be forgotten" a non-starter in America.

In other respects, though, California goes further than the EU. The CCPA adopts a broader definition of personal information (which extends to such things as internet cookies that identify users on websites) and it explicitly forbids discrimination (by offering discounts to those who grant firms access to their data). Companies must enable Californians to opt out of the sale of personal data with a clear "do not sell" link on their home page, rather than through GDPR's fiddlier process. Michelle Richardson of the Centre for Democracy and Technology, a privacy-advocacy group which is bankrolled in part by big tech companies, calls the CCPA "ground-breaking".

The California law will apply to firms with revenues of $25m or more that do business in the state or process its residents' data, even if not based there. Any for-profit entity anywhere that buys, shares or sells the data from more than 50,000 Californian customers, households or devices a year is also covered. Law-breakers face fines of up to $7,500 for every violation, compared with 4% of global annual revenues or €20m ($22m), whichever is higher, for the GDPR. But California's relatively trifling ceiling can add up quickly for firms with thousands of users.

The GDPR's track record suggests the effects of the CCPA will be far-reaching. Some 250,000 complaints have been lodged under the EU rules, and some penalties approach €100m. If breaking the rules could prove expensive, so is respecting them. The International Association of Privacy Professionals, an industry body, and EY, an accountancy, reckon that complying with the GDPR costs the average firm $2m. Tech firms spend over $3m; financial firms, more than $6m. By one estimate, the total cost to all American firms with more than 500 employees could reach $150bn.

"Initial compliance" with the CCPA may, for its part, cost the estimated 500,000-odd affected American firms $55bn, according to a study commissioned by California's attorney-general. Any such estimates should be taken with a grain of salt. For one thing, global firms that are already GDPR-compliant have a head start, even if differences between the two laws mean abiding by the Californian one will be far from automatic. Big firms, which are already on the hook for GDPR, are expected to spend another $2m each. For the tech giants that looks like chump change. Microsoft and Apple say they are not only ready for CCPA, but also plan to implement it across America.

For America's legions of smaller online trinket-sellers, app-makers or other firms present on the internet the Californian law will be onerous. They can ignore European regulations, because most have no EU business, but cannot easily stay away from one of America's biggest domestic markets. A new survey by the US Chamber of Commerce, a lobby group, claims that only 12% of small businesses in America know about the law, let alone have prepared for it.

The impact of the CCPA is being felt beyond boardrooms. Big Tech is lobbying lawmakers in Washington, DC, for a federal statute on the subject. "We really, really support an omnibus federal privacy law," says a data-privacy official at a large American technology company. Facebook and Google do, too, they profess. The US Chamber of Commerce, better known for opposing regulations, is also now in favour.

One explanation for tech firms' sudden enthusiasm to safeguard user information is their reasonable desire to avert a balkanised mess of contradictory state laws. Illinois, New York and Washington have differing state legislation in the works. Many others are looking into the matter.

Tame west, wild east

Tech companies could have another motive to back federal rules. Because much online activity crosses state boundaries

it falls under federal jurisdiction. A national data law would therefore supersede California's, unless it explicitly made federal rules the floor which states could raise if they wished. A Democratic proposal in the Senate does just this. A rival Republican one would set business-friendlier rules as the ceiling, in effect obviating the CCPA. No points for guessing which one of these America Inc would prefer. Neither is likely to pass before November's presidential elections. Until then companies will need to heed California's data sheriffs. After that, expect a shoot-out. ■

Schumpeter

The buzz around AirPods

Why is the ear worth so much less than the eye?

Print | Business Dec 18th 2019

UNTIL RECENTLY the ear was a part of the body relatively unconquered by commerce. The neck long ago fell to the necklace, the ruff and the tie. The wrist surrendered to the bracelet and the watch. The eye sold out to spectacles, shades and mascara. But the ears were a low-rent zone for business, good mostly for cheap jewellery, earphones and hearing aids. Walk around any big city and it is clear how quickly that is changing—thanks to headphones, earbuds and a torrent of new stuff blaring through them.

Apple, as usual, caught the trend early. The number of its AirPods, mocked for looking like broken Q-tips when introduced in 2016, is estimated to have doubled to 60m pairs this year. They have spawned a wave of imitators, from Amazon's black Echo Buds to Xiaomi's Airdots (popular in China) and Microsoft's Surface Earbuds—which creepily link directly to its Office software, including PowerPoint. The devices grow symbiotically with another craze: for streamed audio content in addition to music, such as podcasts. Apple helped popularise this genre. But Spotify, a Swedish streaming service, and big American broadcasting conglomerates, such as Liberty Media, are muscling in.

Industry executives contend that audio is undervalued—especially compared with video. As Spotify's co-founder, Daniel Ek, said earlier this year, time spent on each is about the same, but the video industry is worth $1trn versus $100bn for audio. "Are our eyes really worth ten times more than our ears?" he asks.

The eyeball plainly still dominates. The number of screens dwarfs that of "hearables". Between them, just three Tinseltown groups—Warner Media, Disney and Netflix—have spent as much as $250bn on visual programming since 2010. Audio, including music, comes nowhere near. That said, the battle to "monetise the ear", as Greg Maffei, Liberty Media's boss, puts it, is in full swing. These days no one would lend Mark Antony theirs; they would rent or sell them.

Take hardware first. Apple does not release figures for any of its "wearables", but AirPods are the fastest-growing of all of its products, with profit margins above 50%, says Dan Ives of Wedbush Securities, an investment firm. With the new noise-cancelling AirPod Pro, which costs around $250 a pair, he reckons Apple's ear-ware may generate up to $15bn of sales next year. That would be about four times the revenues of a headphone veteran like Bose. Horace Dediu, a technology analyst, predicts that this quarter AirPod sales could exceed those of the iPod at its peak around Christmas 2007. With iPhone sales slowing, AirPods are a new way of generating revenue from Apple's legions of loyalists; they even allow Siri, the company's voice-activated virtual assistant, to worm her way closer to listeners' brains. The overall market is spreading to the masses, too. Some wireless earbuds sell for as little as $20.

Audible content is likewise undergoing a mini-revolution. For the third year in a row, revenues from recorded music in America grew by double digits in 2018, largely thanks to subscriptions to Spotify, Apple Music and the like. Podcasts have grown both more numerous and more compelling. This year Spotify has set out to rule the roost in this medium, which Apple first streamed via iTunes in the mid-2000s. The Swedish firm acquired Gimlet, Anchor and Parcast, three firms that serve different aspects of the podcast market; it now hosts a staggering 500,000 podcasts; hours spent listening to them grew by 39% year-on-year in the third quarter. In October it boasted that the conversion of podcast listeners to paying subscribers is "almost too good to be true".

The battleground stretches beyond earbuds to the car radio. On December 12th the *Wall Street Journal* reported that SiriusXM, a satellite-radio arm of Liberty Media, had sought clearance from the Department of Justice to raise its stake in iHeartMedia, America's largest radio broadcaster and a big podcasting platform. The aim would be to compete more effectively against Spotify and other audio-streaming services both for subscribers and advertising revenues. Previously Mr Maffei has talked excitedly about podcasting.

The proliferation of digital-streaming devices has spawned the growth of other listening formats. This year, for the first time, the Audio Publishers Association, an industry group, reported that half of Americans listened to an audiobook, a trend it said was boosted by the popularity of digital-streaming devices, as well as podcasts. Audible, owned by Amazon, is the market leader. Malcolm Gladwell, an American author and podcaster, has turned the audio version of his latest book "Talking to Strangers", into what seems like a supersized podcast, with his own narration, actors and music. Romantics see it as a return to the oral tradition.

Though small, some of this spoken word has better economics than the sung variety. As Ben Thompson of Stratechery, a tech newsletter, has pointed out, the more music Spotify's customers download, the more its costs rise because of payments to record labels. Podcasts are different. Spotify has more bargaining power over myriad individual podcasters jostling to reach its 248m-odd users than it does over record labels. It also buys its exclusive podcasts at a fixed cost. The problem is advertising. Ad revenues are paltry. In America terrestrial radio still accounts for 82% of an audio ad market valued at more than $17bn. SiriusXM and Spotify have just a sliver of the pie.

A back door to the brain

Apple has the clout to make the industry more profitable. It could use its strong position with AirPods, Apple Music, podcasts and Siri to create a swirl of audio content around the iPhone—an ecosystem in the jargon—and take the lion's share of advertising. For the time being, though, it appears to be more focused on creating video content, in its battle for eyeballs with Netflix. That is lucky for Spotify. It gives it a bigger opening in the audio market. It is good for listeners, too. The last thing anyone wants is a Big Tech behemoth controlling the next best thing to a brain implant. ■

Wealth management
For the money, not the few

For the money, not the few

Wealth managers are promising business-class service for the masses

Banks, brokers and tech buffs vie to look after common people's $72trn stash of cash

Print | Finance and economics Dec 18th 2019

LINDA, A 54-YEAR-OLD event consultant in Los Angeles, is neither disorganised nor innumerate. Ask about her finances, however, and you lose her for two hours. She opens her current (checking) account on a mobile app, then cites a rainy-day fund at another bank. She has 14 credit cards, five mortgages, six insurance policies and several pensions with ex-employers.

Ranks of pinstriped advisers have long helped the very rich to invest, minimise tax and pass money down the generations. Everyone else has had to work it out on their own. "People's relationship with money is broken," says Martin Gronemann of ReD Associates, which uses anthropology to advise businesses. It reckons that personal finances are a bigger source of stress than worries about crime or health.

Now, however, financial firms are competing to democratise wealth management. On December 8th Goldman Sachs, which used to shun clients with less than $25m, said its robo-adviser could soon serve clients with as little as $5,000 to invest. And on December 14th Vanguard, an asset manager with nearly $6trn under management, teamed up with Alipay, a Chinese tech giant, to counsel customers with at least 800 yuan ($114).

The wealth-management sector is fragmented and ripe for disruption. UBS, the global leader, has a 3% market share and is the only firm in the top four in each of Europe, Asia and America. The industry remains technophobic, says Charlotte Ransom, a Goldman Sachs veteran now at Netwealth, a challenger. Advisers spend half their time on tasks that could be automated. According to EY, a consultancy, only 56% of clients fully understand the fees they pay.

The industry stratifies customers in a manner rather similar to airlines. "Affluent" clients, with between $300,000 and $1m in assets, get premium-economy treatment. They may talk to advisers by phone, but banks will do all they can to keep them out of branches. Investment options are limited to ready-made funds. "High-net-worth" clients, with up to $15m, fly business class, picking stocks and chatting in person with named advisers. Flying private are the "ultra-high-net-worth" individuals, who have access to venture capital and currency hedges, with exclusive dinners, golf outings and so on as cherries on top.

Whereas high-net-worth individuals typically pay no more than 1% of assets in fees each year, the mass affluent often pay over 2%—the average yield of S&P 500 stocks—for inferior service. Cattle class gets no service at all. Saving for retirement is the second-biggest financial commitment most adults ever make (after buying a home), says James McManus of Nutmeg, a British fintech. Yet most do it with no help.

That leaves a lot of money on the table. According to Oliver Wyman, a banking consultancy, the affluent, with $21trn in assets, and those below them, with $51trn, have as much to invest between them as high-net-worth individuals. The problem is that advisers, branches and time are costly. Most private banks deem portfolios below $2m barely profitable.

Yet three factors are conspiring to bring that figure down. The first is technology. In 2001 Credit Suisse tried to go budget with a pan-European online network. But the cost quintupled to €500m ($447m), in part because it relied on huge servers. Today data are in the cloud, and firms can bolt on apps instead of coding everything.

Second, the top of the pyramid is getting crowded. Banks love wealth management, with its high returns and low need for capital. As they have all tried to expand their high-net-worth offerings, competition has squeezed margins. The market value of a panel of 100-odd wealth managers has dropped by 15% in the last year, using Bloomberg data.

Third, negative interest rates are eroding the money held by the masses, about half of which is in cash deposits. So clients are crying for help.

That has sparked a race between banks, fintechs and investment firms. Wealth managers need several strengths to succeed, says Matthias Memminger of Bain, a consultancy: technology, trusted brands, marketing dollars and a human touch. Private banks have the last three, but score poorly on IT. They also fear cannibalising their high-net-worth business. UBS shut its robo-adviser in 2018, a year after launch. Investec, a bank, folded its own in May.

Startups have the opposite profile. Their robo-advisers generate recommendations by asking simple questions, keeping fees down. They allow customers to buy fractions of shares, and net out orders to reduce trading costs. But their brands are weaker, so acquiring customers costs more. And clients entrust them with only smallish sums. Launched in 2011, Nutmeg manages just £1.9bn ($2.5bn), and Wealthfront, a decade-old American firm, $22bn.

Brokers and asset managers also have good technology, which they use to compile data and execute trades. They pile clients' money into cheap exchange-traded funds and have cut fees to rock-bottom, hoping to cross-sell premium products. Charles

Schwab's robo-adviser manages $41bn; Vanguard's, $140bn. But their expertise lies in manufacturing investment products, not distributing them. They help people pursue single investment goals, not plan their financial life.

To tick all the boxes, contenders are combining forces. In May Goldman Sachs paid $750m for United Capital, a tech-savvy manager. It has also invested in Nutmeg. BlackRock has backed Scalable Capital, a digital service whose robo-adviser is used by banks including ING and Santander. Insurers are jumping in, too. Nucoro, a fintech, recently said that it would power Swiss Risk & Care. Allianz has tied up with Moneyfarm, a British robo-adviser.

The logical endpoint is financial platforms—perhaps super-apps that sit on smartphones—which would let customers stitch their patchwork of financial products back together. But the model has not yet been tested by rough economic weather. Volatility makes financial clients prize human contact, says Christian Edelmann of Oliver Wyman. The consultancy reckons the average cost-to-income ratio for the biggest wealth managers would jump from 77% to 91% in a recession. It remains to be seen how well mass-market wealth managers will perform in a downturn. ■

Push-me-pull-you

The coming months will test OPEC's sprawling alliance

December brings both good news and big questions for oil markets

Print | Finance and economics Dec 18th 2019

IT HAS BEEN a difficult time for anyone betting on oil. Climate change threatens long-term demand. In the past year ample production, trade disputes and fears of an economic downturn have weighed on the price of crude. On December 3rd Brent crude fell to $61 per barrel—18% below its April high. Yet by mid-December forces were aligning to support oil prices again. The Organisation of the Petroleum Exporting Countries (OPEC) and its allies agreed on December 6th to lower output by more than 2.1m barrels a day.

Adding to the optimism, Saudi Aramco, the world's biggest oil company, listed 1.5% of its shares. On December 12th its market value surpassed an astonishing $2trn. And on December 13th President Donald Trump announced a preliminary trade agreement with China (see article). That bumped oil prices higher. As *The Economist* went to press on December 18th, Brent crude had risen to $65.74.

Even so, oil gamblers are wrestling with two big uncertainties. The first concerns America's output. The country pumped 17.8m barrels a day in November, compared with an average of 15.5m in 2018 (see chart). But investors have grown impatient with frackers' meagre profits. The cost of capital for American exploration and production companies has jumped by about 50% since mid-2016, according to Goldman Sachs. At the start of December 663 rigs were operating in America, about a quarter fewer than a year earlier. America's oil output will not shrink in 2020, but its growth may slow. The question is when, and by how much.

The second uncertainty concerns whether the members of OPEC's 23-country expanded alliance will stick to their new deal. The past 12 months give reason for scepticism. In December 2018 OPEC and its partners agreed to reduce output by 1.2m barrels a day. Iraq, Nigeria and Russia, among others, have regularly exceeded their allowed limits. To compensate, Saudi Arabia, OPEC's most powerful member, slashed its own production by an average of 500,000 additional barrels a day, according to the International Energy Agency.

Analysts at Morgan Stanley estimate that in 2020 1.8m additional barrels a day will be pumped in countries outside the OPEC alliance, including Brazil, Guyana and Norway. In the run-up to OPEC's meeting in Vienna in December, it was doubtful whether the group would sustain the cuts agreed to a year earlier, let alone go further.

In the end Saudi Arabia's new oil minister, Abdulaziz bin Salman, wrangled an impressive deal. The alliance's 1.2m-barrel cut will extend to 1.7m in January. Additional reductions led by Saudi Arabia will push the total to 2.1m barrels a day. The broader group's collective output will be 1.3% below its level in November. It remains to be seen, however, if the cuts will materialise—or last. The new agreement covers only the first quarter of 2020. It also allows Russia to increase its output of condensate, a type of light crude.

Saudi Arabia remains keen to support prices, both for its budget and to make Aramco's listing a success. The firm's soaring valuation in early trading may not be sustainable. Many big global investors were repelled by its low dividend yield, security risks and state control. But local retail investors piled in, attracted partly by the sweetener of an extra free share for every ten they buy and hold for six months. If Saudi Arabia's allies fail to stick to their promised cuts, the kingdom will have a choice: slash its own production further or let prices fall. Neither is appealing. ■

Trade truce

The ceasefire in the trade war between America and China is fragile

New American tariffs have been cancelled in a "phase one" trade deal

Print | Finance and economics Dec 18th 2019

AMERICAN TRADE deals typically stretch to thousands of pages. The new "phase one" trade deal between America and China takes up only 86. Wang Shouwen, the Chinese deputy representative of international trade negotiations, described a text with nine chapters, including ones on intellectual property, technology transfer, financial services and dispute settlement. Robert Lighthizer, the United States Trade Representative (USTR) gave journalists a glimpse of it on December 13th, hours after it had been agreed. It is due to be signed by both sides in the new year.

Mr Lighthizer said that American tariffs on around $120bn of Chinese imports would be reduced from 15% to 7.5%. Fresh tariffs due on December 15th were cancelled. In return, he said, China would ramp up imports of American agricultural products, manufactured goods, energy products and services by $200bn over two years. Negotiators had set targets for various categories of commodities, so that agricultural purchases would rise from a baseline of $24bn in 2017 to at least $40bn in 2020 and 2021. The exact figures would be secret to avoid influencing markets.

These arrangements are sure to attract criticism. It is hard to see how China will meet its targets while sticking to the World Trade Organisation's principle of non-discrimination. Joe Glauber of the International Food Policy Research Institute, formerly chief economist of America's Department of Agriculture, warns that other countries, in particular Australia, Brazil and Canada, may have objections. He also questions the secrecy regarding the targets, asking "how else would producers get signals on what to plant?"

China, for its part, does not like the idea of becoming so reliant on America for imports of commodities such as soyabeans. It had long insisted that it was unrealistic for President Donald Trump to demand that it double its purchases of agricultural products from America. Intriguingly, after the new deal was announced it refrained from mentioning any numerical targets. Whether that is because it is embarrassed about having been forced into such a concession, or because the purchase agreements are not as solid as American officials suggest, will become clear only when the text is eventually published.

The Chinese do, however, seem to have made some welcome promises. Mr Lighthizer boasted of commitments on intellectual property similar to, albeit narrower than, those in the USMCA, a recently agreed trade deal between America, Mexico and Canada. He also said the Chinese authorities had agreed not to ask multinationals to hand over technology as part of the process of securing a licence to do business—an issue central to America's first tariff action in the trade war. Jake Parker of the US-China Business Council, a lobby group for American companies operating in China, notes that such tech transfer was the biggest concern for many of his group's members.

The Chinese, for their part, insisted that their promises were in line with their broader economic strategy of opening up, and would improve the business environment. Indeed, cynics will note that many of the reforms being chalked up to the deal had already started, raising questions about whether the nearly two-year-long trade battle has made much difference.

Until the deal is signed, the threat of renewed trade hostilities remains. And even then, the enforcement rules will cause anxiety. Mr Lighthizer, hardly an independent arbiter, will have the final say over whether China has broken its commitments. He will be able to consider anonymous complaints by American companies. This fixes a real problem—fear of retaliation that leads executives to hold their tongues. But it also risks the Chinese feeling that they are being accused of misdeeds they can neither verify nor easily fix.

Both sides said that the success of the first phase of talks would determine success in the second, which would presumably unlock further tariff cuts. Mr Lighthizer spoke of climbing a mountain a bit at a time. But the summit is still distant. ■

By the numbers

How US-China trade has changed

A year of disruption in charts

Print | Finance and economics Dec 18th 2019

AFTER AN apparent detente between America and China in late 2018, trade relations soured again at the start of 2019. Over the course of the year America ratcheted up tariffs, and its bilateral trade deficit with China fell. But market forces are powerful, and trade finds a way. America's bilateral deficits with several other countries, including Mexico, rose. Meanwhile Chinese exporters found new homes for their goods, including Vietnam and the Philippines. Next year is likely to see trade patterns further disrupted, as Chinese policymakers aim for a Trump-pleasing increase in imports from America.

Free exchange

Despite the Fed's efforts, the repo market risks more turbulence

A challenge awaits the central bank on December 31st

Print | Finance and economics Dec 18th 2019

FROM ONE perspective, the Federal Reserve is expecting a quiet 2020. Of the 17 rate-setters at America's central bank, 13 expect that it will not change interest rates at all during the coming year. But monetary-policy inaction does not mean that central bankers will enjoy a relaxing festive season. In another area for which they are responsible, there is trouble looming. The so-called repo market, through which financial firms lend each other more than $1trn every day, could cause the Fed a headache on December 31st—and a hangover in the new year.

During 2019, as the Fed partially unwound the quantitative-easing (QE) programme under which it had bought Treasury bonds to stimulate the economy, the supply of cash reserves to the banking system dropped (see chart). Meanwhile, a large fiscal deficit—the result of America's tax cuts and spending increases in recent years—prompted more Treasury issuance. Because buying Treasuries means handing over money to the government, demand for cash reserves rose. The repo market faced a supply squeeze and a demand surge at the same time.

At first banks, of both the investment and the commercial variety, brought things into balance. According to a recent study by the Bank for International Settlements (BIS), a network of central banks, although they had hitherto been net borrowers from the repo market, as it tightened they became net lenders to it, easing the strain. But in September banks too found themselves short of cash when companies' quarterly tax payments fell due and past Treasury purchases had to be settled. Both factors drained cash from the banking system and channelled it into the government's coffers. The repo rate, that is, the interest rate charged overnight in the repo market, jumped above 10%.

Since then the Fed has been firefighting. At first it offered to lend $75bn-worth of cash in repo markets overnight, every night—an offer that was lapped up. Then it began lending for periods of up to one month and increasing its limits on overnight operations to at least $120bn. Then it sought to replace these temporary fixes with an enduring solution. It began to increase its balance-sheet again, thereby permanently raising the volume of cash reserves in the banking system. It has done this by buying $60bn-worth of short-dated Treasuries per month. (It argues this operation is not another round of QE, which mostly involved buying long-dated Treasuries.)

This week the new regime passed its first test. December 16th saw a repeat of the factors that had driven the repo rate higher in September. Payments for Treasuries and quarterly taxes were once again due, but the day passed without drama. The repo rate rose just 0.08 percentage points above recent levels, suggesting that the Fed's efforts to make the market more resilient had succeeded.

But at the end of 2019 a bigger hurdle looms. Regulators will determine the penalty the biggest banks—those deemed "global systemically important" institutions—must pay in the form of higher capital requirements. The penalty varies in increments, starting at 1% of risk-adjusted assets and rising depending on five gauges of riskiness. Among these are banks' size and their reliance on short-term funding, which are judged throughout the year or final quarter. But the other three gauges—complexity, interconnectedness, and global activity—are measured just once annually, on New Year's Eve.

Dressing up for the occasion

That once-a-year measurement encourages big banks that are close to a regulatory boundary to take temporary measures in order to shrink activities, such as lending in repo markets, that can push up their riskiness scores. These financial gymnastics matter because big banks have an outsize effect on repo markets. According to the BIS, the lenders most likely to scale up or down their repo-market activity in response to changing demand are the four biggest banks. Their apparent reluctance to lend in September was a central reason for the spike in interest rates.

In 2018 end-of-year regulatory pressure caused the repo rate to reach 6% on December 31st. Fearing a similar episode, which could compound the more recent market stress, the Fed will offer to lend almost $500bn in repo markets over New Year's Eve. But it might not work if banks, with an eye on their risk scores, are unwilling to perform their usual role as middlemen between the Fed and market participants who want cash.

The spectre of further turmoil in the repo market is uncomfortable for the central bank. It has been trying to calm nerves. In a press conference on December 11th Jerome Powell, its chairman, acknowledged the probable upward pressure on repo rates to come, but was relatively sanguine. The Fed's goal, he said, was "not to eliminate all volatility".

Yet regulators should not introduce volatility, either. It would be relatively easy to fix the problem in future years. Measuring banks on all five regulatory factors throughout the year would remove the pressure on them to try to look their best on New Year's Eve. And varying the capital surcharge smoothly, rather than in steps, would eliminate regulatory arbitrage at the boundaries.

The big picture is that there is a common culprit behind the sudden dysfunction in September and the prospect of further turmoil at the end of the year. Since the financial crisis, regulators have created a world in which compliance is a major influence on banks' balance-sheets. That can interfere with the normal functioning of money markets and bring unintended

consequences.

The problem becomes most obvious at pinch points, such as December 31st, but is true more generally. And it is making the business of operating the financial plumbing—which was always low-margin and balance-sheet intensive—less appealing. "Big banks used to operate as the lender of second-to-last resort," says Bill Nelson of the Bank Policy Institute, an industry lobby group. "That buffer is now gone." Without it the Fed may need to get used to intervening more often. ■

Astrobiology

Bringing rocks back from Mars

A cosmic relay race

Print | Science and technology Dec 18th 2019

THE IDEA, popular in science fiction, that alien life will do bad things to life on Earth if the two come into contact, is not restricted to the activities of malevolent extraterrestrial intelligences. In "The Andromeda Strain", a novel by Michael Crichton, the baddies are mysterious and deadly (but completely unintelligent) microbes that hitch a ride to Earth on board a military satellite. They start by killing everyone in the town of Piedmont, Arizona, and then wreak havoc in a secret underground government laboratory, as scientists struggle to understand and contain them.

Move one state north, to Utah, and at least part of that fiction may, some hope, soon become true. For Utah is the planned landing place of the first samples to be collected from the surface of Mars. Optimists like to think that those samples might contain traces, even if only fossil, of life on Mars. And in case they do, the samples' ultimate destination will be a purpose-built receiving facility with level-four biosafety controls—the highest category possible.

The Mars Sample Return (MSR) mission intended to achieve all this will require three launches from Earth over the course of a decade, and five separate machines. The organisations involved—America's National Aeronautics and Space Administration, NASA, and the European Space Agency, ESA—are each responsible for specific craft in the chain of what David Parker, ESA's head of human and robotic exploration, calls "the most ambitious robotic pass-the-parcel you can think of".

Delta force

On December 11th, at a meeting of the American Geophysical Union in San Francisco, space scientists and astrobiologists outlined the details of the MSR. The project will begin with the launch, next July, of NASA's Mars 2020 mission. This will carry to the planet a successor to *Curiosity*, a rover that has been crawling productively over the Martian surface since 2012. The Mars 2020 rover, yet to be named, will land in a 45km-wide crater called Jezero, in February 2021. Its main purpose is to search for signs of ancient microbial life. Around 3.5bn years ago, Jezero contained a lake. Mars 2020 will drill for samples from the clay and carbonate minerals now exposed on the surface of what used to be a river delta flowing into this lake (visible top right in the picture).

When the rover finds something that its masters want to bring back to Earth, it will hermetically seal a few tens of grams of the material in question into a 6cm-long titanium test tube, and then drop the tube on the ground. It can deal in this way with around 30 samples as it travels to different parts of the crater. Once it has dropped a tube it will broadcast that tube's location to the Mars Reconnaissance Orbiter, a satellite already on station that is armed with a high-magnification camera. This camera will take photographs of the tube and its surroundings, so that the tube can be found at a later date. The tubes are intended to be able to survive for more than 50 years on the surface of Mars, at temperatures less than 20°C.

The next phase of the project will begin in 2028, when a "fetch rover" designed and built by ESA will be sent to Mars to find and collect the tubes. This rover will be small, nimble and ten times faster than any of its predecessors. It will also be semi-autonomous, which will permit it to spot, pick up and manoeuvre the test tubes into the interplanetary equivalent of a test-tube rack without detailed instructions from Earth.

Once the fetch rover has collected all the tubes, it will deliver the rack to a NASA-built craft called the Mars Ascent Vehicle (MAV). This rocket will have arrived from Earth, filled with fuel, in the same mission as the fetch rover. Once it has the samples, it will launch itself from the surface of Mars—the first ever rocket launch from a planet other than Earth.

Once in orbit, the MAV will throw its basketball-sized payload overboard. Waiting nearby to intercept the cargo will be yet another craft, the Earth Return Orbiter (ERO), built by ESA. This will have been launched from Earth independently of the MAV-and-fetch-rover mission. The ERO will find, ingest and seal the payload, to avoid contaminating it with any organisms that might have hitched a ride all the way from Earth. Using a gentle, solar-powered electric propulsion system, the ERO will then take the payload back to Earth over the course of the subsequent few years.

When the ERO eventually goes into orbit around Earth (which will be in 2031, at the earliest) it will release the payload. This will be packed into a special, dome-shaped Earth Return Vehicle designed to carry the samples safely through the ferocity of atmospheric re-entry to a landing in the desert of Utah—whence they will be taken to their new bio-fortified home for examination. Once examined and deemed safe, the samples will then be distributed to researchers around the world for study.

Lakeside view

It is, then, an extraordinary enterprise. But all of this complexity does raise the question of why researchers would go to so much effort to collect Mars rocks. The answer, as Michael Meyer, the scientific boss of NASA's Mars Exploration Programme, told the conference, is that although, when you are on another planet, you have to hand all the rocks that you could ever want, you are also stuck with the handful of instruments that you took with you to look at them. Using sophisticated X-ray scanners or grinding samples up and feeding them through a chemistry set is not an option.

It is true that Martian rocks are already available for study, in the form of 200 or so meteorites that have arrived on Earth after having been blasted from the Martian surface by asteroid impacts. However, though these are geologically valuable they have little to offer about any putative Martian biology because they have spent millions of years travelling through the harsh conditions of space, being bombarded by radiation that will probably have destroyed any complex molecules within them that were made by living things.

A sample-return mission will not be cheap. Researchers from NASA and ESA, who have established a working group to harmonise technical efforts for the various stages of the project, estimate it will cost $7bn to complete. ESA already has approval for some of its parts. When ministers from its 22 member countries met in November to discuss the agency's next three-year budget, they agreed to make €450m ($500m) available to pay for the project's early stages. For its part, NASA expects to hear about funding for MSR in February 2020, as part of next year's federal budget.

NASA needs to confirm its role in the project as soon as possible if the planned timetable is to be met. If it is begun and not ended, though—perhaps because the money runs out halfway through—participants will have the comfort that the bottled-up samples are ready and waiting for collection whenever it is that politicians choose to loosen the appropriate purse strings. ■

A new idea for diagnosis

A system based on AI will scan the retina for signs of Alzheimer's

And, after that, of stroke susceptibility and heart disease

Print | Science and technology Dec 18th 2019

THE DIFFERENT parts of a health-care system have different focuses. A hospital's dementia unit keeps records of patients' mental abilities. The stroke unit monitors blood flow in the brain. The cardiac unit is interested in that same flow, but through and from the heart. Each agglomeration of equipment and data is effective in its own domain, but for the most part has little relevance to other bits of the body and the conditions that plague them. Thus, like the proverbial blind men feeling an elephant, modern health care offers many fragmented pictures of a patient, but rarely a useful cohesive one.

On top of all this, the instruments that doctors use to monitor health are often expensive, as is the training required to wield them. That combined cost is too high for the medical system to scan regularly, for early signs of illness, all patients at risk of dementia, heart disease or a stroke. Rather, doctors work to manage symptoms after a disease has obviously taken hold.

An unusual research project called AlzEye, run from Moorfields Eye Hospital in London, in collaboration with University College, London (UCL), may change this. It is attempting to use the eye as a window through which to detect signals about the health of other organs. The doctors in charge of it, Siegfried Wagner and Pearse Keane, are linking Moorfields' database of eye scans, which offer a detailed picture of the health of the retina, with information about other aspects of its patients' health garnered from other hospitals around England. This will allow them to look for telltales of disease in the eye scans.

The data set includes, whether they know it or not, every one of the 300,000 patients who visited Moorfields between 2008 and 2018 and was over the age of 40—though names and other easily identifiable information are not preserved. The idea is to examine changes to people's eyes within that ten-year period, and correlate these with, say, the emergence of Alzheimer's disease in the same patient. Building such a data set while respecting privacy and confidentiality has been a challenge. It took the doctors two and a half years to go through a series of ethics-committee approvals at Moorfields, UCL and NHS Digital, the body which handles agglomerated data from English hospitals. In order to create the database without the consent of the patients involved they invoked a special legal provision known as Section 251 assent, which comes with its own review process and, in essence, empowers senior government health officials to give consent on behalf of patients from whom it would be impractical or impossible to acquire such individually. The data sets were linked together on November 1st, and the process of correlation is now under way.

The Moorfields data set has a lot of linked cases to work with—far more than any similar project. For instance, the UK Biobank, one of the world's leading collections of medical data about individual people, contains 631 cases of a "major cardiac adverse event". The Moorfields data contain about 12,000 such. The Biobank has data on about 1,500 stroke patients. Moorfields has 11,900. For the disease on which the Moorfields project will focus to start with, dementia, the data set holds 15,100 cases. The only comparable study had 86.

Drs Wagner and Keane are searching for patterns in the eye that betray the emergence of disease elsewhere in the body, and are focusing first, as the name AlzEye suggests, on Alzheimer's disease. They will seek such patterns with the help of machine-learning algorithms that can crunch through imagery far faster than any human being, and which can spot far tinier variations. (The team has collaborated with DeepMind, a British artificial-intelligence firm co-founded by Mustafa Suleyman, who sits on *The Economist*'s board.) They may, it should be remembered, never find such patterns. Although there is circumstantial evidence that the back of the eye does change as its owner develops Alzheimer's, it may be that the changes are too subtle to be detected reliably enough for diagnosis. If such patterns could be recognised reliably, though, the potential impact would be huge. Even in rich countries, between 50% and 80% of Alzheimer's cases go undiagnosed. Moreover, even if the technique does not work for Alzheimer's, it might work for something else. Dr Wagner and Dr Keane therefore plan further searches for patterns related to strokes and heart disease. Even one relevant pattern would constitute a remarkable diagnostic leap forward.

Seeing is believing

If it does work, the technique the two researchers are proposing will be cheap to implement. An indication of how cheap is the project's total budget of just £15,000 (about $19,000). Equipment to perform an eye scan is becoming ubiquitous. Specsavers, which runs a chain of high-street opticians, now routinely offers the same sort of scans as Moorfields' in half of its 800 branches. Costco, a bulk retailer, offers scans in Britain for £24.99 a pop. An Israeli company called Notal Vision is building an eye-scanning device that is small enough to operate at home. The equipment and algorithms required to run machine learning on an eye scan are available to anyone, through cloud-computing services like Google and Amazon. Dr Keane once joked that he would like to see eye-scanning widgets become so cheap that they could be bundled in boxes of cereal.

This project will also act as a model for linking disparate health data together in a useful way while respecting patients' rights. Other such endeavours involving information-technology firms handling health data, such as Google's work with Ascension hospitals in America, or other parts of its subsidiary DeepMind's work with England's health service, have generated controversy

because they offered no notice of their plans to patients. As well as jumping deftly through all the required legal and ethical hoops, Drs Wagner and Keane also posted notices around the hospital and on Moorfields' website, informing patients of the impending linkage. Besides explaining what was happening, these also noted the research's potential benefits. Not one person complained. ■

Climate change

The COP25 meeting on the climate yields little

It was just a cop-out

Print | Science and technology Dec 18th 2019

ANNUAL UN CLIMATE summits are never moments of unbridled optimism, but this year's, held in Madrid and dubbed COP25, was particularly dispiriting. Its logo was a clock with its hands at a quarter to 12. Midnight duly passed on Friday December 13th—supposedly the summit's last day, and then again on Saturday. Only on Sunday did delegates agree to weak and watered-down commitments to enact previously promised cuts in emissions of greenhouse gases. And they deferred until next year a decision on regulating a new international carbon market.

In 2015, in Paris, nearly 200 countries promised to stop global warming before average temperatures rose by more than 1.5-2°C above pre-industrial levels. Most climate scientists, though, admit privately that there is little hope of this. A coalition of governments including the European Union therefore came to Madrid demanding a strongly worded final text that would urge all countries to promise in 2020 to cut emissions further and faster than agreed so far. That text failed to materialise.

In fact, the real effort on this front came from Brussels, where the EU's leaders, after some wrangling, committed themselves on December 12th to reducing emissions to "net zero" by 2050. This means any release of greenhouse gases thereafter will be balanced by the capture of such gases already in the atmosphere by, say, extra afforestation. The European Commission's presidency has published a comprehensive and ambitious, if sometimes vague, proposal for measures that would achieve this goal. As part of it, an EU climate law enshrining the 2050 target will be put forward in the spring of 2020.

Weak and watered-down commitments to enact cuts in emissions of greenhouse gases are nothing new. What COP25 is really likely to be remembered for, though, is a failure to deal with carbon markets. Plans for such markets go back to a scheme created by the Kyoto protocol, a treaty signed in 1992. An arcane technical clause in the Paris agreement then offered a framework for linking existing national or regional markets and thus creating a new global one that would be administered by the UN and offer access to countries that do not have their own. Delegates in Madrid drew up guidelines for environmentally sound trading principles for this putative market. What they did not make clear was how all this would connect with what Kyoto had already achieved.

Credit where it's due

The Kyoto version of carbon markets, the Clean Development Mechanism (CDM), let rich countries buy carbon credits from poor countries for carbon-capturing projects that offset their emissions at home. Thousands of CDM projects were duly registered, but unknown numbers of credits were left unclaimed after their value crashed in 2012, because demand dried up as a result of rule changes within the EU.

Some of the main participants in the CDM, chiefly Brazil, want these credits transferred to the Paris scheme. But doing so would flood that scheme with "hot air": credits that no longer correspond to real, future reductions in emissions.

Done well, international carbon markets could accelerate emissions cuts by drawing in private funds and helping money to flow faster to the cheapest opportunities. One analysis, by the Environmental Defence Fund, an advocacy group, found that they might, in theory, reduce the cost of meeting climate targets by between 59% and 79%, assuming most countries participated. If financial gains were reinvested in further climate action, cumulative emissions cuts between 2020 and 2035 might be double those currently on the table in national pledges under the Paris agreement.

All this leaves a lot to do in 2020. Within the UN, technical work on carbon markets will resume in the new year, leading up to next year's meeting, in Glasgow. Climate is also on the agenda at an EU-China summit scheduled for September. During his presidency, Barack Obama was able to work with China's president, Xi Jinping, and break the stalemate that had previously existed between the world's two largest emitters. With America set to pull out of the Paris agreement in November, perhaps the European Union can step into the gap. ■

Immigration on a plate
A bao in every steamer

A bao in every steamer

The apotheosis of Chinese cuisine in America

Its upward trajectory reflects that of the Chinese-American community

Print | Books and arts Dec 21st 2019

FOR SEVERAL years, beginning in the mid-2000s, devotees of Chinese food on America's east coast obsessed over a mystery: Where was Peter Chang? A prodigiously talented—and peripatetic—chef, Mr Chang bounced around eateries in the south-east. One day diners at a strip-mall restaurant in suburban Richmond or Atlanta might be eating standard egg rolls and orange chicken; the next, their table would be graced by exquisite pieces of aubergine the size of an index finger, greaselessly fried and dusted with cumin, dried chillies and Sichuan peppercorns. Or by a soup made of pickled mustard greens and fresh sea bass, in its way as hauntingly perfect and austere as a Bach cello suite. A few months later, Mr Chang would move on.

He now seems to have settled down, running a string of restaurants bearing his name between Rockville, Maryland, and Virginia Beach. His latest—Q by Peter Chang—in the smart Washington suburb of Bethesda, may be his finest. The space is vast and quasi-industrial, with brushed concrete floors, massive pillars and not a winking dragon in sight. Order a scallion pancake, and what appears is not the typical greasy disc but an airy, volleyball-sized dough sphere. Jade shrimp with crispy rice comes under what looks like an upturned wooden bowl (perhaps, you think, for the shells). On inspection the bowl turns out to be the rice. Thumping through it with a spoon reveals perfectly cooked shrimp floating in shamrock-green sauce.

A tab for two at Q can easily top three figures—several times the outlay on an average Chinese meal. Nor is Mr Chang's the only such restaurant in the area: like many big American cities, Washington has seen a rise in high-end Chinese cuisine. That is good news, and not just for well-heeled gourmands who can tell *shuijiao* from *shuizhu*. The culinary trend is underpinned by two benign social ones. Chinese-Americans are becoming wealthier and more self-confident; and customers are shedding old stereotypes about Chinese food. To put it another way: sometimes a dumpling is more than just a dumpling.

The comfort of strangers

Chinese restaurants began to open in America in the mid-19th century, clustering on the west coast where the first immigrants landed. They mostly served an Americanised version of Cantonese cuisine—chop suey, egg *fu yung* and the like. In that century and much of the 20th, the immigrants largely came from China's south-east, mainly Guangdong province.

After the immigration reforms of 1965 removed ethnic quotas that limited non-European inflows, Chinese migrants from other regions started to arrive. Restaurants began calling their food "Hunan" and "Sichuan", and though it rarely bore much resemblance to what was actually eaten in those regions, it was more diverse and boldly spiced than the sweet, fried stuff that defined the earliest Chinese menus. By the 1990s adventurous diners in cities with sizeable Chinese populations could choose from an array of regional cuisines. A particular favourite was Sichuan food, with its addictively numbing fire (the Sichuan peppercorn has a slightly anaesthetising, tongue-buzzing effect).

Yet over the decades, as Chinese food became ubiquitous, it also—beyond the niche world of connoisseurs—came to be standardised. There are almost three times as many Chinese restaurants in America (41,000) as McDonald's. Virtually every small town has one and, generally, the menus are consistent: pork dumplings (steamed or fried); the same two soups (hot and sour, wonton); stir-fries listed by main ingredient, with a pepper icon or star indicating a meagre trace of chilli-flakes. Dishes over $10 are grouped under "chef's specials". There are modest variations: in Boston, takeaways often come with bread and feature a dark, molasses-sweetened sauce; a Chinese-Latino creole cuisine developed in upper Manhattan. But mostly you can, as at McDonald's, order the same thing in Minneapolis as in Fort Lauderdale.

Until recently, the prices varied as little as the menus—and they were low. Eddie Huang, a Taiwanese-American restaurateur turned author and presenter, recounts how his newly arrived father kept his prices down because "immigrants can't sell anything full-price in America."

That, in truth, was a consoling simplification. Americans have traditionally been willing to pay through the nose at French or Italian joints (where, in fact, Latinos often do most of the cooking). And every city has its pricey sushi bars and exorbitant tapas restaurants (tapas, as one joke goes, is Spanish for "$96 and still hungry").

But Mr Huang is right that Americans have long expected Chinese food to be cheap and filling. One step up from the urban takeaway, with its fluorescent lighting and chipped formica counter, is the strip-mall bistro with its imposing red doors and fake lions standing guard—sufficiently exotic to be special, but still affordable enough for a family to visit once a week when nobody feels like cooking.

American dreams

Even the superior outlets were cheap for what they served (and often still are). Consider the hand-ripped noodles with lamb at Xi'an Famous Foods in lower Manhattan. A tangle of long noodles, each about the width of Elvis Costello's ties in the late 1970s, is tossed with curls of braised lamb and a complex, incendiary sauce laced with cumin and chillies—all for just over $10, a fraction of the price of comparably accomplished dishes at smart restaurants nearby. True, Xi'an Famous Foods has no waiters (diners carry their plates on plastic trays to bench seating). But its noodles are handmade, and the lamb dish may be the single best thing to eat in New York at any price.

But now things are changing. Mr Huang sells deliciously pillowy stuffed buns in New York and Los Angeles for $5.50 each—or, as he puts it, "full fucking price"—and encourages other immigrants not to undervalue their work. Restaurants in Q's bracket are cropping up not just in America's Chinatowns but in the suburbs, where Chinese immigrants and their families have settled, following the classic strivers' path. The median income of Chinese-Americans' households is nearly 30% higher than the average. They are more than twice as likely as other Americans to have an advanced degree.

Meanwhile, although racism persists, the pervasive discrimination of earlier ages has waned. Witness the presidential campaign of Andrew Yang, in which his ethnicity has scarcely been mentioned. Since the Chinese-American population is six times as big as 40 years ago, Americans overall are much more familiar with Chinese people and their cooking. All of which means that, in your correspondent's fairly extensive experience, the new fancy breed of Chinese restaurants draws a heartening mix of Chinese and non-Chinese diners.

Not everyone is enticed. The same cult of authenticity which decrees that good tacos only come from trucks posits that the best Chinese food is found in humble settings. That is as inaccurate as the snobbery that Mr Huang decries. Chinese chefs are as ambitious as any others; a bowl of noodle soup no more stands for all of Chinese cuisine than a slice of pizza does for Italian.

In any case, authenticity is a slippery commodity. Recipes constantly evolve as people move and mingle. The chillies now considered essential to Sichuan dishes were actually brought to China by Iberian traders in the late 16th century. Hot dogs were originally German, pizza Neapolitan, bagels Polish—but now they are all American, and like America, infinitely varied.

The goat ribs at Duck, Duck Goat, in Chicago's trendy meatpacking district, are more Chinese-ish than Chinese. So is the place itself—headed by a non-Chinese chef and kitschily decorated with paper lanterns and bright red walls. The ribs come as a mesh of burnished meat stilettos with a wonderful chew, the sweetness of the glaze giving way to the goat's irresistible gaminess. They spark fights over who gets the last one. They are as inauthentic, and as imaginative and lovingly created, as Mr Chang's scallion dough sphere—and as delicious, which in the end, is what counts. ■

Sword in the snow

A beloved Japanese detective at last appears in English

Who was the masked, three-fingered man—and what was a sickle doing in the camphor tree?

Print | Books and arts Dec 18th 2019

The Honjin Murders. By Seishi Yokomizo. Translated by Louise Heal Kawai.*Pushkin Vertigo; 192 pages; $14.95 and £8.99.*

SEISHI YOKOMIZO was one of Japan's most popular and prolific mystery writers. His first novel appeared in 1935, but it was a tale he published 11 years later that made his reputation. "The Honjin Murders" introduced Kosuke Kindaichi, an amateur sleuth, and launched a bestselling series of 77 titles, many of which were adapted for stage or television. Hailed as a classic of its genre in Japan, it has only now been translated into English (by Louise Heal Kawai).

The setting is the grand residence of the wealthy and illustrious Ichiyanagi family. It is November 1937 and in two days Kenzo Ichiyanagi, the eldest son and heir, will marry Katsuko Kubo. Kenzo's family are united in their objection to his choice of bride: Katsuko may have her own fortune and career, but as the daughter of a tenant farmer, her lineage is wrong.

The ceremony goes ahead, but that night the newly married couple are found stabbed to death, "soaked in the crimson of their own blood". The police are stumped: the room is sealed; a samurai sword stands upright in the snow outside; footprints lead in but not out. Eventually Kindaichi is summoned to solve the puzzle—but not before tragedy strikes again.

An aficionado of Western detective novels, Yokomizo offers a fresh spin on familiar ingredients. The locked-room mystery—not just a whodunnit but a how-done-it—pays homage to past masters such as John Dickson Carr and Gaston Leroux. The rural setting and denouement bring to mind Agatha Christie. But the detective at its centre is a singular creation: scruffy, with "bird's-nest hair", yet possessing brilliant powers of observation, deduction and insight into human behaviour.

The killer's meticulous planning and the author's fiendish plot fulfil one of Raymond Chandler's "ten commandments" for the detective novel: "It must baffle a reasonably intelligent reader." Those readers will delight in the blind turns, red herrings and dubious alibis, as they sift the evidence with Kindaichi. Who was the masked, three-fingered man seen in the vicinity? What was a sickle doing in a nearby camphor tree? And is there any truth to the rumour of a family curse?

Yokomizo (who died in 1981) saves his biggest surprise for the end. If the whole series is as ingenious and compelling, this translation should be the first of many. ■

Charting the news
The Trump bump

The Trump bump

America's president dominated readers' attention in 2019

But the news story that generated the most interest was the fire at Notre Dame

Print | Graphic detail Dec 21st 2019

IF THERE IS no such thing as bad publicity, then 2019 was a roaring success for Donald Trump. America's president has faced withering criticism, from Republicans enraged by his withdrawal of troops from Syria as well as Democrats seeking to impeach him. But even if much of the attention he receives is negative, Mr Trump has a vicelike grip on news consumers. According to Chartbeat, a company that measures audiences for online journalism, readers of the sites in its database spent 112m hours in 2019 devouring stories that mentioned Mr Trump—the most of any keyword.

Chartbeat monitors a wide swathe of coverage. In an annual summary of readership calculated for *The Economist*, it compiled data on 4m articles from 5,000 sites across 34 topics. Half of the publishers it tracks are in English-speaking countries, and a quarter in continental Europe.

Although no subject rivals Mr Trump for sustained interest, readership about him on specific days often lagged behind breaking news. The event that most riveted audiences was the fire that gutted Notre Dame cathedral in Paris on April 15th, with 1m reading hours in its immediate aftermath. The journalistic cliché that "if it bleeds, it leads" held up well in 2019, as the top ten events also included mass murders in New Zealand on March 15th and America on August 3rd. But the mostly Western readers tracked by Chartbeat paid less attention to long-running violence in poor parts of the world. Afghanistan got 2m hours in 2019, as much as Mr Trump generates in a week.

Readers did devote time to less grim topics as well. Of the sporting events in our selection, England's victory over New Zealand in the semi-final of the men's Rugby World Cup generated the most interest. In football Liverpool's miraculous comeback against Barcelona in the Champions League semi-final also glued the public to their screens. The dull finals for both events drew less attention, however, showing that the importance of a match matters less than how surprising its result is.

Another kind of underdog helped drum up attention to climate change. In September Greta Thunberg, a 16-year-old Swedish activist, gave an impassioned speech to the UN that drew 400,000 hours of reading time. Meanwhile, climate-related wildfires in Australia, Brazil and California received 10m hours—a respectable haul, but no match for Mr Trump's fire and fury. ■

Sources: Chartbeat; *The Economist*

Stephen Cleobury
In the bleak midwinter

In the bleak midwinter

Obituary: Stephen Cleobury died on November 22nd

The director of music at King's College, Cambridge, famous for the service of Nine Lessons and Carols, was 70

Print | Obituary Dec 18th 2019

SNOW SELDOM falls in England at Christmas time. Yet cards habitually show woods, cottages and robins sunk deep in it, with more star-flakes descending. For Christmas Eve—once the wrapping is done, the turkey timetable worked out, the door locked for the late-night journey to church—brings with it an enveloping quiet that seems closest to the stillness of snow.

Traditionally this quiet is broken by carolling. It may be the local waits, clustered under a streetlamp with gloves and torches, but more often over the past few decades it has meant the broadcast service of Nine Lessons and Carols by the choir of King's College, Cambridge. Seamlessly, in their red and white robes in the candlelit choir-stalls, the choristers fill listeners' heads not only with their favourite Victorian hymns—"Once in royal David's city", "The first nowell", "Hark! The herald", all stirring tears with memories of Christmases past—but also with the rhythmic, driving freshness of true carols, the dancing medieval folk tunes rescued from the hills and lanes of Derbyshire or Sussex by Cecil Sharp and Ralph Vaughan Williams in the early 20th century, just at the point of disappearing.

When Stephen Cleobury took up this precious task in 1982, as the new director of music at King's, he was terrified. (Being given to understatement, that was not a word he used lightly.) His training was more than adequate: chorister at Worcester Cathedral, organ scholar at St John's, Cambridge, later a fearless conductor, with the Philharmonic and the Britten Sinfonia, of new works for orchestra. But the choir's reputation awed him. The carol service in particular, always beginning with "Once in royal" from an unaccompanied treble, always sung by men and boys in keeping with the founding charter of 1441—was in a sense a piece of public property. He could not radically reform it, any more than he could alter the glorious fan vault of King's chapel to achieve what he had to work hardest for, greater clarity of texture.

He had various ideas, though, to nourish new growth in it. He applied them equally to the week-by-week chapel services and to other jobs he held, such as chief conductor of the BBC Singers. Those changes began with teaching. His own music lessons as a chorister had been hit and miss: theory at desks set up in the cathedral nave, huddling round an ancient stove, and harmony and counterpoint in the deputy organist's house over ten-shillings' worth of cake. But four years spent teaching O- and A-level music at Northampton Grammar gave him insights into dealing with boys—how to keep them up to the mark, affirm that they were good, without giving them any idea that they had arrived—that proved invaluable. Though teaching was not in his contract at King's, he instructed the first-year students in harmony and counterpoint to lay down the basics. He saw to it, too, that each chorister had singing lessons. Meanwhile, to be equally strict or even stricter with himself, he went on learning to play the organ better.

Under him the carol service became more ecumenical and open. It had more Latin, like the weekly services, which now featured Latin masses and canticles. His Anglican suspicion of the Roman church had been soothed, when he was really quite young, by singing an especially wonderful melody in Verdi's "Te Deum", and later by the beauty, which he thought inexpressible, of Gregorian chant. In 1979 he became master of music at Westminster Cathedral, falling deeply in love with the rhythms of the Catholic liturgy. The singing of Latin brought purer vowels into the King's sound, which was pleasing. So too did singing carols in other languages, including Latvian and Church Slavonic. This tested the singers, and made them more expert musicians. It also reminded them—if they needed reminding, with worldwide tours, frequent recording sessions and televised broadcasts of the carol service all over America—that their singing now spanned the globe.

Like his immediate predecessors, he wrote new descants to freshen up the well-known hymns. His most daring innovation, though, was to commission a new carol every year. A lot of new church music was not of very high quality, and he wished to show that fine composers were still willing to write for liturgical settings. Lennox Berkeley, Arvo Pärt and John Tavener all wrote one, and he regretted not asking John Adams, since no one said no. These new pieces were often taxing: a high B for solo treble in Thomas Adès's "The Fayrfax Carol", hectic stops and starts in Judith Weir's "Illuminare, Jerusalem", stamping in Harrison Birtwistle's "The Gleam". Quite hostile letters came into the director of music's office. One suggested that he should be locked up.

Countering those who objected was not too hard, though. The new carols were actually modern versions of the old: the voices of people of the time dancing, celebrating or reflecting, sometimes stridently or clumsily, but with raw devotion. His choristers could sing them with a freedom, edge and individuality they could not show in the weightier hymns or in the anthems. In 1918 Eric Milner-White, who had founded the service, wrote of his wish to bring in "colour, warmth and delight". These qualities were definitely now back at King's. They fitted the director's conviction that choral singing was the best possible use

of body, brain and heart, the whole self. Everyone should get out there and sing.

At the same time, he made sure the choir did not lose its otherworldly sound. He treasured the thought that anyone who heard it might find peace and consolation there. For behind music, especially the music of Bach, lay something wondrous and beautiful that could be touched. Over the years he felt increasingly uncertain what to call it. But he found himself getting keener on the idea of the Holy Spirit, something around in the air and in the silences between the notes, as the choir sang.

Economic data, commodities and markets

Print | Economic Indicators Dec 18th 2019