The Economist

Naval gazing—Russia eyeballs Ukraine

Edit genes, but not like this

Technology Quarterly: Zero carbon

Our books of the year

DECEMBER 1ST – 7TH 2018

Chip wars

America, China and silicon supremacy

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Politics this week

Print edition | The world this week Dec 1st 2018

Ukraine imposed martial law for 30 days after **Russia** fired on and seized three of its vessels near the Sea of Azov. Since grabbing Crimea, a big chunk of Ukrainian territory, Russia has been throttling Ukrainian shipping through a strait it now controls. A new Russian bridge over the strait is, by an amazing coincidence, too low for big ships to sail under. See article .

The *gilets jaunes* (yellow jackets), motorists protesting against higher fuel taxes, blocked more **French roads**. Some called for President Emmanuel Macron to resign. See article .

Britain's Treasury estimated that GDP will be 3.9% smaller in 15 years' time than it would otherwise have been if the country leaves the European Union under the deal recently agreed with EU leaders. Under a no-deal **Brexit**, it would be 9.3% smaller. Theresa May, the prime minister, began the hard slog of trying to whip up support for her deal ahead of a crucial vote in Parliament on December 11th. She said there was no plan B. See article .

We've arrived

American border guards fired tear gas at hundreds of **migrants** who stormed a fence in the Mexican town of Tijuana. America briefly shut the busy crossing. The migrants are part of a caravan of some 8,000 Hondurans who walked through Mexico in the hope of entering America. Donald Trump says they should remain in Mexico while asylum applications are processed.

An American court charged Juan Antonio Hernández, the brother of **Honduras's** president, Juan Orlando Hernández, with smuggling cocaine into America. He denies it. President Hernández said that "no one is above the law."

The rate of deforestation in the **Brazilian Amazon** rose by 13.7% in the year to July 2018, to its fastest pace since 2008. Some 7,900 square kilometres (3,000 square miles) was cleared, mainly by loggers. That is still 72% less than the deforestation that took place in 2004. Brazil's president-elect, Jair Bolsonaro, wants to weaken protection of the rainforest.

America's Treasury Department imposed sanctions on Rosario Murillo, who is both **Nicaragua's** vice-president and the wife of its left-wing president, Daniel Ortega. She has influence over the ruling party's youth wing and the police, which have abused human rights, the Treasury alleges. The sanctions bar Americans from dealing with Ms Murillo.

A familiar face

After their victory in the mid-terms, House Democrats chose **Nancy Pelosi** for Speaker, a job she held between 2007 and 2011. A campaign by some Democrats to deny the 78-year-old the position and inject new blood into the party's leadership fizzled, but could reignite again before the whole House votes in January. See article .

Cindy Hyde-Smith retained a Senate seat in **Mississippi** for the Republicans, beating Mike Espy, a Democrat, in a run-off by 54% to 46%. That means the new Senate that convenes in January will have 53 Republicans, a net gain of two seats, and 47 Democrats. See article .

Robert Mueller's investigation into Russian meddling in American elections concluded that **Paul Manafort**, a senior member of Donald Trump's campaign team, had breached the terms of his plea-bargain deal by subsequently lying to prosecutors, and asked the courts to dismiss the deal.

Returning to the mean

Taiwan's ruling Democratic Progressive Party was hammered in local elections, losing more than half the cities and counties it had held. The Kuomintang party (KMT), which lost power to the DPP in 2016 and is more friendly to China, benefited from a surge in support. Tsai Ing-wen, who refuses to affirm the mainland's formula that there is only "one China", resigned as the DPP's leader. She remains president, but the losses are a blow to her authority. See article .

Taiwanese voters also approved three initiatives to curb gay rights. Taiwan's constitutional court has ruled that the government must allow some form of **gay marriage**. The referendum result complicates the government's undertaking to enforce that ruling.

Three American troops were killed by a roadside bomb in **Afghanistan**. Over 28,000 Afghan security personnel have been killed since 2015.

In **Australia**, the Labor party, in opposition nationally, won an election in the state of Victoria. There was a huge swing against the Liberal party, which leads the national government and had mounted a campaign against immigrants and crime. See article .

Battlefront casualties

Soldiers in **Nigeria** released videos on social media claiming that at least 100 of their colleagues were killed in an attack on an army base by jihadists from Boko Haram. The army disputes the figures but has not released its own.

Freeman Mbowe, the head of the opposition in **Tanzania**, was arrested for jumping bail. His original charges were for joining a protest.

A fragile truce in **Syria** wasthreatened after the regime of Bashar al-Assad, and Russia, an ally, accused rebels of launching chemical weapons from their remaining stronghold in Idlib province. Russia responded to the attack, which the rebels deny, with air strikes.

Binyamin Netanyahu, **Israel's** prime minister, said he plans to visit Chad to re-establish diplomatic ties more than four decades after the majority-Muslim country cut off relations with the Jewish state. Mr Netanyahu's statement came as Idriss Déby, the president of Chad, was visiting Israel.

Muhammad bin Salman, the crown prince of **Saudi Arabia**, was met by hundreds of protesters on a visit to Tunisia. They were upset about the murder of Jamal Khashoggi, a journalist who was strangled and dismembered in a Saudi consulate in Turkey.

The **United Arab Emirates** pardoned a British PhD student it had imprisoned for life for spying. The UAE still insists that Matthew Hedges works for MI6, which he denies.

Global warnings

The White House published an assessment of the effect of **global warming** on America's economy. Floods, droughts and other climate-related ills could reduce GDP by 10% by 2100, the authors warned. Donald Trump said he didn't believe it. The UN unveiled its own report, showing that signatories to the Paris climate agreement are doing nowhere near enough to meet the target of keeping warming below 2°C relative to pre-industrial times. The World Meteorological Organisation reported that carbon dioxide in the atmosphere had reached 405 parts per million, the highest in 3m-5m years. See article .

Business this week

Print edition | The world this week Dec 1st 2018

Investors welcomed the announcement by **General Motors** that it is to shut four factories in the United States, one in Canada and two others elsewhere in order to focus on making profitable SUVs and prepare for the shift towards electric-powered and autonomous vehicles. Donald Trump wasn't happy. The loss of 14,000 jobs and closure of plants in Michigan and Ohio prompted him to threaten to end the federal subsidies that GM receives for electric cars. See article .

Curiouser and curiouser

Prosecutors in Japan continued their inquiries into **Carlos Ghosn's** alleged underreporting of his salary at Nissan. Mr Ghosn, the architect of a three-way alliance between Nissan, Renault and Mitsubishi, was stripped of the chairmanship of Mitsubishi this week, following a similar move by Nissan. Renault, which in effect controls the alliance, has retained him as chief executive and chairman, appointing a deputy to lead the company in his "temporary" absence. See article .

An expert in DNA sequencing in China claimed that he had **edited the genomes** of twin baby girls while they were embryos. Scientists working in the field of genetics roundly condemned the news. See article .

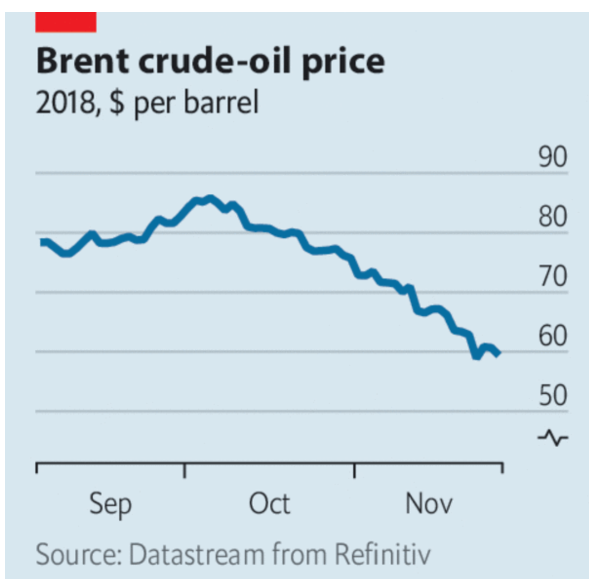
Bitcoin see-sawed, dropping at one point to its lowest level since September 2017. Underlining the speculative nature of investment in cryptocurrencies, it then rose by 6% in a day to above $4,000, its biggest leap since July. But bitcoin's overall trend is down; it has fallen by almost 40% since early September. See article .

In a big speech to Wall Street bankers, Jerome Powell, the chairman of the **Federal Reserve**, defended the central bank's policy of gradual interest-rate rises. He also dropped what investors took to be a hint that a pause may come soon, pointing out that interest rates were just below the broad range of estimates that would be neutral for the economy. That will please President Trump, who has criticised Mr Powell for his "way off base" approach. Stockmarkets perked up after the speech.

Randal Quarles, who is responsible for financial supervision at the Fed, was appointed chairman of the **Financial Stability Board**, an international body created at the height of the financial crisis to advise the G20. Mr Quarles takes over from Mark Carney, the governor of the Bank of England, and is the first American to be handed the job.

Mario Draghi said it remained highly likely that the **European Central Bank** would decide at its next meeting to end its quantitative-easing programme, despite recent disappointing growth figures in the euro zone. The central bank's president described the slowdown as "temporary". Other data point to rising inflationary pressures. The euro area's unemployment rate is at its lowest level since 2008.

The Trump administration raised the stakes in its **trade war** with China. Donald Trump reiterated his threat to raise tariffs on Chinese goods to 25% from 10% unless progress is made on trade issues at his meeting with Xi Jinping at the G20 summit in Buenos Aires. Larry Kudlow, Mr Trump's chief economic adviser, confirmed that the two sides have been negotiating ahead of the meeting, but contended that China "must do more".



The Economist

Oil prices struggled to recover after a steep sell-off pushed them to their lowest point of the year. Brent crude fell below $58 a barrel. Various factors, including a lingering glut in supplies and American pressure on Saudi Arabia to keep energy costs low, have resulted in oil prices falling by a third since early October.

Danish prosecutors brought criminal charges against **Danske Bank** over a €200bn ($230bn) money-laundering scandal that involved Russian funds flowing through one of its branches in Estonia. Investigators are still trying to establish if any senior managers at Danske should face prosecution.

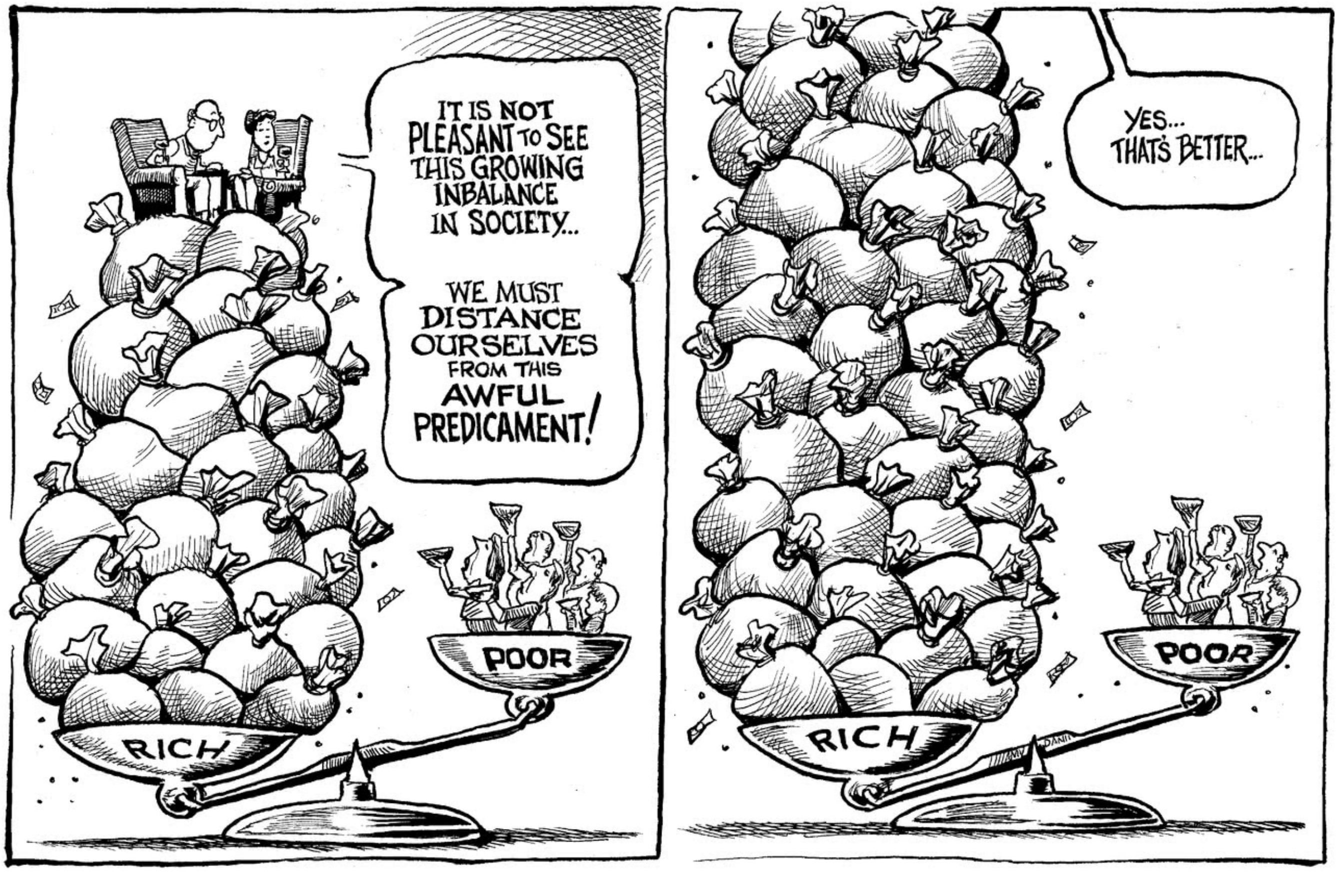
Unilever announced that Paul Polman is to step down as chief executive after ten years in the job. Mr Polman has become a cult figure among activists and NGOs for his support of virtue-driven capitalism. He has sat on the UN High-Level Panel of Eminent Persons, helped found a Dutch group working for sustainable growth and has written about hunger, among other things. His successor is Alan Jope, who runs the Anglo-Dutch conglomerate's beauty-care business.

A workers' revolution

Hundreds of **Google's** employees signed an online letter calling on the company to cancel its project to create a censored search engine for the Chinese market. The tech giant's vociferous staff, who recently staged a walkout in support of the #MeToo movement and also forced Google to cancel work for the Pentagon earlier this year, said that they "object to technologies that aid the powerful in oppressing the vulnerable, wherever they may be".

KAL's cartoon

Print edition | The world this week   Dec 1st 2018



Economist.com   Kal

Trade and technology
Chip wars

Superpowers and technology

Chip wars: China, America and silicon supremacy

America cannot afford to ignore China's semiconductor ambitions. It cannot simply tame them, either

Print edition | Leaders Dec 1st 2018

Luca D'Urbino

THE TRADE disputes President Donald Trump relishes have an old-fashioned feel. Tariffs are the principal weapons. Old-economy markets, from cars to steel, are the main battlefields. Farmers and factories preoccupy the president. And his personal chemistry with other powerful men can make or break deals. Hence the focus on the meeting between Mr Trump and Xi Jinping at this week's G20 summit, which takes place in Buenos Aires after *The Economist* has gone to press.

Yet the trade conflict that matters most between America and China is a 21st-century fight over technology. It covers everything from artificial intelligence (AI) to network equipment. The fundamental battleground is in semiconductors. The chip industry is where America's industrial leadership and China's superpower ambitions clash most directly. And whatever Messrs Trump and Xi say at the G20, this conflict will outlast them both.

That is because computer chips are the foundations of the digital economy and national security. Cars have become computers on wheels. Banks are computers that move money. Armies fight with silicon as well as steel (see article). Firms from America and its allies, such as South Korea and Taiwan, dominate the most advanced areas of the industry. China, by contrast, remains reliant on the outside world for supplies of high-end chips. It spends more on semiconductor imports than it does on oil. The list of the top 15 semiconductor firms by sales does not contain a single Chinese name.

Well before Mr Trump arrived on the scene, China made plain its intention to catch up. In 2014 the government in Beijing announced a 1trn yuan ($150bn) investment fund to improve its domestic industry. Semiconductors feature prominently in "Made in China 2025", a national development plan issued in 2015.

China's ambitions to create a cutting-edge industry worried Mr Trump's predecessor. Barack Obama blocked Intel from selling some of its whizziest chips to China in 2015, and stymied the acquisition of a German chipmaker by a Chinese firm in 2016. A White House report before he left office recommended taking action against Chinese subsidies and forced technology transfer. Other countries are alarmed, too. Taiwan and South Korea have policies to stop purchases of domestic chip firms by Chinese ones and to dam flows of intellectual property.

Although the chip battle may have pre-dated Mr Trump, his presidency has intensified it. He has made a national champion of Qualcomm, blocking a bid for it from a Singaporean firm for fear of Chinese competition. Earlier this year an export ban on selling American chips and software to ZTE, a Chinese telecoms firm in breach of sanctions, brought it to the brink of bankruptcy within days. Startled by the looming harm, and (he says) swayed by appeals from Mr Xi, Mr Trump swiftly backtracked.

Two things have changed. First, America has realised that its edge in technology gives it power over China. It has imposed export controls that affect on Fujian Jinhua, another Chinese firm accused of stealing secrets, and the White House is mulling broader bans on emerging technologies. Second, China's incentives to become self-reliant in semiconductors have rocketed. After ZTE, Mr Xi talked up core technologies. Its tech giants are on board: Alibaba, Baidu and Huawei are ploughing money into making chips. And China has showed that it can hinder American firms. Earlier this year Qualcomm abandoned a bid for NXP, a Dutch firm, after foot-dragging by Chinese regulators.

Neither country's interests are about to change. America has legitimate concerns about the national-security implications of being dependent on Chinese chips and vulnerable to Chinese hacking. China's pretensions to being a superpower will look hollow as long as America can throttle its firms at will. China is destined to try to catch up; America is determined to stay ahead.

The hard question is over the lengths to which America should go. Protectionists in the White House would doubtless like to move the semiconductor supply chain to America. Good luck with that. The industry is a hymn to globalisation. One American firm has 16,000 suppliers, over half of them abroad. China is a huge market for many firms. Qualcomm makes two-thirds of its sales there. Trying to cleave the industry into two would hurt producers and consumers in America. And it would be a bluntly antagonistic act, which would make no distinction between unfair and genuine competition.

In the long run it may be futile, too. Today America has the edge over China in designing and making high-end chips. It can undoubtedly slow its rival. But China's progress will be hard to stop. Just as Silicon Valley's rise rested on the support of the American government, so China blends state and corporate resources in pursuit of its goals. It has incentive programmes to attract engineering talent from elsewhere, notably Taiwan. Firms like Huawei have a proven ability to innovate; blocking the flow of Intel chips in 2015 only spurred China on to develop its domestic supercomputing industry.

Moreover, China's bid to become a global semiconductor powerhouse is propitiously timed. For decades the chip industry has been driven forward by Moore's law, under which the capabilities of a chip of a given size double every two years. But Moore's law is reaching its physical limits. As everyone jumps to new technologies, from quantum computing to specialised AI chips, China has a rare chance to catch up.

The right approach for America, therefore, has three strands. The first is to work with its allies in Europe and Asia to keep pushing back against unfair Chinese practices (such as forced tech transfer and intellectual-property theft) at the World Trade Organisation, and to screen out inward Chinese investments when security justifies it. The second is to foster domestic innovation. More government funding is already going into chip research; greater openness to talent is needed. And the third is to prepare for a world in which Chinese chips are more powerful and pervasive. That means, among other things, developing proper testing procedures to ensure the security of Chinese-made products; and tightening up on data-handling standards so that information is not being sprayed about so carelessly. Measures such as these will not make the headlines at the G20. But they will do more to shape the world in the years ahead.

This article appeared in the Leaders section of the print edition under the headline "Chip wars"

Rookie errors

AMLO, Mexico's president-elect, is sending worrying signals

Andrés Manuel López Obrador has bad ideas and worse plans for implementing them

Print edition | Leaders Dec 1st 2018

SINCE WINNING Mexico's presidential election in July, Andrés Manuel López Obrador, a left-wing populist, has been in power but not in office. In October AMLO, as he is known, summoned Mexicans to vote on whether to cancel a huge airport under construction for Mexico City. A small sample voted to scrap it; he promised to do so, thus preventing the expansion of links between Mexico and the outside world. His Morena party and its allies, in control of congress since September, passed a law barring any civil servant from earning more than the president, who plans to take a 60% pay cut. AMLO will be inaugurated on December 1st (see article); the omens for his six-year term already look worrying.

Voters chose AMLO out of desperation, having rejected him as president twice before. Graft is rife, the murder rate is the highest on record, more than 40% of Mexicans are poor by the government's definition and economic growth has recently been disappointing. In AMLO, a former mayor of Mexico City, many Mexicans saw a possible saviour. He fulminates against the technocratic governing class. He thriftily flies economy class, and has put the presidential jet up for sale. He vows to uplift the needy, curb crime and crush corruption. But he is going about it the wrong way.

The airport fiasco illustrates both his mindset and his methods. He has long opposed the new airport, preferring an alternative that is technically unfeasible. His *consulta*, administered by his party rather than the electoral commission, was a farce. Just 1% of the electorate took part. After AMLO said he would honour the vote by cancelling a project that is already 30% built and into which $5bn has already been ploughed, Mexico's bonds and currency plunged. That prompted the central bank to raise interest rates on November 15th. Even before donning the presidential sash, AMLO has damaged the economy.

Some of his plans for fighting corruption and crime are counterproductive; others are alarming. His cap on public salaries will drive talented people out of government and heighten the temptation to take bribes among those who stay. Worse, he wants to create a National Guard, overseen by the defence ministry, to thwart criminals. Soldiers are terrible at police work. In Mexico making them do it is also unconstitutional, as the supreme court recently reaffirmed. Undaunted, AMLO proposes to change the constitution to allow it.

Good, bad or indifferent, his ideas will not get the scrutiny they deserve. By putting many of them directly to the people, he reduces the chance that congress or any other body will check his power. AMLO arranged a second low-turnout vote on November 24th-25th, which rubber-stamped ten of his pet projects, including a costly refinery in his home state of Tabasco. He plans to put the National Guard to another vote, this one supervised by the electoral commission, alongside two other questions:

whether to create a council of businesspeople to advise him, and whether to launch prosecutions against recent presidents for corruption. The former is too trivial to vote on; the latter is the act of a demagogue. Societies that respect the rule of law do not decide by plebiscite whether to prosecute.

Not all AMLO's ideas are bad. He would legalise recreational cannabis and give apprenticeships to young people, which might reduce crime. Centralised public procurement could discourage corruption. His chief of staff and the incoming ministers of finance and foreign affairs are competent. However, a president serious about fighting villainy would give more priority to strengthening institutions, not least by securing prosecutors' independence from political influence and improving state and local police forces. Alas, AMLO seems uninterested in institution-building. Mexico has always had too few checks on the president, never mind a president with messianic tendencies. Mexicans may come to regret this.

This article appeared in the Leaders section of the print edition under the headline "AMLO's errors"

The great inaction

Why is climate change so hard to tackle?

A problem of unprecedented scope and intractability, to which current responses are unequal

Print edition | Leaders Dec 1st 2018


AFP

IT IS MORE than a quarter of a century since the leaders of the world, gathered in Rio de Janeiro in 1992, committed their countries to avoiding "dangerous anthropogenic interference in the climate system" by signing the UN convention on climate change. The case for living up to their words has only become stronger. The level of carbon dioxide in the atmosphere grows unremittingly. Average global temperatures have risen, too, to about 1°C above those of the pre-industrial era. The science that links the two is incontestable. Recent extreme-weather events, from floods in Hanoi to fires in California, were made more likely by the change that the climate has already undergone. Things will only get worse—perhaps catastrophically so.

In a sense the world is already equipped for the task at hand. Wind and solar power have, after huge subsidies, joined nuclear reactors and dams as affordable ways of generating gigawatts of electricity without burning fossil fuels. As our Technology Quarterly this week shows, parts of the energy system not easily electrified—some forms of transport, industrial processes like making steel and cement, heating offices and homes—could also be decarbonised with coming technologies. And policymakers have tools to bring about change, including carbon taxes, regulation, subsidies and, if they choose, command and control.

Yet when the parties to the convention on climate change meet again in Katowice, Poland, on December 2nd, it will be against a backdrop not just of rising temperatures but also of rising despair. The problem is obvious; the stakes are huge; solutions are within reach. So why is the response inadequate?

One reason is special interests. A formidable lobby exists to warn of the dangers of climate change. But when it counts—as, say, in Washington state's recent ballot initiative on a carbon tax—its antagonists in the fossil-fuel industry smack a chequebook more forcefully on the other side of the scales. On the right that has bred a culture which flatly rejects the evidence.

But the chief reason is that the world has no history of dealing with such a difficult problem, nor the institutions to do so. The harm done by climate change is not visited on the people, or the generations, that have the best chance of acting against it. Those who suffer most harm are and will be predominantly poor and in poor countries. The people called on to pay the costs of reducing that harm are and will be mostly much better off. The *gilets jaunes* angry at increases in French fuel taxes (see article) and the family which in 20 years will be forced from land in Mexico by drought know nothing of each other. But the protester does know that such taxes are not being raised in America or Russia.

The better off are more able to adapt to climate change than the poor, and thus have less cause to avoid change. And making the poor wealthy enough to adapt involves economic growth that is still mostly powered by fossil fuels. Although no one should be asked to forgo that growth, it has consequences.

What might produce a moment of clarity to break this impasse? One possibility is the sheer impact of climate change. Geophysical features of Earth are already being redrawn. The dry edges of the tropics are heading polewards at about 50km a decade. The line of aridity defining the American West has moved roughly 230km east since 1980. The sea ice in the Arctic is a shadow of its former self. Nobody can know whether the world will one day wake up and cut emissions to zero. Even if it does, the main problem—the stock of greenhouse gases already emitted—will remain. A crash programme to suck carbon dioxide out of the air would take vast resources and years to make a difference.

Another spur might be innovation. The world would have many fewer firms developing electric cars were it not for Elon Musk and Tesla. But without policies to spread innovation, such as a carbon tax or subsidy and regulation, inventiveness alone is insufficient. The technology that matters is the technology being used. And citizens have resisted climate-change polices.

Then there are novel forms of international action. Easier than global agreements are small, like-minded groups: I'll do cement, you do steel and then we can share the fruits. Such a "climate club" approach can shrink the free-rider problem. If big economies are willing to be generous, the number of countries prepared to cut emissions could rise quickly.

Ultimately, though, countries suffering from climate change may resort to unilateral measures to improve their own situation. The Intergovernmental Panel on Climate Change notes that reflecting sunlight back into space before it warms the Earth's surface, perhaps using particles—a form of "solar geoengineering"—is "highly likely" to limit temperature rises. Geoengineering is within the scope of a country like Belgium or Brazil. But its effects are not fully predictable, nor will they be evenly spread; some schemes could harm some places. It is no substitute for mitigation and its planned use by one country could terrify others, spreading instability. Geoengineering is worth studying, but it could leave the world an even more dangerous place.

This article appeared in the Leaders section of the print edition under the headline "The great inaction"

Unholy alliance

Carlos Ghosn's arrest shows the merits of a carmakers' merger

The Renault-Nissan-Mitsubishi alliance is tarnished for good

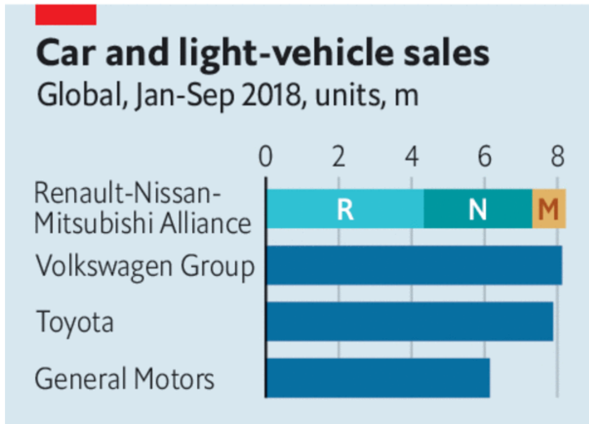
Print edition | Leaders Dec 1st 2018

CARLOS GHOSN was dubbed "Le Cost Killer" for his work transforming Renault, a French carmaker. After Renault rescued Nissan in 1999, he also became known as the "Keiretsu Killer" for severing the tangle of cross-shareholdings that had almost brought the Japanese firm to its knees. Nearly two decades later, Mr Ghosn's creation, an alliance between Renault, Nissan and Mitsubishi, has become the world's biggest carmaker. But his arrest in Japan has shed light on what a tangled and acrimonious cross-shareholding it, in its turn, has become. The time has come to overhaul it.

No one emerges with any credit from the scandal that has landed Mr Ghosn, one of the world's highest-flying chief executives, in a poky jail cell in Tokyo. If one thing is clear, it is that his imperious rule, jet-setting life (albeit much of it on company business) and high pay helped bring about his downfall by alienating once-loyal Japanese subalterns.

That is not enough to justify a judicial roughing-up, however. The accusations against Mr Ghosn by an internal Nissan investigation and Tokyo prosecutors remain murky. They range from suggestions that Mr Ghosn under-reported his deferred pay to the stockmarket over a five-year period from 2011, to allegations that he failed to declare his use of a string of corporate properties owned by Nissan. He has not officially commented on the accusations, though he has reportedly denied them.

If true, however, they reflect as badly on Nissan as on him and his fellow detainee, Greg Kelly. Public filings on Mr Ghosn's pay and perks would have been Nissan's responsibility as well as his; any shortcomings should have been flagged up by internal as well as external audits. In a country that is at last overcoming decades of resistance to corporate-governance reform, the apparent lack of oversight is a stain on the reputation of Nissan and its board of directors. The more powerful Mr Ghosn became, the more essential the need for close board supervision.



The Economist

A failure of governance would be bad enough. Worse still would be if Nissan's executives, as some infer, tipped prosecutors off about Mr Ghosn's suspected activities in order to stymie a possible takeover by Renault. The French firm's 43.4% ownership of Nissan, which in turn owns a meagre 15% non-voting stake in Renault (as well as 34% of Mitsubishi), rankles among the top brass in Japan, not least because Nissan makes more cars and fatter profits than Renault. Mr Ghosn had made little secret of his desire to cement the alliance into something permanent, potentially via a merger. The possibility that this would be run by Renault, in which the French state is a 15% shareholder, scares not just Nissan's executives but the Japanese government too.

The French government bears its own share of the blame for rising tensions within the alliance. Three years ago efforts by Emmanuel Macron, then France's economy minister, to secure double-voting rights for long-term shareholders, the French state among them, sharpened Nissan's suspicions that France would stand in the way of any plans to make the alliance more equitable by rebalancing the stakes. Mr Ghosn's removal offers an opportunity to put things on a proper footing.

The fudge that currently exists, a Netherlands-based joint venture between Renault and Nissan chaired by Mr Ghosn, makes little sense now that the man who held everything together has gone. Although the alliance reported three-way "synergies" of €5.7bn ($6.4bn) last year, the numbers are vague. Instead, the three companies ought to merge properly. Carmakers need both scale and capital to prepare for the era of electric and autonomous vehicles. A full merger would allow more cost-cutting and sharing of production lines. The need to invest is one reason for GM's announcement this week that it will cut 14,000 jobs and close seven factories (see article).

Nissaultbishi

The trouble is, the old guard is digging in. Nissan seems to have wrapped itself in the Japanese flag. The French state, suspicious of the circumstances of Mr Ghosn's removal, is even less likely to cede control than it was before. An alliance that once put a halo on Mr Ghosn's head has become an unholy mess.

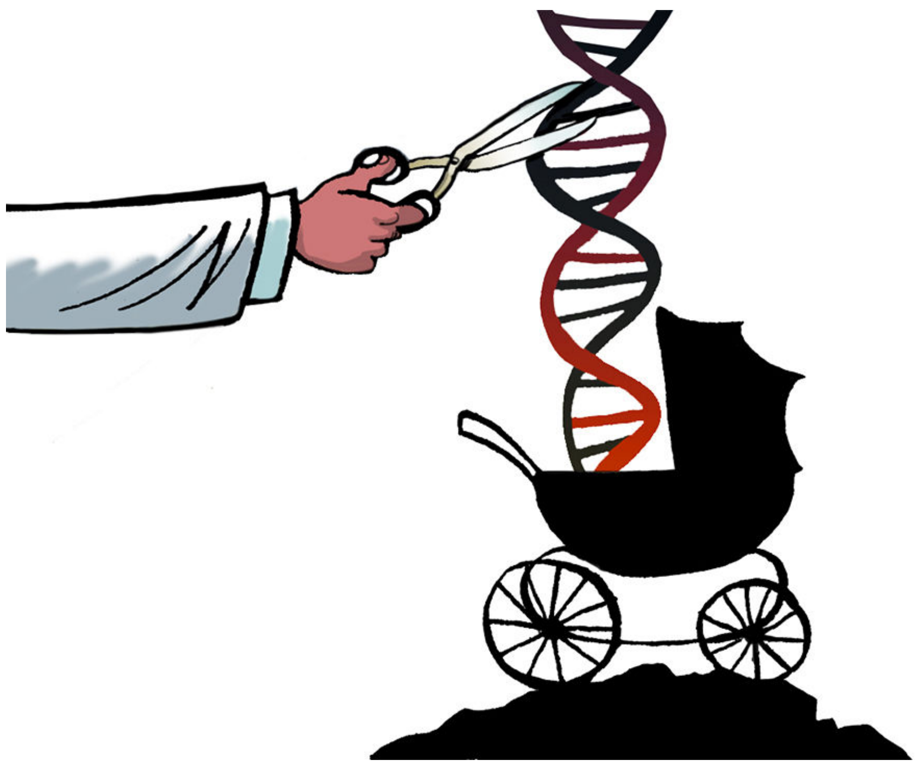
This article appeared in the Leaders section of the print edition under the headline "Unholy alliance"

The baby crisperer

The era of human gene-editing may have begun. Why that is worrying

A Chinese scientist claims to have edited the genomes of twin baby girls

Print edition | Leaders Dec 1st 2018



Peter Schrank

HUMANITY'S POWER to control the four-letter code of life has advanced by leaps and bounds. A new gene-editing technology called CRISPR-Cas9, which was not discovered until 2012, has been the subject of particular excitement. It allows DNA to be edited easily, raising hopes that it could eventually be used to relieve human suffering. This week, however, CRISPR has caused more unease than optimism, because of claims by a Chinese scientist that he edited the genomes of twin girls when they were embryos, as part of IVF treatment.

He Jiankui, of the Southern University of Science and Technology, in Shenzhen—which was not involved in the work—says he edited a gene, CCR5, that allows HIV to infect human cells (see article). Mr He claims to have created one baby resistant to HIV infection, and a twin who is not. (Another woman is apparently carrying an edited embryo.) If reproductive cells were affected, any such modifications will be passed on to subsequent generations. There is still uncertainty over what Mr He has done. But it is just a matter of time before someone, somewhere, edits human embryos that are grown into babies. Governments and regulators need to pay heed.

Presume that Mr He's assertions are truthful. One day it may make sense to edit an embryo—to cure genetic diseases, say. That day has not arrived. The technology is so new that the risks to human subjects cannot possibly justify the benefits. Scientists do not fully understand the scope of the unintended damage CRISPR does to DNA elsewhere in the genome or how deactivating CCR5 might leave you vulnerable to other diseases (it may, for instance, make death from flu more likely).

Mr He's work appears to have had the scantiest oversight and a vice-minister says it violates regulations. Mr He told delegates at a gene-editing conference in Hong Kong this week that he had run the idea for the trial past four people. It seems likely that Mr He himself was largely responsible for deciding whether his human experiment was worth the risks. It is not clear that the babies' parents gave their informed consent.

Nor did the procedure fulfil any unmet medical need. For the child whose genome was edited to confer resistance, the claimed benefit is protection from a virus that she may never encounter (although her father is HIV-positive, his sperm were washed to prevent infection during fertilisation) and for which there is a good, and improving, standard of care. If the reports are correct, the second child has been exposed to the potential risks of an edited genome but can still be infected by HIV.

The idea that one scientist could make the leap towards editing reproductive cells has been condemned, but it has not been ruled out. Even if Mr He turns out to be a fraud, others have the means, the motive and the opportunity to do similar work. CRISPR is not a complex technology. That leads to two responses.

The first is practical: better oversight of places such as fertility clinics, where back-room genome-tinkerers may lurk. That applies not just in China, where Mr He has attracted vocal condemnation, but also in America, where IVF clinics could use greater regulatory scrutiny.

The second is proper debate about when gene-editing is warranted. Editing the unhealthy cells of those suffering from genetic diseases such as Duchenne's muscular dystrophy and cystic fibrosis will alleviate their suffering. It is less clear when it is necessary to edit embryos, but Mr He's experiment obviously fails the test. Fertility treatments already screen embryos for unwanted genes.

It may even be that editing will one day be used on embryos to enhance genomes (to make people cleverer, say), rather than to cure disease. But that requires regulators, policymakers, scientists and civil society to think through deep ethical questions. Work is already under way to develop principles for editing reproductive cells. Earlier this year the Nuffield Council on Bioethics, a think-tank in Britain, outlined two: that the changes brought about by gene-editing should not increase "disadvantage, discrimination or division in society" and that such changes should not harm the welfare of the future person. Such debate was always going to be needed. Now it is urgent.

This article appeared in the Leaders section of the print edition under the headline "The baby crisperer"

Letters
Letters to the editor

Letters

Letters to the editor

On opportunity zones, accents, buildings, India, Europe, DNA, Napoleon

Print edition | Letters Dec 1st 2018

Letters are welcome and should be addressed to the Editor at letters@economist.com

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You painted a frustratingly incomplete picture of America's new "opportunity zones" (" Oh, the places you'll grow ", November 17th). After applauding the policy's objectives, a federal-tax incentive with the aim of boosting investment in struggling communities, you asked whether opportunity zones are adequately targeted towards people and places truly in need of help?

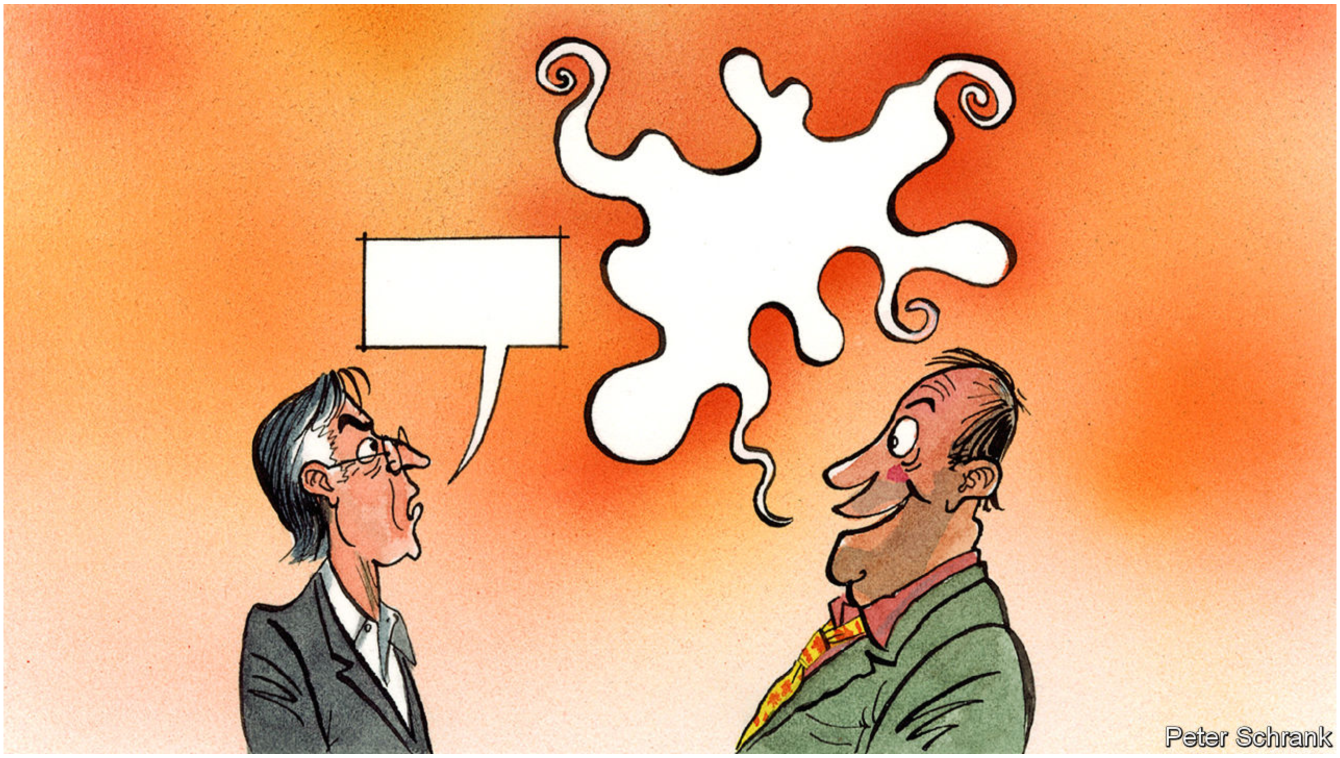
It is an important question. However, the evidence that those in need have been targeted is substantial. State governors selected places that as a group were more distressed than other eligible areas they did not select. For example, 29% of residents in the opportunity zones live in poverty and most zones saw their poverty rates rise over the past decade. The average median family income is nearly 40% lower than the national median. And life expectancy is roughly four years lower in zones than outside them.

You cited an analysis from the Brookings Institution, a think-tank, to assert that the zones are more likely to be gentrifying areas than the poorer communities that were passed over. What you did not mention was that Mississippi, the poorest state, emerged as the worst offender on the Brookings measure. Having raised the spectre of gentrification, you left readers with no way to gauge its pervasiveness across opportunity zones. In fact, only a tiny fraction can reasonably be considered gentrifying. A multidimensional study by the Urban Institute puts the figure at merely 3.6% of all zones.

Like any policy, opportunity zones deserve scrutiny. We believe some additional context would have helped your readers better evaluate the merits of this new initiative.

JOHN LETTIERI
President and chief executive officer
KENAN FIKRI

Director of research and policy
Economic Innovation Group
Washington, DC



Stressing the accent

You seemed perplexed by a French politician's put-down of a journalist who asked him a question in an accent that is common in south-west France (" The fear of accents ", October 27th). Over five decades, linguistic research has laid bare the explicit and implicit biases related to the regional variation of language in society. Such features serve as markers for evaluating a speaker's personality or social status.

The French, just like the English, are cultured to believe that there is only one correct way of speaking. This is entirely arbitrary; there is no one better or worse accent or dialect. Power asymmetry lies at the centre of this. It is no coincidence that the Parisian accent is the model for the French language because Paris is the centre of power. The accents of politicians such as Jean Lassalle from Pyrénées-Atlantique are still openly mocked. In Britain, MPs such as Angela Rayner and Leanne Wood have also been ridiculed for the way they speak. This is linguistic discrimination, clear and simple. We need better education when it comes to linguistic variation on both sides of *la Manche*.

JONATHAN KASSTAN
Department of Linguistics
Queen Mary, University of London

Disabled access

Bartleby addressed the problems of designing buildings for the disabled (November 3rd). The concept of "universal design" has been taught in architectural schools for over 50 years, but there are obstacles to making buildings accessible to all. For example, a ramp that is suitable for a paraplegic might be a hindrance for a pensioner who can't walk more than a few paces. The height of door hardware for a very short person might be impossible to reach for a person who cannot bend over. Cost is another problem. A fully accessible building requires more square footage and duplication of many amenities. Yet few universally accessible buildings will ever be used by people with the full range of unusual needs. So designers, with a fiduciary responsibility to the owners of the building, usually opt to design to code. It is a knotty problem with no easy feel-good solution.

LEE NASON

New Bedford, Massachusetts

India's banking problems

Schumpeter wrote about India's shadow banking crisis (November 10th). The government has not addressed the root cause of the problem and is instead tinkering with more intervention, such as by directing India's largest insurance provider to rescue IDBI, a bank with significant non-performing loans. The government is basically juggling the finances of its public-sector enterprises. It faces an election and is promulgating populist policies, hence the pressure on the central bank to transfer more of its surpluses to the public purse. It is unlikely that the government will prioritise long-term fiscal policy against its short-term electoral aims.

AJITESH SHANKAR DAS
Guwahati, India

La petite armée

Emmanuel Macron's call for a European army (" Macron's long march ", November 17th) awakens long-standing concerns in Britain. In fact, chance would be a fine thing. The EU has over 700,000 soldiers at its disposal, so could theoretically create a European army with ease. In reality, without American support, European nations would struggle to field even one corps of 60,000 troops capable of high-intensity war-fighting. The central problem for European defence policy is not an American no-show, but rather that EU countries, even if they were willing, have so little with which to show up.

ANTHONY KING
Chair of war studies
Warwick University
Coventry

Is it all in the genes?

Here are some questions I do not see behaviour geneticists, such as my long-time colleague, Robert Plomin, addressing ("Destiny's child", November 10th). If heritability coefficients vary across countries, cultures and communities for the same phenotypes (such as IQ), doesn't that make them reflections of environmental—as much as genetic—influence? Doesn't such cross-context variation reflect the fact that some contexts afford the expression, or penetrance, of genetic differences more so than do others? If so, then why do we only interpret heritability coefficients in terms of genetic, and not also environmental, effects?

PROFESSOR JAY BELSKY
Department of Human Ecology
University of California, Davis

In the age-old conundrum of nature versus nurture, Mr Plomin's book comes down clearly on the side of DNA. So it was ironic to read the obituary of James "Whitey" Bulger in the same issue (November 10th). He was one of America's most notorious mobsters. Yet his brother is William Bulger, who led the Massachusetts Senate for two decades and then became president of the University of Massachusetts.

ALAN GOLDFARB
San Rafael, California

The long and the short of it

Further to the question of Napoleon's height (Letters, November 17th), there is a story of an occasion when the emperor was reaching for a book on a high shelf. Marshal Moncey helped him, saying, "Majesty, allow me. I am bigger," to which Napoleon replied, "No, Moncey. You are longer."

DAVE MORRIS
London

Chipmaking
The chips are down

The chips are down

The semiconductor industry and the power of globalisation

Superpower politics may start to unravel it

Print edition | Briefing Dec 1st 2018

SILICON VALLEY, the heartland of America's technology industry, takes its name from the chemical element that is the most important ingredient in microchips. Most of the attention it now attracts is directed at companies such as Facebook, Google and Apple, which are better known for their software and nifty devices rather than the chips that make them work. But it was in the Valley in the 1950s and 1960s where inventions like the transistor and the integrated circuit were refined, helping to transform computers from unreliable machines the size of a room into dependable devices that fit neatly into pockets. That in turn enabled the technology titans of today to prosper.

Modern microchips are now embedded into everything from cars and washing machines to fighter planes. World Semiconductor Trade Statistics, a data provider, reckons that the market for chips was worth $412bn in 2017, a rise of 21.6% on the year before. If anything, these raw numbers understate the importance of chipmaking. The global e-commerce industry, for instance, is reckoned to have revenues of over $2trn a year. If data are the new oil, chips are the internal-combustion engines that turn them into something useful.

The ubiquity of chips has led to the growth of a vast global industry. Modern microchips have billions of components and are made in ultra-advanced factories that cost tens of billions of dollars to build. Indeed, that such devices can be built at all is a testament to the power of specialisation and trade.

These hugely complicated products have spawned an equally complex supply chain involving thousands of specialised companies all around the world. The Semiconductor Industry Association, an American trade body, reckons that one of its members has more than 16,000 suppliers, of which more than 8,500 are outside the United States. The raw materials and the parts that are the components of a chip cross and recross the world before eventually ending up as the brains of a smartphone, a car's anti-lock braking system or thousands of other products besides.

Two forces are now thrusting the semiconductor industry firmly into the spotlight. The first is geopolitics. Chips are caught up in an increasingly bad-tempered rivalry between America, the incumbent techno-superpower, and China, the aspiring one. The second is physics. This brewing technological struggle comes at a historic moment. For 50 years progress has been driven by Moore's law, which states that the number of components that can be crammed onto a chip doubles every two years and thus, roughly, so does its computational power. But the law is breaking down, leaving the future of the industry looking messier and less certain than at any time in the past.

Electronic politics

Start with geopolitics. America has long seen its lead in chipmaking as a vital strategic asset. One of the earliest uses for the chips coming out of Silicon Valley, which owes its existence to the patronage of the Pentagon as much as it does to venture capitalists, was in guidance systems for nuclear missiles. A White House report published in 2017 does not mince its words: "Cutting-edge semiconductor technology is...critical to defence systems and US military strength."

China also sees chips as crucial to its future. In 2014 it established the National Integrated Circuit Industry Investment Fund, to channel cash to research and development in the semiconductor industry. One of the targets of "Made in China 2025", a national programme designed to boost high-tech industries, is to increase domestic production. China wants the revenues of its home-grown chip industry to grow from $65bn in 2016 to $305bn by 2030, and for most of its demand for chips to be supplied domestically (today only around a third is).

America has not welcomed China's incursion onto its patch. It has reacted by trying to slow its rival's progress. In 2015, for instance, it banned the sale of high-end chips made by Intel, the world's second-biggest semiconductor firm, to Chinese labs that design supercomputers. It has thwarted acquisitions of American companies by Chinese firms.

This year the Trump administration briefly banned American firms from selling components to ZTE, a Chinese maker of smartphones and telecoms equipment, after it breached the terms of a settlement to do with illegally exporting technology to Iran. ZTE has revenues of $16bn and sells its products all over the world. But the Chinese company licenses its chip designs from several American firms and, when that supply was cut off, it was paralysed overnight. Bankruptcy was only averted when Donald Trump, America's president, unexpectedly agreed to lift the ban.

Chips in the windscreen

America has also levelled allegations of industrial espionage at China. On November 1st prosecutors indicted Fujian Jinhua Integrated Circuit, a Chinese chipmaker, and United Microelectronics Corporation, its Taiwanese partner, accusing them of stealing trade secrets from Micron, a big American firm. Officials have kept up a drumbeat of warnings about the risks of using equipment made in China, for fear that it may be funnelling sensitive information homeward. On October 12th two senators publicly warned Canada not to let Huawei, a big Chinese electronics firm, become involved in plans to build speedy 5G mobile-phone networks in the country. This week, New Zealand blocked a mobile-network operator, Spark, from using Huawei's equipment in its forthcoming 5G network. And chips are a front in Mr Trump's tariff-led trade war with China. They are among a range of goods on which America raised duties in August.

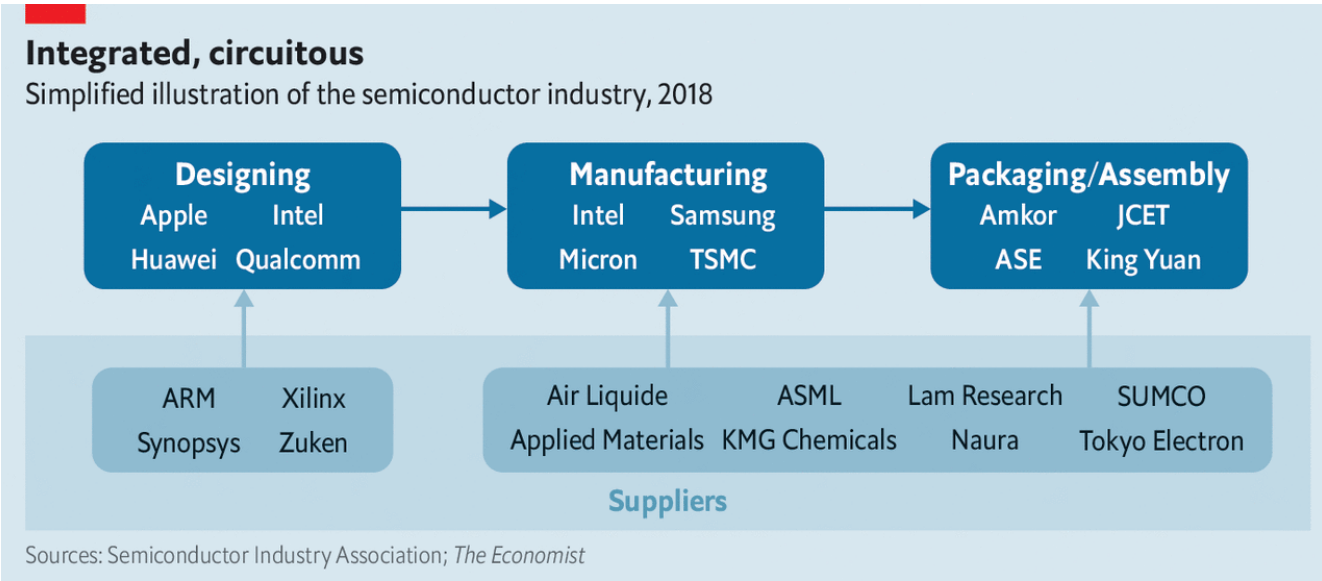
China has toughened up in retaliation. A planned takeover by Qualcomm, an American firm that designs chips, of NXP, a Dutch one, was abandoned in 2018 after heel-dragging by competition regulators in Beijing. Chinese authorities are also investigating price-fixing among American and South Korean manufacturers of memory chips, including Micron.

America's efforts to frustrate China may only serve to make it more determined. Until recently China boasted the world's fastest supercomputer. Named "TaihuLight", and based at the National Supercomputing Centre in Wuxi, near Shanghai, its 40,960 ShenWei 26010 chips are of an entirely Chinese design, says Jack Dongarra, a supercomputing specialist at the University of Tennessee. The main result of the Intel ban, he says, is "that China has put even more money into high-performance computing research". Successor machines to the TaihuLight, using more advanced chips, are in the works.

A trade war and the growing sense of an unfriendly rivalry between America and China is having unwelcome repercussions on one of the world's most complex and globalised industries. "These [chip] companies have been told that globalisation is great for the past 30 years," says Paul Triolo of the Eurasia Group, a political-risk consultancy. "And now all of a sudden this has become a national-security problem, and they have to try to adjust to that."

Refashioning an industry that is vast, fast-growing and vital to the global economy will not be easy. In the early days chipmakers handled every part of the process in-house. That began to change in 1961 when Fairchild Semiconductor began assembling and testing products in Hong Kong, where skilled labour was cheap. That trend has accelerated as chips have become more complicated and more of the manufacturing process has been outsourced to specialised firms. The result is a confusing constellation of thousands of companies. These can be lumped into three rough categories (see diagram)—design, manufacture, and assembly and packaging.

A typical journey from raw silicon to completed chip gives an indication of how elaborate supply chains can be. It may start in the Appalachian mountains, where deposits of silicon dioxide are of the highest quality. The sand may then be shipped to Japan to be turned into pure ingots of silicon. These are then sliced into standard-sized wafers, 300mm across, and sent to a chip factory, or "fab", perhaps in Taiwan or South Korea. Here the slices will be imprinted with a particular pattern using photolithography equipment made in the Netherlands.



The Economist

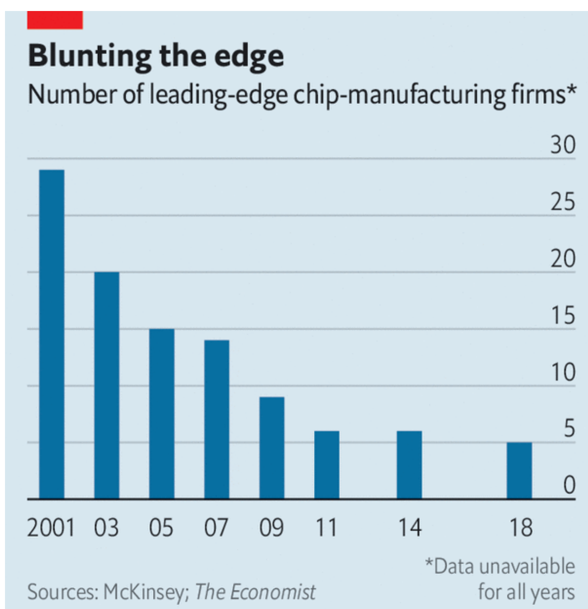
That pattern will be determined by the overall design of the chip. This design might come from ARM, a company based in Britain. But it can be tweaked for specific applications by one of the company's many licensees. Once finished, it must be assembled into a package, in which the etched silicon is placed inside the familiar ceramic or plastic containers that are dotted across any circuit board, and then comes testing. That might take place in China, Vietnam or the Philippines.

Slices both ways

This is then integrated into a circuit board, which could happen somewhere else again. The result will be one of the many components that arrive at factories from Mexico to Germany to China, for assembly into an industrial robot, smart electricity meter or one of the millions of computers that crunch data in the cloud.

China's domestic industry started at the lower-value end of this process, says Jiang Xu, a professor of electrical engineering at the Hong Kong University of Science and Technology. Its strength still lies in assembly and packaging chips. Dozens of firms around the Yangzi delta near Shanghai, for instance, specialise in this sort of work. Their names may be unfamiliar—JCET, Tianshui Huatian and TFME—but their revenues are counted in billions of dollars.

Now, with Western firms reliant on it for this work, and fuelled by a fast-growing home market, China is turning to design and manufacturing. It has already made inroads at the lower end of the market. Firms such as Samsung, Intel, Apple and Taiwan Semiconductor Manufacturing Company (TSMC) design or make powerful, expensive chips for smartphones or cloud computing. But "between 75% and 80% of semiconductors are not bleeding-edge products," says Len Jelinek of IHS Markit, a research firm. Chips that go into LCD televisions, home routers and smart devices that make up the internet of things, which adds sensors and internet connections to everyday objects, "can absolutely be manufactured by firms in China".



The Economist

Chinese firms are beginning to succeed further up the value chain, too. HiSilicon (owned by Huawei) and Tsinghua Unigroup, a state-owned firm, are rated among the world's top ten chip-design firms by revenue. HiSilicon's "Kirin" series of smartphone chips is on a par with anything Western companies can design.

No Moore

Through these efforts China has reduced dependence on foreign expertise, but not yet eliminated it. Mr Xu points out that Chinese firms still rely heavily on modifying designs from ARM. Its chips already dominate the mobile-computing business and are poised to do the same with the array of smart devices that will make up the internet of things. The firm is also trying to break into the market for high-powered cloud-computing chips. Yet ARM is based in Britain, and was recently bought by SoftBank, a big Japanese firm. Both are close allies of America.

China has found it harder to make progress in cutting-edge manufacturing, which is the most demanding part of chipmaking. Chinese upstarts must compete with incumbents that have intimidating technological leads and engineers with decades of hard-won know-how. "The semiconductor [manufacturing] industry is really about repetitive cycles of learning," says Mr Jelinek. The Kirin 980 was the first smartphone chip to be produced on the 7-nanometre node—the current state of the art for squeezing in computing power. Since no fab in China has the required technology, HiSilicon—like Apple and Qualcomm, its American competitors—had to have its chips made in Taiwan, by TSMC.

The demise of Moore's law could offer a means to restrict China's ambitions. It has always been clear that it cannot go on indefinitely. Each time components in a chip shrink, manufacturing gets fiddlier and more expensive. Leading-edge fabs have become eye-wateringly pricey. Samsung is spending $14bn to build one near Pyeongtaek, in South Korea. Chipmakers jokingly refer to Moore's second law, which says that the cost of a chip factory doubles every four years.

The result has been consolidation at the forefront of chipmaking. In 2001 there were 29 companies offering the most advanced fab facilities, according to McKinsey, a consulting firm (see chart). Today there are five. That could make it easier for Western techno-hawks to slow China's progress. These fabs are owned by companies based in America, or in Taiwan and South Korea, both of which are its allies. Another lever might be the firms that supply equipment to those fabs. One in particular—ASML, a Dutch firm—has, after over a decade of trying, finally commercialised "extreme ultra-violet lithography", a manufacturing process needed for the most advanced chips. That could offer Western policymakers a pinch-point.

But the end of Moore's law offers China hope, too. One of its side-effects used to be that, as components shrank, chips were able to operate faster. But that effect—called Dennard scaling—broke down in the mid-2000s, which meant that shrinking a chip's components offered fewer benefits than it used to. For that reason, says Linley Gwennap, a chip-industry analyst, being a pace or two behind the leaders in manufacturing matters a bit less than before.

At the same time, says Andrew Huang, a hardware designer, the slowing of Moore's law has left the industry as a whole casting about for other ways to build better chips. Attention is gradually shifting, in other words, from refining manufacturing towards cleverer design and new ideas. If that changes the way the chip industry operates, Chinese firms could try to move into this new, relatively unclaimed territory.

HiSilicon's chips offer an example. They include super-specialised silicon designed to speed up calculations that are useful for artificial intelligence, another focus of "Made in China" and an area into which the country is ploughing cash. Quantum computing is another promising avenue. It uses the effects of quantum mechanics to speed up enormously some sorts of calculations. China has made big bets on quantum computing, reportedly spending $10bn to build a big research lab in Hefei, the capital of Anhui province. But it will require the mastery of unconventional physics such as superconducting wires and ion traps, technologies that are very different from what chipmakers use today.

As China advances at the boundaries of chipmaking, America is trying to push them further out of reach. American firms, including Google, Microsoft and IBM, have quantum-computing projects of their own. A report in 2017 from the President's Council of Advisors on Science and Technology advised that America's best response to China's rise would be to invest to maintain its technological lead. With that in mind DARPA, an American military research agency, is running a project called the Electronics Resurgence Initiative (ERI), which aims to develop new technologies to the point where they can be commercialised by private firms.

Picking up the pace

Some of its projects are tweaks that aim to improve existing processes. One example, says William Chappell, who runs the ERI, is technology to allow small chip-design firms to integrate more easily their specialised silicon into bigger designs from larger companies, which should help cut costs. But ERIis also investing in more speculative areas. It has projects looking into optical computing, which aims to build chips that run on light rather than electricity; spintronic transistors, which rely on quantum effects to function; and approximate computing, which sacrifices precision in calculations to save energy.

Making chips even more high-tech could keep America in the driving seat. In any case, says Mr Triolo, it may prove easier than trying to unwind the industry's global supply chains. Indeed, freezing out China is not something welcomed everywhere in America. Qualcomm, for instance, derives two-thirds of its revenue from China; for Micron the figure is 57%. And a trend towards collaboration, with the likes of Microsoft and Amazon opening research centres in China, has kept investment flowing both ways across the Pacific. A turn to protectionism to keep China in check would inflict damage far beyond its borders.

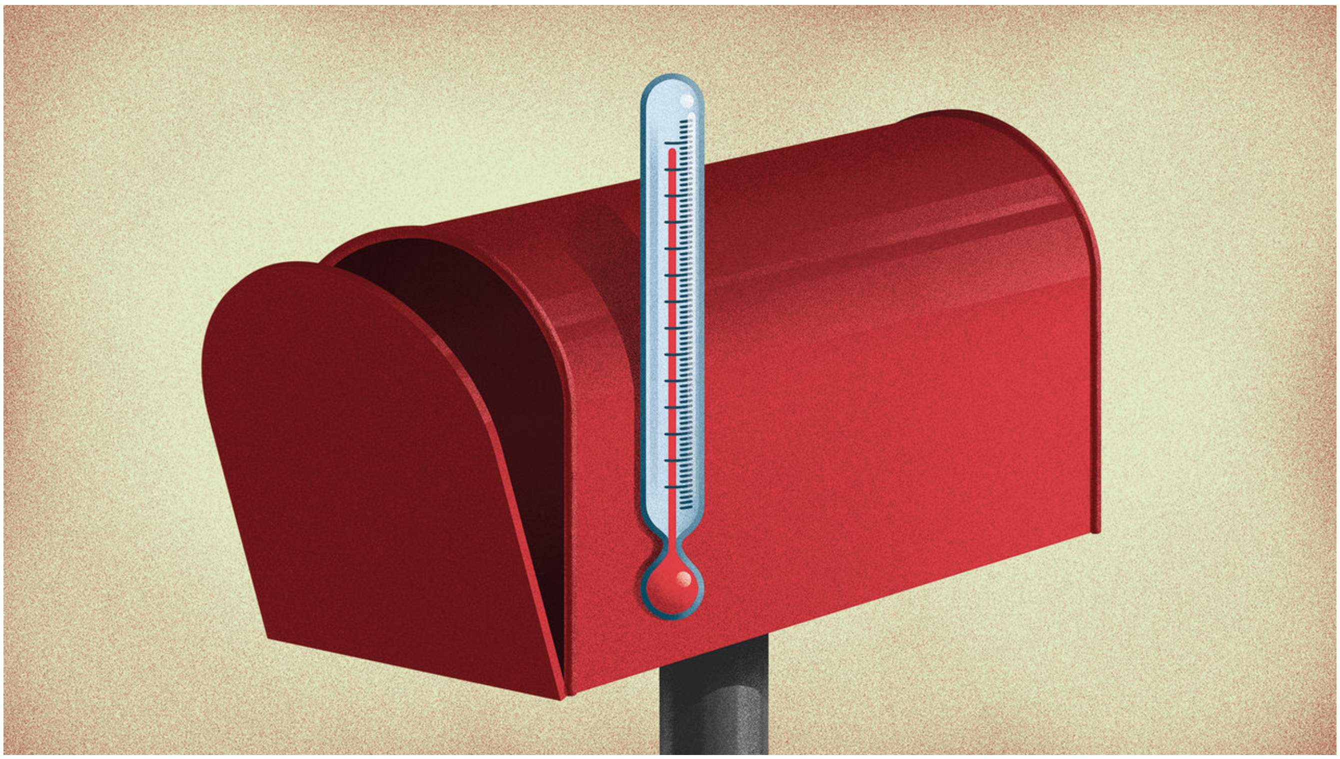
This article appeared in the Briefing section of the print edition under the headline "The chips are down"

Safe as houses

The housing market is having a wobble

Don't be alarmed

Print edition | United States Dec 1st 2018



HOME BUILDERS and buyers are feeling hesitant. Residential fixed investment has dragged back GDP growth in each of the past three quarters; in October sales of existing homes were 5.1% below their level a year before and new ones down by 12%. Since March price rises have slowed. As housing has historically been seen as a canary in the coal mine for the American economy, this wooziness is worrying. But it is not yet cause for panic.

The wobble invites two questions. Why is it happening? And does it matter? Answering them gains importance as chatter about a possible economic slowdown gets louder. The corpse of the last yellow finch is still fresh. In August of 2007 Edward Leamer of the University of California, Los Angeles highlighted the predictive power of residential investment and home-building when forecasting downturns, in a paper called "Housing is the Business Cycle." Eight of the ten previous recessions had been preceded by serious problems in housing, he pointed out, before forecasting that "this time troubles in housing will stay in housing". They did not.

When identifying the causes of what is happening it is better to consider a brew of factors than any single ingredient. Robert Dietz, chief economist at the National Association of Home Builders, refers to five "L"s that have been pushing up builders' costs and so constraining the pace of new home-building: labour, lots, lending, laws and lumber. Construction workers are scarce, and are therefore seeing faster wage increases than the general workforce. These burdens might not matter so much if the sector were managing to squeeze more from its inputs. But it is struggling to do so. As a result, the incentive to build many new homes has been reduced.

With the possible exception of a 20% tariff on Canadian lumber, which led to a spike in prices this summer, these pressures are not new. For several years they have been used to explain why building has been so slow in the face of strong demand and rising prices (aside from the hangover from over-building in the mid-2000s). Mr Dietz says that for cheaper, entry-level homes, the fixed costs of building are most crippling, which helps to explain why their supply has been particularly squeezed.

Homebodies

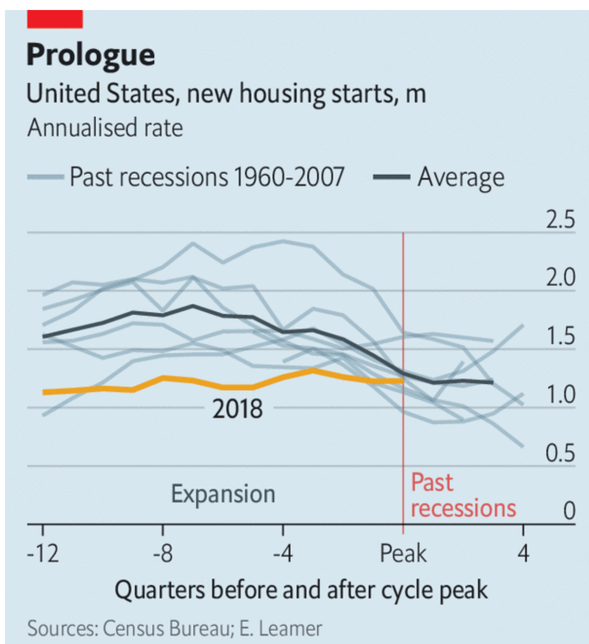
Over the summer something else seemed to change. Aaron Terrazas, an economist at Zillow, a price-listings website, has noticed a tilt in favour of buyers. He has seen less evidence of bidding wars; fewer examples of buyers waiving contingencies, such as forgoing the option to pull out if something about the sale goes wrong; fewer multiple offers, and fewer homes that sell for very much more than their asking price. While the priciest points of the market have been chilly for a while, now the bottom end is catching a cold, too.

The next likely explanation is that demand is being constrained by an affordability crunch. House prices are rising nationally just as, according to Freddie Mac (a government-backed mortgage insurer), the effective rate on home loans has risen by 0.8 percentage points since 2017. As Jerome Powell, chairman of the Federal Reserve, pointed out, on average housing is still more affordable than it was before the financial crisis, and mortgages are still historically cheap. But in this case the change matters, and more expensive houses coupled with more expensive mortgages can still weigh on demand.

The buyers most vulnerable to this dynamic are young. Home-ownership rates for those under 35 collapsed following the recession, and although they have recovered a bit since 2016 they are still well below their historical average, and around seven percentage points below their pre-crisis peak. The young are the most likely to buy cheaper, entry-level homes. To buy an average starter home with a 10% down-payment, the National Association of Realtors estimates that a first-time buyer would need to fork out $1,099 per month in the third quarter of this year, $120 more than a year ago.

On November 14th Mr Powell noted the sensitivity of the housing sector to interest rates, and said that he and his fellow monetary-policy makers were watching it carefully. But elsewhere the economy is doing well, particularly the labour market, which is in ruder health by the day. In a speech on November 28th Mr Powell said that interest rates now are “just below the broad range of estimates” of neutral, the level at which they neither speed up nor slow down growth. Although investors interpreted this as a doveish statement, most still expect another interest-rate rise in December, and at least one more next year.

Mr Powell did not seem too concerned about housing, noting that the sector is less of a motor for the economy than it has been in the past. Mr Terrazas warns of overreaction to “any slight news of softness”. For his part, Mr Leamer is relatively relaxed. Although he agrees that the market is cooling, there are few signs of the over-building that characterised the 2000s—if anything, the opposite. “We haven’t built up a mountain that would create a cliff,” he says. Besides, in historical terms the recent dip in housing starts is small. In the four quarters preceding the peak of an economic cycle, housing starts have fallen by 22% on average (see chart). Over the past four quarters home starts have fallen by 2%.



The Economist

Overall, recent noises from the canary sound less like a cry of distress than a chirp as the atmosphere changes. There are reasons to worry about housing. The fact that a generation is being largely shut out of one of America’s most common forms of wealth accumulation is genuinely troubling. If what is happening in housing is an early sign of a broader decline in consumer confidence, that could spell trouble. And if construction and the spending that accompanies home-building are not driving demand, that may leave the economy more fragile when other stimuli fade. But it is too soon to call this a crisis.

This article appeared in the United States section of the print edition under the headline ”Safe as houses”

The Doomsday book

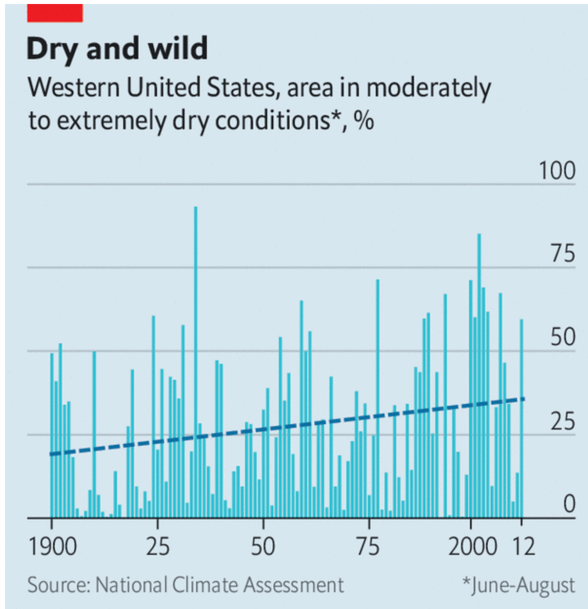
A government report outlines what a warmer world means for America

The president of that government then dismisses its findings

Print edition | United States Dec 1st 2018

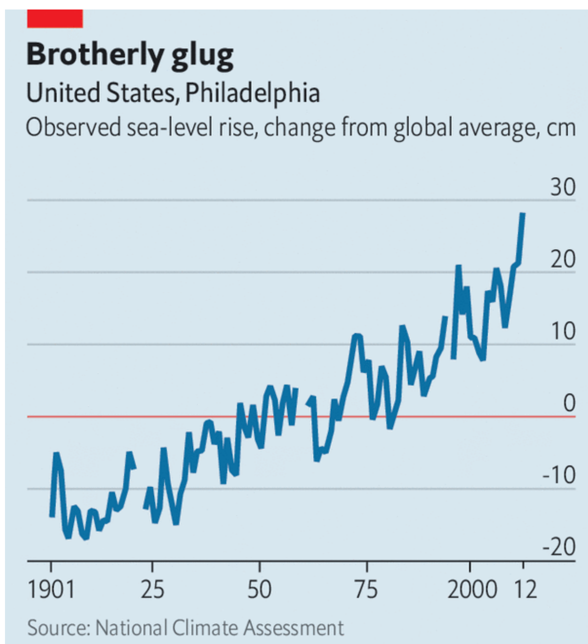
PRESIDENT DONALD TRUMP doubts that man-made climate change is a thing. According to his administration it is a clear, present and future danger to the United States. That conclusion—unsurprising to anyone who has been paying attention to climate scientists—emerges from the Fourth National Climate Assessment, compiled by 13 federal agencies and released on November 23rd. If the White House had hoped to bury the 1,600-page tome, part of a four-yearly exercise which it is obliged to prepare and make public by a law from 1990, under turkey-laden tables, the absence of news over the Thanksgiving weekend promoted it to the front pages.

The findings made for grim reading. The report details how climate change is already affecting America—through more frequent floods and droughts—and what to expect from falling crop yields, the spread of disease-carrying bugs, fiercer hurricanes and much else besides. Sea levels, up by 16-21cm in the past 120 years, may rise by another metre over the next 80, threatening $1trn in coastal property. Rising temperatures could force Texans to work fewer hours (and pay 10-20% more for energy). Wildfires should cause less devastation by 2090 than they do today—but only because many forests most prone to them will have burned to a crisp. All told, unchecked greenhouse-gas emissions could lop a tenth off American GDP this century.



The Economist

Some politicians are heeding the warnings. On November 27th a bipartisan group in the House of Representatives introduced a bill to tax emissions and redistribute the proceeds as a cheque to citizens, though this looks doomed so long as Mr Trump's fellow Republican climate sceptics control the Senate. In any event, action by America would not be enough on its own to limit the damage. Curbing global warming requires a global effort. A UN report released this week estimates that national commitments made so far by the 197 signatories of the Paris climate agreement add up to barely a third of what is needed to keep warming below 2°C (3.6°F) relative to pre-industrial times. Even if this goal were met, climate change could shave $200-430bn a year off American output.



The Economist

Asked about the gloomy economic forecasts, the president said that he does not believe them. They do warrant some caution. Projecting climate and growth decades from now is fraught with uncertainty; so is counting on other countries to act. Another president would read the report as a blueprint for adapting America to a warmer world. Mr Trump appears instead to treat it as a work of fiction.

This article appeared in the United States section of the print edition under the headline "Doomsday book"

Medieval liberties

SCOTUS considers asset forfeiture

Where Magna Carta and Black Lives Matter converge

Print edition | United States Dec 1st 2018

WHEN TYSON TIMBS received a life-insurance payout of $73,000 following his father's death in 2012, he made a series of ill-advised decisions. First he blew $42,000 on a Land Rover. Then he started dealing heroin and made a pair of two-ounce sales totalling $385 to undercover police. Mr Timbs was charged and the authorities soon seized his car, a common practice whereby police "forfeit" items used in the commission of a crime. But the federal constitution says that "excessive fines" may not be "imposed", and the SUV was worth more than four times the maximum fine ($10,000) that Indiana levies for felonies of this sort.

On November 28th, the Supreme Court heard *Timbs v Indiana*, a case asking whether the Eighth Amendment's ban on excessive fines applies only to the federal government—as it has since 1791—or also constrains states and localities. The first court to look at Mr Timbs's complaint found the state's seizure of his car to be disproportionate, but the Indiana Supreme Court said it isn't the state's job to impose the federal constitution's strictures upon itself. Whether the justices decide to do so will not just matter to Mr Timbs.

Examples of police departments using excessive fines and forfeitures to boost their revenue are not hard to come by. In a 2015 report on the police department of Ferguson, Missouri, the Department of Justice found the city made "maximising revenue" the chief priority of law-enforcement, burdening its poor African-American residents unduly in the process. In 2013 revenue from fees, fines and forfeitures made up more than a fifth of Ferguson's general fund. Running a red light in California brings a $100 fine, plus another $390 in fees that go to a portfolio of 18 state and county funds. In New Jersey, getting caught with pot carries a $100 fine and can then lead to an extra $1,000 in charges and fees for associated costs. In 2014, a couple in Philadelphia had their home seized when their son was caught selling drugs there.

The unusual left-right coalition of organisations urging the Supreme Court to side with Mr Timbs—Christian conservatives, libertarians, anti-poverty activists, the Chamber of Commerce—seems to have the support of an ideologically diverse array of justices. On the left, Justices Elena Kagan and Sonia Sotomayor appeared to favour applying the excessive-fines prohibition to the states. Justice Neil Gorsuch, Mr Trump's first nominee, was incredulous that Indiana's solicitor general, Thomas Fisher, was arguing to the contrary. "Here we are in 2018," he told Mr Fisher, "still litigating incorporation of the Bill of Rights. Really? Come on, General." Brett Kavanaugh, Mr Trump's more recently seated justice, appeared to agree.

The bar on extortionate fees has roots in the 1689 Bill of Rights and the Magna Carta. In America's earliest years, colonists fretted over William Penn being fined 40 marks for refusing to doff his hat in an English court. At one point Justice Stephen Breyer asked Mr Fisher if a state could seize a Bugatti whose driver was caught cruising five miles over the speed limit. Yes, Indiana's lawyer said, to raised eyebrows.

That answer may be galling, but it won't necessarily be fixed by a Supreme Court decision incorporating the excessive-fines clause against the states. As Justice Kagan pointed out, "we could incorporate this tomorrow and it would have no effect on anybody" unless the ruling offers guidance as to what kinds of fines and forfeitures count as excessive. Chief Justice John Roberts worried that the court was being asked to "buy a pig in a poke"—apply a constitutional right in a new direction without having much of a handle on what it means.

This article appeared in the United States section of the print edition under the headline "Fine tuning"

Death, destruction and investment

Puerto Rico is slowly recovering

The data suggest that the island is stirring

Print edition | United States Nov 29th 2018

ON A BALMY evening Cocina Abierta, a restaurant in Condado, a neighbourhood on the oceanfront in Puerto Rico's capital, is fully booked, as it has been most evenings since it reopened a few days after Hurricane Maria devastated the island in September 2017. Tourists mingle with well-heeled locals over tuna *tatake* and octopus tentacles, sipping wine and exchanging tales of sailing expeditions.

Get away from the bright lights and the picture is very different. Modest single-storey houses remain badly damaged, with mould on the walls and leaky roofs. Many of them are boarded up. About 40% of those over 65 live below the poverty line and the median household income is $19,000 a year. Still, after more than a year that brought hardship for many of this Caribbean island's 3.4m residents, Puerto Rico is getting back on its feet.

A slew of statistics confirm that for the first time since Maria killed almost 3,000 Puerto Ricans, cut off the entire island's electricity and cell-phone communication, damaged more than half a million houses and nearly all hospitals, made roads impassable and blocked ports—there is actually some good news.

At the end of October the oversight board raised its forecast for economic growth. It filed a plan in court to restructure roughly $17.5bn in bonds issued by the Puerto Rico Sales Tax Financing Corporation. A federal judge has approved the board's restructuring of the island's Government Development Bank, which lends to the central and local governments.

In the first seven months of this year companies announced investments of $360m and the creation of more than 6,700 jobs, compared with $48m and 1,200 jobs in all of 2017. In October the official unemployment rate hit 8.3%, the lowest in more than 70 years. Puerto Rico's critical infrastructure—electricity, water, telecommunications, schools and hospitals—is functioning again, according to the Centre for a New Economy, a think-tank. Brad Dean of Discover Puerto Rico, a marketing board, says almost 90% of hotels are open.

The Federal Emergency Management Agency (FEMA) was widely criticised for its slow response to the hurricane. The agency has since given $4bn to Puerto Rican citizens, either directly to rebuild their homes or in the form of Small Business Administration loans, says Mike Byrne, who runs FEMA in Puerto Rico. At the peak of the hurricane 19,000 soldiers worked for FEMAon the island. "The real villain was 30 inches of rain and winds of 180mph," says Mr Byrne. "Maria pushed our limits."

With a more competitive economy, Puerto Rico might succeed in paying some of the $120bn it owes to bondholders and pensioners, but not all. Joseph Stiglitz, an economist, and his co-authors argue in a recent paper that Puerto Rico will still need to write off up to 70% of its debt.

This article appeared in the United States section of the print edition under the headline "Death, destruction and investment"

Lakeshore views

Machine politics as Illinois marks its 200th birthday

How one of America's longest-serving politicians keeps getting re-elected

Print edition | United States Nov 29th 2018

ONLY BARNACLES, royals and African dictators grip tighter. No state Speaker in America has served longer than Michael Madigan in Illinois. Mr Madigan has held the office since 1983 (a two-year hiccup in the nineties aside). For years his name, in elegant black letters on white glass, has glowered above the door of room 300 at the Capitol in Springfield. None of the grey-suited lobbyists who mill in the corridor before it can imagine him gone. Nor can he. This week he arranged for the Democratic caucus to return him, yet again, to his job.

Unusually, he faced some dissent. A lone freshman Democrat, Anne Stava-Murray, said in advance she would not back Mr Madigan. She had promised as much to her suburban voters, after the 76-year-old had mishandled cases of sexual harassment among his most senior staff. For flustering the party, however, Ms Stava-Murray has earned rebukes and intimations that she will struggle to bring bills to a vote.

By what political magic does Mr Madigan cling on so tight? He was elected to the 22nd district nearly half a century ago, in 1971, and has won more than 20 elections since. Despite his neighbourhood turning heavily Hispanic, "Iron Mike", who is of Irish descent, wins every poll. This year he squeaked by with 100%. It helps that no one has opposed him in a general election for years. One woman who challenged him in a primary, in 2012, had her car tyres slashed.

Embittered editorial writers and Republican opponents call him a puppet-master, responsible for dysfunction in the Land of Lincoln. Plenty exists: the state marks its 200th birthday on December 3rd facing a dire $250bn pension deficit, high taxes, sluggish economic growth and a shrinking population. He dismisses such criticism as "hateful...laughable...a clear failure", while cheering the Democrats' mid-term results.

Unusually for a politician, Mr Madigan avoids interviews (including requests from *The Economist*) and most public events. This has increased his reputation for opacity. As has his co-ownership of a Chicago law firm that specialises in helping clients appeal against property-tax appraisals handed out by officials in Cook County (which covers the city). The tax office used to be led by a pal of Mr Madigan.

Observers say he learned most from his mentor, Richard J. Daley, who was mayor of Chicago for (only) 21 years until 1976. The mayor was the arch-exponent of machine politics, using patronage, control of party funds and backroom deals to outmanoeuvre opponents. The title of a seminal book on that period, "Don't Make No Waves, Don't Back No Losers", also encapsulates Mr Madigan's method.

He adopts similarly cautious techniques, taking care not to back any bill, candidate or cause unless he is sure of its chances of success. And though fewer patronage jobs exist in Illinois than before, politicians, journalists and others say soldiers for Madigan advance through Chicago's suburban rail system and other government agencies.

His power over such institutions is as nothing, however, compared with his hold on the state's Democratic Party. One person who used to dine regularly with Mr Madigan recalls how he spluttered and swore at a suggestion he would step aside even to let a close relative rise to higher office. Another insider complains that Mr Madigan presides over "literally a cult" and that the party goes beyond the norm in snuffing out independence among its own candidates.

A phone call to union leaders might result in a surprisingly small number of supporters showing up to a candidate's fundraising event. If that fails, a suggestion that party staff might be withdrawn may prove more persuasive. The party can "make you lose at the last minute" of a campaign, says one, who adds that the party demands 60-hour weeks as it "physically breaks" candidates. Others mention that candidates may be banned from talking to the press, while door-knocking may be monitored by live video feeds.

Newly elected representatives—one person calls them "targets"—are also vulnerable. Whereas voters might expect them to oppose the Speaker, they fear being refused funds to hire assistants or denied plum committee chairmanships (which come with extra pay). They can be reminded that the Speaker has a personal say in deciding whether any of their bills will be brought to a vote. "Any lever of power he has access to, he will use", says Austin Berg of the Illinois Policy Institute, a non-profit in Chicago that promotes small government. He says the Speaker "thinks only of loyalty, favours, patronage and power".

Mr Madigan is driven, say various close observers, not by ideology but by a raw desire for power. He relishes the game of calculating political odds, says one. Another suggests he delights in the puzzle of composing coalitions of voters to win elections. Several liken it to a passion for chess. Steve Brown, Mr Madigan's spokesman, agrees with the chess analogy, but chides "anyone who concocts the mythology that Mike Madigan is more powerful than the governor". He denies that the Speaker has unusual clout, talking instead of his astute adaptability and liberal legacy, for example in getting the death penalty abolished or approving same-sex partnerships.

Yet the pieces on the board are changing. In January a big-spending billionaire, J.B. Pritzker, takes office as the new governor. His enormous funds provide a second locus of power in the party. Mr Pritzker, while campaigning, said he "didn't get to choose" his Speaker and referred to the benefits of term limits. Do not write off the Speaker yet. But even a barnacle cannot hold on for ever.

This article appeared in the United States section of the print edition under the headline "Make no waves, back no losers"

Lexington

The rise of Native American politicians

Indians are unlike any other minority group

Print edition | United States Dec 1st 2018

DEB HAALAND, who last month became one of the first native-American women elected to Congress, experienced what this meant to other Indian women on her first post-poll trip to Capitol Hill. She was recognised there by a party of native visitors from South Dakota, who rushed to embrace her in tears. "I was crying, they were crying," she says. "Representation matters. And if you disagree, try not being represented for over 200 years and then see how it feels to have someone who looks like you in Congress!"

One of the most dismal stories in the run-up to the mid-terms was an attempt by Republicans in North Dakota to suppress the vote of left-leaning Indians. Yet one of the most cheering to emerge from the election was the success of native candidates. Ms Haaland, a veteran activist from New Mexico and member of the Laguna Pueblo tribe, will enter the House of Representatives alongside Sharice Davids, a lawyer, martial-arts specialist and member of the Ho-Chunk tribe from Kansas. According to a count by Mark Trahant of the website Indian Country Today, 103 native candidates ran for office in the mid-terms. At least 60 won, mostly for the Democrats—though Oklahomans elected a Republican Cherokee, Kevin Stitt, to be America's first Indian governor.

This represents an acceleration of a welcome trend. Indians are doggedly beset by poverty, ill health and other social problems. Yet the picture of wretchedness on the reservation this conjures is misleading. Over 70% live in cities, where an educated Indian middle class has emerged. Some of that progress is driven by Indian casino revenues—which also helped fund Ms Haaland's campaign. But it mainly reflects a positive transformation in the way Americans view native history and culture. Several factors—including the legal protections and economic benefits Indians secured in the 1960s, the environmental movement, and a cultural rethink by Hollywood—have encouraged anyone with Indian blood to identify as native. This phenomenon, known as Cherokee Grandmother Syndrome, explains rapid growth in the Indian population. It leapt by over a quarter between 2000 and 2010. Ms Haaland is half-white; Mr Stitt does not look Indian at all.

Native Americans still represent less than 2% of the population. So none of the candidates for national or statewide office made much of their Indianness on the trail. It helped Ms Haaland win a tough primary, but mainly because white liberals in Albuquerque wanted to send a native woman to Congress. The fact that New Mexico was the last state to give Indians the vote, in 1962, made that especially appealing. Ms Haaland's ethnicity also helped her shrug off two convictions for drunk driving.

She said she had "been sober for 30 years". A reference to the blight of addiction among Indians, and to her fortitude, that ended the matter.

Indian candidates for lower office were more obviously motivated by native issues. They included veterans of the Standing Rock protest against a gas pipeline in North Dakota, in 2016 and 2017, which drew the biggest Indian crowd in decades. Many also focused their criticism of President Donald Trump on his efforts to shrink protection for tribal lands. A decision by the interior department in September to deny a reservation to the landless Mashpee Wampanoag tribe of Massachusetts provided a timely illustration. Such common concerns, uniting America's 573 recognised tribes, have proliferated as Indian economic interests and cultural identity have deepened. The response of native politicians in Alaska to Brett Kavanaugh's contentious Supreme Court confirmation was another example of this. They denounced him for his description of Hawaii's affirmative action for natives as a "naked racial spoils system". That in turn helped persuade Senator Lisa Murkowski of Alaska to oppose his elevation.

A groundbreaking survey of Indian voters, formerly a lacuna in political research, by the think-tank Latino Decisions also points to more unity and engagement. Native turnout was high, including in places such as North Dakota where Indians faced attempts to discourage them from voting. It may have proved decisive in several races won by Democrats by thin margins, including Senate races in Arizona and Montana. And it was highest among voters aged 18-29, who were most energised by Standing Rock. Over a quarter of young native voters had volunteered for a mid-term campaign or voter-registration drive. Yet the survey also pointed to the traditional diversity of Indian views, which makes native Americans unlike other minority groups. They leant Democratic by a slimmer margin than blacks or Hispanics. Almost half of Indian men voted Republican. There were also signs of a long-standing ambivalence towards national politics. Though contemptuous of Mr Trump, most expressed little enthusiasm for either party.

Whose blood and soil?

It will fall to Ms Haaland and Ms Davids, alongside two existing Indian House members, Republicans Tom Cole and Markwayne Mullin of Oklahoma, to represent such contradictory sentiments. Indians are starting to behave politically more like other groups. Yet they remain heterodox and distinct. Mental health, land rights and criminal justice are among the problems that affect Indians differently, because of their history and because of provisions such as the Indian health service. A danger for the two native women is that, already hailed as champions of Indian social affairs, they will neglect their districts. Yet by providing a stronger, subtler voice for native Americans they have an opportunity to accelerate their engagement with national politics.

In a time of Trumpian nativism, that might be even more instructive for whites. "Native America provides a touchstone of identity: about who we westerners are and particularly who we are not," wrote the anthropologist J.C.H. King. Ms Haaland calls herself a 35th-generation New Mexican. Mr Trump is a second-generation Scots-German American. The notion that he and his nativist followers have a proprietorial claim to America is absurd.

This article appeared in the United States section of the print edition under the headline "Off the reservation"

Mexico's new president
El Estado soy yo

El Estado soy yo

AMLO will be the most powerful Mexican president in decades

Andrés Manuel López Obrador has retreated from pragmatism. The markets are worried

Print edition | The Americas Dec 1st 2018

THE SCRAPPERS and dreamers on Mexico's political left have waited more than three decades for national power. The inauguration on December 1st of Andrés Manuel López Obrador as Mexico's president ends the wait. The 65-year-old former mayor of Mexico City will be sworn in before a crowd that will include dignitaries from 28 countries. Mr López Obrador, or AMLO, as he is known, will don a tricolour presidential sash for a second time. The first was in 2006, when he refused to accept defeat in that year's presidential election.

This time the sash is the real one. Voters gave AMLO the biggest democratic mandate in Mexico's history. He won with 53% of the vote, defeating his nearest rival by 30 percentage points. Angered by corruption, violence and economic torpor, they accepted his argument that the political system needs renewal, not technocratic tweaks.

As AMLO prepares for what he calls the "fourth transformation" of Mexico, a term suggesting that his election is as important as the revolution of 1910-20, his power and popularity have grown. He controls Morena, the party he founded in 2014. Along with its allies it has majorities in both houses of congress. Critics have gone quiet. Emboldened, he has dropped a promise not to change the constitution in the first half of his six-year term. Polls suggest that two-thirds of Mexicans support him.

In recent weeks, AMLO has retreated from the pragmatism he sometimes espoused in the campaign, which had reassured some middle-class Mexicans and investors. Instead, he has pursued a populist agenda that has shocked markets even as it consolidates his power. In October he said he would cancel a $13bn airport for Mexico City that is already one-third built. That decision came after 1% of Mexican voters took part in a *consulta* organised by Morena to answer a question AMLO himself wrote: do they prefer the airport now being built or his alternative scheme? The president-elect's allies in the new congress, which began in September, have introduced bills regulating banking, mining and pensions. The stockmarket has lost nearly a fifth of its value since early October.

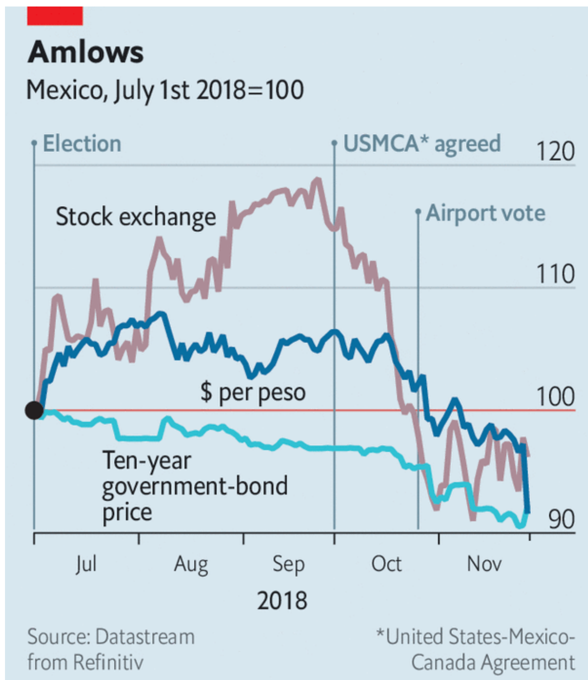
AMLO sceptics had hoped that, in the absence of strong political checks and balances, financial markets would constrain him. That could happen. The central bank raised interest rates after the airport vote, which will slow the economy and oblige the government to pay more to bondholders. After November 26th, when the stockmarket fell by 4%, the government calmed investors somewhat by promoting two respected officials. The budget, due to be presented to congress by December 15th, will give the new government a chance to show that it is serious about fiscal stability, says Gabriel Lozano of J.P. Morgan, a bank.

But many of AMLO's allies see stability as the continuation of an unjust status quo. Ricardo Monreal, the leader of Morena in the senate, says that many firms' profits are too high and that regulations are needed to "disturb their accumulation of wealth". Markets will change their minds when they see how well AMLO governs, he says.

AMLO's crimebusting army

The new president is certainly energetic. He has assented to an updated version of the North American Free Trade Agreement with Canada and the United States. He has put forward 50 ideas for curbing corruption and promoting thrift in the public sector and is beginning to implement them. He will cut his own salary by 60% and cut the pay of senior civil servants to that level. He has unveiled a crime-fighting plan that includes creating a 50,000-strong National Guard under military command. Morena has proposed a bill to legalise cannabis. AMLO intends to give apprenticeships to jobless youths and higher pensions to the aged. His many projects include a tourist train through the south and a refinery in his home state of Tabasco.

AMLO is pursuing his goals through an unconventional combination of congressional deliberation and direct democracy. Congress passed the law that caps bureaucrats' pay. But AMLO plans to put most big decisions—and many small ones—directly to the people. The tourist train and refinery were approved in a vote on November 24th-25th, which attracted the same tiny fraction of the electorate that the airport *consulta* did. Voters approved eight other schemes, including a ballot proposal to "plant fruit and wood trees across 1m hectares, creating 400,000 permanent jobs".



The Economist

In a third *consulta* next March, voters will probably approve the National Guard, which is contentious. Human-rights activists and the supreme court do not think the army should be involved in policing. AMLO agreed with them until recently. He plans to let people vote on whether to prosecute former presidents for corruption but says, confusingly, that he is against it. Midway through his term, voters are promised a chance to recall him from office.

What looks like extra accountability is, in fact, a way of amassing power. The referendums marginalise congress. But AMLO is prepared to go through the legislature, especially if he fears the people's verdict. A bill to undo education reforms, one of the few popular achievements of the outgoing government, will be introduced in mid-December. Congress passed a law that allows AMLO to name "super-delegates" to supervise each state's spending. That will tame governors who might oppose him.

Mexico is about to have "a strong president, like there hasn't been in the past 30 years", says Mr Monreal approvingly. AMLO will have no excuses for failure.

This article appeared in the The Americas section of the print edition under the headline "El Estado soy yo"

Pencil, ruler, gay kit

Brazil's classrooms become a battleground in a culture war

Jair Bolsonaro and his allies crusade against left-leaning teachers

Print edition | The Americas Dec 1st 2018

ON OCTOBER 28TH, the day Jair Bolsonaro won Brazil's presidential election, Ana Caroline Campagnolo, an "anti-feminist" history teacher who had recently been elected a legislator in the southern state of Santa Catarina, sent out a message on Facebook. "Attention students!" she wrote. "Many doctrinaire teachers will be disconcerted or revolted" by the election of Mr Bolsonaro, a politician of the right. "Film or record all partisan manifestations that … offend your freedom of thought or conscience," she urged.

Ms Campagnolo's rallying call issues from a movement called Escola sem Partido ("School without Party", or ESP). It claims that Brazil's schools have been politicised by left-wing teachers and demands "pluralism" in the classroom. Miguel Nagib, who founded ESP in 2004, contends that schools are engaged in "social engineering" that undermines the rights of parents. Mr Bolsonaro, a former army captain, is an enthusiastic supporter. The movement's critics say that its goal is not political neutrality but to instil a culturally conservative agenda that is intolerant of feminism, gay people and the left.

With Mr Bolsonaro's election ESP, which has ties to evangelical churches, has moved from the fringe to the centre. During the campaign he echoed its rhetoric, accusing the federal government of promoting "homosexuality and promiscuity" in schools. A proposed law, backed by ESP, would ban teachers from talking about "gender ideology" (a catch-all term for trendy ideas about sex and gender), sexual orientation and their political views. How that will promote pluralism is unclear.

When the president-elect was reported to be on the verge of naming a respected moderate, Mozart Neves Ramos, to be his education minister, conservatives rebelled. Mr Bolsonaro retreated. On November 22nd he announced that the new education minister will be Ricardo Vélez Rodríguez, a Colombian theologian who has written that schools force "Marxist ideology" on their pupils.

Brazil's biggest teachers' union, with more than 1m members, has ties to the left-wing (but non-Marxist) Workers' Party (PT), whose presidential candidate Mr Bolsonaro defeated. ESP is obsessed with the influence of Paulo Freire, an educator who in the 1950s taught impoverished sugar-cane cutters to read. He thought teaching should draw on issues that affected learners, like hunger. His book, "Pedagogy of the Oppressed", published in 1968, spread that view worldwide. Brazil's military rulers exiled him in 1964. Today, his writings are on the syllabus in most teacher-training courses in Brazil. A law designates him "the patron of Brazilian education".

For ESP, Freire transformed “innocent illiterate people into illiterate communists”. During the election campaign Mr Bolsonaro, who speaks well of the dictatorship that exiled Freire, vowed to “take a flame-thrower to the ministry of education and get Paulo Freire out of there”.

The panic is overdone. Freire is a source of “fashionable jargon”, not a shaper of policy, says Vitor Henrique Paro, a professor of education at the University of São Paulo. ESP has produced no rigorous studies showing that schools are promoting left-wing ideas and non-traditional lifestyles. “They’re citing isolated incidents,” says Mr Paro. Olavo de Carvalho, an influential conservative intellectual and ally of ESP, admitted in a newspaper interview that the proposed federal law to suppress such evils is “premature” because there is no evidence that they are widespread.

There have been enough incidents to rile ESP, which in turn has sowed panic in schools. Teachers in classrooms have worn T-shirts supporting leftist candidates and described the impeachment in 2016 of President Dilma Rousseff as a “coup”, echoing the language of the PT, her party. In a video shared on Mr Bolsonaro’s Facebook page, a teacher screams at a student: “I fought for democracy and you’re here talking about that piece of crap Bolsonaro.”

Equally sinister in ESP’s eyes are campaigns to discourage discrimination against gay people. In 2011 the human-rights committee of the lower house of congress proposed a programme called “schools without homophobia”, which would have encouraged discussion of gender stereotypes and the viewing of films such as “Beautiful Thing”, about a gay relationship. That angered evangelicals. Ms Rousseff, who was president at the time, blocked the programme. That has not stopped Mr Bolsonaro from accusing the PT of distributing “gay kits”, his name for materials that promote tolerance of gays.

A school in Porto Alegre, in the southern state of Rio Grande do Sul, sacked a teacher for assigning material that discussed gay sex. In Rio de Janeiro a private school removed from the syllabus a book about a family escaping from Brazil’s military dictatorship after parents complained that it teaches communism. Juliana Lopes, a high-school teacher in São Paulo, was fired after telling pupils that she wouldn’t vote for Mr Bolsonaro because she thinks he has an authoritarian agenda. The school accused her of discussing politics “with an explicit partisan bias”. Ms Lopes says she was encouraging “critical thinking”.

By suggesting that pupils record their teachers in action, ESP has heightened their fears. “Teachers don’t have the right to confidentiality,” says Mr Nagib. Mr Bolsonaro backs the practice. “Only bad teachers should have to worry,” he says.

Classroom-made recordings appear on social networks and provoke threats. One video showed a teacher telling a student that “idiotic police officers or your lowlife pastor” are lying to him. The teacher says that he received death threats; he admits that the harangue was inappropriate.

With Mr Bolsonaro in the presidency and Mr Vélez at the education ministry, ESP will have more powerful advocates than it could ever have dreamed of. But the movement faces formidable opposition. Courts in at least five states have overturned ESP-backed municipal laws, saying they violate the constitution’s guarantee of freedom to learn and teach. If the congress backs the federal proposal, it will surely be challenged in the courts. In the fight to contain a radical president’s powers, classrooms will be an early battleground.

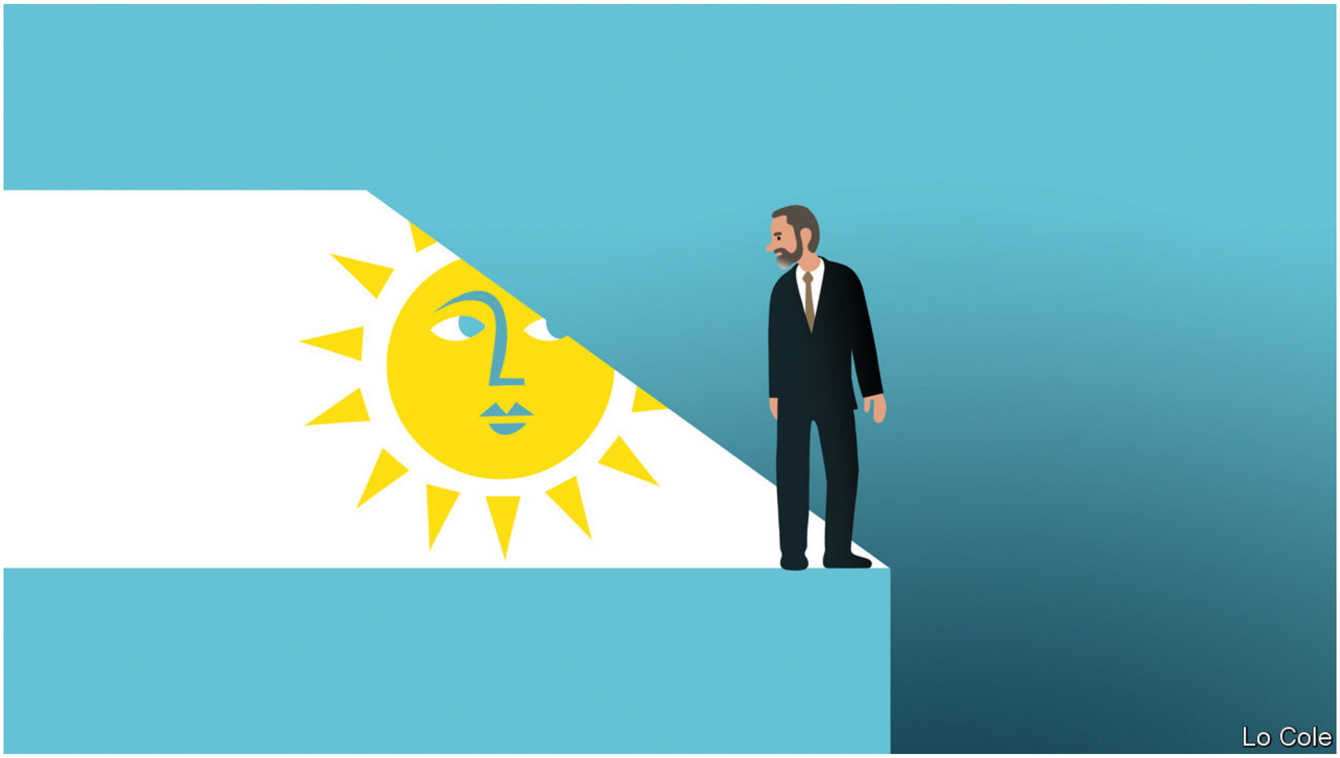
This article appeared in the The Americas section of the print edition under the headline ”Pencil, ruler, gay kit”

Bello

A memoir of Argentina's collective madness

In recounting his father's life, a journalist tells the story of his country

Print edition | The Americas Dec 1st 2018



Lo Cole

"BEFORE JUMPING feet first from the 16th floor, papa said goodbye to the Argentine working class." With that irresistible sentence Martín Sivak begins "El Salto de papá" ("Papa's Leap"), a book that has been a bestseller in Argentina since its publication last year. It is both a moving tribute to his father and an oblique but telling examination of Argentina's lingering, pathological streak of self-destruction.

Jorge Sivak, the papa in question, was a man of contradictions: banker, property developer, communist. He dabbled in urban guerrilla warfare. His contacts included military men and politicians of many stripes. He took his life on December 5th 1990, with the authorities poised to take over the insolvent family finance company. It was the remnant of a business empire set up by Martín's grandfather, Samuel Sivak, initially by investing funds from Argentina's Communist Party. As Jorge jumped, he waved to horrified workers building what would become a Hyatt hotel. His leap came as global communism was crumbling.

Aged 15 at the time, the author has been haunted ever since. Whatever his faults, Jorge was a loving father, his son writes, and an exciting one. He took Martín to conspiratorial meetings and to watch Independiente, a football team. He introduced him to Independiente's balding midfield genius, Ricardo Bochini, a friend and working-class hero in an era when footballers were swindled rather than pampered. The book is "first and foremost...the text of a son who has grieved for 25 years", he writes at the end of it. What he calls "the big childish question—why did you abandon us?" yielded to an attempt "to understand why he had committed suicide and what his life had been like".

To answer those questions the author, a journalist, sets out to interview those who knew his father (this being Argentina, they include his psychoanalyst and hairdresser). They conjure up a bizarre and tragic period, centred on the cold-war-era conflict among Peronists, guerrillas inspired by Che Guevara (an Argentine, after all) and the army and its allies. This continued, in the shadows, even after the military dictatorship of 1976-83 gave way to the elected government of Raúl Alfonsín.

Jorge Sivak's elder brother, Osvaldo, groomed as Samuel's successor, was kidnapped by anti-communist police officers in 1979 and again in 1985. They suspected that the Sivak company was laundering guerrilla money. The kidnappers pocketed a ransom of $1.1m and shot Osvaldo.

Jorge was a hopeless and reluctant businessman, operating in an Argentina in which business, politics and guns were entwined. He befriended army officers, especially the *carapintadas* (painted faces), far-right mutineers who repeatedly threatened Alfonsín's government. In a quixotic way he was trying to unite Argentina, but around nationalism, not democracy. The finance company made loans to politicians that were not repaid; Jorge gave jobs to friends and political contacts. Proud of having been a political prisoner, he feared jail for financial crimes. That, together with survivor's guilt, seems to have driven him to suicide.

According to his psychoanalyst, Jorge was "an almost neurological case of disorganisation". That goes for Argentina in this period, too. There were guerrilla movements and dictatorial responses across Latin America. Leftist violence and its repression were extreme in Argentina, a country that has found it hard to recognise limits (that may explain why its middle class is addicted to psychoanalysis). Many doctoral theses are needed to explain this. Perhaps it has something to do with its past wealth, its limitless space (a population of 45m inhabits a country almost the size of India) or the mass immigration of Italian and Spanish anarchists (they included Martín's maternal grandfather).

Despite its continuing difficulty in achieving economic stability, Argentina has overcome its penchant for political violence over the past 30 years and the army now has no role in politics. It is progress, perhaps, that on the eve of a G-20 summit in Buenos Aires on November 30th, the main news was merely that stone-throwing football hooligans prevented the playing of the final of the Copa Libertadores (Latin America's club championship) between Boca Juniors and River Plate, Argentina's biggest clubs. It is notable, too, that despite the country's descent into recession and inflation, it is not impossible that the reformist, moderate government of Mauricio Macri will win an election next year. Just maybe, Argentina is maturing.

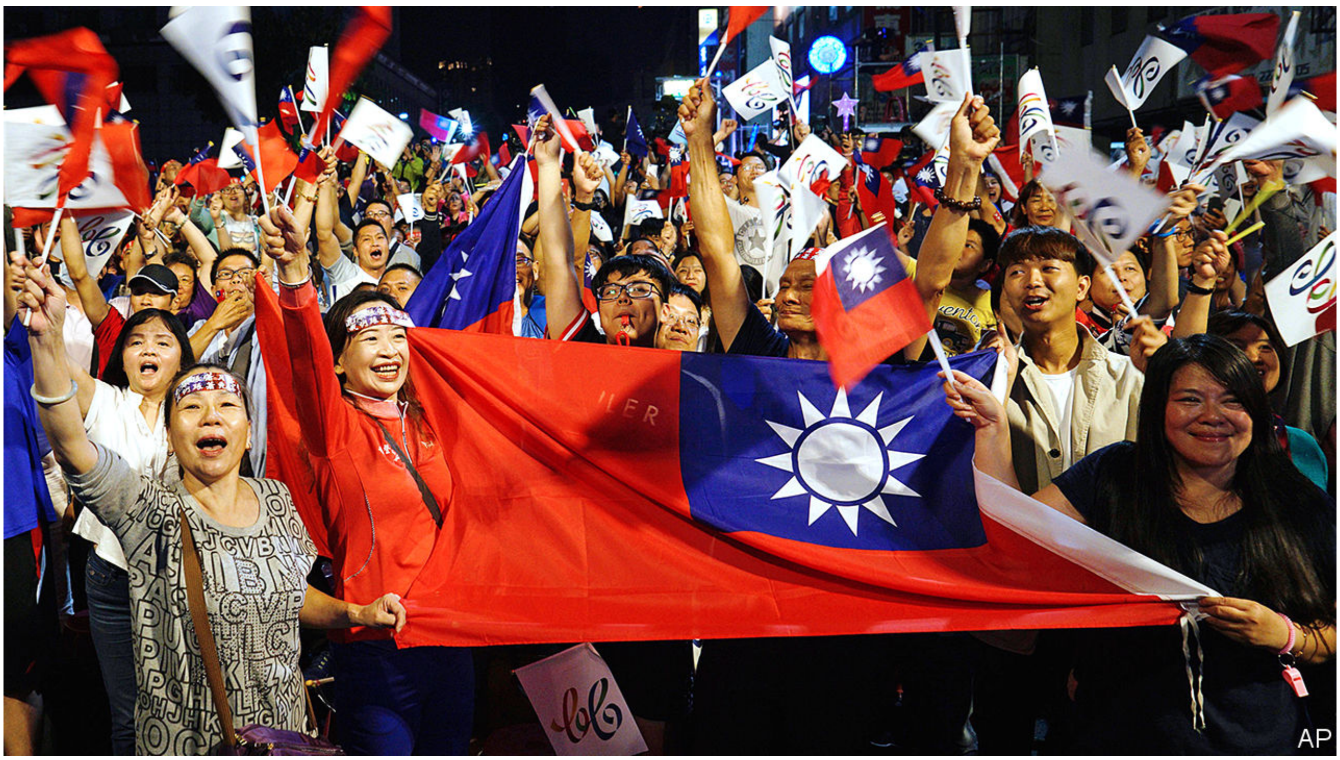
This article appeared in the The Americas section of the print edition under the headline "Bankers, communists and football"

Tsai swiped

Cheered on by China, Taiwan’s opposition drubs the ruling party

The president’s chances of re-election look dimmer

Print edition | Asia Dec 1st 2018



ON THE FACE of things, local elections in Taiwan on November 24th had little to do with China. Rather, they centred on disgruntlement with Tsai Ing-wen, the president, who had pushed through several controversial reforms since taking office in 2016, while dithering over some of her supporters’ most cherished causes. But the outcome, a crushing defeat for Ms Tsai’s Democratic Progressive Party (DPP), which would like Taiwan to abjure its notional status as part of China and declare itself a distinct country, will have prompted delight on the other side of the Taiwan Strait. The opposition Kuomintang (KMT), which favours ever-closer ties with China, has been revived after a dismal performance in 2016. Ms Tsai’s hopes of re-election in 2020 are looking dimmer.

Before the election the DPP controlled 13 of Taiwan’s 22 counties and cities. Now the tables have been turned. The KMT will run 15 and the DPP just six. (An independent candidate appears to have won re-election as mayor of Taipei, the capital.) The DPP even lost control of its electoral stronghold, the southern city of Kaohsiung, which it had ruled for 20 years. The results seemed so calamitous that Ms Tsai felt obliged to resign as head of the DPP. Her popular prime minister also offered to resign, but she demurred. “I’m the one that needs to change,” she declared on Facebook on November 26th.

Lo Chih-cheng, a DPP lawmaker, argues that Ms Tsai took on too many reforms at once. “The president was quite idealistic, not realistic,” Mr Lo said. “She thought the more, the better.” She cut unsustainable public pensions dramatically, which alienated many civil servants. She froze and in many cases confiscated the KMT’s assets, on the grounds that it had acquired them unfairly as the governing party during nearly 40 years of authoritarian rule. She pushed through a law to phase out nuclear power by 2025, alarming industrialists who rely on cheap and stable electricity.

Moreover, Mr Lo adds, when grappling with polarising issues, Ms Tsai has sometimes angered both sides in a fruitless search for middle ground. She limited normal working hours, upsetting bosses who now have to pay more overtime, but also trimmed the number of public holidays, angering ordinary workers. She dithered about legalising gay marriage, which she had supported during her election campaign, leaving it to the courts to settle the matter. And although she enraged China by refusing to affirm that it and Taiwan are both parts of the same country, she has been careful to do nothing else to provoke it, to the ire of independence activists.

Going west

The GDP growth rate has risen during Ms Tsai's tenure, from 1.4% in 2016 to a projected 2.7% this year. But that has not been enough to dispel a sense of economic stagnation, compounded by the abrupt contraction of tourism from China following Ms Tsai's election. Young Taiwanese continue to emigrate to the mainland in search of greater opportunity, often lured by generous official grants. Roughly a tenth of the Taiwanese workforce now lives in China.

China makes no bones about supporting the KMT. It cut all official contact with the national government after Ms Tsai's election, but maintained links with KMT-run cities. During the campaign it halted intimidating circular patrols around the island by its warships and military aircraft, since such shows of force tend to stir nationalist feelings among Taiwanese, boosting the DPP. The Taiwanese government accused China of spreading false rumours on social media to help the KMT. Areas where the KMT has prevailed, such as Kaohsiung, are expected to see an influx of Chinese tourists and a surge in exports of agricultural goods to China.

But Mr Lo argues that it would be a mistake to view the results as endorsement of closer ties with China. There was a referendum on the ballot that touched directly on cross-strait relations, asking whether the country should demand to be called Taiwan at the Olympics, instead of Chinese Taipei. The result was ambiguous: the proposal was rejected, but only after the Olympic authorities warned that it might lead to Taiwan's exclusion from the Tokyo games in 2020. The DPP did not campaign in favour of the idea, which is just the sort of departure from the status quo that Ms Tsai has tried to avoid.

Moreover, the KMT is still in disarray. Its candidate in Kaohsiung, Han Kuo-yu, proved to have genuine star power. But he is an outsider, initially written off by the leadership as a no-hoper. The party has no obvious presidential candidate.

Some in the DPP even see a silver lining in the nine other referendum questions on the ballot, none of which went the party's way. Voters approved several measures hostile to gay rights, making it tricky for the government to fulfil the supreme court's injunction to legalise gay marriage. They also rejected Ms Tsai's scheme to close Taiwan's nuclear plants. But it is the DPP that champions the idea of direct democracy. The Chinese authorities, who would love one day to absorb Taiwan, must hate the precedent being set.

This article appeared in the Asia section of the print edition under the headline "Tsai swiped"

Banyan

Singapore's ruling party reveals the next prime minister

All hail the new first assistant secretary-general!

Print edition | Asia Dec 1st 2018


Till Lauer

READERS OFTEN grumble that Singapore's high commissioner to London (a public servant of great intelligence and charm) wastes inordinate time penning letters of complaint to *The Economist*, usually over any hint that Singapore is in effect a one-party state. Banyan once argued that the ruling People's Action Party (PAP), with 82 out of 89 elected parliamentary seats, had maintained its uninterrupted rule since 1959 not only by governing competently, but also through gerrymandering, harassing opposition figures, cowing the media, threatening spending cuts in districts that vote against it and "inculcating the absurd notion that its survival and that of Singapore itself are synonymous". The high commissioner duly responded: Singaporeans vote for the PAP "because it continues to deliver them good government, stability and progress". One reader promptly called out the "delicious irony": surely such claims are for the PAP to make, not "the ambassador who represents the very state she insists is not synonymous with its ruling party."

This column returns to the one-party theme, because years of speculation over who the next prime minister of Singapore will be would appear to have been settled. Lee Hsien Loong, eldest child of Singapore's late independence leader, Lee Kuan Yew, has run the country since 2004. But he will step down ahead of his 70th birthday in 2022.

Never say that Singapore is a hereditary state, like North Korea. The fact that Lee family members occupy high positions in state bodies has nothing to do with nepotism but with talent and selfless energies. Admittedly, Lee Kuan Yew occasionally allowed that superior genes might have something to do with it. But those genes are not flawless. Their inheritors have indulged in an unseemly family squabble, played out in social media, over the great man's will. That may have tarnished the family somewhat in Singaporeans' eyes. At any rate, there is no strong family candidate to take over the reins.

On November 23rd came news instead that Heng Swee Keat, the 57-year-old finance minister, will be Singapore's next leader. The PAP didn't put it quite like that: it announced that he had been appointed its first assistant secretary-general. But media with ties to the government, such as the *Straits Times*, lost no time inferring it.

So comparisons with China may be more apt. Its Communist Party loves to send signals through appointments to obscure positions within its hierarchy. It refers to party "cadres"—just like the PAP. It emphasises "collective" leadership, or did before the rise of Xi Jinping. And it talks in terms of "generations" of leaders since "new" China's founding in 1949: Mr Xi is of the fifth. Mr Heng's elevation was supposedly a collective decision of the PAP's "4G" (fourth-generation) cadres. No intra-party democracy there.

Another parallel: for all the talk of a new generation taking over, the oldies never fade away. For 21 years after stepping down as prime minister, Lee Kuan Yew remained in the cabinet. And years ago Lee set up Mr Heng by saying that his bright former private secretary was destined for greatness. Deng Xiaoping also ruled from beyond the grave. Well before his death in 1997, he had picked out Hu Jintao, Mr Xi's predecessor, who held power from 2002 to 2012.

The late Mr Lee's only regret was that Mr Heng, at around five feet six inches, "is not of a big bulk, which makes a difference in a mass rally". But then the PAP loves a technocrat. Mr Heng, who has run the education ministry and the central bank, is nothing if not that.

Popular sentiment also surely counts. Singaporeans like Mr Heng's soft-spoken humility, and sympathise over a stroke he suffered two years ago. Ad nauseam, the *Straits Times* and others praise his propensity to "listen". That has come to matter since the PAP's poor electoral showing in 2011 suggested it had lost touch with ordinary Singaporeans.

A second assistant secretary-general was also appointed: the trade minister, Chan Chun Sing. A scrappy politician, you can imagine him thriving in any full-throated democratic system, unlike Mr Heng. He makes much of his humble origins and subsequent success, including scholarships and a brilliant army career. That grates on many Singaporeans, but there is no denying his ambition. And so, a final parallel with the Chinese Communist Party: might a populist challenge upset succession plans, just as Bo Xilai's dramatic bid nearly did for Mr Xi in 2012? Best to leave any speculation about that to the high commissioner.

This article appeared in the Asia section of the print edition under the headline "Rolling out 4G"

A cleric for all seasons

Indonesia’s president picks a Muslim scholar as his running mate

Ma’ruf Amin’s beliefs are worryingly changeable

Print edition | Asia Dec 1st 2018

MA’RUF AMIN cuts a demure figure. Short and smiling, he dresses in sandals, sarong and skullcap. The 75-year-old Muslim cleric is likely to be Indonesia’s next vice-president. He and his running-mate, Joko Widodo, Indonesia’s president, who is usually known as Jokowi, have a 20-percentage-point lead in the polls ahead of the election in April. He says governing with Jokowi will be like “a game of badminton doubles”. When the president goes toward the net, Mr Amin should drop back. When one steps left, the other moves right.

Mr Amin certainly provides his partner with a type of balance. Religion looms large in Indonesian elections. Many in the world’s third-largest democracy see Jokowi as not devout enough, a serious charge in an overwhelmingly Muslim country. When he was first elected, in 2014, rumours circulated that he was in fact a closet Christian. Most religiously inclined parties supported his opponent in that election, Prabowo Subianto. Mr Amin is the head of Nahdlatul Ulama (NU), a Muslim organisation that claims 50m members, as well as the chairman of the country’s main clerical council. By adding Mr Amin to his ticket in place of his current, term-limited vice-president, Jokowi doubtless hopes to attract more pious voters in his re-match against Mr Prabowo next year.

But some worry that Mr Amin is less of a counterbalance and more of an albatross. NU is a moderate organisation, which aims to defend the syncretistic, folksy form of Islam that was once the norm in Indonesia against the more austere (some would say purer) version that has become commonplace in cities. But Mr Amin himself has at times espoused doctrinaire views. He has issued fatwas against sects he deems deviant. He advocates a ban on gay sex, arguing that most Indonesians would approve. He would like to implement sharia, though only through the proper legislative process. In 2017 Mr Amin’s testimony as an Islamic scholar helped secure the conviction of Basuki Tjahaja Purnama (“Ahok”), a former governor of Jakarta and an ally of Jokowi, on trumped-up blasphemy charges. Mr Amin argues that the biggest problem facing Indonesia is a crisis of belief, rather than more common complaints such as corruption or bad roads.

At one level, the choice of Mr Amin seems to be helping Jokowi. Polls suggest that the most pious voters (those who pray at least twice a day and read the Koran) will plump for the president—the reverse of 2014, when a majority of them are thought to have opted for Mr Prabowo. Voters trust Mr Amin on religious matters more than they do his counterpart on Mr Prabowo’s ticket, Sandiaga Uno, a businessman and former deputy governor of Jakarta. But surveys also show that, among voters who are familiar with all the candidates, the vice-presidential choices reduce Jokowi's lead over Mr Prabowo by six percentage points. The number of voters Mr Amin attracts to the ticket, in other words, may be outweighed by those he puts off.

Two compensating factors may have drawn Jokowi to Mr Amin. First, his age. Running for vice-president boosts a candidate's chance of being elected to the top job in the future. Jokowi's choice had to be approved by the leaders of the coalition of parties from which he derives his support in parliament. Most of them have a candidate they would like to see win the presidency at the following election, in 2024. The already elderly cleric is unlikely to be in the running then.

Second, Mr Amin is politically shrewd and ideologically elastic. Despite coming from humble stock, he has climbed to the upper echelons of political and religious life. He has positioned himself as an authority on the sharia economy and won lucrative positions on the compliance boards of big banks. Already, Mr Amin's tone appears to be moderating. He says that Islamic schools should champion tolerance to curb the spread of violent radicals. He has been buttering up religious minorities and supporters of Ahok.

This apparent lack of fixed beliefs makes Mr Amin dangerous, some say. But just how dangerous depends on how big a role he is given. A convincing win would allow Jokowi to sideline Mr Amin. A narrow victory, in contrast, might leave him dependent on the religious camp that Mr Amin helps to cultivate. In the game of presidential badminton there is still much to play for.

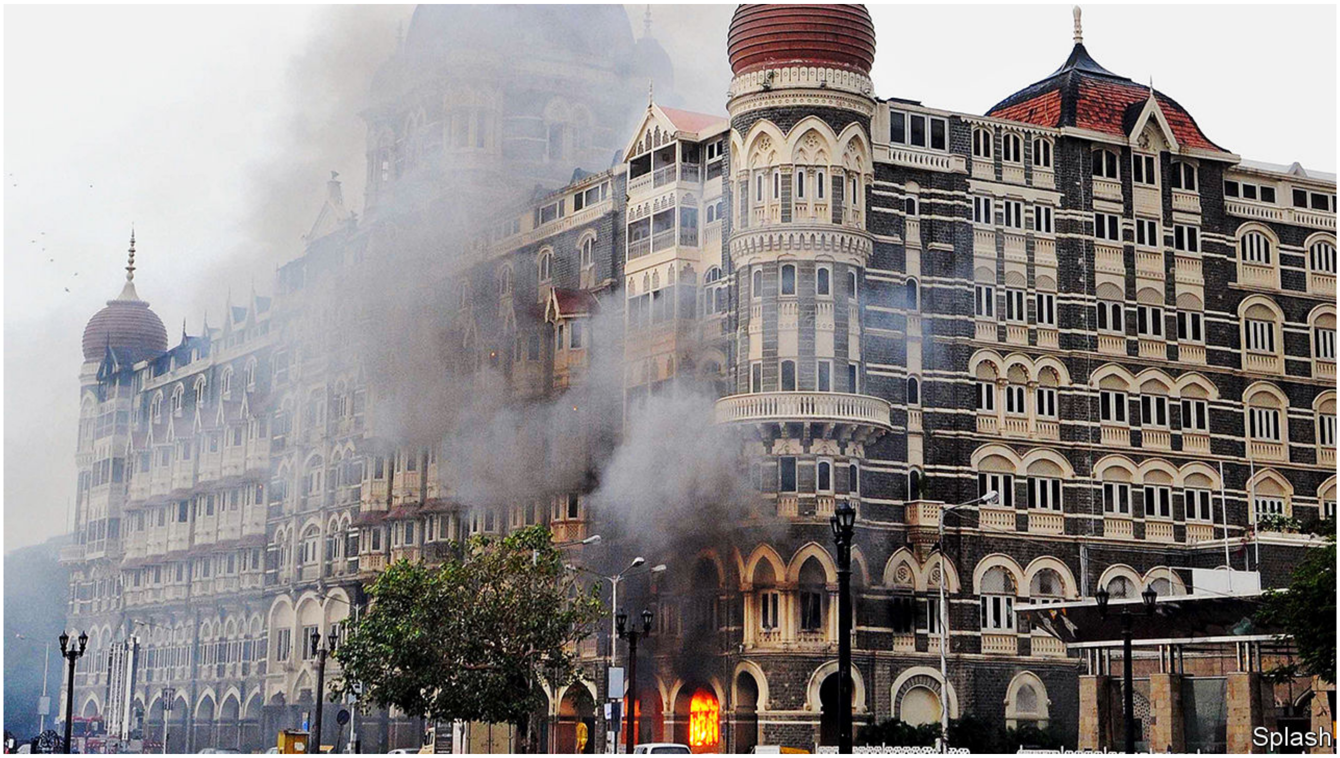
This article appeared in the Asia section of the print edition under the headline "A cleric for all seasons"

Room for improvement

A decade after the Mumbai attacks, India remains vulnerable

The outfit that mounted them still operates in Pakistan

Print edition | Asia Dec 1st 2018



THIS WEEK residents of Mumbai marked ten years since gunmen of Lashkar-e-Taiba (LeT), a terrorist group with close ties to Pakistan's intelligence service, rampaged through their city over four harrowing days, killing 166 people. A decade on India has beefed up security, launched cross-border raids against terrorists and drummed up international pressure on Pakistan. Yet many of the institutional failings that left it open to attack remain unchanged, while LeT and like-minded jihadists are stronger than ever.

The good news is that Indian cities are safer than they were. The number of serious attacks, excluding those in insurgency-ridden states like Kashmir, fell from 25 in the eight years leading up to the Mumbai attacks to six since, notes Tilak Devasher, a former Indian security official. Large cities have avoided Mumbai-like atrocities.

That may partly be owing to improved defences. A spate of institutions were established or spruced up after 2008. A new National Investigation Agency became the lead law-enforcement body for terrorism cases. The Multi Agency Centre, which was created after lapses in intelligence-sharing between different government agencies allowed Pakistani troops to grab a sliver of Indian territory in Kashmir in 1999, was strengthened following a similar failure of co-ordination ahead of the assault on Mumbai. The National Security Guard (NSG), a force of commandos that was pilloried for taking ten agonising hours to get to Mumbai from its New Delhi headquarters, set up hubs in six other cities.

India's spies and soldiers have also stepped up their work. India has tightened links with foreign spy services, including those of America and Britain, both of which eavesdrop closely on jihadists in Pakistan, and the United Arab Emirates, once a favourite hideaway for shady Pakistanis. It has signed extradition treaties with seven additional countries and agreed Mutual Legal Assistance Treaties with 15 more.

Shivshankar Menon, who became national security adviser after the Mumbai attacks, says that India responded with "covert" and "asymmetric" measures as well. The army has been more willing to flex its muscles, too, conducting what the government called "surgical strikes" on Pakistan's bit of Kashmir after a massacre in 2016 of Indian soldiers by militants based in Pakistan, though many thought these more a political stunt than a serious deterrent.

For all this activity, many experts and officials remain sceptical about how much has changed. Co-ordination between the central government and states, which have constitutional responsibility for policing and public order, as well as among states, remains a problem. Vappala Balachandran, a veteran police officer and intelligence official, points to a tussle between the

Anti-Terrorism Squad of Maharashtra, a large western state which includes Mumbai, and New Delhi's police force, with each arresting one another's operatives. A National Counter Terrorism Centre was supposed to resolve these feuds but never got off the ground. Officials also point to massive staff shortages, poor personnel management and rampant nepotism in intelligence agencies, as well as a police-to-population ratio that is one of the lowest in the world. Remarkably, NSGcommandos still lack their own aircraft.

In recent months Ajit Doval, the national security adviser, seen by acolytes as a swashbuckling figure who would personally slip across the border to shoot at terrorists if given the chance, has ushered in a sweeping reorganisation of his office, stacking it with spies instead of diplomats, increasing its budget tenfold and taking over prime New Delhi office space from cabinet ministers. The concentration of power has irked many. It is "totally unsuited to a democracy like India", Mr Balachandran says.

Meanwhile the threat to India is dormant but undiminished. Pakistan has largely kept LeT on a leash over the past decade, wary of provoking Indian bombs or America's wrath. But Hafiz Saeed, LeT's leader, was allowed to field candidates in elections in July and his front organisations were recently dropped from Pakistan's list of banned outfits. On September 30th the loquacious Mr Saeed even shared a stage with Pakistan's religious affairs minister, cheerfully defying a $10m American bounty on his head. Were he to be permitted to strike an Indian city once more, India's only partly patched defences would be sorely tested.

This article appeared in the Asia section of the print edition under the headline "Blasts from the past"

Victorian values

A state election signals disaster for Australia's ruling party

A lurch to the right is costing the Liberals dearly

Print edition | Asia Dec 1st 2018

DANIEL ANDREWS, the premier of the Australian state of Victoria, calls his government "the most progressive...in the nation". In a state election on November 24th it was returned to power in a landslide. Results are still trickling in, but as *The Economist* went to press, the Labor party had won almost 43% of first-choice votes (the electoral system allows voters to rank parties in order of preference), compared with 31% for the Liberals, the country's conservative ruling party. Victorians, Mr Andrews declared, had chosen a "positive and optimistic plan" over "the low road of fear and division".

In his four years in charge, Mr Andrews has dug metro stations, built schools and legalised voluntary euthanasia. The state's economy is Australia's fastest-growing. Whereas his party campaigned on its ability to "get things done", the Liberals tried to convince Victorians that their capital city, Melbourne, was under siege. Crime is running "out of control", insisted the party's leader in the state, Matthew Guy. Victoria, it pronounced, is the "state of disorder".

First the Liberals accused South Sudanese immigrants of terrorising the state. Their marauding gangs make Victorians "scared to go out to restaurants", complained the reactionary federal immigration minister, Peter Dutton, after a spate of crimes last year. "African chaos" shrieked the state's most-read newspaper, following a fracas in August. A religiously motivated attack two weeks before the election was swiftly politicised, too. The perpetrator was an Islamist of Somali birth, who fatally stabbed a café-owner in Melbourne before being shot by police. Conservatives in Victoria's parliament immediately blamed the state government for not having locked him up, and suggested suspicious characters should be banned from city centres.

But this tub-thumping does not seem to have resonated. Almost a third of Victorians were born abroad. It did not help the Liberals' case that crime has fallen by almost 8% over the past year, and that Africans account for only a tiny sliver of it. The Liberals' share of first-choice votes was down by six percentage points compared with the previous election. In the wealthy suburban constituency of Brighton, which Labor has never won, its 19-year-old candidate, a student, lost by only a whisker.

That should serve as a warning to the federal Liberal party, which is locked in an ideological identity battle ahead of an election due by May. The right wing, led by Mr Dutton, attempted to drag the party in its direction in August by deposing the moderate prime minister, Malcolm Turnbull. Some claimed this would help win marginal votes in the conservative state of Queensland. In the past the party has had great electoral success stoking fears about unchecked immigration. Yet its obvious fear-mongering and its refusal even to discuss climate change—coal is another of the right wing's pet causes—have alienated centrists, leading to trouncings at recent by-elections in Sydney and rural New South Wales. Moderates are at a loss. A disgruntled federal MP resigned from the party after the election in Victoria, further reducing the standing of the Liberal-led minority government. She complained that the party was in the hands of right-wing reactionaries, and that most of her colleagues were too self-interested to stand up to them. The polls suggest that even bigger embarrassments loom.

This article appeared in the Asia section of the print edition under the headline ”Victorian values”

Taxation
What about representation?

Dodgers on notice

Why only 2% of Chinese pay any income tax

The government wants to raise that to 15%

Print edition | China Dec 1st 2018

"OF COURSE NOT, I'm not an idiot," says Liu Yongli, a chauffeur in Beijing, when asked whether he has ever paid personal income tax. Despite earning well above the tax-free threshold, Mr Liu (not his real name) breezily explains that he has never faced any consequences for tax-dodging. Cavalier views like his may help explain why personal income tax accounted for only 8% of total tax revenue in China last year, compared with an average of 24% in the OECD, a group of rich countries.

The finance ministry estimates that 187m people ought to be paying income tax. Yet a former finance official reckons that in 2015 only 28m people—just 2% of the population—did so. In theory, the income-tax reform on which the authorities are embarking, which the *People's Daily*, the Communist Party's main mouthpiece, is calling the most significant in the country's history, is about narrowing the tax base, not widening it. The threshold at which tax becomes payable was raised from 3,500 yuan ($503) to 5,000 yuan a month on October 1st. The finance ministry says the number of people liable for income tax should fall to 64m as a result. But it also seems determined to make those who owe tax actually pay it—a change that could have dramatic implications for politics.

A revamp of the income-tax system has been in the works for several years. A tax-evasion scandal this summer involving Fan Bingbing, China's most famous actress, who was exposed by a whistleblower for having ducked nearly 300m yuan in taxes, may have added urgency to the task. (Ms Fan was eventually fined 884m yuan.)

Fanning the flames

Public interest is enormous. A state-sponsored "consultation exercise" on the reform in July attracted over 130,000 comments. That is around 100 times the average for such exercises, which the national parliament is legally required to conduct before approving new laws.

Salaried professionals in big cities have long complained that they bear an unreasonable share of the tax burden. That is because firms are legally required to withhold a portion of salaries in taxes. The rich, whose income usually does not come in the form of a pay cheque, and those in the informal economy, like Mr Liu, find it comparatively easy to evade the taxman. Even salary-earners can evade tax by arranging to receive most of their pay under the table, in cash, keeping their declared earnings below the level at which income tax starts being levied. Employers agree to this scam because it allows them to shirk on social-insurance contributions, which can be as high as 40% of a worker's salary.

The finance ministry reckons that a worker on a monthly salary of 15,000 yuan is enjoying savings of around 1,000 yuan a month as a result of raising the tax-free threshold. Special deductions that come into force in January for education, care for the elderly and rent, among other expenses, will further boost tax savings. A spokesman for the ministry says the reform will result in 320bn yuan in lost revenue, about a quarter of what the government currently collects in income tax.

But the reforms also include rules that aim to make it harder for companies to avoid social-insurance contributions by paying workers under the table. Those who make more than 60,000 yuan a year will be required to file annual tax returns, starting next year. Preferential tax treatment for annual bonuses may end, notes Freeman Bu of Ernst & Young, an accounting firm. There will be more audits and investigations, predicts Ellen Tong of Deloitte, another accounting firm. Expatriates, who had previously found it easy to avoid being taxed on their worldwide income, will face closer scrutiny. The anti-tax-avoidance provisions in the new law are likely to convince many to "reconsider", says Grace Lin of Cuatrecasas, a law firm.

Mr Liu, the chauffeur, intends to call the government's bluff. He believes that most people will not file taxes despite the new regulation. Everyone knows "there is an equilibrium of cheating", he says: workers skimp on taxes because they do not trust the government will spend their money wisely. Mr Liu cites the Belt and Road Initiative, a global infrastructure-building project, as an indefensible giveaway to poor countries. The government, he explains, has enough "self-awareness" to recognise that turning a blind eye to tax shirkers is in its political self-interest.

But China has run a budget deficit in 21 of the past 22 years. Last year the deficit breached the government's self-imposed cap of 3% of GDP. Public debt stands at around 50% of GDP. Although none of these figures is alarming, especially by the standards of the rich world, the economy's slowing growth will eventually make the government's debts harder to control.

No wonder, then, that officials are keen to boost revenues. Authoritarian regimes typically prefer indirect levies such as consumption taxes, not least because these are less likely to arouse resentment than income tax. If the government manages to expand the ranks of taxpayers, it may feel pressure to provide more detail on how their money is spent, and perhaps even a say in its use. As Bruce Gilley of Portland State University points out in a recent paper, resentment against a tax on salt under the Nationalist government helped to propel the Communist Party to power.

This article appeared in the China section of the print edition under the headline "What about representation?"

London calling

A Chinese state broadcaster is accused of abetting human-rights abuses

A legal complaint aims to take it off the air in Britain for showing a forced confession

Print edition | China Dec 1st 2018

PETER HUMPHREY was a British corporate investigator living in Shanghai when he was convicted in 2014 of violating Chinese laws protecting personal data. He was sentenced to two-and-a-half years in prison. The verdict was a shock but not a surprise: the previous year, viewers of Chinese state television had watched a video of Mr Humphrey confessing from jail.

At a press conference in London on November 23rd Mr Humphrey, now released and living in Britain, said that the confession was scripted and filmed under duress. He claimed the footage was not only shown to domestic audiences but also broadcast on China's international news channel, which is available in Britain (since 2016 it has gone by the name of CGTN). He says this is forbidden by Britain's broadcasting regulations and is asking Ofcom, Britain's telecoms regulator, to take CGTN off air.

Televised confessions, shot and broadcast before trial, have become a regular feature of China's criminal-justice system. Safeguard Defenders, a civil-rights group, counts nearly 50 such recordings made since 2013, involving around 100 detainees. In his complaint to Ofcom, Mr Humphrey says that he was required to make two confessions, and that on the first occasion he was filmed while fastened to a chair that was placed within a cage. He says that his jailers had denied him medical treatment and that they had sedated him. Ofcom says it is examining the matter "as a priority"; in the past it has ruled against television stations named in similar complaints. In January it fined Al Arabiya, headquartered in Dubai, £120,000 ($153,000) after it broadcast footage of a Bahraini opposition politician confessing to offences while awaiting a re-trial. In 2011 it levied a £100,000 fine on an Iranian channel that had broadcast an interview with an imprisoned journalist conducted under duress.

Mr Humphrey's complaint comes as the Chinese government seeks to increase the reach of its international media outfits. In March it said it planned to merge the foreign arms of its main television and radio services into a new group called Voice of China, which would come under the responsibility of the Communist Party's propaganda department. CGTN is opening a new production centre in west London, expected to be bigger than its two existing hubs in Nairobi and Washington, DC. These ambitions are making people wary, and not just in Britain. In September America's justice department was reported to have asked CGTN and Xinhua, China's state newswire, to register as "foreign agents". This limits access to lawmakers and government officials, among other hassles.

The party's foreign-media operations are one focus of a broad investigation into Chinese efforts to gain influence in America published on November 29th by the Hoover Institution, a think-tank. Its authors (a working group of some 30 academics) said that as well as promoting English-language content of its own, the party had used a variety of means to limit criticism of its policies in supposedly independent Chinese-language media in America. They cautioned that some Americans are now consuming news and discussions posted on WeChat, a Chinese social-media platform "known to be censored by a foreign government that opposes free speech". They noted that many foreign correspondents stationed in China feel that the government is circumscribing their activities ever more severely; they argued that when American reporters are prevented from doing their jobs as a result of "visa denials and restrictions of access", American authorities should respond in kind.

For the time being much of the party's international media output remains dull and little-watched. Punishing China's state-media firms for their government's harassment of Western journalists may encourage the party only to keep viewing the press as proxies of foreign powers (and thus chips that can be bargained with in all manner of future disputes). Peter Dahlin of Safeguard Defenders, who himself was required to make a televised confession in 2016 after being arrested in Beijing in connection with his work for another NGO, cautions against trying to "fight censorship with censorship". But he says it is only right to make sure that China's international news organisations are following the rules that already exist.

This article appeared in the China section of the print edition under the headline "London calling"

Chaguan

A history of China in 8m objects

A new network of museums does not gloss over the awkward bits

Print edition | China Dec 1st 2018

"WE DO NOT speak. We let the cultural relics speak!" declare the ambiguously worded signs around China's most interesting history museum: the Jianchuan Museum Cluster, a sprawling, astonishing memorial to China's 20th century. Taken literally, the notices are a request not to be noisy. They remind elderly couples or red-scarved school groups to whisper as they wander through the 33-hectare campus with its dozens of museums housing three-dimensional recreations of life under Japanese occupation in the 1940s, or during the "Red Age". That is the museums' tactful name for the 1960s and 1970s—above all the Cultural Revolution, the decade after 1966 when Mao Zedong unleashed terror on his own country, pitting neighbour against neighbour, students against teachers, children against parents and Red Guard mobs against officials whom Mao despised. More than a million lives were lost, and many more ruined. Centuries-old temples and libraries were smashed to so much rubble and firewood.

The signs also carry a symbolic meaning that no Chinese visitor can miss. In a country where historical studies are a tool of the Communist Party's control, not an invitation to debate, the Jianchuan museums take another path. Quietly and sympathetically, without bossy sloganeering, they let visitors explore and share memories of the recent past, as jogged by a unique collection of some 8m artefacts. These are museums that show, rather than tell.

Taken as a whole, the exhibitions comprise the largest private-sector museum in China. They are the work, essentially, of one man, Fan Jianchuan, a government official turned property tycoon. His museums are divided between two sites. First came the campus outside Anren, a country town in the soft, green lowlands of Sichuan province. In June Mr Fan opened another complex in the Yangzi-river city of Chongqing. There he hosts Chaguan for a fiery Sichuanese lunch in offices above an old munitions factory built into a cliff. Restless and plain-speaking, he has the shaved head of a monk and the torso of a wrestler, squeezed into a green T-shirt with a motto that pays homage to his army years on the border with Russia. He talks of patriotism, calligraphy and the commercial headaches of running museums. Everything returns to his collector's love of the authentic. "The real thing, this," he says, giving the massive steel lunch-table a loud slap. "Second world war."

China has no monuments that explicitly remember victims of the Cultural Revolution. The party has declared that period a disaster while asserting that Mao's achievements far outweigh his mistakes. Until this year, a history textbook used in Chinese middle schools devoted three pages to the Cultural Revolution. In January social media erupted over news that that decade of turmoil is now covered in six paragraphs of a chapter headed "Arduous Exploration and Achievements in Development".

Mr Fan's museums pick no fights with a party whose accomplishments he notes with pride, and of which he is a member. His exhibits are sincerely patriotic. They have been garlanded with official praise and awards, notably for displays depicting the Japanese occupation. Over the course of a rainy couple of days this reporter shared the museums at Anren and Chongqing with flag-toting school parties and a platoon of uniformed police. Many visitors bring grandchildren, wanting them to comprehend a past that is so recent, and so alien.

At times the museums' architecture hints at traumas that hundreds of millions of Chinese endured together. One entrance hall is a claustrophobic horror, and not by accident. Long, high-ceilinged and windowless, it is illuminated by red floor panels and—at the far end of the room—by a screen showing footage of hysterical Red Guards greeting Mao. No caption hints at a rebuke of the Great Helmsman. The museums do not challenge party injunctions about how the past should be remembered. Instead, they use relics and physical spaces to test the boundaries of what may be recalled.

Some objects evoke happy nostalgia. Spotting a sewing machine in a display about life in the 1970s, a man cries to his wife, daughter and mother-in-law: "My mother had one just like that! She made clothes, trousers and everything!" Other exhibits recall hardships. One museum in Anren is devoted to the nearly 18m urban youngsters who were banished to the countryside for years of ploughing, hauling manure and digging ditches instead of being educated. Propaganda photographs show such "sent-down youths" beaming as they toil, but nearby the diaries of some who endured the experience are displayed in glass cases. They speak of loneliness and longing. A visitor explains why he brought his son and four other teenagers: "It is necessary for them to know this. Their lives at home are too easy," he murmurs.

Who owns the past?

The museums capture the paradox of a country that combines rising prosperity with ever-tighter political control. Private property—such as the relics collected here—enjoys stronger protection than at most times in China's history. Yet Communist bosses remain unwilling to cede control over private thoughts, including the memories that such exhibits might evoke. Drawing the wrong lessons about the past can prompt charges of "historical nihilism", an offence that sees museums punished and careers blighted.

Now 61, Mr Fan does not want China to forget hard-won lessons about past mistakes. But he calls it reasonable to wait another generation before debating who was right and who was wrong half a century ago. He has kept tons of historical papers in storage. If someone was raped or purged and never wants to speak of it, what right does he have to bring that up, he asks? "Why can't China just tell its history straight? Because there's no sure way of telling it straight. Everyone was involved," he says with emphasis.

China's complexities make Mr Fan reluctant to lecture. Instead he builds: his dream is another 50 museums, preserving still more relics for his fellow Chinese. One day, there will be a lot to say.

Angola
Party guy

Party guy

President João Lourenço sees himself as an Angolan Deng Xiaoping

Though better than the last guy, a reforming autocrat is still an autocrat

Print edition | Middle East and Africa Dec 1st 2018

AN INDUSTRIAL ZONE should be a noisy place. At the Zona Económica Especial (ZEE), a Manhattan-sized plot near Luanda, Angola's capital, the only sound is birdsong. "My boss said to only show you the factories that are working," a guide tells your correspondent. Yet all is not well at a handpicked pipe manufacturer. It operates at 10% capacity. Power has just gone out, so unfinished tubes droop out of machines, like saggy wizard sleeves. "Would you like to take a photo of a worker pretending to use the machine?" asks the guide.

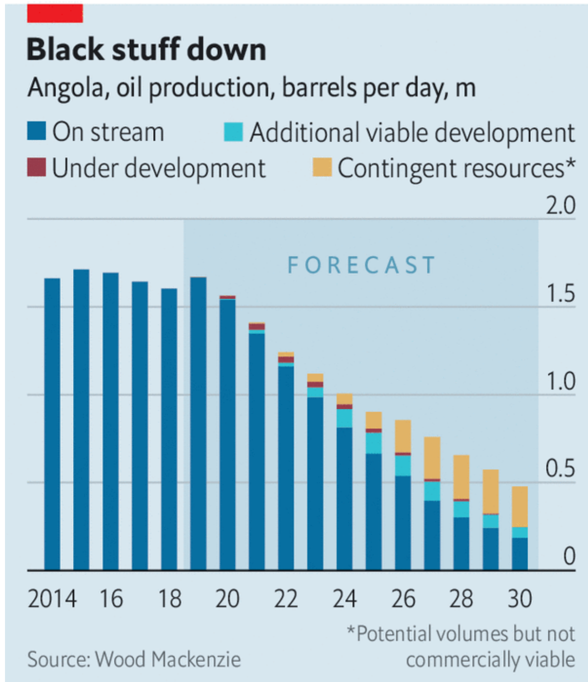
ZEE is a monument to Angola's gigantism, corruption and folly. The country is sub-Saharan Africa's third-largest economy and its second-largest oil exporter. From 2002, when 27 years of on-off civil war ended, until 2015, GDP grew by almost 10% a year, a result of high oil prices and a surge in production. But little wealth trickled down to ordinary Angolans, nearly two-thirds of whom live on less than $2 a day. The elite in the ruling MPLA party stole or squandered billions on projects such as the ZEE. In the zone the state runs 73 factories, which splurge on everything from machines to uniforms without a nod to cost.

After becoming president in September 2017 João Lourenço vowed to stop such idiocy, overhaul the economy and tackle corruption. He surprised many observers by swiftly sacking the super-rich children of his predecessor, José Eduardo dos Santos, from the top jobs at Sonangol, the state oil company, and Angola's sovereign-wealth fund. The ex-president's son, José Filomeno dos Santos, was charged with fraud and money-laundering, which he denies.

The purge raised expectations. On WhatsApp Angolans shared images of "The Terminator", with Mr Lourenço as Arnold Schwarzenegger. But the new president prefers another analogy. Last year he likened himself to Deng Xiaoping, the politician who led China's economic reforms in the 1980s. This is revealing, says Ricardo de Soares Oliveira of Oxford University. For Mr Lourenço, Deng was someone who saw reform as a means to an end: a way of keeping the ruling party in power.

Angola has little option but to reform. Oil accounts for about 95% of exports and half of government revenues. But relatively low oil prices mean that the economy has lagged behind population growth since 2015, and will continue to do so until at least

2019. Even if oil prices recover, Angola is set to sell less of the black stuff. Production is forecast to fall from 1.6m barrels per day in 2018 to 0.7m in 2028 (see chart). “We can no longer depend on oil,” says José Massano, the governor of the central bank.



The Economist

Under Mr dos Santos “diversifying” the economy meant Potemkin projects like the ZEE. Mr Lourenço, instead, plans to privatise 50-100 companies, including many in the Sonangol empire. A new law removes the need for foreign investors to have an Angolan partner, a rule that had created a cadre of useless but well-connected “tenderpreneurs” during the boom years.

In January Angola stopped pegging its currency (the kwanza) to the dollar, relieving pressure on foreign reserves. The central bank now auctions dollars instead of handing them to cronies.

The authorities are also trying to clean up Angola’s financial system. Most banks in Angola are, in fact, not banks in the normal sense, says Carlos Rosado de Carvalho, the editor of a business newspaper. As recently as 2009, 85% of all lending went to about 200 individuals. Business plans can amount to “I need $5m now,” sighs one bank executive. Nearly 29% of loans are in default. The central bank has raised capital requirements, introduced new accounting standards and suspended the board of one of the worst-run state banks.

Whereas Mr dos Santos made Angola the main recipient of Chinese lending in Africa, Mr Lourenço has sought to rebalance its foreign relations. He has visited Belgium, France, Germany and Portugal. Perhaps the clearest sign of change is Angola’s improved relationship with the IMF. Under Mr Lourenço Angola has adopted many of the fund’s recommendations and is set to borrow money from it in the next few months.

His reforms are encouraging. But it is too soon to get carried away. He has barely begun to mend the harm caused by his awful predecessor. More years of slow growth and inflation in the double digits will test the patience of Angolans ahead of local elections in 2020.

It is also too early to judge his anti-corruption efforts. Mr Lourenço remains a party man. And many MPLA bigwigs would hate to see corruption curbed. Since taking power after independence from Portugal in 1975, the MPLA has proved remarkably adaptive. During the cold war it embraced communism; as its Soviet sponsor crumbled it turned to crony capitalism and multiparty elections. At no point have its leaders shown much interest in the welfare of ordinary Angolans. It is possible, alas, that Mr Lourenço’s appointees may see the new order as their chance to get rich quick.

Nor has Mr Lourenço shown himself to be much of a political reformer. He has rejected calls to change the constitution to limit his powers. He has put loyalists in key positions in the army and security services. And he has shown little desire to make courts independent. Such omissions undermine his talk of a new Angola. “We don’t need a strongman,” says a local activist. “We need strong institutions.”

This article appeared in the Middle East and Africa section of the print edition under the headline ”Party guy”

A battle within a battle

The struggle to get Ebola vaccine to rebel-held areas of Congo

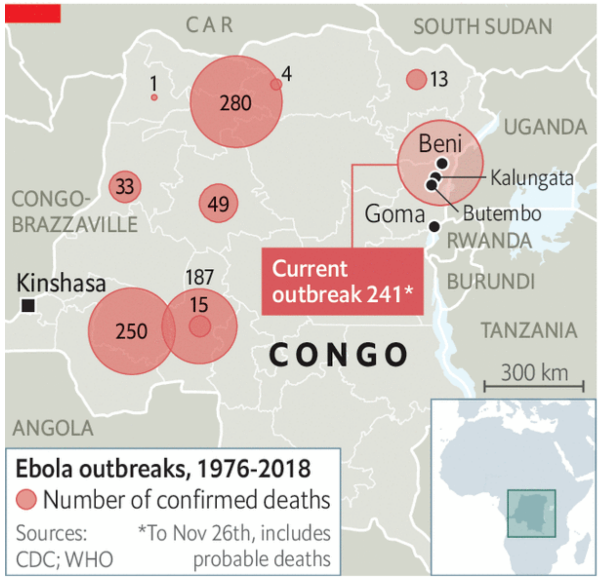
Jabs can stop the epidemic. But men with machetes can stop the vaccinators

Print edition | Middle East and Africa Nov 29th 2018

WHEN A YOUNG woman living near Beni came down with a fever, a nurse told her to go to the clinic for a test. But by the time the Ebola virus was detected in her blood, she was in a car bumping her way towards Kalungata, an area controlled by the Mai-Mai, a plundering, raping militia. She probably fled because of a widespread belief that people go to clinics to die. Beni is the epicentre of the Democratic Republic of Congo's latest Ebola outbreak.

A week later a cluster of Ebola cases cropped up in a village close to where the woman was hiding. It took three days of talks with a Mai-Mai chief before vaccination teams were allowed in. This was too late. The vaccine does not work on those who already have symptoms, which can appear within 48 hours of infection. The disease, which causes copious bleeding, spread to 45 people in the area, killing 23.

The overall toll from this outbreak stands at 241, making it Congo's third-deadliest and the world's fourth-largest. Congo, with its long experience of battling the virus—it had one of the world's first recorded outbreaks in 1976—is seen as a model for the way in which it isolates and treats people to break transmission. But this outbreak, its tenth, is proving harder to contain. The problem is that Ebola is spreading to areas rife with machete-wielding rebels. Fighting has driven more than 1m people from their homes in the provinces affected by the outbreak (see map).



The Economist

The violence is escalating. On November 15th an extremist group called the Allied Democratic Forces (ADF) killed eight UNpeacekeepers. A day later the ADF fired at hotels housing humanitarian workers.

"I was in the restaurant when we heard bangs," says Guido Cornale, senior co-ordinator of the Ebola response for UNICEF. "We put the lights off and got under the tables." Bullets flew through windows, but did not injure any of the health workers.

Geography complicates matters, says Oly Ilunga, the minister of health. The outbreak is near the frontier with Uganda and refugees regularly slip across. It is also the first time in Congo that Ebola has reached a city as big or as bustling as Butembo, a trading stop on one of Congo's few highways. And it has spread through remote villages that are hard to get to at the best of times—and are now reachable only in armoured cars escorted by UN blue helmets.

The new vaccine may yet turn the tide. Without it, thousands of people would have already died, says Dr Ilunga. When health workers reach remote villages they tend to vaccinate everyone in them. This is a change from the World Health Organisation's (WHO) standard "ring vaccination" strategy of jabbing only those most likely to come into contact with an Ebola patient. Unfortunately some people refuse, says Michel Yao of the WHO in Beni.

Other weapons are being developed. This week the WHObegan the first multi-drug trial of potential cures for Ebola. No one knows whether they will work, but four treatments show promise.

Peter Salama of the WHOreckons it will take at least six months to end this outbreak. But Robert Redfield, the director of America's Centres for Disease Control and Prevention, warns that Ebola may become endemic, or entrenched, in the region. In addition, if new treatments succeed in saving lives, they could also increase the (remote) possibility of survivors becoming carriers of the virus who then pass it on through sex. Either way, it may become necessary to vaccinate whole populations and not just the people most obviously at risk. If the men with machetes allow it.

This article appeared in the Middle East and Africa section of the print edition under the headline "A battle within a battle"

The sands time forgot

A new push to resolve the conflict over Western Sahara

Expectations are low

Print edition | Middle East and Africa Dec 1st 2018

IN THE SAHARA, rain is said to bring good luck. So negotiators from the United Nations should be encouraged by a recent downpour in Laayoune, the capital of Western Sahara. On December 5th they will gather in Geneva to try, yet again, to resolve the differences between Morocco, which rules two-thirds of the territory, and the Polisario Front, a nationalist movement that controls the other (mostly inhospitable) third. Since Morocco annexed Western Sahara in 1975, upon Spain's withdrawal, Polisario has fought for its independence.

Expectations for the talks, the first between Morocco and Polisario in six years, are low. The main goal is an agreement that more talking is needed. But even that may be a tough sell. Polisario insists that Morocco must at last hold a referendum on independence in Western Sahara, which it promised to do as part of a UN-backed ceasefire in 1991. Morocco says a vague autonomy plan that it produced in 2008 should be the basis for negotiations.

Pressure from Donald Trump's administration helped to restart the talks. In March America made the renewal of MINURSO, the UN peacekeeping mission in Western Sahara, conditional on political progress. Neither side in the conflict wants to see the peacekeepers go, lest the result be more war. The Trump administration has also been more willing than its predecessors to press Morocco. When John Bolton, Mr Trump's national security adviser, was involved in past UN efforts to find a solution in Western Sahara, he thought the kingdom negotiated in bad faith.

Many observers have reached the same conclusion. For years Morocco has sought to normalise its control of Western Sahara. It has convinced thousands of Moroccans to move there by offering generous subsidies and demanding no taxes. Some think the newcomers now outnumber Sahrawis. The kingdom is also spending billions of dollars in the territory to win over locals. After a recent facelift, Laayoune is adorned with fountains, squares and, more usefully, new schools and clinics.

The Economist

The strategy is not working. Despite the influx of investment, the region still lacks jobs and a good university. “Morocco has invested in the territory, but not the people,” complains a Sahrawi student. Local councils, held up by Morocco as evidence that the region is self-governing, are regarded with contempt. “All these Sahrawis who defend Morocco have good jobs and nice houses,” says a resident of Laayoune. Meanwhile, the police forcefully suppress pro-independence protests. Those who publicly support Polisario say they are denied jobs.

Morocco’s efforts to claim Western Sahara have also faced legal setbacks abroad. The territory under its control is rich in phosphates and its waters teem with fish. But in February a South African court ruled that a shipment of phosphates from Western Sahara should be auctioned off, with the proceeds going to Polisario. Days later the European Court of Justice ruled that an EU-Morocco fishing agreement did not apply to the territory. The UN still lists Western Sahara as a “non-self-governing territory”. This has deterred foreign investors.

The prospect of independence still looks dim for Polisario, which is based in refugee camps in Algeria, a supporter of its cause. Tens of thousands of Sahrawis live in the camps; some have spent their whole lives there. Many young Sahrawis see war as the only way to change the status quo. But the Moroccan army is much stronger than Polisario, and it is unclear if Algeria would go to war to help the group.

There are other reasons for Polisario to consider compromising on full independence. Although it would have fish and phosphates (and, perhaps, oil), an independent Sahrawi state might struggle to maintain current living standards, which are supported by Moroccan investment. It might also find it difficult to police the territory, which is the size of Britain but home to just a few hundred thousand people. Neighbours have been destabilised by smugglers, jihadists and war. Sceptics point to South Sudan, an oil-rich territory that won independence and then imploded, as a cautionary tale.

But Morocco would have to move first—and concede a lot more—before Polisario even considers autonomy. The kingdom would probably have to allow Western Sahara to have its own government, a separate police force and more control over its natural resources. International guarantees would be needed. Even then, some question whether autonomy could work under Morocco’s half-baked democracy. “Look at their regime,” says Mhamed Khadad, Polisario’s outspoken liaison to MINURSO. “It would not be like autonomy in Britain or Spain.”

At least, for the moment, the two sides are talking. But America’s brinkmanship over MINURSO may eventually backfire. Both sides would probably give up the blue helmets rather than make real concessions. A return to shooting cannot be ruled out, though for now it seems unlikely.

This article appeared in the Middle East and Africa section of the print edition under the headline ”The sands time forgot”

A host of problems

How Qatar is preparing for the World Cup, despite an Arab embargo

It can build stadiums quickly, but can it get Arab fans to show up?

Print edition | Middle East and Africa Dec 1st 2018

QATAR FOUNDATION stadium has no fans or grass, but the action on the pitch is frantic. Two years ago it was a hole in the ground. Now a hulking crane and dozens of workers are installing a compression ring that will support the 4,500-tonne roof. Meanwhile, a state-run laboratory is experimenting with grasses flown in from around the world to find one best suited to Qatar's desert climate.

In most countries big sporting events leave a trail of broken promises about new and improved infrastructure. That is less likely to happen in Qatar, the gas-rich Gulf state that will host the football World Cup in 2022. It can rely on an army of foreign labourers, toiling in difficult (but improving) conditions. But as Qatar prepares to host the tournament, it is facing familiar difficulties—and plenty of new ones.

Signs of progress are everywhere in Doha, the capital. Driving around the city has become a headache for visitors, because Google Maps cannot keep up with all the new highways. The old congested roundabouts are gone, replaced by smooth elevated interchanges. When Qatar was awarded the tournament in 2010 the Doha metro was a sketch on paper. Its first line will start running in a few weeks.

If anything, Qatar may be building too much. It expects up to 200,000 fans per day, swelling its population by 8%. Some will sleep on cruise ships. Others will camp in the desert. But most of the 100,000 new hotel rooms promised by the host will be in and around the capital. Qatar is, in effect, a city-state (not a big country, like previous hosts). Organisers made that a selling point. Fans can attend more matches. Teams avoid hours of travel. It also means accommodation will be concentrated in one place, leaving Doha with a glut. Nor is it clear what will happen to seven new stadiums after the tournament. Cities that host the Olympics often face similar problems.

A particular problem for Qatar is what fans will do when they are awake. It has a few diversions, such as miles of beach and a handful of museums. But they are a far cry from the rich cultural offerings of Russia, which hosted this year's tournament. "The World Cup itself brings its own joy," says Hassan al-Thawadi, who oversees Qatar's planning. He thinks fans will create their own entertainment. In Moscow they could mingle in Red Square. Qatar's main fan zone is a park between the seaside highway and the hospital district. Alcohol will not be available in public, only in "designated areas", which have yet to be designated. (Qatari police, who lack experience with drunken football hooligans, have asked their British counterparts for advice.)

This will be the first World Cup in an Arab state—yet politics may keep Arab fans away. Several Arab countries, led by Saudi Arabia and the United Arab Emirates (UAE), have cut transport links with Qatar for a variety of reasons, including its support for Al-Jazeera, a television channel that criticises every Arab ruler except Qatar's. Before the dust-up there was talk of using Qatar Airways, the national carrier, to run shuttles to Dubai, in the UAE. Now it is unclear if Emirati fans will even be able to attend. One-third of Arabs live in countries that lack direct flights to Qatar.

Gianni Infantino, the president of FIFA, football's global governing body, wants to expand the tournament from 32 to 48 teams. That is unlikely to happen. If it does, Qatar would have to share the tournament with neighbouring countries, most of which have severed diplomatic ties. Organisers had hoped that the tournament would bring Arabs together. Instead it may underscore their divisions.

This article appeared in the Middle East and Africa section of the print edition under the headline "A host of issues"

Walking on desalinated water

Can the Sea of Galilee be saved?

The Israeli government has a novel solution

Print edition | Middle East and Africa Dec 1st 2018

THE WATER level of the Sea of Galilee, on which Jesus supposedly walked, is a national obsession in Israel. Newspapers report its rise and fall next to the weather forecast. Lately the sea, which is actually a freshwater lake, has been falling. It is now a quarter empty. Small islands have emerged above its shrinking surface. If Jesus were to return today, he'd have a much easier time.

For the past five years Israel has experienced its worst drought in nearly a century. That has reduced the flow of the Jordan river and other streams that feed into the Sea of Galilee. Less turnover in the lake's water is leading to increased salinity and the spread of cyanobacteria (sometimes called "blue-green algae", despite not being algae). As the pressure from fresh water eases, it allows in more salt water from subterranean streams. Climate change is expected to exacerbate these problems, perhaps one day making the lake water undrinkable.

Israel can probably cope. For most of its history the Sea of Galilee was its largest source of drinking water. But over the past decade the country has invested heavily in desalination plants and projects that allow it to reclaim effluents and brackish water. Since 2016 well over half of the water consumed by households, farms and industry has been "man-made". Less than 70m cubic metres of water will be pumped out of the Sea of Galilee this year for consumption, down from 400m in the past. Some 50m will go to Jordan, which is also suffering from a severe drought.

The Economist

Though it is no longer a vital water source, few want to see the lake run dry. People in the city of Tiberias and dozens of smaller communities eat and sell its fish. More importantly, its religious significance attracts thousands of Israeli tourists and Christian pilgrims each year.

So in June the government authorised a billion-shekel ($270m) plan to pump desalinated sea water, mostly from the Mediterranean, into the Sea of Galilee. Work on a new pipeline began last month. A freshwater lake has never been replenished in this way, but the scientists monitoring the plan believe it will work similarly to rainfall and will not harm the lake's unique ecosystem.

By 2020 the new pipeline is expected to pump enough desalinated water into the Sea of Galilee to stabilise its level. But Yuval Steinitz, the energy minister, wants to go further. His ministry is preparing plans for larger desalination plants, which would double Israel's current output of nearly 600m cubic metres of desalinated water. The surplus would go to refill the lake, providing Israel with a strategic store of water, says Mr Steinitz, in case the desalination plants are hit by earthquakes or war.

Jesus impersonators should take advantage while they still can.

This article appeared in the Middle East and Africa section of the print edition under the headline "Walking on desalinated water"

Sea of troubles

Explaining the naval clash between Russia and Ukraine

Russia seizes three ships and seeks to landlock eastern Ukraine

Print edition | Europe Dec 1st 2018

"WE NEED TO fucking fuck them up, fuck…it seems like the president is controlling all this shit," a Russian commander tells the captain whose ship rammed a Ukrainian military tug-boat in the Kerch Strait while another used live ammunition against a Ukrainian warship. The intercepted conversation, published on YouTube, provides a flavour of what happened between the Sea of Azov and the Black Sea on November 25th. A video shot aboard one of the Russian ships provides the images.

It looked more like piracy than self-defence. The Russian coastguards, part of the FSB, or security service, seized the Ukrainian ships and captured 23 sailors, wounding six of them. They took them to Crimea, a chunk of Ukraine that Russia grabbed four years ago. In 2014 Russia acted deniably, sending "little green men" in unmarked fatigues to Crimea. This time its forces acted openly, under the Russian flag.

The crisis did not emerge from out of the blue. It is the culmination of six months of growing Russian pressure on Ukraine. Having in 2014 annexed Crimea, Russia is now restricting access from Ukraine's eastern ports to the Black Sea, and thence to the Mediterranean and the world.

To get to the Black Sea, ships must pass through the Kerch Strait (see map). On May 16th Russia opened a bridge across the strait that is too low for large ships. It also moved five naval vessels from the Caspian to the Sea of Azov. Russia's coastguard has since then detained scores of Ukrainian and foreign merchant ships—more than 140 between May and August—for hours and even days at a time, in what amounts to an undeclared blockade.

The Economist

An agreement between Russia and Ukraine in 2003, before Ukraine tried to break away from Russia's sphere of influence, established joint control of the Sea of Azov. Now both sides of the strait that controls access to it are held by Russia. Immediately after the latest clash, Russia briefly parked a tanker across the waterway, to remind Ukrainians what Vladimir Putin's promises are worth. Ukrainians fear that his next move will be to take control of the whole of the Sea of Azov—a huge strategic prize—and further endanger the port of Mariupol, Ukraine's third largest.

The detentions, delays and uncertainty have already strangled eastern Ukrainian ports like Mariupol and Berdyansk. The new bridge has bottled up 144 Ukrainian ships that are too tall to slip under its 33-metre structure. Shipping in and out of Mariupol has fallen by a quarter.

Ukraine cannot fight back. It lost up to 80% of its navy when Crimea was annexed, since most of its ships were moored there and the Russians pinched them. Now, the most formidable vessel owned by Mariupol's coastguard is an old fishing boat confiscated from Turkish poachers.

Sailing small military vessels from Odessa through the Kerch Strait last week was a "provocation" staged by Petro Poroshenko, Ukraine's president, said the Kremlin, adding that he wanted to create a crisis and have an excuse to delay presidential elections due next year. Like all shrewd propaganda, it contained an element of truth. Mr Poroshenko, who is badly trailing his rivals in opinion polls, probably did want to rally popular support around the flag and buy himself more time. When Russia escalated the situation, he called for martial law in Ukraine—a move his critics decried as a political stunt.

The clash may have helped Mr Putin, too. The Russian strongman's poll ratings have fallen to levels not seen since before he annexed Crimea. His mouthpieces in the Russian media now have useful material to decry the perfidious Ukrainians and praise Russia's great protector. The timing of the clash—near the anniversary of the Maidan "revolution of dignity" that overthrew the Moscow-backed government of Viktor Yanukovich in Ukraine in 2014—provided a perfect peg for reheating conspiracy theories about the West trying to meddle in Russia's back yard.

As Mr Poroshenko gave a rousing speech in the Rada (parliament) on November 26th, demanding the introduction of martial law, many deputies asked: "Why now?" Ukraine did not introduce martial law when Russian forces seized Crimea. Nor when they surrounded and killed its soldiers trying to recapture the Donbas (a part of eastern Ukraine seized by Russian-backed separatists in 2014). Nor when a Russian-supplied missile shot down a Malaysian airliner over eastern Ukraine. The question was rhetorical. The two months of martial law that the president requested probably would have forced a delay to the presidential election, due at the end of March, and allowed Mr Poroshenko to associate himself with the armed forces, one of the few institutions in Ukraine that people respect. Perhaps for this reason, parliament, in an unusual display of muscle, gave him much less than he wanted. Martial law has been declared, but only for one month and only in areas bordering Russia.

Mr Putin may not get all he wants, either. The annexation of Crimea temporarily pushed up his approval ratings to nearly 90%. This time, however, his adventurism could backfire. Denis Volkov, a sociologist with the independent Levada Centre, wrote recently: "They may still consider Russia's renewed greatness on the international stage to be Putin's main accomplishment, but the public is growing disillusioned with Russia's isolation, its unresolved conflict with the West, and the fact that the country is constantly 'helping others' at the expense of its own citizens."

The Western response has so far been mixed. American officials condemned Russia's aggressive actions. However, Donald Trump, who once said that the annexation of Crimea would not have happened on his watch, said nothing for 24 hours. When he finally spoke, he did not mention Russia by name, and said merely that he did not like the situation "either way".

Germany's reaction was also muted. Angela Merkel, the chancellor, who has been the strongest European voice against the Kremlin, had a telephone conversation with Mr Putin but did not condemn Russia's actions publicly. Mrs Merkel's critics say her hand is weakened by Germany's interest in the planned Nord Stream 2 gas pipeline that passes through it. Others hint that she is too busy worrying about her party's leadership election to pay attention to Russia (see article). Mrs Merkel may feel that quiet diplomacy works better than public denunciations. Alas, there is little sign that either approach is working.

This article appeared in the Europe section of the print edition under the headline "Sea of troubles"

Change, but not too much

The race to succeed Angela Merkel

Germany's CDU hopefuls duke it out in Düsseldorf

Print edition | Europe Dec 1st 2018

IN THE 1950s West Germany's Christian Democratic Union (CDU) reassured wary voters that it would deliver "no experiments". So it is striking to see the party, languishing in opinion polls and tiring after 13 years in government, suddenly revitalised by an almost unprecedented innovation: a leadership election.

Having mustered three serious candidates to replace Angela Merkel as party chairperson, the CDU has become intoxicated with the possibility of change—even as Mrs Merkel hopes to remain as chancellor until 2021. Annegret Kramp-Karrenbauer, Friedrich Merz and Jens Spahn are a study in contrasts, lending the proceedings an air of competition far removed from the usual CDU stitch-up. This matters, for the winner, to be elected by 1,001 delegates at a congress in Hamburg on December 7th, may sooner or later replace Mrs Merkel as chancellor. "It is very sexy to be a member of the CDU these days," says Oliver Wittke, a junior economics minister.

Admittedly that was not the first word to spring to mind this week as 4,000 predominantly grey-haired party troops packed an exhibition hall near Düsseldorf airport to see the would-be leaders in action. But the party is delighting in its sense of renewal. The heartiest applause of the night went not to a candidate but a questioner from the audience who revealed that he joined the party three weeks ago. A homecoming feel added to the occasion: Messrs Merz and Spahn are from the surrounding state of North Rhine-Westphalia, Germany's largest, and Ms Kramp-Karrenbauer used to run nearby Saarland.

The event was the sixth, and most important, of eight regional beauty contests in the run-up to Hamburg. The 296-strong North Rhine-Westphalia delegation there will far exceed that of any other state. Long a left-wing stronghold, the state's blend of wealthy cities, rust-belt industry and sleepy countryside mirrors Germany as a whole. The CDU won a surprise victory in a state election here last year, instantly elevating its local leader, Armin Laschet, into one of the party's national stars (and, say some, a future chancellor). The candidates were thus keen to impress.

On stage Mr Merz (pictured left), a former party hero squeezed out of politics by Mrs Merkel years ago, jabbed at his old rival by urging the party to stop aping the Social Democrats, its junior coalition partner. His charisma appeals to members who have grown tired of Mrs Merkel's centrist equivocations, but recent gaffes, especially on the asylum guarantee in Germany's constitution, highlight his long absence from politics. Perhaps for that reason polls make Ms Kramp-Karrenbauer (pictured right) the clear favourite among CDU supporters (of whom the delegates to Hamburg are not necessarily representative).

After a slow start to the campaign, the candidates have begun sniping at each other, albeit in newspaper interviews rather than on stage, over migration and how to defeat the far right. Yet for all the hubbub, the debate has failed to ignite properly. All want to appear fresh, but without rejecting the party's successful past. In Düsseldorf Mr Merz and Ms Kramp-Karrenbauer, the front-runners, touched on defence, taxation and foreign policy, but seemed most interested in convincing the crowd that they could restore the CDU to its proper place as a *Volkspartei*, with over 40% of the vote. (Ms Kramp-Karrenbauer points out that she achieved that feat in Saarland, while Mr Merz was off making a fortune in the private sector.) Today it hovers around 27% in polls.

So for all the talk of party renewal, it is difficult to discern a hunger for revolution. Over beer and sausages, party members in Düsseldorf spoke warmly of all three candidates. Many of the delegates to Hamburg, a hotch-potch of state representatives, local politicians and party apparatchiks, have not yet decided whom to back. The mood is Merkelism without Merkel, or perhaps even with her: the candidates all say they will happily cohabit with her as chancellor (though in Mr Merz's case that seems implausible). "Many people in the party are looking for some change," says Günter Krings, head of the North Rhine-Westphalia CDU group in Germany's parliament. "But not too much, otherwise we wouldn't be Christian Democrats." Experiments are fine, so long as the result is predictable.

This article appeared in the Europe section of the print edition under the headline "Change, but not too much"

High visibility

France's gilets jaunes protesters are hurting President Macron

Struggling workers are angry at a fuel-tax hike

Print edition | Europe Dec 1st 2018

"WE'RE NOT blocking the traffic, just filtering it," declares Loup, a 64-year-old former education assistant, who has a hand in each pocket and a silver ring in each ear. In his high-visibility jacket, from which the *gilets jaunes* ("yellow vests") movement gets its name, he and a dozen others are manning a protest at a roundabout outside Evreux, in rural southern Normandy. On the muddy ground, a fire of wooden crates is blazing, and bags of croissants are piled up on a camping table. Protesters have blocked off one lane of the road, yet passing motorists hoot their horns not in anger but in support.

Two weeks ago the *gilets jaunes* emerged from nowhere via Facebook to block road junctions across France. The anger that started as a protest against a rise in diesel taxes has since widened into a revolt against President Emmanuel Macron. "At the end of the month, I just can't afford to fill up the tank," says Sandra, another *gilet jaune* and single mother of two small children, who works at an optician's and drives 20km each way to her job. "We're not rich, but we're not poor. It's an attack on the middle classes who work."

The government says its tax increase of 7.6 euro cents ($0.09) a litre on diesel is part of a plan to align diesel and petrol taxes, to curb the small-particle pollution caused by diesel engines. A further increase of 6.5 cents is due in January 2019. "I'd rather tax fuel than work," Mr Macron says. "Those who complain about higher fuel prices also demand action against air pollution because their children get sick."

In France's big cities, commuters are well served by metros, bike-share schemes and Uber drivers, and green taxes are seen as a virtue. But in places such as rural Normandy, modest earners do not buy the government's green argument; they recall that previous governments encouraged the use of diesel at a time when it was judged to be less polluting than petrol. Today, they think that the tax hike is, rather, a punishment for families struggling to make ends meet, and proof of the president's disdain. "Monsieur Macron is arrogant and has little respect for the people," says Loup.

A first day of protests, on November 17th, drew some 280,000 yellow vests nationwide. A week later, less than half that number took to the streets. But a protest in Paris turned violent when shop windows were smashed on the Champs-Elysées, and barricades were set alight. Riot police dispersed protesters with water cannons and tear-gas. Sandra made the trip up to Paris from Evreux to take part in those protests, and blames infiltrators for the violence. For her, the purpose of the revolt is nothing less than the removal of Mr Macron.

France is used to theatrical demonstrations and the revolutionary imagery protesters often embrace. On one roundabout in southern France, *gilets jaunes* brought along a guillotine and a stuffed effigy of Mr Macron. “When people stormed the Bastille it wasn’t clear what the objective was that day,” declared a far-left deputy on the radio. But the *gilets jaunes*’ lack of formal leadership makes them volatile and hard to handle.

How long the *gilets jaunes* last depends partly on whether they can survive an attempted mutation into a more organised movement. Internal rivalries and conflicting objectives could yet be divisive, as could a loss of public support if the movement radicalises. This week, a delegation of *gilets jaunes* met the environment minister, François de Rugy. But the legitimacy of the emerging spokesmen is uncertain.

Mr Macron tried to defuse the anger this week by adopting a more modest tone: “You’ve said ‘Stop’. I hear that. So we’re going to change our method.” Instead of lecturing the French on the merits of his green policy, he promised to consult them. While he said that he will keep the green taxes in place, he vowed to review tax increases if world energy prices rise. A snap poll suggests nevertheless that 66% of people still back the *gilets jaunes*, a figure that has been stable throughout the protests.

Over in Evreux town centre, another group of *gilets jaunes* is blocking access to the prefecture, or departmental administrative building. Three police officers stand on a step between the protesters and the glass entrance. The numbers are thin, but the exasperation is palpable. “France has a social pyramid, and Macron sits on the top,” explains one protester, who works at a fairground. “We want him to smell what it’s like down here at the bottom.”

This article appeared in the Europe section of the print edition under the headline ”High visibility”

Sound of silence

#MeToo in Turkey

Turkey's #MeToo moment has not yet arrived. But it is long overdue

Print edition | Europe Dec 1st 2018

IT IS NEVER easy for assault victims to go public, Sila Gencoglu, a popular Turkish singer, wrote on Twitter on November 1st, days after accusing her boyfriend of beating her, dragging her across the floor and hitting her head with an ashtray. "But I also know that by remaining silent I would be betraying myself, the women of this country and anyone who stands against violence." A storm of hashtags and news articles followed.

Domestic violence is alarmingly widespread in Turkey. Two out of every five Turkish women have been subjected to physical or sexual assault by their partners at some point in their lives, according to the UN. The number murdered by a partner or a family member reached 409 last year, up from 237 four years ago.

Unlike Ms Gencoglu's, most abuse cases go unheard and undocumented. According to a study by Hacettepe University and the Ministry of Family and Social Policies, a mere 11% of women who suffer physical or sexual violence in Turkey seek help from the authorities. Many tend to downplay the abuse, the study found. Victims also fear they will be shamed by relatives and neighbours if they decide to move to a shelter or file for divorce. Attitudes remain stuck in the past. Some 54% of women in Turkey think it acceptable for a man to use violence if he suspects or discovers that his wife is cheating on him, according to the same study.

The share of Turkish women who work outside the home has increased over the past decade from 25% to 34%. Still, that is nearly twenty points below the OECD average. (Turkey also languishes near the bottom of the World Economic Forum's gender gap index.) Women with no resources of their own and scant job prospects are less likely to leave abusive husbands, says Gulsum Kav, founder of We Will Stop Femicide, a pressure group.

President Recep Tayyip Erdogan once seemed to have feminist sympathies. He has called violence against women one of Turkey's biggest problems. His government binned old penal code provisions that allowed those who murdered female relatives in the name of family honour to seek reduced prison sentences. A law passed in 2012 gave all women, regardless of marital status, the right to seek restraining orders against abusive partners, and offered victims shelter and job training. Implementation has been patchy, however. Only 23% of women who apply for protection receive it.

And Mr Erdogan has turned increasingly reactionary. Two years ago, his party proposed a bill that would have allowed statutory rapists to walk free if they married their victims, though he shelved the idea after a popular outcry. The government has pledged to push the female labour-force participation rate past 40% in the next five years, but it has hardly led by example.

Only two of the 17 ministers in Mr Erdogan's cabinet are women. The continuing decay of Turkey's democracy has not spared the women's rights movement. On November 25th, just days after Mr Erdogan unveiled a new campaign against domestic violence, police used tear-gas against a group of mostly female protesters in Istanbul. They were denouncing violence against women.

This article appeared in the Europe section of the print edition under the headline "Sound of silence"

Let Polish pollsters poll

Social media makes a joke of Poland's ban on surveys near elections

Why not scrap it?

Print edition | Europe Dec 1st 2018

"ALLOW ME TO quote the agri-food exchange prices at 18.00, obtained from a number of independent producers," began one tweet. "Tomatoes [up to] 33.7 [zloty]... beetroots [are at] 8.9," said the next. In the run-up to elections in Poland, Twitter tends to be full of such market talk. Not because tweeters take a sudden interest in vegetable prices, but because, like two-thirds of European countries, Poland bans the publication of polls just before elections. Tomatoes (in Polish, *POmidory*) are code for the Civic Platform (PO), a centre-right party; red beetroots signify the Left Democratic Alliance.

Across Europe the median pre-ballot blackout period lasts for two days. In Italy, Montenegro and Slovakia it lasts for more than two weeks. States justify such speech-gagging measures as a useful time for reflection. They add that muzzling pollsters reduces the risk that an inaccurate poll at the last minute will influence the result. Most countries also ban electioneering on election day itself.

Such embargoes are a joke. They have always been hard to enforce. With the spread of social media, the task is virtually impossible. Poles have merrily tweeted about the "prices" of "products" that sound suspiciously like political parties since at least 2011. "PIStachios" means the ruling Law and Justice Party (PiS), for example. In 2015 the then-ruling Civic Platform had another nickname: "octopus", after some of its leaders were recorded swearing profusely over a taxpayer-financed seafood dinner with a price tag that shocked taxpayers. Before a local election in October, some social-media users celebrated as the price of Rafaello sweets was said to have surpassed 50 zloty in Warsaw. This was a reference to Rafal Trzaskowski, who trounced the government candidate to become the capital's next mayor.

Banning pre-election polls makes access to information less equal. Parties and big firms can pay for private surveys. Astute voters can sift for credible data via foreign websites or the betting markets. Other voters are unlikely to do any of these things.

In the absence of reputable polls, bogus ones proliferate and mislead. Lifting the ban and letting pollsters poll seems wiser, and not just in Poland.

This article appeared in the Europe section of the print edition under the headline "Poll-gagged"

Charlemagne

Why Spain had to overlook its painful history

Its transition to democracy ignored the demands of justice. That is why it succeeded

Print edition | Europe Dec 1st 2018

AMID THE cypresses and palms that adorn the small municipal cemetery of Paterna on the outskirts of Valencia a blue and white tarpaulin protects a two-metre deep hole from autumn rain. It is one of many unmarked mass graves scattered among the flower-decked tombs. That morning Alejandro Vila, an archaeologist, and his team exhumed a skeleton from the hole, the 266th since they began work at the cemetery in March. In an adjoining office, the bones of each are carefully arranged on a tray and a DNA sample taken for matching with that of surviving relatives.

Valencia was the last bastion of the doomed Republic during the Spanish civil war of 1936-39. After their military triumph, General Francisco Franco's Nationalist forces unleashed a reign of terror. At Paterna alone, some 2,000 civilians were summarily shot and their bodies dumped. Many of the relatives—mainly grandchildren now—take a close interest. "There was a long night of silence," says Mr Vila. "They feel a burden removed."

On December 6th Spain will commemorate the 40th anniversary of the democratic constitution that followed Franco's death. In this period, the country has changed out of all recognition. It is more than twice as rich, socially tolerant and a vibrant democracy fully integrated into Europe. But its dark past still occasionally tugs at the present. "The tragic thing is that we went from dictatorship to a democracy with no reparations [for the victims]," says Rosa Pérez, a left-wing representative in Valencia's provincial parliament who has promoted the Paterna exhumations.

That was because of the circumstances of the transition to democracy. Unlike Hitler or Mussolini, to whom he is often compared, Franco was a winner who died in his bed. Nasty though it was, his regime eventually presided over Spain's economic development and the creation of a middle class. When he died in 1975, there was no rupture, as with the contemporaneous demise of dictatorships in Portugal or Greece. The transition was negotiated between reformers in the regime and moderates in the opposition, pushed along from above by King Juan Carlos, and from below by popular pressure. Conventional wisdom holds that it involved an enduring "pact of forgetting" about the civil war and the dictatorship, and that this was a bad thing.

Both halves of that statement are questionable. Rather than a "pact of forgetting" there was a sweeping amnesty (a long-standing demand of both Socialists and Communists) and a tacit political consensus not to use the past as a partisan political weapon in the present. There were two reasons for that. Unlike Portugal or Greece (or indeed Nazi Germany), Spain suffered a civil war. Because Germany, Italy and the Soviet Union all intervened, and because it proved to be a dress rehearsal for the second world war, the civil war was often portrayed as a purely anti-fascist or purely anti-communist struggle between good and bad.

In fact, although Fascists played a part in Franco's regime at the outset, its defining character was a Catholic, nationalist and military authoritarianism, as Santos Juliá, a historian, explains. By the 1960s Spaniards had come to view the war as a fratricidal catastrophe in which both sides committed atrocities (though Franco, the victor, committed more). The transition involved "a consensus of 'never again a civil war', not a pact of forgetting", as Enrique Moradiellos, a younger historian, says. Indeed, Spanish society has "remembered" copiously, in a flood of publications and commemorations. The other reason is that the transition involved a political bargain in which the regime accepted democracy in return for no reprisals. That outcome was favourable to the opposition. There was nothing inevitable about it: largely thanks to ETA, the Basque terrorist group, and *franquista* diehards in the army the Spanish transition saw more violence than others in southern Europe. It could easily have been reversed, at least temporarily.

In giving priority to peace and democracy rather than holding the past to account, Spain flouted the demands of what is now called transitional justice. This sees a failure to confront the past, through trials and/or a "truth commission", as denying the rights of victims and as inimical to consolidating the rule of law and democratic values. Its handmaiden is a cult of "historical memory", which is at best an oxymoron (memory is subjective and personal) and at worst a pretext for rewriting history.

Time for a reckoning?

These views have gained ground in Spain among the civil war's grandchildren, in part justifiably so. A law of 2007 required the state to support relatives' searches for disappeared bodies and the removal of public monuments to the dictatorship. Pedro Sánchez, a Socialist who became prime minister in June, has issued a decree to remove Franco's remains from the Valley of the Fallen, the grandiose monument that he erected to his victory in the mountains outside Madrid. It is proving complicated: the dictator's descendants want to rebury him in a family tomb in the crypt of Madrid's cathedral, in the heart of the capital. The government is now searching for ways to insist on a more obscure resting place.

For a democracy to honour a dictator in a public monument is indeed an aberration. Franco's exhumation commands widespread support. So does the demand to recover the missing bodies. Some want to go further. Ms Pérez in Valencia favours legal cases against police who tortured in Franco's later years. Others want a truth commission into the civil war and the dictatorship.

An "official truth" is neither possible nor desirable, retorts José Álvarez Junco, another historian. Rather than undo the transition, Spain needs to find a way to honour all its dead and to teach its children the lessons of its history. Transitional justice has much to commend it. But it should not become a categorical imperative that prevents the greater good of the establishment of democracies that respect human rights. That applies to the Spain of the 1970s, and to many other troubled places around the world today.

This article appeared in the Europe section of the print edition under the headline "Forgetting and remembering"

Religious schools
Leap of faith

Leap of faith

New types of religious state school deepen segregation

Christianity has long played a big role in English education. Now other religions are getting involved

Print edition | Britain Dec 1st 2018

AS THE HEAD teacher at a Hindu secondary school, Simon Arnell might be expected to have a sophisticated understanding of the religion. And one day he might. For now, he relies on regular tutoring sessions with the head of the trust that runs his school. Mr Arnell was hired for his academic expertise, not his religious knowledge. The aim, he explains over a vegetarian school lunch of curry and fresh fruit, is to get his establishment to the same position as some Christian schools, where people say: “Yes, it is a faith school. It’s also just a really good school.”

Avanti House in Stanmore, north London, is one of a new generation of religious schools. Some 94,000 children in England now attend a non-Christian religious school, up from 64,000 in 2011. Over the past two decades the number of Jewish schools has more than doubled and the number of Muslim ones has roughly sextupled. As a result, around six in ten Jewish children attend a religious school. Although just one in 20 Muslim children do, the proportion is rising fast. And there is a small but growing band of Sikh and Hindu schools. A religious education is no longer the rarity it once was for non-Christians.

Most of the recent growth has been in the state sector. Since the 1990s governments have encouraged minority religious groups to set up their own faith schools, which are funded by the state but allowed to select pupils on the basis of their religion. A few opened under Tony Blair’s first Labour government in 1997-2001. Since 2010 faith groups have benefited from the Tories’ “free schools” programme, which lets a wide variety of organisations set them up. There are now 101 non-Christian religious state schools in England.

Their growth redresses what some saw as an injustice. Whereas Christian families could get a free religious education at one of the church-run schools that have long been a part of state education in England, followers of other faiths usually had to go private. But the boom in religiously selective schools sits oddly with another government aim, to deepen religious integration. Earlier this year Theresa May called on the country at large to “do more to confront the segregation that can divide communities”. Faith schools, by definition, divide communities by letting schools pick pupils on the basis of their religion.

Those that opened after 2010 may select half their intake on religious grounds if they are oversubscribed; those that opened earlier can select more.

Non-Christian faith schools, in particular, seem also to deepen ethnic segregation. No nationwide data are available on the religious make-up of schools. But according to SchoolDash, a data-analysis firm, non-Christian secondary faith schools are more than three times as likely as non-faith schools to be ethnically segregated (measured by comparing their ethnic composition to that of other local schools), and a bit less likely to teach poor children. Avanti House is unusual among faith schools in that it does not explicitly select pupils on the basis of religion. Still, only a couple of pupils in each year group of 180 or so come from non-Hindu families.

Parents pick religious schools for varying reasons. Among Jews, the move to faith schools was prompted by worries over the loss of Jewish culture, more mixed marriages and, in some cases, unhappiness with mainstream provision, says Jonathan Romain, a rabbi who campaigns against faith schools of all types. The feeling from the 1970s onwards was that, having been "Anglicised", the Jewish community "now needed to be Judaised", he explains.

Parents with very strong religious beliefs of any sort are likely to turn to the private sector, where schools are more lightly regulated. According to the Institute for Jewish Policy Research, a think-tank, 87% of Orthodox Jewish schools are private, compared with 15% of mainstream Jewish schools. Ofsted, the schools inspectorate, has also drawn attention to the phenomenon of illegal, unregistered schools, which offer dogmatic religious education to children whose parents falsely claim to be teaching them at home.

Some therefore suggest that religious state schools should encourage integration, by drawing pupils away from more doctrinaire private schools. Ghulam Abbas, an education consultant who previously worked at the Department for Education, says the growth of Muslim state schools has encouraged private ones to turn their attention from religious to academic instruction, as parents increasingly expect both to be of high quality.

Indeed, many religious state schools have a sparkling reputation. Tauheedul Islam Girls' High, in Blackburn, is the most successful state school in the country according to the government's "Progress 8" score, which measures academic improvement from the age of 11 to 16. On average, pupils at non-Christian faith schools seem to make a bit more progress than those at schools with a similar intake (even if the small sample size means these results should be treated with caution).

But religion sometimes feeds into the teaching of other subjects—in a few cases extraordinarily so. A recent inspection found that at Yesodey Hatorah, an Orthodox Jewish girls' state secondary in London, staff did not teach reproduction (human or animal) and had censored textbooks to remove images featuring exposed ankles, chunks of "Sherlock Holmes" and much else. Ofsted considered the school "inadequate", but acknowledged that parents approved of the way it was run. The school accused Ofsted of following a "secularist agenda". Since England has no syllabus for religious education, provision often depends on the whims of head teachers, says Linda Woodhead of Lancaster University. The subject "has become a dark hole in schools", she says.

One hope is that non-Christian schools will become less segregated as parents of other faiths and none become accustomed to them, just as many non-Christians are willing to send their children to Church of England schools. That may take a while. In the meantime, children at Avanti House report that they mix with non-Hindus outside school—on the football pitch, for instance. And Claudia Kitsberg of the United Synagogue, which runs ten Jewish state schools, argues that worries of segregation are overblown, given that children spend so much time mixing with a diverse bunch on social media.

But that may not be a perfect substitute. And as the number of religious schools continues to grow, fewer children will come into regular, humdrum, day-to-day contact with those of different faiths.

This article appeared in the Britain section of the print edition under the headline "Leap of faith"

The knights who say Brexit

Government whips use the honours system to manage tricky MPs

Knighthoods, plum jobs and the prospect of peerages could be useful inducements ahead of the Brexit vote

Print edition | Britain Dec 1st 2018

HONOURS ARE not always honoured. John Hayes, a Eurosceptic Conservative MP, discovered as much when he was awarded a knighthood on November 23rd. Rather than congratulate him, some fellow Tories subjected him to ridicule, suggesting that the title was an inducement to back the government's unpopular Brexit deal. One fellow Brexiteer, feeling betrayed, had some advice for Sir John regarding his coat of arms: "Could I cheekily suggest a crest with an utter cock rampant on one side and a big chicken on the other."

In the run-up to Parliament's vote on the deal on December 11th, government whips are scrambling to win MPs' support. But whips are less powerful than they used to be. Although the House of Commons is still a wildly unprofessional workplace, threats of physical violence are these days frowned upon. And jobs on influential select committees are no longer the whips' to give out as rewards for loyalty, instead being distributed by MPs among themselves.

The honours system is one weapon still in their arsenal. The chief whips of both main parties sit on the committee that decides which MPs are to receive gongs, in an arrangement labelled "inappropriate" by the House of Commons' own Public Administration Select Committee. And they seem to be using the power freely. Whereas during 13 years of Labour government under Tony Blair and Gordon Brown only a couple of sitting Labour MPs were made knights or dames, in the eight years since the Conservatives took office at least 35 Tory MPs have received such honours, according to our tally (see chart).

The Economist

Giving out medals is not the only way in which Downing Street has rolled the pitch. The "informal" payroll vote, which refers to the number of MPs with jobs in the government or party, who are expected to back the prime minister come what may, has ballooned, according to the Institute for Government. It recently hit 173—over half of all Tory MPs—compared with about 130 in the 1990s. This includes nine extra vice-chairmen of the Conservative Party that have been created under Theresa May. It also counts positions such as trade envoys for exotic emerging markets, which are often dished out to loyal backbenchers, despite supposedly being cross-party positions. In 2012 there were eight such emissaries. There are now 32, 18 of whom are Tory MPs.

The honours system makes a mockery of British democracy, argues Willie Sullivan of the Electoral Reform Society. Yet political patronage works only if those being cajoled believe the people in charge will be around long enough to carry out the promised favour, points out one Eurosceptic plotter. Rough estimates suggest that up to 100 Tory MPs could vote against Mrs May's Brexit deal. If that happens, the prospects for the prime minister will darken. And if her strategy looks doomed she may find that no knights, whether in shining armour or grey suits, will ride to her rescue.

This article appeared in the Britain section of the print edition under the headline "Knights become pawns"

Brexit and the economy

How to make yourself poorer

The government's own economic analysis confirms that Brexit will make Britons worse off

Print edition | Britain Nov 29th 2018

WHEN MPS called for a vote on the Brexit deal, many said economics should influence their decision. The government and Bank of England have now published their analyses. They make gloomy reading for Brexiteers who think leaving the EU will boost the economy. The message is that Britons will be worse off with any plausible form of Brexit.

The government says that, even on benign assumptions about its deal, GDP per person will be 0.6% lower than otherwise in 15 years' time. It claims this is better than a Norway-like deal that trims GDP per head by 1.4%. But allowing for cuts in migration and higher non-tariff barriers, the cost of the government's deal is as high as 2.7%.

These figures are comparable to new estimates from two think-tanks, the National Institute of Economic and Social Research (NIESR) and the UK in a Changing Europe. The first says the deal will reduce GDP per person by 3%; the second has a central estimate of 1.9% (see chart). A cut of 3% translates into an average annual loss at 2016 prices of £1,090 ($1,400) each.

The Economist

All the analyses also model the impact of a no-deal Brexit. The government finds this would reduce GDP per person by as much as 8.1%. The Bank of England reaches a similar conclusion, suggesting also that the pound would slump by a quarter. The two think-tanks come up with smaller numbers, of 3.7% and 3.5% respectively. But that is mainly because they model an "orderly" no deal, which reverts easily to normal trade terms while mitigating the damage. A disorderly no deal, as assessed by the bank, seems more likely.

Brexiteers say all this is "Project Fear", which proved wrong after the referendum. Even Theresa May asked this week if economic forecasts could be described as facts. Yet although predictions of job losses after the vote were off the mark, John Springford of the Centre for European Reform, another think-tank, says those for the economy were not. GDP per person is some 2% below where it would have been without the Brexit vote.

The main factor is new friction with Britain's biggest trading partner, the EU, which means a drop in trade of as much as 40%. This will also cut foreign investment, which is unusually high in Britain. Ending free movement will curb valuable EU immigration. And all three factors will further reduce productivity growth.

Nor are Brexiteers' dreamt-of offsets big enough. The government's analysis finds a benefit to GDP per person of only 0.1% from likely deregulation. Savings on net payments into the EU budget are small. And free-trade deals with America, Australia and the BRICS countries would add just 0.2% or so to GDP per head. President Donald Trump said this week that a free-trade deal with America may be impossible. If the Irish backstop keeps Britain in a customs union, he is right. (Oddly, the government does not fully assess this.) But a deal with America would not be worth much.

A fair conclusion is that even hardliners should admit that Brexit will make Britons poorer. Their goal should be justified on grounds other than money.

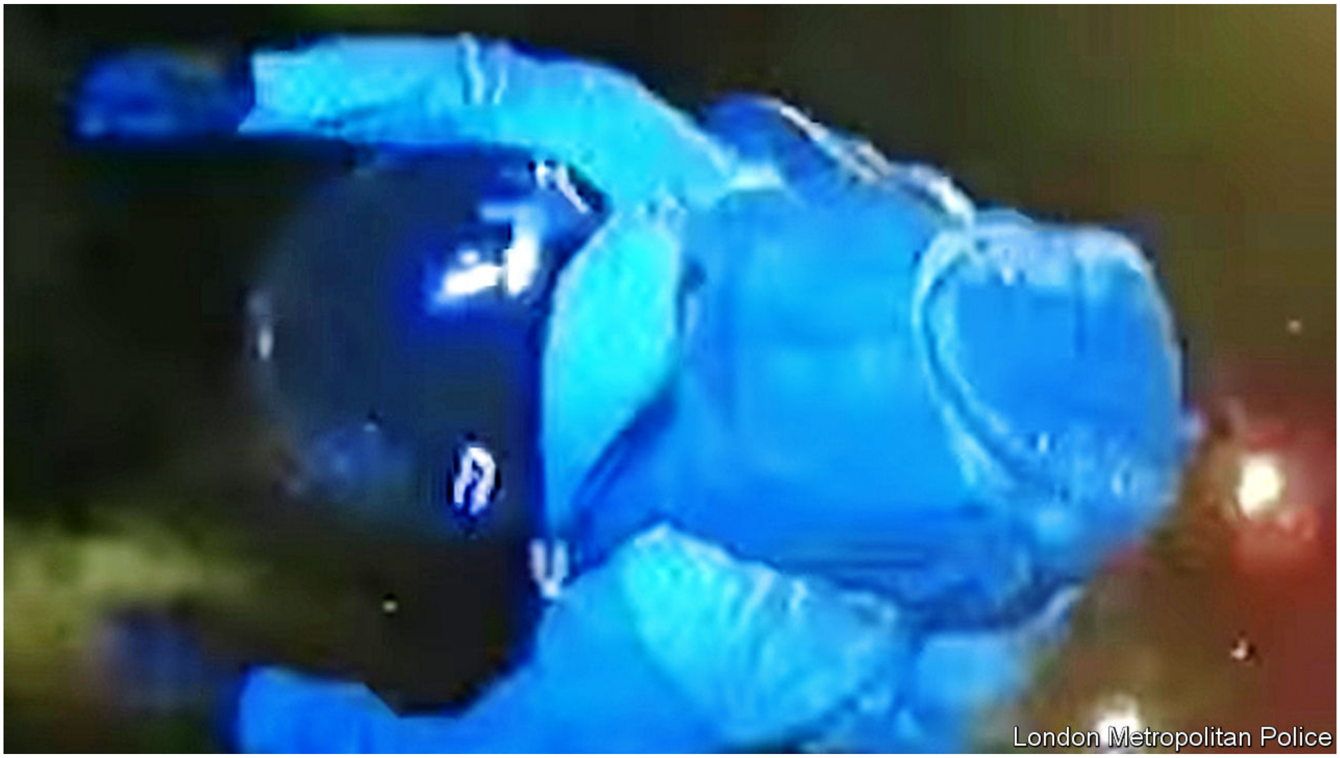
This article appeared in the Britain section of the print edition under the headline "How to be poorer"

Crash, bang, wallow

Britain's cautious coppers unveil a tough new tactic

Ramming suspects from their mopeds might deter criminals, but it could backfire

Print edition | Britain Dec 1st 2018



London Metropolitan Police

FEW THINGS delight Britons more than watching a miscreant brought to book. So the dashcam footage released by the Metropolitan Police, London's force, of officers ramming suspected criminals off their mopeds was a guaranteed crowd-pleaser. In one clip a rider hits the bonnet of a police car before bouncing onto the road. One delighted viewer tweeted that cinemas should screen a feature-length version. Before detailing her reservations, a columnist wrote of her initial "fist-pumping glee".

Police chases are nothing new, and officers often bring suspects who flee arrest to a "hard stop". But until recently British cops hardly ever rammed two-wheeled vehicles, especially if a rider removed their helmet. In recent years, though, the number of criminals using motorbikes and scooters for sprees of purse-snatchings, muggings and even acid attacks has jumped. In 2015 there were fewer than 400 such attacks every month in London, but the incidence soon soared, peaking at over 2,600 in July 2017. The Met changed its tactics to fight back. So far this year, its officers have given chase 480 times and knocked a suspect flying on 60-odd occasions.

The police claim the tactic is working: moped crime is down by 36% on last year. They credit the fall to "tactical contact", a euphemism for ramming, as well as innovations like slim motorbikes for chases on narrow streets and spray-tagging bikes.

Even if it works, is it right? As Lawrence Sherman of Cambridge University puts it, "the videos show what could be either heroic police work or attempted homicide, depending on the facts that led to the decision." Proponents of the tactic claim it is proportionate to the threat. Snatches from mopeds amount to more than a humdrum property crime, they say: some ruffians threaten their victims with long-bladed "zombie knives"; others carry guns. Since they often commit several offences in a single trip, Mr Sherman reckons there is "sound reason" to believe that if riders are not apprehended, they may go on to commit more crimes. British cops are also pretty good at using force responsibly. Data are patchy, but police chases in America appear far more likely to kill somebody than those in Britain. Amanda Pearson of the Met says officers will ram only if the risk to the public of not doing so outweighs the risk of hitting the rider. The "over-riding objective" is not to begin a pursuit at all.

But Geoffrey Alpert, an American expert on police chases, thinks the ramming tactic risks "pretty vicious falls" or worse, and so is not widely used in America (though fleeing suspects there run the risk of being shot instead). And lawyers predict the policy will soon be tested in court. "There's quite a high risk that it will be found unlawful, and that won't help community relations," says Hugh Southey, a barrister. The government is likely to change the law to make it harder to prosecute cops for dangerous driving. But until it does so they might face trial, even if a jury would probably clear them. There will also be misconduct probes.

A cop will eventually run over a rider, says Mr Alpert. At that point, the Met will face a headache. “Public opinion could change very quickly as soon as you get a blue-eyed boy driven off the road,” predicts a Tory MP who nevertheless thinks the tactic is “commendably robust”. That could well be a different kind of car crash.

This article appeared in the Britain section of the print edition under the headline ”Crash, bang, wallow”

Can you dig it?

Why archaeologists love HS2

Construction of a controversial railway has kicked off Britain's biggest-ever archaeological dig

Print edition | Britain Dec 1st 2018

FEW INFRASTRUCTURE projects are more controversial than High Speed 2, a proposed railway between London and the north of England. Most of the councils through which HS2 will run are opposed, as are residents, who worry about noise and its effect on house prices. Some who originally supported the project have cooled, amid soaring costs. And environmental protesters have tried to block its construction. But the new railway has proved a runaway hit with at least one group: archaeologists.

HS2 has kicked off Britain's biggest-ever archaeological dig. Planning guidelines require builders to commission archaeological investigations of their sites before construction. Teams have already spent years surveying the railway's first phase, which runs 140 miles (225km) between London and Birmingham. Now they have picked up their trowels and are excavating the artefacts along the route. At its height (or, perhaps, depth) the dig will employ 1,000 archaeologists across more than 60 sites.

The line slices through 10,000 years of history. Before the track is laid, experts will examine evidence of prehistoric reindeer herds in Buckinghamshire, Roman villages in Northamptonshire and airfields from the second world war. At both ends of the line, skeletons are being exhumed from 19th-century graveyards. In London alone, 45,000 bodies are being dug up to make way for a new station. Contractors have joined forces with the Church of England to look for a new resting place, but have yet to find a patch of consecrated ground big enough.

HS2's managers hope the archaeological work may drum up enthusiasm for the railway. Pop-up museums will exhibit finds locally. Volunteers are being encouraged to don their wellies and join archaeologists in the trenches. The BBC is due to film a documentary about the discoveries. But such efforts have done little to muffle calls for the line's second phase (running to Manchester and Leeds) to be scrapped in favour of a cheaper alternative.

One of the few groups still keen for the whole project to proceed is the archaeologists themselves. Austerity has seen many councils shed their resident diggers. Those in the private sector earn a precarious living, moving around the country on a "digging circuit" of short-term gigs lasting a few months. Unlucky ones find themselves sleeping in tents. Big projects like HS2 bring stability, says Mike Court, who is leading the digs. If the second phase goes ahead it will bring in an order book running up to 2033.

Since Britain is home to just 6,250 professional archaeologists, big projects like HS2 draft in lots of foreign experts, mainly from Europe. A no-deal Brexit could turn off that tap. If that happened, says Mike Heyworth of the Council for British Archaeology, a charity, it might not be possible to get everything out of the ground before the machines move in.

This article appeared in the Britain section of the print edition under the headline "Can you dig it?"

Vanguard of the Clubcard

Should customers help to set bosses' pay?

A paper commissioned by Labour suggests giving loyalty-card holders a say on remuneration

Print edition | Britain Dec 1st 2018

GOLDEN HANDSHAKES? Banned. Payment in stock options? Not allowed. Your company has a pension deficit and no binding plan to fix it? No bonus for you. Britain's bosses were given a preview of life under a Labour government on November 27th when the party published a report laying out options for its executive-pay policy.

Bonuses should be "discouraged" and reserved only for "carefully specified and extraordinary performance", according to the report, which was commissioned by Labour's economic team and written by friendly academics. Any extra money would be subject to approval not just by shareholders but by all "stakeholders", including workers and even customers. In general, pay should be in cash, rather than complicated incentive plans.

Some of the proposals have been seen elsewhere. In Switzerland, often thought of as a bankers' paradise, voters backed draconian curbs on executive pay in a referendum in 2013. Golden handshakes were forbidden. Company managers can now go to prison for breaking these rules. Legal obligations to disclose pay ratios and name high earners, which Labour is considering, are common. America recently passed a law requiring publicly traded companies to disclose how much a chief executive is paid compared with their median worker. Shareholders in Britain already have some say over executive pay.

Nonetheless, argues Alexander Pepper, a professor of management at the London School of Economics, Labour's ideas are "extraordinarily bold" and would go far beyond most international practice. For instance, no country pays executives exclusively in cash, he says; only Japan comes vaguely close.

Giving customers a say on company bosses' remuneration would be unique. It would also be extraordinarily tricky. How would the government weigh the rights of the many stakeholders of a supermarket, say, from a shelf-stacker to a shareholder to a shopper who has just bought a bunch of bananas? The paper's proposals are vague. Customers could be identified through their membership of loyalty schemes, for instance. The rules would apply to all large companies, defined as businesses with more than 250 employees or turnover of more than £36m ($46m). In effect, this would subject big private companies to scrutiny over pay that was similar to that faced by firms listed on the stock exchange.

Promising to crack down on executive pay is generally popular. Earlier this year a poll by Britain Thinks found that 39% of the public approved of another Labour policy, to impose a 20:1 maximum pay ratio between the highest- and lowest-paid workers in any company bidding for government contracts. Only 8% thought it was a bad idea.

Under the leadership of Jeremy Corbyn and the shadow chancellor, John McDonnell, Labour has long promised to "democratise" the economy. As it gradually fills in the blanks of its programme for government, it is becoming clear quite how radical their plans may be.

This article appeared in the Britain section of the print edition under the headline "Vanguard of the Clubcard"

The promised land

Scottish islanders are buying out their lairds

But remote settlements will need more than new owners to survive

Print edition | Britain Dec 1st 2018

WITH HEATHER and woodland running down to basalt cliffs, Ulva is a picture-perfect Hebridean island. Since 1835 the 5,000-acre (20 square kilometre) estate, perched off the Isle of Mull on the west coast of Scotland, has been privately owned. Yet times—and titles—change. In June Ulva was bought by its residents, a result of sweeping land reform by the Scottish government. “For the first time, the people who live on the island will get to decide what happens to it,” declared Rebecca Munro, an islander.

When Ulva was put on the market last year, Mrs Munro and her family feared that a new landlord might terminate their tenancies. A brochure portrayed the island as a private playground, they said, listing the dates when tenants could be evicted. Community ownership, by contrast, suggests security and self-determination. But the fate of fragile and marginal places depends on more than land changing hands.

Who owns what, and why, has a particular emotional pull in Scotland. Half the country’s private land is owned by fewer than 500 people. Nationalists view this as a legacy of English colonialism, which saw the appropriation of land that under the clan system had been mutually owned. The clearances of the 18th and 19th centuries, when rich landowners forcibly evicted poor tenants to make way for sheep farming, loom large in the cultural imagination.

When land ownership is cast as a struggle between the people and the powerful, reform offers fertile political ground. In 2016 Scotland’s nationalist government expanded legislation that grants communities first refusal to buy land, provided they intend to develop it sustainably. Ministers set the price, 95% of which can be paid by a Lottery-backed Scottish Land Fund. The ruling Scottish National Party declared land reform the route to a “fairer and more equal society”. The Ulva buy-out was announced to cheering delegates at the party’s spring conference.

John Addy, a director of the community trust which purchased Ulva for £4.7m ($6m), with a contribution of £4.4m from the Scottish Land Fund, dreams of a future resembling what he has seen while sailing in Norway, with families thriving in every small fjord. When the island was run as a private estate, he says, jobs were scarce and the population dwindled. By renovating and increasing the housing stock, the trust hopes to lure new residents. The Big House, as the island’s stately home is known, will be let to local businesses. An old hostel will be reopened and Ulva will make a renewed pitch for tourists.

These projects require cash. According to a business plan submitted before the sale, the first five years will need capital investment of at least £840,000. The Scottish Land Fund will provide up to another £100,000, but much more money is needed.

The island's old farm will be divided into small plots, to qualify for government grants for crofters. Even with the grants, the windswept land is unlikely to be profitable, so the trust expects that crofting tenants will have second jobs.

There are other snags. Their isolation means that the cost of building on some islands is nearly a third higher than on the mainland. The government builds public housing where there is demand, so sparsely populated places like Ulva don't qualify. Yet without new housing, people will not come. Similarly, schools cannot stay open without a steady flow of pupils, but families won't send their children to a school that might shut.

Just 316,000 Scots live in remote places of the sort likely to qualify for community ownership. More than 70% of the population are in towns and cities. Some might wonder why they should subsidise the lifestyles of born-again crofters on Ulva.

But the appeal of land reform remains strong. The government wants the amount of community-owned land to double, to 1m acres, in the next two years, and has given communities a new power to buy abandoned or neglected land. If it is to make such settlements sustainable, it must find ways to persuade more people to move to them. Until then, islanders will merely have swapped their dependence on a local laird for one in Holyrood.

This article appeared in the Britain section of the print edition under the headline "The promised land"

Bagehot

Don't write off the prime minister's deal just yet

Everything is stacked against her, but Theresa May might get her Brexit plan through Parliament—eventually

Print edition | Britain Dec 1st 2018

IT TAKES A lot to unite the House of Commons in these fevered times. But Theresa May seems to have pulled it off. When she presented her Brexit deal to a packed House on November 26th, MPs of every shade of opinion rose up to denounce her. Jacob Rees-Mogg, the head of the hardline Brexiteers, and Jeremy Corbyn, the leader of the Labour Party, could at last agree that this was a pig's ear of a deal, and a sell-out to boot.

Mrs May will spend the next two weeks in something akin to election mode, trying to flip Parliament. She will repeat her theme that hers is the best deal available. She will tour the country trying to get voters to keep their MPs in line. She will jawbone businesspeople to get behind her plan. And she and Mr Corbyn have agreed in principle to hold a televised debate on the proposal, though the details are still being thrashed out.

Is she wasting her time? The consensus in the Westminster village is that she doesn't have a snowball's chance in hell of getting her deal through. The opposition is much wider and deeper than almost anybody—and certainly Downing Street—had anticipated. Everybody expects the likes of Iain Duncan Smith to make trouble: that is his raison d'être. But the government was taken aback when Sir Michael Fallon, a former defence secretary and loyal party man, declared that the deal was "doomed". To add to Mrs May's problems, President Donald Trump has warned that her deal may stop America signing a free-trade agreement with Britain, and Emmanuel Macron has said that it will provide France with "leverage" in future negotiations.

The Westminster village is right on one thing: Mrs May's deal is almost certain to fail on the first attempt. But that will not necessarily be the end of it. The great question is how badly it flops, for that will determine whether Mrs May can then turn defeat into victory. If she fails miserably, say by more than 100 votes, it will all be over, perhaps for Mrs May as well as for her deal. But if she fails respectably—badly enough to worry the markets, but well enough to keep her job—she will have a chance of saving the situation. She will be able to go back to negotiators in Brussels to plead for some minor tweaks, return to a panicking House of Commons for a second vote and, with luck, salvage her deal.

The fear among senior Tories is that Mrs May's campaign to sell her deal will be a repeat of the 2017 general election. The Maybot will keep repeating the same stock phrases—this time "smooth and orderly" rather than "strong and stable"—while the opposition gains momentum. But there is also a possibility that this will be the general election in reverse. Mrs May began the 2017 campaign with inflated expectations and underperformed. This time she is starting with rock-bottom expectations and can only improve. In the general election she didn't know what she was selling—stable continuity or radical change to tackle the problems revealed by Brexit. This time Mrs May believes what she is saying and is on top of every detail.

Mrs May could prove to be a better saleswoman than people expect. Her recent performances at the dispatch box have been the best of her career. She not only has fire in her belly, but also a withering contempt for the likes of Boris Johnson, who can't be bothered to come up with anything more than fatuous slogans. The prime minister may not have the gift of charisma. But she does have character: a high sense of duty and a willingness to endure any pain in order to perform that duty. The world is dominated by irresponsible populists who are whipping up resentments, and irresponsible elitists who are ignoring discontent. Mrs May is that rare thing: a responsible leader who is trying to deal with populist anxieties rather than exploit them.

In that vein, her deal has more to recommend it than the Westminster village imagines. It achieves the single biggest thing that Leave voters wanted: abolishing free movement between Britain and the European Union. It also provides a lot of the smaller things that drove the Leave vote, ending big payments to Brussels, albeit slowly, limiting the power of the European Court of Justice and quitting the EU's agricultural and fisheries policies.

Mrs May's biggest advantage when it comes to building support is that there is no easy alternative. The most precious resource for dealmaking—time—is running out. There is some momentum behind the "Norway option" of joining the European Economic Area. But that would mean continuing free movement. There is even more momentum behind the idea of a second referendum. But whatever the merits of such a vote, it would prove painful in the short term, as the country relived the debates of 2016. A growing number of Tories are contemplating replacing Mrs May as leader. But is it really worth trashing the Conservative brand still further when that only increases the likelihood of a far-left government under Mr Corbyn? And is it really worth risking such a leadership contest when Mrs May's successor—Sajid Javid, say, or Jeremy Hunt—would inherit exactly the same problems in Brussels?

Oh no, not I

The election-in-reverse hypothesis, in which Mrs May exceeds expectations and her deal survives, might quickly prove to be hopelessly naive. There is a madness in the air in Westminster at the moment that makes all predictions suspect. MPs may well be so convinced that she is doomed in the first round that they vote against her en masse. That might produce such a devastating defeat that Mrs May has no choice but to resign, and unleash political mayhem. There is a chance that Mr Corbyn will at last come out in favour of a second referendum. That would rescramble not only the Brexit debate but also British political alignments. Nonetheless, it would be a mistake to write off Mrs May's Brexit plan completely. She has shown many times in the past that she has an extraordinary ability to turn weakness into strength, and humiliation into not quite triumph, but at least survival.

This article appeared in the Britain section of the print edition under the headline "Theresa agonistes"

Indigenous peoples
The value of solitude

Protect and survive

Indigenous peoples across the world no longer seem doomed to extinction

The first of three articles explains why

Print edition | International Dec 1st 2018

NORTH SENTINEL has few visitors, which is just as its 150 or so residents want. The 30,000-year-old tribe on the tiny island in the Andaman archipelago in the Bay of Bengal has had almost no contact with the outside world since 1991. So when John Chau, a young American missionary, paid some boatmen to drop him off on the island last month he was greeted with bows and arrows. The same happened in 2006 to two Indian fishermen who drifted ashore when they were asleep on their boat. All three were killed.

The Sentinelese may be the most isolated people in the world. For the past 20 years the Indian government, which administers the Andamans, 1,300km east of India's mainland, has decreed that they be left entirely alone, though periodically it checks from a distance that they are not suffering an epidemic. Since they probably lack any resistance to new diseases, contact with outsiders might kill them. The Indian government will make no effort to find Mr Chau's killers, and has no plans to retrieve his body.

It is not yet clear if the tragedy will have long-term ramifications for the Sentinelese. Nevertheless, thanks to a long fight for indigenous rights, they have a better chance of survival now than they did a generation ago. The same holds true for many other indigenous peoples, broadly defined as groups that preceded today's dominant societies and have tried to resist integration into them.

Many have come back from near extermination. In Latin America Hispanic invaders saw little point in co-existing, especially with the tribes of the Amazon. In Australia the incomers, mainly from Britain, considered Aboriginals barely human. In Africa and Asia indigenous groups were often pushed into the forests or deserts and disdained by newcomers. All over the world the number of indigenous peoples shrivelled. SIL, a Texas-based charity, reckons that more than 5,000 languages have died out in the past half-century.

But in the past 30 years a number of developments raised hopes. The Brazilian constitution of 1988 set a trend by recognising indigenous rights. In the rich world awareness of such rights has soared. In 1989 the International Labour Organisation declared that indigenous peoples had a right to their land and to be consulted if it was to be developed. In 2001 the United Nation's Commission on Human Rights appointed a special rapporteur for indigenous rights. In 2007 the UN passed a declaration to defend them.

Picking the right battles

Rights have been enshrined in many countries, too. India's constitution seeks to protect "scheduled" tribes, though they remain among the country's most disadvantaged groups. Similar laws have been enacted elsewhere in Asia, such as the Philippines. African governments tend to be loth to concede that groups such as the San, Pygmies and other hunter-gatherers should have rights stemming from their prior presence in parts of the continent. But such peoples are belatedly winning recognition. Battles between the Kenyan government and the Sengwer and Ogiek forest peoples, for instance, are more often being fought in the courts.

Most of the groups campaigning for the protection of indigenous peoples are cautiously hopeful. Marcus Colchester of the Forest Peoples Programme, a British charity, says that in the 1970s the prevailing opinion was that indigenous tribes were doomed to extinction. In Latin America cowboys who killed indigenous people were sometimes pardoned on the ground that they did not know it was wrong. "The struggle for the self-determination of all peoples will go on for a long time, perhaps for ever, but the principles are now accepted. That is a huge change," says Mr Colchester. Victoria Tauli-Corpuz, the UN's special rapporteur for indigenous rights, who is from the Kankanaey people of the northern Philippines, agrees that there have been "great advances".

The difficulty lies in finding a halfway house between the total isolation of, say, the Sentinelese, and absorption (ie, where peoples can retain their heritage and decide their own destinies yet still benefit from some of the advantages of modern life). Fiona Watson of Survival International, warns that "integration is a no-no, a dirty word" among those who seek to protect the Amazonian Indians. That is because many in Brazil's ruling circles still believe that the choice is between assimilation or extinction. Yet she hopes that aspects of the Indian way of life, like its reverence for biodiversity, are becoming more accepted. It is not only indigenous peoples who can learn from the rest of the world.

See also: " Brazilian Indians are learning to live with the state "

This article appeared in the International section of the print edition under the headline "The value of solitude"

Of soldiers and game fish

Brazilian Indians are learning to live with the state

The second in a series of articles on indigenous peoples

Print edition | International Dec 1st 2018

Alamy

DRIVE AN HOUR north-west from Boa Vista, capital of Brazil's Roraima state, towards the border with Venezuela, and pastures of grazing cattle and rice fields give way to the stunning but unkempt expanses of the São Marcos indigenous reserve. Here, sleepy roadside villages show little sign of life, aside from omnipresent prayer sheds marked with the green signs of Seventh Day Adventists.

Brazil outlaws large-scale agriculture or mining in areas demarcated for its 1m-odd indigenous citizens. But the dearth of smaller, local businesses irritates some indigenous leaders by helping to perpetuate the stereotype of the "lazy Indian". "We must prove to other Brazilians that we too can produce," says Alindo Ferreira, the ambitious chief of Tarau-Paru, a community of 170 souls on the edge of the reserve.

Mr Ferreira, who is in his early 40s, is keen to grow more manioc, bananas and other cash crops, from which the average family in his village earns more than $125 a week. He proudly points to a flour-production shack with a corrugated-iron roof that has replaced a prettier but rain-prone traditional hut nearby. Ancestors would always let the forest retake the land as it pleased. The chief sees nothing wrong with nudging reforestation along by cultivating more profitable native plants.

At a meeting of the Indigenous Council of Roraima in Boa Vista, community leaders broadly agree with this hopeful vision. Yet the discussion soon reverts to a topic of perpetual concern: land. In 2017 two-thirds of areas traditionally occupied by indigenous peoples had been officially recognised. Nearly half of Roraima state has been demarcated as indigenous land. The land remains the property of the federal government, but its native inhabitants are granted the use of it in perpetuity. Opponents of further demarcations argue that the Indians, just 0.4% of the national population of 211m, occupy 14% of the land. Surely, that is enough.

In theory, indigenous rights have long enjoyed strong guarantees. But implementation has been patchy. For much of the 20th century the Brazilian government sought less to protect indigenous people than to bring them into mainstream society. In the 1950s the federal government made a concerted effort to tap Brazil's vast Amazon region for its hydropower, farmland and minerals. Roads and railways brought diseases that killed huge numbers of Amazonian natives. Their numbers fell from several hundred thousand (no one is sure of the population) in 1900 to as few as 70,000 in the 1950s.

Attitudes only began to shift after Norman Lewis, a British writer, wrote an article in 1969 entitled "Genocide". An international outcry led to minor improvements. Then in 1988 a new constitution gave Indians a clutch of rights, including to land, cultural expression and freedom from tutelage. A census in 2010 reckoned that Indian numbers had recovered to 818,000.

Governments now promise schools, clinics and sanitation, as well as new transport links. Many peoples welcome such help. "No one is against development," says Sônia Guajajara of Brazil's Indigenous People Articulation (APIB), a lobby group. Nevertheless, she argues that development should be balanced with the sustainable management of resources. In the Amazon indigenous people guard the jungle. Satellite images show that in many countries indigenous lands are less likely to be deforested than similar non-demarcated ones.

Indigenous representatives particularly fear the clout of the farmers' lobby. Across much of central and southern Brazil Indians live in conflict with farmers over land. The lobby's congressional caucus is now said to number 260 deputies and senators, out of a total of 594. They are emboldened by the recent election of Jair Bolsonaro, a right-wing populist, who says he wants an end to further demarcations (but also supposedly to make it easier for tribes to profit from their land). Even before Mr Bolsonaro's election the government had hinted at a desire to approve more mining, drilling and farming projects regardless of their location. The agency for indigenous people had its budget slashed by around 40% in 2017, as part of spending cuts to close a yawning fiscal deficit.

But the APIB has become more active in the capital. Three years ago it convinced 48 out of 81 senators to oppose a proposed constitutional amendment that would have transferred oversight of demarcations from the justice ministry to the farmer-friendly legislature. Work has now stalled on a "super-permissive" mining code (as Maria Augusta Assirati, a former head of the National Indian Foundation, calls it). In July the government set up a 581,000-hectare protected area where Indian residents will be able to make money by, for instance, offering anglers a chance to hook *tucunaré*, a prize game fish.

Indians' attitudes towards the state are evolving, too, as Mr Ferreira demonstrates. To help tackle alcoholism, he has enlisted the help of the army, long accused of disrespect towards Indians. At his request, guards at the neighbouring garrison search tribesmen returning from town and confiscate booze, which he bans in the village. As a result, soldiers and Tarau-Paru rub along well. Children throng the garrison's deputy commander, Lieutenant Bruno Anastácio, on arrival in his armoured car. Asked who they want to be when they grow up, all the boys (and some girls) eagerly volunteer to be soldiers.

See also: " Why New Zealand's Maori do better than Australia's Aboriginals "

This article appeared in the International section of the print edition under the headline "Of soldiers and game fish"

The Kiwi model

Why New Zealand's Maori do better than Australia's Aboriginals

The third in a series of articles on indigenous peoples

Print edition | International Dec 1st 2018

WHEN JAMES COOK landed in Australia in 1770, Aboriginals had been there for about 60,000 years. Their 500 or so separate nations lacked kingpins or settled agriculture, so colonisers deemed the land *terra nullius*, free for the taking. Aboriginals were butchered or displaced, and later their children were stolen and placed in foster care under a cultural assimilation programme that lasted for six decades. They got the vote only in 1962. After a referendum five years later, they were included in the census. But not until 1992 did the high court recognise that they should have some claim over their land.

Even well-intentioned policies brought in more recently have failed them. When the law said they must be paid the same wage as other Australians for the same job, many were sacked. Billions of dollars are poured into programmes to help indigenous peoples every year, with mixed results. The decade-wide gap in life expectancy is getting wider. Though only 3% of the population, Aboriginals fill a quarter of Australia's prison cells. Their young men have one of the highest suicide rates in the world. Their children are almost ten times more likely to be in state care.

In Broome, a tourist resort on Australia's north-western coast, groups hang out under trees, or drink on park benches. For a small town, it has a lot of police. "We operate in a kind of failed state," explains Peter Yu, head of the Yawuru Aboriginal Corporation, which represents Broome's pre-colonial owners. Some communities are afflicted by diseases which are almost unheard of outside the poor world, including trachoma, which can lead to blindness.

Part of the frustration of the Aboriginals stems from how small a say they have in their own affairs. Many of them want to amend the constitution to guarantee wider rights, enshrining a voice for the "first nations", as they are now more often known. But the conservative-led coalition government rejected their idea of a national representative body. Still, indigenous land rights have strengthened since a native title law was passed in 1994. Aboriginals hold title over 31% of the country, with rights to hunt and fish, and to negotiate over economic developments such as mining.

Some groups, like the Yawuru, have struck lucrative deals with the government. Their corporation is now the biggest private landowner in Broome, according to Mr Yu, with assets including a cattle station and a licence to export livestock. It has used the cash from compensation to revive local culture through language lessons and the promotion of ancestral "dreamtime" stories. But it is an exception. Native title rarely confers actual ownership. Neither does it permit a veto over projects. To extract compensation from mining companies, traditional owners are often required to "extinguish" their title, which is anathema to those who view their land as sacred.

Many Aboriginals therefore look with envy across the Tasman Sea, to the Maori. They remain at the bottom of New Zealand's pile, but still live longer and healthier lives than Aboriginals. New Zealanders who identify as Maori are 15% of the population of 5m. Their median weekly income of NZ$900 ($610) is almost double that of their Aboriginal counterparts. Although more than half of New Zealand's inmates are Maori, they are less likely to go to prison than Aboriginals.

This relative success is partly a reflection of colonial history. British settlers reached New Zealand much later than Australia, found what they saw as a more civilised society, and signed a treaty with the Maori in 1843. It was routinely flouted but a tribunal established in 1975 has allowed the Maori to seek redress for historical abuses.

But it also reflects the Maori themselves. They are a tight-knit group compared with Australia's distinct indigenous "nations". They formed a monarchy in order to unify against colonialists, and almost all speak the same language. Once near extinction, it is now taught in schools and spoken in Parliament (where the Maori have reserved seats). An illustrious list of leaders includes Winston Peters, the current deputy prime minister and foreign minister. Three Maori have become archbishops and two governors-general.

Some 87 agreements have been struck between various tribes and the state in the past 30 years, helping them to lay the past to rest. Financial reimbursements can be stingy, but some have won large enough settlements to develop successful companies. The largest belongs to the Ngai Tahu, a people spanning most of the South Island, who own farms, fisheries and tourism ventures. TDB Advisory, a consultancy, values the assets of Maori "post-settlement entities" at NZ$7.8bn, far more than Australia's entire indigenous economy.

The two countries' attitudes towards their indigenes could scarcely be more different. Mainstream Australians are still largely segregated from Aboriginals. New Zealanders tend to take more pride in their mixed heritage. Maori tattoos are ubiquitous in mainly white suburbs. Citizens of every hue glory in their country's domination of rugby (both the men's and women's teams are ranked top of the world). All purr with pride at the *haka*, a Maori war dance that precedes international matches.

This article appeared in the International section of the print edition under the headline "The Kiwi model"

Sources and acknowledgments

Print edition | Special report Nov 29th 2018

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Acknowledgments

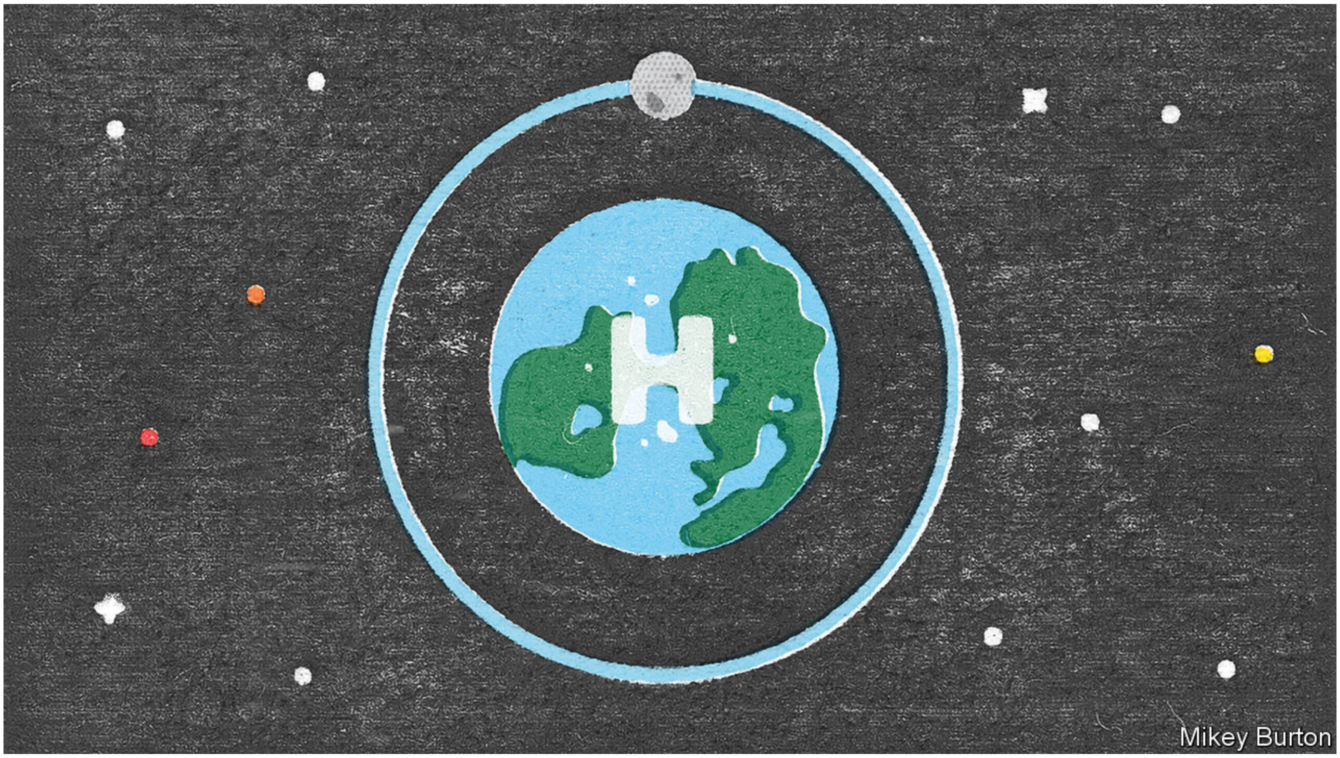
As well as those mentioned in the report, the author would like to thank Cecilia Tam, Marco Olvera, Nicola Pitts, Graham Winkelman, Richard Dowling, Stephen Bull, Marius Holm, Florian Kühn, Mårten Görnerup, Yvonne Deng, Jasmin Cantzler, Markus Hagemann, Richard Black, Zoe Lagarde, Paul Fennell, Jules Kortenhorst and Rémy Kolessar

Conquering carbon dioxide

What would it take to decarbonise the global economy?

Lots of clean electricity and a revolutionary shift towards the lightest gas, writes Henry Tricks

Print edition | Technology Quarterly Nov 29th 2018



FROM BEHIND the wheel of a self-driving electric Tesla model S, gliding amid the forests and fjords of Norway, the future of the planet looks pretty good. It almost feels as if you are on the road, hands-free, to a post-fossil-fuel future. Virtually all of Norway's electricity is emissions-free. It comes from hydropower delivered by cascading waterfalls, dams and rivers that run so close to the roads that you can almost run your fingers through them. There are so many fast-charging stations that you are unlikely to get stranded. Teslas have become so run-of-the-mill in Oslo that it is not unusual to see them spattered with mud, their seats matted with dog hair.

When your destination is Rjukan, three hours west of Oslo, which in the early 20th century was one of the world's biggest power plants, alternatives to fossil fuels look even more achievable. This is where one of the best potential zero-carbon options, hydrogen, was produced by hydroelectricity as far back as 1928. Cars powered by hydrogen fuel cells have now started to appear on Norway's streets, even though there may be much better uses of the gas than powering vehicles over short distances. A Hyundai Nexo, owned by Nel, a Norwegian hydrogen company that traces its roots back to Rjukan, carries a message on its rear window: "Thanks for the ride, dinosaurs! We'll take it from here." That could be the motto for the age of decarbonisation. Or it could be extreme hyperbole.

Alongside China, Norway has helped supercharge demand for electric vehicles, but it could afford to finance the tax breaks and other incentives because of the immense wealth it derives from oil and gas. Hydrocarbons produced by the state energy company, Equinor, generated 310m tonnes of greenhouse gases in 2017. That was almost as much as the total carbon dioxide (CO_2) belched out by Britain, a country with 12 times Norway's population.

Torn in much the same fashion between a desire to tackle global warming and a dependence on fossil fuels, the world is moving far too slowly to decarbonise its energy system. Acting on the promises made under the 2015 Paris agreement on climate change could see the world on a path to global warming of 3°C above pre-industrial levels by the end of this century, rather than the 1.5-2°C countries agreed to strive for. To stabilise global temperatures, humans must be putting no more CO_2 into the atmosphere than they are taking out by about mid-century.

Coming clean

Renewables are advancing, absorbing twice as much investment for power generation as coal, gas, oil and nuclear combined last year. Sales of electric vehicles (EVs) are also gaining momentum. According to Bloomberg New Energy Finance, a clean-energy consultancy, it took 17 months, from mid-2014 to 2016, for the global number of passenger EVs to rise from 1m to 2m. It took just six months this year for them to go from 3m to 4m.

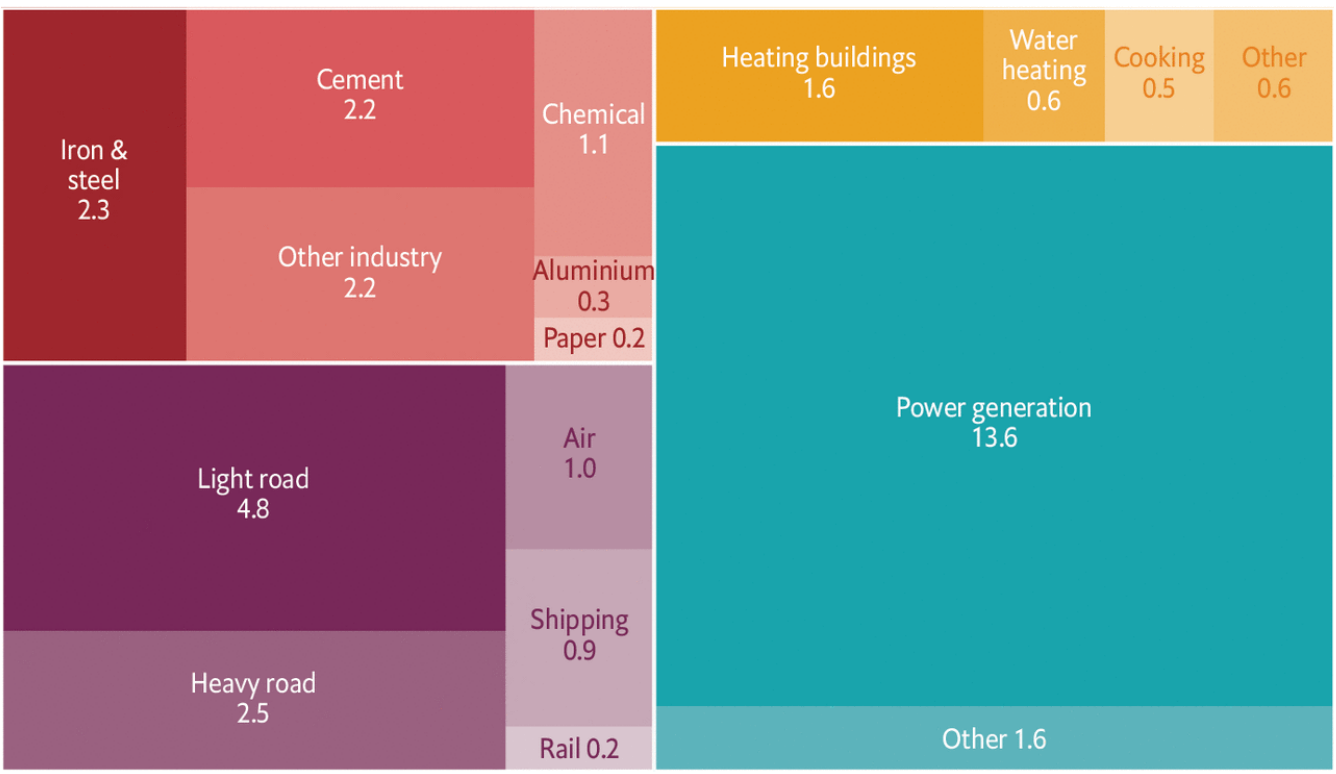
Yet last year the global energy system still derived 85% of its oomph from fossil fuels, and the International Energy Agency (IEA), a forecaster, expects global CO2 emissions to reach a new record this year. In order to mitigate the impact of global warming and reduce the air pollution that does serious harm to physical and mental health around the world, the immediate task is to encourage the spread of zero-carbon ("clean") electricity and battery storage. By some estimates, power supply needs to increase fourfold over the next 30 years. To produce this electricity will require a huge increase in renewables, as well as nuclear power (more likely in the developing than developed world), as well as the use of fossil fuels with carbon capture and storage (CCS). And that is just what specialists call the "easy" part.

Decarbonising parts of the economy where electricity and lithium-ion batteries cannot be easily used, such as heavy transport, heating and industry, will be much harder. In 2014 (the latest year for which figures are available) these "hard-to-abate" sectors produced about 15bn tonnes of CO2, or 41% of the total, compared with 13.6bn tonnes for the entire power sector (see chart). The biggest industrial emitters are cement, steel and chemicals.

Dirty business

Global energy-related CO_2 emissions, by sector, 2014, tonnes bn

Total: 36.2bn



Source: International Energy Agency

The Economist

In order to limit global warming to less than 2°C, total emissions from global energy use across industry alone will have to be 50-80% lower by 2050 than they are now, and as much as 75-90% lower if the rise in temperatures is to be capped at 1.5°C, according to the Intergovernmental Panel on Climate Change (IPCC), a UN-backed body of experts. Even then, over the course of the century hundreds of billions of tonnes of CO2 will need to be extracted from the atmosphere, in what are called "negative emissions".

It is an historic undertaking. In the 200 years from the start of the coal age to 1970, the burning of fossil fuels, flaring and cement-making produced 420bn tonnes of greenhouse gases, mostly CO2, or about 1,200 times the weight of every person on the planet today. Between 1970 and 2011, the amount tripled to 1.3trn tonnes.

CO2 is invisible and odourless, so it is harder to visualise the effects of all of this than for more tangible scourges like sulphur and nitrogen oxides, which cause acid rain. Yet the quantities belched out are staggering. The steel and cement industries each produce more CO2 than any country except China and the United States. For every tonne of cement produced, almost three-quarters of a tonne of CO2 seeps into the atmosphere. Cars and trucks are an even bigger burden on the climate; and knowing how much you produce when you fly can ruin the joy of taking off in an aeroplane. This report focuses on energy-related emissions, not greenhouse gases emitted by agriculture, forestry and other land use. The latter account for about a quarter of total emissions.

Where were you while we were getting hydrogen?

Steven Davis of the University of California, Irvine, has led a team of researchers in mapping out what a net-zero-emissions energy system would look like, using a set of already available technologies that he describes as "fairly simple and finite". Besides electricity and batteries, they include hydrogen and ammonia, biofuels, synthetic fuels, CCS, and removal of carbon from the atmosphere. They can have many end uses. Hydrogen could have a role in light and heavy transport, heating, steelmaking and synthetic fuels for jet aircraft. CCS could be used in heating and cement-making.

Each of them has its pros and cons. There are obstacles to making, moving and using hydrogen on a large scale. Biofuels such as ethanol are already blended with hydrocarbons in fuels in places such as Brazil and America, but energy crops compete with the food industry for land, and their cultivation also produces greenhouse gases. Emission-free synthetic fuels rely on lots of hydrogen and carbon monoxide to produce surrogate hydrocarbons, so their development hinges on low-cost supplies of those two gases. CCS, as Mr Davis puts it, elicits a "collective groan" from environmentalists, who see it as life support for the fossil-fuel industry. But it is hard to imagine decarbonisation of industries like cement without capturing the CO2 emitted in flue gases.

Some are much closer to commercialisation than others. Those working on decarbonising the energy system have an approximate time frame for their endeavours. They say 2025-35 could see the emergence of battery and hydrogen-powered long-distance lorries, and hydrogen-fuelled residential heating. In the 2030s, synthetic hydrocarbons may be developed for ships and planes. In the 2040s, CCS and hydrogen could be applied at vast scale in industry. By the 2050s there would be full-scale carbon removal, either by massive reforestation or direct capture from the air.

All this may seem pie in the sky if you live in Africa, or another impoverished region, where the main priority is to satisfy existing energy demand. It will hinge crucially on what government mandates and tax incentives are in place to encourage the shift.

Still, this report will argue that the obstacles to decarbonisation of the energy sector are not insurmountable. What is more, they could bring economic benefits. The IPCC estimates that, between 2016 and 2035, the annual cost of keeping the rise in temperature to 1.5°C would be about $2.4trn, or roughly 2.5% of world GDP. Last year total energy investment was $1.6trn, mostly in coal, oil and gas. Adair Turner, chairman of the Energy Transitions Commission (ETC), a global body, says the additional cost per year of running the hard-to-abate industries with net-zero emissions would be $1.2trn in 2050. "You can be absolutely terrified [by the amount]. But if you could go back to building railways in 1850, I'm willing to bet you would also terrify yourself."

Moreover, none of the technologies involved is new; and, unlike fossil fuels, the more they are used, the more their costs fall, providing an incentive to use them across as many industries as possible. Hydrogen could be the most promising, because it is the best complement to mass electrification and could also be used in heavy transport, heating and industry.

In a report, the ETC says that to achieve net-zero CO2 emissions, global hydrogen production needs to rise from about 60m tonnes a year today to 500m-700m tonnes by mid-century, even without assuming there will be many hydrogen fuel-cell cars. That sounds ambitious but the interest in hydrogen is growing fast. Membership of the Hydrogen Council, a forum made up of global chemical, car and oil companies started in 2017, has quadrupled in 18 months. Francis O'Sullivan, head of research at the MIT Energy Initiative, says: "Battery storage may feel like a headline act in the transition. But ultimately it will play second fiddle to hydrogen."

To make the hydrogen cleanly, most of it will have to come from electrolysis of water, which today accounts for only 5% of hydrogen production (the rest comes from "steam reforming" of fossil fuels). That will require vast quantities of low-cost, zero-carbon electricity. Making that available, along with batteries to electrify cars, is one of the most pressing priorities in the coming decade.

This article appeared in the Technology Quarterly section of the print edition under the headline "The hydrogen bombshell"

The (relatively) easy part

Mass electrification is possible

But the challenges of renewable energy are still daunting

Print edition | Technology Quarterly Nov 29th 2018

HENRIK POULSEN, boss of Ørsted, a big Danish wind developer formerly known as Dong Energy, has a dream that may scare sailors and seabirds, but warms the hearts of renewable-energy advocates. He reckons there is scope to install 600,000 megawatts (MW) of offshore wind capacity in relatively shallow waters off Europe's Atlantic, Baltic and North Sea coasts, which could supply 80% of Europe's electricity. "You could turn the northern seas into one large power factory over the next 10-15 years," he says.

As yet, only 16,000MW of offshore wind has been installed in Europe, and already people are talking about space constraints, as with onshore wind and solar farms. Partly in response, Norway's Equinor, an energy company, is using its deepwater-oil technology to build floating wind turbines tethered to the ocean floor, which could be installed far from land in the North Sea, off the west coast of America and in East Asia. So far it has built one 30MW project off the coast of Scotland, and is considering another to power North Sea oilfields. But Mr Poulsen says the cost of floating turbines, up to four times that of fixed ones, may be prohibitive.

The price of offshore wind generated by his turbines, he says, fell by 60% in 2013-17 as they doubled in size to 8-9MW apiece without needing large increases in their foundations, cabling and installation time. By the mid-2020s he expects each of them to have a capacity of 15MW, but such growth is still not fast enough to meet Europe's climate goals. The same is true elsewhere.

Almost all agree that a lot more electricity, all of it carbon-free, will be the backbone of efforts to decarbonise the energy system. The Energy Transitions Commission (ETC) says that electricity's share of final global energy demand, currently about 20%, could rise to 60% by mid-late century, with bioenergy and hydrogen providing most of the rest. That entails demand for electricity quadrupling to about 100,000 terawatt-hours over the same period to power vehicles, heating and other users of energy. A quarter of that would be just to make hydrogen.

Figures from BP, an oil company, show that last year less than 35% of the world's electricity was generated from non-carbon sources, including nuclear and hydro, and only 8.4% from non-hydro renewables. The ETC estimates that in order to produce all electricity by renewables in 2050, the annual deployment rate of solar and wind power would have to rise tenfold. Yet it is not necessary that all electricity should come from a mixture of renewables and batteries, even if it were possible. Some argue persuasively that it is cheaper to include non-renewable sources in the power mix to stabilise the system. Nestor Sepulveda at MIT and others argue in a recent paper that it is far more cost-effective to mix intermittent renewables with "firm" (ie, not intermittent) low-carbon resources such as nuclear, natural gas with carbon capture, and bioenergy. Without these, costs rise rapidly as the electricity system gets closer to full decarbonisation, even with storage and the ability to flex demand to cope with surpluses and shortages of power.

Savings in the total use of electricity could be made by using it more efficiently, lowering the amount of energy needed to produce each unit of GDP. Energy intensity declined at an average rate of 2% a year in 2010-16, which helped reduce greenhouse-gas emissions, though they have since risen again. Tightening new constructions standards, retrofitting existing buildings and managing consumption better would all help. At the same time electricity consumption in the developing world still lags far behind, averaging around a third of that in rich countries. Moreover, as energy efficiency increases, consumers may simply use more of it.

There is an outside chance that a "breakthrough" technology will emerge to replace fossil fuels with a steady source of electricity. Ernest Moniz, who was America's energy secretary in the Obama administration, says he has never seen so much interest in new nuclear fission technologies. Some continue to hold out hope for nuclear fusion. But as the price of renewables falls, hydrogen is looking more attractive as a way to store electricity over longer periods and distances than batteries. It could have even more uses with further development of carbon capture and storage.

This article appeared in the Technology Quarterly section of the print edition under the headline "The (relatively) easy part"

Brain scan

John Goodenough

The man who helped invent the lithium-ion battery is still trying to reinvent it

Print edition | Technology Quarterly Nov 29th 2018

Joe Mckendry / University of Texas

"I WANT TO solve the car problem. I'd like to get all the gas [petrol] emissions off the highways of the world. I'm hoping to see it before I die. I'm 96 years old. There's still time." Delivered with an infectious chuckle, these words sum up what makes John Goodenough of the University of Texas a living legend in the world of batteries.

Almost 40 years after his pioneering electrochemistry helped usher in the era of the rechargeable lithium-ion battery, he is still trying to tame his troublesome brainchild. Today's mobile phones and electric vehicles contain the same core battery components as when Sony first introduced them in 1991: a liquid electrolyte, a lithium-cobalt-oxide cathode (the positive side of the battery), developed by Dr Goodenough, and a carbon anode (the negative side of the battery), pioneered by Akira Yoshino in Japan.

But as Dr Goodenough has been pointing out for years, serious drawbacks persist. The electrolyte is flammable. If the battery is charged too fast, the anode grows dendrites ("metal whiskers") that can pass through the liquid electrolyte, either shortening the life of the battery or short-circuiting it and causing it to catch fire. Dealing with these shortcomings and making stacks of battery cells light, powerful and affordable enough to propel a car is his life's mission.

In the past few years he and his colleagues have claimed a breakthrough. They have developed a solid-state battery using a lithium-glass electrolyte with a conductivity similar to a liquid electrolyte, and a lithium or sodium metal anode that does not produce dendrites, making it safer and easier to charge quickly. It does not use cobalt, which is increasingly hard to obtain, it can be charged and discharged up to 23,000 times, rather than just a few thousand cycles.

Dr Goodenough is particularly keen on a sodium anode because, as he puts it, it is available to anyone with access to an ocean, whereas lithium may one day, like oil, require what he calls "gunboat diplomacy" to secure supplies. The cathode remains a work in progress. Some scientists are sceptical of the team's claim that the more often their new battery was cycled, the more its capacity to store electricity increased. But Dr Goodenough dismisses such criticism as competitive rivalry. He is not alone in expecting solid-state batteries to become commercially successful within the next 5-10 years. Japanese carmakers and Panasonic (which also produces lithium-ion cells for Tesla) have formed a partnership to develop them.

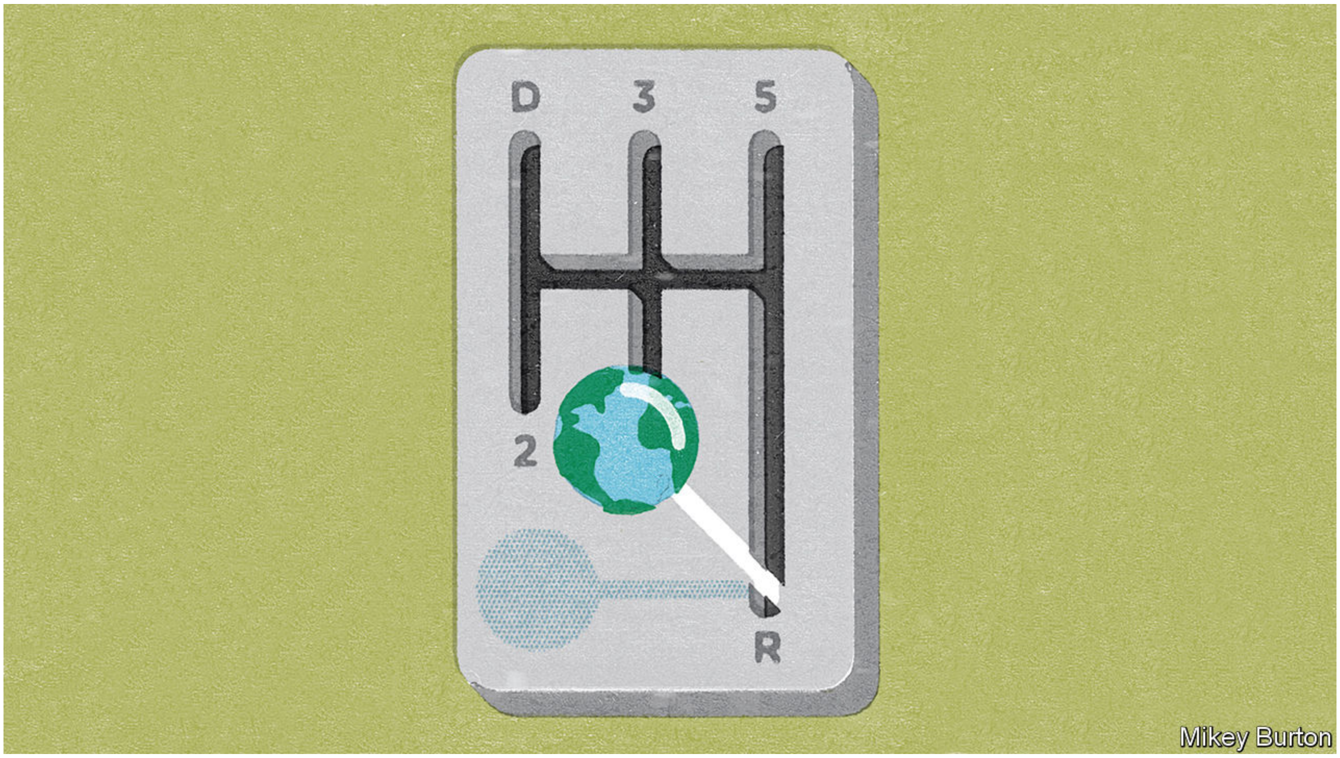
Dr Goodenough's technology has not yet been licensed by a battery manufacturer, and he is the first to concede that battery breakthroughs have been exaggerated in the past. "When everybody's blowing trumpets, be careful," he says.

Heavy transport

Lorries can help deliver the hydrogen economy

Reducing road-freight emissions is taking many forms

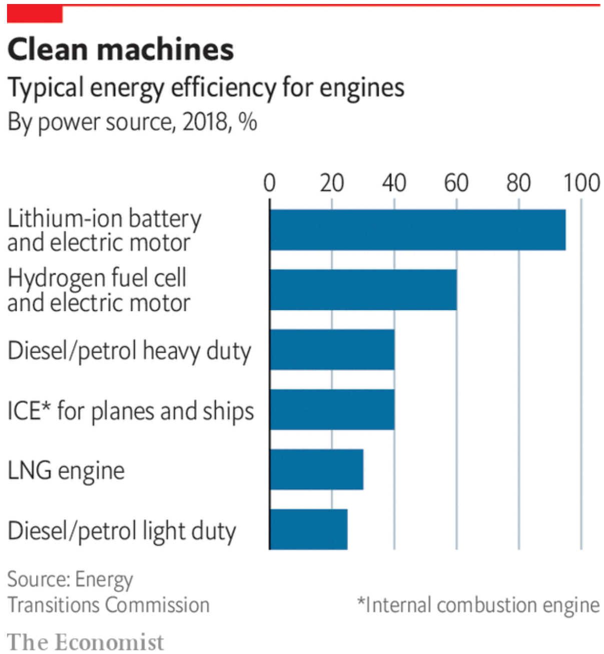
Print edition | Technology Quarterly Nov 29th 2018



"GET THE hell out of our way and stop funding the oil companies. That's the thing that pisses me off," thunders Trevor Milton, boss of Nikola, an American startup making hydrogen-powered lorries. His rage is directed at the government, and not for nothing does he sound like Elon Musk, the other clean-energy maverick with a company named after Nikola Tesla, developer of the alternating-current electric motor. He and Mr Musk are engaged in a race to decarbonise road transport.

Nikola, based in Arizona, has pre-orders for 8,000 hydrogen-fuelled trucks that will compete with Tesla's battery-powered "Semis", as well as other zero-carbon juggernauts made by Volvo, Hyundai, BYD and others. Many dismiss batteries and hydrogen in trucking because of the weight and volume needed to move heavy loads over long distances. Though both types of engine are more energy-efficient than internal-combustion engines (see chart), neither produces as much power per litre as conventional fuels, so they need far more storage space. Hydrogen has the additional disadvantage that it takes lots of electricity to make.

Yet finding ways to decarbonise freight is becoming increasingly important, because its share of CO_2 emissions is likely to rise as that of increasingly electrified light transport declines. Currently lorries produce about 2.5bn tonnes of CO{-2} a year out of an estimated total for all transport of about 9.5bn tonnes (not to mention the air pollution they generate). But emission standards for trucks are rare, unlike those for cars, and it is a fragmented business with lots of owner-drivers who cannot easily be corralled into taking collective responsibility for tackling climate change.



Reducing road-freight emissions can take many forms. Sweden is trying out power lines along a short stretch of road for heavy vehicles to hook up to, as buses do in some cities. Policymakers are also encouraging companies to move more heavy goods by rail, which has lower carbon emissions and may also be electrified. Biofuels such as ethanol could be used more extensively to curb emissions from internal-combustion engines. But since 2008, when China introduced battery-powered rubbish trucks for the Beijing Olympics, the most popular approach has been to use batteries in short-haul transport, especially along predictable routes where recharging is easy. McKinsey, a consultancy, estimates that in Europe and America, light- and medium-duty electric lorries could become cost-competitive with diesel ones in the 2020s.

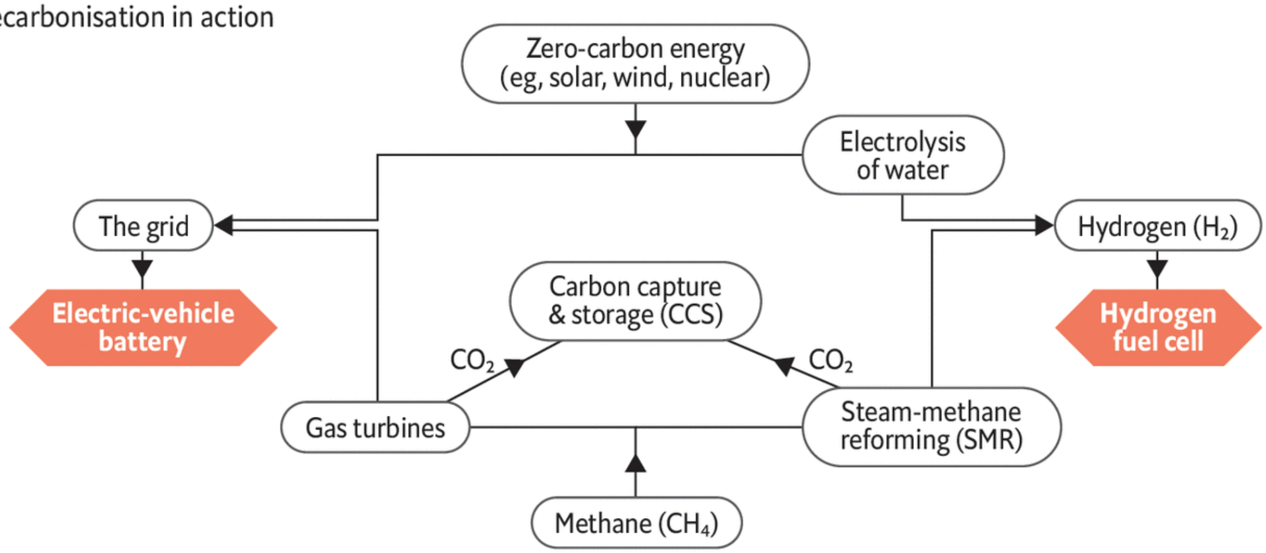
Journeys of more than 800km (500 miles) are more problematic because the weight of large battery packs reduces the amount of cargo that a lorry can carry, and long battery-charging times—perhaps 90 minutes a go—can penalise drivers who get paid by the mile. Enter the Tesla Semi, which Mr Musk promises will be on the road in America in 2019, with four battery packs to speed up charging. Some Tesla specialists estimate that their fuel system will weigh two tons more than that of a 40-ton diesel truck, meaning smaller cargoes. But that may not put off all users, especially since firms that use them can claim to be cutting emissions, making their products more environmentally friendly.

Enter, also, hydrogen fuel-cell vehicles, which have a driving range and refuelling time similar to those of conventional vehicles, and an exhaust that is just water vapour. Companies like Nikola could find themselves in the vanguard of the hydrogen economy before it extends to heating, shipping and heavy industry. But first they have to overcome three challenges that will affect the future of hydrogen as a whole: making it, using it and transporting it.

Start with hydrogen's main drawback: it has to be manufactured. On Earth it is rarely found in isolation, instead forming compounds like natural gas and water. About 95% of today's industrial hydrogen comes from fossil fuels. The most common method of making it is steam-methane reforming (SMR), which uses a catalyst to separate hydrogen from natural gas and steam. This method is used extensively in the chemicals industry but produces lots of carbon dioxide, which needs to be captured if hydrogen is to be produced with low emissions (see diagram).

Go with the flow

Decarbonisation in action



Source: *The Economist*

The Economist

The cleaner way is to use zero-carbon electricity to run electrolysers that split water into hydrogen and oxygen. This is a power-hungry process. For every unit of energy used, only 0.8 units of hydrogen is produced. So the cost of electricity is crucial, accounting for perhaps three-quarters of the price of hydrogen. And the price of emitting CO2 is negligible (at least until governments make it more realistic) giving SMR a big advantage. But the paltry share of hydrogen produced by electrolysis is expected to grow because the more renewables are installed, the more prices drop. The IEA says that recent renewables auctions in places like Chile and Morocco suggest power prices of about $30 a megawatt-hour. At that price, hydrogen could be produced at $2 per kilo, making it competitive with SMR, which costs $1-3 per kilo.

Higher demand for electrolysers will lower their price, too. Graham Cooley of ITM Power, a British company based in the city of Sheffield, says that the price of the electrolysers his firm produces has halved to £800 ($1,000) per kilowatt (kW) in three years. (Others claim lower prices.) He puts this down mainly to volume production. ITM Power is currently building what it says will be the world's largest Polymer Electrolyte Membrane (PEM) electrolyser, with a capacity of 10MW, for Shell in Germany. Mr Cooley expects the cost of electrolysers to fall to about £400 a kilowatt by the mid-2020s.

The main technologies used for electrolysis arePEM and alkaline. Alkaline electrolysers are more established and cheaper, but bulkier. PEM is becoming cheaper and has faster response times, which works better with intermittent renewables, and can be used on a small scale, which is suitable for hydrogen refuelling stations.

Nikola has helped boost production of alkaline electrolysers. In June it awarded a contract to Nel—a Norwegian company that was once a part of Norsk Hydro, which built the first such electrolysers in 1927—to supply 448 of them, plus fuelling equipment for Nikola trucks. They will have a total capacity of 1,000MW, or 1.5 times all the electrolysers Norway has produced since 1927. The lorries will be leased by Anheuser-Busch, an American brewer, and others.

Dickon Pinner of McKinsey, a consultancy, reckons that, though at present levels electrolysers are still "out of the money", their costs could fall a lot through industrialisation, as has happened with wind and solar, especially if China embraces the technology. A price on carbon would also make them more attractive.

Not only will hydrogen have to be produced more cleanly and cheaply, the cost of using it as a fuel must also come down. The instrument of choice is the fuel cell, which works like electrolysis in reverse, turning hydrogen back into electricity and water to power an electric motor. Fuel cells are not new; they provided power for the spacecraft that put the Apollo astronauts on the Moon. But until now they have been too pricey for widespread terrestrial use. They feed hydrogen to an anode and air to a cathode. Both are sandwiched around an electrolyte. Hydrogen electrons released at the anode travel through an external circuit to the cathode, making electricity.

America's Department of Energy says the cost of fuel cells for use in small vehicles, currently $53-60 per kW if produced at scale with the best available technology, will need to fall to $40 per kW to compete with internal-combustion engines. Fuel cells will also have to be more rugged and better able to operate in freezing weather, and more refuelling stations will be needed, along with better systems for getting the green hydrogen to them. Nikola's Mr Milton says its electrolysers will be powered by solar power, wind farms and hydro, most of it coming from off-grid sources.

Making clean hydrogen at scale will also require supply chains. Setting up a new infrastructure for delivering it could be prohibitively costly, especially in developing countries. (Nel recently showed off its hydrogen filling stations, hand-assembled in Denmark and costing about €1m, or $1.14m, apiece.) Many of the best sources of renewable energy that could be used to power electrolysers are found in isolated places such as the Atacama Desert in Chile, Patagonia, Somalia, Tibet and Australia. Hydrogen is very hard to send through pipelines, and shipping it in liquid form requires very low temperatures and very high pressures.

Get on board

With encouragement from Japan, which wants to be a leader in the hydrogen economy, Australia is working on a solution to this that could also benefit another freight sector: shipping. Michael Dolan of the Commonwealth Scientific and Industrial Research Organisation (CSIRO), an Australian body, notes that as yet there are no ships that can move hydrogen as a liquid (other than space ships, which burn liquid hydrogen).

To avoid the drawbacks of liquefying hydrogen it can be converted into ammonia via the simpler (though energy-intensive) Haber-Bosch process. Counterintuitively, there is a greater mass of hydrogen in a litre of liquid ammonia than in one of liquid hydrogen. The ammonia can then be shipped in liquid form—and some of it could be used in ships' engines if they are modified.

Hydrogen fuel-cell vehicles, alas, cannot burn ammonia, and so it would have to be converted back into hydrogen after shipping (at additional cost). In August, CSIRO demonstrated, with some excitement, that a Toyota Mirai and a Hyundai Nexo could be fuelled with high-purity hydrogen extracted from ammonia using its membrane technology. The membrane allows the hydrogen through while blocking other gases.

All this may put the world's truckers closer to the post-carbon era. But to get the economies of scale to bring hydrogen costs well down, non-fossil energy needs other big drivers of demand. One, which may use carbon capture and storage, is heating.

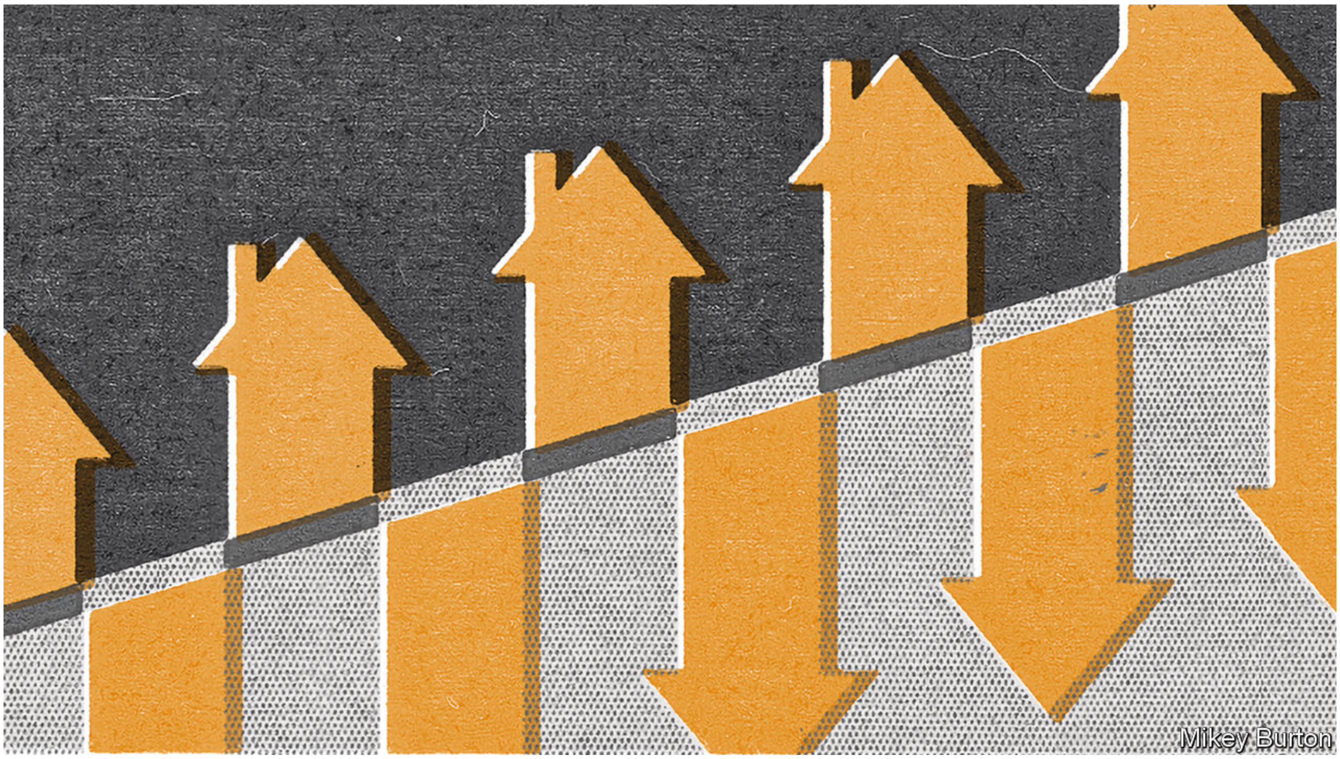
This article appeared in the Technology Quarterly section of the print edition under the headline "The great freight race"

Heating

In the rush to renewables, decarbonising heating has been overlooked

Britain and Norway are at the forefront

Print edition | Technology Quarterly Nov 29th 2018



STARTING IN THE 1960s, a flat-capped army of gasfitters fanned out across Britain to convert a network that used so-called town gas, a mixture of hydrogen, carbon monoxide and other gases, to one based on natural gas, recently discovered under the North Sea. The operation was meticulously planned to avoid stranding customers without heat, and avoiding gas leaks and explosions. Natural gas is less toxic than town gas, which is derived from coal, so the potential benefits were huge, not least that the suicide rate fell as fewer people gassed themselves with their ovens.

If Leeds, Britain's third-largest city, has its way, parts of the country may soon put the process into reverse, going from natural gas back to hydrogen, though this time the pure stuff. Northern Gas Networks, a utility, has pioneered a project, calledH21, that uses a blueprint based on Leeds to set out how Britain's gas networks can be used to bring low-carbon hydrogen instead of natural gas into homes and businesses. Once the city's old cast-iron pipes are fully replaced by polyethylene ones, the challenge will be to prove that hydrogen can be delivered safely at scale. If it can, Northern Gas hopes to provide hydrogen for heating and cooking across the north-east of England. It wants to make Leeds a powerhouse of a global hydrogen economy. To achieve that, it hopes to adapt the most common way of making hydrogen, by steam-methane reforming (SMR), capturing the CO2 emitted in the process.

Apart from the need to improve insulation in houses, heating gets little attention in discussions about the climate, though it is a huge consumer of energy, especially in chilly climates. Britain uses more energy for heating than for generating electricity or for running its transport system. Some 70% of this energy comes from burning natural gas, producing more than a quarter of the country's CO2 emissions. According to the IEA, about three-quarters of the fossil fuels used in the world's buildings goes on heating.

One reason why heating rarely figures in climate discussions is that it is harder to decarbonise than electricity. This gives policymakers an incentive to ignore it. It is much easier to feed renewable energy into a single power grid than to convert millions of gas-fired boilers in people's homes and workplaces to electricity. Second, gas companies are smaller and draw less attention than electric utilities. "The gas industry is an invisible industry," says Northern Gas's Dan Sadler, the brain behind the Leeds project.

Electricity can heat homes but often that may not be the best option. In Britain, for instance, peak heating demand during periods of extreme cold runs to about 300 gigawatts, five times peak electricity demand. It would take a vast expansion of the power grid to satisfy that, especially until it becomes possible to store large amounts of electricity.

Moreover, in places where natural gas is the dominant heating fuel, abandoning gas networks could "strand" trillions of dollars-worth of assets. If hydrogen or other gases such as biomethane produced from organic matter can be produced cleanly and cheaply, they may be able to use many of the same pipelines and storage facilities as natural gas, with minor modifications. Once new burners are installed in stoves and boilers, consumers may barely notice.

Electricity will still have a big role to play, especially when combined with better insulation. Electric heat pumps, for example, work like a refrigerator or air-conditioning system in reverse, taking heat from the air or the ground to warm a building. They are expensive to buy but cheap to run, consuming less energy than they use to transfer the heat. The European Heat Pump Association says the stock of pumps in Europe doubled between 2011 and 2017, to 10.6m.

But where natural gas is already the main heating fuel, hydrogen could act as replacement. In Leeds the plan is to create it by turning steam and methane into hydrogen and CO2, capturing the CO2 using carbon capture and storage (CCS). Eventually, when sufficient zero-carbon electricity is available, it may be possible to produce it sustainably via electrolysis of water. The biggest question now is whether CCS can be a viable technology.

The Norway way

On the other side of the North Sea, Equinor, an energy firm that is part of the Leeds project, is trying to help answer that question. On the bleak west coast of Norway, it is a partner with the Norwegian government, Shell and Total in the Technology Centre Mongstad (TCM), which cost a hefty NKr6bn ($600m) to build. Started in 2012, it is now the world's largest test centre for carbon-capture technologies. From December, Fluor, an American engineering and construction company, will be the latest big firm to test a new CCS process at the site.

CCS is a technology that has repeatedly failed to live up to expectations. Fossil-fuel producers want to make it work because it could provide their products, such as natural gas, with a role in a post-carbon future. But the cost of capturing emissions and burying them—estimated at $50-100 per tonne in the power sector—is high, especially as emitting CO2 into the atmosphere carries few penalties. As the IEA notes, for every large-scale CCS operation started or operating since 2010, at least two have been cancelled.

Britain uses more energy for heating than for generating electricity or running its transport system

Yet the technology may have a bright future, especially when applied to SMR, and in industries such as cement (see article). This year the administration of President Donald Trump threw CCS an unexpected lifeline in the form of a revamped Section 45Q, a tax-credit scheme that sharply increased the amount of financial support per tonne of CO2 captured, and removed a cap on how much of it could be stored. It is likely to give CCS projects a boost, in the same way that investment tax credits have boosted solar and wind.

Environmentalists, many of whom distrust CCS, say the credit is most beneficial for firms wanting to use the subsidised CO2 to inject into oil wells to bolster recovery. Tellingly, after the 45Q modification an American lobby group called the National Oil Enhanced Recovery Initiative changed its name to the Carbon Capture Coalition.

TCM in Norway is testing two ways of capturing CO2. Ernst Petter Axelsen, its managing director, explains that the more widely used one involves injecting flue gases into a tall solvency chamber and adding droplets of a solvent called amine, a stripped-down form of ammonia that binds with the CO2 in the flue gas to form a liquid. This is then boiled at 120°C, releasing the CO2. The other technology, using chilled ammonia as a solvent, is less popular because it requires more manpower, engineers say.

Companies use the facility to test their amine chemistry, which they view as a "secret sauce", to explore new processes such as lung-like membranes, and to work with absorbent materials instead of solvents. Mr Axelsen says interest in CCS has been rekindled by 45Q. And some of the world's largest oil companies have set up a group called the Oil and Gas Climate Initiative, with a $1bn fund devoted to supporting CCS projects.

As for storage, Norway is in the early stages of a big project to capture CO2 from Norcem HeidelbergCement, in the south of the country, and a waste-to-energy Fortum Oslo Varme plant in Oslo. It will then use Equinor, Shell and Total to ship the CO2 and inject it into a porous limestone formation 3km below the sea bed.

Equinor hopes this will be the start of an industry that develops into transporting CO2 by ship or pipeline from Teesside in Britain. Some of that CO2 may come from the Leeds hydrogen project (Equinor is also working with Northern Gas on a supplementary proposal to turn the north of England's biggest cities from methane to hydrogen). The CO2 could also be stored in former hydrocarbon deposits in Britain's North Sea waters.

But CCS projects eat up a lot of capital, which is hard to recuperate in the absence of a meaningful price on carbon. Globally, it also relies on huge amounts of storage sites. The best hope for boosting carbon capture is its role in industry.

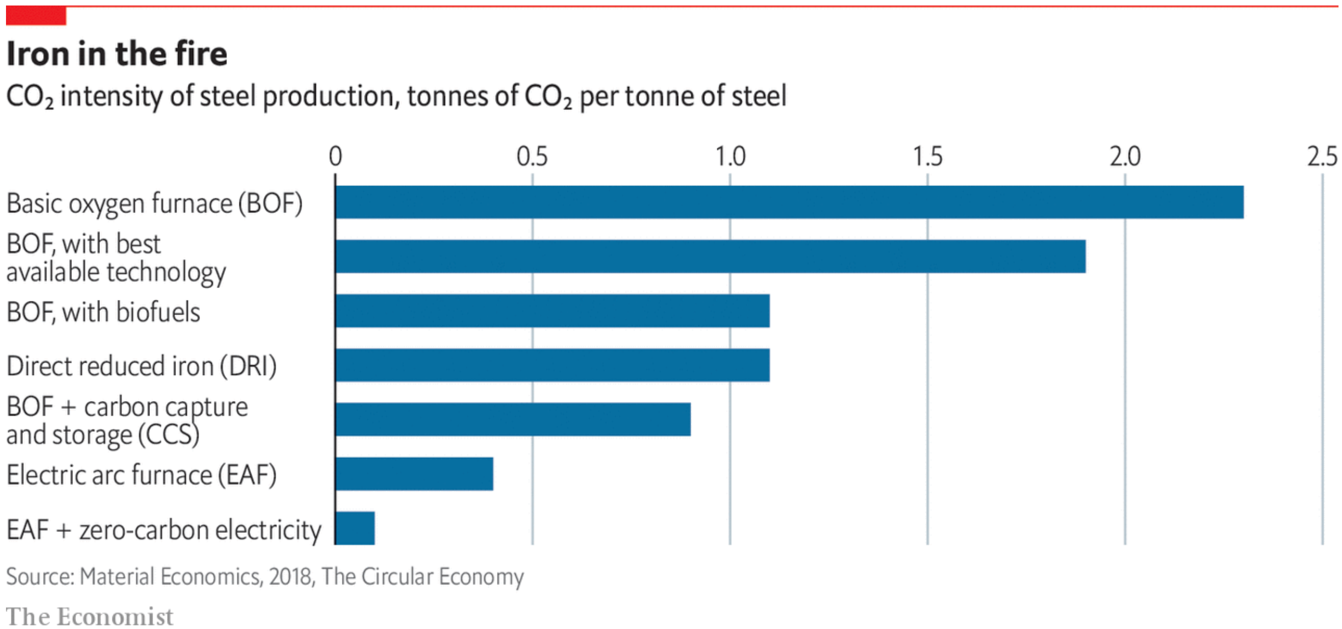
This article appeared in the Technology Quarterly section of the print edition under the headline "Left out in the cold"

Decarbonising industry

How to get the carbon out of industry

Steel and cement plants have long lifespans, so change needs to start now

Print edition | Technology Quarterly Nov 29th 2018



ON THE SWEDISH shore of the Baltic Sea near the Arctic Circle, work has started on a SKr1.4bn ($150m) pilot project aiming to help Sweden become the first country in the world to produce fossil-free steel. Martin Pei, the engineer behind the project, promises that by 2020, passengers flying to the nearby Luleå airport will be able to look down on a 50-metre-high test plant. "We need to hurry up, because 'Winter is coming'," quips the Chinese-born engineer. Or should that be global warming?

In fact, he says, it was not so much the threat of climate change that led Mr Pei to the idea of making Sweden a pioneer of "green steel". It is the risk that SSAB, the steel company where he is head of technical development, could face public humiliation and a collapse in its business model if it were to stop Sweden from achieving its ambition to become carbon neutral by 2045. SSAB's existing blast furnace and steel plant in Luleå emits 1.6 tonnes of CO_2 for every tonne of steel. Though low by global standards, the industry as a whole belches out one-tenth of Sweden's total emissions.

HYBRIT Development, the zero-carbon-steel joint venture between SSAB, LKAB, a state iron-ore producer, and Vattenfall, a state-owned power company, aims to eliminate almost all of these emissions by curbing the use of coking coal. Instead, it will take advantage of Sweden's abundant renewable energy to generate hydrogen via electrolysis, and use this to produce a product called "direct-reduced iron" (DRI). It hopes to complete the experimental phase by 2024, moving on to a full-scale trial in the decade up to 2035.

This is not the only example of fossil-fuel-dependent companies trying to reinvent themselves for a post-carbon future. According to McKinsey, almost half of the CO_2 emitted by the entire industrial sector comes from four industries; cement, steel, ammonia and ethylene. Unless consumption patterns change, all of them will have to cut emissions while meeting rising demand for cars, buildings, plastics and infrastructure. And because most of their products are commoditised, higher costs imposed by decarbonisation risk "carbon leakage"—the possibility that places with laxer climate policies will produce the commodities more cheaply.

In many countries the first priority for reducing industrial emissions will be to encourage recycling. But that will not be nearly enough, and the way the materials are made will also need to change. HYBRIT's experience may provide a model. Its technological challenge starts with the fact that 75% of the world's steel, including SSAB's, is made using a blast furnace into which carbon, in the form of coke, is added to "reduce" the iron ore. In this "basic oxygen furnace" system, the iron oxide and the carbon react to form molten iron, carbon monoxide and CO_2 (see chart). In the alternative DRI process, natural gas instead of coke is used as the reductant, producing sponge iron that is then converted to steel via an electric arc furnace.

The reduction process generates as much as 90% of the CO_2 emissions in steelmaking, so HYBRIT wants to stop relying on blast furnaces, introduce DRI instead and use hydrogen rather than natural gas as the reducing agent. The hydrogen will react with iron oxides to form water rather than CO_2. The hydrogen will be produced using fossil-free electricity, which is abundant in Sweden. The arc furnace, into which scrap steel will be added, will also be powered by clean energy.

HYBRIT explored the alternative of using CCS to remove the carbon gases from the blast furnace, but found that it would fail to capture about half of the CO_2—not good enough for meeting Sweden's zero-emissions goal. It also rejected the idea, used by some Brazilian steel companies, of using charcoal instead of coke in the reduction process, because of the possible toll on Sweden's forestry. And it reckoned electricity prices in Sweden will be low enough to make it cheaper to use hydrogen from electrolysis rather than biogas in the DRI process.

That said, the process is likely to add 20-30% to the price of crude steel, assuming electricity prices remain at current levels. The amount of additional electricity needed will be staggering. Mikael Nordlander of Vattenfall says that at full production HYBRIT would use about 15 terawatt-hours of electricity a year, or 10% of the country's current power supply.

Production is not expected to reach commercial scale until at least 2035, which seems slow for such an important adjustment. Mr Pei explains that this is because scaling up takes time; all new technologies pass through a "valley of death" when progress appears to stall. Moreover SSAB's blast furnace in Luleå has recently been renovated. He says there would be a stranded-asset problem if the project moved ahead too quickly, because the blast furnace would be suddenly rendered obsolete.

Rock-hard

If steel is a big test, cement is an even tougher challenge. Cement is the world's most widely used manufactured material, but cement works are typically small, scattered and undercapitalised, which makes them hard to press into service for the good of humanity. Demand for cement, which is mixed with water and aggregates to produce concrete, is set to soar in regions such as India and Africa. That means huge additional volumes of carbon dioxide will be generated. About 60% of the waste gas comes from producing clinker, one of the main ingredients of cement. This process, called calcination, involves heating ground limestone to more than 1,600°C in a kiln, which produces calcium oxide and CO_2.

The clinker is ground and blended with other materials to form what is known as Portland cement; the power used for grinding also normally releases CO_2. Nearly all of the remaining emissions come from the fuels used to heat the kilns, often coal or coke. These can be replaced with alternatives, from biomass to waste materials such as tyres and municipal solid waste (but not electricity, which at present cannot generate the high temperatures needed to produce the clinker). Along with efficiency improvements, that would be the quickest way to lower cement's carbon footprint.

CCS is a possible low-carbon option for capturing the CO_2 from calcination and from the heat. McKinsey notes that the combined exhaust gases have low concentrations of CO_2, making them more expensive to capture. The consultancy points to an innovative EU-backed project in Belgium called LEILAC that aims to redesign kilns to make it easier to capture exhaust gases from calcination.

The bigger ambition is to develop clinker substitutes, which would do more to reduce emissions. A recent report by Johanna Lehne and Felix Preston of Chatham House, a think-tank, does not hold much hope for an early breakthrough on clinker. But having analysed 4,500 patents, it found that, surprisingly, "the cement sector is more technically innovative than its reputation suggests" (more than steel, for instance).

"Novel cements", or alternatives to Portland, are being developed by Solidia, an American startup now in partnership with LafargeHolcim, a big cement producer. Solidia claims that its low-clinker concrete slashes CO_2 emissions, partly by containing them within the material. But cement and concrete standards usually dictate the Portland clinker content, and builders, architects and customers are understandably wary of new technology, lest their buildings fall down.

Other ways of decarbonising industry may be less daunting. One of the companies exploring potentially lucrative opportunities is Elysis, a joint venture between Alcoa and Rio Tinto which could revolutionise aluminium smelting for the first time since it was invented in 1886. At present, aluminium comes from the combination of three ingredients: aluminium oxide (alumina), electricity and carbon. Electricity is run between a negative cathode and a positive anode, both made of carbon. The anode reacts with the oxygen in the aluminium oxide, producing CO_2 and liquid aluminium, which is then cast. The quantities of CO_2 can be huge. Vincent Christ, the boss of Elysis, says that in China, which uses coal for the smelting process, 16 tonnes of CO_2 are produced for each tonne of aluminium. Elysis aims to eliminate emissions by using an undisclosed proprietary, non-carbon material for the anode, producing oxygen rather than CO_2.

The project is backed by Apple, maker of the iPhone, which says it wants to lower the carbon footprint of its products. By 2024, Elysis hopes to sell a technology kit that can be used around the world to retrofit existing smelters or build new ones. The aim is to make zero-carbon aluminium 15% more cheaply and 15% more productively than the existing technology, says Mr Christ, partly because the anode will last 30 times longer. If it works at commercial scale, that will hugely increase the technology's potential. "It's taken us ten years to crack the code," he notes. "If it were merely an environmental initiative, it wouldn't have as much interest in the market."

Yet in the end much will depend on China, which produces and uses most of the world's steel, cement, aluminium and other industrial materials. Mr Pei, who recently explained the HYBRIT concept in his country of birth, says China has given little thought to producing zero-carbon steel, because its focus is on curbing the use of coal in its power system. It also has relatively new steel plants which it will be unwilling to close.

Cement may be a different story. The Chatham House study says China has invested more than any other country in cement R&D. Elsewhere in Asia, Japan's steel industry is pursuing both the hydrogen and CCS approaches to decarbonising industry.

But ultimately it will take pressure from governments to ensure that industry takes the tough, long-term decisions needed for the transformation. They can start by drawing up plans to ensure that enough renewable electricity and sufficient carbon-storage sites are available for a combination of greater electrification and CCS. Then they can offer incentives for hydrogen production and CCS, either by pricing emissions more strictly or providing regulatory and financial support. In time, they can encourage the use of green cement, steel and other zero-carbon materials in public infrastructure projects, creating new markets. That way, industry will be able to move away from old technologies sooner rather than later, without fear that its customers will move elsewhere.

This article appeared in the Technology Quarterly section of the print edition under the headline "Coke fiends"

Aviation

Synthetic fuels could help low-carbon aviation take off

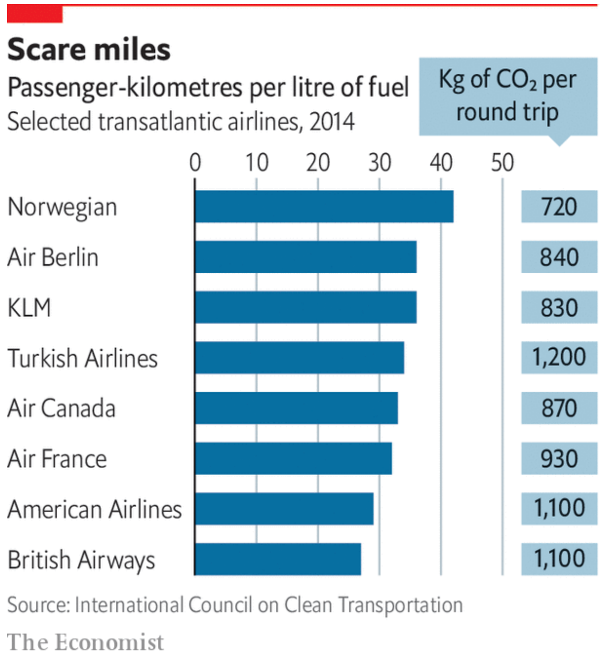
How to combine hydrogen and carbon capture

Print edition | Technology Quarterly Nov 29th 2018

READERS OF *The Economist* are a well-travelled lot. Many of them will be aware, perhaps slightly guiltily, that one of the biggest personal contributions to climate change is all that jet-setting. On average, each person on Earth going about their normal business produces the equivalent of five tonnes of CO_2 a year. But a single transatlantic round trip produces the equivalent of about one tonne per passenger even in economy class.

For some, the problem with global warming is the idea that they may have to change their behaviour to fight it, not just by recycling or eating more seasonal food but by, heaven forbid, forgoing that holiday in Gstaad or the Maldives. Eventually zero-carbon technology may be able to avert some of those difficult sacrifices, by combining green-hydrogen production with a way of sucking CO_2 out of the atmosphere to make synthetic fuels. This is currently very expensive, but it could help low-carbon aviation to take off.

On current trends, air-passenger numbers are expected to double within the next 20 years, mostly because of growth in Asia. That could push up today’s emissions of 1bn tonnes of CO_2 a year to at least 1.7bn tonnes, mostly from long-haul flights. The International Air Transport Association, an industry group, has pledged to halve emissions by 2050. Airlines are buying more efficient aircraft to lower their emissions, some with more success than others (see chart). But it is not enough.



Batteries and hydrogen fuel cells are already finding their way into light aircraft for short trips, but they are too heavy or too bulky to propel a jetliner on a long flight. Instead, biofuels or synthetic fuels that combine clean hydrogen and CO2 could be used as "drop-in" fuels in existing engines.

In Finland a refiner called Neste has made biofuels from the waste products of slaughtered cows and pigs. It has dropped small quantities of them into the fuel systems of Boeing Dreamliners. But the availability of all biofuels, even those from energy crops, is constrained by the shortage of land to produce raw materials sustainably. At Finland's Lappeenranta University of Technology researchers are looking at synthetic fuels as an alternative. Christian Breyer says that if electrolysis were used in places with abundant renewable resources, such as the Atacama Desert in Chile, hydrogen could be produced cleanly at low cost.

To turn it into aviation fuel, he suggests siting the electrolysers near plants extracting CO2 from the air—a process known as Direct Air Capture (DAC). The gas would be converted into carbon monoxide and combined with hydrogen using the 100-year-old Fischer-Tropsch process that is used to make liquid fuels, all powered by renewable energy. The fuel could be refined into kerosene and other products, such as diesel for marine transportation and naphtha for use in the chemicals industry. When burned, there would be no net addition of carbon dioxide to the atmosphere. "It would work like nature," says Dr Breyer.

Unfortunately DAC is the most nascent of nascent technologies. Yet it is attracting the attention of influential promoters such as Bill Gates, founder of Microsoft. Initially it was conceived as a way to reduce the amount of CO2 in the atmosphere; if a captured CO2 molecule can be burned again to keep people flying, at least it does not add to the overall stock.

The firm backed by Mr Gates is Carbon Engineering, based in Canada, that has run a DAC pilot project since 2015 that is capable of extracting one tonne of CO2 per day, and has produced synthetic fuels since 2017. Another firm is Climeworks of Switzerland. Estimates have suggested the DAC technology can cost up to $600 per ton of CO2 removed, but in a recent paper in *Joule*, an energy journal, Geoffrey Holmes of Carbon Engineering and others argue that costs can be below $100 per ton if done at scale.

Mr Holmes says the company has borrowed and modified tested technologies to ensure that it is not reinventing the wheel. The pilot plant sucks in lots of air using a modified version of cooling-tower technology, and draws it through corrugated sheets of plastic sprayed with a hydroxide solution. The CO2 absorbs into a liquid film to form a carbonate solution which goes through a pellet reactor, using chemistry common in water treatment, to form calcium carbonate pellets "like hailstones" that molecularly bind the CO{-2} for further processing. These pellets are heated to 900°C in a high-temperature reactor to produce calcium oxide and CO2. The heating process can be fired by natural gas and both the atmospheric CO2 and that from combustion can be gathered and used.

The carbon thus captured does not have to be turned back into fuel; it could simply be buried. This is one of several ways of removing carbon dioxide out of the air for good. They include producing biomass such as forests, burning wood to generate electricity and capturing and sequestering the CO2. A report by America's National Academy of Sciences says that even the cheapest negative-emissions technologies such as biomass with CCS are still too limited in scale to make a big dent in atmospheric CO2. A study by Britain's Royal Society and Royal Academy of Engineering said a carbon price of $100 a tonne may be needed to make most negative-emissions projects feasible. The danger is that policymakers will delay curbing emissions now in the hope of being able to remove large amounts of greenhouse gases from the air in the future. In fact, both are needed on a massive scale.

Correction (December 12th 2018): *The original version of this piece called Neste a former oil refiner. In fact it still refines oil. We have made the change.*

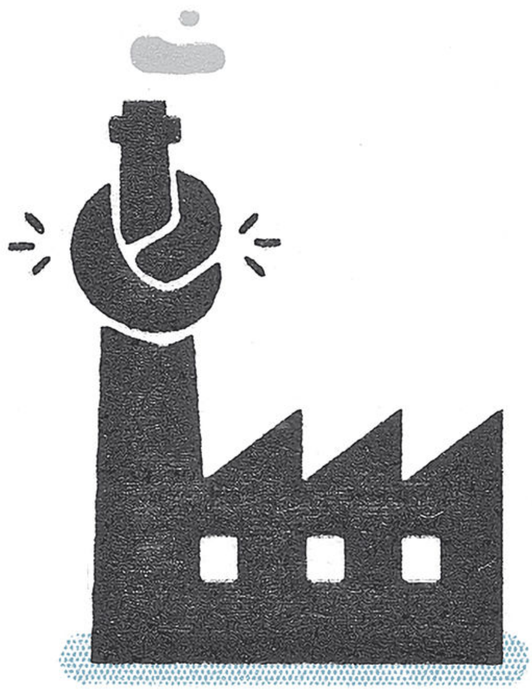
This article appeared in the Technology Quarterly section of the print edition under the headline "Flying in formation"

Decarbonised capitalism

From hot air to action

Hope for mankind is not yet lost

Print edition | Technology Quarterly Nov 29th 2018



Mikey Burton

IMAGINE, SAYS Adair Turner, chairman of the Energy Transitions Commission, that a beneficent god had sent envoys in the night to steal two-thirds of the world's store of fossil fuels, so that mankind knew it would run out of them within 40 years. "I'm certain that by 2060 we'd have built a zero-carbon economy and the cost of doing so would be trivial," he says.

The alternative to heavenly intervention may be equally fanciful: that governments will curb the world's addiction to fossil fuels by agreeing on the global application of the ultimate sin tax—a price on carbon-dioxide emissions that will rise from, say, $50 a tonne in 2025 to $200 a tonne in 2050.

Miracles do happen, but it is unwise to rely on them. In the meantime, the challenges of building a global energy system that requires a fourfold increase in electrification, a hydrogen economy built almost from scratch, and the removal of hundreds of billions of tonnes of greenhouse gases from the atmosphere, should not be underestimated. It is feasible; the technologies are available and could become a lot cheaper if they were adopted widely. Mandates to curb carbon emissions in the future are spurring companies to innovate to survive. But to have a meaningful global impact, the effort requires a level of political ambition that does not yet exist.

To encourage such ambition, it helps to bear three mantras in mind. The first comes from a ten-year-old gem of a book called "Sustainable Energy—Without the Hot Air", by the late British scientist David MacKay. It is "think big". As he puts it (with his italics): "Don't be distracted by the myth that 'every little helps.' *If everyone does a little, we'll achieve only a little.* We must do a lot. What's required are *big* changes in demand and in supply."

Second, think inside the box, not just outside it. The more that zero-carbon technologies can make use of existing systems built for the fossil age, the less risk there will be of trillions of dollars-worth of stranded assets, or of consumers having to change their habits much. Examples include synthetic fuels in existing jet engines, hydrogen in natural-gas pipelines, or zero-carbon aluminium smelters. Steve Oldham, boss of Carbon Engineering, a Canadian startup that sucks CO2 out of the atmosphere, puts it this way: "To make an impact, non-disruptive disruptive technologies are required."

Certainly none of the zero-carbon technologies is developing quickly enough, but they have been under development for decades, at least in the laboratory. The hard part is scaling them up. And the more potential uses a technology such as hydrogen has, ranging from heating to making steel to powering ships with clean ammonia, the more compelling it is as a business venture.

Third, embrace collaboration as well as competition. Just as Carbon Engineering has borrowed ideas from other industries to make direct air capture more efficient, so steelmakers, iron-ore producers, utilities, cement companies and oil multinationals should be exchanging ideas on how best to turn natural gas into hydrogen or capture and store CO2. Competition is still vital. Potential rewards beckon for those who can license the first zero-carbon-steel or aluminium technologies, if the carbon price is high enough. But tackling climate change is a shared mission to overcome a massive market failure: the negligible cost of potentially catastrophic emissions. This is not about “winner takes all”, more about “we all lose unless we work together”.

In the long run, decarbonisation could be a way of reinvigorating capitalism. Carbon-intensive energy, together with capital, ingenuity and cheap labour, has been a driving force of economic growth since the Industrial Revolution. It has changed everything, from agriculture, industry, transport and warfare to global geopolitics. Billions of people still crave the development fossil fuels bring. Yet they have also delivered huge rewards to despotic, rentier regimes, encouraged cartels and over-centralised economies, and never borne the cost of their environmental impact.

Mass electrification, from zero-carbon sources, could stimulate new industries and further decentralise the global economy. It could absorb some of the surplus savings that exist in parts of the rich world, provide plentiful demand for jobs to meet the engineering challenges and ease energy poverty in poor countries. It might sound far-fetched in an era of trade wars and isolationism to think that anything can be done for the common good. But using human ingenuity to build a post-carbon future could be a big economic, as well as environmental, opportunity. Sadly, mankind is still not doing nearly enough to rise to the challenge.

This article appeared in the Technology Quarterly section of the print edition under the headline ”Decarbonised capitalism”

Extractive industries
In a hole

In a hole

Glencore's attempt at reinventing mining has run into trouble

Mining's most risk-hungry company is under pressure to change its culture

Print edition | Business Dec 1st 2018


Bloomberg

FROM THE edge of the Kamoto Copper Company's pit, it is hard even to see the mechanical diggers toiling dozens of tiers below. The 280-metre hole on the southern edge of the Democratic Republic of Congo is deeper than Africa's tallest building is tall. Lorries take the best part of an hour to crawl out from its heart. The greenish ore they lug is given its hue by copper but much of its value by cobalt nestled within. Usually driven to South Africa, then often shipped to China, the cobalt will emerge from a series of factories as the priciest component of a battery powering a smartphone or, increasingly, an electric car.

A sign at the mine indicates it is 1,320km to Kinshasa, the capital, half a week's drive away. Another arrow points to a less likely destination: Baar, a sleepy suburb of Zurich, 6,600km away at the foot of the Swiss Alps. Located in a business park there are the headquarters of Glencore, the company that ultimately controls the Congolese mine. Once a commodities trader that merely bought and shipped stuff others dug out of the ground, in recent years Glencore has gatecrashed an august club of global mining companies, such as Rio Tinto and Anglo American, whose histories stretch back to colonial times.

Its transformation has not been problem-free, however. Glencore's dealings in Congo have landed it in a hole as deep as Kamoto. Authorities in America, Canada and Britain are probing whether its executives, known in the industry for their sharp suits and elbows, deployed even sharper business practices to get ahead. Investors have started to question the firm's prospects; its share price has slumped. Mining firms once encouraged to emulate Glencore's aggressive culture now wonder whether their old-fashioned approach might not have more merit after all.

Glencore is to mining what Goldman Sachs is to high-street banking: nominally in the same trade but in a turbo-charged way. Like the Wall Street stalwart, it thrived first as a private partnership, set up in 1974 as Marc Rich + Co. Its eponymous founder gained fame as a consummate trader, and infamy for evading American authorities irked by his busting of sanctions and dodging of taxes. (He was ousted from the firm in 1993, after which the company was rechristened Glencore.)

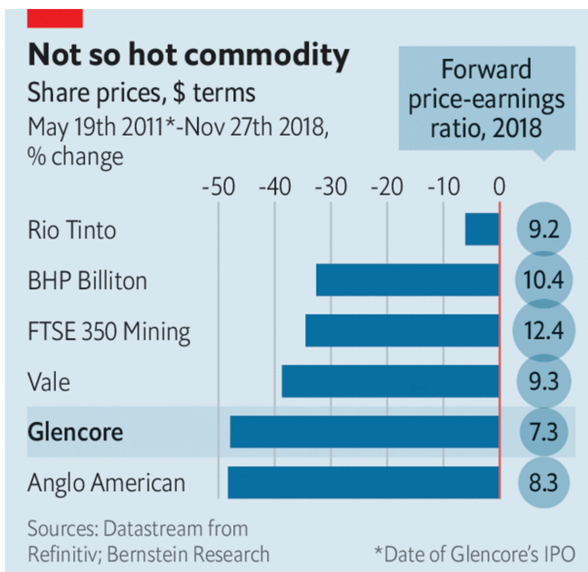
When the firm listed its shares in London in 2011, it was the first in a generation to be propelled straight into the blue-chip FTSE 100 index. Its top brass, particularly Ivan Glasenberg, a brusque South African who joined in 1984 and who has been chief executive since 2002, were lauded as visionaries in a staid field. At least five senior executives were revealed to be billionaires—almost unheard of for employees rather than founders of any company, whatever the industry. Around 40 top traders held shares valued at over $200m each.

Bosses of mining firms are mostly engineering types, as comfortable down a mineshaft as in a boardroom. An accountant by training, Mr Glasenberg's spiritual home is the trading floor. Unlike hedge funds, commodities-traders do not make money on fluctuating prices, but by working out how to get the best price for whatever they can source. The job is more logistics than speculation. A wrinkle in markets might mean a pile of high-quality coal and a low-quality one are worth more if blended together into a medium-quality grade. Access to natural resources is vital, and tricky. In recent years, Glencore has made loans to "state-owned" oil firms in Libya and Iraqi Kurdistan, for example, to be repaid in barrels. (That trick works so long as the "state" in question keeps control of the oilfields.) Glencore handles over 90 commodities, from soyabeans to aluminium.

Trading is a fabulously lucrative business. Returns on equity at Glencore's operation can top 40% a year. But there are limits to how big it can get. So Glencore branched out. Instead of just securing the offtake of mines, it wanted to own them. With little in-house engineering nous, it has mostly bought facilities set up by others (or so sniffy rivals decry). Its transformation was complete when in 2013 it took full control of Xstrata, a big coal and metals venture.

Glencore is now overwhelmingly a mining group—around two-thirds of its $8.6bn in adjusted operating profits last year came from stuff coming out of the ground. But its DNA is still that of a trader's. Sometimes it cuts its own production to support prices: a sort of one-firm OPEC. It is nimbler than rivals, and more opportunistic. "Glencore has a different culture to other miners. They are quick, they trust their own judgment," says Paul Gait of Sanford C. Bernstein, a research firm.

The superlatives are less frequently heard now than they were at the time of listing. Investors who bought Glencore shares at the time have lost 48% of their money since 2011—a worse return than any of its big FTSE mining peers except for Anglo American (see chart). Mr Glasenberg failed to spot a commodities-price wobble coming in 2015. A humbling $2.5bn capital infusion was required to fix the balance-sheet. After recovering, its shares have slipped again since the start of 2018 and trade at just 7.3 times this year's estimated earnings.



The Economist

Many people in mining think Glencore's buccaneering business model is now haunting the firm rather than helping it. Mr Glasenberg's strategy has been not so much contrarian as actively seeking out opportunities others shun. His firm has snapped up coal mines that rivals have been all but forced to divest by environmental activists: it is now the world's biggest seaborne exporter of thermal coal, for example. Peers might panic at being exposed to Vladimir Putin's Russia; Glencore has stakes in Rosneft and Rusal, two firms active in oil and aluminium respectively, both battling American sanctions.

Most worrisome to investors has been its investment in Congo, a country avoided as too risky by Glencore's big rivals. Tricky conditions have necessitated $7bn in investment to improve its mines there. At first the payoff seemed worth it, especially given a surge in the price of cobalt, a by-product that was a mere afterthought when Glencore had first invested in 2007.

But just as production has been ramping up, the political landscape has worsened. Old agreements to freeze royalties paid by Glencore have been all but torn up by the government. Remitting profits abroad is harder. Under duress, in June Glencore wrote off $5.6bn it loaned to a joint venture with a government-owned miner, in exchange for equity. To add to its woes, in November cobalt at Kamoto was found to be contaminated with uranium. Sales are suspended until a plant to remediate the radiation can be built.

Yet even radioactivity is not Glencore's biggest problem in Congo. Since first investing a decade ago, it has relied on a deep-seated alliance with Dan Gertler, a controversial Israeli businessman who started in the diamond trade. According to a UN report, after arriving in 1997 Mr Gertler won favour with the ruling Kabila family by offering $20m to finance the purchase of arms, which the current president's father used to win a bloody civil war. That gained him a perch as an unavoidable middle man to just about anyone looking to dig something from the ground in Congo. Mr Gertler is said to be the inspiration for the film "Blood Diamond" (presumably not for the hero). Through a spokesman, Mr Gertler declined to comment but reiterated claims of having committed no impropriety.

American authorities now have Mr Gertler in their sights. Under "Global Magnitsky" sanctions first enforced to target Russian wrongdoing, in December 2017 he was among 13 kleptocrats and their cronies placed under sanction for egregious breaches of human rights and for corruption—a problem for Glencore, whose boss once described Mr Gertler as "a supportive shareholder" in a joint venture in Congo. It has found it hard to cut ties with him.

Glencore might have known from the outset of Mr Gertler's sulphurous reputation. The UN report that outlines his past was written in 2001. In the wake of an American hedge fund facing scrutiny for allegedly dealing with him in 2016, before he was sanctioned, Glencore bought him out from its mines, including Kamoto, for $534m. But the deal entitled its erstwhile partner to further royalty payments in the region of over $20m this year and $100m in 2019. When Glencore at first refused to make these payments, citing the sanctions, Mr Gertler filed a lawsuit and, in essence, threatened to close down Glencore's Congolese operations. Keen to avoid that outcome, Glencore decided to pay him.

Glencore has insisted it did not violate American sanctions, largely by means of having paid Mr Gertler his dues in euros, and outside America. It has made the case to American and Swiss authorities that penalising it would be tantamount to self-inflicted industrial sabotage: Congo is the source of two-thirds of the world's cobalt, an element which is crucial to modern electronics (see article). If it were to leave the place, Glencore has argued, Chinese miners already active there would send ever-more precious cobalt straight to China (as Glencore itself often does, too).

Whatever its merits, this argument seems to have fallen on deaf ears. Three weeks after Glencore paid part of this year's dues to Mr Gertler, on July 3rd, it announced it had received a subpoena from America's Department of Justice (DOJ) in respect to compliance with the Foreign Corrupt Practices Act; its activities in Congo, as well as in Venezuela and Nigeria, were cited. Britain's Serious Fraud Office is also reported to be investigating Glencore on matters relating to Congo, as is the Ontario securities regulator in Canada.


Eyevine/13photo

"Paying Gertler was a blatant finger in the eye of US authorities," says a senior executive at a rival firm. "You can't do that and hope to get away with it, even if you are Ivan Glasenberg." Worse, the matter is not even fully resolved: Glencore has yet to publicly announce whether it intends to pay Mr Gertler the money he is entitled to in 2019 under existing agreements. (The company declined to comment.)

Glencore's market value fell by $5bn on the news of the DOJ investigation—an amount more than five times greater than the biggest fine ever meted out under the relevant statute. That reflects investors' fear not only of a large penalty, but also that American authorities could in effect force a change of direction at the company.

The miner is hardly unique in the corporate world in having faced the attention of American authorities. But Glencore's case stands out. Other American investigations have mostly been against firms where the alleged wrongdoing was peripheral to their activities, where the top brass could blame underlings and where the problem was not seen as indicative of wider culture. Yet some analysts estimate that Congo, at least before its current woes, represented around a quarter of Glencore's market value (now at $51bn). Mr Glasenberg is reported to be a regular visitor. And the DOJ investigation targets three countries, suggesting it is investigating a pattern of problems.

Analysts have fretted about Glencore itself coming under "secondary sanctions" for its relationship with Mr Gertler. That seems unlikely. But even the slightest whiff that Glencore is abetting sanctions-busting will jangle the nerves of the compliance department of its banks. Commodities trading is fuelled by ample and cheap bank financing; Glencore has $33bn in bonds and loans outstanding.

Mr Glasenberg has had to reassure analysts about this. “He knows that if banks start worrying about getting caught up in sanctions stuff just by doing business with Glencore, that would be a terminal issue,” says one. It was worried banks that pushed Mr Rich from his perch in 1993. Given its supportive shareholders—30% are Glencore employees, and the Qatari sovereign-wealth fund has a further 8.5%—the firm’s lenders are the most likely source of pressure on its business model.

Some industry executives worry that Glencore is turning mining into the new banking: a sector aggressively pursued by American authorities, with the power to dictate fresh faces at the top of firms they deem to fall short. “The DOJ worries about sectors that don’t take compliance seriously. Industries only wake up after one of them is hammered, like HSBC in Mexico,” says one industry figure. The bank’s money-laundering of cartel drug money earned it a $1.9bn fine in 2012, along with five years of intense monitoring, prompting wider change in the banking industry’s culture.

How and when the Glasenberg era ends is what investors are most curious about now. Aged 61, he has already started indicating to investors he won’t be around for more than three to five years—as it happens, roughly the time frame of a DOJ investigation of the scale Glencore faces. None of his lieutenants are in line for promotion; even in the gossipy world of mining, no one has any idea who will succeed him. Once, the obvious choice would have been a swashbuckling trader willing to win at all costs and to plough on in the face of criticism. Less so, now.

This article appeared in the Business section of the print edition under the headline ”In a hole”

Battery farming

Can the world produce enough cobalt for electric vehicles?

The main source is the unstable Democratic Republic of Congo

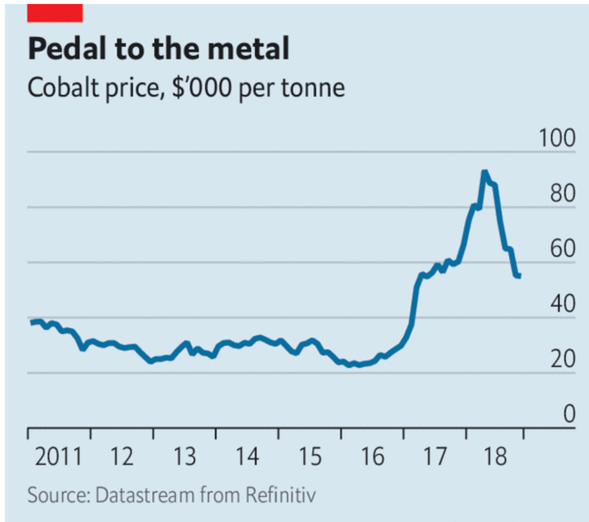
Print edition | Business Dec 1st 2018

THE ONLY thing that can accelerate as fast as an electric car is the price of the most expensive metal in its batteries. Once a niche input used to strengthen turbine blades, cobalt's value has soared since it started to feature in modern electronics. Most phones need a few grams' worth, and every car requires 5-10kg. That adds up. Many business models are based on ample reservoirs of cobalt that experts warn do not exist.

Soaring demand for a commodity is usually met by vaulting investment to ensure supply. Cobalt's case is somewhat different. Nearly all of it is obtained as a by-product of mining nickel and copper. Even the sharp rise in cobalt's price thus far has not been enough to justify fresh investment in digging more nickel and copper out of the ground. Worse, most of it is in the Democratic Republic of Congo, where neat models of supply and demand count for little.

Most incremental demand for cobalt comes from carmakers, which have invested around $100bn in electric-vehicle (EV) technology. According to one estimate, by 2030 at least as much of the stuff will be needed for transport alone as was mined in 2017. America has designated it a "critical mineral".

The expected demand spike assumes both a rapid rise in EVs, which is likely, but also continued dependence of batteries on cobalt, which is less certain. Battery technology is evolving; some need less or no cobalt. Tesla, an electric carmaker, is among those saying it is "aiming to achieve close to zero usage of cobalt", helping derail a rally in the metal's price this year (see chart).



The Economist

In part, Tesla is responding to concerns about how the stuff is sourced. Several NGOs have started to put pressure on tech firms to ensure their gizmos are free of "conflict cobalt". The bit of Congo where the metal is mined is mostly peaceful, but tensions in the country persist, fuelled by money from mining. Perhaps a quarter of production is done by "artisanal" miners, meaning local people working on a small scale.

Sometimes they operate on the territory of big miners. "We take shovels, torches, hammers, picks and wire-cutters to make a hole in the fence," says Paul, one such miner in Kawama, near Glencore's operations. "We usually go to the mine at around 10pm. If we don't get caught we'll stay there, digging, until dawn." Cobalt traders, many of whom are Chinese, will buy a night's output for $40—a small fortune by local standards.

Some groups think artisanal mining can help bridge the gap between supply and demand. Efforts are afoot to clean it up, for example by designating permitted areas. But that will not be enough to ensure the ample supplies needed.

A few other places, such as Australia, have small amounts of cobalt. But the biggest source is even trickier than Congo to explore: leagues below the high seas. Much of the floor of the Pacific ocean is lined with nodules rich in cobalt. If there is not enough in the ground, going underwater is the logical next step.

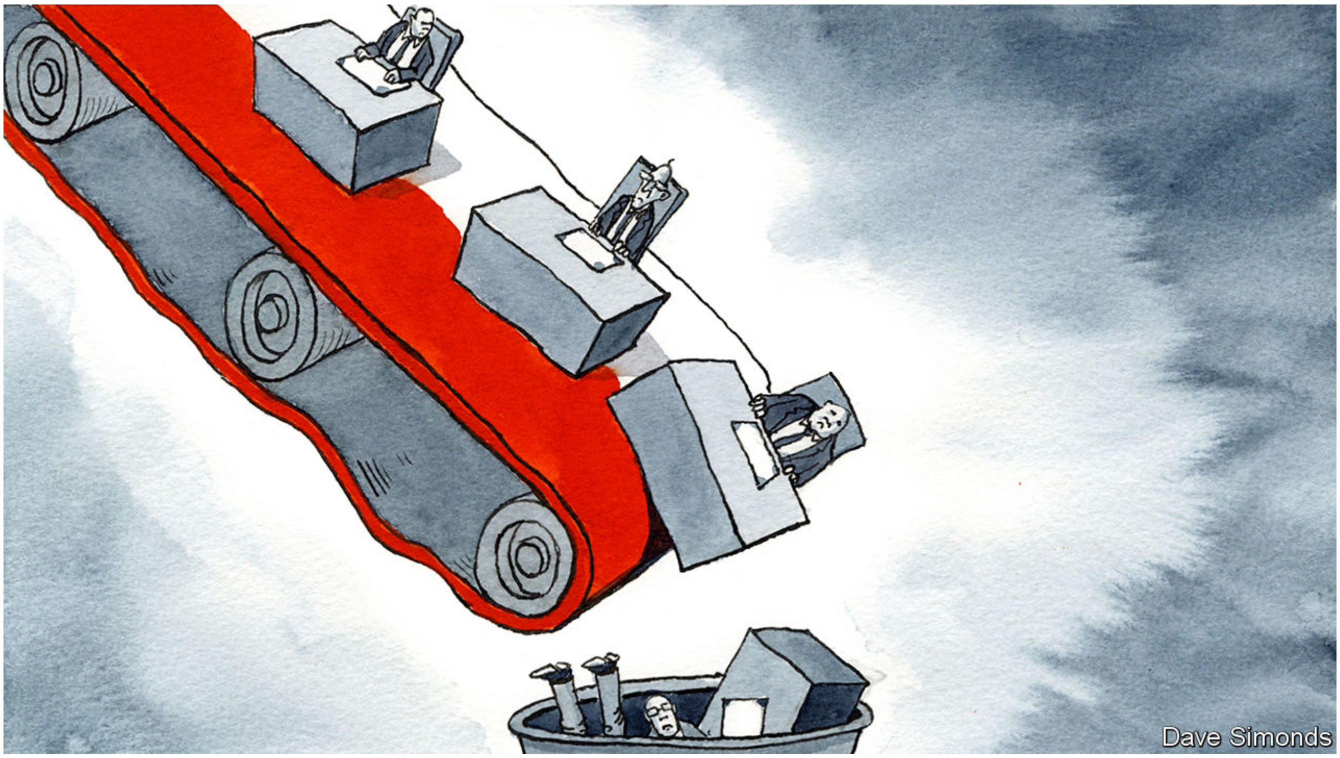
This article appeared in the Business section of the print edition under the headline "Battery farming"

Chief Executed Officers

Poland's state-owned giants cope with unprecedented turnover

The government is removing the boss of an SOE every three weeks on average

Print edition | Business Dec 1st 2018



FOR 17 YEARS the state-owned stud farm in Janow Podlaski in eastern Poland has hosted the "Pride of Poland" auction. In its heyday Arabian horses strutted around a grassy track, tempting foreign buyers into eye-popping bids. In 2016 the new government replaced the stud's long-standing boss with an inexperienced newcomer. In his first two months two horses died, prompting media headlines; the new boss was ousted. Last year the auction brought in only a tenth of what it made before the changes. The next boss was also sacked.

Executive turnover is not restricted to Janow Podlaski. Since coming to power three years ago, the populist Law and Justice (PiS) party has swept the stables at state-owned enterprises (SOEs) with Herculean energy. The 30 most "strategic", as defined by the government, have been run by over 100 bosses during the period; average tenure now stands at just under a year. According to an analysis of over 20 big SOEs that are listed on the stockmarket by *Puls Biznesu*, a business newspaper, the public sees a change of chief at one of them every three weeks on average. That compares with every eight weeks under the Civic Platform government, in power between 2007 and 2015, and every ten weeks under a left-leaning government in office between 2001 and 2005. As the current prime minister, Mateusz Morawiecki, said: "We sometimes bet on new faces, sometimes they prove their mettle, sometimes they do not."

How the SOEs are run matters. Poland has one of Europe's most overgrown public sectors. The government controls the two largest banks, the biggest insurer and two defence groups, as well as important energy, mining and petrochemical companies. Constant turnover risks throwing sprawling organisations into disarray. Severance packages and recruiting costs add up. And long-term strategies are harder to set—by August, for example, firms inside the biggest state-owned defence group had not agreed on their goals for the year. Aware that their tenures will probably be short, bosses can be myopic. Jaroslaw Dominiak, president of the Private Investors Association and a former board member at the Warsaw Stock Exchange (WSE), describes how one of the exchange's chief executives unwisely fired experts to achieve quicker cost cuts, knowing that the time allowed was limited.

But SOEs are also finding ways to cope with the churn. Firms are keeping daily business moving by shifting operational work to technical managers, leaving only large strategic decisions to the board. Strong unions and pledges to local communities about manufacturing bases also help stabilise companies such as the mining giant, KGHM, notes Andrzej Bobinski at Polityka Insight, a research firm in Warsaw.

Moreover, many state firms are enjoying good results, partly owing to a strong economy. Last year profits at the 15 largest, listed state-owned companies reached around $4bn, double the equivalent figure in 2016. The shares of the nine companies which have been state-owned and included in the WSE's index of 20 largest companies since 2012 rose by 62% in 2016-17, outperforming the benchmark by 23 percentage points.

If high turnover of bosses has not proved disastrous, the state's wider influence is still unhealthy. Firms are encouraged to bail out unprofitable businesses that carry political clout. In 2013 Civic Platform, for example, tried to pressurise the head of PGE, the country's largest power producer, into making an unprofitable investment in a coal plant that the state wanted to protect. He refused, and resigned. And instead of investing in existing plants, in 2016 PGE bought into the Polish Mining Group, the European Union's largest producer of hard coal. Its shares have tumbled since 2013; electricity prices in Poland are set to be the EU's highest partly as a result of old, coal-reliant infrastructure.

In 2016, 17 state-owned groups opened their coffers to fund a new body, the Polish National Foundation, which aims to promote Poland's economy and cultural heritage. One recent project is funding English-language films by Hollywood scriptwriters. When the economy turns, such investments will become more problematic. SOEs may even wish they had a bit more stability at the top.

This article appeared in the Business section of the print edition under the headline "Chief executed officers"

Bartleby

Working for a purpose

An academic calls for an overhaul of the conventional company

Print edition | Business Dec 1st 2018

THE MODERN company has morphed into a "money monster" enslaved to the doctrine of shareholder value. That is the thesis of a new book* by Colin Mayer, a professor at the Saïd Business School in Oxford. It is the latest challenge to the principle enunciated by Milton Friedman, an economist: namely, that "there is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game." An influential paper** by Oliver Hart and Luigi Zingales last year argued that profitability is not the only criterion that should apply and that shareholders' welfare is affected by a broad range of factors, including social and environmental conditions.

Mr Mayer takes a similar line, arguing that companies have relationships with many more people than just shareholders. As well as financial capital, they use several other types—human, intellectual, material (buildings and machinery), natural (the environment) and social (public goods like infrastructure).

He also notes that the original conception of a firm was quite different from now. The *societas publicanorum* were Roman bodies that performed public functions such as tax-collecting or maintaining buildings. They raised finance from shareholders and their shares were traded. The medieval idea of a company revolved around a family business. The founders were people who took bread together (hence the term *cum panis*). In the early-modern era, firms such as the Dutch and English East India Companies‘ were set up in order to pursue national trade objectives.

This mix of family and state-linked businesses still exists in many developing nations. The countries with a really narrow focus on shareholder value are America and Britain, and this is where Mr Mayer concentrates his criticism.

Mr Mayer thinks that companies should find a purpose that is broader than the amassing of profits. They should be "doing well by doing good". With that principle in place, the law should then require firms to demonstrate how their governance, leadership and incentives are organised so that purpose can be realised. Financial accounts should be redrawn to reflect the company's effect on human, social and natural capital, as well as its financial performance. He also proposes (along with other proponents of "long-term" capitalism) that interest payments on debt should no longer be tax-deductible and that the voting rights of shareholders should reflect the length of time that they have owned their certificates.

Mr Mayer's riposte to the charge that his ideas are overly idealistic is that the current system is simply not working according to conventional measures of economic success. Britain has a corporate model that is very friendly to investors, with dispersed share ownership, an active takeover market and strong creditor rights. The result, he posits, has been a poor national record on investment, productivity and innovation.

He also notes that firms which pursue approaches that come under the heading of "sustainability" or "social responsibility" enjoy higher returns, lower risks and lower costs of capital. (A recent paper by Robert Eccles, Ioannis Ioannou and George Serafeim showed as much.***)

Yet this line of reasoning also raises some objections to the author's broad thesis. If sustainability is profitable, then shareholders should push more companies in that direction without the need for an overhaul of the current system.

And the change of financial accounting that Mr Mayer recommends would create all sorts of headaches. Social and environmental costs would be tricky to calculate. Financial profits form the basis for corporate taxation and for the distribution of dividends. It is hard to see a new, lower figure being used for tax purposes (government receipts would fall) or dividend calculation (cash would pile up on companies' balance-sheets). So the main use of the number would be as a benchmark for incentive plans. And that would give scope to senior executives to game the new measure. Mr Mayer's prescriptions may be laudably virtuous overall, but there would be lots of devils in the details.

* "Prosperity: Better Business Makes the Greater Good", Oxford University Press

** "Companies Should Maximise Shareholder Welfare Not Market Value", *Journal of Law, Finance and Accounting* 2017

*** "The Impact of Corporate Sustainability on Organisational Processes and Performance", *Management Science*, Vol 60, No 11

Last-chance saloon

GM prepares to close five factories, attracting Donald Trump's ire

Mary Barra is responding to customers' soaring appetite for SUVs and pickups

Print edition | Business Nov 29th 2018

THE CAR industry's changing fortunes have left a deep mark on Detroit's urban landscape. Once-bustling factories such as the Fisher body plant, Ford's Highland Park and the Packard plant became vast, abandoned graffitied shells—a sad reminder of the former might of America's "motor city". Now General Motors's Hamtramck assembly plant looks likely to join the list of closed facilities. On November 26th GM announced that Hamtramck, along with four other factories in North America, and two more unspecified plants elsewhere, would not be assigned new vehicles or components to put together after next year.

News of the cost-cutting initially sent GM's shares soaring. In total it will trim its North American workforce by a substantial 15%. Another Michigan plant is among those to be idled, as well as facilities in Ohio and Maryland, and in Ontario, Canada. The day after the announcement, however, criticism from President Donald Trump sent shares the other way. Mr Trump tweeted that he was "very disappointed" in Mary Barra, GM's chief executive, noting that she was not shutting down plants in Mexico or China: "The US saved General Motors, and this is the THANKS we get!" He threatened to cut off GM's access to federal subsidies for electric cars (although industry-watchers noted that this is not a concern, since GM has mostly used up its permitted allocation of such subsidies).

Mr Trump is not the only disgruntled politician. Justin Trudeau, Canada's prime minister, tried to reassure workers about the proposed closure of the plant at Oshawa, on the shores of Lake Ontario, where GM started making cars over half a century ago. After trade liberalisation led to tighter integration of the North American car market, cars became Oshawa's lifeblood. When the financial crisis pushed GM towards bankruptcy, Canada joined America in bailing out the company to save local jobs.

Yet the swirl of forces upending the industry means GM probably had little choice but to take some action. Car sales in America and China are already growing only tepidly. Some worry that a harsh automotive recession is coming. Capacity utilisation in the American automotive sector has plunged from nearly 90% in late 2015 to 80% now. This is a particular problem for GM, which in the past was known for a "bigger is better" mindset. On one estimate, the five North American plants to be shut down have the capacity to make 800,000 cars but are producing fewer than 300,000.

A big factor behind that gap is collapsing consumer demand for saloon cars, long a mainstay of the big car firms. Six years ago, annual sales of pickup trucks and sport-utility vehicles were roughly 7.5m in America, equivalent to sales of saloons. Now Americans buy over 12m pickups and SUVs each year, more than twice the sales of saloons. The plants that GM is winding down make the Buick LaCrosse, the Chevrolet Cruze and other saloons. Once buzzing with three shifts, these plants have been running just one shift of late.

Another trend forcing Ms Barra's hand is rising costs. Both GM and Ford, its chief American rival, have estimated the impact on profits of the tariffs imposed by Mr Trump's administration on a variety of essential imports (most importantly, steel and aluminium) at over $1bn each. On top of this are the heavy investments that GM must make for the future in electric-vehicle and autonomous technology. Cruise Automation, its well-regarded autonomy division (which in May attracted $2.3bn of investment from Japan's SoftBank), expects to launch robotaxis on the streets of San Francisco next year.

Seen in this light, the cuts look sensible. Since taking over four years ago, says Colin Langan of UBS, a bank, "Mary Barra has done a phenomenal job". She moved faster than rivals in preparing for the future, he notes, by selling off GM's loss-making Opel division in Europe and pulling out of several unpromising emerging markets. Nor will her cuts hit the factory floor alone—they include a vow to trim GM's executive ranks by a quarter. In total the changes will take $6bn off the firm's annual cost base by 2020. Mr Trump may attack her and unions will revile her. But tough decisions are needed if GM is to survive another downturn and without another bailout.

This article appeared in the Business section of the print edition under the headline "Last-chance saloon"

Good times in Grainville

Russia has emerged as an agricultural powerhouse

Enterprising farmers have overcome the legacy of Soviet collectivisation

Print edition | Business Dec 1st 2018

THE DISTRICT of Zernograd, or Grainville, in Russia's southern Rostov region has many hallmarks of a depressed post-Soviet backwater. Decaying villages dot dusty roads; grey apartment blocks fill sleepy cities. Yet thanks to its namesake crop, times for many here have never been better. Take Yuri and Aleksandr Peretyatko. When the brothers launched their grain farm in the early 1990s, "we didn't even have bicycles," says Aleksandr. Now they own 1,500 hectares and cruise around in new white Lexus SUVs. Their children, Aleksandr boasts, "ride Range Rovers".

The Peretyatko brothers embody the optimism in Russian agriculture, a booming sector in an otherwise sluggish economy. Production has increased by more than 20% in the past five years, despite a broader recession and now stagnation. "That's what's called a breakthrough," President Vladimir Putin gushed as he discussed the upbeat figures at a recent meeting with farmers. Export revenues from agriculture—which reached over $20bn in 2017—now exceed those from typically strong earners such as armament sales. Grain has been the star. In 2016 Russia became the world's leading exporter of wheat for the first time since before the Russian revolution (see chart). "Grain is our second oil," said Aleksandr Tkachev, the agriculture minister at the time.

This roaring output is the result of a confluence of short- and long-term factors. Since the Soviet Union's collapse, farming has undergone a gradual transformation from "a fantastically ineffective collective model to effective capitalism", says Andrei Sizov, head of SovEcon, an agricultural consultancy in Moscow. Although the state's overall role in Russia's economy has grown, agriculture has largely remained in private hands, fuelling competition. The devaluation of the Russian rouble in 2014 and bans on agricultural imports from countries that sanctioned Russia that year have provided additional boosts.

The Economist

Tsarist-era Russia was a big agricultural exporter, but Bolshevik collectivisation wiped out farming traditions and created an inefficient collective system that by the 1970s left the Soviet Union importing grain and other foodstuffs. In the post-Soviet era, farmers had to learn how to run competitive enterprises. The Peretyatkos travelled to Europe to study best practices. “We went to see what private ownership meant, to see how people work for themselves,” Yuri recalls. Over the ensuing decades, investments in machinery, land and supplies accumulated; the government made agriculture a national priority, offering subsidies and support. Recognising the newfound strength of local competitors, in October an American trade group, US Wheat Associates, closed its Moscow office after 26 years of operations.

The rouble’s devaluation has been a particular boon for exporters in recent years. Amid a global glut in grain, Russians have sucked up market share in Africa and the Middle East, leveraging their advantages in geography and weather over competitors in America, while undercutting prices. Grain traders have also begun targeting more distant markets such as Indonesia and even Mexico. Bans on agricultural imports from Western countries have also cleared space for local producers, though at the cost of higher inflation. Although Russia still imports more food than it exports, steps have been made towards the government’s goals of feeding itself: in the past five years, for example, Russia has become self-sufficient in pork and poultry.

The future also looks bright owing to global trends. As populations grow, so too should food consumption, especially in some of Russia’s largest export markets, such as Turkey. Rising temperatures and improving technologies mean longer growing seasons, higher crop yields and wider swathes of arable land in much of Russia. “Everyone is moving north,” says Yuri. His son has started farming in the Belgorod region, closer to Moscow.

Russia also has latent agricultural potential. Millions of hectares of land abandoned after the Soviet collapse could be reclaimed. Investments in digital technologies, where Russia lags, would lift productivity; downstream food manufacturing is underdeveloped. But tapping these possibilities would need infrastructure improvements. Grain terminals have struggled to cope with record harvests. Outside the fertile south, much farmland sits far from ports. Some also worry about competition as concentration in the hands of giant agro-holding firms increases.

Yet none of that can dampen the mood of those like the Peretyatkos who have seen the sector’s turnaround first-hand. “When we started, we had big doubts about whether it would work out at all,” says Aleksandr. Now, as Yuri puts it, “You could say that Zernograd is returning to its name.”

This article appeared in the Business section of the print edition under the headline ”Good times in Grainville”

Clout and reach

Why Barclays and Standard Chartered should merge

Together the two subscale British lenders could reach the top table of banking

Print edition | Business Dec 1st 2018

Brett Ryder

SCHUMPETER WOULD like to propose a merger between two British banks, Barclays and Standard Chartered. The suggestion is not a popular one. It was trashed by some analysts in the City of London when it was first floated in May. Some of the people running the firms dislike it. It would create a bank with a big balance-sheet and it involves two unfashionable geographies: Britain and emerging markets. Nonetheless, a union would turn two flawed international firms into a safer, more powerful and more profitable combination. It deserves serious consideration.

Europe's banks lack scale. They have global reach but not a big, integrated domestic market. The top four lenders are 50% smaller than the top four American firms and 66% smaller than the top four Chinese ones, measured by median revenues. Return-on-tangible-equity (ROTE) in Europe still languishes below the cost of capital after a decade of grim cost cuts. As banks digitise, the fixed cost of staying at the top is rising: JPMorgan Chase will spend $11bn on technology this year. European banks will struggle to keep up.

Although Barclays and StanChart avoided bail-outs in 2008 they have been on painful odysseys. Since the 1990s Barclays has dithered about investment banking, and about retail banking abroad. In 2007 it made an abortive bid for ABN AMRO, a Dutch firm, with the aim of creating a huge, universal bank. In 2008 it bought part of Lehman Brothers after it collapsed. Since then Barclays has retrenched, shrinking subscale operations abroad and selling jewels such as its asset-management and African arms.

That has left it as a British retail bank with a chunky corporate-and-investment bank in New York and London. The split is roughly 50:50. Under Jes Staley, the boss since 2015, it ground out a decent ROTE of 10% in the last quarter. Still, questions remain about the investment bank. It had a return of 7%—well above the zombie investment-banking unit of Deutsche Bank (1%) but below the 14% booked by the median of the main American firms, which are three times its size. Wall Street is booming now, but it and the City will account for a shrinking share of global financial activity.

A deal with a euro-zone bank is off the agenda owing to Brexit. Alternatively, Edward Bramson, an investor who owns 5% of Barclays, is thought to want to shut much of the investment bank. But that makes little sense: it is mediocre, not abysmal, and the high cost of closure would make the cure worse than the disease.

StanChart, meanwhile, is a network bank, connecting companies that shift money around, conduct trade and tap capital markets. Domiciled in London, two-thirds of its business is in Asia. It has hubs in Hong Kong and Singapore, and is one of the biggest foreign banks in India and mainland China. Network banks work best if they have a big home market with clients who will pay for global connectivity. This ideal led to the expansion of Citibank in the 1950s and, in the 1990s, to the takeovers of Paribas by BNPin France, and of Britain's Midland by HSBC. Today ICBC, a Chinese bank, and MUFG, a Japanese one, are using this template, too.

StanChart has instead grown across emerging markets, quadrupling income between 2003 and 2013. But rip-roaring growth led to bad debts and breaches of American rules on sanctions. Bill Winters, its boss since 2015, has cleared up the mess and rebuilt relationships with its supervisors. But the bank has shrunk so far that it struggles to cover its costs. It makes a ROTE of 7%. Given that revenue growth is sluggish it is unclear how this will improve.

Joining the two firms in an all-share deal would create a bank with a global network, a big Asian presence and two large core markets, America and Britain. It would have clout and reach, ranking fifth among global corporate-and-investment banks by revenue, and fifth measured by its revenues from global payments.

Two constituencies would have to be won over. First are shareholders, who would scrutinise a merger's returns. They include Temasek, a Singaporean state fund that owns 16% of StanChart. Eliminating duplicated technology spending could save perhaps $1bn a year. But the firms have limited overlap. The bigger prize is higher revenues as institutional customers of Barclays used the network. Taking HSBCas a benchmark this could deliver $2bn of profits, and, if you include the cost cuts, too, raise ROTEfrom 9% to 12%. More optimistically, if the combined firm had the same profit margins as the median of the American giants, ROTEwould be 13%.

StanChart has been a takeover candidate for 20 years. But some of the mooted buyers may never show up. The American authorities would block a Chinese acquirer because of StanChart's important role in the dollar clearing system. A bid from a Singaporean bank might cause problems in Hong Kong, where StanChart is one of three firms that can issue banknotes. JPMorgan Chase has expanded its own network since 2000. Bank of America lacks clout abroad but its management team eschews deals. Credit Suisse has Asian ambitions, but at its present valuation is too small.

Uncharted territory

Regulators would need to be won over, too. In America, Hong Kong and Singapore there are no obvious grounds for objection. Britain, rightly, worries about banks posing a threat to the taxpayer. But the size of British banks' collective balance-sheet would be unchanged. The firm would rank second in Britain, after HSBC, measured by risk-adjusted assets. Under Britain's post-financial-crisis rules, its international arm would be ring-fenced, legally speaking. The firm would have a high core-capital ratio of 14%. And StanChart has a surfeit of dollar deposits, meaning it would improve Barclays' funding position. Providing it is profitable and well regulated, having another large global bank based in London with deep links to emerging economies would be a big advantage.

Bank deals usually happen when valuations are high, balance-sheets stretched, profits inflated, and managers and investors are wildly bullish. That is why they often do not work. Today the exact opposite conditions are in place. That is a sign it is time to act.

This article appeared in the Business section of the print edition under the headline "Clout and reach"

Finance and economics

Brexit and finance (1)
Ready, set, sort of

Ready, set, sort of

Financial firms have quietly prepared for Brexit

The benefits of scale, regulation and fear

Print edition | Finance and economics Dec 1st 2018

SINCE BRITONS chose to leave the European Union in June 2016, the clichés have piled up almost as thickly as the votes: "no deal is better than a bad deal"; "Brexit means Brexit". And you might count yourself rich—even by the City of London's standards—if you had a fiver for every time you had heard a banker say his firm was "hoping for the best, but preparing for the worst". Four months before Britain is due to quit the EU, financial firms have long ago given up hoping for the best (for most, that Britain would remain after all) and are still not sure they will avoid the worst—a sudden, no-deal Brexit on March 29th 2019. But they have been quietly bracing themselves for it.

Firms based in any EU member state may serve clients in any other: lending and raising money, trading and clearing derivatives, and insuring lives and property across the union without setting up shop locally, in a system known as "passporting". London is by far the biggest base. If Parliament rejects Britain's withdrawal agreement with the EU (a vote is due on December 11th), those London passports will expire in March. If it accepts the deal, they will run on while Britain and the EU sort out new arrangements. By June 2020 they should have frameworks to decide whether each other's regulatory systems are "equivalent", allowing some business to continue much as now. Either way, though, financial firms must keep serving their clients.

In preparing for Brexit, the financial industry has had three advantages over most other sectors. The first is size. Banks, insurers and asset managers tend to be big. Although they can imagine better uses for them, they have the resources for contingency planning. The second is regulation. Rules help you plan, even if Brexit's final form is unclear. As things stand, for instance, banks and others will need bases in the EU27. Equivalence is an uncertain prize because the EU's current rules allow it to withdraw its blessing at 30 days' notice. And the clearing of derivatives is especially touchy (see article). The third is fear. No bank wants to tell a client on April 1st that it cannot execute a trade because the two are on opposite sides of the English Channel. And no supervisor wants Brexit to upset the financial system. Memories of 2007-08 are painfully but usefully fresh.

For two years and more, therefore, firms have been making preparations in other EU centres. Danièle Nouy, the head of the supervisory arm of the European Central Bank (ECB), said recently that 37 firms, including 25 banks, had secured new or improved licences or were close to doing so.

The ECB is insisting that banks set up more than mere "empty shells", in which business is booked with EU27 clients while the real business—and risk—stays in London, outside its purview. This means shifting assets and installing senior staff, such as risk and compliance managers. In particular, the ECB wants banks to avoid being "overly reliant" on "back-to-back" hedging strategies—coupling a transaction with an EU27 client in (say) its Frankfurt base with another internal deal, which moves the risk to its London balance-sheet.

According to Hubertus Väth of Frankfurt Main Finance, which promotes the German financial centre, 30 institutions are pitching camp in Frankfurt; the banks among them will shift €750bn-800bn ($850bn-910bn) of assets. Plenty of firms are building on existing foundations. HSBC is consolidating its EU27 banking subsidiaries in Paris, a city which also claims to have charmed a lot of firms; Bank of America and Barclays have chosen Dublin. And financial centres have developed specialities: Luxembourg, like Dublin, has pulled in insurers and asset managers; exchanges, such as the London Stock Exchange Group and CBOE Global Markets, have headed to Amsterdam.

Firms are not putting everything in one place. Brexit is prompting big banks to put more sales people, especially, in several cities, so that they will be closer to their corporate clients, reversing a 20-year trend towards concentration in London.

All of this means more jobs in EU27 centres. It does not, however, yet add up to the Brexodus from the City that some feared. Some jobs—eg, in compliance—will have to be duplicated in London and the EU27, meaning more jobs overall. Wall Street banks speak of having a few hundred people in their EU bases on "day one", whether that falls in March 2019 or in 2020. Over time, however, local hires as well as moves from London will bulk up the numbers. Mr Väth foresees "significant" second-round effects. In future years both supervisors and clients may demand that banks employ more people inside the EU.

Supervisors are also getting ready. On November 28th the Bank of England said British banks had enough capital and liquidity to bear even a "disorderly" no-deal Brexit, in which current trade agreements with non-EU countries are lost, border infrastructure cannot cope with customs requirements and GDP is 10.5% below its pre-referendum trend by the end of 2023.

Yet preparing for the worst can only take you so far. One banker points out a difference between Brexit and MiFID 2, a burdensome EU financial-markets directive that came into force at the start of 2018. The industry knew what MiFID 2's rules would be, prepared for it in a consistent way and could test its likely effects in advance. With Brexit none of that is true.

The financial industry's post-Brexit fortunes will depend on the economic health of those they serve. If they are roughed up by a no-deal Brexit, finance will be too. Moreover, many customers, lacking know-how, resources and the constant prodding from nervous supervisors, are unlikely to be as well prepared. Hold on, and hope.

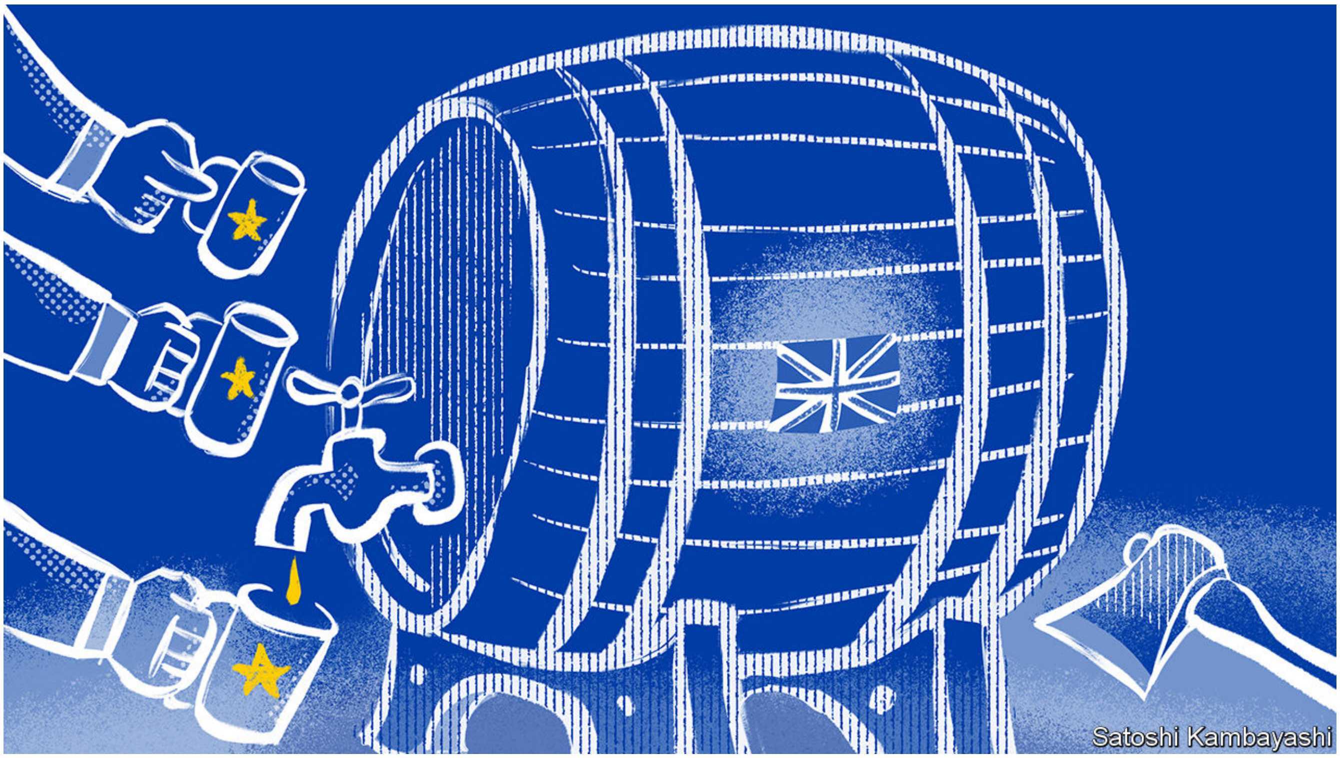
This article appeared in the Finance and economics section of the print edition under the headline "Ready, set, sort of"

The future of contracts

Europe makes contingency plans for clearing-houses after Brexit

London's clearing-houses will be granted temporary equivalence

Print edition | Finance and economics Dec 1st 2018



AS THEY PREPARE for Brexit, many of London's financial firms have begun to move some staff, or operations, to the continent. But financial contracts, notably derivatives, are difficult to uproot. London's clearing-houses, which ensure that a contract is honoured even if one side goes bust, are globally important. As fears of an acrimonious Brexit have risen, so too have those of havoc. Now European Union regulators have unveiled contingency plans.

Clearing-houses have grown vastly in significance since the financial crisis, after which the G20 group of economies made it mandatory to settle most simple derivatives trades through them. London's three big clearing-houses handle vast amounts of derivatives, and much of the trading cannot be done elsewhere. LCH, London's largest clearing-house, clears interest-rate swaps with a notional value of over $340trn, making up 95% of the world's total. LME Clear (part of the London Metal Exchange) is near-irreplaceable for precious-metals traders. ICE Clear Europe handles half of the world's oil-futures contracts, and is typically the only place to go for those linked to the Brent benchmark.

EU rules state that European firms can only do business with, or be members of, clearing-houses that are either within the union, or recognised by it as "equivalent". Without action, in the event of a no-deal Brexit, Britain's clearing-houses risked being in neither camp. That would have been a particular problem for EU-based "clearing members": banks or broker-dealers that have direct access, and through which other market participants interact with the clearing-house. Of the LCH's 100-odd members, over a third are based in the other 27 EU countries. And because clearing-houses require 90 days' notice to end membership, the deadline that mattered was not March 29th, Brexit day, but three months before. That lent the quandary some urgency.

For months EU authorities did nothing to intervene, even though Britain had promised a temporary permissions regime allowing British banks and broker-dealers to be members of EU clearing-houses. The Bank of England warned in October that no deal would put £41trn-worth ($53trn) of derivatives in clearing-houses at risk. Market participants, though worried, were loth to start the gargantuan, expensive task of transferring their positions.

As it became clear that LCH would soon serve cancellation notices, the European Securities and Markets Authority (ESMA) and the European Commission were compelled to act. On November 13th the commission agreed that EU action on clearing was needed, and for the first time said that existing equivalence rules could be applied. On November 23rd ESMAsaid it was preparing to recognise British clearing-houses temporarily as of March 30th.

Although this provides a reprieve for market participants, it is not a lasting solution. EU authorities have not yet specified how long their temporary recognition will last. Under the existing equivalence rules, recognition is decided unilaterally by the EU and can be revoked at any time. The move does not alter the EU's medium-term goal of coaxing business to relocate. Indeed, argues one London lawyer, it merely allows the EU to do so in a "managed and controlled", rather than chaotic, way.

Some European officials have made their intentions very clear. On November 23rd François Villeroy de Galhau, the governor of the Banque de France, said that any temporary recognition of British clearing-houses should not last more than a year. In the same speech he hoped that Paris could become a new "market hub".

Businesses, too, are chipping away at London's lead. In January Frankfurt-based Eurex Clearing started to share profits with member banks. Its interest-rate-swap clearing business has since grown steadily, to nearly €10trn ($11trn). It now handles about 15% of the European market. Last month it announced plans to extend its profit-sharing scheme to foreign-exchange derivatives and repurchase agreements. Chaos may be avoided. But Britain's clearing-houses are still under threat.

This article appeared in the Finance and economics section of the print edition under the headline "The future of contracts"

Homing in

Non-bank firms are now big players in America's mortgage market

Nearly half of mortgage originators are not banks

Print edition | Finance and economics Dec 1st 2018

TWICE IN THE past 30 years, housing finance has taken down America's economy. As interest rates rise and the housing market stutters (see article), regulators are again pondering the risks from the mortgage market—this time from a shift towards non-bank originators.

These firms, which create mortgages and often sell them on to other institutions, exist outside the bank-regulatory framework. They now account for 44% of lending by the top 25 originators, up from 9% in 2009, according to *Inside Mortgage Finance*, a trade publication. Five of the largest ten are non-banks, as is the largest retail mortgage originator, Quicken Loans. Their market share for servicing mortgages, or collecting monthly payments, has risen from 5% in 2009 to 41% in 2018.

Some of this shift reflects non-banks' marketing and customer service. Instead of waiting for a distracted bank-branch employee to type information into an ancient computer, Quicken offers a smartphone app and responsive helplines.

But banks have also retreated from the market. Most home loans are originated by private institutions and then sold to government-sponsored entities, such as Fannie Mae and Freddie Mac, which securitise them. (Mortgages of the lowest credit quality tend to be sold to another government enterprise, Ginnie Mae.) In theory that should transfer the risk away from the originators. But when mortgage lending soured during the financial crisis, banks found themselves forced to take back some of their mortgages, or ended up paying fines. When they repossessed homes they were harried by state governments. Unwilling to bear those risks again, some banks have ceded ground to non-banks.

That does not mean they have left the field entirely. The period between issuing a mortgage and selling it on is usually financed by bank loans. As a paper from the Brookings Institution, a think-tank, notes, when banks stopped lending during the financial crisis, the number of mortgage companies fell by half. The business of servicing mortgages can become capital-intensive if a mortgage goes bad. The servicing firm must carry the costs until the mortgage is repaid—which can take years.

As a result, although banks are playing less of a direct role in the mortgage market, they are still indirectly exposed. Jelena McWilliams, the head of the Federal Deposit Insurance Corporation (FDIC), noted in a recent speech that banks' exposure to non-banks has increased from $56bn in 2010 to $376bn in June this year.

Much about these non-banks is still unknown. Most are private: there is little information on their ability to survive a housing slowdown. Their finances may be fragile: Christopher Whalen, an analyst, reckons more than half have "blown through their bank credit covenants due to impaired capital, poor profitability or both". He expects 10% to shut down this year. As Ms

McWilliams pointed out, America regulates the entity rather than their activity. That approach means the threats from housing finance are always evolving. Regulators must be nimble.

This article appeared in the Finance and economics section of the print edition under the headline "Homing in"

Riding the rollercoaster

Bitcoin has lost most of its value this year

Other cryptocurrencies have followed suit

Print edition | Finance and economics Dec 1st 2018

ON DECEMBER 17TH 2017 the price of bitcoin on CoinMarketCap, a cryptocurrency exchange, neared $20,000. True believers hoped that was just the beginning. One analyst at a Danish investment bank predicted bitcoin could be worth $100,000 by the end of 2018. The year is not yet over. But as *The Economist* went to press, bitcoin's price was $4,223, and trending downwards (see chart). Where bitcoin goes, other cryptocurrencies follow. Ether, the second-most popular cryptocurrency, is down from $1,432 in January to $120 today.

All this marks the deflating of the third cryptocurrency bubble (the others were in 2011 and 2013). The trigger is unclear. Explaining the movements of deep, liquid markets is tricky at the best of times. Cryptocurrency markets are neither. One popular theory is that the the supply of brave buyers willing to take a punt has now been exhausted.

Regulatory interest may be another reason. Cryptocurrencies have long been a haven for fraudsters. Now the law has started to pay attention. America's Department of Justice is probing price manipulation in cryptocurrencies, which is widely believed to be rife.

The Economist

The Securities and Exchange Commission (SEC), another American regulator, is investigating several initial coin offerings (ICOs). These are a fundraising wheeze that sell crypto-tokens to investors, who hope that their value will rise in future; they have raised $7.3bn so far this year. Some ICOs are outright scams, in which the firms vanish once the tokens have been sold. But even honest ICOs could be illegal. On November 8th the SEC charged the founder of EtherDelta, a cryptocurrency exchange, with running an unregistered securities exchange.

Most fundamentally, bitcoin is still far from its notional goal of becoming a digital alternative to ordinary money. Technical faff, and the volatility that makes it attractive to speculators, means that it is hard to use bitcoin to actually buy things. Morgan Stanley, a bank, found that only three of the 500 biggest online retailers accepted it in 2017, down from five the year before.

Punters will be wondering how much lower the price can go. Nobody knows, but hope springs eternal. Smartereum, a cryptocurrency website, is earnestly discussing whether bitcoin could rebound to $50,000—or even $100,000—before the year is out. Caveat emptor.

This article appeared in the Finance and economics section of the print edition under the headline "Riding the rollercoaster"

Verdant and vibrant

Green asset classes are proliferating

Green financial assets are a small but significant share of the total

Print edition | Finance and economics Dec 1st 2018

IF THE WORLD is to tackle global warming, vast amounts of money—$3.5trn annually from now until 2050, according to the International Energy Agency, a forecaster—will have to flow into clean-energy research and generation. Capital will have to shift from carbon-intensive industries into clean ones. That means asset managers will have to offer more green investment products, and regulators will have to set standards that enable investors to make green choices.

Much has already been done. In a decade green-tinged assets under management have grown from almost nothing to a small but significant share of the total. In America, where scepticism about climate change is common, climate is the most frequently used "ESG" (environmental, social and governance) criterion among asset managers, reckons US SIF, an industry group. As of this year, $3trn of the $46.6trn in professionally managed American assets take climate issues into account—more than double the amount in 2016.

The first "green" bonds, which raise funds for environmental projects, were issued by the World Bank in 2008. Just ten years later more than $170bn-worth are issued annually, reckons SEB, a bank. That is 2.5% of global bond issuance. Last year the biggest single issuer was Fannie Mae, one of America's mortgage giants, with $27.6bn in securities backed by mortgages on energy-efficient properties.

Definitions still vary. China, for instance, allows green bonds to finance "clean" coal projects; Western rules do not. The money raised has mostly been spent in rich countries; projects in poor ones tend to be too small and perceived as too risky to merit issuance.

But green bonds' success has inspired other environmentally friendly asset classes. In September Vasakronan, a Swedish property-management firm, issued the first green commercial paper, ie, short-dated debt, for funding the short-term expenses of the firm's environmentally friendly buildings. The Seychelles recently issued a "blue" bond to fund sustainable fisheries and ocean management. Equity investors can put their money into low-carbon index-trackers.

Investors are not simply motivated by concerns about the planet. Climate change could directly affect firms: rising sea levels could damage a factory making crucial parts, say. Some fear effects on their portfolios from changes to government policies—such as higher carbon taxes, which would hit the share prices of big emitters. Mercer, a consultancy, reckoned in 2015 that average yearly returns from coal firms could fall by 26-138% over ten years. So far, though, the returns of a low-carbon portfolio are similar to those of less green ones.

Some institutional investors are applying green principles across their portfolios. One approach is to exclude polluting firms or assets: Norway's $1trn sovereign-wealth fund, for instance, stays away from coal. Another is to stay invested in polluters, but to seek to mitigate the harm they do.

Probably the largest group seeking to engage in this way is Climate Action 100+, which comprises institutional investors with $32trn in assets. It is using its muscle to try to get the world's 100 most-polluting companies, representing two-thirds of global greenhouse-gas emissions between them, to reduce emissions faster and to provide investors with more climate-related information. Most investors mix divestment and engagement. CDPQ, Quebec's C$300bn ($226bn) pension fund, aims to cut carbon emissions per dollar invested by a quarter by 2025.

Regulators are starting to ensure that investors get more of the information they need to make green choices, and that banks are thinking about climate risks. The European Union is planning to mandate that financial advisers tell clients about ESG investment options. The Bank of England requires banks and insurers to report on their vulnerability to climate change.

But lack of data remains an issue. Just 21 firms worldwide reported all of their direct emissions in 2016, says the 100% Club, a lobby group. And most rules on disclosure still lack teeth. Although it has grown fast, green finance is still undeveloped. As elsewhere in the fight against climate change, that makes it both a success and unequal to the problem it is trying to solve.

This article appeared in the Finance and economics section of the print edition under the headline "Verdant and vibrant"

Opening time

Why opening pubs on the Emerald Isle is so difficult

The rules date from when Ireland had too many pubs

Print edition | Finance and economics Dec 1st 2018

FOR A COUNTRY whose chief cultural export is its pubs—there are some 7,000 Irish pubs worldwide, and 8,403 on the island itself—Ireland makes it surprisingly difficult to open a drinking establishment. In both Northern Ireland (part of the United Kingdom, but with many of its own laws) and the Republic, the process is slow, pricey and fraught with uncertainty.

Both use a system familiar to anybody who has ever queued to get into a nightclub: one in, one out. Aspiring landlords must buy licences from those willing to "surrender" theirs. Moreover, buyers must prove local "need" by pointing to a growing population or the closure of nearby pubs. Objections, from existing publicans, say, can cause months of delays. Transfers of licences are approved by courts and dates for disputed cases are hard to come by, says Maura McKay, a lawyer in Belfast.

Getting a licence in Ireland therefore involves lawyers, brokers and far more time and money than in England and Wales, where permits are granted more freely by local councils. Colin Neill of Hospitality Ulster, a trade group, reckons the value of a licence in Northern Ireland is at least £50,000 ($64,000). Mark Adams, a licence broker in Belfast, says he has been involved in transactions worth hundreds of thousands of pounds. Lorraine Compton, a lawyer in Dublin, estimates that the cost of a licence in the Republic is €53,000 ($60,000). The standard licence fee in England and Wales is a few hundred pounds.

Ireland's licensing laws can be traced back to the potato famine. In 1845, the first year of the blight, there were 15,000 pubs for 8.3m people. By 1891 just 4.7m people remained and the number of pubs had grown to 17,000. The Royal Commission on Liquor Licensing Laws reported in 1897 that the number of pubs was "out of proportion to the necessities of the inhabitants".

In 1902 the Licensing (Ireland) Act, passed by Parliament in London, established the one-for-one rule to keep the number of pubs from rising. That was tightened further in the north in the 1920s, before the earlier rule was reinstated in 1971. The number of pubs in Northern Ireland fell from 2,336 in 1971 to 1,210 last year (partly offset by shops that sell alcohol).

Consider JD Wetherspoon, a chain with more than 900 pubs in Great Britain but fewer than ten on the island of Ireland. In 2014 it bought a building in Belfast with plans to open a pub. It acquired an existing licence, and thought a new university campus nearby would help establish need. Yet in January 2018, nine months after it applied, a court turned down its request. The previous licencee had extended his premises, and so invalidated the licence.

The situation is unlikely to change. Proposed reforms of Northern Ireland's licensing laws, put forward before its government collapsed in January 2017, did not include changes to the surrender principle. Lawmakers south of the border are debating tightening booze laws. Nor is there any demand for loosening from the industry: Northern Irish publicans see it as their retirement kitty. It may not be long before the number of Irish pubs outside Ireland, like the number of people claiming Irish ancestry, exceeds those on the Emerald Isle.

This article appeared in the Finance and economics section of the print edition under the headline "Opening time"

Buttonwood

Corporate bonds in an ageing business cycle

Scavenging in the junkyard

Print edition | Finance and economics Dec 1st 2018

IN THE 1970s the junk-bond market was a dark underworld. It was the home of "fallen angels", the bonds of investment-grade firms that had gone to seed. Most investors were too genteel to hold them. So they traded at hefty discounts to face value. Then Michael Milken, a junk-bond guru, came along with a new gospel. A portfolio of high-yield junk was a better bet than one of supposedly safer bonds. After all, an A-rated bond can only go in one direction—down.

The corporate-bond class system is still in place. Many types of mutual fund are barred from holding non-investment grade (ie, junk) bonds. But junk is no longer a stunted and shameful offspring. The high-yield market in America is now worth $1.2trn. And investment-grade bonds have also come down in the world. Around half are rated BBB, a notch above junk. Issuers are slumming it for a reason. A low rating is the price they pay for loading up on cheap debt.

A world with less snobbery of any kind is a better one. But something has been lost. Mr Milken's early disciples found value in lower classes of bonds precisely because a lot of investors shunned them. Now there is no taboo on holding (or issuing) junk or the junkier sort of investment-grade paper. Therein lies a paradox. When investors get too comfortable with corporate bonds, they may no longer be an asset worth holding.

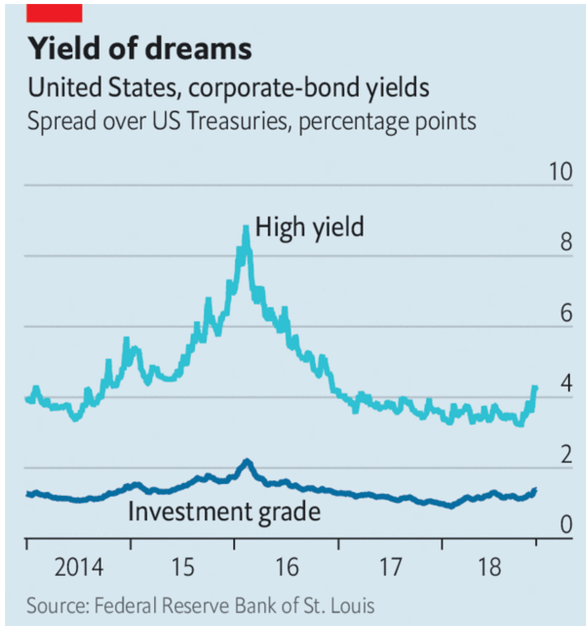
That level of comfort varies with the business cycle. The best returns are made in the early stages. The default rate is still high. Selling by panicky investors has driven bond prices down, and pushed up yields. Then, as the signs of economic recovery become clear, bond prices rally. As recovery takes hold the "spread"—the extra yield over risk-free Treasury bonds—narrows further.

It is in the latter stages of the cycle, when confidence returns, that things become more hazardous. Lots of bonds are issued to finance projects that will look questionable with hindsight. Tighter monetary policy, a feature of late-cycle economies, pushes up yields. Eventually, the economy is squeezed. This is perilous for firms with heavy debts, which rely on steady profits to pay the interest. Spreads start to widen. Default rates creep up, then surge. And bond prices plummet.

Where the present cycle differs is in the scale of bond issuance. Relative to America's GDP, the debt of companies now exceeds its previous peak of 2009. Capital markets have more than filled the gap left by slower bank lending. The stock of outstanding bonds has doubled. The share of triple-B bonds has steadily increased. The proceeds have often been used to buy a firm's own shares.

A further twist has been the surge in so-called leveraged loans, which are packaged by banks and sold to private investors. Their appeal is that they are secured and have floating rates, so they do not lose value as interest rates rise in the way that fixed-rate bonds do. The downside is they feature in the sort of risky buy-out deals that have come to exemplify late-cycle exuberance, says David Riley of BlueBay Asset Management.

When trouble strikes the economy, corporate leverage is likely to make it worse. Corporate-bond spreads are closely watched for early signs that a recession is brewing. Junk spreads have widened in recent weeks (see chart). That in part is because of lower oil prices. Exploration firms are a big chunk of high-yield bonds outstanding, which is why spreads blew out in 2016, when the price of a barrel of crude fell below $30. But it also reflects nervousness about the economy.



The Economist

The $3trn or so of corporate bonds that lie just above the junk-bond threshold pose a particular threat. “In any recession, a portion of those bond-ratings are at risk,” says Stefan Isaacs of M&G, a fund-management group. Bond funds on either side of the divide have some flexibility in precisely when they sell or buy, he says. It is an opportunity from which old-school junkyard scavengers can make a killing. Still, there may not be enough buyers of junk to snap up such newly fallen angels without prices falling steeply. If a lot of bonds have to change hands quickly, things could easily get messy.

In that event, much of the financial engineering of the past few years will come to look too clever by half. Even so, the secular decline in bond ratings will not always seem like something to regret. The A-rated world will not return. A bigger corporate-bond market is a source of opportunity—for good as well as ill. Losses will be taken. Balance-sheets will be cleaned up. And bonds will eventually rally. Then the cycle can begin again.

This article appeared in the Finance and economics section of the print edition under the headline ”Scavenging in the junkyard”

Free exchange

Paul Volcker's memoir invites a rethink of the fight against inflation

The former Fed chairman's approach to monetary policy is still influential

Print edition | Finance and economics Nov 29th 2018

PAUL VOLCKER'S legend is almost as grand and imposing as his physical personage, all six feet and seven inches of it. In 1979 President Jimmy Carter chose him to run the Federal Reserve and tackle America's high inflation. Mr Volcker acted with grim determination, tightening monetary policy even as the economy sank into deep recession and beleaguered Americans pleaded for relief. Eventually he not only routed inflation, but also won a hard-earned credibility for the Fed that would help successors keep inflation stable. Mr Volcker himself recounts the story in a new memoir, "Keeping At It", which calls on central banks to resist the siren song of loose money. But the book also invites readers to reconsider his legacy, and to ask whether central bankers have drawn the right lessons from the legend of Chairman Volcker.

The recessions and disinflation of the early 1980s proved a watershed both for macroeconomics and the practice of central banking. On the eve of Mr Volcker's tenure the academic field was riven by arguments over why inflation crept ever higher and what should be done about it. The monetarist disciples of Milton Friedman argued that inflation was "always and everywhere a monetary phenomenon", reflective of changes in the money supply that could be managed by the central bank. Economists of a Keynesian bent thought tighter money could reduce inflation, but only by inducing a severe depression. Other camps doubted monetary policy mattered much. Some economists thought inflation was rooted in cost pressures that required structural remedies, such as reforms to weaken monopolies and labour unions. Those of the rational-expectations school—which argued that policy must contend with people's rapidly shifting views of the future—doubted that monetary policy could affect the real economy at all.

Mr Volcker's disinflation settled several disagreements at a stroke. Among all but a few holdouts it put to rest the notion that monetary policy was powerless. It showed that tight money could indeed bring inflation down. Though the economy did shrink, the downturn was milder than Keynesians had feared. Monetary policy worked in part through its influence on people's expectations of price rises. Once the Fed's actions persuaded people that future inflation would be lower, workers moderated their wage demands, and firms their price rises, without being forced to do so by a 1930s-style slump.

A new academic synthesis arose from this experience. Central banks should stabilise the economy by anchoring policy to some nominal variable (most ended up targeting a low rate of inflation). When a boom or a slump pushed inflation away from the target, they should act to prevent that deviation from influencing expectations and leading to higher inflation or unemployment. The more trusted the central bank, the easier the task.

Mr Volcker's memoir suggests the chairman saw his inflation-fighting efforts in a very different light, however. He was familiar with the debates progressing within academia: he had studied economics extensively (though he never finished his PhD, for which he blames his penchant for procrastination). He was also a seasoned economic policymaker: he had run the Federal Reserve Bank of New York and served in the Treasury department under three presidents. Even so, he lacked strong intellectual commitments. Mr Volcker's career at the Fed suggests monetarist sympathies; he launched his war against inflation by announcing that policy would operate through limits to money-supply growth rather than changes to interest rates. But those limits were soon abandoned. And his writing reveals an eclectic view of inflation: he blames fiscal incontinence for fuelling price increases, for instance, and credits another president, Ronald Reagan, for helping to subdue wage and price growth by reining in trade unions.

Moreover, his distaste for inflation seems rooted in a surprisingly moralistic view of the economy. Of economists' support for a low but positive rate of inflation he asks: "[W]hat was the economic purpose, and for that matter the morality, of the government...intentionally debasing the nation's currency a little every year? My mother would see through that." Instead, he reckoned, the "fundamental responsibility of monetary policy" is to maintain confidence in the stability of the currency. Courting even a little inflation in an effort to boost growth risks eroding that confidence, forcing future central bankers to re-fight the disinflationary war Mr Volcker won in the early 1980s. Central banking is a test of character, he seems to suggest, in which resorting to the expediency of higher inflation is a sign of weakness.

Aim high

Although central banks today are filled with top monetary economists, Mr Volcker's intuitive approach to monetary policy often seems as influential as the academic orthodoxy his tenure helped inform. He worries that economists favour reforms that would free central banks to court higher inflation during downturns. Although many do, central banks have very conspicuously declined to make such changes. They would view years of above-target inflation as a dangerous threat to their credibility, and easing policy in the face of such inflation an unforgivable sign of weakness. But years of below-target inflation in the aftermath of the global financial crisis did not generate a corresponding panic. Indeed, the Fed began raising interest rates while inflation remained below its target, unfazed by the risk that this would undermine public faith in its ability to boost the economy when the next recession strikes.

Mr Volcker writes that, time and again, governments accept "a little inflation" only to find themselves beset by spiralling prices. But the more time passes, the more the 1970s look like an inflationary aberration book-ended by decades of modest inflation. Inflation is a danger, but one among many. It is the strength of Mr Volcker's character that deserves emulation rather than his response to a specific, bygone set of economic circumstances.

This article appeared in the Finance and economics section of the print edition under the headline "Tall tales"

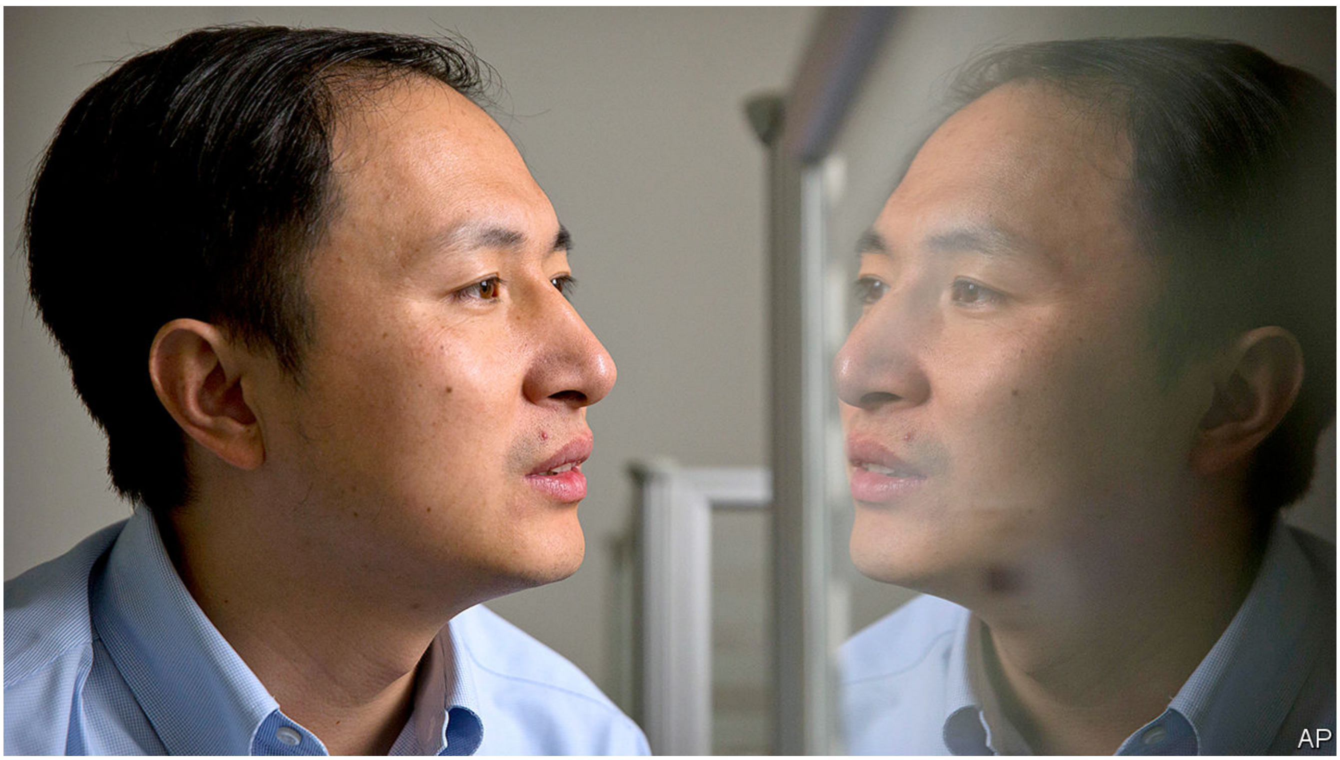
GM human beings
A moment for reflection

Genetically modified human beings

A maverick researcher claims to have created GM children

His stated aim is to protect them from AIDS

Print edition | Science and technology Dec 1st 2018



THE SECOND International Summit on Human Genome Editing, held in Hong Kong this week, was supposed to be a forum in which the idea of editing the genomes of human embryos could be discussed calmly and soberly. Fat chance of that. On November 26th, the day before it opened, one of the scheduled speakers, He Jiankui, an expert in DNA sequencing at the Southern University of Science and Technology, in Shenzhen, announced that he had already done it, and that twin girls, named Lulu and Nana, had been born in early October as a result.

The consensus of the first human-genome-editing summit, which was held in 2015, was that researchers should be allowed to edit genes in human embryos subject to regulation, but that no pregnancy should be established before dealing with questions of safety and ethics (for example, addressing the point that changes to an embryo's genome may be passed on to the children of that embryo's adult self). Those questions had become pressing because of the development of a technique called CRISPR-Cas9, which makes editing DNA much easier. So easy, in fact, that there were worries even then that people might start editing it, as it were, in their garages.

And this is more or less what Dr He (pictured above) seems to have done. On November 28th, having disappeared for two days, he explained his version of events to the meeting. Visibly nervous, he outlined his methods and data in a 20-minute talk that was broadcast live on the web.

Interesting times

According to Dr He, seven couples undergoing *in vitro* fertilisation (IVF) participated in the study (an eighth was recruited, but dropped out). One criterion for recruitment was that the putative father was HIV-positive. This seemed connected to the stated purpose of the experiment—to confer immunity to HIV infection on the embryos—even though IVF involving HIV-positive men involves washing the virus out of their semen, and the risk of infecting any resulting embryo is negligible. HIV immunity was to be conferred by disabling both copies of the gene (one inherited from each parent) for a cell-surface protein called CCR5, which the virus uses to help it enter and infect a cell. People without a working version of CCR5 are, indeed, immune to HIV infection. But they may also be at greater than average risk of dying of some other infections, including flu.

Dr He says the IVF was carried out at Shenzhen Women and Children's Hospital. In exactly what circumstances is unclear. So far, the twins are the only children said to have been born as a result, but another volunteer mother is pregnant with a supposedly gene-edited embryo.

Reactions, both to the announcement on Monday and to the actual presentation, have been almost universally hostile. David Baltimore, a Nobel prize-winning geneticist who works at the California Institute of Technology, condemned the procedure as irresponsible and a blatant violation of international norms, and also "a failure of self-regulation by the scientific community". And Zhai Xiaomei, the executive director of the Centre for Bioethics at the Chinese Academy of Medical Sciences, says that it is contrary to Chinese law.

As far back as 2003, according to Dr Zhai, the government introduced a regulation prohibiting interventions that could lead to changes in the human genome. Many institutions—including the Chinese Academy of Sciences, the National Health Commission and the Genetic Society of China—have also said that Dr He's work broke the rules. An open letter signed by 122 Chinese scientists denounced it. And, according to their official statements, neither the university nor the hospital was aware of what was going on. According to Chinese media the hospital has reported the matter to the police as a potential fraud.

Criticism has also come from Feng Zhang of the Broad Institute, in Cambridge, Massachusetts, who is one of the pioneers of CRISPR. He says that the talk was cursory—too thin on the details for him to assess the work properly. Dr Zhang is clear that no aspect of what Dr He did is innovative. "The method used has existed for several years, now," he says, "and we, as a community, have decided it is still too immature to move to humans. But Dr He pressed ahead anyway and in a way that is totally unnecessary. It's simply beyond belief."

Off target?

One concern is that Dr He's treatment of the embryos may have resulted in mutations in non-target genes and other undesired changes in the DNA of the babies concerned. These could have devastating consequences. Dr He claims he addressed this concern in four ways. Before implantation he sequenced the entire genomes of two cells from each embryo. This showed that both CCR5 copies were disabled in one twin, but only one in the other. He says that the parents were fully aware of that, and decided to implant both embryos anyway. After the implantation, he twice sequenced fetal DNA that had leaked into the mother's blood, and also DNA from umbilical-cord blood, a fetal tissue. When the babies were born, he also sequenced cells from various of their tissues. He concluded, as a result of all this, that there might be one potential off-target mutation, that no mutation existed in the 609 cancer-associated genes he tested and that no large chunks of DNA were missing.

How accurate his sequencing was is a matter of conjecture. Dr He himself said that in the case of the umbilical-cord blood it covered only about 80% of the genome. That leaves a lot of scope for error. Moreover, scientific matters aside, there are questions about whether informed consent for what happened was properly obtained. It is unclear, for instance, whether those involved in obtaining that consent, including Dr He himself, had received training in the ways of doing so properly.

There is also the question of why anyone thought genetic modification might be of help to the children on whom it was performed. HIV infection is easily avoided and also easily treated (albeit that the treatment is lifelong). The choice of CCR5 as the gene to disable is therefore questionable. And, though the off-target mutations and accidental deletion of sections of DNA that CRISPR can cause may not matter too much if (as is often the case) crops are the recipients, they matter a lot if the recipient is human. In this context, Dr He's claims about the tests he carried out are not reassuring.

One of the most bizarre aspects of the story is that Dr He has no official training in reproductive research. After graduating from the University of Science and Technology of China, in Hefei, he obtained a PhD in biophysics from Rice University, in Texas, and then, at Stanford University, became an expert on DNA sequencing. His website lists no papers on matters reproductive, only of a few conference talks on basic and preclinical research.

This inexperience has not, apparently, stopped him putting together what is, in effect, a private human-genome-editing project. He says the work was paid for in part by his private resources and in part by a startup fund from his university intended to encourage its scientists to be entrepreneurs—though, to reiterate, the university denies any knowledge or involvement.

Before Dr He's talk, there was scepticism that he had actually done what he had claimed—and his claims do, indeed, need independent verification. Many people now, though, seem inclined to believe him. The question is how to react to this belief. Dr Zhai warns that China might become a fertile ground for such scandals if its regulatory capacity is not greatly strengthened. As George Church, a geneticist at Harvard University, puts it, "the genie is already out of the bottle." It needs to be put back.

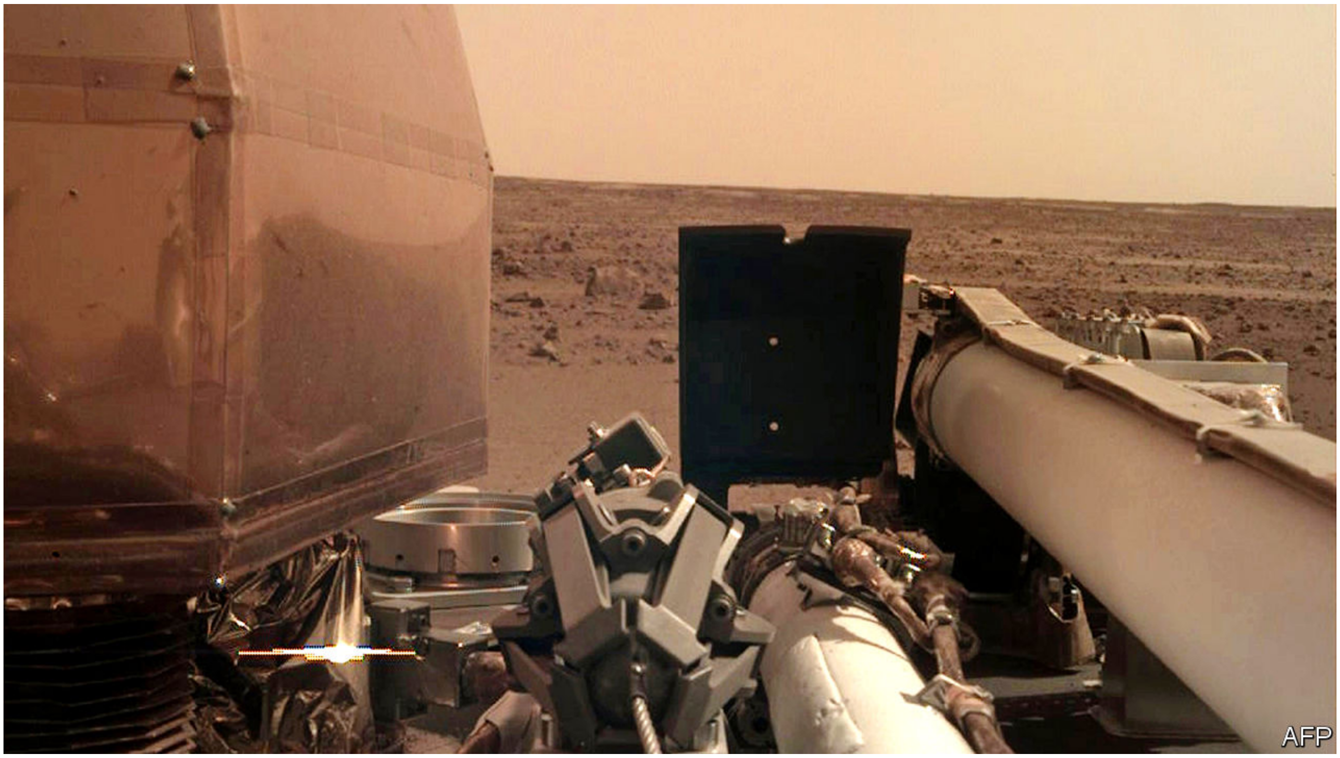
This article appeared in the Science and technology section of the print edition under the headline "A moment for reflection"

Target in sight

A probe lands on Mars

The red planet hosts another visitor

Print edition | Science and technology Dec 1st 2018



THIS IS THE view from the instrument deployment camera of InSight, America's latest probe to Mars, which landed safely on November 26th. InSight joins one, or possibly two, other missions now operating on the Martian surface (an American rover called Opportunity stopped working six months ago in a dust storm, but may revive if wind blows the dust off its solar panels). Six further craft are making observations from orbit. InSight will investigate the planet's interior, deploying its instruments (a seismometer to record the echoes of Marsquakes and meteorite impacts, and a probe to measure the planet's subsurface heat) in two or three months' time, after its controllers have practised using models, built on Earth, of its surroundings.

This article appeared in the Science and technology section of the print edition under the headline "InSight lands on Mars"

Arachnid parenting

A species of spider that suckles its young

They are looked after so well that they do not want to leave home

Print edition | Science and technology Dec 1st 2018

SUPERFICIALLY, INDIVIDUALS of a species of jumping spider called *Toxeus magnus* look like ants. This protects them from the attentions of spider wasps—a group of insects that catch and paralyse spiders in order to lay their eggs on the arachnids' bodies, which thus act as a living larder for the wasps' larvae. Ants are not, however, the only group of unrelated animals that *T. magnus* resembles. They are also quite like mammals. That, at least, is the conclusion of a study just published in *Science* by Quan Ruichang of the Xishuangbanna Tropical Botanical Garden, in Yunnan, China.

Female mammals produce milk to suckle their young. Before modern gene-based phylogeny developed, that was indeed the definition of a mammal. A few other types of animal do something similar. Pigeons, for example, generate a milklike secretion in their throats, which they feed to their squabs. But until now, only in mammals (or some of them, anyway) was lactation thought to be the basis of an extended relationship between parent and offspring. Dr Quan and his colleagues have changed that thinking.

Their study was stimulated by the observation that wild *T. magnus* seem to remain in the maternal nest far longer than most other spider species. They wondered why. They therefore brought some specimens into their laboratory for a closer look. This showed that the mother of a brood exudes fluid from her epigastric furrow, the canal through which she lays her eggs. For the first week of her hatchlings' lives, she deposits this fluid in drops around the nest, from which the young spiders drink. After that, until they are about 40 days old, she suckles the spiderlings directly.

Experiments that measured the growth and survival of young spiders, some of which involved sealing the mother's epigastric furrow using typing-correction fluid, showed that the spiderlings did, indeed, depend on the secretion for nutrition. They relied on it completely until they were 20 days old, at which point they started leaving the nest to hunt on their own account. Even after this, though, the fluid formed an important dietary supplement until they were about 40 days old. And chemical analysis showed that it is a rich source of nutrients. It contains four times as much protein as cow's milk does.

Even when weaned, young spiders, like many young mammals, returned home regularly after they had been out searching for food of their own—and experiments that removed the mother showed she was in some way contributing to their health and survival even then. Young spiders continued to return until they were 60 days old, and thus sexually mature. At that point, the mother started attacking returning sons, thus driving them away—presumably to avoid the risk of them mating with their sisters and producing inbred offspring. Daughters, though, she continued to tolerate. At what point those daughters, too, left to set up shop by themselves the study did not investigate.

Whether epigastric lactation and its consequent prolongation of family life is confined to *T. magnus*, or is more widespread among jumping spiders, remains to be looked at. But unless the strategy has evolved very recently it seems likely that at least some of *T. magnus*'s relatives will also employ it. Either way, Dr Quan's discoveries serve as a reminder that if something works well in one part of the animal kingdom, the chances are that it will do so elsewhere, too.

This article appeared in the Science and technology section of the print edition under the headline "One jump ahead"

Medicine

A novel way to stop the spread of antibiotic-resistant bacteria

Expose them to sunlight and mix in viruses

Print edition | Science and technology Dec 1st 2018

NEW DELHI metallo-beta-lactamase is a bacterial enzyme that poses a serious threat to people. It grants its host resistance to carbapenems and other beta-lactam antibiotics used by doctors around the world as a last line of defence against stubborn infections. And, as if that were not bad enough, it also confers protection against sunlight.

This second protection matters because, in many places, the idea that sunlight is the best disinfectant is no mere metaphor. Part of the treatment of sewage water in sunny climes is often to leave it out in the sun, permitting ultraviolet light to inflict damage to the complex molecules, such as DNA, that sustain bacterial life. Bacteria that survived such assault would be available to cause disease, or to pass their genes on to others that do so.

And, in 2015, one such was found in a treatment plant in Saudi Arabia. This was a strain of *E. coli* (a common bug that lives, usually harmlessly, in human guts) that was, indeed, in possession of New Delhi metallo-beta-lactamase. Peiying Hong at the King Abdullah University of Science and Technology, in Thuwal, has been working on this bug since its discovery and thinks she may have come up with a way to deal with its resistance to sunlight. As she reports in *Environmental Science and Technology*, she and her colleagues have found that phages (viruses which infect bacteria) sabotage this resistance.

Dr Hong knew from her earlier work that sunlight promotes the activity of some of the bug's genes and suppresses that of others—a process she suspects is mediated by New Delhi metallo-beta-lactamase. In particular, the promoted genes relate to cell-wall synthesis, DNA repair and the production of compounds that mop up harmful oxidising agents produced by sunlight. The suppressed genes (downregulated presumably to avoid competition within a bacterial cell for scarce metabolic resources needed for more immediate tasks) include many related to fending off phages. She therefore speculated that letting phages loose on these now-undefended bacteria might kill them.

She and her colleagues collected naturally occurring phages from Saudi wastewater plants. They found seven types which, when unleashed on the photoresistant strain of *E. coli*, readily destroyed it. Three of the seven, moreover, looked particularly suitable for development as weapons against this strain. When offered various bacteria as potential prey, they attacked only it. And they were also tolerant of sunlight.

Experiment proved this notion correct. When suspensions of the three phages in question were mixed together as a cocktail and added to a suspension of photoresistant *E. coli*, the bacteria began to decay within two hours. In phage-free suspensions, by contrast, they held out for more than four hours.

Using phages to attack bacteria in wastewater plants is not a new idea. There is a long history of their being employed to breach the otherwise-impenetrable biofilms that many species form on bits of equipment used in such plants. Dr Hong's approach, though, is completely novel—and may be of particular value in Saudi Arabia. In such a desert country, water is a precious commodity while sunlight is abundant and free. Wastewater facilities there are already under pressure to release treated water for agricultural and even domestic use. Making sure bugs of this sort are dead before such water is used is of the utmost importance. Using other, even smaller, bugs to do it has elegance.

This article appeared in the Science and technology section of the print edition under the headline "Enlightenment"

Attention-deficit hyperactivity disorder

A vast study seeks to understand the genetic underpinnings of ADHD

That may change social attitudes to the condition

Print edition | Science and technology Dec 1st 2018

TRUE DISORDER or mythical modern ailment? Attention-deficit hyperactivity disorder (ADHD) is one of the most controversial topics in psychiatry. Not for the first time, the internet is brimming with conflicting information. Some deplore a lack of recognition and insufficient diagnoses and treatment. Others denounce overdiagnosis and overtreatment, and argue that the condition is bandied about willy-nilly as an excuse for poor parenting.

Identifying the inherited underpinnings of ADHD has proved challenging. Studies of twins with and without its eponymous symptoms suggest that genetic factors bear between 70% and 80% of the blame for causing it. There is not, though—as there is in the case of (say) colour blindness—a clear gene or genes on which that blame can be pinned. Instead, the presumption is that a range of small and hard-to-detect tweaks in the sequence of DNA letters (known as nucleotides) combine to bring about susceptibility to the disorder. Environmental factors such as social deprivation and low birthweight play a greater or lesser role (or sometimes none at all) depending on exactly which genetic tweaks are present.

Now, a dozen of those tweaks have been identified by what is the first large-scale investigation of the matter. An international consortium of more than 200 geneticists and ADHD experts have published, in *Nature Genetics*, what is known as a genome-wide association study (GWAS). The tweaks being sought, called single-nucleotide polymorphisms, or SNPs, are the simplest possible differences between two genomes—namely variations between individuals of single genetic letters in particular spots in the DNA sequence. The researchers looked at SNP patterns in the genomes of 55,000 Europeans, more than 20,000 of whom had been diagnosed with ADHD, seeking SNP variants consistently associated with the condition.

Understanding the roles of the genes these dozen SNPs affect will lead to better understanding of ADHD's causes. Some, for instance, are variations in genes, or the control systems of genes, involved in determining how brains develop in the womb and in early childhood. Others relate to how brain cells communicate with each other. Such understanding may also lead to ideas for new drugs to treat the condition.

Comparing this study with similar ones on what may be related conditions can also be informative. The SNP pattern found, for instance, overlaps with those discovered in GWASs of insomnia. As Stephen Faraone of Upstate Medical University in Syracuse, New York, one of the ADHD study's leaders, observes, "we've known for years that children with ADHD have sleep problems."

The dozen identified variants do not, on their own, confer the disorder. The findings will not, therefore, lead directly to genetic tests for ADHD. What they do do, though, is dispel the idea that ADHD is merely bad behaviour, or even a mythical condition. And that, of itself, may help to change attitudes towards children who have it, and towards their parents.

This article appeared in the Science and technology section of the print edition under the headline "Attention, please"

Smart prostheses

Experience of phantom limbs lets amputees control real replacements

An algorithm interprets the brain's instructions to the phantom

Print edition | Science and technology Dec 1st 2018

IN THE EARLY 16th century a knight called Gottfried von Berlichingen spent decades marauding and feuding on behalf of the Holy Roman Empire. He conducted most of his career singlehandedly—the other having been blown off by a cannonball. To replace it he had a metal duplicate made, with spring-loaded fingers that could hold a sword, shield or the reins of his horse. This early prosthetic device gave him the nickname "Götz of the Iron Hand".

Prostheses have come a long way since Götz's day. A technique called targeted muscle re-innervation (TMR) permits surgeons to take the nerves that once controlled a missing limb and attach them to muscles in a patient's chest or back. The redirected nerves grow into their new muscular homes. These then act as signal amplifiers: a muscle's electrical activity reflects that of the nerves supplying it, but is far more powerful and therefore easier to detect using external electrodes. That activity, duly interpreted by computer, can be used to drive motors within the prosthesis to make it do what its wearer wants.

For this to happen, though, the patient must spend weeks, or even months, learning to twitch the re-innervated muscles in particular ways to achieve particular outcomes. That is frustrating and tedious. Nor is the re-innervating surgery itself without risk. A better way to control prosthetic limbs would be welcome. And one may now be on offer.

Some amputees feel the presence of a phantom limb where the real one was. Often, they feel that phantom to be under their control. If it were possible to use these feelings to direct the behaviour of a prosthesis, TMR might be made redundant. Nathanael Jarrassé of the Sorbonne and Jozina de Graaf of Aix Marseille university, both in France, have begun working on how to do this.

In their latest study, just published in *Frontiers in Bioengineering and Biotechnology*, Dr Jarrassé and Dr Graaf stuck six electrodes onto the arm stumps of two volunteer amputees who had each lost that limb above the elbow. (The loss of the elbow joint as well as the wrist greatly complicates the task of interpreting the signals and controlling the prosthesis.) These half-dozen electrodes read activity coming from the arm's remaining muscles as the volunteer thought about moving the missing limb.

The trick was that the learning needed to manipulate the prosthesis was done not long-windedly, as in TMR, by the patient, but rapidly, by a computer algorithm. This recognised within minutes the different patterns of electrical activity that corresponded to different actions of the phantom limb as imagined by the volunteer, such as opening or closing the hand, or moving the wrist. It then directed motors to replicate such actions in the prosthetic arm. Both patients were thus able to use the device intuitively—successfully grasping, placing and releasing objects.

The new system is not perfect. At the moment the algorithm recognises only the type of movements the phantom limb is making in the patient's mind, not their speed or their amplitude. It also takes half a second or so to process the electrodes' signals. This delay between intention and execution means the user does not yet experience the prosthesis as if it were part of the body. These imperfections are, though, things that might be overcome in the future. And if they can be, the phenomenon of phantom limbs will have been turned from something that is often distressing to those experiencing it, into something of great benefit.

This article appeared in the Science and technology section of the print edition under the headline "Ghost busters"

Books of the year
The big read

The big read

The Economist's books of the year

They are about corruption, blood, slavery, survivalism, espionage and a drifting second-world-war veteran

Print edition | Books and arts Dec 1st 2018

Politics and current affairs

Moneyland. By Oliver Bullough. *Profile Books; 298 pages; £20. To be published in America by St Martin's Press in May; $28.99*

Moneyland is the author's term for the virtual country into which the world's mega-rich smuggle their (sometimes ill-gotten) wealth, so insulating it from the attention of tax and other officials. Focused in part on the kleptocrats of the former Soviet Union, the book ranges across the world and a wide cast of lawyers, accountants and mountebanks who see to it that money stolen in poor, ill-run countries can be invested in rich, safe ones. An urgent exposé of a vital subject.

Enlightenment Now: The Case for Reason, Science, Humanism and Progress. By Steven Pinker. *Viking; 576 pages; $35. Allen Lane; £25*

His critics regard him as Panglossian, and suspect he cherry-picks statistics, but the author's case for global optimism is entertaining and well-argued. The Enlightenment virtues of reason and education, allied to trade and technology, have made the world richer, safer and even happier, he contends, and the improvements are likely to continue. Populists and demagogues are merely a blip in this consoling counterpoint to the misery of the news.

Fascism: A Warning. By Madeleine Albright. *Harper Collins; 254 pages; $27.99 and £16.99*

The former secretary of state—and a longtime professor of international relations at Georgetown University—fled both Nazism and communism as a child. She does not deploy the term "fascism" loosely and deplores those who do; instead she cooly analyses the way countries can descend into tyranny. In uncertain times, she observes, many people no longer want to be asked what they think: "We want to be told where to march."

First Raise a Flag: How South Sudan Won the Longest War but Lost the Peace. By Peter Martell. *Hurst; 320 pages; £25*

A correspondent based in Juba, capital of the new, troubled country of South Sudan, explains its tragic predicament. A history of slave raids, imperialism and brutal rule by Khartoum leads to independence and civil war. The saga is enlivened by interviews with retired spooks and elderly veterans of the colonial administration.

Into the Hands of the Soldiers: Freedom and Chaos in Egypt and the Middle East. By David Kirkpatrick. *Viking; 384 pages; $28. Bloomsbury Publishing; £25*

In this pellucid chronicle of Egypt's trajectory since the toppling of Hosni Mubarak in 2011, the former Cairo bureau chief of the New York Times is almost as scathing about the bungling foreign policy of successive American administrations as he is about Abdel-Fattah al-Sisi, Egypt's strongman president. The country's so-called stability, he suggests, is again breeding misery and extremism.

Shadows of Empire. By Michael Kenny and Nick Pearce. *Polity; 200 pages; $19.95 and £14.99*

The "Anglosphere" is not a term in common parlance. This timely and enlightening book shows that, throughout the 20th century, the idea of a fraternity of English-speaking nations exerted a powerful influence on British politicians, including Churchill and Thatcher. It has resurfaced in Brexiteers' dreams of invigorated Commonwealth trade.

History

A History of America in 100 Maps. By Susan Schulten. *University of Chicago Press; 256 pages; $35. British Library; £30*

A collection of maps, by turns beautiful and eccentric, which charts the making of America. It shows the role of maps in exploration and conquest and proves that, while some aspects of American political geography are enduring, much in the country's make-up has, like the banks of the Mississippi, always been in flux.

Pogrom: Kishinev and the Tilt of History. By Steven Zipperstein. *Liveright; 288 pages; $27.95 and £20*

The pogrom in Kishinev in 1903 became a byword for anti-Semitic violence for Jews everywhere, its victims blamed variously for their passivity and for having resisted their attackers. The event roused Zionists and Jew-haters alike, and was instrumental in both the publication of the "Protocols of the Elders of Zion" and the establishment (in New York) of the NAACP. A gripping, scrupulous history of a seminal but mythologised atrocity.

The China Mission: George Marshall's Unfinished War, 1945-1947. *By Daniel Kurtz-Phelan. W.W. Norton & Company; 496 pages; $28.95*

Marshall's mission to China is much less well-known than his effort to rebuild Europe after the second world war. The former, unlike the latter, failed; China descended into civil war and then a communist dictatorship. This account of the debacle by a former diplomat is both a compelling portrait of a remarkable soldier and statesman and an instructive lesson in the limits of American power, even at its zenith.

Rise and Kill First: The Secret History of Israel's Targeted Assassinations. By Ronen Bergman. *Random House; 784 pages; $35. John Murray; £19.99*

For this impressive work of reportage, the author not only spoke to hundreds of Israeli spies but also convinced them to hand over a trove of documents. Then he constructed a thrilling narrative of extreme bravery and compromised morality.

Business and economics

We the Corporations: How American Businesses Won Their Civil Rights. By Adam Winkler. *Liveright; 496 pages; $28.95*

"For most of American history", the author comments, "the Supreme Court failed to protect the dispossessed and the marginalised, with the justices claiming to be powerless in the face of hostile public sentiment." Meanwhile "the court has insisted that broad public sentiment favouring business regulation must bend to the demands of the constitution." A lively survey of a neglected but important feature of American history.

AI Superpowers: China, Silicon Valley and the New World Order. By Kai-Fu Lee. *Houghton Mifflin Harcourt; 272 pages; $28*

A former manager at assorted American tech giants—and now the boss of a Chinese venture-capitalist fund—anticipates the coming contest to dominate artificial intelligence. He thinks China will crush Silicon Valley because it has more data, disdains privacy and competes more ruthlessly. Thought-provoking, if not altogether convincing.

Radical Markets: Uprooting Capitalism and Democracy for a Just Society. By Eric Posner and E. Glen Weyl. *Princeton University Press; 368 pages; $29.95 and £24.95*

A law professor and an economist argue that the way out of liberalism's impasse is to expand the role of markets, not to subdue them. Some of their ideas—on property rights, elections, immigration and much besides—are impractical, and others eccentric; but together they point to a possible response to the challenges of populism and protectionism.

EuroTragedy: A Drama in Nine Acts. By Ashoka Mody. *Oxford University Press; 672 pages; $34.95 and £25.49*

A comprehensive and authoritative history of the euro which argues that the project was a predictable error. Written by a former senior official at the IMF, the book laments the intellectual failures present at the foundation of the single-currency area and in the mishandled response to the sovereign-debt crisis after 2010.

Crashed: How a Decade of Financial Crises Changed the World. By Adam Tooze. *Viking; 720 pages; $35. Allen Lane; £30*

This panoramic survey of the aftermath of the financial crash of 2008 has four main themes: the immediate response, in which the banks were rescued; the euro-zone crisis; the shift in the developed world after 2010 to more austere fiscal policies; and the rise of populist politics in Europe and America in the wake of the debacle. The author has little faith in the ability of governments to take decisive action when the next crisis hits.

Biography and memoir

The Wife's Tale: A Personal History. By Aida Edemariam. *Harper; 314 pages; $26.99. Fourth Estate; £16.99*

The author's Ethiopian grandmother, Yetemegnu, was married at the age of eight to a religious student more than 20 years her senior. By 14 she was a mother. She fled her husband's mistreatment, yet when he was arrested she petitioned the emperor on his behalf; on his death she mourned "my husband, who raised me". The family sought sanctuary in the mountains when the Italians invaded in 1935. This intimate memoir is also an oblique chronicle of Ethiopia's turbulent history.

Educated. By Tara Westover. Random House; *385 pages; $28. Hutchinson; £14.99*

A riveting memoir of a brutal upbringing. The author grew up in a normally opaque environment: a Mormon survivalist household in Idaho, where she endured abuse and received no education. Despite not setting foot in a classroom until she was 17, she made it to university and wound up with a PhD from Cambridge.

Barracoon. By Zora Neale Hurston. *Amistad; 208 pages; $24.99. HQ; £12.99*

Zora Neale Hurston's study of Kossula, later called Cudjo Lewis, one of the last Africans to be kidnapped into slavery in America, has never been commercially published before. Interviewed at his home in Alabama in 1927-28, he vividly recalled his capture and illegal transportation on the eve of America's civil war: "I think maybe I die in my sleep when I dream about my mama." A devastating book.

Napoleon: A Life. By Adam Zamoyski. *Basic Books; 784 pages; $40. William Collins; £30*

Some of his critics portray him as a monster; enthusiasts have characterised him as a demi-god. In this superlative account, Napoleon is a mortal, with great virtues and equally great flaws, at once dazzling and gauche. "From the sublime to the ridiculous", Napoleon himself said after his disastrous campaign in Russia, "there is but one step."

Churchill: Walking with Destiny. By Andrew Roberts. *Viking; 1,152 pages; $30. Allen Lane; £35*

Of the many biographies of Winston Churchill, this is the fullest. Acknowledging its subject's flaws and sometimes catastrophic mistakes, it nevertheless makes a compelling case for his greatness, both as a statesman and a writer. More unusually, by evoking his wit, generosity and courage, it also succeeds in making him lovable. "I was not the lion," Churchill said, "but it fell to me to give the lion's roar."

Gandhi: The Years That Changed the World 1914-1948. By Ramachandra Guha. *Knopf; 1,104 pages; $40. Allen Lane; £40*

At a time of rising Hindu nationalism, the Mahatma's values and example are as relevant as ever in his homeland. This second volume of a magisterial biography begins in 1914, when Gandhi returned to India from South Africa. It conveys his charisma, his intellect and the evolution of his political beliefs, including his advocacy of Hindu-Muslim reconciliation.

The Spy and the Traitor: The Greatest Espionage Story of the Cold War. By Ben Macintyre. *Crown; 368 pages; $28. Viking; £25*

Oleg Gordievsky, a vital Western asset inside the KGB, was smuggled across the Soviet Union's border with Finland in the boot of a car. The story of Mr Gordievsky's life, and that of Aldrich Ames, the renegade CIA officer who outed him, is told with the gusto of a thriller. A fitting tribute to a brave but lonely man.

Culture

The Personality Brokers. By Merve Emre. *Doubleday; 336 pages; $27.95. Published in Britain by William Collins as "What's Your Type?"; £20*

The Myers-Briggs Type Indicator, the best-known personality test, is the focus of an entertaining cultural history of the personality-assessment industry. It was invented by a mother-and-daughter team, under the influence of Carl Jung. Its enduring popularity ought not to be surprising: after all, it offers both the "rush of self-discovery" and "the comfort of solidarity" with others of the same type.

The Prodigal Tongue. By Lynne Murphy. *Penguin Books; 368 pages; $17. Oneworld; £16.99*

The first and perhaps only book on the relative merits of American and British English that is dominated by facts and analysis rather than nationalistic prejudice. For all its scholarship, this is also a funny and rollicking read.

Space Odyssey: Stanley Kubrick, Arthur C. Clarke and the Making of a Masterpiece. By Michael Benson. *Simon & Schuster; 512 pages; $30 and £25*

An illuminating account of a collaboration that resulted in a landmark film. The author's scientific background helps him to explain its pathbreaking visual effects. The making of a great work of art has rarely been anatomised so thoroughly.

Astounding: John W. Campbell, Isaac Asimov, Robert A. Heinlein, L. Ron Hubbard and the Golden Age of Science Fiction. By Alec Nevala-Lee. *Dey Street Books; 544 pages; $28.99. To be released in Britain in August; £10.99*

An indispensable book for anyone trying to understand the birth and meaning of modern science fiction in America from the 1930s to the 1950s—a genre that reshaped how people think about the future, for good and ill.

Boom Town. By Sam Anderson. *Crown; 448 pages; $28*

The fortunes of the Thunder, Oklahoma City's basketball team, become a metaphor for the city's own history in a hymn to an unsung metropolis. In this colourful compendium of heroism, skulduggery, land-grabs, oil and violence, its subject emerges as equal parts Wild West and Oz.

Fryderyk Chopin: A Life and Times. By Alan Walker. Farrar, Straus and Giroux; *768 pages; $40. Faber & Faber; £30*

Chopin's romantic life—he was a child prodigy who ran off with George Sand before dying at 39—has had many chroniclers. This definitive account draws on new sources to shed light on his career and volatile times. The man behind the myth emerges as an amiable perfectionist.

Fiction

The Long Take. By Robin Robertson. *Knopf; 256 pages; $27. Picador; £14.99*

The wondrous story of a Canadian veteran of the second world war who washes up in New York and then Los Angeles—told mostly in verse. Walker, the protagonist, is haunted by his experiences in combat and by memories of his youth, and pained by the neglect of the homeless in California. Probably the best novel of the year.

The Silence of the Girls. By Pat Barker. *Doubleday; 304 pages; $27.95. Hamish Hamilton; £18.99*

The "Iliad" reimagined from the perspective of Briseis, the captured slave-girl who is the cause of the quarrel between Achilles and Agamemnon that animates Homer's epic—and in the original is almost silent. The technicolour horrors of war are accompanied by similes of almost Homeric brilliance.

Washington Black. By Esi Edugyan. *Knopf; 352 pages; $26.95. Serpent's Tail; £14.99*

The title character of this poignant saga is born into slavery on a sugar plantation in Barbados; he escapes in the company of an eccentric inventor, a slave-catcher on his trail, before wandering across several continents. An original and compulsive exploration of a tragic subject.

Milkman. By Anna Burns. *Graywolf Press; 360 pages; $16. Faber & Faber; £8.99*

The winner of this year's Man Booker prize is set during the Troubles in Northern Ireland in an unnamed city that looks like Belfast. "Middle sister", the protagonist (nobody in the book has a conventional name), is stalked by a paramilitary. A haunting depiction of the impact of violence on ordinary lives.

Love is Blind. By William Boyd. *Knopf; 384 pages; $26.95. Viking; £18.99*

The tale of a Scottish piano-tuner infatuated with a Russian opera singer gallops across fin-de-siècle Europe, from Paris to St Petersburg to Trieste, then onwards to the Andaman Islands. A treat for the author's many fans and a masterclass in old-fashioned storytelling.

Normal People. By Sally Rooney. *Faber & Faber; 266 pages; £14.99. To be published in America by Hogarth in April; $26*

A beautiful portrait of an on-off relationship between two Irish youngsters, at school and university. The scrutiny of their self-deceptions is at once unforgiving and tender. The tango of power is masterfully conveyed in their dialogue.

Fire Sermon. By Jamie Quatro. *Grove Press; 224 pages; $24. Picador; £14.99*

A lyrical, experimental novel about faith and adultery, divine and erotic love, worship and transgression, from an accomplished writer of short stories.

Science and Technology

Beyond Weird. By Philip Ball. *University of Chicago Press; 384 pages; $26. Bodley Head; £17.99*

Most books on quantum mechanics emphasise its weirdness, a built-in excuse for being baffling. Wearing deep learning lightly, this author explains his subject simply and thoughtfully, revealing the theory's true power as a way of knowing what can be said about nature.

Rocket Men. By Robert Kurson. *Random House; 384 pages; $28. Scribe; £18.99*

A gripping account of *Apollo 8*, the first manned space flight around the Moon. The story of the dangerous mission that laid the ground for the Moon landing has not been told in such detail until now.

Nine Pints: A Journey Through the Money, Medicine and Mysteries of Blood. By Rose George. *Metropolitan Books; 368 pages; $30. Portobello Books; £14.99*

This history of blood takes its name from the quantity in a human body. The author visits high-tech facilities, a South African slum and Nepalese villages to convey, scintillatingly, what is known and what remains mysterious about the liquid.

This article appeared in the Books and arts section of the print edition under the headline "The big read"

A short history of moonlighting

Books by The Economist's writers

We wrote about language, presidents, capitalism, sexuality and saints

Print edition | Books and arts Dec 1st 2018

Talk on the Wild Side: The Untameable Nature of Language. By Lane Greene. *Economist Books/Hachette; 240 pages; $26. Profile Books; £14.99*

Our Johnson columnist argues that English is a living organism; language rules are often preferences in disguise. "He is open-minded and discerning," the *Spectator* said; "no zealot and no snob."

Dark Shadows: Inside the Secret World of Kazakhstan. By Joanna Lillis. *I.B. Tauris; 272 pages; $25 and £20*

A portrait of an enigmatic country by our correspondent there. She traverses deserts, mountains and cities, talking to oilmen, oligarchs and villagers.

All You Need to Know: Sexuality. By Charlie McCann. *Connell Publishing; 121 pages; $14.99 and £9.99*

A tour of the meanings of sex in the West—by the deputy digital editor of *1843*—that romps through ancient Greece, medieval Europe, Georgian London, Weimar Berlin and the sexual revolution to the controversies of today.

Revolution Française: Emmanuel Macron and the Quest to Reinvent a Nation. By Sophie Pedder. *Bloomsbury; 297 pages; $28 and £25*

A close-up biography of an odds-defying president by our Paris bureau chief. "A terrific first draft of a history with significance far beyond the borders of France," said the *Wall Street Journal.*

Bibi: The Turbulent Life and Times of Benjamin Netanyahu. By Anshel Pfeffer. *Basic Books; 432 pages; $32. Hurst; £20*

A biography of an embattled, pugnacious prime minister by our Israel correspondent, tracing his rise from MIT student to leader. "Insightful and readable," reckoned the *New York Times*.

The Golden Thread: How Fabric Changed History. By Kassia St Clair. *John Murray; 368 pages; £20*

From Viking sails and ancient Egyptian linen to modern factories, a regular arts writer explains how and why fabric has changed the world. "A charming, absorbing and quietly feminist history," said the *Sunday Times.*

The 100 Best Novels in Translation. By Boyd Tonkin. *Galileo Publishers; 304 pages; £14.99*

Critical essays introducing some of the greatest works of fiction ever translated into English. Our regular reviewer's appreciation "is always fresh, unforced and illuminating," said the *Spectator*.

Picasso and the Painting That Shocked the World. By Miles Unger. *Simon & Schuster; 480 pages; $32.50 and £24.99*

The story of how a young Spanish painter came to Paris and launched an artistic revolution. The *Washington Post* called our art reviewer's study "a historically and psychologically rich account of the young Picasso."

Capitalism in America: A History. By Adrian Wooldridge and Alan Greenspan. *Penguin Random House; 496 pages; $35. Allen Lane; £25*

Our political editor and his co-author argue that a high tolerance for creative destruction has underpinned America's success. The *Financial Times* said they instilled "a sense of exhilaration that so much of the American experience could be described so vividly and insightfully."

Francis: A Life in Songs. By Ann Wroe. *Jonathan Cape; 191 pages; £16.99*

Our obituaries editor turns to verse for her portrait of St Francis, counterpointing themes in his life with contemporary echoes. The *Spectator* called her "a poet with a distinctive voice, a command of form and a lightness of touch matched by a depth of heart."

Seriously Curious: The Facts and Figures That Turn Your World Upside Down. Edited by Tom Standage. *Economist Books; 272 pages; $9.99 and £8.99*

Startling facts and explanations, compiled by our deputy editor. *Booklist* called it "bemusing, informative, provocative—and always interesting".

This article appeared in the Books and arts section of the print edition under the headline "A short history of moonlighting"

Economic data, commodities and markets

Print edition | Economic and financial indicators Nov 29th 2018

Economic data

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	Gross domestic product % change on year ago: latest		quarter*	2018†	Consumer prices % change on year ago: latest		2018†	Unemployment rate %	
United States	3.0	Q3	3.5	2.9	2.5	Oct	2.5	3.7	Oct
China	6.5	Q3	6.6	6.6	2.5	Oct	2.1	3.8	Q3§
Japan	0.3	Q3	-1.2	1.1	1.4	Oct	0.9	2.3	Sep
Britain	1.5	Q3	2.5	1.3	2.4	Oct	2.4	4.1	Aug††
Canada	1.9	Q2	2.9	2.3	2.4	Oct	2.3	5.8	Oct
Euro area	1.7	Q3	0.7	2.1	2.2	Oct	1.7	8.1	Sep
Austria	2.3	Q2	-4.0	2.9	2.2	Oct	2.1	4.9	Sep
Belgium	1.7	Q3	1.6	1.5	2.8	Oct	2.2	6.3	Sep
France	1.5	Q3	1.7	1.7	2.2	Oct	2.1	9.3	Sep
Germany	1.2	Q3	-0.8	1.9	2.5	Oct	1.8	3.4	Sep‡
Greece	1.8	Q2	0.9	2.0	1.8	Oct	0.8	18.9	Aug
Italy	0.8	Q3	0.1	1.1	1.6	Oct	1.4	10.1	Sep
Netherlands	2.4	Q3	0.8	2.8	2.1	Oct	1.7	4.6	Oct
Spain	2.5	Q3	2.4	2.7	2.3	Oct	1.8	14.9	Sep
Czech Republic	2.7	Q2	1.6	2.8	2.2	Oct	2.3	2.2	Sep‡
Denmark	1.5	Q2	2.8	1.3	0.8	Oct	1.1	3.9	Sep
Norway	1.1	Q3	2.3	1.7	3.1	Oct	2.7	4.0	Sep‡‡
Poland	5.1	Q2	7.0	5.0	1.8	Oct	1.8	5.7	Oct§
Russia	1.3	Q3	na	1.6	3.5	Oct	2.9	4.7	Oct§
Sweden	2.4	Q2	3.1	2.7	2.3	Oct	2.0	5.5	Oct§
Switzerland	3.4	Q2	2.9	2.7	1.1	Oct	1.0	2.5	Oct
Turkey	5.2	Q2	na	3.8	25.2	Oct	15.3	11.1	Aug§
Australia	3.4	Q2	3.5	3.2	1.9	Q3	2.1	5.0	Oct
Hong Kong	2.9	Q3	0.3	3.4	2.7	Oct	2.4	2.8	Oct‡‡
India	8.2	Q2	7.8	7.4	3.3	Oct	4.6	6.9	Oct
Indonesia	5.2	Q3	na	5.2	3.2	Oct	3.4	5.3	Q3§
Malaysia	4.4	Q3	na	5.0	0.6	Oct	0.8	3.3	Sep§
Pakistan	5.4	2018**	na	5.4	7.0	Oct	5.4	5.9	2015
Philippines	6.1	Q3	5.7	6.2	6.7	Oct	5.5	5.4	Q3§
Singapore	2.2	Q3	3.0	3.5	0.7	Oct	0.6	2.1	Q3
South Korea	2.0	Q3	2.3	2.8	2.0	Oct	1.6	3.5	Oct§
Taiwan	2.3	Q3	1.9	2.6	1.2	Oct	1.6	3.7	Oct
Thailand	3.3	Q3	-0.1	4.1	1.2	Oct	1.2	1.0	Sep§
Argentina	-4.2	Q2	-15.2	-2.3	45.5	Oct	33.6	9.6	Q2§
Brazil	1.0	Q2	0.7	1.5	4.6	Oct	3.8	11.9	Sep§
Chile	2.8	Q3	1.1	3.9	2.9	Oct	2.5	7.1	Sep§‡‡
Colombia	2.6	Q3	0.9	2.7	3.3	Oct	3.3	9.1	Oct§
Mexico	2.5	Q3	3.4	2.1	4.9	Oct	4.8	3.2	Oct
Peru	2.3	Q3	-8.3	4.1	1.8	Oct	1.3	6.9	Oct§
Egypt	5.4	Q2	na	5.3	17.7	Oct	17.0	10.0	Q3§
Israel	3.1	Q3	2.3	3.4	1.2	Oct	0.9	4.1	Oct
Saudi Arabia	-0.9	2017	na	1.5	2.4	Oct	2.6	6.0	Q2
South Africa	0.4	Q2	-0.7	0.7	5.1	Oct	4.8	27.5	Q3§

Source: Haver Analytics. *% change on previous quarter, annual rate. †*The Economist* poll or Economist Intelligence Unit estimate/forecast. §Not seasonally adjusted. ‡New series. **Year ending June. ††Latest 3 months. ‡‡3-month moving average.

The Economist

Economic data

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	Current-account balance	Interest rates		Currency units	
	% of GDP, 2018†	10-yr gov't bonds latest,%	change on year ago, bp	per $ Nov 23rd	% change on year ago
United States	-2.6	3.14	80.0	-	
China	0.5	3.20§§	-71.0	6.94	-5.2
Japan	3.8	0.14	10.0	113	-1.4
Britain	-3.4	1.42	13.0	0.78	-3.9
Canada	-2.6	2.33	49.0	1.32	-3.8
Euro area	3.4	0.35	nil	0.88	-4.5
Austria	2.2	0.57	-5.0	0.88	-4.5
Belgium	-0.3	0.83	22.0	0.88	-4.5
France	-0.9	0.74	4.0	0.88	-4.5
Germany	7.9	0.35	nil	0.88	-4.5
Greece	-1.3	4.33	-108	0.88	-4.5
Italy	2.4	3.28	149	0.88	-4.5
Netherlands	10.1	0.49	4.0	0.88	-4.5
Spain	1.1	1.60	6.0	0.88	-4.5
Czech Republic	0.8	2.07	31.0	22.9	-6.0
Denmark	7.2	0.31	-9.0	6.58	-4.6
Norway	8.5	1.87	32.0	8.59	-5.4
Poland	-0.5	3.17	-15.0	3.78	-6.1
Russia	5.1	8.96	131	66.3	-11.8
Sweden	3.8	0.54	-17.0	9.08	-8.6
Switzerland	9.9	-0.01	7.0	1.00	-2.0
Turkey	-5.7	16.73	420	5.29	-25.9
Australia	-2.6	2.62	13.0	1.38	-5.1
Hong Kong	2.0	2.31	47.0	7.82	-0.1
India	-2.4	7.64	61.0	70.9	-8.9
Indonesia	-2.6	8.16	166	14,540	-7.1
Malaysia	2.2	4.17	21.0	4.19	-1.9
Pakistan	-5.9	12.20†††	427	134	-21.2
Philippines	-2.2	7.08	150	52.5	-3.5
Singapore	17.4	2.40	27.0	1.37	-1.5
South Korea	4.5	2.16	-32.0	1,130	-4.0
Taiwan	12.8	0.98	-1.0	30.9	-2.9
Thailand	8.1	2.53	18.0	33.0	-1.1
Argentina	-4.3	11.26	562	36.7	-52.6
Brazil	-1.0	7.89	-110	3.82	-15.4
Chile	-2.2	4.39	-17.0	674	-5.8
Colombia	-2.7	7.09	61.0	3,229	-7.8
Mexico	-1.8	9.24	201	20.4	-8.6
Peru	-2.1	5.63	63.0	3.38	-4.1
Egypt	-2.0	na	nil	17.9	-1.1
Israel	1.6	2.46	69.0	3.74	-6.2
Saudi Arabia	8.0	na	nil	3.75	nil
South Africa	-3.5	9.04	-13.0	13.9	0.4

Source: Haver Analytics. §§5-year yield. †††Dollar-denominated bonds.

The Economist

Markets

	Index Nov 28th	% change on: one week	% change on: Dec 29th 2017
United States DJIA	25,366.4	3.7	2.6
United States NAScomp	7,291.6	4.6	5.6
China Shanghai Comp	2,601.7	-1.9	-21.3
China Shenzhen Comp	1,355.4	-2.2	-28.6
Japan Nikkei 225	22,177.0	3.1	-2.6
Japan Topix	1,653.7	2.3	-9.0
Britain FTSE 100	7,004.5	-0.6	-8.9
Canada S&P TSX	15,171.3	0.5	-6.4
Euro area EURO STOXX 50	3,168.3	0.5	-9.6
France CAC 40	4,983.2	0.2	-6.2
Germany DAX*	11,298.9	0.5	-12.5
Italy FTSE/MIB	19,115.2	2.0	-12.5
Netherlands AEX	519.6	0.4	-4.6
Spain IBEX 35	9,102.7	1.6	-9.4
Poland WIG	57,633.3	2.1	-9.6
Russia RTS, $ terms	1,113.5	-1.2	-3.5
Switzerland SMI	8,894.6	0.6	-5.2
Turkey BIST	94,070.9	1.5	-18.4
Australia All Ord.	5,800.1	1.4	-6.0
Hong Kong Hang Seng	26,682.6	2.7	-10.8
India BSE	35,717.0	1.5	4.9
Indonesia IDX	5,991.3	0.7	-5.7
Malaysia KLSE	1,686.6	-0.5	-6.1
Pakistan KSE	40,704.8	-1.7	0.6
Singapore STI	3,094.5	1.8	-9.1
South Korea KOSPI	2,108.2	1.5	-14.6
Taiwan TWI	9,884.3	1.5	-7.1
Thailand SET	1,640.6	1.4	-6.4
Argentina MERV	31,138.7	2.9	3.6
Brazil BVSP	89,250.8	2.3	16.8
Mexico IPC	40,989.5	-1.2	-16.9
Egypt EGX 30	13,309.5	-3.1	-11.4
Israel TA-125	1,472.4	1.1	7.9
Saudi Arabia Tadawul	7,632.5	1.6	5.6
South Africa JSE AS	51,895.1	1.1	-12.8
World, dev'd MSCI	2,029.8	2.3	-3.5
Emerging markets MSCI	991.7	1.7	-14.4

US corporate bonds, spread over Treasuries

Basis points	latest	Dec 29th 2017
Investment grade	169	137
High-yield	477	404

Sources: Datastream from Refinitiv; Standard & Poor's Global Fixed Income Research.
*Total return index.

The Economist

Commodities

***The Economist* commodity-price index**

2005=100	Nov 20th	Nov 27th*	% change on month	% change on year
Dollar Index				
All Items	136.9	135.6	-1.3	-7.6
Food	142.0	141.2	-1.0	-5.6
Industrials				
All	131.6	129.8	-1.6	-9.7
Non-food agriculturals	120.5	120.6	0.1	-8.1
Metals	136.4	133.7	-2.2	-10.2
Sterling Index				
All items	194.2	191.9	-2.2	-4.8
Euro Index				
All items	149.2	148.4	-1.3	-3.5
Gold				
$ per oz	1,224.2	1,213.2	-0.9	-6.3
West Texas Intermediate				
$ per barrel	53.4	51.6	-22.1	-11.1

Sources: CME Group; Cotlook; Darmenn & Curl; Datastream from Refinitiv; FT; ICCO; ICO; ISO; Live Rice Index; LME; NZ Wool Services; Thompson Lloyd & Ewart; Urner Barry; WSJ. *Provisional.

The Economist

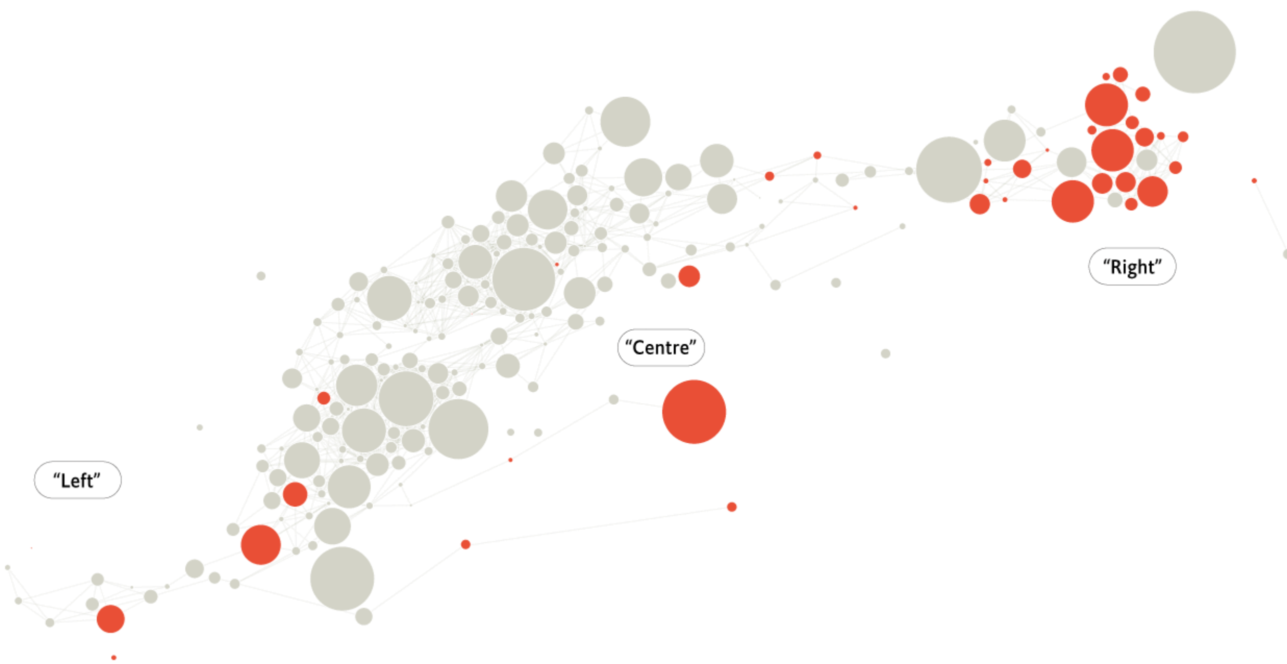
Populism in Europe
Aux armes, citoyens!

Aux armes, citoyens!

Europeans sour on elites and the EU, but agree on little else

Anti-immigrant parties have not made significant electoral gains since 2014

Print edition | Graphic detail Dec 1st 2018



The Economist

MATTEO SALVINI, the head of the Northern League, a populist party that forms part of Italy’s governing coalition, has a pithy explanation for the global rise of movements like his. “It is a common factor,” he says. “The confrontation of the people versus the elite.” Scholars would agree. Since 1999 the University of North Carolina at Chapel Hill has surveyed political scientists about European parties’ policy positions and rhetoric, yielding ideological ratings for each party on various issues. Sure enough, the attribute most correlated with gaining votes since 2014 has been criticism of elites. (The ratings in the survey, conducted roughly every four years, closely match those that voters give to parties when polled, as well as ideological scores that can be derived from manifestos.)

What has drawn voters to such parties? To identify what else they might share, *The Economist* has used a statistical clustering method to calculate the ideological distances between 244 European parties. Our analysis is based on Chapel Hill’s scores on four issues: social liberalism, economic policy, immigration and the EU.

A familiar left-to-right spectrum emerged for the first three subjects. Parties with free-market economic views also tended to endorse tighter limits on immigration and on personal freedoms. The reverse was broadly true on the left.

Mr Salvini’s League landed on the right, as did most parties with high scores for anti-elite rhetoric. However, some of the fastest-growing upstarts—such as Syriza in Greece, Podemos in Spain and the Five Star Movement in Italy—sat in the middle or on the left. Because of this ideological diversity, no statistically significant relationship exists between the change in a party’s vote share from 2014-18 and its views on immigration, social liberalism or economic intervention by the state.

However, one policy area neatly cleaved off the “populist” parties from their “establishment” rivals. The EU is often described as an elite-driven project. So it is little surprise that anti-elite parties with little else in common generally rail against European integration—and that hostility to the EU predicts increases in vote shares nearly as well as anti-elitism does. Voters seem eager to tear down the old order, but do not agree on what the new one should be.

This article appeared in the Graphic detail section of the print edition under the headline ”Aux armes, citoyens!”

Raed Fares
One small town in Syria

One small town in Syria

Obituary: Raed Fares was shot dead on November 23rd

The tireless activist against both the Assad regime and Islamists was 46

Print edition | Obituary Dec 1st 2018


Luca Locatelli/INSTITUTE

THE FILM was blurry, and no wonder. Raed Fares had shot it on his Nokia phone, holding it over the gathering of men in the main street of Kafranbel on April 1st 2011. It was the day they broke through the barrier of fear. He could see a few small flags raised, very tentatively, above head-height. They were not the official Syrian flag of red, white and black with two green stars, but green, white and black, with three red stars. The flag of the Syrian revolution. There was anti-Assad chanting going on. Several men were still glancing over their shoulders, jumpily, in case the security forces turned up. It felt unreal; they had not dared to chant in the street for 40 years. A few years later, though, Huriyah (Freedom) Square was hosting crammed, colourful, noisy demonstrations under rivers of the red-starred flag. And this was largely his doing.

Kafranbel did not look like a hotbed of revolt, just a dozy country town in Idlib province, in north-western Syria near the Turkish border. It sat among dusty olive groves and brown hills. But it contained enough people who thought the town of Daraa, where the Syrian revolution had started, should not be left to fight alone. And it also contained him, a bulky, hearty guy in jeans and leather jacket, with a big boxer's nose, a liking for boiled potatoes witholive oil, a sharp sense of fun and a way of calling everyone *arsa* ("pimp"). He could get anything going.

The Assads, both father and son, had terrorised Kafranbel as long as he could recall. As a child of seven, he had seen security forces kill a neighbour and throw him into a car. At ten, he met refugees from the massacre at Hama straggling into town. Under Bashar's despotism his house had been raided by security men. He'd had enough. So after the Free Syrian Army, in 2012, took the town, he set up in a small concrete office his grandly named Union of Revolutionary Bureaus (URB). From there he organised demonstrations, campaigned for clean water, ran a health centre with a mobile clinic (he had started to study medicine at university, but became an estate agent to support his parents), set up a fund to assist survivors and helped women and children get education. He built a mini civil society, the only way out of war.

The URB also monitored the regime's raids, killings and bombings. Since Western powers seemed not to care, he sent them videos, shot when the ground was still rocking and the air full of dust. He recorded the revolution's martyrs, people he knew, friends, sprawled in their gaping houses, or lying in pieces among the ruins of their market stalls. Uploading 2MB videos to social media could take half an hour with Syria's crawling internet. That infuriated him, as did the fact that he couldn't send Westerners the smell of death: burnt blood and burnt vegetables, corpses and heavy weaponry. That might have made them notice.

Yet what they seemed to notice most were the big political banners he posted on Facebook. Each Thursday evening he and two dozen others would meet at the URB with a giant cotton sheet and a wooden frame. He took charge of the whole thing, from brooding over the week's slogan to painting the Roman letters the West could read. He made them big, black and in capitals, calling for Assad to go and counting up his victims. There were cartoons too, of Assad and Barack Obama dancing, or of Assad killing innocents on "Terrorists Got Talent". The little band, often with him in the middle, would pose in front of some shelled place, and the last red-painted line of their banner proclaimed who and where they were: SYRIAN REVOLUTION—KAFRANBEL. As the posts went viral, his town became famous worldwide as the revolution's beating heart.

It went on beating even as government forces, helped by Russia, took back the country. It held out and still holds out to this day, though battered and with far fewer people. The banners helped. So did Mr Fares's chief pride and joy, Radio Fresh. He started the station in 2013, the first to broadcast from opposition-held territory, sending out news and music from an abandoned government building. For once, Westerners helped and he got funding, though American money dried up last May. He employed 82 people, including women, and trained up hundreds of citizen-journalists.

All this was bound to cause trouble, but that came from an unexpected source, for by then Kafranbel was being squeezed between two sorts of terrorism. On one side, the Assad regime went on killing; on the other a brutal clutch of Islamist groups had taken over the town. These, with their long lists of sharia rules, unleashed his most sarcastic streak. They banned music, which he loved—he was a good oud-player among friends—so he broadcast Big Ben's bongs, sirens, ticking clocks and loud farm animals. (For didn't war-criminal Assad think Syrians were animals anyway, even insects, to be killed with chemical sprays?) They forbade him to use women as announcers, so he ran their voices through a computer program that made them sound like robots, or men. Radio Fresh was declared *haram*, raided, closed, had all its equipment seized, but kept bouncing back.

He did the same, though he was arrested several times, hung up once by his arms and, in 2014, almost killed. Both URB and Radio Fresh had defiant signs outside. Hiding was not an option. At most he varied his commute, but took no gun with him. If they wanted to kill him, let them, he would say, scornfully throwing his cigarette butt away. Ideas weren't killed with weapons. He was not about to give up his campaign to bring civil society to Syria. And that meant staying where he and the fight belonged, in Kafranbel.

This article appeared in the Obituary section of the print edition under the headline "One small town in Syria"