The Economist

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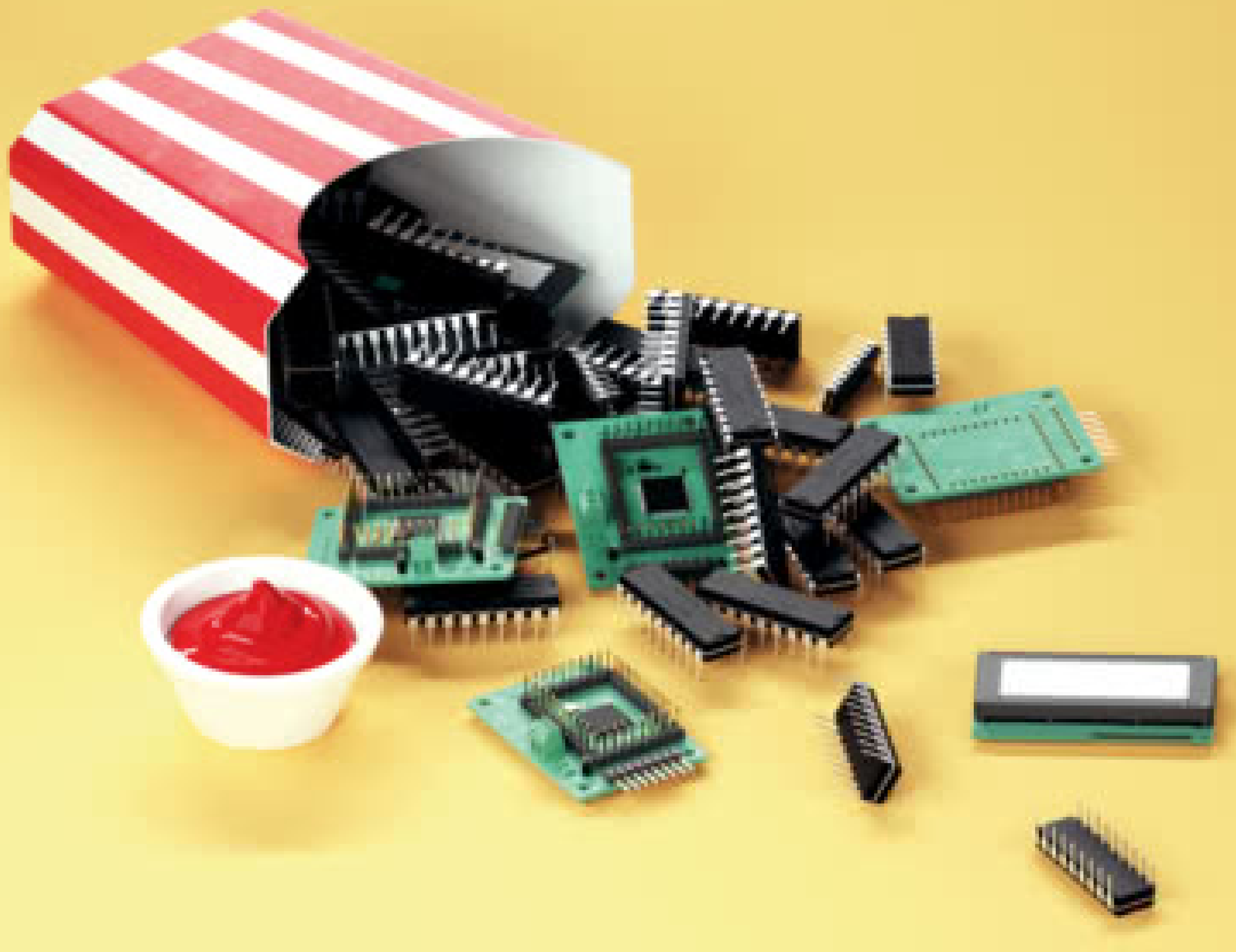
SEPTEMBER 14TH–20TH 2019

Chips with everything

How the internet of things will change the world



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Politics this week

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Donald Trump sought his fourth national security adviser in less than three years after firing **John Bolton**, who had been in the job for 17 months. Mr Bolton says he resigned before Mr Trump sacked him. The pair had not seen eye to eye: Mr Bolton was far more hawkish on Iran, North Korea and Russia. See article .

At least one of Mr Bolton's views appears to have prevailed. Mr Trump abruptly cancelled a peace summit with the Taliban. Hawks had fretted that Mr Trump's proposed deal made a big concession—the partial withdrawal of American troops from **Afghanistan**—without even securing a ceasefire from the Taliban. See article .

The CIA removed one of its most highly placed intelligence sources from the Kremlin in 2017, according to press reports, in part because of concerns that the new Trump administration was careless in handling sensitive material. The decision to extract the **spy** came shortly after Mr Trump discussed classified information with the Russian foreign minister during a meeting at the White House.

Still on the streets

Thousands of protesters marched to the American consulate in **Hong Kong** to show support for a bill being considered by Congress that could result in sanctions against officials who suppress freedoms in the Chinese territory. On the fringes, some demonstrators set fires and engaged in other vandalism.

The government in **Beijing** closed the city's central thoroughfare to allow the army to practise a parade that will be staged on October 1st, the 70th anniversary of Communist rule. The state news agency said about 90,000 people were involved in the rehearsal.

Indian scientists lost contact with the country's first lunar lander during its final descent to the Moon. The craft's mothership, in orbit around the Moon, later located it near its intended landing site, but attempts to resume contact with the probe have failed. See article .

Shinzo Abe, **Japan's** prime minister, reshuffled his cabinet. Shinjiro Koizumi, the son of a former prime minister and a rising star within the ruling Liberal Democratic Party, was appointed environment minister.

North Korea offered to resume disarmament talks with America. But it also tested two short-range missiles, the eighth such exercise since July.

The race begins

Canada's prime minister, Justin Trudeau, formally began the campaign leading up to a general election on October 21st. Both his Liberal Party and the opposition Conservatives, led by Andrew Scheer, have the support of about 30% of voters. Among the main issues will be climate change and allegations that Mr Trudeau's office improperly tried to end the prosecution of SNC-Lavalin, a big engineering firm, for paying bribes.

Marcelo Crivella, the mayor of **Rio de Janeiro**, who is a former evangelical bishop, ordered the confiscation from a book fair of a comic book that depicts two men kissing. He said "Avengers: The Children's Crusade" was unsuitable for children. The president of Brazil's supreme court ruled the book-grabbing unlawful.

Migrants not welcome

Violent protests in **South Africa** against immigrants from other African countries entered their second week. About 12 people have been killed in the riots. Other African nations have responded with outrage. A Nigerian airline began evacuating terrified Nigerians who want to leave South Africa. See article .

Robert Mugabe, who ruled Zimbabwe for almost four decades after its independence until he was overthrown in a coup in 2017, died aged 95. Much-praised by leftists when he took over, he swiftly started locking up and murdering his opponents. His policies caused economic collapse, hyperinflation and a mass exodus of hungry Zimbabweans. See article .

Almost 300,000 people have fled their homes in **Burkina Faso** because of attacks by jihadist groups. The country, which was moving towards democracy, has been destabilised by jihadist insurgencies in neighbouring Mali and Niger.

Israel's prime minister, Binyamin Netanyahu, promised to annex the Jordan Valley and northern Dead Sea (about a third of the occupied West Bank) if he wins a general election on September 17th. Sceptics called it a political stunt to woo hawkish voters. See article .

An **Iranian tanker** seized by British marines in July delivered its cargo of oil to Syria. The ship was released after Iran promised that it was not bound for Syria. Britain said the move represented an "unacceptable violation of international norms" and summoned Iran's ambassador in London. It was also revealed that Iran had detained three westerners.

The autumn of our discontent

In **Britain** opposition MPs demanded to return to work after Scotland's highest court ruled that Parliament's prorogation by the British government was unlawful. The UK Supreme Court will decide the matter. Before Parliament's suspension MPs again voted down the Brexit plans of Boris Johnson, the prime minister, handing him six defeats. John Bercow said he would resign as Speaker. Though a hero to Remainers, he has been criticised by Leavers for helping MPs thwart the government's Brexit plans. See article .

Ursula von der Leyen, the next president of the **European Commission**, unveiled her proposed team of commissioners. Three new "executive vice-presidents" will help her. Margrethe Vestager is the most interesting of these, with the key job of making Europe "fit for the digital age" on top of her powerful existing role overseeing competition policy. See article .

Russia and **Ukraine** swapped prisoners who had been held over the conflict in east Ukraine. Dozens were freed in what is seen as a modest step towards easing tensions. See article .

Vladimir Putin's ruling United Russia party suffered a stinging rebuke at the hands of **voters in Moscow**, losing 15 of the 40 seats on the city council it had controlled. This was despite the fact that many opposition candidates had been barred from contending. See article .

Business this week

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Ren Zhengfei, the founder and boss of **Huawei**, said he was considering selling his company's 5G technology, which has become a source of tension between America and China. The Chinese maker of telecoms equipment has in effect been locked out of the American roll-out of 5G because of national-security concerns. Mr Zhengfei suggested Huawei would share 5G patents with a buyer, along with licences and codes, but it would continue to sell its own 5G equipment. See article .

The operator of the **Hong Kong stock exchange** submitted a surprise $36.6bn unsolicited bid for the **London Stock Exchange**. The LSE said it remained committed to its recent agreement to buy Refinitiv, a financial-data provider, for $27bn. See article .

The gig is up

California's legislature passed a bill that will compel firms in **the gig economy** to reclassify their workers as employees rather than contractors. The law comes into force on January 1st and will affect many startups and firms that rely on low labour costs. Uber and Lyft lobbied hard against the legislation, arguing that it could wreck their businesses. Portending a possible legal challenge, Uber suggested the law would not apply to its drivers. See article .

South Korea lodged a complaint at the World Trade Organisation over **Japan's** limits on exports of materials crucial to South Korea's consumer-electronics industry. Japan claims the restrictions are based on national-security concerns, though its actions are widely seen as a response to the decisions of South Korean courts ordering Japanese firms to pay compensation for forced labour during the second world war.

Hiroto Saikawa resigned as **Nissan's** chief executive, as the company revealed that he had received an "improper" increase in share-based compensation in 2013 (it did not accuse him of misconduct). Investors had also lost confidence in Mr Saikawa as profits plunged and relations soured with Renault, Nissan's partner, following the ousting of Carlos Ghosn. See article .

Steven Mnuchin, America's treasury secretary, went to Capitol Hill to explain his proposals for reforming **Fannie Mae** and **Freddie Mac**, government-sponsored enterprises that back most of the mortgage industry. Fannie and Freddie were bailed out during the financial crisis. Mr Mnuchin wants to begin recapitalisation soon, and has urged Congress to agree to more far-reaching reforms. See article .

British Airways struggled to recover from a two-day strike by pilots over pay, which caused the airline to cancel the vast majority of its flights. Unless the dispute over pay is resolved another strike is scheduled to take place at the end of the month. See article .

America's Centres for Disease Control advised the public not to use **e-cigarettes**, after the deaths of six people were linked to vaping. Meanwhile, the Food and Drug Administration requested more information from Juul, the biggest e-cigarette maker, about its marketing practices, especially to young people. See article .

The Epstein connection

MIT appointed a committee to oversee its **Media Lab** after Joichi Ito resigned as director following press reports that the lab had accepted donations from Jeffrey Epstein, the late disgraced financier, and tried to conceal them. The Media Lab is at the forefront of bringing together disparate research in technology, notably artificial intelligence.

In an abrupt move **Saudi Arabia** replaced Khalid al-Falih as energy minister with Prince Abdulaziz bin Salman, an oil-industry insider. Mr Falih was also recently removed as chairman of Saudi Aramco, the kingdom's state oil company. The promotion of Prince Abdulaziz is a sign that the government wants to accelerate Aramco's delayed IPO.

Tributes were paid to **T. Boone Pickens**, who died aged 91. An oilman who undertook a number of audacious takeover bids, Mr Pickens came to define American tooth-and-claw capitalism in the 1980s. He once said, "I never liked being called a raider. I never destroyed anything."

Apple's annual product launch underscored the shift in its strategy towards services, as sales of the iPhone stall. Rather than using the event to jack up prices, Apple is selling the basic version of the iPhone 11 at a comparatively modest $699, which helps it retain customers. It also priced its new TV streaming service at $4.99 a month, undercutting Netflix. The low price may reflect the limited content Apple will screen on the service when it starts in November. See article .

Jack Ma stepped down as chairman of Alibaba, the Chinese tech giant that he founded 20 years ago. Daniel Zhang is combining the role with that of chief executive. Mr Ma announced his retirement a year ago in order to focus on philanthropy, but he will remain on hand to offer advice to his successor, who faces an uncertain trade climate.

KAL’s cartoon

Print | The world this week Sep 12th 2019

Connected computers
Chips with everything

Chips with everything

How the world will change as computers spread into everyday objects

The "Internet of Things" will fundamentally change the relationship between consumers and producers

Print | Leaders Sep 12th 2019

ON AUGUST 29TH, as Hurricane Dorian tracked towards America's east coast, Elon Musk, the boss of Tesla, an electric-car maker, announced that some of his customers in the storm's path would find that their cars had suddenly developed the ability to drive farther on a single battery charge. Like many modern vehicles, Mr Musk's products are best thought of as internet-connected computers on wheels. The cheaper models in Tesla's line-up have parts of their batteries disabled by the car's software in order to limit their range. At the tap of a keyboard in Palo Alto, the firm was able to remove those restrictions and give drivers temporary access to the full power of their batteries.

Mr Musk's computerised cars are just one example of a much broader trend. As computers and connectivity become cheaper, it makes sense to bake them into more and more things that are not, in themselves, computers—from nappies and coffee machines to cows and factory robots—creating an "internet of things", or IoT (see Technology Quarterly). It is a slow revolution that has been gathering pace for years, as computers have found their way into cars, telephones and televisions. But the transformation is about to go into overdrive. One forecast is that by 2035 the world will have a trillion connected computers, built into everything from food packaging to bridges and clothes.

Such a world will bring many benefits. Consumers will get convenience, and products that can do things non-computerised versions cannot. Amazon's Ring smart doorbells, for instance, come equipped with motion sensors and video cameras. Working together, they can also form what is, in effect, a private CCTV network, allowing the firm to offer its customers a "digital neighbourhood-watch" scheme and pass any interesting video along to the police.

Businesses will get efficiency, as information about the physical world that used to be ephemeral and uncertain becomes concrete and analysable. Smart lighting in buildings saves energy. Computerised machinery can predict its own breakdowns and schedule preventive maintenance. Connected cows can have their eating habits and vital signs tracked in real time, which means they produce more milk and require less medicine when they fall ill. Such gains are individually small but, compounded again and again across an economy, they are the raw material of growth—potentially a great deal of it.

In the long term, though, the most conspicuous effects of the IoT will be in how the world works. One way to think of it is as the second phase of the internet. This will carry with it the business models that have come to dominate the first phase—all-conquering "platform" monopolies, for instance, or the data-driven approach that critics call "surveillance capitalism". Ever more companies will become tech companies; the internet will become all-pervasive. As a result, a series of unresolved arguments about ownership, data, surveillance, competition and security will spill over from the virtual world into the real one.

Start with ownership. As Mr Musk showed, the internet gives firms the ability to stay connected to their products even after they have been sold, transforming them into something closer to services than goods. That has already blurred traditional ideas of ownership. When Microsoft closed its ebook store in July, for instance, its customers lost the ability to read titles they had bought (the firm offered refunds). Some early adopters of "smart home" gadgets have found that they ceased to work after the firms that made them lost interest.

That tilts the balance of power from the customer to the seller. John Deere, an American maker of high-tech tractors, has been embroiled in a row over software restrictions that prevent its customers from repairing their tractors themselves. And since software is not sold but licensed, the firm has even argued that, in some circumstances, a tractor-buyer may not be buying a product at all, instead receiving only a licence to operate it.

Virtual business models will jar in the physical world. Tech firms are generally happy to move fast and break things. But you cannot release the beta version of a fridge. Apple, a smartphone-maker, provides updates for its phones for only five years or so after their release; users of Android smartphones are lucky to get two. But goods such as washing machines or industrial machinery can have lifespans of a decade or more. Firms will need to work out how to support complicated computerised devices long after their original programmers have moved on.

Data will be another flashpoint. For much of the internet the business model is to offer "free" services that are paid for with valuable and intimate user data, collected with consent that is half-informed at best. That is true of the IoT as well. Smart mattresses track sleep. Medical implants observe and modify heartbeats and insulin levels, with varying degrees of transparency. The insurance industry is experimenting with using data from cars or fitness trackers to adjust customers' premiums. In the virtual world, arguments about what should be tracked, and who owns the resulting data, can seem airy and theoretical. In the real one, they will feel more urgent.

Then there is competition. Flows of data from IoT gadgets are just as valuable as those gleaned from Facebook posts or a Google search history. The logic of data-driven businesses, which do ever better as they collect and process more information, will replicate the market dynamics that have seen the rise of giant platform companies on the internet. The need for standards, and for IoT devices to talk to each other, will add to the leaders' advantages—as will consumer fears, some of them justified, over the vulnerability of internet-connected cars, medical implants and other devices to hacking.

Predicting the consequences of any technology is hard—especially one as universal as computing. The advent of the consumer internet, 25 years ago, was met with starry-eyed optimism. These days it is the internet's defects, from monopoly power to corporate snooping and online radicalisation, that dominate the headlines. The trick with the IoT, as with anything, will be to maximise the benefits while minimising the harms. That will not be easy. But the people thinking about how to do it have the advantage of having lived through the first internet revolution—which should give them some idea of what to expect. ■

Talking chop

America will have to resume negotiations with the Taliban eventually

It cannot win the war in Afghanistan by force of arms. But it should not cut and run

Print | Leaders Sep 12th 2019

FOR MONTHS America and the Taliban had been haggling over an agreement to end their 18-year war in Afghanistan. A deal was in sight. But then President Donald Trump learned that a Taliban bomber in Kabul had killed an American soldier, as well as 11 other people (see article). "I immediately...called off peace negotiations," he fumed on Twitter.

The decision came as a relief to many, who had feared that Mr Trump was ready to sign any deal with the Taliban, no matter how humiliating for America or catastrophic for Afghanistan, just to keep a campaign promise to stop America's "endless wars" and bring the troops home. As he called off the talks, the president revealed that he had been on the verge of hosting Taliban negotiators at Camp David, his rural retreat, in the hope of sealing a deal there. Many Americans would have been shocked by the spectacle of their president welcoming the group that once sheltered Osama bin Laden, just days before the anniversary of the attacks of September 11th 2001. Instead, after Mr Trump put his foot down, the American commander in Afghanistan said he was increasing the tempo of attacks on the Taliban. Negotiations were "dead", Mr Trump reiterated.

The deal America was on the verge of striking looked lopsided. It was one of the sources of disagreement between Mr Trump and John Bolton, his national security adviser, who left his job this week, removing the administration's chief hawk (see article). It involved America withdrawing 5,000 troops without the Taliban even agreeing to a ceasefire. That is not quite as abject as it sounds. America would still have had enough manpower to carry on training the Afghan army and giving it air support. In the meantime, the Taliban in effect agreed to negotiate directly with the Afghan government, although this was dressed up as part of a national dialogue. That is something the Taliban had until now tenaciously resisted.

The problem is that the Taliban have no incentive to make big concessions, such as accepting a ceasefire or moderating their demand for a theocracy, if they believe that time is on their side. Some suspect that Mr Trump just wants to declare victory before the next election and leave Afghanistan to its fate come what may. To forge a durable peace, Mr Trump must convince them they are wrong and that he will stay if needs be. It will not be easy.

The war cannot be won by arms alone. Even when America had 100,000 troops in Afghanistan, seven times more than today, it could not stamp out the Taliban. With relatively few troops, America suffers just a dozen or so deaths a year, and still stops the Taliban from overrunning the country. Yet thousands of Afghans perish, and life is made miserable for the remainder.

An abrupt American pull-out would make matters worse, dooming Afghanistan to an even bloodier civil war and possibly to an eventual Taliban victory. That would destabilise the region, create another potential haven for terrorists and leave Afghans at the mercy of a group that murders girls for going to school. It is hard to imagine a worse outcome from 18 years of war.

If military victory is unattainable and surrender unpalatable, that leaves only one option: more negotiation. The Taliban say they are still open to dialogue. Fine, let them talk with the elected government of Afghanistan. America should use all its muscle to bring both sides to the table. And it should make clear that it will support the regime in Kabul until it is no longer in danger of being overthrown by jihadists. Everyone will have to make galling compromises. The Taliban will once again have to be allowed a prominent role in government, because that is the way to give them a stake in the peace.

Such a deal is a long way off. It will not be settled in time for anyone to brag about it on the campaign trail in 2020. So be it. Mr Trump was right not to rush into a bad deal. Afghanistan's future and America's credibility will depend on him, or a future president, having the patience and resolve to strike a better one. ■

A way forward?

Huawei has made a peace offering that deserves consideration

The idea of selling off its 5G intellectual property is not so outlandish

Print | Leaders Sep 12th 2019

AMERICA HAS unleashed a barrage of actions against Huawei, a Chinese telecoms giant which it believes spies for the Chinese government and threatens Western interests because of its dominant role in 5G technologies. Since May, American firms have mostly been banned from supplying Huawei. The Justice Department wants Canada to extradite a top executive who is accused of sanctions-busting. Uncle Sam's diplomats have urged other countries to stop using Huawei gear. America's aim has been to cripple a business that it views as a menace.

As we report this week from Shenzhen, where Huawei is based, the plan has not worked. True, Huawei is suffering. Western banks are wary of it. Silicon Valley suppliers and the owners of datasets have shied away. And on September 19th Huawei, which as well as building networks is the world's second-biggest smartphone-maker, faces the humiliation of launching a new handset that lacks popular American apps such as Google Maps and WhatsApp.

Yet the Chinese firm is hardly on its knees. Not many 5G contracts have been cancelled. It is doing well at home and in countries that are not close American allies. The growth in its revenues is stabilising, following a drop after May, and it expects to stay profitable. It has $36bn of spare cash. The firm says it has alternative sources for most components and it may soon launch a rival to Android, Google's smartphone operating-system.

Instead of Huawei's demise, the tech world faces a split, with an increasingly self-sufficient Chinese industry active everywhere but America. America and its allies could lag behind in 5G, because Chinese firms offer cutting-edge technology at the lowest cost. Replacing existing Huawei gear would be expensive. Competition would suffer. And if Huawei develops rivals to the likes of Android it would weaken Western tech firms.

It is right to be wary of Huawei. No Chinese firm can simply defy the country's autocratic rulers, especially in matters of national security. The question is whether there is a mechanism to mitigate the risks and create trust where little exists. Britain and Germany have set up monitoring bodies to scrutinise Huawei products, but that has not impressed American officials.

Now Ren Zhengfei, Huawei's boss, has floated an alternative: cloning his 5G technology "stack" (patents, code, blueprints and production know-how) and selling it to a Western firm, which would be free to use it outside China and develop the technology as it sees fit. Buyers might include Samsung or Ericsson.

Telecoms intellectual-property portfolios have been sold before. Microsoft bought parts of Nokia in 2014, for example. In this case the buyer would face no competition from Huawei in America, where the Chinese firm does not operate (although it would need to deal with different spectrum frequencies there). In other countries the two would go head to head, though it would take the new competitor years to ramp up manufacturing.

The sale of Huawei's technology would not guarantee security from Chinese spies or saboteurs. Its spooks would remain perfectly capable of hacking networks run by Western companies. But the West would gain safe access to cutting-edge 5G technologies, avoiding roll-out delays. Competition would be enhanced by a new Western contender or a stronger existing one. The world might regrettably still have two tech ecosystems, but the plan might nonetheless help defuse the tech cold war.

The two superpowers are on a dangerous path. If it chooses escalation, America has one option: to try to put Huawei out of business outside China, which could spark a gloves-off conflict. In normal circumstances Mr Ren's suggestion would be outlandish. In times like these it deserves a hearing. ■

Dig deeper

Ren Zhengfei may sell Huawei's 5G technology to a Western buyer , September 12th 2019
Huawei's founder defends Deng Xiaoping's Chinese model , September 12th 2019
A transcript of Ren Zhengfei's interview , September 12th 2019

The vice of vaping

Don’t panic about e-cigarettes

Banning them all will cause far more harm than good

Print | Leaders Sep 12th 2019

“IT’S TIME to stop vaping,” says Lee Norman, a health official in Kansas. Six people are dead in America, apparently from smoking e-cigarettes. More than 450 have contracted a serious lung disease. So Mr Norman’s advice sounds reasonable. The Centres for Disease Control and the American Medical Association agree: the country’s 11m vapers should quit. A new idea is circulating, that vaping is worse than smoking. On September 11th the Trump administration said it intends to ban non-tobacco flavoured vaping fluid (see article). Some politicians want a broader ban on all e-cigarettes.

The facts have gone up in smoke, as so often happens during health scares. Although more research is needed, the evidence so far suggests that the recent vaping deaths in America did not come from products bought in a shop but from badly made items sold on the street. In five out of six cases, the tainted vaping products were bought illicitly; the other involved liquid bought in a legal cannabis shop in Oregon. One theory is that the vape fluid was mixed with vitamin E. This is an oil—something that should not enter the lungs. If inhaled, oil causes the type of symptoms that the stricken vapers display.

America’s Food and Drug Administration (FDA), which is investigating the products involved, rightly refuses to panic. It says vapers should not buy products containing cannabis extract, or those sold on the street. This is sensible. When you buy an unlicensed liquid from an unregulated supplier, you have no idea what you are puffing. This is why governments also discourage people from drinking moonshine spirits, which are sometimes deadly. In Costa Rica, for example, 25 people recently died from imbibing hooch contaminated with methanol. However, just as with alcohol, regulators should draw a distinction between illicit products and the legal, unadulterated sort.

E-cigarettes are not good for you. The vapour that vapers inhale is laced with nicotine, which is addictive. Some of the other chemicals in it may be harmful. But vaping is far less dangerous than smoking tobacco—a uniquely deadly product. If people turn to e-cigarettes as a substitute for the conventional sort, the health benefits are potentially huge. Smoking kills 450,000 Americans every year, and a staggering 7m people worldwide. Anything that weans people off tobacco is likely to save lives.

The big worry about e-cigarettes is that they will create a new generation of nicotine addicts. Some people who have never previously smoked have taken up vaping, including a worrying number of children. In America, for example, one quarter of high-school pupils vape.

This is alarming, and helps explain why so many governments, such as those of Egypt, Mexico, Singapore, Taiwan and Brazil, have banned e-cigarettes. They should not. Prohibition usually causes more harm than good. Forbidding e-cigarettes will lead vapers to buy illicit products—the type that are far more likely to poison them. It will also deter many law-abiding smokers from switching to something less deadly.

For these reasons, regulating vaping is wiser than trying to eliminate it. Governments should carefully control what goes into vape fluid, following the example of the European Union, which restricts the amount of nicotine it may contain. America’s FDA, by contrast, seems constantly to change its mind about how to regulate vaping. Governments should also regulate how e-cigarettes are advertised. Marketing aimed at children is obviously unacceptable. So, perhaps, are fruity flavours that appeal especially to young palates. Government health warnings should be clear and measured. Vaping may be a dangerous habit, but it is vastly less deadly than lighting up. ■

Growing barriers

Why Europe's single market is at risk

The continent's best hope of revival lies in reanimating its great economic project

Print | Leaders Sep 12th 2019

EVERY FIVE years the appointment of a new team at the European Commission is a chance to steer the European Union (EU) in a fresh direction. On September 10th Ursula von der Leyen, the incoming boss, set out her priorities: managing the transition from fossil fuels, extra dollops of American big-tech bashing and "upgrading our unique social market economy".

The first two at least have the benefit of being clear. On the economy, however, Europe needs a lot more than blather. In the past decade the trend of economic integration that defined post-war Europe has gone backwards. The "single market", once breathtaking in its ambition to eliminate all internal EU barriers for goods, services, capital and people, has failed to keep up with the economies it was trying to shape. If Europe wants to create prosperity and world-beating firms, it needs not just to reinvigorate the single market, but also to rediscover that original vision in neglected areas of trade such as services.

The single market still matters—look at the mess Britain finds itself in as it tries to extricate itself from the EU. But a policy originally devised to break down trade barriers in the era of coal and steel has not adapted fast enough to the era of bits and likes (see Briefing). In the past decade Europe's banks have retrenched to their home markets and its firms have shifted their energies to expanding outside the EU. As a result, Europe still looks like a series of mid-sized economies patched together, not a single rival to China and America.

That is one reason why, even as central bankers administer a drip-feed of monetary adrenalin, Europe's economy is losing ground to global rivals. It risks becoming a business backwater. A decade ago ten of the world's 40 largest listed firms by market value were based in the EU; now only two are—in 32nd and 36th place. Desperately few of the world's leading startups are European.

Policymakers who ache at the absence of a European tech success on the scale of Google or Amazon pay lip service to the importance of the single market. And yet France and Germany argue that the real answer is dirigiste industrial policy. They have called for mergers of European firms to create industrial "champions" shielded from antitrust rules and Chinese competition.

They should be aiming to complete the single market instead. A functional single market helps firms achieve economies of scale. It is cheaper to make a product that has to meet one set of EU regulations than to try to follow 28 different national rulebooks. Stiffer competition from firms across the continent means that shoppers get better and cheaper stuff. Imagine if the dozens of mobile operators in Europe were free to pitch their data plans to those beyond their national borders. Instead, consumers have to make do with higher-charging local oligopolies.

Innovation spreads faster in a unified market, pepping up productivity. A properly integrated energy grid would boost the most efficient (and greenest) power producers. Banks with loans out across the continent avoid trouble if their home market falls into recession. Capital markets on a continental scale can help them distribute risks beyond the banking sector. Safer banks and deeper markets mean cheaper capital and fewer bail-outs.

For all those reasons, reinvigorating the single market ought to be at the centre of the debate on how to boost Europe's economy. It is not. Since her appointment two months ago Mrs von der Leyen has mentioned the single market only in passing (see article). The commissioner in charge of the brief, Sylvie Goulard of France, is well regarded, but will have to split her time between internal-market duties, regulating artificial intelligence, and a new defence-industry and space brief.

That might be understandable if the single market were beyond saving. In fact it can be revitalised in three ways. The first is to ensure that its statutes are fully implemented. Too often, national governments flout the edicts of the single market so as to protect a politically connected industry. On average, each European country regulates the workings of nearly 200 professions, making it needlessly tricky for Europeans to move to where the jobs are. No wonder bits of the continent still have double-digit unemployment. The new Brussels team should step up enforcement against governments that fail to apply the rules.

The second way is to focus on the euro. The single currency is in some ways an extension of the single market, even if fewer countries belong to it. It would be more stable if a central fund insured bank deposits. A more substantial euro-zone budget, focused on unemployment insurance, say, could help integrate euro-zone economies. As an added benefit, this would also deepen cross-border links, notably by helping banks become truly European. Here, Mrs von der Leyen has a harder task. Her native Germany will seek to keep progress glacial.

Most ambitious would be a fresh push to remove what structural barriers remain to cross-border European trade. Collecting value-added tax in a neighbouring country would not be so daunting for small businesses if the levy was structured in the same way across Europe, for example. Banks would pitch their wares more broadly if bankruptcy laws were harmonised, and a proper capital-markets union created. Standard contracts for business services (on professional liability, say) would make it easier for German accountants to tout for business in Italy, or for Spanish architects to pitch their offerings beyond the Pyrenees.

A grand bargain of policies serving up tax reform, services liberalisation and a more robust euro would run into plenty of national red lines. But each country would also have lots to gain. Europe needs to shield itself from the fallout a global trade war might bring. It needs a vision after the departure of Britain, the single market's most reliable champion in Brussels—but also, often, a brake on ambitious projects. Meanwhile, Britons tempted to say good riddance to the single market's frustrations should reflect on how much losing a seat at the table could cost them.

Jacques Delors, a former head of the European Commission who championed closer integration, rightly pointed out that "nobody can fall in love with the single market". There is nothing flashy about reworking bankruptcy rules or tax regimes. But Europe's greatest economic project is half-finished business, yielding just half the benefits it could. Europe has few such obvious levers to pull to boost its economy. Time to tug on this one. ■

Letters to the editor
On sea levels, democracy, property, Taiwan, India, Europe, Jacob Rees-Mogg

On sea levels, democracy, property, Taiwan, India, London, Europe, Jacob Rees-Mogg

Letters to the editor

A selection of correspondence

Print | Letters Sep 14th 2019

Rising sea levels

"Higher tide" (August 17th) shone a light on the serious threat that climate change poses to the world's coastal communities. Existing efforts to reduce carbon emissions and limit average temperature increases are insufficient. Climate mitigation must also be met with climate adaptation.

Fostering resilience to the effects of climate change not only meets a compelling humanitarian obligation, but also makes economic sense. For example, mangrove forests are one of the most effective tools to shield the world's poorest coastal communities from rising sea levels. Each year these forests protect 18m people from coastal flooding and prevent more than $80bn in damages. The benefits of mangrove preservation and restoration are up to ten times the costs.

But rising sea levels are just one symptom of climate change. Its effects touch upon every aspect of our lives. In advance of the UN Climate Action Summit in New York, the Global Commission on Adaptation has just published its landmark report offering practical solutions to guide countries on how to adapt to the effects of climate change. This is a live issue and the quicker we act to adapt the greater the dividends.

PROF. PATRICK VERKOOIJEN
Chief executive
Global Centre on Adaptation
Rotterdam

Things fall apart (eventually)

The most compelling explanation for the rise of today's populism ("Democracy's enemy within", August 31st) can be found in the sociological study of structural-demographic theory. In the "Ages of Discord", Peter Turchin described how America is going through a "disintegrative phase", last seen in the 1860s. In this phase, political fragmentation grows, social democracy declines, elites take greater economic and political power (and seek more positions than the country offers), workers suffer from stagnant wages and inequality, authoritarianism grows, and the state is headed toward fiscal crisis. Mr Turchin's book fully explains the dynamic factors at work and is supported by much empirical data. You actually described the disintegrative phase without recognising it for what it is. This phase may not be the end of some democracies (or democracy in general), but as Mr Turchin says, there is no guarantee a country will survive it.

PAUL MCVINNEY
Accokeek, Maryland

America's property market

Comparing the American residential real-estate market with other countries, as you did in "Sellers beware" (August 31st), is an apples-to-oranges comparison. The market in America surpasses other countries and encourages homeownership among first-time and low-income buyers, because these people generally do not have to add a commission to the amount they are already paying to the seller.

Moreover, because of the Multiple Listing Service system, which lists all properties for sale in one place, we are seeing unprecedented competition among brokers, especially when it comes to service and commissions. Brokers offer varying commission models, flat fees and fee for service. A large majority of sellers choose to use a broker, demonstrating that they value the services that brokers offer and that fees are competitive.

Furthermore, characterising brokers as "middlemen" ignores the incredibly valuable services they provide. Research has shown that while many buyers begin their home search online, they soon turn to the assistance of a trusted real-estate agent to guide them through this infrequent, complex, significant transaction. Even though there is a voluminous amount of information available to them, buyers value a qualified, local buyer broker to help them sift through this information, advise them and perform many other functions essential to the buying process.

JOHN SMABY
President
National Association of Realtors
Washington, DC

Arms and Taiwan

So China "never tires of reminding America that in 1982 it promised to reduce arms sales to Taiwan" ("Tsai's prize", August 24th). Rather, it is time for America to remind the Chinese government that promises are not a one-way street. Ronald Reagan was crystal clear on the issue in a note to the National Security Council: America's "willingness to reduce its arms sales to Taiwan is conditioned absolutely upon the continued commitment of China to the peaceful solution" of their differences. Given that Taiwan does not threaten to invade China but China continually threatens to invade Taiwan, there can be no question that America should continue buttressing Taiwan's defence capabilities.

DANIEL MARTIN SCHULZ
Hamburg

India's record

Your article on the Indian government's effort to revive the economy overlooked the fruits of incremental improvements ("Meagre fare", August 31st). Since 2014 India has moved up 57 places to 77 in the World Bank's ease of doing business index. Endemic corruption has been reduced. In the year to March India attracted a record $64.4bn in foreign direct investment.

Big steps have been made in the banking system to deal with bad loans. Inflation is tamed and the central bank has room to manoeuvre on monetary policy. You mentioned a decrease in spending on biscuits. A more telling tale is how access to the internet is surging because Indians can buy data on their mobile phones cheaper then virtually anywhere else in the world.

Mr Modi is doing what is needed to sustain low inflationary growth.

DAVID CORNELL
Chief investment officer
Ocean Dial AM
Mumbai

Binning the continental

May I suggest you use the occasion of Brexit finally to ban the term "continental Europe" (Charlemagne, August 17th). Why place this tediously generalising adjective before the name of a vast continent with a few islands on the periphery? This custom of dividing Europe into Britons and continentals, as if they are somehow equal in numbers or diversity, reflects the same British-centrism and delusions of grandeur that motivated one class of Brexit supporters. But wait, maybe after Brexit the term continental becomes redundant anyway because there will be just Britain and Europe.

GUNNAR NIELS
Oxford

*** Rumble in the concrete jungle**

Your recent article ' London's Tube is worryingly noisy '. As the London Assembly Member (West Central) my constituency includes Pimlico, where hundreds of residents have seen their quality of life destroyed by significant levels of Tube noise in their homes, well above World Health Organisation guidance. With ever increasing Tube frequency on the London Underground and the rollout of the night Tube under Sadiq Khan, the Mayor of London, this issue has never been more important—thank you for drawing it to the attention of your readers.

TONY DEVENISH
Assembly Member for West Central
London

In a meme state

Bagehot described Jacob Rees-Mogg as "lying prone across the Commons benches" (September 7th). He was actually lying supine. If depicted prone Mr Rees-Mogg might make an even better election poster for the opposition.

HUBERT DE CASTELLA
London

* Letters appear online only

The single market
An unconscious uncoupling

An unconscious uncoupling

The economic policy at the heart of Europe is creaking

The health of the single market is vital for the future of Europe's economy

Print | Briefing Sep 12th 2019

HELLO KITTY, a Japanese cat-girl with a bright pink bow, is an unusual mascot for European integration. But in July the cartoon character inadvertently became one. Sanrio, Hello Kitty's owner, admitted to the European Union (EU) that it had granted trademark licences to business partners on the condition each would sell the ensuing Hello Kitty merchandise—from school bags to pencil cases and duvet covers—only in specified EU states. This attempt to treat Europe as a disjointed bundle of countries breaches an article of economic faith: that the EU's 28 members are one single market. The European Commission doled out a €6.2m ($6.8m) fine.

Maps of Europe still show its various countries separated by borders, some of them not much moved in centuries. Commercially, they are meant to be anachronistic. In theory, at least viewed from Brussels, the EU's 500m citizens live in a single economic zone much like America, with nothing to impede the free movement of goods, services, people and capital.

This single-market policy has underpinned Europe's continued, if somewhat diminishing, importance to the global economy. But three decades after it was dreamed up, Europe's commercial unification is creaking. In parts it is incomplete and in others actively going backwards. At a time when Britain is attempting to leave the EU and trade wars loom, this is worrying. The health of the single market is vital to Europe's economy.

Less united states

The single market is an economic arrangement unlike any other. Its origins lie in a series of treaties signed in the 1950s, creating what was to become the EU. Their aim was to weld the French and German economies so closely together as to make war impossible, for example by creating a common market in coal and steel. Economic integration gradually deepened. In 1993 the single market proper came into existence, promising "an area without internal frontiers". All EU countries (and some others, like Norway and Switzerland) vowed to abolish not just tariffs but myriad non-tariff barriers that hamper trade.

One of the single market's underlying principles is that decisions made in one EU country—whether a car is safe to drive or a financial product fit for investors—should be recognised by all others. Some regulation is harmonised and ruled upon by EU bodies, as with the regulation of big banks. More often, European rules are transposed into each country's law and applied by national watchdogs. The EU's fierce privacy regulations, for example, are enforced not by Brussels but by 28 national agencies.

The arrangement is thus a sort of free-trade agreement on steroids. Estimates vary, but EU countries trade roughly half as much with each other as states in America but twice as much as they would in a looser arrangement. All EU countries, with the exception of Britain and Ireland, trade more with other EU countries than with the outside world. Cross-border supply chains in Europe have more foreign inputs from neighbouring countries than those in Asia or North America.

Yet the importance of the single market is fading. Like all rich-world economies, Europe is shifting from the making of goods to the provision of services, such as banking, cloud computing and child care. Such services now make up nearly three-quarters of EU GDP, up from around two-thirds before the single market; all the net new jobs created in Europe in the past decade have been in services.

The single market, on the other hand, was originally devised for goods—stuff made with the steel and coal from which the ever-closer union was to be built. Markets for such goods could be liberalised by opening up borders, or boosted by agreeing joint rules on things like product safety.

Abolishing barriers to trade in services is much harder. "What stops services moving across borders is how they are regulated by different countries," says Jonathan Faull, a former commission official now with Brunswick Group, a consultancy. "Some of that regulation goes back to medieval guilds."

National politicians have long been hesitant to take on the lawyers, pharmacists and taxi drivers of the service economy. As a result, only in 2006 was a fresh set of commitments made to include services in the single market. Even then, many industries ended up being exempt entirely. For services that were covered, implementation has been patchy.

No way to say goodbye

By the EU's own estimate, 5,000 national regulations exist to protect the delivery of different types of services in its member states—nearly 200 per country. Denmark, for example, demands law firms be 90% owned by lawyers qualified or registered there. A Swedish lawyer looking to offer advice across the Oresund strait cannot easily do so without significant hassle.

Similarly, lots of jobs require practitioners to register with professional bodies—often a tiresome process. Though not overtly designed to hamper trade, the rules often have that effect.

Tackling this kind of de facto protectionism is essential if the single market is to keep pace with Europe's ever more service-led business landscape, says Nicolas Véron of Bruegel and the Peterson Institute for International Economics, two think-tanks. "If you do nothing to deepen the single market [to include services]," he says, "it covers a shrinking part of the economy."

Brussels once had the stomach for such liberalisation. It crafted new rules designed to curb protectionism and cracked down on countries that failed to enforce them. But in 1999 many of those who might have continued the push for abolishing commercial borders shifted their attention to another ambitious federalist project—the euro. A decade later, all their energies went into battling for the survival of their single currency as it descended into crisis. "The single market disappeared off the agenda for several years," says Stefano Micossi of Assonime, a trade group.

Mario Monti, a former European commissioner and Italian premier, once put the post-crisis lull in single-market activism down to a mix of "integration fatigue", meaning few wanted a fresh push for ever-closer union; and "market fatigue", an all-round disenchantment with according primacy to the role of the market. Fans of services liberalisation originally estimated that it would result in EU GDP being boosted by 0.8-1.8% over a decade. But that "bonus" never materialised, further sapping enthusiasm for the project.

The effect is starting to be felt. It was once assumed Europe would move to ever-closer economic relations. That is no longer the case. Consider banking. With the advent of the euro, lenders increasingly ventured beyond their national borders to the rest of Europe. In the decade to 2007, the share of bonds held by EU banks issued in countries other than the banks' own tripled to 46%—overtaking the amount of bonds they held issued by companies and government entities in their own countries. The prospect of a true pan-European financial market seemed close. The trend quickly reversed with the financial crisis (see chart one). Financial integration is now on hold. Banks currently make 85% of loans to companies in their own country.

Another indicator of economic convergence is the extent to which people pay the same price for the same goods in different parts of an economic area. In a seamless market, for example within a country, prices should equalise as firms arbitrage differences.

For years, this measure pointed to rapid convergence in the EU. The continent was coming together and turning into something akin to America (though itself not a perfect single market). But again in 2008, progress stalled (see chart one). Firms in increasingly cosseted national markets are freer now to raise prices without losing share to other European firms. Part of that is down to the shift towards services, some of which are hard to trade. A hairdresser in Bratislava will struggle to attract customers from Lisbon.

Other measures do point to continuing integration—but one is soon to be disrupted. Since 2007, the number of Europeans living in an EU country other than their own has more than doubled, to around 17m. But the second-most-popular destination after Germany is due to leave within months. Although European citizens are expected to be able to stay in Britain for a time, and vice versa, the number of Europeans living in a country other than their own will fall by nearly a third overnight. This is not so much a retrenchment of the single market as an abrupt truncation.

Go your own way

How the single market works in practice does much to determine the opportunities open to the EU's firms and thus the shape of its economy. European companies selling goods can make use of the single market, reaching scale and so profitability quickly. They have an edge over those that sell services. Partly as a result, Europe is a continent of goods companies. Fully 21 of the EU's 25 biggest listed firms supply goods, including cars, make-up, alcohol and planes. Two decades ago the same was true in America—where now 17 of the 25 biggest companies provide services such as software, data plans and bank accounts.

This matters: services companies are, on the whole, more productive than those making goods. That usually translates into higher salaries for their employees. Services companies spring up quickly. America's five biggest companies are tech giants mainly focused on services (and gadgets, in the case of Apple) with an average age of just 30, worth $4.3trn between them, 35 times last year's profits. Europe's biggest firms all existed in one form or another a century ago—think of Unilever and Royal Dutch Shell. Combined, they are worth under $1trn, about 23 times last year's profits.

It is not just European multinationals that are smaller. The splintered European market means there are three times as many services companies in the EU as in America. Italy has roughly as many firms as America, despite an economy one-tenth as big. Being undersized saps productivity as firms lack the capacity to adopt new technologies. Around 30% of Europeans work for a company with ten or fewer employees, three times the figure in America and over twice the rate in Japan.

Stunted market opportunities make it hard for companies to raise venture capital. Those stay-at-home banks can also charge higher interest rates to corporate borrowers, having fended off EU competitors who might have eaten away lending margins. Consumers foot the bill.

Similarly, markets are dominated by national champions who can get away with higher prices. In telecoms, Europe has dozens of operators—but in no country can consumers pick from more than three or four. That means the telecoms firms have all the rent-seeking advantages of oligopolies, but none of the economies of scale available to Chinese or American rivals.

European energy markets are equally fragmented. That means higher prices for consumers and businesses. It also stifles investment, not least for renewable-energy projects. The commission has set targets for more integration of electricity grids, for example, but progress has been slow.

Lost that loving feeling

If Europe were a true single market, firms based there would expand at home before venturing overseas, as American tech firms typically do. But the incompleteness of the single market means they are far likelier to expand outside the club. Data from Morgan Stanley, a bank, show that EU firms in 1997 made nearly three-quarters of their sales in wealthy parts of Europe. Today the figure is under half. The bigger a European firm gets, the less it relies on sales to EU countries other than its own (see chart two). This suggests that business bosses view their domestic market as their home country, not the EU.

Big European firms have invested in emerging markets instead. In part, this is to chase economic growth. But the frustrations of doing business in foreign parts of the EU must also be a factor. A database put together by *The Economist* of large companies based in five EU countries shows European companies are ever keener to invest anywhere but their home continent.

The 300 or so firms who break down foreign sales, as reported in Bloomberg, attach less importance to Europe than they once did. Ten years ago, 35% of their sales came from EU countries other than their national home market, versus 29% for the rest of the world. Now, despite a ten-percentage-point increase in exports, the share of European sales has dropped to 30%, while 44% of sales go farther afield.

European firms are less anchored to their home continent as a result. The boss of Schneider Electric, a French blue-chip engineering company, is now based in Hong Kong. In 2000 over 75% of the money spent by European companies on cross-border takeovers was earmarked for other European companies. In the past few years the figure has been under 50%, according to Dealogic, a data provider.

Policymakers in Brussels point to cross-border trade within Europe rising. This is true. But that is a feature of a far wider increase in imports and exports: trade outside the EU is rising nearly as fast. Globalisation has proved just as potent a force as Europe's push towards integration.

Why has the single market not lived up to its promise? Part of it may be down to Europe's many tongues, a natural barrier that no legislation will ever remedy. But a survey conducted in 2015 suggests this is a hurdle for only 45% of companies—versus 83% who fear administrative complexity when crossing EU borders.

The digital economy is particularly damaged by this red tape. Around 40% of European websites do not sell to consumers based in other member states; 77% of online sales are domestic. While EU digital firms stick close to home, limiting opportunities for expansion, the likes of Netflix and Amazon have seized dominant positions in the EU. This is one reason why Europe has only 47 "unicorns" (unlisted startups valued at over $1bn), compared with 97 in China and 194 in America.

Nor is it clear the situation will improve soon. The past few years have been, at best, a period of stasis. "The single market is not a project people can get behind," says Christian Odendahl of the Centre for European Reform. "It isn't a vote-winner."

The European Commission, which enforces the single market, has not given up. In recent years it has focused on building cross-border links in specific areas, such as energy and capital markets, with varying degrees of success. On June 6th it threatened all 28 EU countries with lawsuits if they failed to improve cross-border access to services. But the number of "enforcement actions" it has undertaken to bring wayward governments back on track has nearly halved in a decade. This suggests either fewer new rules or less diligence in enforcing them.

Knowing me, knowing EU

Ursula von der Leyen, the incoming commission president (pictured), hardly mentioned the single market in a speech outlining her agenda in July. That is perhaps not surprising given her political champions, Germany and France, have other priorities. Germany, with its world-class manufacturers and less competitive service firms, enjoys the status quo. And like France it is calling for a more energetic "industrial policy" in which politicians would steer state funding and protection to favoured sectors—the antithesis of the single-market approach.

Britain, once the biggest champion of the single market, would previously have provided a counterweight. But now in its place are a coalition of pro-market small countries, including Sweden and Ireland, that lack its heft. The single market looks set to remain a third-order priority.

Wopke Hoekstra, the finance minister of the Netherlands, another traditional champion of the single market, recently warned in a speech that Europe could not continue "applying bricks-and-mortar rules to a digital economy". It is a strategy that has been tried for too long. Its limits have now been reached. ■

Foreign policy
New job opening

Third strike

What to expect after John Bolton's exit

John Bolton's successor as national security adviser is unlikely to change America's foreign policy

Print | United States Sep 14th 2019

FOR THREE years President Donald Trump's foreign policy has seesawed between threats to bomb enemies and moon-shot diplomacy. The president has flirted with nuclear war with North Korea, only to become the first sitting president to step onto its soil. He has strangled Iran's economy and ordered bombers into the air, then offered talks. A troop surge in Afghanistan gave way to a proposed summit with the Taliban.

John Bolton's appointment as national security adviser in April 2018 seemed to tilt the scales towards the hawks. His acrimonious departure on September 10th—fired by presidential tweet—suggests that Mr Trump is now in a dealmaking mood, ahead of next year's election. That is likely to have consequences for America's relations with enemies and allies alike.

In recent months Mr Bolton has clashed with the president on many fronts. Mr Trump grew impatient with his adviser's dogged opposition to making concessions during negotiations with Kim Jong Un of North Korea and his fixation with sanctions on Iran. Nicolás Maduro's hold on power in Venezuela also proved more durable than Mr Bolton advertised.

Mr Trump sees economic and military muscle-flexing as part of a bargaining process in which foes (he hopes) morph quickly into interlocutors; Mr Bolton would settle for nothing less than their surrender. He forcefully opposed Mr Trump's proposal to ease sanctions against Iran in order to secure a meeting with Hassan Rouhani, Iran's president. But the last straw appears to have been Mr Bolton's dissent over Mr Trump's invitation (later rescinded) to the Taliban to sign a peace agreement at Camp David, the presidential retreat.

Hunting for deals

Mr Bolton's influence should not be overstated. He was more irritant than obstacle. He could not prevent Mr Trump from pulling troops out of Syria, pursuing talks with the Taliban and charming Mr Kim. Even so, his departure is a statement of presidential intent. Though Mr Trump considers himself a master tactician and accomplished dealmaker, he has yet to secure a big diplomatic deal after three years in office. Meanwhile, Mr Maduro remains firmly in power, while arms control with Russia is collapsing. North Korea continues to churn out bomb fuel and Iran's nuclear programme is expanding once more. Violence against civilians in Afghanistan stands at near-record levels.

Mr Trump, eager for a first-term legacy, is therefore likely to renew his pursuit of grand bargains, probably punctuated by set pieces like the trio of encounters with Mr Kim. Iran looks to be first on the list. Mike Pompeo, the secretary of state—a hardliner himself, who nevertheless feuded with Mr Bolton—hinted on September 10th that Mr Trump could meet Mr Rouhani with "no preconditions" during the UN General Assembly, which begins on September 17th. That would be the first meeting between American and Iranian leaders since Iran's Islamic revolution in 1979, and a route to easing six months of growing tensions.

Although Mr Trump said that talks with the Taliban were "dead", they may well be resuscitated. It is hard to know why they collapsed. Perhaps because the president saw a deficiency in the agreement, or because of insurgent violence—which has killed thousands of Afghans since talks began—perhaps because an American soldier was killed at an inopportune moment or because of the poor optics of hosting the Taliban at Camp David the weekend before September 11th.

The biggest prize of all would be Russia, whose covert intervention in America's 2016 election was intended to help nudge Mr Trump into office. In August, Mr Trump unnerved several allies at the G7 summit in France by reiterating his demand that Russia be readmitted to the club. The president will be encouraged by a thaw in the Ukraine crisis, following the exchange of 70 prisoners between Russia and Ukraine on September 9th, and recent efforts by Emmanuel Macron, France's president, to repair Europe's own frayed ties with Russia.

Here, Mr Trump might see arms control as an opportunity. Mr Bolton, a veteran saboteur of nuclear diplomacy, urged the president to quit the Intermediate-Range Nuclear Forces (INF) treaty and played down the prospects that New START, the linchpin of arms control between America and Russia, would be renewed in 2021. Though the INF treaty died on August 2nd, New START now looks a little likelier to limp on.

Mr Bolton's departure leaves Mr Pompeo as the administration's dominant foreign-policy voice. He lacks Mr Bolton's familiarity with the federal bureaucracy, but he has a skill vital for survival in this administration: a willingness to accommodate Mr Trump's views, shaping them if necessary, rather than blocking or sabotaging their implementation. Mr Pompeo also possesses an ability to turn the president's gut instincts into policy.

Mr Trump says he will name Mr Bolton's replacement—the fourth national security adviser in three years, a record—within days. Several names have been floated, each typifying a different approach. Mr Trump could choose a veteran bureaucrat such as Brian Hook, the State Department's point man on Iran. If he wants someone skilled at selling his policy on Fox News, he might choose Richard Grenell, America's undiplomatic ambassador to Germany. Or he may opt for military expertise, in which case the prize might go to Keith Kellogg, a national security adviser to the vice-president who filled in after Mike Flynn left the administration.

Whoever takes over, their most urgent task will be to reinvigorate the national-security bureaucracy that Mr Bolton—who has long held dim views of bureaucrats who are not John Bolton—sidelined, to give himself and his views maximum influence with the president. That process is deliberately unwieldy, but it provides the president with the range of perspectives to inform his decisions and the structure to enforce them. If Mr Trump is to have any hope of striking advantageous deals with his adversaries, he will need a functional policymaking apparatus.

Unfortunately, that apparatus cannot save Mr Trump from himself. No matter how proficient his adviser, Mr Trump will still make foreign policy on the fly, tweet by tweet. Worse, his obvious thirst for a legacy-defining deal puts Iran, North Korea and Russia at an advantage. ■

Just past the post

What a Republican victory in North Carolina means for 2020

Both parties may recalibrate after a close House race

Print | United States Sep 12th 2019

UP CLOSE, POLITICAL enthusiasm is gloriously strange. At the rally held by President Donald Trump in Fayetteville on the eve of election night in North Carolina's 9th congressional district, the atmosphere was festive. "I haven't been in a crowd like this since I saw Fleetwood Mac," said a retired marine, who was unaware that the Democrat running in the district was also a retired marine. Before the president spoke there was discussion, among other things, of whether it was still OK to play Michael Jackson songs at such an occasion ("I hope he doesn't come on stage to this, it's a bit off"; "It's probably just 80s Spotify"). A tall African-American man dressed head-to-toe in pyjamas with the president's face all over them, capped with a Trump wig, lifted his top to reveal a T-shirt underneath with "Grab Her By The Pussy" written on it. A trans woman waved a banner that read "Women For Trump". There were speeches from the president's son and from the president's son's girlfriend, who said that the Trump family has sacrificed so much for America, because they love the people.

Yet when it comes to election time, voters behave in ways all too easy to generalise about. Between the previous election in North Carolina's 9th district in November 2018 and the special election on September 10th, which Dan Bishop, the Republican candidate, won narrowly, the news cycle has been dizzying. The trade war with China has intensified, the Mueller investigation concluded, the president has sent 4,800 tweets. The net effect of all this, at least in NC-9, was that the Republican increased his vote share by one percentage point. For all the effort poured into campaigning, and the speculation over whether this or that will hurt or help Mr Trump with voters, the overwhelming majority of people just voted for the party they supported last time.

Such stability might be a relief to Republican congressmen. Art Pope, a former Republican state representative with a fearsome reputation among Democrats as a political operator, reckons the result shows that the Democratic wave of 2018 is now receding. In 2018, he says, the Democratic candidate, Dan McCready, the former marine and current entrepreneur, was free to define himself in the eyes of voters. A year on, with "Nancy Pelosi basking in the bright sunshine of Alexandria Ocasio-Cortez and the socialist wing of the party," Mr Pope says it was easier to pin him down.

That interpretation is kind to Republicans. No Democrat ought to have been competitive in the district, which stretches from suburban Charlotte to Fayetteville in the east. "The Most Patriotic City In The USA" is just outside the gates of Fort Bragg, a military base which covers 160,000 acres and is home to 50,000 soldiers and 25,000 of their family members. NC-9 has returned a Republican in each election since 1963. Mr Trump won it by 12 points in 2016.

Yet the Republican candidate would probably have lost but for a particularly good result in Robeson county (see chart). Robeson is home to the Lumbee tribe of Native Americans, who were courted by both candidates. Mr Bishop, overcoming a reflexive Republican aversion to handouts, sponsored a bill signed into law in July in North Carolina's statehouse to funnel money for health care and poverty alleviation to the Lumbee. Turnout in Robeson was low, because the tribe's members are mostly poor, but it may have been decisive.

One-off elections are not always good predictors of what comes next, but the mid-term results in 2018 were in line with the special elections that preceded them. If the Democratic Party were to do as well next year as its candidate did in NC-9, it would secure a huge majority in Congress. There are 32 seats currently held by Republicans that Mr Trump won by fewer than 12 points. Given Democrats already have a majority of 36, a repeat of the outcome in NC-9 would give them the biggest majority held by either party in the House since the early 1990s. For their part, the state's Republicans are not exactly behaving like a party that knows it commands the support of a majority of North Carolinians. The day after the election they pushed through an important budget vote in the state legislature—while most of the Democratic members were at a ceremony to mark the terrorist attacks of September 11th 2001. ■

Highbrow organising

Beleaguered unions seek members beyond the factory floor

But how terrifying is a striking graduate staffer?

Print | United States Sep 12th 2019

JUDGING BY RECENT headlines, America's unions appear stuck in time. Consider one of the biggest, the United Auto Workers (UAW). Its 400,000-odd members include nearly 150,000 who work at Detroit's "big three" carmakers—GM, Ford and Fiat Chrysler. The UAW's boss, Gary Jones, was busy this week hammering out a four-year labour contract for them, starting at GM, before the current one expires on September 15th. If not, strikes loom.

Yet he is likely to feel distracted. Mr Jones has endured intense scrutiny since federal investigators in late August raided his home, those of former bosses and a union resort in Michigan. The feds have been busy exposing bribery at the UAW in a case that has rumbled on for years. So far nine union leaders have been charged and eight convicted for taking dodgy payments and gifts, including pairs of $1,000 shoes.

Mr Jones has not been charged, but fellow bosses' graft casts a poor light. If members lose trust in him, they might strike rather than take whatever deal he extracts from carmakers. That reputational hit could weaken union efforts elsewhere. The UAW and others long dreamed of organising workers at southern, foreign-owned "transplants" whose car factories are likelier than Detroit's to grow. Scandal makes it harder to imagine winning them over. At the same time, overall union membership has been declining. Just 6% of private-sector employees are in unions, from a peak of 35% in 1954. Last year the Supreme Court reduced unions' ability to take levies from public-sector workers.

Beyond recent headlines, however, the likes of the UAW have some reasons to cheer. As unions have weakened the public's sympathy for them has grown. A Gallup poll on August 28th suggested 64% of Americans approve of unions, close to a 50-year high (see chart). Similarly a Pew study last year said 51% see less unionisation as "mostly bad" for working people.

This uptick probably has many causes. For one, workers are in a jauntier mood thanks to a tightening labour market, with rising wages, in the past few years. Harry Katz of Cornell University suggests unions are also helped by their "remarkable success" in promoting higher minimum wages in many states.

Politics may be shifting attitudes, too. Donald Trump won votes of 43% of union households in 2016, a historically high share that was only slightly behind Hillary Clinton's 51%, poor for a Democrat. This year Democratic candidates—not just the leftiest ones—are falling over each other to praise unions and labour rights such as paid parental leave, sick days and holidays.

Among the public, youngsters look the most supportive, points out Steven Greenhouse, author of a book that traces unions' changing fortunes. An earlier poll shows 65% of 18- to 34-year-olds approve of unions. He argues the young are spurred on by worries over income inequality and burdens of student debt. Mr Katz sees other drivers, such as the rise of informal "affinity groups", when workers organise over a particular issue rather than pay bargaining. For example last November 20,000 Google staff walked out to protest against the way bosses handled charges of sexual harassment. Such groups, Mr Katz thinks, might stir interest in unions proper.

Industrial unions have also spent the past few decades hunting for professional members. Overall white-collar unionisation slid to 9.5% last year, down from 11% a decade before. But the decline has been less rapid than for blue-collar workers.

The UAW counts 109,000 white-collar members among its ranks. Staff at the Brooklyn Academy of Music belong to a UAW local, as do casino workers and civil servants in Michigan. Technical workers at the Guggenheim museum in Manhattan enrolled in a union this summer, the first time they have unionised. More journalists appear to be joining unions—the NewsGuild, representing print and digital workers, says it has 25,000 members in North America, a slight increase over the past few years. The United Steel Workers is trying to unionise tech staff, including the Pittsburgh branch of HCL, an Indian firm that supplies contractors to Google.

Bigger unions see potential in higher education. The UAW boasts of 50,000 academic members, mostly junior staff who may face precarious working conditions. Dan Parsons, president of a 6,000-strong UAW affiliate at the University of Washington, traces a "pretty rapid increase" in recent membership. His union recently signed up 900 post-doctoral staff.

Todd Wolfson, president of a union of 8,000 at Rutgers, says in the past year he has seen "more interest than for a decade" as adjuncts and graduate workers enrolled. Junior instructors feel exploited when asked to work 60-hour weeks for paltry pay, he says. As universities hire fewer tenured staff, they depend on such non-faculty, so "we are all just widgets, that's why people are so attracted to unions."

If the UAW and others sign up more white-collar workers while losing blue ones, will the clout of the unions change? Not for a while. Mr Katz points out that academic unions remain fragmented across the country. And as Marick Masters at Wayne State University notes, service workers have less bargaining power than carmakers who can threaten—as in Detroit this month—to close massive factories. Strikes by casino staff or graduate lecturers might not make the same impression. ■

Categorical shift

New rules in California could reshape the gig economy

Firms such as Uber and Lyft may have to treat contractors as employees

Print | United States Sep 12th 2019

IN A JOLT to California's gig economy, the state's lawmakers approved on September 11th a landmark bill, AB5, that will force many firms to classify independent contractors as employees. California's governor, Gavin Newsom, a Democrat, had pushed hard for the change. As he argued in a Labour Day op-ed in the *Sacramento Bee*, firms must no longer be allowed to "shirk responsibility" and should cough up for things like medical benefits, unemployment insurance and paid sick days. The bill's sponsor, Democratic assemblywoman Lorena Gonzalez, has argued it will help workers, "not Wall Street and their get-rich-quick IPOs".

Whether that is true or not is fiercely debated. Firms that rely heavily on contract workers argue that a requirement to treat them as employees will put many out of work. The bill's authors seemingly admitted as much, inserting dozens of exemptions for workers including accountants, architects, dentists, doctors, engineers and estate agents. Missing from the exemptions are drivers for ride-sharing firms like Uber and Lyft—since, the bill's authors argue, the ride-sharing platforms impose rules on their drivers which mean that they are not truly self-employed.

Only "a small fraction" of Lyft's roughly 325,000 drivers in California will keep working if the law takes effect as expected on January 1st, says Adrian Durbin, head of policy communications for the San Francisco-based firm. Some experts reckon ride fares could rise by as much as 30%. Demand for trips could therefore slip. Beyond that, Lyft drivers will lose the ability to work, or not work, whenever they want, Mr Durbin notes.

Unions such as Teamsters pressed hard for the legislation, which promises to make recruiting members easier. One big backer of the bill, the Service Employees International Union, reckons other states will follow suit. A day before the bill passed, New York's governor, Andrew Cuomo, a Democrat, lauded California's push and said it got his "competitive juices flowing". Democrats running for president who have endorsed California's bill include front-runners such as Kamala Harris, Bernie Sanders and Elizabeth Warren.

Lyft and Uber have lost roughly a third of their stockmarket values since July but both are gearing up for battle. The firms now hope to strike an alternative deal with unions and lawmakers by offering drivers certain benefits including reimbursement for some expenses and guaranteed earnings that exceed the minimum wage. Should that fail, Uber, for its part, reckons it may still manage to keep its drivers as contractors. In a conference call following the bill's passage, Uber's top lawyer, Tony West, said the idea is to argue in court that its main business is being a technology platform. That distinction could waive the requirement to treat drivers as employees.

A final option, both firms say, is to gather petition signatures to kick-start a ballot initiative that would sidestep California's lawmakers. Last month Lyft and Uber each put $30m into a joint campaign fund for that effort. "If we need to, we'll take it to the voters," says Lyft's Mr Durbin. Uber has already begun to hire a campaign team. ■

Vaped and confused

A deadly outbreak casts a dark cloud over e-cigarettes

Researchers are trying to understand the effects of illicit black-market cartridges

Print | United States Sep 14th 2019

WITH SIX PEOPLE dead and more than 450 suffering from serious pulmonary disease across America, doctors and federal officials are trying to identify the cause of a mystery illness tied to e-cigarettes. Although the dead have largely been older, the wider outbreak is unusual in hitting young and otherwise healthy people. A recent study of 53 cases in Illinois and Wisconsin found the median age was just 19.

Much of the investigatory work is focused on agents that may have been added to illicit black-market cartridges containing cannabis extracts. On September 9th health officials in New York issued subpoenas to firms selling thickening agents, such as vitamin E, used in black-market vaping products. Then on September 11th the Trump administration announced plans to ban flavoured vaping products.

Although the Centres for Disease Control (CDC) has recommended that people should stop vaping until the source of the outbreak is identified, the Food and Drug Administration (FDA) has issued different advice. The FDA—now conducting product testing to work out the source of the problem—has advised consumers to avoid buying vaping products on the street and to stop vaping with products containing cannabis. This warning includes products bought legally in states that allow cannabis to be sold.

Many of the patients have similar symptoms. Daniel Fox, a pulmonologist with WakeMed, a health-care system in North Carolina, says a small cluster of cases in his state had symptoms such as shortness of breath, nausea, vomiting and fever. All had consumed cannabis by vaping. Dr Fox says the diagnosis was lipoid pneumonia, a rare non-infectious condition that occurs when oils or lipid-containing substances enter the lungs. The finding that immune cells in the lungs have oil inside them also indicates that oil is causing the injuries.

The current outbreak is acute and seems to be a reaction to something toxic found mostly in illicit products. But the news could not come at a worse time for vaping firms. They are under pressure for marketing e-cigarettes to children, enticing them with fruit flavours. The National Youth Tobacco Survey found that e-cigarette use among high-school pupils increased by 78% between 2017 and 2018, from 11.7% to 20.8%. Among American teenagers, e-cigarettes are now the most commonly used tobacco product. Bloomberg Philanthropies said this week that it would spend $160m to discourage their use by the young. The non-profit organisation will back the end to flavoured e-cigarettes.

The FDA is on the warpath, too. On September 9th it sent a warning letter to Juul Labs, an e-cigarette firm in San Francisco, about its marketing. The FDA wants companies to show evidence that vaping is less harmful than smoking cigarettes before claiming as much—a message the agency says Juul has given to students. Gregory Conley, president of the American Vaping Association, a non-profit group, called the letter a "colossal" waste of resources aimed at appeasing congressional Democrats.

Although public concern over marketing and sales to children is understandable, vaping by adults trying to quit or reduce smoking needs to be put in perspective. E-cigarettes have been on the market around the world for over a decade and are used annually by about 11m adults in America. Legal, regulated vapes typically use a water-soluble solvent, as putting oil in the lungs is known to be dangerous. While e-cigarettes are not harmless, evidence from trials suggests that vaping causes no serious short-term harm, though in the long term it may. Public-health experts are also keen to point out that vaping is less harmful than smoking, contrary to the FDA's scepticism.

Peter Hajek, an expert on tobacco dependence at Queen Mary University of London, says the scare is being used to deter cigarette smokers from switching to less risky vapes. Overall, 450,000 smokers die each year in America. Dr Hajek said the current outbreak of serious lung disease is more like the methanol poisoning that occurs when contaminated alcohol is sold. These are unusual, but can be deadly. Despite the evidence, in the unfolding panic, facts are the first thing to go up in smoke. ■

Friends with benefits

Facebook has unleashed a new dating service

It could return dating to its pre-internet ways

Print | United States Sep 12th 2019

IN AMERICA it is no longer merely acceptable to meet your romantic partner on the internet. It is the norm. The latest data from a long-running survey by researchers at Stanford, released this summer, shows that 40% of new heterosexual couples met online in 2017, far more than at bars, through friends or at work. For gay couples the proportion is even higher, at 60%.

Little wonder, then, that Facebook is bringing a dating service to the richest denizens of its internet fief. Facebook Dating launched in America on September 5th, having been tested first in smaller markets such as Colombia and Canada. American Facebook users seeking significant others can now find the dating service in a dedicated tab within the firm's smartphone app. Willing daters must explicitly create a profile and fill in their preferences. Users may, if they wish, tap into their social graph to look for matches among friends of friends, but that option is not on by default. Facebook says any data generated while searching will be kept separate from its main service and not used to target ads.

Facebook Dating has the potential to break one of the most interesting features of internet dating. Most dating apps pair up strangers, rather than friends of friends. For instance Tinder, the most popular dating app, pairs people up by allowing them to choose from a menu of potential partners within a set radius of where they are. OKCupid, a more old-school text-based approach, asks users to read through a profile. Real-life pairings are usually circumscribed by a person's social sphere, and the chances of meeting a total stranger are low. But online most people are paired with strangers. Some sociology research suggests that this means that online dating has the potential to create couples from more diverse backgrounds than would tend to form in real life, possibly helping to reduce income inequality over time.

Facebook's effort will also make it possible to match anonymously, but trawling through friends of friends is likely to prove more alluring. Thus Facebook is remaking the old world that was governed by social ties, probably reducing any benefits that may have come with less assortative coupling through online dating.

These are inauspicious times for Mark Zuckerberg's company to roll out a dating service. The firm is under antitrust investigation from attorneys-general in eight American states and the District of Columbia. The firm's record on handling user data is poor. Adding dating information to the mix—which includes sexual orientation and, perhaps, HIV status—seems bold at best, misguided at worst.

Still, recent history suggests Facebook Dating will be a success. The firm has more tools at its disposal to help its amorous users find a good match than any other dating service, thanks to its huge user base and its trove of their data. Although user growth on Facebook itself is slowing, users seem generally unfazed by the firm's numerous missteps. Its other services, including WhatsApp and Instagram, are still growing strongly. If that success is anything to go by, it suggests that future versions of the Stanford survey may do well to break out a new category of coupling: Facebook. ■

I.M.probable

A small Indiana town boosts its big architectural legacy

Columbus is a surprising mecca of Modernist design

Print | United States Sep 12th 2019

YEARS BEFORE I.M.Pei designed the Louvre Pyramid in Paris or the Bank of China Tower in Hong Kong, he planned a squat yet elegant library in a midwestern city of 50,000 people. In Columbus, Indiana, Pei's Modernist Cleo Rogers Memorial Library sits across 5th Street from Eliel Saarinen's First Christian Church. The imposing glass-fronted structure is only the second-most attractive of Saarinen's churches in Columbus. North Christian Church, with its slender spire and vaulted concrete interior, takes pride of place. Across town, the white bricks of Robert Venturi's Fire Station 4 recline in a sly number four.

Some argue that America's best city for architecture is Chicago. Others favour Miami's Art Deco legacy, the dilapidated elegance of New Orleans or the jumbled cosiness of San Francisco. But to see the greatest collection of Modernist masterpieces in the smallest space, fly to Indianapolis and drive south-east for about an hour to Columbus, the Hoosier State's 21st-largest city and birthplace of America's vice-president, Mike Pence.

It was also home to Joseph Irwin Miller, a native son who built the Cummins Engine Company into an industrial powerhouse. In the middle of the last century, he began commissioning rising young architects to design the city's public buildings in the hope of attracting young engineers to southern Indiana.

The town boosts its legacy in Exhibit Columbus, an annual festival that alternates between a symposium and installations across town. This year's 18 installations include a garden between Pei's library and Saarinen's church, and a glass and carbon-fibre tower outside the other Saarinen church.

But Columbus also showcases its legacy in the care paid to design in its elegant downtown. Across from a school designed by Gunnar Birkerts sits a Lutheran church. Parishioners liked his work so much they hired him to build an addition. The University of Indiana recently opened an architecture school in an old newspaper building; two professors designed a set of lattice panels leading to the front door. Miller did not just give his home town some important buildings. He gave it an identity.

Lexington

A full-court press

The prospect of another Trump election causes an unwarranted panic among political journalists

Print | United States Sep 12th 2019

NOTWITHSTANDING THE help he got from fake news reports, Donald Trump probably owes his presidency more to the traditional kind. Only a small minority of voters absorbed made-up accounts of Hillary Clinton's endorsement by Islamic State, lesbianism and links to a child-sex ring. Yet most were subject, indirectly or directly, to an incessant drumbeat of negative reporting by mainstream outlets such as the *New York Times*, *Washington Post* and network news channels on the Democratic candidate's wooden public speaking and the largely confected scandals she was said to be embroiled in.

In a multi-part study of the media's role in the election, Thomas Patterson of Harvard's Kennedy School of Government found that Mrs Clinton's use of a private email account at the State Department, among lesser supposed scandals, received four times as much coverage as Mr Trump's alleged record of harassing women. That unrelenting focus opened the gates for Mr Trump's wilder attacks on his opponent. It also helped persuade many voters, who had initially balked at the Republican's character, that the two candidates were comparably flawed. "If everything and everyone is portrayed negatively, there's a levelling effect that opens the door to charlatans," wrote Mr Patterson.

Could history be about to repeat itself? Hostile coverage of Joe Biden's presidential campaign suggests it might. The septuagenarian former vice-president is increasingly coming across in the same mainstream outlets as outdated, forgetful and sloppy with the truth. The question of his relative fitness for Mr Trump's office, by contrast, has rarely surfaced. Last month an inaccurate account Mr Biden gave of a conversation with a war hero—in which he conflated exchanges with two different medal-winners, mashing up their heroism—made the *Washington Post*'s front page. Meanwhile the paper consigned to page ten the president's use of a crudely doctored government map to try to justify his false and apparently politically motivated insistence that Alabama lay in the path of a hurricane. Such coverage will exacerbate an existing argument among left-leaning journalists and academics over whether America's mainstream journalistic traditions, which strive for non-partisanship and balance, can handle such an unconventional figure as Mr Trump.

It was evident in the leaked transcript of a meeting of the *New York Times* newsroom last month, in which the paper's executive editor, Dean Baquet, fielded criticism from reporters who wanted to call the president a "racist" more unambiguously and often. Mr Baquet pushed back because—as a native of the segregated South—he said the word lost its power with frequent use. In a subsequent interview he suggested that preserving the *Times*'s hard-pressed reputation for non-partisanship was another concern. "We don't want to change all our structures and rules so much that we can't put them back together—we don't want to be oppositional to Donald Trump."

Yet that is what many left-wing commentators, and perhaps a good few in Mr Baquet's newsroom, want. Some consider the risk of becoming aligned with the Democratic Party worth running in an effort to give the most accurate measure of Mr Trump's failings. Others just want to be aligned with it, either out of political conviction or, as Nathan Robinson of *Current Affairs* magazine has argued, because they also believe the increasing strain apparent in the mainstream outlets' claim to be non-partisan is undermining public trust in them. Only by being more upfront about their leanings, as the Republican Party moves to the right and their newsrooms to the left, it is argued, can such outlets hope to restore it.

Without wishing to minimise the challenges of covering American politics—with which this newspaper also grapples, not always successfully—these arguments should be dismissed as the attempted left-wing power-grab they are. The media has much less potential to give Mr Trump an unwarranted advantage over his opponent next year than it had in 2016. The election is likely to be a referendum on his presidency, not a face-off between two novel candidates, and most voters have already made up their minds on that. This is not ground for emergency media measures.

Americans' calamitous loss of trust is also fuelled by the extreme partisanship that has made their politics and related institutions so dysfunctional. The fact that a dwindling number of mainstream outlets have retained readers and viewers from both sides of the divide makes them, despite their imperfections, the closest thing to a neutral arbiter going. This was underlined by a study suggesting Mr Trump performed best in 2016 in areas with the lowest levels of subscription to newspapers, whether of the centre-left or centre-right. A more partisan media environment is the last thing America needs. Those who doubt that should consider that it would be squarely in Mr Trump's interest. The president's attempt to gin up his supporters by depicting the media as biased is one of his most powerful lines. Why vindicate it for him?

Plumbing the mainstream

Retrofitting American political journalism to defend it against populists—to which, mind, the left has historically been as susceptible as the right—calls for more modest change. It should start with an acknowledgment that the country's style of election coverage can seem frivolous—especially compared to the rigour of its reporting on government. The characteristic features, including an obsessive focus on the candidate's personality and details of the campaign—especially glitches—are as entertaining as any soap-opera, but rarely useful in appraising the relative merits of a politician's qualities for public office. This is a lesson with broad application. Mr Trump's relentless attacks on America's institutions have, by and large, done damage only where he has hit on some pre-existing weakness. For those who would defend them, steely self-criticism may be more effective than outrage. ■

Venezuela's exodus
Darkness falls

Darkness falls

Millions of refugees from Venezuela are straining neighbours' hospitality

Latin America's biggest-ever exodus continues

Print | The Americas Sep 12th 2019

KATALINA, A 20-YEAR-OLD nursing student from Barquisimeto in north-western Venezuela, fled last year as living conditions became intolerable. She spent 11 months in Peru, but her hosts were hostile towards Venezuelan migrants, especially women, and she found little work. So in June she moved to Chile, arriving just as its government tightened rules for Venezuelans entering the country and began expelling those without the right papers. She sneaked across the border at night, dreading that she would step on a landmine planted by Chile in the desert in the 1970s. Now she is staying with a friend in Santiago, Chile's capital, waiting for permission to remain. "All I want is for my situation to be regularised," she says.

Katalina's obstacle-strewn odyssey is becoming the norm for Venezuelans joining the 4m who have fled since 2014. Perhaps half a million more have not been counted because they sneaked across borders. On August 26th Ecuador became the latest country to tighten entry requirements, joining Peru and Chile in obliging most Venezuelans to present a passport and evidence of a clean criminal record, which are difficult to obtain. Brazil and Colombia have so far kept their borders open.

Barriers will not stop Venezuelans from fleeing chaos and repression at home. The exodus could exceed 8m, a quarter of the population, by the end of 2020 unless democracy and stability return, predicts the Brookings Institution in Washington (see Bello). Even then, not everyone will go back; those who do will take time. "We are looking at a complex set of needs for the next two years, even if there is a political solution today," says Eduardo Stein, the representative for Venezuelan migrants of the UN's refugee agency and the International Organisation for Migration.

Until now, the largest displacement of people in Latin America's history has occurred without much international fuss. In part that is because it has taken place mostly by land, unprompted by war or natural disaster. Four-fifths of migrants have stayed within the region (see map). The good grace with which most neighbouring countries have received them up to now has allowed others to ignore the crisis. Outside donors have given just $100 for each Venezuelan migrant, compared with $5,000 for each of the 5.6m refugees from Syria.

But as Venezuela's crisis has dragged on, destination countries are withdrawing their initial warm welcome. Recent refugees are poorer than those in earlier waves. They are arriving in countries where economic growth is slow, good jobs are scarce and budgets for health and education are stretched. Early promises to co-operate in dealing with the flow of migrants are being broken. Door-slamming adds to the number of unlawful migrants, who are vulnerable to exploitation by employers and recruitment by criminal groups.

It increases the burden on Colombia, which remains the most open of the destination countries. That is partly because it cannot police its 2,200km (1,400-mile) border with Venezuela. The influx adds to disorder on a frontier already plagued by Venezuelan-backed guerrilla groups. Now Colombia must cope with a build-up on its southern border of refugees who had hoped to enter Peru and Ecuador. Although Venezuelans are likely to boost economic growth in their new countries, few governments appreciate the opportunity.

Destination countries have largely avoided setting up camps, wisely preferring to integrate Venezuelans into their societies. Brazil is relocating migrants from the border state of Roraima to cities farther south. Venezuelans do all kinds of work. Three-fifths of people who took Chile's medical exam in July were Venezuelan doctors seeking recertification. In Colombia Venezuelans ease labour shortages in the flower and coffee industries.

More visible are those who appear at street corners to sell sweets or beg. Unskilled workers swell the informal labour force, in countries where a huge proportion of jobs are informal. Many women in Trinidad find work in bars and clubs, sometimes a gateway to prostitution. In Boa Vista, Roraima's capital, the population of 400,000 now includes more than 50,000 Venezuelans. "We lost control of the city," says its mayor, Teresa Surita. Homelessness in towns on Colombia's border with Venezuela has shot up.

Though they are letting in fewer Venezuelans, governments are trying to provide services to those who have already arrived. That is a struggle. Hospitals in Roraima have staff shortages, in part because Cuba recalled its doctors in the face of hostility from the country's right-wing president, Jair Bolsonaro. Colombia's government estimates that the cost of providing health care, schooling and other services to Venezuelans will be 0.5% of GDP this year, about a fifth of its expected budget deficit. Ecuador, whose highly indebted government has had to go to the IMF for financial help, will spend $170m a year on health and education for holders of an "exceptional humanitarian visa" and Venezuelans who arrived before the visa rule took effect.

“People used to feel sorry for [Venezuelans], but now there’s fear of crime,” says Amparo Goyes, a resident of Tumbaco, a suburb of Quito, Ecuador’s capital. In January the stabbing of a pregnant Ecuadorean woman by her Venezuelan ex-boyfriend triggered attacks on migrants in the northern city of Ibarra and contributed to the decision to tighten entry requirements. A survey by Peru’s government found that 86% of Peruvians expect to be the victim of a crime in the coming year.

Such strains are hardening attitudes. A Gallup poll published in June showed that support among Colombians for accepting refugees fell below 50% for the first time. Venezuelans’ “negative image” rose to 67%, its highest-ever level. A survey of Chileans by CADEM, a pollster, published in July found that 73% approved of the government’s crackdown and 83% backed restrictions on immigration. In Trinidad opposition politicians have called for tighter controls on Venezuelans.

Colombia does not have that option. It has been an exemplar, issuing permits that allow 700,000 Venezuelans to work and receive public services for at least two years. It plans to issue a permit for migrants without the right papers, allowing them to stay if they find an employer. In March most parties with members in congress signed a pact promising not to stir resentment against Venezuelans in campaigns for regional elections due next month.

But its neighbours’ new barriers are making Colombia nervous. A senior official says co-operation among destination countries started well, but in the past four months it has moved backwards. Colombia recently asked its neighbours to open a “border-to-border humanitarian corridor”. Ecuador agreed to let through migrants with visas for other countries. The UN has urged all countries in the region to give Venezuelans the rights of refugees, on the presumption that staying at home puts them at risk.

The one thing receiving countries all agree on is that they need more outside help. The UN has collected less than a third of the $738m it sought in 2018, mostly from the United States. At the UN General Assembly this month, Colombia’s president, Iván Duque, will lead a regional appeal for more. “Unfortunately, the world has not seen this as a global crisis,” says David Smolansky, an exiled Venezuelan mayor who leads the migrant working group of the Organisation of American States. If Latin America is to continue coping as well as it has, that must change. ■

Double happiness

What a new Chinese restaurant in Havana says about Cuba

Autocracy does not beat bureaucracy

Print | The Americas Sep 14th 2019

A PHOTO OF Fidel Castro, the late Cuban dictator, shaking hands with Xi Jinping, China's living one, hangs in the entrance to the newly opened "Beijing" restaurant in Havana. Around it are snapshots of Chinese and Cuban bigwigs past and present. One from 1961 shows a smiling Mao Zedong and Osvaldo Dorticós Torrado, then Cuba's president, on a balcony. On a flight in 2014 from Havana to Santiago de Cuba, the birthplace of Cuba's revolution, Mr Xi promised Raúl Castro, then its president, a fine Chinese restaurant. That visit, too, is memorialised in the vestibule.

It took five years, and millions of dollars in rent and renovation, before the Beijing was ready to serve its first *dandan* noodles. It opened in August at last, two years later than planned. Even when the Chinese and Cuban autocrats bless the enterprise, doing business in Cuba is hard.

The restaurant, which was the first firm in Cuba to be wholly owned by a foreign one (state-owned Beijing Enterprises Group, or BEG), has long mystified *habaneros*. They watched as Chinese builders refurbished the structure, which was built in the 1930s. Fussy building inspectors and slow clearance of equipment and ingredients through customs held up its opening.

Now Chinese executives, ferried to the portico in German cars, enter through circular front doors painted with a huge red *shuang xi*, which means double happiness. The phrase is often emblazoned on cash-stuffed red envelopes given as wedding presents. Small fans display table numbers. (There is no table four, an inauspicious number in China.) Cuban waitresses dressed in red *qipao*—high-necked dresses—take orders on tablets made by Huawei, a controversial Chinese maker of telecoms kit.

Cuban complications intrude. Unlike eateries in China, where diners can pay by reading a barcode on the table with their mobile phones, the Beijing accepts only cash. It aims for authenticity, but must buy most ingredients through Cimex, the state-run export-import company. Ducks for Peking duck come from Canada. Their skin is thicker than that of Chinese ducks, and so does not become as crispy, explains Li Sha, who helps run the restaurant. The sweet-and-sour fish is Cuban *pargo* (red snapper), not mandarin fish. Though tasty, it is a clumpier meat that resembles fried cauliflower. Egg and tomato stir fry is off the menu because the chefs cannot buy enough eggs and tomatoes. Although BEG owns Yanjing, a Chinese brand of beer, do not assume you can order it to wash down your spicy cumin lamb. Crates of it await clearance through the ports.

Despite gastronomic glitches, BEG plans investments in Cuban hotels, condominiums and a golf course. The Trump administration's hostility towards Cuba and economic chaos in Venezuela, Cuba's main foreign backer, are strengthening its relationship with China. The country is Cuba's largest creditor. A fleet of Chinese-made trains—the first Cuba has bought in 45 years—arrived in May. A $150m loan from China helped pay for them. Most of the vehicles joining elderly classic American cars on Cuba's roads are made by Geely, Yutong and other Chinese brands. The machinery that is gradually replacing cow-drawn ploughs, still the usual method of tilling Cuban fields, is made in China. Huawei routers provide the outdoor hotspots that make it possible for Cubans to go online.

So far, China has profited little from its friendliness. From 2000 to 2018 it forgave $6bn of Cuban debt, about 60% of the total foreign debt that it wrote off during that period, according to Development Reimagined, a consultancy, and the student-run Oxford China Africa Consultancy. The two communist states may be in for a period of double disappointment. ■

Bello

Negotiating a way out of Venezuela's morass

An agreement that allows chavismo to survive is the only option

Print | The Americas Sep 12th 2019

GIVEN THAT their home country was built on oil, it is appropriate that the social hub of Venezuelan exiles in Miami should be a diner at a petrol station. El Arepazo is in Doral, a suburb near Miami's international airport with a golf resort belonging to President Donald Trump. It is a shrine to a Venezuela lost. It is wallpapered with blown-up black-and-white photos of Caracas in the 1950s and 1960s. Along with strong coffee it sells *arepas*, the cornmeal griddle-cakes that are a Venezuelan staple.

Morale among the clientele is sagging. "Trump is deserting us," says Pedro Pereira, who abandoned his dairy farm near Lake Maracaibo in 2017 because of threats, extortion and chronic shortages of electricity and animal medicines. He was full of hope in January this year when Juan Guaidó, the head of the national assembly, proclaimed himself interim president and was recognised by 55 countries who shared his view that Nicolás Maduro's second term as Venezuela's ruler is illegitimate. "But everything was just words," fumes Mr Pereira. Like many exiles, he favours an American invasion, citing the one that dislodged Manuel Noriega, a Panamanian strongman, in 1989 at the cost of about 300 civilian dead.

But Venezuela is far bigger than Panama, its regime is better armed and it has Cuba and Russia as allies. Despite much bluster from American officials earlier this year ("all options are on the table"), there is no sign that Mr Trump, a war-averse president, has any intention of invading. Instead, to restore democracy in Venezuela his administration trusts in sanctions, ramped up to target Mr Maduro's oil exports and finances as well as 118 regime officials. The confident expectation in the National Security Council (NSC) in Washington was that they would quickly cause the army to turn on its boss.

It hasn't happened. And on September 10th the NSC's hawkish chief, John Bolton, was sacked. But the economic squeeze did prompt Mr Maduro, who rules as a repressive dictator, to start seemingly serious talks with the opposition under the auspices of Norway's government. In late July, according to several sources, the government delegates agreed to an early presidential election next year. On August 5th the United States slapped on additional sanctions without consulting the opposition. The Venezuelan government said it was "suspending" the talks.

This does not mean they are dead, though some in the Trump administration have never believed in them. Elliott Abrams, the State Department's special representative for Venezuela, says: "We're not trying to torpedo the talks. We think our policies have made the talks possible." His position in the administration has been strengthened by the failure of the NSC to oust Mr Maduro, and by Mr Bolton's firing. But several obstacles remain.

Top of the list is the position of Mr Maduro in a transition. "There's no way to hold a free election with him in power," says Mr Abrams, adding that Mr Maduro could be a candidate. Hardliners on both sides might reject whatever negotiators agree to. Then there are Mr Maduro's allies. Russia has reportedly sent security specialists to Venezuela. The Trump administration has given Cuba no incentive to help dislodge Mr Maduro, having stepped up sanctions against the communist island in what looks like a bid to secure the Cuban-American vote in Florida.

Critics of American policy point out that sanctions have never toppled determined dictators. Although the humanitarian crisis in Venezuela is of Mr Maduro's making, the longer sanctions last the more they will add to it. But what is the alternative? Even if a military coup were possible, "we know that a negotiated solution is more likely to produce a stable democracy," says Mr Abrams. He is frustrated that the European Union has not widened sanctions on individuals in order to make agreement easier.

Mr Maduro's people are likely to agree to a transition only if they have credible guarantees that they will not be jailed or expelled from politics. Rather than an amnesty, that means a national-unity government in which they have sufficient power to protect themselves, argues an experienced former American diplomat. "All negotiated transitions have involved guarantees for the losers."

Without such an agreement, El Arepazo's customers may be in for a long wait. Beside the café, groups of men sit at tables under an awning playing dominoes. The scene could be that on Miami's Calle Ocho, where the Cuban exiles' domino games have lasted 60 years.

Afghanistan
No retreat

No retreat

America calls off negotiations to end its 18-year war in Afghanistan

But the American-backed government is still in peril

Print | Asia Sep 12th 2019

IN THREE TWEETS (how else?) President Donald Trump upended more than a year of painstaking American negotiation with the insurgents of the Taliban, who have been fighting to overthrow the American-backed government in Afghanistan for 18 years. First Mr Trump revealed that Taliban leaders had been due to meet him at Camp David, the presidential country retreat. Then, he explained, he had learned about a Taliban suicide-bombing in Kabul on September 5th that had killed an American soldier along with 11 others.

"I immediately cancelled the meeting and called off peace negotiations," Mr Trump declared on September 7th. He continued: "If they cannot agree to a ceasefire during these very important peace talks, and would even kill 12 innocent people, then they probably don't have the power to negotiate a meaningful agreement anyway." Two days later he repeated his decision, saying that the talks were "dead".

Mr Trump's change of heart came less than a week after his negotiator, Zalmay Khalilzad, had announced that a deal had been reached in principle to begin winding up America's longest war. Mr Khalilzad said the accord with the Taliban would see 5,400 of America's 14,000 troops leave in the next four-and-a-half months. A fuller withdrawal was expected over the next year or more.

Yet Mr Khalilzad was vague about what the Taliban would give in return. The details have not been published, but there seems to have been a pledge not to harbour foreign militants such as al-Qaeda. No ceasefire was promised. Instead, there was talk of reducing violence around American bases. Afghan forces, which already bear the brunt of the conflict, do not seem to have been offered any reprieve.

Opinion against Mr Khalilzad's deal hardened as indiscriminate bombings in Kabul killed dozens of civilians. Nine former American envoys to Afghanistan warned that a hasty withdrawal would only intensify the civil war. The Afghan government, led by Ashraf Ghani, expressed grave misgivings.

Was it cold feet about the deal that caused Mr Trump's reversal? Or was it an attempt to wheedle more concessions out of the Taliban? If the latter, it may backfire. The Taliban have never trusted American promises. They say they remain committed to talks, but this volte-face will only deepen their mistrust. Meanwhile Mr Ghani, sidelined until now, is no doubt relieved. The Taliban had wanted him to call off presidential elections at the end of the month, which he is hoping to win. He used his strengthened hand to call for direct talks with the Taliban, something the insurgents have steadfastly refused—although the now-scrapped deal did involve a woolly national dialogue in which both the Taliban and the government would have taken part.

The Taliban and America have said they will now redouble military operations. Heavy fighting is expected. Mike Pompeo, America's secretary of state, crowed earlier this week that 1,000 Taliban fighters had been killed in the past ten days alone. Despite his bravado, however, the military realities have not changed. The Taliban are slowly gaining ground and control much of the countryside, but, thanks to American backing, and especially air support, the Afghan army retains control of all the cities. A "political settlement" remains the only way to end the conflict, as General Austin Miller, the commander of American forces in Afghanistan, recently affirmed.

In his tweets Mr Trump asked of the Taliban, "How many more decades are they willing to fight?" The answer is probably longer than Mr Trump. This suggests that, sooner or later, the talks will resume. ■

Going for pot

Japanese law and social mores still treat users of soft drugs severely

Woe betide any celebrity caught with a spliff

Print | Asia Sep 12th 2019

UNTIL HIS dramatic *mea culpa* in June, Junnosuke Taguchi was just another pop star-turned-minor actor. Dressed in funereal black, Mr Taguchi (pictured) prostrated himself in contrition before a scrum of reporters after his release on bail for drugs charges. A police raid on his apartment in Tokyo had uncovered rolling papers, a seed-grinder and 2.2 grams of marijuana (enough to roll a couple of joints).

While other countries legalise marijuana or instruct the police to turn a blind eye to casual use, Japan maintains strict prohibition. Possession is punishable by up to five years in prison—seven if the intent is to profit from distribution. Teams of detectives are dispatched to raid the homes of pot-smokers in remote rural areas. Every summer police comb the cooler northern countryside for wild cannabis, methodically pulling up millions of plants and incinerating them in bonfires.

Strict enforcement of the Cannabis Control Act leaves most young people with little exposure to the sort of drug-taking that is commonplace elsewhere, says an official with the justice ministry, and so narrows the "gateway" to harder substances. Hard drugs are indeed vanishingly rare: police reported only 14 heroin-related crimes last year. But the anti-cannabis regime is not purely punitive. Nearly half of offences go unprosecuted, and even those that are often end in suspended sentences. The emphasis, at least for young, first-time offenders, is on rehabilitation.

Worse than the official penalties, in most cases, is the stigma that comes from getting caught with drugs of any kind. Mr Taguchi's career will be lucky to survive. Pierre Taki, an actor and musician, has disappeared from public view since his conviction in June for taking cocaine. NHK, the country's largest broadcaster, scrubbed his scenes from a TV series, including some that had already aired. Mr Taki's father felt obliged to offer a public apology for the misconduct of his son, who is 52.

Japan's relative social cohesion helps to curb its appetite for drugs, says Yuko Kawanishi, a sociologist of mental health. But social norms are not entirely consistent, she argues. In the absence of alternatives, many Japanese self-medicate with booze, she points out: "A lot of drinking considered normal in Japan would be labelled alcoholic elsewhere." To the extent that any drug is common, it is methamphetamines, often taken to help users with punishing work schedules. An official was recently dismissed from the education ministry after being caught using stimulants, traces of which were found at his office.

Once addicted, many people stay that way because there is little help for abusers, says Yasuhiro Maruyama of Rissho University. Few in Japan see much distinction between soft and hard drugs, he says. To most, "cannabis means all illegal drugs."

Mr Maruyama is one of many who wonder whether Japan can keep the world at bay. The taboo on pot appears to be easing among the young. Last year over 3,500 people were arrested on cannabis-related charges—a record, but still far below the levels that prevail in other rich countries. With Tokyo bracing for the arrival of millions of tourists for the Olympic Games next year, the organisers have warned them to leave their stashes at home.The line on cannabis may be softening elsewhere, says the justice ministry official, but such talk has no place in Japan. ■

Lunacy

India's government is pouring money into dung

When it comes to government funding, cows have jumped over the moon

Print | Asia Sep 12th 2019

ON SEPTEMBER 7TH mission control in Bengaluru lost contact with an Indian-designed and -built lunar probe mere seconds before it was supposed to land. Some Indians were consoled by the fact that their country had nearly pulled off an extraordinarily complex mission on a shoestring budget. But others asked why the budget was quite so pinched.

As a proportion of GDP—0.6%—public spending on research and development has not budged in 20 years. That is one of the lowest figures among big economies. Since 2015 the largest state funding agency, the Council of Scientific and Industrial Research, has seen its budget decline in real terms. The government wants it to attract private money. Yet firms are even stingier: India's top companies spend barely half a percent of their income on R&D.

Scientists complain, too, that state funding bodies seem increasingly driven by ideology. A particular focus, since the Hindu-nationalist Bharatiya Janata Party (BJP) took power in 2014, has been on promoting ancient Indian science and medicine. One recent three-year, government-funded hospital study explored the effects of Vedic chants on brain-trauma victims. This included consultation with an authority on "medical astrology" who incorporated horoscope data in the chants, undertook purification rituals with holy Ganges water and performed special prayers. The results of the study have yet to be published.

Scientists also describe mounting pressure to propose work on *gomutra* (cows' urine) or *panchagavya* (a mixture of milk, yogurt, clarified butter, urine and dung), so as to win funding from a recently created government board tasked with "validating" the beneficial qualities of all things bovine. "These ideas are based on absolutely unscientific mythology and scripture," complains a researcher who declined to be named, fearing funding cuts. "But my department needs equipment and lab facilities for our real research, and we can't get funds without doing this stuff." A newly created National Cow Commission has pledged to fund up to 60% of startup capital for businesses that commercialise *panchagavya*.

A recently elected BJP MP insists that it was drinking cow urine that cured her breast cancer, not the three operations she had. The Cow Urine Therapy and Research Institute of Indore claims to have cured dozens of patients, while Junagadh Agricultural University says its researchers have not only destroyed cancer cells in vitro with *gomutra*, but discovered gold in the miraculous liquid. Online retailers happily flog dung-based soaps and urine-based medicines promising to cure cancer. The benefits of the lunar mission are less clear.

Gong wrong

A row about medals reveals disputes about East Timor's history

Who should be honoured for helping the country become independent?

Print | Asia Sep 12th 2019

THE PRISON in the six interconnected bungalows of Comarca became notorious during the 24 years that Indonesia occupied East Timor. Many of those locked up there for resisting the occupation did not survive its torture cells. Comarca is now occupied by Centro Nacional Chega! (CNC), an institution set up in 2016 to continue the work of the truth commission established after the Timorese voted for independence in a UN-supervised referendum in 1999.

Comarca has in recent weeks been receiving more foreign visitors than usual. Many were in Dili for a party to mark the 20th anniversary of the referendum on August 30th. The Timorese paid a big price for freedom. The Indonesian army and its local militias went on the rampage, killing at least 1,400 Timorese and reducing the country to ashes. Recently declassified American documents show that the American and Australian governments knew about the Indonesian army's intentions for months, but did nothing. They acted only when the country was already burning.

The truth commission's report, published in 2005, includes a long list of recommendations to prevent the recurrence of atrocities. But the Timorese government chose to ignore them, partly so as not to upset Indonesia, its powerful neighbour, and partly because of internal opposition. The report was left to gather dust in churches and libraries.

The CNC's director, Hugo Fernandes, wants to make sure East Timor "will learn from its past and knows its own history". Every group in East Timor has developed its own narrative of the struggle for independence, casting itself in a pivotal role. The trick, he says, is "to balance these into one communal history."

It was partly with that aim that the government in 2009 created the "Order of Timor-Leste", the highest national honour, to acknowledge locals and foreigners who have "contributed significantly" to the country. Taur Matan Ruak, the prime minister and a former resistance fighter, says it is important to give young Timorese "altruistic role models".

Some in government wanted to mark the anniversary by conferring the order on countries and institutions that helped in the independence struggle. Bill Clinton and Kofi Annan, respectively the American president and UN secretary-general at the time of the referendum, were both named as recipients. But others argued the outside world did too little, too late and that East Timor should rather reward individuals who had taken personal risks for the country. Several journalists who drew attention to abuses under Indonesian occupation, including your correspondent, made the list. At the last minute, however, the president decided to add two UN officials who had worked on East Timor. Since there were no spare medals for the presentation ceremony, that meant another prospective recipient had to be dropped.

Saskia Kouwenberg, a Dutch journalist and human-rights campaigner who managed to smuggle out footage of an Indonesian massacre in 1991, was abruptly removed from the list of recipients. Her snubbing enraged civil-society groups. They organised an alternative "popular solidarity award" for her. The ceremony took place in the forecourt of Comarca, neatly fulfilling its mission to grapple with conflicting versions of the past. ■

Life after Dhaka

Bangladesh tries to muffle the siren song of the capital

But climate change displaces farmers and factories lure them

Print | Asia Sep 12th 2019

INDUSTRIAL ZONES, residential developments, clinics and universities—the mayor of Mongla's ideas for his town's expansion seem a bit ambitious. Mongla has a mere 40,000 people; his office is in a crumbling building hemmed in by forest. But in five years, Zulfikar Ali insists, Mongla will be a regional economic hub, accommodating thousands of migrants drawn by rapid industrialisation and pushed by the loss of agricultural land to the rising sea. (Already, the sea is eating away at the surrounding low-lying delta region.) "I want to be ready," he says.

In 1974 just 9% of Bangladeshis lived in towns or cities. Today 37% of the country's 170m people do. In a few decades more than half will. The capital, Dhaka, which attracts the majority of rural migrants, has grown from 3m in 1980 to 18m today. It is "already bursting at the seams", says Saleemul Huq of the International Centre for Climate Change and Development, a think-tank trying to bolster education and employment in eight places, including Mongla, to help absorb migrants.

The surge of labour into Dhaka has powered Bangladesh's brisk economic growth, which has averaged 6.5% a year over the past decade. Dhaka generates 35% of the country's GDP. The fast-growing garment industry, which supplies around 11% of GDP, employs lots of internal migrants.

But growth has come at a price. According to an index compiled by the Economist Intelligence Unit, a sister company to *The Economist*, Dhaka, notorious for traffic jams and pollution, is the world's third-least liveable city. Some 60% of residents live in makeshift structures, according to the Centre for Urban Studies (CUS), another think-tank. Many of these slum-dwellers lack access to clean water and sanitation and are at constant risk of eviction.

In such conditions diseases—especially waterborne ones—thrive. Frequent bouts of illness that stop slum-dwellers from working keep them trapped in poverty, says Abdus Shaheen of Water & Sanitation for the Urban Poor, an NGO. "This, of course, hampers the wider economy, too," he adds.

There is also an environmental cost. Every day 1.1m cubic metres of sewage are pumped into Dhaka's rivers. As the city has expanded into nearby wetlands, a natural drainage system has been destroyed, increasing the risk of floods.

These problems stem from a combination of too much centralisation and too little urban planning, says Nazrul Islam of CUS. The government was taken unawares by the rapid growth of the garment industry. There was no effort to provide low-cost housing or services, he laments.

Some 30 years later, the government is no longer ignoring the problem. The ruling Awami League, elected for a third consecutive five-year term in December, is trying to curb migration from rural areas by providing villages with the same facilities as urban areas, including reliable power and access to the internet.

Decentralisation is also on the agenda. The government has been creating new local authorities and giving them more money for development. To foster growth outside Dhaka, 100 industrial zones are to be built over the next decade. Eleven were inaugurated earlier this year, including one in Mongla.

Meanwhile, in Dhaka, a metro system is under construction. RAJUK, the city's planning authority, is working on a plan for orderly expansion to the north and east. The World Bank has approved a $100m project to improve public spaces and municipal services in four of the city's poorer neighbourhoods.

But neither in Dhaka nor around the new industrial zones are there plans for lots of cheap housing, notes Mahfuja Aktar, a planner at RAJUK. (The mayor of Mongla wants to build some, but has not yet received government approval.) Moreover MPs, who fear their clout will diminish, are resisting decentralisation. Nonetheless, Mr Islam is optimistic: Dhaka has become so dysfunctional, he argues, that the government has no choice but to plan better. ■

Banyan

Japanese spies, once renowned, have fallen on hard times

A country known for pacifism struggles with covert aggression, too

Print | Asia Sep 12th 2019

IT IS RARE for James Bond to pass up a martini. But on a visit to Japan in 1967, in "You Only Live Twice", he opts for sake—served at 98.4°F (36.9°C). "For a European, you are exceptionally cultivated," enthuses Tiger Tanaka, a Japanese spymaster. Mr Tanaka is a suave, Suntory-sipping spook who runs a ninja school in a remote castle, and helps Mr Bond storm the bad guy's volcano lair.

In reality, Mr Tanaka would scarcely have a licence to snoop, let alone kill. When Banyan asked a former American intelligence official for his judgment on Japan's spies, the answer was simple: "pretty woeful". In a new book—"Special Duty: A History of the Japanese Intelligence Community"—Richard Samuels, a professor at MIT, explains why that is so.

The history of Japanese espionage is filled with derring-do, from sabotage in Tsarist Russia to stealing secrets in Latin America. But that came to an end with Japan's defeat in the second world war. The American occupiers forced Japan to disband its army and renounce war. As part of the same process of pacification, Japanese intelligence was shrunk, divided into squabbling units and focused narrowly on communists at home and trade secrets abroad. It has since recovered a little. Japan now boasts first-rate spy satellites. When the long-serving national security adviser retires on September 13th, the country's top spy chief will replace him. But despite growing threats, change has been slow.

Part of the problem is that the police run the show. Cops have always led the Cabinet Intelligence and Research Office (CIRO), the main intelligence agency, and held important jobs in almost all others. Police have stymied reform by leaking proposals, and their bureaucratic skirmishing with diplomats and soldiers has, at times, been crippling.

A related problem is that politicians' and bureaucrats' risk-aversion does not lend itself to the messy business of old-fashioned human intelligence. According to Mr Samuels, Junichiro Koizumi, the prime minister of the day, told his colleagues in 2005 that Japan had "destroyed its intelligence capabilities" and needed more "ninjas". But in 2015 Shinzo Abe, Mr Koizumi's successor, rejected his own party's plans to create a "Japanese-style CIA". One retired officer tells Mr Samuels that too little has changed: "We do [human intelligence], but not a lot of it, and not as covert action." And perhaps not all that well. Since 2015 nine Japanese nationals have been arrested in China for espionage. Depressingly, some see that as an encouraging sign. At least Japan is trying.

In theory, tech-savvy Japan should be better off when it comes to electronic espionage. Its armed forces have submarines, ships and planes that are good at hoovering up Chinese and North Korean radar and other signals, says the former American official. "But you don't get good intelligence", he points out, "unless you get them close."

Nor is it easy for Japan to hack phones and computers. Cyber-security spending jumped by over a third between 2018 and 2019, to 85bn yen ($770m), and the number of cyber-warriors will grow from 150 at present to 500 in five years. But most of that is for parrying intrusions from China and North Korea, rather than actively stealing secrets. Japanese officials admit that their would-be hackers are hobbled by strict privacy laws that limit what they can do on domestic networks, and by self-imposed constraints on offensive action.

Espionage, in any case, requires secrecy. "I never travel in the streets of Tokyo," Mr Tanaka tells Mr Bond from his office in an underground railway. "In my position, it would be most unwise." His real-world counterparts are said to be more lax. During the cold war, Mr Samuels recounts, Japan was an open book to the Soviet Union, China and North Korea, prompting America to withhold intelligence. In 2013 Mr Abe passed a landmark state-secrets law, but the system remains leaky.

That makes others reluctant to share secrets. Japan has long wanted to get closer to the Five Eyes pact, in which the signals-intelligence agencies of America, Australia, Britain, Canada and New Zealand share the fruits of their spying. In 2017, amid rising nuclear tensions with North Korea, Japan (with South Korea) was invited to a Five Eyes conclave for the first time. Several meetings have followed, building trust. "Japan wants to be the sixth eye," says a Western diplomat in Tokyo. That, says the American official, is not on the cards. Asked why, he says, bluntly: "They're not bringing anything to the table."

Social stability
Shutting the gate

Shutting the gate

China says Hong Kong's protesters have the mainland in their sights

In the neighbouring province of Guangdong, many people have surprisingly little sympathy for them

Print | China Sep 12th 2019

"I CAN SYMPATHISE with the protesters in Hong Kong," says a young saleswoman from Guangdong province, which borders on the territory. "The rule of law, greater democracy—these are good things to be demanding," she adds, attributing her views to an "open mind" and software that allows her to bypass China's censorship apparatus. Then she wonders whether she might have said too much.

Since the protests broke out in Hong Kong three months ago, officials on the Chinese mainland have been working hard to prevent views like hers from circulating openly. China's state-controlled media have focused only on the more chaotic aspects of the unrest, portraying participants as a small number of violent separatists in cahoots with foreign "black hands". They have ignored the record numbers who have joined peaceful demonstrations and dismissed their pleas for democracy as merely a ruse to achieve independence. So it is hardly surprising that many people echo the government's line. They often argue that the "rioters" in Hong Kong deserve to be crushed. The saleswoman is a rarity.

But the authorities are jittery. In an article published last month on the website of *Newsweek*, Cui Tiankai, China's ambassador to America, said the biggest threat to China's "one country, two systems" arrangement for Hong Kong was posed by "ill-intentioned forces" trying to turn Hong Kong "into a bridgehead to attack the mainland's system and spark chaos across China." On August 19th Xinhua, a government news agency, accused "anti-Chinese Western powers" of trying to unleash a "colour revolution" in Hong Kong that would "penetrate" the mainland. A week later China's public-security minister visited Guangdong and urged local police to "resolutely defend the great southern gate of China's political security" by combating "all kinds of infiltration, sabotage and subversion". In other words, he appeared to suggest, they must guard the province from Hong Kong's political influence.

If the government has reason to worry about contagion from Hong Kong, Guangdong—the country's most populous province, with as many residents as France and Spain combined—would be a logical place to look for it. One reason is shared culture and language. Many Hong Kongers are refugees from Guangdong, or their descendants. Hundreds of thousands fled from the province to the then British-ruled territory to escape famine or persecution during Mao Zedong's rule. Inhabitants of both places commonly speak Cantonese, which sounds very different from the mainland's official tongue, Mandarin. They take pride in the region's distinct traditions. Many travel back and forth frequently.

Another reason is that Guangdong has a history of relatively liberal thinking. It was a laboratory for the economic reforms launched four decades ago by Deng Xiaoping. Perhaps because it is so far from Beijing (the province��s capital, Guangzhou, is more than 1,800km from the national one) and so close to Hong Kong, Guangdong has also sometimes enjoyed more leeway to experiment politically, such as in the development of NGOs and trade unions. Under China's current leader, Xi Jinping, those freedoms have been chipped away. This has given Guangdong something else in common with Hong Kong: a shared sense of the Communist Party's tightening grip.

But in interviews across the province, few people express sympathy for Hong Kong's protesters. This is partly the result of the censorship that prevails across China. People in Guangdong have legal access only to a couple of television channels from Hong Kong: TVB and Phoenix, which are known for their relatively pro-party stance. When these channels report on the protests in Hong Kong, censors cut the feed to avoid any scenes being shown that might embarrass the mainland authorities. The government has been trying harder to stop people using illegally installed satellite dishes that can pick up other channels from Hong Kong. A few years ago such dishes were a far more common sight.

Gone are the days when Guangdong's media were given freer rein than those elsewhere in China. In 2013, not long after Mr Xi took power, hundreds of people gathered outside the headquarters of *Southern Weekend*, a newspaper in Guangzhou with a national reputation for its investigative reports. They were protesting against the party's ban on the publication of an editorial calling on China to uphold its constitution, which notionally enshrines wide-ranging freedoms. Incensed readers gave speeches at the gate. One even called for a competitive multiparty system. But the authorities tightened control over *Southern Weekend*. A former journalist there says that what was once China's "boldest" newspaper has been completely tamed.

The province's leadership has become tamer, too. In the five years leading up to Mr Xi's accession, Guangdong's party chief was Wang Yang, a relatively liberal official who was linked with what admiring academics in China called the "Guangdong model". (Mr Wang is now one of the seven members of the party's most powerful organ, the Politburo Standing Committee, but shows fewer signs of liberal thinking.) The model included innovations such as making government budgets public—in

2010 Guangdong became the first province to do so—and making it easier for NGOs to register. Mr Wang emphasised the need for "thought emancipation" among officials, reviving a slogan promoted by Deng and the then party chief in Guangdong, Xi Zhongxun (Mr Xi's father, ironically).

It was on Mr Wang's watch that thousands of residents of the fishing village of Wukan, in south-eastern Guangdong, rose up in 2011 against local officials who had illegally sold large tracts of collectively owned land to developers. The protesters demanded, and were granted, a free election by secret ballot for the village leadership—a rarity in China. The villagers' extraordinary pluck made headlines around the world.

Much has changed. Mr Wang was succeeded in 2012 by a less adventurous official. Guangdong's current party chief, Li Xi, who took over in 2017, is an ally of Mr Xi and shows little enthusiasm for reform. Wukan, meanwhile, has long since reverted to the grip of the local officials whom the villagers had once defied. The leaders they elected were turfed out in 2016. Reporters who visit Wukan risk detention. On a recent, entirely legal, trip, your correspondent and a colleague were interrogated for hours by plainclothes police.

Cutting the shoots

The chill is also evident among NGOs. Fu Changguo, a labour-rights activist in Shenzhen, was arrested last year for allegedly organising a protest by workers at Jasic, a tech firm in the city (the authorities accused him of colluding with a Hong Kong-based NGO). Dozens of students from elsewhere in the country were also detained for supporting the strike. In January the director of Chunfeng Labour Dispute Service Centre, another labour NGO in Shenzhen, was arrested for "disturbing social order". An employee at the centre says that last year she had four colleagues. She is now the only one left—the others have been "scared off". A decade ago Shenzhen had about two dozen such groups. Today, there are "just a handful", says one activist. He says his NGO survives because of its "consciously mild approach".

Guangdong's many Christians are feeling the impact, too. In the past year numerous house churches (informal congregations which often meet in people's homes) have been shut. One of China's biggest and best known, Rongguili Church in Guangzhou, which had a congregation of several thousand, was closed last December. A former pastor at the church says the local government cited "fire-safety regulations".

The province retains its strong cultural affinity with Hong Kong. A commentator from Guangdong with more than 3m followers on Weibo, a microblog platform, said last year that more than 90% of Guangdong natives cannot stand to watch even five minutes of China's annual televised Spring Festival gala. He said people preferred shows from Hong Kong. Lao Zhenyu, the founder of a popular local news website, writes that when he was at primary school in Guangzhou in the 1980s, he was taught in his native Cantonese. Now, he notes, some schools in the city ban the use of it even during breaks.

A young native of Guangzhou admits to feeling "more culturally at home in Hong Kong than Beijing". But he says education in China, which stresses patriotism, has "completely inoculated us" against even thinking about siding with Hong Kong's protesters. Others are less diplomatic. Asked about the demonstrators, an old man strolling outside Jinan University in Guangzhou huffs, in broken Mandarin, that the army should "just kill them all".

In recent years some people in Guangdong have come to resent Hong Kongers for their perceived arrogance, which they say has grown in tandem with a localist movement in the territory. The localists, including some of today's protesters, resent the huge influx of mainlanders into Hong Kong since China took over, many from Guangdong. An article last month on gznf.net, the news site founded by Mr Lao, accused Hong Kongers of harbouring "prejudice" towards people from his city.

If Guangdong is resistant to contagion from Hong Kong, it is likely that the rest of the country is immune, too. China's liberals have never drawn much inspiration from the territory's democratic aspirations. Its politics have not exerted the same fascination as that of Taiwan, where democratisation in the 1980s and 1990s offered hope to some observers on the mainland that the same might happen in China.

The party, however, never takes chances. The 70th anniversary on October 1st of the founding of the People's Republic is fast approaching. Hong Kongers are widely expected to spoil the occasion by holding a mass pro-democracy demonstration that day. Short of unleashing the army in Hong Kong with a mandate to use extreme force—which the party now seems reluctant to do—it is hard to see how the central government can stop it. It can, however, step up efforts to prevent copycats in the mainland. The big gate of Guangdong will be under close watch. ■

Chaguan

China's long-distance lorry drivers are unsung heroes of its economy

What is it like to join this invisible army?

Print | China Sep 14th 2019

AROUND FIVE in the morning is the most lethal time on China's motorways, says a transport-industry veteran. The peril comes from long-distance lorry drivers, whose vehicles may have been rolling for days, pausing only for fuel and the rest stops required by law: 20 minutes every four hours, with no daily limit on driving. As dawn breaks, a long-haul trucker may be munching sunflower seeds and sipping cold tea to stay awake, while a driving partner dozes on a bunk bed. To help that partner sleep, the windows may be closed. The only sound may be the tinny tones of a satellite-navigation device. Such drivers "are like ticking bombs, you don't know if they are awake or asleep," says the veteran, adding that as a result wise travellers avoid highways until after seven.

If that makes drivers sound a bit unloved, the reality is sadder. Many Chinese do not think about long-haul lorries enough to be scared of them. China's 30m lorry drivers are vital but invisible. Their toil helped the country become a manufacturing juggernaut. It is now feeding a consumer-spending boom, as middle-class Chinese order anything from a sofa to a selfie-stick with a tap on a smartphone, for express delivery at cut-price rates. This explosion in mobility, involving the creation of a vast highway network and a high-tech logistics industry in less than a generation, has brought Chinese truckers neither fame nor respect. When America and western Europe experienced similar transport booms in the 20th century, popular culture made folk heroes of long-distance drivers—brawny, taciturn types who prefer to brave blizzards than obey a foreman on a factory floor. Hollywood made films about wisecracking, heartbreaking truckers outsmarting policemen and other authority figures. Country singers recorded tributes like the hit of 1975, "Convoy" ("Ain't nothin' gonna get in our way"). Soon after becoming president Donald Trump invited truckers to the White House, climbed into a big rig and blasted its air horn, burnishing his blue-collar rebel credentials.

In contrast, China's rulers are wary of authority-flouting loners. Greeting scooter-riding delivery workers in Beijing before the Chinese new year, President Xi Jinping offered them a thoroughly collective compliment, beaming that they were "busy as bees".

Chaguan recently cadged a ride from Liu Chengbing, a 43-year-old lorry driver, as he began a run from Beijing to a chemicals plant in the coastal city of Jiaxing. Back in the 1990s drivers had a pretty high status, Mr Liu recalled. They earned good salaries, though most had only a middle-school education. They could make a still better living if they bought their own lorry and then touted for jobs, perhaps by handing out cards at factories. Self-employment is harder today. Margins are shrinking and repeat deliveries go to logistics firms. In June 2018 caravans of drivers used social media to organise nationwide protests about fuel prices, low incomes and the market dominance of a few, Uber-like load-finding apps.

Mr Liu sometimes takes his wife along in the cab to help with navigation, parking, food and accounts—a common practice. Like so many migrant workers, Mr Liu lives in the east, near Hangzhou, leaving his sons, 16 and 12, with their grandparents in rural Sichuan. Mr Liu can earn over 10,000 yuan ($1,400) a month. At least as a specialist driver of dangerous goods his hours are limited, and night-driving banned. Asked why lorry drivers are not heroes in Chinese films, he snorts, adjusting the brace that he wears for a painful back. "When I load stuff at the factory, the security guard sort of orders me around. That shows you our status," he says. Near Cangzhou, south of Beijing, a traffic jam allows Mr Liu time for a swift roadside pee, a cigarette and a spot of kung-fu style high-kicking. He does not chat with nearby drivers. Truckers are not especially sociable, Mr Liu explains, back in the cab. One exception is on social media such as WeChat, where drivers share tips about bad traffic, good food and clean guesthouses. Some lorry drivers, including some of the roughly one in 25 who are women, have built followings on Kuaishou, a video-sharing app. Mr Liu does not fear self-driving lorries taking jobs. "Maybe for smaller cars," he muses. But for big lorries like his, hauling a tank of sulphuric acid plastered with warning signs, "you're going to need a guy."

A nationwide survey of the industry, published by the Social Sciences Academic Press in 2018, found that more than 71% of drivers own their vehicles, often after borrowing heavily. A big majority are from rural areas and are married with children. On average, drivers see their families once every 20 days. Asked if they would like their children to drive lorries, nearly 96% said no.

Rugged individualists with Chinese characteristics

Mats Harborn, a Beijing-based executive at Scania, a Swedish lorry-maker, has devoted years to promoting a Western-style "truck culture" in China, including driving contests that hail truckers as "heroes". In part, this is to sell expensive imported lorries with fuel efficiency that makes them good value in the long run, but only if they are well driven. In part, Mr Harborn sees a broader need to help China develop a safe, sophisticated transport sector, rather than a "Wild East" industry plagued by overcapacity.

Imported lorries are mostly bought by big logistics firms, and give drivers bragging rights among their peers, says Harry Huang of Volvo Trucks, another Swedish firm. Their comfort and safety—including gadgets that brake automatically if they detect a sleepy driver—may help deal with the industry's chronic recruitment problems, he suggests, standing on the sidelines of a Volvo driving contest in the southern province of Guangdong. One contestant, Shao Panpan, drives the same route all year, connecting Suzhou with Harbin, more than 2,300km to the north. Each leg involves four days of non-stop driving, shared with a partner. He likes the job, and does not mind sharing a cab for days on end. "The partner thing is like a marriage, you need to get along and compromise," Mr Shao says. Still, round-the-clock driving is hard. "Our bodies wear out faster than other people's." He can expect little thanks. ■

Israel's election
The magician's latest trick

The magician's latest trick

Will Binyamin Netanyahu's vow to annex part of the West Bank work?

Israel's prime minister is trying to sway voters ahead of an election

Print | Middle East and Africa Sep 12th 2019

BY NOW IT is something of an Israeli ritual. As an election looms, Binyamin Netanyahu digs deep for ways to scare or thrill his hawkish supporters. He says unkind things about Israel's Arab minority. He warns of voter fraud. He invites nervous conservatives to imagine a cabinet minister named Ahmed. On September 10th he offered a carrot: if re-elected, Mr Netanyahu said, he would annex the occupied Jordan Valley in the West Bank. Such a move—indeed, any discussion of it even—would be reviled abroad, including by Israel's allies. But foreign criticism worries him far less than the threat of defeat at home.

This will be Israel's second election since April. The previous ballot gave 65 seats to hawkish and religious parties, which should have let Mr Netanyahu form a government (see chart). But Avigdor Lieberman, the leader of the nationalist Yisrael Beiteinu party, refused to join unless the government agreed to pass a long-delayed law to make it harder for ultra-Orthodox Jews to avoid military service by attending religious schools. Mr Netanyahu could not agree to this without spurring his ultra-Orthodox allies to quit any potential coalition. He was left humiliated, one seat short of a majority.

In an earlier era the Israeli president would have asked another party to form a coalition. But Mr Netanyahu is eager to avoid this. He faces looming indictments for corruption and fraud. Remaining in power will make it easier for him to defend himself. Perhaps for this reason, Mr Netanyahu persuaded the newly elected Knesset to break with political tradition and dissolve itself, forcing a snap election. And so, on September 17th, Israeli voters will trudge to the ballot box yet again.

If polls are accurate, Mr Netanyahu will again fail to win a majority. Mr Lieberman's gambit proved popular; surveys show his small party doubling in size since April. This would not make him a serious contender for the premiership. But it does make him a bigger obstacle for Mr Netanyahu. The ultra-Orthodox parties adamantly oppose a conscription bill and will not support a government that plans to pass it.

This ought to be good news for Mr Netanyahu's rivals—but they too have little prospect of winning. The largest centre-left party, called Blue and White, has run a desultory campaign plagued by infighting and gaffes. It has no easy path to forming a coalition. Meanwhile Ehud Barak, a former prime minister, re-entered politics to great fanfare this summer. Instead of shaking up the race, though, he merely muddied the waters for centre-left voters confused about whom to support.

Five months after the previous election, public opinion has barely budged. If Mr Lieberman sticks to his position, a majority of the Knesset will probably be held by parties eager to see Mr Netanyahu leave. That is the only thing that unites them—hardly enough to make left-wing Arab parties sit with Jewish nationalists in the same government. Deadlock beckons again.

Turnout in April was 68%, down four points from the previous vote in 2015. Much of the drop was due to a poor showing among Israeli Arabs. Their turnout was just 49%, a 15-point decline. The ultra-Orthodox will show up en masse at the urging of their rabbis, which helps Mr Netanyahu's allies. But he no doubt worries about whether his own supporters will bother.

For years Likud pollsters have noticed that even staunch right-wing voters are tiring of Mr Netanyahu's long rule and his seemingly endless personal scandals. They are not willing to cross party lines and vote for the centre-left. But they may decide to stay home or go to the beach.

In the past Mr Netanyahu has overcome "Bibi fatigue" with fear. On election day in 2015, for example, he warned that Arab voters were "coming to the polls in droves". This year he is at it again, accusing Arab citizens of voter fraud and trying to "steal the election". Less than two weeks before the vote, he tried to rush a bill through parliament to permit observers to film in Israeli polling stations, an effort seen as an attempt to intimidate Arab voters. (The bill did not pass.)

Now comes his promise of annexation, a long-cherished dream of the far right. In one sense it is a desperate stunt, similar to one before the election in April. But it was still jarring to hear an Israeli prime minister speak of annexing one-third of the West Bank, land the world sees as part of a future Palestinian state. It is far from clear that Mr Netanyahu will keep his promise—he has been in power for 13 years and has never taken any actions towards annexing the territory. But even if he does not act, his words help to normalise the idea. A future leader may be less restrained.

A new bloc is coalescing at the centre of Israeli politics, motivated by resentment at the influence of religious parties, Mr Netanyahu's largely dependable allies. Both Mr Lieberman and Benny Gantz, the leader of Blue and White, call for the formation of a "secular national-unity government". Together with Likud, and the much-diminished Labour, such a coalition would have a comfortable majority.

They cannot agree on who will lead it. Mr Gantz has ruled out serving under an indicted prime minister. Mr Netanyahu will not relinquish power voluntarily. His own party could push him out—but Likud has never deposed one of its own leaders.

Unless Mr Netanyahu defies the polls, Israel looks set for further instability. ■

A wide-open race

Tunisia's election features fed-up voters and bizarre candidates

The front-runner is campaigning from jail

Print | Middle East and Africa Sep 12th 2019

IT WAS THE first true presidential debate in the Arab world, yet the front-runner was nowhere to be seen. Nabil Karoui was not entirely to blame for his absence from the stage, though. The businessman and media mogul is campaigning to be president of Tunisia from jail.

On September 15th Tunisians will choose a new president for the second time since their revolution in 2010. The democracy that emerged has endured assassinations, terrorist attacks and a moribund economy. Most recently it survived the death of a president: Beji Caid Essebsi, the winner of the election in 2014, who died in July. In a country that had only two rulers for the first half-century after independence, 26 people are now competing to replace Essebsi. With the winner needing at least 50% of the vote, a run-off is likely.

The televised debate that began on September 7th was spread over three nights and featured most of the candidates. Some appeared nervous and hesitant. The format precluded any real discussion. Still, Tunisians were riveted. Cafés that showed the debate drew the sorts of crowds usually reserved for a big football match.

Whether the people turn out to vote is a different matter. The electoral commission, known as ISIE, has worked hard to sign up new voters. Almost everyone eligible is registered. But voters seem increasingly frustrated with politics. Turnout for presidential and parliamentary elections in 2014 was 63% and 68%. In last year's municipal election just 34% of voters showed up. "There have been other elections and nothing really happened," says Khmais Boungisha, a student from Bizerte. "I can't see why I should be optimistic."

Such frustrations have drawn eclectic candidates into the race. There are no recent polls (ISIE forbade their publication in July), but earlier surveys offered encouragement to outsiders such as Mr Karoui, who promises a "war on poverty" with new infrastructure spending. He says little about how Tunisia will pay for this. The government is in the middle of an IMF-backed reform programme that seeks to reduce the budget deficit from 6.3% of GDP in 2016 to 3.9% this year.

Not everyone is a populist, of course. The race features stalwart members of the establishment, such as Moncef Marzouki, who led the country after the uprising. Ennahda, the moderate Islamist party that won Tunisia's first free legislative election, is putting forward Abdelfattah Mourou. The prime minister, Youssef Chahed, a technocrat, announced his candidacy for president with a promise to "challenge old mindsets". Yet for many voters Mr Chahed himself represents an old mindset. His economic reforms have been painful.

As Mr Karoui soared in the polls, parliament passed a controversial law this summer that barred him (and a few other candidates) from running. To his credit Essebsi refused to sign the measure, which was eventually declared void. In August the authorities tried a new tactic: the police arrested Mr Karoui for tax evasion and money-laundering, charges that his aides insist are political. Under Tunisian law, however, he is still eligible to stand, even from jail. He will split the populist vote with candidates like Kais Saied, a law professor dubbed "the robot" for his tendency to speak in stilted classical Arabic. Mr Saied wants to bring back the death penalty and thinks homosexuality is a foreign plot to weaken Tunisia. Another candidate, Abir Moussi, views the revolution as a mistake and seeks to abolish parliament.

Whoever wins will soon realise that the president has little say over domestic affairs. Elections for parliament, scheduled for October, will do more to shape economic and social policy. The presidential vote will be a protest against the status quo. In a region mired in autocracy, perhaps even that is something to cheer. ■

Of cashews and cash

Mozambique's nut factories have made a cracking comeback

But farmers are being squeezed

Print | Middle East and Africa Sep 12th 2019

INDUSTRIALISATION, UP CLOSE, is organised monotony. For eight hours a day workers at a cashew factory in northern Mozambique scoop nuts from their oily shells. It is hard to talk above the thrum of machines. The pay is a modest 4,600 meticais ($76) a month. But it is a job. There are precious few good ones in Mozambique.

African countries are trying to climb the industrial ladder, and the processing of agricultural commodities seems a natural first step. By roasting coffee and spinning cotton they hope to boost export earnings and create jobs. For example, a fifth of the retail price of cashews goes to primary processors (see chart). By reviving its industry, Mozambique has captured some of that value. But its story also shows why industrial policy is hard to get right.

In the 1960s Mozambique produced half the world's raw cashew nuts and processed much of the crop domestically. Then the industry was brought to its knees by a long civil war. The knockout punch came in the 1990s, when the World Bank told the government to remove controls and cut taxes on the export of raw nuts. Trading firms shipped out cashews and processed them elsewhere. Domestic processors shut down and 8,000 jobs were lost. Mozambique's cashew industry became a cause célèbre for anti-globalisation activists.

Then the government changed tack. Since 2001 it has levied an export tax of 18-22% for raw nuts, and zero for processed kernels. It also bans exports entirely during the first months of the harvest. In practice, many nuts are smuggled out, hidden in crates of beans. Industry insiders say this informal trade helps launder money for politically connected cartels, which ship heroin the other way. Even so, the export tax has revived the processing industry. With less competition from foreign buyers, processors can squeeze farmers to sell them nuts more cheaply. There are now 16 factories employing 17,000 people, which process about half the cashews sold.

Without the export tax the domestic processing industry would not survive, says one factory-owner. After each season he buys enough nuts to last for the full year ahead, paid for with costly bank loans. His competitors in India and Vietnam import nuts from all over the world, so need inventories of only 4-6 weeks.

Of course, the export tax hurts nut-growers by pushing down the price of their crop. Most cashews in Mozambique are grown by smallholders. The government is neglecting these 1.3m families to protect a few thousand jobs in processing, says Carlos Costa, a cashew expert in Maputo, the capital. Farmers have little incentive to replace old trees or use anti-fungal sprays, despite subsidies, and the quality of raw nuts is one of the lowest in the world. Harvests have increased more slowly than in other African countries.

This is a classic dilemma for agro-processing: governments that want to protect a nascent industry end up hurting much larger numbers of farmers. Past World Bank reforms came down on the side of the nut-growers. And yet the trade-off is rarely as simple as theory predicts, because farmers connected to markets by rutted roads are often at the mercy of a small number of middlemen. "It is a Wild West," says Daria Gage of TechnoServe, a non-profit helping to develop the cashew industry. "Usually the farmers don't win out." The reforms of the 1990s made the average cashew-growing household richer by just $5.30 a year.

The government is holding consultations about changes to the export tax. Ilidio Bande, the head of the state-run cashew institute, harrumphs that the tax is "crucial" to the survival of the industry. He points out that nobody else is playing fair. India, the biggest consumer and processor in the world, raised its import duty on processed kernels to 70% this year. Mozambique's export tax is likely to stay. ■

Hate thy neighbour

Xenophobic violence flares in South Africa

As anti-foreigner attacks spread, the authorities respond with denial

Print | Middle East and Africa Sep 14th 2019

WAVING FIGHTING sticks, improvised spears and shields, they advanced like an army through the streets of central Johannesburg, chanting and singing in Zulu: "Foreigners must go back to where they came from." As they went they looted and burned shops, attacked a mosque and killed two people. The murders on September 8th came after more than a week of attacks—mostly by South Africans against migrants from other African countries—that had already led to ten deaths.

This is not the first time South Africa has experienced such horrors. Dozens of people were killed in anti-foreigner riots in 2008 and 2015. But the most recent outbreak of violence shines a particularly harsh light on the rabble-rousing of South African politicians, some of whom have blamed migrants for supposedly taking jobs from locals and committing crimes.

Two years ago the deputy minister of police complained in a press conference that South Africans had allowed foreigners to take over the centres of cities such as Johannesburg. "We fought for this land…we cannot surrender it to the foreign nationals," he said. Aaron Motsoaledi, then the health minister but now in charge of home affairs, last year blamed overcrowded hospitals and the spread of infectious diseases on sick foreigners.

Anti-foreigner sentiment is not confined to politicians from the ruling African National Congress. Herman Mashaba, who was elected mayor of Johannesburg for the opposition Democratic Alliance, regularly scapegoats foreigners for crime in the city.

The killings are straining diplomatic, trade and cultural relations between South Africa and others on the continent. Nigeria has started flights to evacuate hundreds of its citizens affected by the violence. Some Nigerian lawmakers have called for South African firms operating in their country to be nationalised. Rioters have attacked South African-owned companies in Nigeria and prompted the closure of South Africa's diplomatic outposts. Protests have also been staged outside South African embassies in Zambia and the Democratic Republic of Congo.

Some locals whisper that clandestine forces are whipping up the violence in South Africa for political ends. Perhaps, but it is not unusual for riots to break out spontaneously. Youth unemployment is a staggering 40%, so there are plenty of frustrated young men with time on their hands. Economic growth is slow, and the gap between rich and poor is vast. Trust in the police and government has been weakened by years of corruption scandals. The provision of basic services such as water and electricity is woeful. Many South Africans would like someone to blame, and many politicians are keen for them to blame someone else.

Mangosuthu Buthelezi, a veteran Zulu leader, was one of the few politicians to try to quell the anti-foreigner rage on September 8th. Speaking to a crowd, he asked them to remember how other African countries had supported the fight against apartheid. "Is this how we repay them?" he asked. But his appeals were drowned out by the angry mob as it turned is back on him and set about its grim business. ■

Grave threats

Even in death, Robert Mugabe worries his successor

Emmerson Mnangagwa, Zimbabwe's president, is bracing for trouble

Print | Middle East and Africa Sep 14th 2019

ROBERT MUGABE had been out of power for nearly two years when he died on September 6th (see Obituary). He had been far away and sick since April, so you might think his death would not rattle his successor as president of Zimbabwe, Emmerson Mnangagwa. But bones have a way of making themselves felt.

In the past few months Zimbabwe has fallen into a pit of despond that is as deep as it was during a horrendous period in 2008 when inflation reached world-record levels and shelves in the shops went bare. Rumours of rancour and plots in Zanu-PF, the ruling party, especially among the generals, are flying thick and fast. Even the arrangements for the dead despot's funeral have been causing confusion, consternation and bad blood.

As *The Economist* went to press, Mr Mugabe's body, after arriving from Singapore, where he died, was due to lie in state for two days in a football stadium near the centre of Harare, the capital, before being moved to the bigger National Sports Stadium. This happens to be across the road from Heroes' Acre, a hill on the edge of the city where the leading lights of the anti-colonial liberation struggle, including Mr Mugabe's first wife, Sally, are buried. A place has long been reserved next to her.

The funeral service is expected to take place in the bigger stadium on Saturday. Mr Mnangagwa, the dead man's blood-stained, long-serving enforcer, who ousted him in a coup in 2017, is expected to preside. The government says Mr Mugabe is to be buried in Heroes' Acre the next day. But his family, led by his widely reviled and notoriously acquisitive second wife, Grace, wanted him buried in his home village, Kutama, an hour's drive to the west. Wherever it takes place, the prospect of huge crowds, swelled by rising anger and desperation among the poor, leaves Zimbabwe's rulers nervous.

That is not surprising. Electricity is available for barely six hours a day. Clean water runs once a week. A civil servant's monthly salary barely buys two days of groceries for a family of four. Drivers queue for hours for scarce supplies of petrol, the price of which has more than quintupled this year. Annual inflation is reckoned to be about 500%. The value of Zimbabwe's newly introduced currency, which is meant to take the place of the American dollars that have been used for a decade, has slumped.

Western governments and bodies such as the IMF will not lend unless Zimbabwe clears its arrears with the World Bank and the African Development Bank. The finance minister, Mthuli Ncube, has cut subsidies and sought to reduce the state payroll but seems increasingly erratic. Harsher austerity risks a popular explosion. Moreover, he is hobbled by party bigwigs and generals who fiddle the foreign-exchange rates and continue to plunder the treasury.

Outsiders also insist that, if Mr Mnangagwa (pictured on the right) is to get foreign help, he should be less repressive, first by repealing two laws that have long enabled the government to lock opponents up and muzzle independent voices. He is moving towards doing so, but has yet to complete the task. Human-rights campaigners say his proposed security bill looks a lot like the repressive old act, and that abuses have surged even in the past month. They report more than a score of new charges of treason, abductions and cases of torture of opposition campaigners, mainly belonging to the Movement for Democratic Change (MDC). Civil-society groups say they are being threatened as viciously as ever.

Mr Mnangagwa has long been adept at suppressing dissent, though street violence could erupt again as the economy melts down. The MDC insists that, before it might agree to co-operate in a "transitional mechanism" to implement reforms, he should first admit that last year's parliamentary and presidential elections were rigged, something he is unlikely to do.

In any case, the biggest threat to his survival comes from within his own party, especially from the generals who helped him seize power in the first place. His first vice-president, Constantino Chiwenga, the armed-forces chief behind the coup, is said to be gravely ill. Other army types are reported to be plotting for the succession. Some prominent holdovers from the Mugabe era may, it is speculated, at last be charged with corruption. Mr Mugabe's widow and her family, whose bid for power sparked the coup, may finally be dispatched into political oblivion. And the lethal internecine struggles within the ruling party that marked the despot's 37 years in power will persist beyond his grave, wherever it may be. ■

France
Risking the rage of the aged

Emmanuel Macron faces the rage of the aged

Another French president tries pension reform

It hasn't ended well in the past

Print | Europe Sep 12th 2019

SISYPHUS HAD it easy, compared with French pension reformers. The mythical Greek was damned eternally to roll a boulder up a hill and watch it roll back down again. But he never had to persuade Gallic workers to retire later. In 1995 Jacques Chirac's government shelved his attempt to reform the system after weeks of protests and strikes brought Paris to a standstill. He tweaked it in 2003 but faced protests of 1m workers and more. Nicolas Sarkozy made a bit more progress in 2010, but still not nearly enough.

Now Emmanuel Macron has put a cautious shoulder to the boulder. On September 9th the president invited Laurent Berger, leader of the Confédération Française Démocratique du Travail, the country's biggest private-sector union, to talks about pension reform at the Elysée palace. His prime minister, Edouard Philippe, held discussions last week with each of the big unions and employers' organisations.

After protesters wearing *gilets jaunes* (yellow jackets) brought the country to a standstill last year, a chastened Mr Macron wants to be seen to be listening. Reproached for his previously haughty know-it-all manner of governing, he is keen to avoid the impression that he is about to impose new rules on an unwilling public. Yet his caution raises questions about what, and how much, this reform is likely to achieve. The pension tsar, Jean-Paul Delevoye, made it clear in a report this summer that the new system would not change at all the overall amount that France spends on pensions.

Given the scale of the problem, this is disappointing. The French retire earlier than workers in any other OECD country (see chart). Thanks to high life expectancy, they enjoy an average of a quarter of a century in their armchairs. Moreover, the French pension system is hugely generous. Retirees receive on average 61% of previous earnings, pre-tax—less than in Italy (83%) but far more than in Germany (38%).

This puts strain on the public purse, all the more severe because the French system relies on taxing today's workers to pay the pensions of their elders. In June the official pensions advisory council warned that by 2022 the public-pension deficit would rise to €10bn ($11bn), up from its previous forecast of half that figure. Overall, France spends nearly 14% of GDP on pensions, a bit less than massively indebted Italy (16%), but more than Germany (10%) and way above the 8% OECD average.

The obvious way to close this gap would be to raise the retirement age, as many other countries have done. In France, the most recent effort to do this dates back to Mr Sarkozy. In 2010 he raised the minimum age from 60 to 62 years, and the age for a full pension (without penalties) from 65 to 67. However, thanks to France's monstrously complex system, many people are allowed to retire much earlier than this, so that the male retirement age is, on average, still only 60. One problem is that Mr Macron campaigned in 2017 with a clear manifesto pledge not to touch the retirement age. This means that his reforms will, at best, solve only part of the problem.

Mr Macron's team argues that it is embarking on a redesign that will be as tough to pull off as it would have been to raise the retirement age. It will also be more complicated. France has no fewer than 42 different mandatory public pension systems, which have grown up over the decades to serve farmers, civil servants, actors, railway workers, mine engineers, notaries and so forth, including a default public scheme in which everyone not otherwise covered must enroll. Rules governing pension rights and contributions vary wildly between them, and cannot easily be combined. The system is opaque and curbs job mobility, as rights are hard to transfer. To replace this tangle, Mr Macron has promised to merge all these regimes into a single, points-based system that treats all workers equally.

"What the French are trying to do is a big deal," says Monika Queisser of the OECD. "France has one of the most fragmented public pension systems, and they are finally trying to get things harmonised." To this end, Mr Macron this month brought Mr Delevoye into government. He has already spent many months conducting a review of the French system and discussing reform options. After all these talks, a bill is promised, but not till next summer.

Up to a point, it makes sense to take the time to get it right. In the 1990s, notes Hervé Boulhol, a pensions specialist at the OECD, it took Sweden nearly a decade to put in place a similar system. The French government, wary of renewed unrest, wants to try to forge a consensus. A poll for the Institut Montaigne, a liberal think-tank, suggested that only 33% of the French currently back Mr Macron's reform.

If anything, such doubts will harden when details emerge. So far nothing is fixed. Mr Delevoye has said, for instance, that he wants to identify a "pivot age" of 64 years, around which incentives to work later and penalties for early retirement would be based. This could, it is hoped, help nudge people into working longer. Mr Macron, however, says that he "would prefer us to find agreement on the length of contributions rather than on age". Either way, harmonising rules will inevitably mean some lose out. In anticipation, unions were planning a big public-transport strike in Paris on September 13th.

The trouble is that, however ambitious they look, the reforms would not do enough. Mr Macron promises to close the pension deficit by 2025, and the idea is to put in an automatic mechanism that adjusts the contribution rules as life expectancy increases. He wants people to be able to make their own informed choice about when to leave their desks, and with what package. Yet the new universal system will do nothing to curb overall spending on pensions. Indeed, Mr Delevoye has made this a selling point, promising in July that the universal system "will keep an identical level of pensions spending".

At some point this will catch up with France. As it is, there have been big rows within government about the wisdom of Mr Macron spending so much political capital on a project that will not save money. It is true that once the system is in place, it will indeed become administratively, if not politically, simpler for future governments to change the rules and make savings. But in the meantime, Mr Macron is putting vast effort into a reform that will leave the task half-done. ■

Von der Leyen's line-up

The new top jobs in Europe

A punchy new team at the European Commission

Print | Europe Sep 12th 2019

EMMANUEL MACRON is having a good summer. In July, at his urging, leaders of the European Union's member states picked Ursula von der Leyen, then the German defence minister, to be president of the European Commission. In a package deal Christine Lagarde, the French head of the IMF, was chosen to lead the European Central Bank; Charles Michel, the Belgian prime minister and a Macron ally, got the European Council presidency; and Josep Borrell, Spain's Francophone foreign minister, will be the EU's next high representative for foreign affairs. Having narrowly won her confirmation vote in the European Parliament, on September 10th Mrs von der Leyen presented her proposed line-up of commissioners at the Berlaymont building in Brussels. It was another good day for the French president.

Under Mrs von der Leyen's proposal—the European Parliament will begin confirmation hearings later this month and must endorse the new commission as a group before it can take office on November 1st—the next commission will be more hierarchical than the last. Directly below her will be a team of three silo-busting "executive vice-presidents" in charge of the three broad areas which, Mrs von der Leyen has indicated, will be her priorities. Margrethe Vestager will lead on making Europe "fit for the digital age" and stay on as competition commissioner—in which role the Danish liberal has capably taken on American digital giants and made an enemy of Donald Trump. Frans Timmermans, a Dutch social democrat, will be in charge of Europe's "green new deal", accelerating the EU's progress towards carbon neutrality by 2050. And Valdis Dombrovskis, a Latvian Christian democrat, will be responsible for economic and financial affairs, with an emphasis on "inclusivity".

The choice of the three reflects the long-term shift towards a more political and active commission. They come from the three largest political groups in the new, more fractured parliament that Mrs von der Leyen will have to keep happy in order to secure majorities for her proposals (she may also rely on Greens, hence the focus on climate change). Ms Vestager and Mr Timmermans were both "lead candidates" in the European elections, boosting the team's democratic legitimacy. The inclusion of Mr Dombrovskis tackles central-European fears of "second-class" status. With Mrs von der Leyen the trio will form an inner quad running the EU's executive, with an outer ring of five regular vice-presidents (three from eastern Europe and two from southern Europe, providing a geographical balance), and beyond them the remaining 18 members of the commission.

Among the other vice-presidents and commissioners are several notable appointments. Paolo Gentiloni, a centre-left former prime minister of Italy, becomes commissioner for economic affairs with responsibility for fiscal rules—indicating that Mrs von der Leyen wants to use the opportunity of Italy's new, more pro-European governing coalition to resolve the Brussels-Rome dispute over the Italian budget. This may, however, worry flintier Germans and northern European members of the so-called New Hanseatic League.

Sylvie Goulard, a French former defence minister and close ally of Mr Macron, takes charge of the single market and defence. She will oversee the establishment of a European strategy for regulating artificial intelligence and, with Ms Vestager, will push forward a Digital Services Act on e-commerce. Phil Hogan of Ireland, currently the agriculture commissioner, will take over the trade portfolio, including responsibility for negotiating any deal with a post-Brexit Britain—a firm reminder that the EU's first allegiances in such matters are to Dublin rather than London.

Less auspicious is the nomination of Laszlo Trocsanyi as commissioner for enlargement; as an ally of Hungary's authoritarian Viktor Orban, he is hardly well-placed to pass judgment on the rule of law in would-be accession countries. The fact that Margaritis Schinas, the Greek commissioner and a former chief spokesman for the commission, has been made vice-president for migration (a portfolio ominously dubbed "protecting our European way of life") suggests the incoming commission will see that matter as a question of tough borders and public relations.

Most important for the wider world is that the von der Leyen commission will be committed to making Europe a more autonomous actor in a dicey world—or extending "European sovereignty", as it is called in euro-speak. Ms Vestager and Ms Goulard want to use their clout to develop a distinctively European way of managing new technology and finding a balance between open markets and interventionist industrial strategy in responding to new industrial giants from China and Silicon Valley (tough Ms Vestager's liberal instincts may collide with the activist mood, personified by Ms Goulard, in Paris and Berlin). Mr Borrell, a straight-talking socialist and foreign-policy heavyweight, will also have a licence to project Europe's voice in the world more loudly. ■

Moscow's slap to Putin

Local elections embarrass the Kremlin

The ruling party loses half its Moscow city council seats

Print | Europe Sep 12th 2019

THE FIRST indication that things were not going to plan for Vladimir Putin came when the official exit polls for city-council elections in Moscow failed to materialise on schedule at 6pm on September 8th. By the early hours, the majority enjoyed by United Russia, the ruling party, had taken a huge dent, a sign of a growing mood of discontent in the capital.

Before the election, United Russia had held 40 of the 45 seats in the largely powerless but symbolically significant city council. By the time the final votes were totted up next day, it had seen that total fall by almost half, to 25.

United Russia's collapse was all the more remarkable given that over a dozen aspiring candidates linked to Alexei Navalny (pictured), Mr Putin's most prominent domestic critic, had been barred from the polls, a move that sparked weeks of protests in Moscow over the summer. The decision to blacklist the opposition figures was reportedly taken when the Kremlin realised that they would win at least nine seats, providing them with a political springboard for parliamentary elections due in 2021. But the move turned the election into a referendum on the government's record, leading to a much stronger protest vote than anyone had expected.

A number of United Russia candidates had opted to run as nominal independents in a bid to mask their association with the regime. Mr Navalny outed them as members of the party. This, even more than the formal vote, exposed the fact that United Russia has become a liability rather than an asset for the Kremlin. The party's ratings have slumped to near-record lows this year, amid anger over an increase in the national pension age and frequent allegations of corruption. Mr Putin's popularity has slumped too, for the same reasons.

Mr Navalny also called on his supporters to vote for whichever candidate was best placed to defeat United Russia, even if that meant for fake opposition parties; he called this tactic "smart voting", and it succeeded beyond expectation. "This is a fantastic result for 'smart voting'," said Mr Navalny as the election results started to come in. The Communist Party, the largest officially recognised opposition party, won 13 seats, up from five last time round. A Just Russia, a centre-left party that, like the Communists, is part of the Kremlin-loyal "opposition", won three seats. Yabloko, the only genuine opposition party allowed on the ballot, saw all four of its candidates enter the city council.

The plan produced some odd effects. Liberal Russians who celebrated the collapse of the Soviet Union in 1991 gritted their teeth and voted for Communist Party candidates, some of them open admirers of Stalin. "It's not ideal, but there's no other way left to register my disapproval of United Russia in Moscow," said Mikhail, a middle-aged voter. "The Communists have the best chance of victory."

Even widely reported ballot-box trickery was unable to save one United Russia heavyweight. Andrei Metelsky, the head of the party's offices in Moscow, lost his seat to a little-known socialist running on the Communist Party ticket.

Besides the vote in Moscow, Russians also voted for the heads of 16 regions, as well as lawmakers for 13 regional parliaments. United Russia suffered a colossal defeat in the Khabarovsk region, in the country's far east, where the nationalist Liberal Democratic Party of Russia won 34 of 35 seats in the local parliament.

There was better news for Mr Putin in the elections for governorships, where United Russia's candidates all triumphed in the first round. However, six of its incumbent governors ran as independents, including Alexander Beglov, the party's former boss in St Petersburg. Mr Beglov's biography was removed from United Russia's website before the vote.

Dmitry Medvedev, Russia's toothless prime minister, said the election results proved that United Russia remains the country's biggest political force. He is right. But Mr Putin's foes will have scented a new vulnerability in the ruling party. ■

Not going quietly

The Turkish rappers who rib the regime

Sticking it to the man, sultan, Ottoman, Erdogan

Print | Europe Sep 12th 2019

"I GREW UP apolitical, I never voted, and all I cared about was vacation, travel, and debt," a young man in a buttoned-up polo shirt says into the camera. "Now I'm too scared to tweet, I'm afraid of my own country's police." The camera pulls out. The man, it is revealed, is behind bars. Seated to his side is Sarp Palaur, better known as Saniser, a popular rapper. "Sorry to say, but this hopeless generation is your creation," Mr Palaur snaps back at his cellmate. "The justice that was supposed to protect you will come knocking and break down your door...you didn't say a word, which means you're guilty."

Packed with such lyrics and images, "Susamam" ("I can't stay quiet") has touched a nerve among a large number of Turks. In the week since its release, the song and accompanying video have earned praise from opposition figures, 20m views on YouTube and accusations of links to terror groups from pro-government newspapers. A searing jeremiad on the current state of Turkey's democracy, "Susamam" pulls few punches. Over the space of 15 minutes, a parade of about 20 rappers, including Mr Palaur, who masterminded the project, fume about corruption, violence against women, the arrests of journalists, education, the lakes of concrete poured over some of the country's natural wonders, and creeping fascism. The song does not mention Turkey's President, Recep Tayyip Erdogan, by name. But it is as good an indictment as any of his government's recent abuses.

The string of losses Mr Erdogan and his Justice and Development (AK) party suffered in local elections earlier this year seems to have emboldened some previously tongue-tied government critics. Ekrem Imamoglu, the opposition politician the government robbed of victory in the Istanbul mayoral race back in March, pointedly called on artists and businessmen to break their silence before the re-run. Many did so, and endorsed Mr Imamoglu, who went on to win big. A handful of former AK bigwigs have since broken with Mr Erdogan, confirming they would launch one or more rival parties.

Yet speaking out continues to come at a price. On September 6th, the day "Susamam" was released, a Turkish court sentenced Mr Imamoglu's closest associate, the head of his party's Istanbul branch, to nearly 10 years in prison for "insulting the president", "inciting people to hatred and enmity" and "terrorist propaganda". The evidence against her consisted of a collection of social-media posts. A couple of weeks earlier, the government unseated the newly elected mayors of Diyarbakir, Van and Mardin, three of the country's biggest Kurdish cities, over alleged (but unproven) links to an armed separatist group, the PKK. Rumours persist that other opposition mayors may meet a similar fate.

Many Turks are now calculating that it is better to be silent than sorry. A recent study by the Reuters Institute found that 65% of respondents said they were anxious about expressing their political views on the internet, the highest among the 37 countries examined. Only last year, over 36,000 people were investigated on charges of insulting Mr Erdogan. The artists behind "Susamam" may be next in line. One government mouthpiece has already referred to the song as the work of outside enemies and terrorist groups. "Susamam" is in fact something more dangerous to Mr Erdogan—a reminder that Turkish society is too diverse, too young and too unruly to remain quiet for long. ■

Render unto God

Why so many non-religious Europeans pay church taxes

And how cunning Icelanders avoid it

Print | Europe Sep 12th 2019

IN THE Old Testament, priests are told to take a tenth of every believer's crops as a tax to support the faith. In these latter days, they can outsource the job to the state. In many European countries, "church taxes"—levied on all registered members of religious organisations by governments—still exist.

The governments of ten countries across Europe administer membership fees on behalf of religious organisations. In two of these, Spain and Portugal, believers can opt to pay a portion of their income tax to their religion of choice. Six others run opt-out systems, whereby registered members of certain Christian churches (and, in some cases, other religious groups) are required to pay tax. In most of these, apostasy is the only way to get out of paying. Some states in Germany require even more arduous methods of disassociation—in addition to leaving the church, you must also file a notarised deregistration form with the local government, which demands a fee.

In Italy and Iceland churches get a cut of income tax, so it is hard for taxpayers to avoid bankrolling them. But not impossible. Italians can ask for their share to go to the state, to spend on humanitarian aid. Icelanders, meanwhile, have found a cunning way to get refunds. Their tithes are distributed to each religious group according to the size of its flock. A surprising number of people have registered as members of the Zuist Church of Iceland, a previously obscure group that preaches ancient Sumerian beliefs. It refunds the contributions of its members, greatly broadening its appeal.

Some people are content to keep paying. A report in April found that in the six European countries that run opt-out systems, 68%-80% of people said that they pay the church tax. Not all of them are religious—in Sweden 32% of people reported paying despite being unaffiliated to any creed.

Why would the godless choose to fund a faith? Many believe, often rightly, that churches help the needy. The sheer bother of bureaucracy probably stops others from opting out. And some find it emotionally difficult to make a formal declaration that they are leaving the faith in which they were brought up. "I can't for some reason get myself to leave the church altogether, although I'm highly sceptical of the institution," explains Jonas, a German who gives about €50 of his monthly salary to the Catholic church. "I know it's a bit irrational, but there's something that holds me back."

Nonetheless, many secular types wonder what business the state has in collecting membership dues for religious institutions. No other civil association is so lucky. Ironically, church taxes were first introduced to separate church and state by preventing the state from funding churches directly.

Charlemagne

Why Europe should take the lead on trade

Who else will speak up for consumers?

Print | Europe Sep 12th 2019

"THIS IS DEEPLY offensive," declares Cecilia Malmstrom, gesticulating around her orchid-lined office in the European Commission's Berlaymont headquarters. "We have colleagues here whose parents fought together [with the Americans] on the Normandy coast and we are a threat to national security?" The EU's trade commissioner is referring to Donald Trump's imposition of tariffs on European steel and aluminium, which he preposterously claims is necessary for national-security reasons. The EU has retaliated with its own tariffs on bourbon, Harley Davidson motorbikes and other iconic American goods.

This tit-for-tat does not come easily to Ms Malmstrom, a pro-trade Swedish liberal. When she took office in 2014 the World Trade Organisation's (WTO's) Doha round of multilateral tariff reductions was stagnant and European city squares thronged with protests against the Transatlantic Trade and Investment Partnership (TTIP), a mooted trade deal with America. Since then the drawbridge-up tendency has surged: first in Europe, with wins for nationalists and Britain's vote for Brexit, and then in America with the election of Mr Trump.

Ms Malmstrom has been one of the stars of the current commission, which will leave office at the end of October. TTIP may have vanished from the agenda—its prospects looked poor even before Mr Trump's election, thanks to America's Democratic Party—but elsewhere the EU has implemented bilateral deals with 15 additional countries, including Canada and Japan. It has also updated existing trade deals with Singapore, Vietnam, Mexico and clusters of countries in east and west Africa. An agreement with Mercosur, the Latin American bloc centred on Brazil and Argentina, is awaiting ratification. Exports from the EU have increased by about 15% over the past five years.

How has all this happened? Three factors stand out. First, the EU's size and strongly pro-trade stance make it a formidable force. In Japan, Canada and Latin America the trade commissioner has found like-minded interlocutors who share the EU's commitment to free trade and are smaller than the EU (and therefore relatively pliant negotiating partners). Second, the EU has maintained the buy-in of its own citizens. Ms Malmstrom has insisted on transparent negotiations, has involved the European Parliament and has imposed European social and environmental standards on the EU's partners. "I'd say we are the most transparent trade negotiator in the world," she insists, noting that: "There were strikingly few protests against the EU-Japan deal." Guntram Wolff of the Bruegel Institute, a think-tank, points to a related EU strength: its relatively generous welfare states cushion citizens from the negative effects of trade and thus curb anti-trade sentiment. Finally, Mr Trump has concentrated minds. The president is broadly disliked in Europe, and in the countries with which the EU has done deals. His anti-trade message has blunted domestic opposition to those accords. It has also made elites in other parts of the world keener to seek refuge in Europe's giant economy.

All three of these factors are now under strain, creating three big problems for Phil Hogan, her nominated successor as trade supremo in Ursula von der Leyen's incoming commission. At the top of Mr Hogan's in-tray will be talks not with smaller, friendly powers but with big, difficult ones. Ambitions for the next few years include an investment agreement with China (which continues to demand openness from others while shielding its own state-led industries), a free-trade deal with India (whose protectionism has stymied talks to date), a deal with a post-Brexit Britain (which remains wedded to the notion of benefits without costs outside the EU) and a deal to cut tariffs with Mr Trump's America (already threatening new levies on European cars and wine).

The domestic picture, too, is becoming harsher. The new European Parliament—which has a veto on trade deals—is more fragmented than the last. It contains a somewhat larger populist component, and Mrs von der Leyen's commission may in certain votes be reliant on the flourishing Greens, who set a high bar for environmental and consumer standards that even the EU's trade deals (green by international standards) may struggle to meet.

Finally, the marginal benefits for the EU of Mr Trump's anti-trade stance are drying up. In future, the American president may make life for free-traders much harder. He could yet bring down the entire WTO, leaving the EU reliant entirely on bilateral deals. And his trade war with China could yet force the Europeans to pick sides—something they are understandably loth to do.

Time to take the lead

All of which will not be easy, concedes Ms Malmstrom, but can be managed. Transparency and better measures to combat the negative effects of free trade can suppress European voters' protectionist instincts. Internationally, she insists that "the EU can lead if it has allies." It has good friends in the likes of Canada and Japan; deals with others such as Australia and India remain to be done. The commissioner notes hopefully that American politicians and businessmen continue to troop through Brussels preaching co-operation. Even China, though cynical and defensive, does not want the WTO system to collapse, and might be willing to work with the EU to keep it alive or replace it if America walks out.

The biggest challenge will be psychological. The EU does not usually have to think much about the shape and character of the world economy. That was America's job: a reality rooted in a post-war order whose emergence began with the Normandy landings that Ms Malmstrom fears Mr Trump is forgetting. Yet today, with the president cutting America off and escalating tensions with a more assertive China, leadership is scarce. Under Ms Malmstrom, Europe has acquitted itself pretty well. To continue to do so as the going gets choppier will take a new self-confidence. The old continent must learn to lead. ■

How Europe sees Brexit
Watchers in the dark

Watchers in the dark

Europe ponders how to avoid blame for no-deal

As the courts are drawn into the argument, there is still no sign of an alternative proposal to the rejected deal

Print | Britain Sep 12th 2019

IT IS UNUSUAL for European diplomats to become obsessed with British constitutional niceties. But recently they have watched Westminster with rare attention—and growing concern. Some gloat over the chaos of Boris Johnson's government, after it lost six Commons votes, its parliamentary majority, a clutch of Tory MPs and two ministers. Yet many are also alarmed by Mr Johnson's bullheaded insistence on leaving the EU on October 31st, "do or die", meaning deal or no-deal.

One example concerns the new law requiring Mr Johnson to seek the EU's agreement to extend the Brexit deadline rather than accept no-deal. His claim that he would rather be "dead in a ditch" than do this is seen as a threat to the rule of law. A second is the early suspension of Parliament, which many believe was done solely to avoid further scrutiny of the government by the legislature. On September 9th Scotland's highest court seemed to endorse this view by ruling that Mr Johnson's advice to the queen to suspend Parliament so that he could prepare a new legislative agenda was unlawful—in effect, accusing the prime minister of misleading the monarch.

The government is appealing against the judgment to the Supreme Court, which will hear the case next week with appeals from similar cases in England and Northern Ireland. The English judgment was that suspension was a political not a justiciable issue, and the Supreme Court may well agree. Some lawyers suggest it could even endorse both judgments, because Scottish law differs from English law.

Claims that Mr Johnson has misled the queen reverberate in Brussels. Next week marks 30 days since Mr Johnson met Germany's Angela Merkel, who seemed to set this deadline for finding an alternative to the Irish backstop that the prime minister wants to excise from Theresa May's withdrawal agreement. Yet no British proposal has been made.

When Mr Johnson met Leo Varadkar in Dublin this week, he claimed to be working for a deal and called no-deal a "failure of statecraft". His government's "Yellowhammer" analysis of no-deal, published on September 11th, talks of possible food, fuel and medicine shortages, lorry tailbacks and the risk of civil disorder. But the taoiseach insisted that no backstop would mean no-deal, adding that it was impossible to replace a legal guarantee of no hard border in Ireland with a mere promise.

Diplomats report that twice-weekly talks are now taking place with Mr Johnson's EU adviser, David Frost. In late August there was even talk of adjusting the backstop by narrowing it to agrifoods or setting a time limit. The EU would also happily apply the backstop only to Northern Ireland, not the whole UK. A Northern Ireland-only backstop was originally in Mrs May's deal. It was replaced by a UK-wide backstop because the Democratic Unionist Party, which propped up her majority, insisted on no new border checks in the Irish Sea. Since Mr Johnson now has no parliamentary majority, the DUP is in a weaker position. Some of Mr Johnson's advisers want to revert to a Northern Ireland-only backstop.

Yet the EU has hardened its position on Brexit, for three reasons. The first is that Mr Johnson has added new demands. He wants to drop promises to maintain a level playing field for regulations and distance Britain from future defence co-operation. These promises are in the political declaration about the future relationship, not the withdrawal agreement, but backing away from them still sends an unwelcome signal. The EU is clear that, without level-playing-field guarantees, it cannot offer a Canada-style free-trade deal to Britain for fear of being competitively undercut.

Second is Mr Johnson's loss of parliamentary control. Just as with Mrs May earlier this year, EU negotiators fret that any concession they may offer will still see the Brexit deal rejected in Westminster. They have noticed that MPs are better at saying what they are against than what they are for. They know many Tory MPs oppose Mrs May's withdrawal agreement even without the backstop. And they see a rising prospect of an early election that Mr Johnson is by no means certain to win.

Third is the law to force the prime minister to seek an extension if no deal is reached by October 19th. For all Mr Johnson's threats to ignore it, EU leaders expect that, without an agreed deal, they will indeed be asked to extend the deadline. And although many are fed up with Brexit and would need a good reason for yet another extension, nobody is likely to veto one, if only because the EU wants to avoid any blame for no-deal. For the same reason, suggestions that Mr Johnson might scupper an extension by threatening to behave badly, refusing to nominate a commissioner or asking a friendly leader to block one, are unlikely to prove correct. If no-deal happens, the EU wants it to be clear that it is by British choice, not by necessity.

A similar argument is heard against Mr Johnson's repeated claims that the EU will give him what he wants only at the last minute if he credibly threatens no-deal. The EU does not function with a gun at its head, says one diplomat, adding that in this case the gun is anyway pointed at Mr Johnson himself. It is true that nobody wants no-deal, which would damage European exporters as well as Britain. But EU leaders value even more the interests of Ireland, the integrity of the single market and the laws underpinning it, and the need not to be seen giving in to bullying.

What will happen when the European Council meets in Brussels on October 17th? It seems clear that there will not be a British election beforehand, so EU leaders know they will be facing Mr Johnson for the first (and, some hope, last) time. Some diplomats fear that he might produce a proposal only at the meeting in hopes of bouncing the summit into agreement rather than risk a no-deal outcome. Yet without proper preparation, summits are not good places to conduct detailed negotiations. Instead, the leaders are likely to offer to extend the October 31st deadline to the end of January—and then wait for an election.

Mr Johnson's team still insists Brexit will happen on October 31st. Yet a deal is a long way off. And Parliament's intervention means a no-deal Brexit then also looks unlikely. The prime minister seems to want to fight an election in which he styles himself as the champion of the people against an anti-Brexit establishment, a category into which Brexiteers now lump the courts, along with Parliament, the civil service, the Bank of England and others.

He may win on such a platform, although the polls are volatile. But if he does, he will face the same demands in Brussels. Only if he comes up with a credible, legal alternative to the Irish backstop that can pass in Westminster will he get a Brexit deal. It will still be a tall order. ■

Speaker muted

John Bercow is ousted—but the government will not choose his successor

By retiring now, Mr Bercow ensures the next Speaker will be chosen by the current lot of hostile MPs

Print | Britain Sep 14th 2019

JOHN BERCOW was tearful when he announced his decision to retire on October 31st, or at a general election if that comes sooner. But as a connoisseur of political theatre he must have relished the rest of the day. MPs spent much of it singing his praises, sometimes in the most unctuous terms. Then at 2.30am, as Black Rod ceremonially prorogued Parliament, MPs tried to pin Mr Bercow to his chair, wielding placards saying “Silenced”. The Speaker reluctantly went along with the ceremony, but not before denouncing the prorogation as a constitutional abomination. Someone placed a “Silenced” placard on his empty chair.

Mr Bercow has built up a following, at home and abroad, in his ten years in the Speaker’s chair, the longest stint since the war. A diminutive figure, he nonetheless dominated the House of Commons through force of personality and sheer lung-power. He enjoyed elongating words (“Orrrdurrr”), using Dickensian phrases (“chuntering from a sedentary position”) and calling on obscure MPs with odd names (“Mr Peter Bone!”).

But he has been a divisive Speaker as well as a colourful one. He is accused of bullying his underlings and then, last year, frustrating an investigation into his behaviour (he denies wrongdoing). He has empowered MPs, creating chances for them to interrogate ministers; in his farewell speech he described himself as the “backbenchers’ backstop”. During the recent Brexit frenzy he stopped the government ramming its policies through the legislature. Yet his critics say he is an anti-Brexit partisan, willing to tear up precedent and ignore expert advice. Almost all the MPs who sang his praises this week belonged to the opposition.

There is no doubt that Mr Bercow is a Remainer. But the accusation of left-wing bias is debatable. He was originally elected as a Tory. The theme of his speakership has been support for MPs, not for Labour. Before the referendum he championed the rights of pro-Brexit Tory backbenchers. This week’s ruling by the Scottish courts against proroguing Parliament lends independent support to his view of the matter. The problem is not Mr Bercow but the way the referendum is testing all Britain’s institutions.

The Conservative Party is nonetheless so fed up with Mr Bercow that it intended to break with convention by contesting his seat, Buckingham (a safe Tory constituency), at the next election. His decision to retire not only deprives the Tories of the pleasure of taking his scalp. It also ensures that the job of appointing his successor will fall to this parliament, with its resurgent anti-government alliance, rather than the next.

Nine candidates are vying to replace him, including Sir Lindsay Hoyle, his deputy, and Harriet Harman, the Mother of the House. Whoever wins must deal with the bullying and abuse that has plagued the House for so long and which Mr Bercow, for all his Brexit heroics, failed to tackle.

Labour pains

What lies behind the strike that has grounded British Airways

An acute shortage of pilots has turned into a glut

Print | Britain Sep 12th 2019

ON A NORMAL Monday morning Terminal 5, Heathrow airport's busiest, is a hive of activity. Over 100,000 passengers arrive or leave for more than 150 destinations. But on September 9th its departure halls were almost completely abandoned. The only flights taking off were to Cairo, Madrid and Tokyo. The reason was a two-day strike by British Airways (BA) pilots and their union, the British Airline Pilots' Association (BALPA). The walkout, which grounded almost 1,700 flights due to carry at least 280,000 people, was the first ever pilot strike at BA. BALPA threatens more—on September 27th and then other dates stretching until January. But far from showing the growing clout of pilots' unions, their battle for better pay exposes their rapidly weakening position.

At first glance, it would seem that BA's pilots have little to complain about. In July they rejected a pay deal which would have increased their salaries by 11.5% over three years—more than average pay in Britain is forecast to rise over the period—and which would have taken the annual pay of a long-haul captain to over £200,000 ($248,000).

But BALPA says its pilots also want a share of BA's profits. During the last recession, in 2008-09, its members accepted a 2.6% pay cut and saw some extra allowances slashed when times were tough. So BALPA now says its pilots deserve to benefit from the carrier's more recent success. After losing £531m in 2010, BA swallowed Aer Lingus, Iberia and Vueling, and since 2014 the combined group, IAG, has made more profit in absolute terms than any other European airline group. IAG's announcement in February that it made record profits of €2.9bn ($3.2bn) last year was a red rag to BALPA's bulls.

BA's refusal to budge on pay has puzzled analysts. BALPA claims the two sides were just £5m a year apart when the talks collapsed. BA claims the last-minute proposal BALPA put forward to avoid the strikes would have cost it £50m a year. But even that looks something of a bargain compared with the cost of the strikes. Alex Cruz, BA's chief executive, has admitted that the cancelled flights will "punish the brand". Damian Brewer, an airline analyst at RBC Capital Markets, estimates that each day of strikes will cost IAG €50m.

BA is not the only airline with which BALPA is in dispute. Ryanair, Europe's largest low-cost carrier, is also feeling its pilots' new-found assertiveness keenly. In 2017 it was forced to recognise unions for the first time, after a shortage of pilots had forced it to cancel 20,000 flights that autumn. And this summer it has been hit by a long run of industrial action. Last month its British pilots called five days of strikes, and on September 4th they announced seven more days of walkouts.

Yet the rapid growth of Europe's airline industry, which created the shortage of pilots that unions are trying to exploit, is coming to an end. In each of the past four years global passenger numbers grew by 7% or more. But in the first half of 2019 the rate fell to around 3.5% because of slowing economic growth and the grounding of Boeing's 737 MAX planes, due to safety problems. Ryanair and Norwegian, a low-cost rival, have now hired and trained too many pilots, and in Britain are trying to lay off hundreds of them. Several European airlines have gone bust over the past year, including WOW Air of Iceland, Flybmi of Britain and Primera Air of Latvia, leaving lots of pilots scrambling to find work. Last month Ryanair announced that pilot turnover had "dwindled to zero"—a clear sign that an employees' market had become an employers' one.

Unfortunately for passengers, that is unlikely to bring a swift resolution to BA and Ryanair's disputes. BALPA wants to get as good a deal as it can for its members before the glut of pilots gets worse. And Mr Cruz is worried that if he gives in to the pilots, cabin crew and ground staff could start making similar demands. With increasingly sluggish demand for air travel and a possible no-deal Brexit threatening to dent profits over the next year, he wants to defend his margins. Passengers should buckle up for more disruption. ■

Hire education

Britain signals an about-turn on immigration

Foreign students will be allowed to work for two years after study, rather than the current four months

Print | Britain Sep 12th 2019

AS THE TORY leadership election hobbled on, the London *Evening Standard* hoped that Boris Johnson would prove a "big-hearted, optimistic, liberal" leader. They expected that as prime minister he would reassure millions of socially liberal voters who backed Remain. Yet in his nearly two months in Downing Street, the liberal Mr Johnson has been absent. His authoritarian alter-ego has stolen the show by suspending Parliament, ditching plans to abandon short prison sentences and delivering a speech in front of a phalanx of uniformed coppers. When he droned on for so long that one of them fainted, he didn't look terribly big-hearted either.

This week the liberal returned—at least for a day. On September 11th he announced that foreign students will be allowed to stay in Britain for two years after their degrees while working or looking for a job, rather than the current four months. It is the most significant sign yet that Mr Johnson's government will abandon the hostile approach to immigration favoured by his predecessor, Theresa May.

Foreign students could stay for two years after their studies until 2012, when Mrs May, then the home secretary, introduced the current limit in an attempt to cut net migration. Mr Johnson's government is "explicitly moving away from the focus on reducing numbers," says Robert McNeil of the Migration Observatory at Oxford University. The new policy is also significantly more liberal than that recommended by the government's independent migration advisory committee.

It is good news for universities. Britain has long been a destination of choice for foreign students, thanks to tuition in English and the cachet of its institutions. Though it remains the second-most favoured destination (see chart), it has lost market share in recent years. Indians, in particular, have switched to countries with more generous options for post-study work. Foreign students already account for a fifth of places in Britain. The relaxed rules should tempt many more of them.

Vice-chancellors are especially keen on students from outside the European Union, who pay the full cost of their degree, rather than the £9,250 ($11,400) per year that universities can charge Britons and other Europeans. The number of Asian students looking to study abroad is booming, thanks to growing wealth and connectedness. The British government hopes to increase the number of foreign students from about 450,000 to 600,000 by 2030.

Employers are cock-a-hoop, too. The current rules leave them a brief window to find good graduates to sponsor or risk them going home. The new scheme gives firms and graduates the time to "try before you buy", says Ian Robinson of Fragomen, a law firm. The overall impact on the labour market will be slight, since only 40,000 or so students a year took up the two-year period before it was abolished. But it will give firms a bigger pool of workers with desirable skills. Far more international students plump for business or engineering degrees than courses in history or philosophy.

And the policy is the most significant attempt yet by a Leaver to follow through on the commitment to create an outward-looking "global Britain" after Brexit. Exporting education boosts Britain's soft power around the world. More heads of state and government (58) were educated in Britain than in any other country, according to a study in 2017 by the Higher Education Policy Institute, a think-tank. As Brexit roils the country, at least there are some lessons Britain can still teach. ■

Divided they fall

How pacts and tactical voting could sway the coming British election

Nigel Farage makes the Tories an offer they can refuse

Print | Britain Sep 12th 2019

NIGEL FARAGE came bearing gifts. The Brexit Party, jogging along at about 14% in the polls, would step aside for the Conservatives in seats across the country, provided the Tories backed a no-deal exit from the European Union, he proposed. The price? The Conservatives would have to give Mr Farage's party a free run at 80-90 seats in the Midlands and the north, where the Leave vote was strong but residual antipathy to the Tories is stronger. "Does Boris have the courage?" read the kicker of a wraparound advert by the Brexit Party on the front page of the *Daily Express* on September 11th.

Downing Street quickly slapped down the idea. The Brexit Party leader and his ilk "should never be allowed anywhere near government", declared one senior Tory source. Pacts in British politics tend to come to naught. Yet rumblings about a deal will continue until an election is called. The UK Independence Party, Mr Farage's old outfit, came second in 120 constituencies in 2015, with 12.6% of the vote. If current polls bear out, the Brexit Party's performance could determine the winner of the next election.

The rarity of pacts in British politics is in some ways surprising. After all, they can work. In a by-election in Brecon and Radnorshire in August, a Liberal Democrat beat the Conservative candidate by 1,400 votes, after the Green Party and Plaid Cymru, which had won 3,000 votes between them in 2015, sat it out. The Brexit Party would have comfortably won a by-election in Peterborough in June if the Conservative Party had stood aside. Instead, Labour squeaked home by 683 votes.

Political tie-ups do not come easily. MPs, aides and activists spend all day plotting against other parties. Asking them to work together for a few months before an election is not natural. Campaigners fear that sitting out one election will leave them playing catch-up in the next one. Mr Farage is heartily disliked by Dominic Cummings, chief adviser to the prime minister, who sees the Brexit Party leader as political kryptonite for middle-class voters.

Pacts also come with big risks. First-past-the-post generously rewards the two largest parties, providing a big incentive for Labour and the Conservatives to stamp out smaller challengers, lest they end up usurping them. Nor is teaming up with another party risk-free for the smaller entity. After the Lib Dems entered a coalition with the Conservatives in 2010, voters rewarded them by kicking out all but eight of their 56 MPs at the next election.

Party pride and political practicality leave tactical voting as the most viable way for parties to work together against a common enemy. In 1997, tactical voting by Labour and Lib Dem supporters cost the Conservatives about 30 seats, points out Peter Kellner, a pollster. This year, with polls predicting a close-run election, a handful of seats may determine the fate of the country. Well-organised campaigns that back staying in the EU are preparing a propaganda onslaught aimed at making Remain supporters back the right horse, just as Mr Farage is attempting to corral Leave voters into one camp.

Not all in the Conservative Party are resistant to Mr Farage's charms. The Brexit Party leader has already promised not to field candidates against the self-styled "Spartans", Conservative MPs who opposed the Brexit deal all three times it was put before the Commons. The concern of those hardline Tory MPs is leaving the EU, rather than the electoral health of the Conservative Party—better a Brexit Party MP with their heart set on a "no-deal" Brexit than a Tory candidate who might compromise. An unofficial pact, with Conservative candidates playing dead in certain no-hope constituencies, is possible, suggest Tory aides. This would help the party to limit its loss of support among liberal Conservatives, who would blanch at a formal deal with the likes of Mr Farage.

But parties that want a second referendum on Brexit, such as Labour and the Greens, or to cancel it altogether, like the Lib Dems, can do the same. This has happened before. In 2017, Labour and Lib Dem activists did not tread on each other's toes in three marginal seats on the Sussex coast. The unofficial tactics worked: the Conservatives lost all of them. Britain is roughly equally split into two tribes, one which supported Brexit and one which opposed it. The outcome of the next election will be decided by which tribe can marshal its members in the most efficient way. ■

Out with the new

Cabinet churn is disrupting Britain’s government

Ministerial life expectancy in some departments is less than a year

Print | Britain Sep 12th 2019

AFTER AMBER RUDD quit the government on September 7th, Thérèse Coffey became the seventh work and pensions secretary in little more than three years. Since the 2016 referendum the cabinet has been churning, making it harder still to fix problems like Universal Credit (Ms Coffey’s task), scarce housing and rising knife crime.

Floored

What would happen to interest rates after a no-deal Brexit?

The Bank of England has less room for manoeuvre today than it did after the referendum

Print | Britain Sep 12th 2019

IMAGINE THAT you are driving a car during a torrential downpour. You hit a puddle and start to aquaplane. Some drivers would instinctively slam on the brakes. But some petrolheads claim that the best course of action is to accelerate out of trouble. Make the wrong decision and your car could end up skidding off the road.

The Bank of England may soon face a similar dilemma. In the event that Britain leaves the European Union with nothing agreed, should it raise or lower interest rates? Shortly after the referendum in 2016 the bank cut the base rate of interest and launched a round of quantitative easing (printing money to buy bonds). But now it argues that "[t]he monetary-policy response to Brexit, whatever form it takes ...could be in either direction." On September 19th the bank is expected to keep rates at 0.75% for the 14th month running. It may also offer some clues about what it would do if the storm of a no-deal Brexit swept over Britain.

One impact of no-deal would be to damage the demand side of the economy (ie, how much stuff people want to buy). Worries about the future would prompt households to trim their spending. Unemployment might start to rise. Companies would postpone or cancel their investment plans. By cutting interest rates, the bank would lower the cost of borrowing and make saving less rewarding, thereby helping to stimulate demand.

However, rate-setters have less room for manoeuvre than they did after the referendum. Back in mid-2016, consumer prices were growing at 0.5% a year. Now the inflation rate is slightly above the bank's 2% target. Following a no-deal Brexit, sterling would almost certainly fall, further pushing up prices as imports became more expensive. A depreciation of 10% or more in the value of the pound is likely—which, according to a rule of thumb, would increase prices by 2-3%. All else equal, that calls for tighter monetary policy.

There is another reason why bringing out the playbook from 2016 would be tricky. The referendum did not change anything fundamental about the British economy. All laws and regulations in place on June 24th 2016, the day after the vote, were the same as they had been on June 23rd. A no-deal Brexit would be different. Britain's trading relationship with its biggest market would change overnight. The imposition of non-tariff barriers would make it more difficult to do business with the EU market. Ports would gum up.

The shock to the supply side of the economy (ie, what it can produce) could be inflationary. In a speech in 2017 Ben Broadbent, a member of the bank's monetary-policy committee (MPC), suggested that with the European market less accessible, British households and firms might try to source products closer to home. They might buy British cheese, say, instead of the foreign stuff. But domestic producers would not be able to satisfy all that extra demand right away. Faced with more customers for their wares, they might simply raise their prices.

The bank must balance these competing pressures. In the past it has tolerated above-target inflation for a short while, the better to support economic growth and jobs. Mark Carney, the bank's governor and chairman of the MPC, told a committee of MPs on September 4th that "it is more likely that I would vote to ease policy in the event of a no-deal Brexit than not." But, he added, "It is not assured." Other members of the MPC sound even more cautious. Most probably the bank would treat the British economy the way that you should treat an aquaplaning car—neither stepping too hard on the gas nor slamming on the brakes. Anyone looking for radical measures to save the British economy from the consequences of a no-deal Brexit is likely to be disappointed. ■

Bagehot

When two tribes go to lunch

Despite being locked in conflict, Leavers and Remainers have some striking things in common

Print | Britain Sep 12th 2019

THE MOST powerful tool at the political journalist's disposal is the lunch invitation. You take a senior politician out to an expensive restaurant in the hope that good food and hot gossip will loosen the ministerial tongue. This was easier in the days when politicians frequently drank at lunch—and some drank a lot—but remains a stock-in-trade even in these abstemious times.

This columnist recently tried a revolutionary tactic: having lunch with real people rather than politicos. His companions were a small group of Leavers one day and a slightly larger group of Remainers two days later. The first lunch took place in a riverside pub on the border of the Runnymede and Weybridge constituency, in London's commuter belt (Bagehot paid). The second took place in a comfortable kitchen in Vauxhall, in the inner-London gentrification belt (Bagehot sponged). There was nothing scientific about any of this lunching—the groups were assembled on the basis of chance acquaintance rather than psephological profiling. But the encounters nevertheless suggest answers to two pressing questions: how are the tribes organising themselves? And why do they feel so strongly about Brexit?

The groups had some striking things in common. They have both been radicalised by the European question. For the Leavers, radicalisation began with the Maastricht debates of the early 1990s. For the Remainers, it started with the referendum of 2016. Both groups are now super-charged. One Leaver says he is returning to referendum mode and working "24/7". A Remainer says he is in Parliament Square "all the time", despite having a full-time job.

Engagement with Brexit has coincided with disengagement from established politics. The Leavers have all quit the Conservative Party, largely because of its dithering over Europe, but also because David Cameron severed the party from its roots. All but one of the Remainers have left the Labour Party, because of the rise of Jeremy Corbyn and his "ill-disguised support for Brexit". Abandonment has been hastened by the fact that their local MPs are batting for the other side. Kate Hoey, Vauxhall's Labour MP, is a Leaver, while Philip Hammond, Weybridge's MP, backed Remain and is a leading Tory rebel.

Both groups have little time for mainstream media—not just because it is biased (pro-Leave or pro-Remain, according to where you stand), but also because it is unnecessary. Modern technology means you can do it all yourself. Members of both groups constantly share articles that catch their attention. They pore over official reports, forwarding them approvingly if they agree with them or with forensic comments if they don't. They also create their own media. The Remainers have recently posted a series of videos designed to highlight the practical pitfalls of leaving.

The biggest similarity between the groups is that they are both very upset. "I'm not political," says one Brexiteer, "I'm just angry." The Remainers reject the word "angry" and highlight other emotions: "determined", "bereaved", "panic-stricken", "scared". "I feel upended," says one. "Everything I am is being challenged." What is it about the European issue that arouses such strong emotions in people who are enjoying such enviable lives?

For the Leavers, the most emotive subject is democracy. They say they became involved in Brexit politics because they worried that the European Union was a fundamentally anti-democratic project, determined to hand power to unelected elites and reduce Parliament to the status of a borough council. Their involvement was deepened when the elites decided to subvert the result of the referendum by watering it down (Theresa May's strategy) or reversing it completely (via a "People's Vote"). The Remainers have broken the fundamental principle of losers' consent.

For the Remainers, the most emotive issue is deceit. They think the Leavers lied their way to victory by putting inflated numbers on the side of a bus and feeding misleading ads into Facebook. There is a lot of talk about Vladimir Putin and "malign external influences". They also believe that a bigger lie is involved. A cabal of ultra-Thatcherites is using Brexit to tear up the social contract and turn Britain into a "US-style dog-eat-dog dystopia".

Full English Brexit

But again there are striking similarities in what motivates Leavers and Remainers. One regards control. The Leavers think that you need to assert sovereignty in order to regain control of your destiny. Weybridge has suffered serious shortages of doctors, school places and housing because of an influx of eastern Europeans which, thanks to free movement, the country cannot control. The Remainers think you need to be able to pool sovereignty into a larger entity in order to combat global companies, particularly American internet giants.

The second similarity is a vision of England. For most of the people gathered in the pub or around the kitchen table, the issue is not so much Europe as Britain. The Leavers think that a country which pioneered parliamentary government and individual rights is becoming a "slave state to the EU" (they repeatedly point out that the Magna Carta was signed at Runnymede, in their constituency). The Remainers think that a country which embodied the principles of humanity and generosity in the post-war welfare state is being vandalised. "Our sense of what it is to be British—fair play, decency, compassion for the poor—is being challenged."

The existence of groups like these across the country makes the result of the next election unusually hard to predict. Both tribes are much more interested in Brexit than in anything else. Both are self-organising entities with their own networks and newsfeeds. And both are adamantine in their commitment. The Leavers are perhaps the wildest card in an election of wild cards. They have time on their hands, thanks to retirement, and sophisticated national networks, thanks to Silicon Valley. The youth-obsessed media ignores the power of these greying activists at its peril. ■

Drug shortages
The parrots eat ’em all

The parrots eat ’em all

A dire scarcity of drugs is worsening, in part, because they are so cheap

Many generic drugs have too few manufacturers

Print | International Sep 14th 2019

FOR MOST people, a good belly laugh is a wonderful thing. For Rachel Rothwell, it can literally cause her to crumple to the floor. She suffers from cataplexy, a condition whereby strong emotions, such as joy or anger, paralyse the muscles, prompting complete physical collapse. For the past nine years, a medication called clomipramine has alleviated her symptoms. So effective was the medication she almost forgot she suffered from the disease at all.

In April, however, the drug vanished from the shelves of the pharmacies in Calne, in southern England, where she lives. Initially she was able to get her hands on supplies in towns nearby, but within a month it was nowhere to be found. Ms Rothwell’s doctor prescribed a different medicine, but it took months to calculate the correct dose for her. In the meantime, her symptoms returned.

Clomipramine is on Britain’s official list of drugs to be stockpiled by pharmaceutical firms in preparation for Brexit, the country’s looming departure from the European Union. For some reason, not everyone is confident that Brexit will go smoothly. So some Britons with chronic illnesses are hoarding drugs on which they depend. Yet the scarcity of clomipramine has little to do with Brexit. The drug has been in short supply around the world as a result of manufacturing problems at Teva and Mylan, until recently the only two companies that supplied Britain.

Ms Rothwell’s experience has become painfully common. Over the past three years the number of medicines in short supply in America has increased by half, to more than 280. In a survey in 2018 of more than 700 hospital pharmacy managers, 70% said that on at least 50 occasions in the past year, they were unable to provide doctors and nurses with the drugs needed to treat their patients because of wider shortages. Last year the American Medical Association urged the federal government to treat the dearth of medical supplies as a national-security issue, which would enable the government to offer incentives to domestic producers.

America is not alone. In France shortages in medications increased 20-fold between 2008 and 2018, according to the country’s drug regulator. Local pharmacists in Europe spend five to six hours a week trying to track down medicines for their customers in other dispensaries because they themselves have run out, or trying to identify suitable alternatives. Reports from doctors and other health workers in 21 EU countries in 2018 suggested that shortages are growing more acute.

Data from poor countries are more limited but shortfalls in America or Europe often flag up a worldwide shortage, says Jayasree Iyer from the Access to Medicines Foundation, a Dutch charity. When supplies are squeezed, drug firms flog their products first to rich countries since they command higher prices there.

Medical staples, such as injectable antibiotics and saline solution (which is used to prepare injections), run out most often. But a wide variety of medicines, including common anaesthetics and drugs for epilepsy, heart disease, cancer and schizophrenia, have run low of late. The products affected are mostly generic drugs, which make up 90% of prescriptions in America and 70% in Europe.

The consequences can be dire (see chart). Cancer treatments and operations may be delayed or cancelled. When a last-resort antibiotic is unavailable, an otherwise treatable infection can be deadly. Alternative drugs, if they exist, usually involve different doses. That can lead to mistakes, such as doctors administering the wrong number of ampoules. One in five pharmacists in America and a third in Europe say they know of medication errors linked to drug shortages.

Medications most commonly vanish from pharmacies as a result of manufacturing problems in the factory that makes the drug or its active ingredient. Roughly 40% of generic drugs sold in America have just one manufacturer each. That means that a snag on a single production line can trigger a worldwide shortage.

The low price of generic drugs (a single vial or blister pack may cost as little as $1) explains the dearth of competition between their makers. The problem is particularly acute for older drugs, such as penicillin or morphine. On the day a drug’s patent expires, a dozen or so generic pharmaceutical companies stand ready to make it. Price competition is so intense that within a decade there are almost no profits to be made, often leaving just a single manufacturer. They then keep prices low to discourage new competitors from entering the market.

The pressure to reduce the prices of generic medicines has led to an increasingly fragmented and globalised production process. It is not unusual for a single drug to involve a ten-step process (which includes milling, blending and filtering chemicals several times to get to the final formulation). The cheapest way of doing that may involve factories in three or four countries. But as production chains become more diffuse, they also become more fragile and less transparent. Researchers are not always able to find out which company makes a given drug or where factories are located, says Erin Fox of the University of Utah, who tracks shortages. Such information is considered to be proprietary for the company that holds the sales licence. A glitch early in the supply chain that portends a shortfall may not become apparent until the last minute.

The active chemicals for many medicines also have just a handful of manufacturers. These are increasingly based in India or China, where recalls of poor-quality products are common. The recent discovery of contamination in a Chinese factory making valsartan, the active compound in a widely used blood-pressure medication, has led to the withdrawal of dozens of drugs in at least 22 countries, mostly in Europe. That particular factory, it transpired, made half of the world's supply of valsartan. An ongoing global shortage of piperacillin-tazobactam, a last-resort antibiotic, was sparked by an explosion in 2016 in another factory in China—which left a sole source for one of the active ingredients.

Slim profit margins mean manufacturers are unwilling to shell out for factory upgrades. As a result, mechanical breakdowns are more likely. Some of America's drug shortages in the past decade have been traced to facilities that have been in operation, with limited improvements, since the 1960s. When regulations demand costly upgrades, some manufacturers simply shut them down.

Such disruptions, even if temporary, are troublesome. Other factories cannot immediately pick up the slack. The typical lag between an order being placed and the pill being made is a year, says Markus Krumme of Novartis, a Swiss drug firm. Injectable medicines are particularly finicky to make because every piece of equipment involved must be meticulously sterilised. Repurposing existing factories to make such drugs can take years. Similarly, the manufacture of some antibiotics and cancer drugs requires dedicated equipment—and even buildings—which cannot then be used to make other medicines. Shortages of some critical medicines in America have been so acute that its drug regulator has resorted to such desperate measures as allowing the distribution of a liquid medicine containing glass particles—with instructions for doctors to use a filter to remove them before use.

International aspirinations

In Europe the nature of contracts between bulk buyers of medicines and manufacturers exacerbate the difficulties caused by breakdowns. Procurement contracts for medicines are often at a national or provincial level. Tenders for these contracts are typically done every year. With contracts lasting for such short periods, manufacturers see no reason to invest in new production plants, says Adrian van den Hoven of Medicines for Europe, a generic-drug-industry lobby group.

If long supply chains bring one kind of risk, the clustering of factories in a single place brings another. Puerto Rico, an American territory in the Caribbean, is home to one such cluster. When two hurricanes blasted the archipelago in 2017, half of the world's ten biggest drugmakers were affected. Storm damage to Puerto Rican factories limited the supply of 11 of the world's 20 most popular drugs. Nobody knows how many other vulnerable clusters now exist.

The panic around shortages has reached fever pitch, says Ms Iyer—so governments are scrambling to find solutions. Some countries are pondering paying more for critical older medicines to secure their supply. America's drug regulator has begun to expedite the approval of new production lines for scarce drugs. That should make it easier for new manufacturers to enter the market. France has just published a plan for managing shortages, calling for incentives to bring the production of active pharmaceutical ingredients back to Europe by 2022. Other governments are drafting special trade agreements with neighbouring countries to speed up the import of drugs when there is a deficit.

In desperation, some have suggested that the supply of medicines should no longer be the exclusive preserve of big drug firms. Exasperated by constant shortages in the world's biggest pharmaceutical market, American hospitals are entering the drugmaking business. In 2018 a partnership of hospital groups which together cover a third of hospital beds in America set up Civica Rx. Its mission is to secure availability of essential drugs through contracts with manufacturers that last between five and ten years, and which include provisions for six months of buffer stocks.

The organisation's first contract, with Xelia, a Danish drugs firm, is for vancomycin and daptomycin, antibiotics for highly resistant infections. Xelia will also make vancomycin's active ingredient in factories in Europe; until recently, it all came from China. In the future Civica Rx hopes to set up its own manufacturing facilities in America and to add more than 100 drugs to its portfolio.

Recent innovations in drug manufacturing may also alleviate the problem. At the Novartis campus in Basel, Switzerland, sits one of the world's few continuous-manufacturing drug facilities, built in 2017 and developed in collaboration with the Massachusetts Institute of Technology. It is the size of a small apartment but carries out the work of a large factory. In a traditional facility, drugs are made batch by batch and every step of the process involves transferring material between a series of giant pots. If a contaminant is found in one pot, the entire batch is discarded. With continuous manufacturing, quality is monitored non-stop by equipment that tests the chemicals as they flow through the system.

According to Novartis, this new system can cut production time by 90% and costs by half. That will make it easier and quicker to spin up new factories when they are needed. That cannot come soon enough for patients like Ms Rothwell. ■

Ubiquitous computing

Drastic falls in cost are powering another computer revolution

The Internet of Things is the next big idea in computing

Print | Technology Quarterly Sep 12th 2019

THE INTERNET OF THINGS (IoT) is a clumsy name for a big idea. It holds that, despite all the changes the computer revolution has already wrought, it is only just getting started. The first act, in the aftermath of the second world war, brought computing to governments and big corporations. The second brought it to ordinary people, through desktop PCs, laptops and, most recently, smartphones. The third will bring the benefits—and drawbacks—of computerisation to everything else, as it becomes embedded in all sorts of items that are not themselves computers, from factories and toothbrushes to pacemakers and beehives.

The magic of computers is that they provide in a machine an ability—to calculate, to process information, to decide—that used to be the sole preserve of biological brains. The IoT foresees a world in which this magic becomes ubiquitous. Countless tiny chips will be woven into buildings, cities, clothes and human bodies, all linked by the internet.

Up close, the result will be a steady stream of quotidian benefits. Some will arise from convenience. Microchipped clothes could tell washing machines how to treat them. Smart traffic systems will reduce waiting times at traffic lights and better distribute cars through a city. Some will be the sorts of productivity improvements that are the fundamental drivers of economic growth. Data from factory robots, for instance, will allow algorithms to predict when they will break down, and schedule maintenance to ensure that does not happen. Implanted sensors will spot early signs of illness in farm animals, and micromanage their feeding. Collectively, those benefits will add up to a more profound change: by gathering and processing vast quantities of data about itself, a computerised world will allow its inhabitants to quantify and analyse all manner of things that used to be intuitive and inexact.

One way to understand the IoT says Martin Garner at CCS Insight, a firm of analysts, is by analogy with another world-changing innovation. Over the past century electricity has allowed consumers and businesses at least in the rich world, access to a fundamental, universally useful good—energy—when and where they needed it. The IoT aims to do for information what electricity did for energy.

Taking over

As befits such a dramatic ambition, the heralds of the IOT are fond of very big numbers. Bain & Company, a management consultancy, reckons total spending on it will reach $520bn by 2021. McKinsey, another consultancy, is giddier still about the future: it reckons the economic impact of the IoT could be as much as $11.1trn every year by 2025. Arm, a chip-design firm specialising in the sort of low-power chips the IoT needs, thinks there could be a trillion such devices by 2035, meaning that computerised, networked gizmos would outnumber the humans that control them by well over a hundred to one.

Like most futures, a lot of the IoT is already here—it is just not (yet) evenly distributed. The idea of building computers into other things is not new. Nuclear missiles, jet fighters and the billion-dollar spacecraft that carried astronauts to the Moon were all early uses. At first, computers were prohibitively expensive. But costs have fallen steadily and rapidly. The price of computation today is roughly one hundred-millionth what it was in the 1970s, when the first microprocessors became commercially available (see chart). According to figures collected by John McCallum, a computer scientist, a megabyte of data storage in 1956 would have cost around $9,200 ($85,000 in today's prices). It now costs just $0.00002.

Operating costs have fallen, too. Jonathan Koomey of Stanford University reckons that between 1950 and 2010 the amount of number-crunching possible with a kilowatt-hour of energy grew roughly a hundred-billion-fold. That means that even cheap, battery-powered chips now offer performance better than the supercomputers of the 1970s. Giving those computers access to the world is also cheaper. Partly thanks to smartphones, which are packed with everything from miniaturised cameras to gyroscopes and accelerometers, the cost of tiny sensors is dropping. Goldman Sachs, a bank, says that the average cost of the sort of sensor used in the IoT fell from $1.30 to $0.60 between 2004 and 2014.

Over the past few decades those trends have transformed airliners and cars, which have become networks of computers with wings or wheels. They have spread to washing machines and smoke alarms, to thermostats and to medical devices implanted into human bodies. In July, 50 years after the computer-assisted landings on the Moon, Pampers, an American firm, announced Lumi, a sensor designed to be clipped to disposable nappies. It monitors sleep patterns and sends smartphone alerts to parents whenever their little darlings need changing.

To create an IoT you need more than just a trillion cheap computers. You also need ways to connect them to each other. Data on telecoms costs are fuzzier than those on computing. But better technology has cut costs there, too. In 1860, sending a ten-word telegram from New York to New Orleans cost $2.70 (about $84 in today's money). These days, speeds are measured in megabits per second. (A megabit is equal to roughly 2,700 ten-word telegrams). Connection speeds of tens of megabits per second can be had for a few tens of dollars a month. As telecommunications have got cheaper, they have spread. The International Telecommunications Union, a trade body, reckons that 51.2% of the world's population had internet access in 2018, up from 23.1% ten years ago.

The final ingredient is a way to gather all the data that a trillion-computer world will generate and to make sense of it all. Modern artificial-intelligence techniques excel at extracting useful patterns from large quantities of raw data. Ubiquitous communications mean that data gathered by comparatively simple chips can be analysed by much more powerful machines in the data centres that make up the cloud.

Everybody in

Attracted by the lure of new business, and fearful of missing out, firms are piling in. Computing giants such as Microsoft, Dell, Intel and Huawei promise to help industries computerise by supplying the infrastructure to smarten up their factories, the sensors to gather data and the computing power to analyse what they collect. They are competing and co-operating with older industrial firms: Siemens, a German industrial giant, has been on an IoT acquisition spree, buying up companies specialising in everything from sensors to office automation. Consumer brands are scrambling, too: Whirlpool, the world's biggest maker of home appliances, already offers smart dishwashers that can be controlled remotely by a smartphone app that also scans food barcodes and conveys cooking instructions to an oven.

The computerisation of everything is a big topic, and one that will take decades to play out. This report aims to serve as a guide, and to offer a way to think about what such change might mean. It will look at consumer and industrial applications. It will also examine the new sorts of chips that might make the IOT work, which will cost less than a cent each and will be able to harvest the energy they need to run from sunlight or ambient heat.

It will examine the downsides, too. A world of ubiquitous sensors is a world of ubiquitous surveillance. Consumer gadgets stream usage data back to their corporate makers. Smart buildings—from airports to office blocks—can already track the people who move through them in real time. Thirty years of hacks and cyber-attacks have proved that computers are insecure machines. As they spread, so will that insecurity. Miscreants will be able to exploit it remotely and at a huge scale.

The place to start is where the new computing revolution has already made its most visible mark, and where most people will—or do already—encounter the IoT: in their homes, and the consumer gadgets that fill them. ■

Correction: *In a previous version of this article we confused Bain Capital, a private-equity firm, with Bain & Company, a management consultancy. We regret the error.*

Smart homes

Tech firms think the home is the next big computing platform

Many of the technologies needed to make smart homes work already exist

Print | Technology Quarterly Sep 12th 2019

FILM BUFFS will tell you that watching a movie on the big screen is a much more immersive experience than watching it at home. But if Matthew Ball gets his way, that might not be true for much longer. Mr Ball—who used to be head of strategy at Amazon Studios, the tech firm's TV division—spends a lot of time thinking about the future of film and TV. He is especially interested in the possibilities offered by connected, computerised homes.

Imagine an action film, he says, in which a smart television, equipped with the sorts of gaze-tracking cameras already used in smartphones, can wait until it has a viewer's full attention before showing a monster leaping out from behind a door. Or a horror film which commandeers a house's lights and makes them flicker at the appropriate moment, or plays eerie sounds—even whispering the viewer's name—from speakers in another room.

For now, Mr Ball admits that such ideas are experimental. But many of the technologies necessary to make them work already exist. Consumers can buy smart light bulbs, such as Hue from Philips, a Dutch electronics giant, which can be switched on or off by phone or voice and can generate thousands of tones and shades. Viewers of "12 Monkeys", an American science-fiction TV series released in 2015, can download an app that will sync with their light bulbs, automatically changing their colour and brightness to match the mood of an episode moment by moment.

GSMA Intelligence, the research arm of a mobile-industry trade body, reckons that smart homes will be the biggest part of the consumer side of the IoT (see chart). For now, most of the applications are more prosaic than powering a futuristic home cinema. Besides light bulbs, technophile consumers can use voice-activated window-blinds, robotic vacuum cleaners and mattresses that track heart rate, movement and sleep patterns (and also nag you about your poor "sleep hygiene"). Wifi-connected, camera-equipped fridges can let you check their contents from anywhere in the world.

Security is another popular use, says Alexandra Rehak, who heads the IoT division of Ovum, a firm of tech analysts. Smart doorbells have built-in surveillance cameras and motion detectors. Their users can choose to let visitors in by unlocking the door over the phone.

IDC, a market-analysis firm, reckons 833m smart-home gadgets of various sorts will be sold in 2019, a number that it forecasts will double by 2023. Most of these devices sell themselves on a combination of comfort, convenience and cost-saving.

And he built a crooked house

It all sounds good in theory. But Ben Wood, the chief of research at CCS Insight, another firm of analysts, says that installing and maintaining smart gadgets—let alone trying to get them to work together—can be a chore. "It's a very Heath Robinson kind of patchwork, a jigsaw puzzle of connectivity." He should know: besides his day job, Mr Wood is a keen tinkerer who has converted his own house into a home smart enough to win a European award in 2017, complete with voice-activated lighting and windows, room-by-room heating, phone-controlled speakers and a camera-equipped door that can be locked or unlocked from anywhere in the world.

Making it work required installing 2km of network cabling, all of which feeds back into a cupboard containing a set of rack-mounted computers that would not look out of place in a data centre. Another problem is that products from one manufacturer often fail to work well with those from another. Standards do exist: Zigbee and Z-wave are wireless networking protocols designed for the type of low-power radios found in smart-home gadgetry. But many firms either use proprietary standards or implement existing standards in ways that prevent their products working with those from other companies.

Many companies are involved. Tim Hatt at GSMA Intelligence says that telecoms firms are keen to find new, higher-margin businesses rather than simply acting as "bit pipes", so they have built smart-home offerings as well. Vodafone, a telecoms company, advertises the V-Home hub as a central control point for smart-home devices. SK Telecom, a South Korean firm, has the Nugu. AT&T, an American company, offers its Smart Home Manager. Others are startups, such as Wink, which launched with backing from General Electric. In Britain, even British Gas, a former state-owned energy monopoly, has got in on the act. It launched Hive, a smart-home ecosystem in 2013.

That fragmentation means risks for early adopters and highlights some of the problems involved in installing gadgets that rely on external services. Last year Logitech, a Swiss company, stopped supporting its Harmony Link smart hub, which was designed to get smartphones to act as universal remote controls. In 2016 Revolv, a smart-home startup that had been bought by Google, announced that its app and home hub were being abandoned, leaving the firm's customers high and dry. "My house will stop working," wrote one disgruntled user.

The companies best placed to solve the fragmentation problem, and thus to dominate the business, are the existing internet giants—and specifically Google and Amazon, thanks to their lead in the fast-growing smart-speaker market. Until fairly recently, says Mr Wood, the assumption was that smart homes would be controlled from phones. But, he says, the reality is different. “Pulling out your phone, unlocking it, tapping an app, then using it to turn the lights on, is much more complicated and annoying than simply walking across the room and pushing a button”. Voice, he says, is by far the most convenient user-interface.

Amazon’s Alexa and Google Home, the two firms’ smart-speaker products, already have greater market penetration than rival smart-home hubs. Canalys, a market-research firm, reckons that 78m smart speakers were sold in 2018, more than double the number in 2017, with Amazon and Google accounting for roughly a third each, and products from Alibaba, Xiaomi and Baidu, a trio of Chinese tech giants, making up most of the rest (see chart). According to surveys, around a quarter of American smart-speaker owners already use them to control at least one other device.

Having a home’s smart gadgets controlled via a central hub simplifies things for consumers. Consumer-goods firms are increasingly keen to ensure that their devices are capable of working with Google and Amazon’s speakers. Many tech firms have set up certification programmes, as well as smartphone-style app stores aimed at third-party developers keen to integrate Alexa and Google Home with their own products.

The tech firms are chasing two prizes, says Ms Rehak. The first is that, through a combination of standardisation and convenience, those who master the smart-speaker market will come to occupy the same dominant position as Google and Apple do in the smartphone market.

The second is that connected homes offer a rich seam of data to be mined for consumer preferences. “What these companies are really good at is making use of data to sell you things you think you want,” she says. Smart televisions report the programmes their users are watching. A camera-equipped fridge might reveal useful information on its owners’ eating habits. Even simple data on when the lights are on can reveal occupancy patterns, or when a home owner is awake or asleep. There are already reports of arguments between smart-device makers and the tech giants over who has access to those data, and how much must be collected.

As for consumers, Ms Rehak thinks that many are still ignorant about the basic trade-off of the smart-home model, in which a service is provided in return for “collecting a whole bunch of personal data”. Even among the cognoscenti, there are differing opinions. “I love this stuff,” says Mr Wood. “But I have some colleagues who refuse to have any of these things in their houses at all.” ■

From the home to the office

Companies are taking advantage of their new ability to track their workers

And, increasingly, their customers too

Print | Technology Quarterly Sep 12th 2019

WHEN SIEMENS, a big German industrial conglomerate, rebuilt its offices in the Swiss town of Zug, it did not skimp on the project's green credentials. Water from nearby Lake Zug is piped in and fed through pumps to heat or cool the offices. None of the materials used in the building came from more than 800km away. Rain that falls on its grass-covered roof is used to flush the toilets.

It did not skimp on technology, either, for the buildings were designed partly as a showcase for the firm's new "Smart Infrastructure" division. High-tech buildings are one of the most common uses of the sensors and distributed computing that make up the IoT. GSMA Intelligence, a research firm, forecasts that industrial uses of the IoT will overtake consumer ones by 2023, with smart corporate buildings leading the way.

Some of the smarts in the Siemens building are there for the workers. An app called Comfy, made by an American firm called Building Robotics that Siemens bought for an undisclosed sum last year, allows workers to adjust temperature and light levels in their offices with their phones. Over time, the system will learn the preferences of individual workers, and automatically warm or cool their offices. The app can also be used to find unoccupied desks, browse the cafeteria's lunch menu, book meeting rooms and flag up any maintenance that might need doing, such as replacing a broken monitor.

Feeling the heat

Other features are designed for managers. The building is studded with hundreds of sensors made by another American company, called Enlighted, which Siemens also bought in 2018. The sensors are integrated with the building's light fixtures, which supply power, and come with a low-resolution infrared camera, a Bluetooth networking beacon and sensors to measure energy consumption, air temperature and light levels. Individual sensors can collaborate with their fellows to establish a wireless network.

Such sensors have all sorts of uses, enthuses Christoph Leitgeb, the building's designer. They can keep track of daylight levels, ramping up the artificial lights on gloomy days and cutting back on sunny ones. The result, reckons Enlighted, can be a 38% saving in energy consumption. Building Robotics claims that better lighting can boost employees' productivity by 23%. The infrared cameras can be used to track employees—or at least, the heat given off from their bodies.

That information can be converted into a heat map of the building, showing popular areas and less-travelled ones, helping managers make the best use of space. Occupancy data can be fed to the heating systems, allowing energy savings when the building is sparsely populated. "It allows us to quantify things that used to be intangible," says Mr Leitgeb.

For now, data gathered by sensors in the Siemens building are anonymous. The cameras see heat blooms, meaning they can record only numbers and general circulation within a building. But more personal tracking is possible, says Mr Leitgeb, via the sensors' Bluetooth beacons, which could track smartphones or building passes. So far Siemens is not making use of that capability—although discussions with its workers "are ongoing".

The firm has big ambitions. "Our goal is to have thousands of buildings like this," says Peter Löffler, head of innovation at Siemens Smart Infrastructure. There are possibilities beyond simple passive tracking, he says. When people are tracked and inventory is kept up to date by beacons on all of a building's equipment, a "digital twin" of the building—essentially a high-fidelity computer model—can tell occupants where to find anything they need. For a busy hospital that could be a godsend.

Another option is to track customers rather than workers. Xovis, a Swiss firm, offers a tracking technology based on computer vision that can tell the difference between men and women; this information can be used to see how they move around a shop differently. It can also be used to measure waiting times at airports. One Florida mega-church uses the system to monitor attendance. BLIP Systems, a Danish firm, offers a similar service using data gleaned from shoppers' smartphones. Markets and Markets, a research firm, reckons the global demand for such "in-store analytics" is growing by 23% a year and will be worth $3.2bn by 2023.

Tracking need not be confined to buildings. Insurance firms have been enthusiastic adopters of the surveillance capabilities offered by connected gadgets. Many insurers have offered discounts to drivers willing to install a black box that collects data from their car on acceleration, cornering, braking and the like, and relays it back for analysis. These days, such additional hardware is increasingly unnecessary. Modern cars are stuffed with sensors capable of measuring everything from engine revs to cornering speeds. Ovum, a consultancy, reckons that 80-90% of new cars sold in the rich world now come with SIM cards fitted as standard, allowing them to stream those data across the mobile-phone network.

The next step beyond monitoring drivers is trying to change their behaviour. Aviva, a big British insurer, offers a smartphone app called Aviva Drive that uses GPS to track customers in their cars. Besides offering lower premiums to careful drivers, the app rewards them with cutesy badges ("Fuel Friendly", perhaps, or "Corner Master") modelled on the "achievements" common in video games, before rating their driving out of ten. Another possibility, says Jon Hocking, who covers insurance for Morgan

Stanley, a bank, might be real-time price adjustment. "It's fair enough to pay for collision insurance while you're driving," he says. "But maybe your premium should be lower when you're parked up on your drive at home."

It is not just car insurance. Customers of Ping An, a Chinese insurer that is the world's biggest, can use the firm's facial-recognition software when registering accounts. One of the data-points extracted from a face is a person's body-fat percentage, which is fed into the algorithm that calculates their life-insurance premiums. In 2018 John Hancock Financial, an American firm, said in future it would sell only health-insurance policies that can make use of data gathered from smartphones or wearable devices such as Fitbits, which track how much exercise policyholders are taking. Beam, an American dental-insurance firm, supplies policy-holders with internet-connected smart toothbrushes. Diligent brushers can save 15% on the cost of their premiums.

Creeping me out

The limits of public tolerance for such nudging and nannying are not yet clear. "There's definitely a crossover point where this goes from helpful to creepy," says Mr Hocking. Morgan Stanley has done surveys asking people what level of price reduction they would require to share their data. He says respondents in Asia were most willing to trade data for a price cut. Westerners were less keen, and Germans the most wary of all.

But grumpy customers will have to contend with the structural imperatives of the insurance business. Companies that collect more data will be better able to categorise customers as low- or high-risk, says Mr Hocking. In the absence of regulators to stop them, firms employing the latest technology will be able to cream off the lowest-risk business for themselves, leaving their slower rivals to compete for the less profitable clients who remain. That offers a powerful incentive for snooping, no matter how intrusive customers may find it. ■

Computerised farming

Sensors and AI are finding their way into the barnyard

With 80m cows in the rich world alone, there's no shortage of potential customers

Print | Technology Quarterly Sep 12th 2019

LIKE ELITE athletes, dairy cows have exacting nutritional requirements. "If you're slightly up on protein, or down on carbs, you'll see a drop in milk production," says Robbie Walker, the boss of Keenan Systems, an Irish firm which makes feed-mixing wagons.

For that reason, the firm's latest products have gone digital. With the help of Intel, a big American chipmaker, Keenan has developed a computer that can be attached to its wagons. Every day the firm's nutritionists load the computer with the herd's dietary requirements. Sensors on the wagon weigh what the farmer puts into the mixer and compare it with what the recipe calls for. "It's a bit like making a cake," says Mr Walker. "Even if you're being careful, you usually put in a little too much of one ingredient, or not enough of another."

The collected data are transmitted over the mobile-phone network to the nutritionists, who can analyse any deviations from the ideal in what the animals were fed. A big deviation triggers a text message to the farmer. Smaller ones are noted, and the feed mix for the following day tweaked to correct any nutritional deficits that might have crept in.

Keenan is not the only firm trying to computerise cattle-farming. Cainthus, another Irish company, is one of several startups hoping to use computer vision to boost farmyard productivity. It uses cameras to track cows in barns and fields, relying on machine learning to analyse the images. The technology is sensitive enough, says David Hunt, the firm's boss, to track individual animals, and to alert farmers if a cow is not feeding when it should be, or moving in a way that suggests it might be sick.

For now, he says, the company is working mainly on Friesian and Holstein cows, whose distinctive markings "mean they're basically walking QR codes", though he hopes to expand to other breeds eventually. The technology works well enough to have persuaded Cargill, an agriculture-focused conglomerate and America's largest private company, to take a minority stake in Cainthus in 2018.

An alternative approach is to put the sensors inside the cows themselves. An Austrian firm called smaXtec has developed a sensor that can be swallowed. It lodges inside the reticulum, one of a cow's four stomachs, and stays there for the rest of the animal's life, monitoring body temperature, movement and stomach acidity, and uploading the results when the cow is near a wireless detector.

When fed to machine-learning algorithms, says Stefan Rosenkranz, smaXtec's co-founder, those data can be used for all kinds of things. They can detect when animals are in heat, and spot the early signs of calving up to 15 hours before it happens. They can identify diseases several days before they become obvious to human observers, allowing early treatment and a 15-30% drop in antibiotic use. A new sensor, due out next year, will add the ability to monitor digestion. Sales are doubling every year, says Mr Rosenkranz. And with 278m dairy cows in the world, there is no shortage of customers.

Throwaway technology

How to build a disposable microchip

Many chips will be embedded into objects like clothes, food and water-treatment plants

Print | Technology Quarterly Sep 12th 2019

EVERY RESEARCH project needs a striking name, and it is hard to think of a better one than “Plastic Armpit”. The idea is to design and build a chip with an electronic nose, which can sample the odours and chemicals in its environment. Such a chip, says James Myers, a senior engineer at Arm, a British-based chip designer, could be usefully attached to all sorts of consumer goods. Its name came from the idea of weaving such a chip into items of clothing, where it could let oblivious wearers know when the need for a shower was becoming urgent.

Despite the jocularity, the project—a collaborative venture between Arm, the University of Manchester, Pragmatic, a firm which makes flexible electronics, and Unilever, a British-Dutch consumer giant—is a serious one. Gartner, a research firm, reckons that 259m PCs were sold last year. Pew, a pollster, puts the number of smartphones in the world at more than 2.5 billion. Arm, whose designs dominate the market for the sorts of low-power microprocessors that go into everything from smartphones to televisions, organises its business around the assumption that there will be a trillion computers in the world by 2035.

Plastic Armpit is an attempt to design the sort of chip that might meet that demand. The goal is to produce a robust, bendable, mass-producible computer, complete with sensors and the ability to communicate with the outside world, for less than $0.01 apiece. A prototype version, shown off at Arm’s headquarters in Cambridge, looks like a stiffer-than-usual piece of tape festooned with circuit traces.

Mr Myers is keen to talk about applications beyond personal hygiene. He points out that such a sensor could be built into food packaging, where it could replace printed use-by dates with an accurate assessment of when the contents of a package had gone off. That, in turn, could help supermarkets and shoppers reduce waste.

The chip in the Plastic Armpit is cheap and simple. Its logic gates, the basic components of information processing, are crude things as big as those that were standard in the 1970s, and it has only 1,000 of them. The sensors, each tuned to a different class of odiferous chemical, are simple too, generating imprecise, rough and ready signals. Most computer scientists would look to the modern cleverness of machine learning to make up for the sensors’ deficiencies. But how to do so on such a simple chip?

Cramming a machine-learning algorithm into such a limited machine required cutting everything to the bone. The chip uses a simple form of machine learning called a naive Bayesian classifier. Flexibility of use was sacrificed, too: to keep things as cheap and simple as possible the algorithm is etched directly into the plastic, meaning the chips are not reprogrammable. A chip designed to monitor the chemicals given off by strawberries would be useless for chicken. “If you want it to do something new, you’ll need to design and print a new circuit,” says Mr Myers.

Since chip design is expensive, and chip designers scarce, he and his team have been working on software tools to simplify that task. The idea is to describe a new algorithm in Python, a widely used programming language, and then have software turn it into a circuit diagram that can be fed into Pragmatic’s chipmaking machines. That approach has attracted interest from DARPA, the Pentagon’s most ambitious research outfit, which is looking into ways to do simple, quick chip design as part of its $1.5bn Electronics Resurgence Initiative.

The Plastic Armpit demonstration model is, for now, powered by a battery. A reliable source of power means the chip can keep a constant eye on the things it is looking after. In future, says Mr Myers, and for applications where only intermittent monitoring is necessary, it should be possible to do without. The chip has an antenna etched onto its plastic substrate to allow it to communicate with the outside world. The idea is that a smartphone, or a specialised wireless reader device, can be held near the chip. The reader emits radio waves that are used to transfer data, but which also induce enough of a current in the chip to jolt it into life (contactless credit cards work in a similar way).

Look, mum, no batteries

Some chips are already capable of harvesting more common sorts of ambient energy, capturing everything from sunlight to heat to vibration. Matt Johnson, a vice-president at Silicon Labs, an IoT-focused American chipmaker, says that, for now, such harvesting is mostly used to supplement a battery rather than to replace it. The chief constraint is wireless data transmission, which uses much more energy than data processing. “But things are improving with every generation,” he says. Soon there will be an “alignment” between what sort of consumption is required and what harvesting can provide. A report in 2018 from Semico Engineering, a market-research firm, reckoned that the market for energy-harvesting devices might be worth $3.4bn by 2022.

Self-powering chips would be especially useful, says Mr Johnson, for situations where battery replacement is a chore—monitoring devices in structures such as bridges or tunnels. It may prove necessary for other reasons, too. Arm estimates that powering each of the trillion chips it forecasts by 2035 with a single button cell, the sort used in watches, would require three times as much lithium (vital to high-performance batteries) as the world produces in a year. After all, says Arm's Paul Williamson, a trillion is "quite a big number, when you think about it". ■

■ *In a previous version of this article, we inadvertently promoted Mr Johnson to CEO of Silicon Labs. He is in fact a vice-president. Apologies for the mistake.*

Cyber security

A connected world will be a playground for hackers

Few companies making connected gadgets have much experience with cyber security

Print | Technology Quarterly Sep 12th 2019

As ways to break into casinos go, a fish tank is an unusual route. Yet that is what was used in an unnamed American gambling house in 2017. It had invested in a fancy internet-connected tank in which the temperature and salinity of the water were remotely controlled. Its owners were not naive: when they installed it, they isolated its controls on their own specific part of their company network, away from all their sensitive systems.

It made no difference. According to Darktrace, a computer-security firm, attackers from Finland managed to break into the tank's systems, then used it as a stepping stone for the rest of the casino's networks. They made off with around 10GB of data.

Computer security is already hard. Everyone from the central bank of Bangladesh to America's National Security Agency has suffered hacks or data breaches. The IoT will make things worse. A world in which more objects are computers is a world with more targets for miscreants.

David Palmer, Darktrace's director of technology, reels off a list of examples. "We've seen corporate espionage between suppliers inside a power station," he says. "One supplier was using [their] access within the network to look at the performance characteristics of another supplier's equipment." His firm also discovered an attack on fingerprint readers that controlled access to a luxury-goods factory, and malware which spread through a hospital department after infecting a connected fax machine.

Other incidents have been spectacular enough to make the news. In 2016 millions of people in America found themselves struggling to reach many websites, including those of Twitter, Amazon, Netflix and Reddit. The culprit was a piece of IoT-focused malware called Mirai. By exploiting a list of default usernames and passwords, which most users never change, Mirai had infected hundreds of thousands of connected devices, from smart energy meters to home CCTV cameras and connected baby monitors.

Each infected gadget became part of a "botnet", a group of computers in thrall to the malware. The botnet then performed a "distributed denial-of-service attack" against Dyn, a company that helps maintain the routing information that allows browsers to reach websites. By deluging Dyn's servers with junk messages generated by the subverted devices, the botnet prevented them from responding to legitimate requests.

But the IoT will do more than simply give hackers new targets. As computers spread into objects that can interact with the physical world, it will enable attacks that endanger life and property.

In 2015 a pair of security researchers from Twitter, a social network, and IOactive, a cyber-security firm, staged a demonstration for *Wired*, a technology magazine, in which they remotely took control of a car while it was being driven. They were able to turn on the stereo and the windscreen wipers, cut the engine, apply the brakes and even, in some circumstances, control the steering wheel. As a result Fiat Chrysler, the car's manufacturer, announced it would recall 1.4m vehicles. Security researchers have demonstrated an ability to hack into medical devices, including pacemakers and insulin pumps.

Hacking an insulin pump would be a convoluted way to kill someone. But less drastic sorts of crime will be possible, too. Ransomware, which prevents use of a computer until cash is paid, is a natural fit for a world where everything is connected. Ransomware for cars or home-lighting systems is a popular near-future prediction at computer-security conferences. Some accidental infections have already happened. In 2018, 55 speed cameras in Victoria, Australia, were infected by a piece of ransomware that was designed to attack desktop computers. In June Avast Software, a Czech cyber-security firm, demonstrated how to install ransomware on a networked coffee machine, making it gush boiling water and constantly spin its grinder until the victim pays up.

Dangers of connection

Companies are aware of the danger. A survey of managers by Bain & Company, a consulting firm, found that worries about security were the single biggest barrier for companies thinking of adopting IoT technologies. Consumers are worried, too. A survey of 2,500 of them by Ernst & Young, a management consultancy, found that 71% were concerned about hackers getting access to smart gadgets.

Patching up the holes will not be easy. One reason is that computers, and computer software, are complicated. Ford's best-selling F150 pickup truck, for instance, is reckoned to have around 150m lines of code. A general rule is that good programmers working under careful supervision average about one bug per 2,000 lines of code. That means that almost any computerised gadget will be riddled with bugs.

Another problem is that few of the companies making connected gadgets have much experience with cyber security—or the incentives to take it seriously. Good security costs money, and the better it is, the less its benefits are visible to the end-user. Attacks like Mirai, in which the costs fall not on the gadget-makers or their owners but on unrelated third parties, muddy things even more. The upshot is that basic precautions are routinely ignored. A paper published in June by Stanford University analysed telemetry from 83m connected devices and found that millions used old, insecure communication protocols or weak passwords.

One option is to learn from others. In February the Industrial Internet Consortium, a trade body focused on industrial deployments of the IoT, published a guide to security written by experts from veteran firms such as Fujitsu, Kaspersky Labs and Microsoft. Another is to outsource the problem to those better suited to dealing with it. Arm has fortified its chip designs with built-in security features, as has Intel, the world's biggest chipmaker.

Big computing firms are trying to turn security into a selling point. Microsoft sees the IoT as an important market for its cloud-computing business. Under the Azure Sphere brand it has developed a security-focused, low-power microcontroller designed to be the brains of a wide range of IoT devices (these are smaller, cheaper and less capable than a microprocessor). Those micro-controllers run a security-focused version of the Linux operating system and communicate through Azure's cloud servers, which have extra security features of their own. Mark Russinovich, Azure's chief technology officer, says many of the security features were inspired by lessons from the firm's Xbox video-gaming division, which has plenty of experience designing hack-resistant computers. Starbucks, a coffee chain whose connected coffee machines can download new recipes, is one early customer.

Governments are getting involved, too. In 2017 America's Food and Drug Administration issued its first cyber-security-related product recall, having found that some wireless pacemakers were vulnerable to hacking. The following year California became the first American state to mandate minimum security standards for IoT products, including a ban on the use of default passwords. Britain's government is mooting similar laws to require manufacturers to provide contact details for bug-hunters and to spell out how long products can expect to receive security updates.

But whereas widget-makers can learn much from the computing giants, some lessons will have to flow in the other direction, too. The computing industry moves at high speed. Smartphones, for instance, rarely receive security updates for more than five years. That sort of institutional neophilia is not going to work with products like cars or factory robots, which can have much longer lifespans, says Mr Palmer. Employing the programmers necessary to provide support for dozens of models for decades, he says, will be an expensive proposition.

Code and the law

Looming over everything, says Angela Walch, an American lawyer who specialises in tech, is the question of legal liability. The software industry uses licensing agreements to try to exempt itself from the sort of liability that attaches to firms that ship shoddy goods. Such an exemption, she says, amounts to an enormous de facto subsidy.

So far courts (at least in America) have been broadly happy to enforce such disclaimers. Ms Walch says any attempt to change that would be fought by the software industry, which has long argued that holding it liable for mishaps would stifle innovation. But that line will become harder to defend as software spreads into the sorts of physical goods that, historically, have not been granted such legal exemptions. "What are we saying?" she asks. "That if buggy software or compromised software kills someone, you won't be able to claim?"

Bruce Schneier, an American security expert, thinks that, in the long run, the consequences of poor security could mean that businesses and consumers reach "peak connectivity" and begin to question the wisdom of connecting everyday objects. He draws an analogy with nuclear energy, which enthusiasts once saw powering everything from cars to catflaps. These days "we still have nuclear power," he writes, "but there's more consideration about when to build nuclear plants and when to go with some alternative form of energy. One day, computerisation is going to be like that, too." ■

When humans are connected

Hugo Campos has waged a decade-long battle for access to his heart implant

What happens when humans are connected to smart machines?

Print | Technology Quarterly Sep 12th 2019

A WORLD FULL of connected sensors will generate huge amounts of data. It will also generate arguments about who can use and analyse those data. For Hugo Campos—an American campaigner whose vital organs are connected to the internet via a medical implant—such arguments have consumed the past decade of his life.

Mr Campos has hypertrophic cardiomyopathy, a disease in which the heart muscle becomes abnormally thick, to the point where it can interfere with the patient's blood flow. In Mr Campos's case, it also interferes with the delicate electrical system that controls how his heart beats. In 2007 he was given an implanted cardioverter-defibrillator (ICD). The device monitors his heart rhythm, looking for dangerous abnormalities. When it spots one, it administers a corrective electrical shock.

Such devices have existed since the 1980s. But Mr Campos's model was one of the first that could be monitored online. "I was really excited," he says. "I remember thinking that I'd be able to get alerts from the device, to see what it was doing. I asked my doctor to point me to the patient website. And he looked at me and said, 'Oh, this is all for us, not for you'." Data from the device were streamed to its maker, Medtronic, and from there to doctors. The patients, for whose benefit the ICD had been designed, had no access, and not just those with heart conditions, says Mr Campos. Similar restrictions applied to people with positive airway-pressure machines (used to treat sleep apnoea) and to diabetes sufferers fitted with connected insulin pumps.

Mr Campos has been lobbying for change ever since. He has had sympathetic press coverage; in 2015 he was honoured by the White House. Yet the data remain locked away. Part of the problem, he thinks, is cultural. "For the manufacturers of a lot of these devices, the patient is not the customer," he says. Instead, companies must persuade doctors and hospital administrators to buy their products, so firms focus on features that appeal to them, rather than to the patients into whose bodies the devices will be put. And, he says, companies question whether patients would be able to make sense of the data even if they were made available.

In 2012 Mr Campos lost his health insurance. Without easy access to a doctor, he took matters into his own hands. He obtained a device from eBay designed to reprogram his ICD and set about trying to hack his way in. Wary of experimenting on his own device, he tracked down an undertaker who would sell him used ICDs which had been removed from bodies before they were cremated.

In recent years, though, that kind of do-it-yourself approach has become harder. The medical-device industry has become more conscious of computer security, says Mr Campos, particularly after an incident in 2011 when researchers at a security conference remotely hacked a pacemaker live on stage. These days, he says, the devices are hardened against intrusion, and the data they stream are encrypted.

Doctors in some areas of medicine, such as diabetes, seem more willing to let patients see what the devices they carry are up to, perhaps because such data can directly help them manage their condition (for example by watching their diet). New entrants, more focused on consumers than doctors, are emerging: Mr Campos points to Apple's latest smart watch, which can detect atrial fibrillation, another sort of abnormal heart rhythm, and which shares all its data with its wearer.

America's medical regulators have been prodding device-makers. In 2016 they confirmed that rules controlling where patient data can be sent did not prevent sharing the data with patients themselves. But Mr Campos is frustrated: "If you'd asked me a decade ago, would I have access to these data by now, I'd have said of course I would. But I don't."

Connected future

The Internet of Things will bring the internet's business model into the rest of the world

For better and for worse

Print | Technology Quarterly Sep 12th 2019

IN JULY THE Bank of England announced that its new £50 note would carry a picture of Alan Turing, a British mathematician widely regarded as the intellectual father of computer science. Along with excerpts from a seminal paper in 1936 and a binary representation of his date of birth, the new note contains a quotation from 1949, when only a handful of computers existed in the world. "This is only a foretaste of what is to come," it begins.

Turing's remark remains true today. Computers have already changed the world in ways that their inventors could never have imagined. Turing could no more have predicted Instagram celebrities and high-frequency trading than Karl Benz, an automotive pioneer, could have predicted suburbs and strip malls. And that is in a world with tens of billions of computers. If predictions about the IoT are correct, that number could rise a hundred-fold.

Clues about what is to come can be glimpsed in changes that have already happened. In the quarter of a century since the internet first became a consumer phenomenon, it has upended businesses. Data are the currency of the online world, gathered, analysed, sold and occasionally stolen in a business model that has built some of the world's most valuable companies—but which is attracting increasingly unfriendly scrutiny from governments and regulators, and which its critics decry as "surveillance capitalism".

Ubiquitous computing offers the companies which master it the ability to mine data from the real world in the way that big tech firms now mine them from the virtual one. The result will be a slow-burning revolution of quantifiability in which knowledge that used to be fuzzy or incomplete or even non-existent becomes increasingly precise. That will give rise to what sports coaches call "marginal gains". A 10% decrease in costs or a 15% cut in energy use are individually unexciting. Put enough of them together, though, and they will amount to a revolution in productivity.

This will change how companies operate. In a world in which more things are computerised, more companies will come to resemble computer firms. In expensive, high-tech industries, where the economics of the IoT have made sense for decades, the results of this are already visible. Rolls-Royce, a big British maker of jet engines, launched its "Power by the Hour" service in 1962, offering to maintain and repair its engines for a fixed cost per hour. Its digital transformation began in earnest in 2002, built around the ability to do continuous, real-time monitoring of its products. Real-time data mean that the firm's engineers can watch engines wear out as they fly. When something needs fixing, they can arrange for repair teams to be waiting on the ground. The firm's data offer flying tips to pilots that can result in fuel savings worth hundreds of thousands of dollars.

A changing business has meant a changing culture. The firm now hires computer programmers as well as aeronautical engineers. It has an internal software division, called r Data Labs, which is run like a startup, to look for new ways to turn the flood of data into new businesses. It even plans to remodel parts of its industrial-looking campus, replacing the low brick buildings with the manicured-lawn-and-mirror-glass architecture popular in Silicon Valley. After all, says Andrew Hutson-Smith, the chief business officer of r, "We're competing with Facebook and Google for staff."

Rolls-Royce is not alone. General Electric, its chief rival in the jet-engine business, offers similar services. As costs falls, the model will spread. At an IoT conference in London earlier this year, companies from TVH, a Belgian firm that makes forklifts and industrial vehicles, to ABB, a Swedish heavy engineering firm, were lining up to describe the benefits of what Alexandra Rehak, an IoT expert at Ovum, a firm of analysts, describes as "servicisation".

Secure beneath the watchful eyes

If ubiquitous computing will turn companies of things into companies of services, the IoT will transform consumers of things into computer users, with all that implies. Like social networks or email, smart gadgets offer convenience and comfort, at the price of turning everything done with them into fuel for an ever more pervasive data economy.

Smart televisions already watch the users watching them, sending back data on programme choices and viewing habits; some even monitor background conversation. These data, sold on to advertisers and programme-makers and crunched by machine-learning systems, subsidises the price of the televisions themselves (which explains why non-connected, "dumb" televisions have become very difficult to buy). Consent is murky. In 2017 Vizio, an American TV-maker, was fined $2.2m by the Federal Trade Commission after regulators found it was not properly seeking users' permission to harvest and resell information on viewing habits.

Nor is it just televisions. Smart scales monitor weight and fat percentage, a gold mine for the fitness industry. IRobot, maker of the Roomba line of robot vacuum cleaners, caused a furore in 2017 when it revealed plans to share the maps its products build up of users' homes with Google, Amazon or Apple (it has since said it would not share such data without its users' explicit consent). Gadgets from high-tech locks to new cars come with privacy policies running to thousands of words (see chart).

Refuseniks might choose not to put such gadgets in their home. But outside, in public places, they will be surveilled anyway. The advertising industry is already experimenting with "smart" billboards, which can use cameras and facial-recognition software to assess people's reactions to their contents. Hundreds of American police departments can request access to video recorded by Ring, an Amazon subsidiary that makes camera-equipped doorbells. Internal company emails also show Ring providing suggested talking points for police officers to help them persuade homeowners to buy its products, and to allow their recordings to be shared. The American Civil Liberties Union, a campaigning organisation, complains that the result is a half-private, half-public, murkily regulated video-surveillance network.

Consumers may discover other downsides. Computerisation allows data to flow from users to companies, but it also allows power and control to flow in the other direction. Most smart-home services require a durable connection to remote servers that can fail without warning. Apple is famously unwilling to allow its customers to have broken iPhones repaired anywhere except in its own shops, going so far as to use software updates to disable replacement touchscreens installed by cheaper third-party fixers. John Deere, an American tractor-maker, has spent four years facing down a rebellion from farmers angry at being subject to similar restrictions. Its products have become so computerised that the firm has argued that farmers no longer own their tractors, but merely purchase a licence to operate them.

We're all surveillance capitalists now

If the IoT continues along these lines, it has the potential to reshape the entire world in Silicon Valley's image. One reading of the history of the internet is that, for all the hand-wringing about privacy and control, they are dogs that have never truly barked. The rise of surveillance capitalism proves that, in the end, consumers are willing to trade their data for the products and conveniences that it offers. A survey in 2016 by the Interactive Advertising Bureau, a trade body, reported that 65% of IoT users seemed happy to see advertising on their devices, presumably in return for lower prices.

Another reading, though, is that the business models of the internet established themselves early, at a time when neither regulators nor consumers properly understood the technologies underlying them, and when not even the most avid techies could have predicted all their implications.

These days, things are different. Blamed for everything from addicted children to nurturing terrorism, Big Tech has lost its Utopian shine. That disillusionment has fed back into gloomy predictions about the IoT. In many ways, that is valuable, for if problems can be foreseen they can be more easily prevented. But if the techno-optimism that infused the 1990s and 2000s now looks naive, the techno-pessimism that is fashionable today can be similarly overdone. Like the original internet, the IoT promises huge benefits. Unlike the original internet, the IoT will mature in an age that has become sceptical about where a connected, computerised future might lead. If it has to earn the trust of its users, it will be the better for it in the long run. ■

Correction (September 17th 2019): An earlier version of this article referred to Mr Hutson-Smith as the "head" of r. He is in fact the chief business officer. Apologies for the error.

Huawei
Piece offering

Piece offering

Ren Zhengfei may sell Huawei's 5G technology to a Western buyer

The Chinese telecoms giant's boss considers creating a competitor for his company

Print | Business Sep 12th 2019

IN AN ATRIUM designed to evoke ancient Greece—ringed by stone columns and six towering approximations of the Caryatids—it was fitting that Ren Zhengfei, chief executive of Huawei, should extend an olive branch to the West: a piece of his company. The palatial edifice on Huawei's sprawling campus in Shenzhen houses an exhibition hall proudly displaying the Chinese telecommunications giant's "fifth-generation" (5G) technology. The ultra-swift, and ultra-coveted, mobile-phone networks will soon connect everything from cars to industrial robots.

It is this 5G technology—central to Huawei's future revenue growth—that Mr Ren said he was ready to share, in a two-hour interview with *The Economist* on September 10th. For a one-time fee, a transaction would give the buyer perpetual access to Huawei's existing 5G patents, licences, code, technical blueprints and production know-how. The acquirer could modify the source code, meaning that neither Huawei nor the Chinese government would have even hypothetical control of any telecoms infrastructure built using equipment produced by the new company. Huawei would likewise be free to develop its technology in whatever direction it pleases.

Huawei has been on a charm offensive this year. It has wheeled Mr Ren out once a month since January for interview bonanzas with international media outlets. But the idea of transferring its 5G "stack" to a competitor is by far the boldest offering to have surfaced. "It's hard to come up with similar precedents in the history of technology," says Dan Wang of Gavekal Dragonomics, a research firm.

Mr Ren's stated aim is to create a rival that could compete in 5G with Huawei (which would keep its existing contracts and continue to sell its own 5G kit). To his mind, this would help level the playing field at a time when many in the West have grown alarmed at the prospect of a Chinese company supplying the gear for most of the world's new mobile-phone networks. "A balanced distribution of interests is conducive to Huawei's survival," Mr Ren says.

No kidding. A months-long assault by America has pummelled the firm, whose global networks it suspects of allowing China to spy on others. America has also attempted to press allies not to use Huawei's equipment as they begin to build their own 5G networks. In May American companies were barred from selling components and software to Huawei on the ground that it posed a national-security risk. Last month America restricted government agencies from doing business with it (the firm is challenging this ban in court).

At first glance, Mr Ren's gesture has much going for it. If the sale eventually gave rise to a thriving competitor, countries such as Australia (which has banned Huawei's gear) would no longer have to choose between, on the one hand, technology in their networks that is both cutting-edge and cheap, as Huawei's is, and, on the other, fears of Chinese eavesdropping. They could have the best technology from an ally instead. Decisions on the purchase of telecoms equipment could then return from politicians to pragmatic boardrooms.

The gesture may also convince those suspicious of Huawei's tech that the firm's business intentions are hard-nosed. Mr Ren says money from the deal would allow Huawei to "make greater strides forward". The value of the firm's entire 5G technology portfolio, if it were sold, could run to tens of billions of dollars. In the past decade the company has spent at least $2bn on research and development for the new generation of mobile connectivity.

In saying he wants to create a fairer technological race, Mr Ren is also attempting to dissociate American security fears from those of Huawei's market dominance. His offer is "essentially calling their bluff", says Samm Sacks of New America, a think-tank in Washington. As she points out, America's government is working out how to create a rival to Huawei, whether by fostering American firms or helping bolster its two main global competitors, Ericsson, a Swedish firm, and Nokia, a Finnish one. Moves are also afoot to make certain components of mobile networks interchangeable with each other, to let carriers mix and match suppliers more easily. OpenRAN, a standards body, wants infrastructure manufacturers like Huawei to agree on standards for the technology in their networks that shuttles data around to make joint operation easier. Huawei has so far declined to join.

Yet questions over the feasibility of the deal abound. Would China accept hiving off a core part of one of its few globally powerful corporations? For better or worse, 5G has become a proxy for superpowerdom. As Mr Ren told *The Economist*, "5G represents speed" and "countries that have speed will move forward rapidly. On the contrary, countries that give up speed and excellent connectivity technology may see economic slowdown."

Even if the Chinese state gave its blessing, who might be the buyer? Mr Ren says he has "no idea". Analysts suspect that giants such as Ericsson and Nokia would balk at an offer out of pride, and would question the value of Huawei's tech. (Having posted losses last year, they are also short of cash.) The technology may not help a smaller firm compete on an equal footing with Huawei. The Chinese company is so well entrenched with big operators, say consultants, that it would not make financial sense for most of them to take on a new supplier. Samsung, a South Korean electronics giant, has deep pockets and a smallish but growing networking-gear business—and without rival bidders, it could drive a hard bargain. A consortium of buyers is possible; who would make one up is unclear, however.

Suitors may be put off by other considerations. If Huawei really is ready to transfer all its technology to another company, then, as Mr Wang points out, "it has to accept the risk of a major competitor in the future". But Huawei's dominance owes as much to technology as to its low prices and the speed at which it can roll products out, says Ms Sacks. Its willingness to serve places Western firms steer clear of is also a factor: who else besides Huawei would wade through malarial swamps in Africa and haul base stations up the flanks of Colombian mountains? Mr Ren knows this. Asked whether he thought that an American firm, with Huawei's precious know-how in hand, would be able to pull it off, he said, with swagger, "I don't think so." But potential buyers know it, too.

Lastly, few believe that a sale would placate America's national-security apparatus, at least in the short run. A new competitor would almost certainly still need to make equipment in China, which produces half of America's telecoms kit. Concerns about Chinese meddling would not go away. And Huawei's latest offensive is not all charm. Last week it accused American officials of committing infractions while posing as Huawei workers, in order to "bring unsubstantiated accusations against the company". It also accused America's government of targeting it with cyber-attacks. That may sour relations.

Could Mr Ren's proposal, then, be a sign of desperation? Not a bit of it, he says. He claims that Huawei has found alternative suppliers for its network-infrastructure business that are unaffected by its blacklisting by America. He denies that the company will make a loss in the coming year.

Nonetheless, the consumer business is under pressure. Half of the company's $105bn in sales last year came from the 208m smartphones it sold around the world. So did an outsize share of profits. This business is in deep trouble. Phones that Huawei sells outside China are desirable communication devices largely thanks to proprietary software available exclusively from Google. Android, Google's mobile operating system, which Huawei uses, is open-source and freely available. But the American tech giant's own apps are not. Because Google is American and its apps are compiled in America, the Commerce Department's ban on sales of American technology to Huawei applies to them.

Mr Ren says that Google has been lobbying the Trump administration to allow it to resume supplying Huawei with proprietary Android software, but so far to no avail. Unless American policy changes, Huawei will remain stuck with the open-source version of Android, without any of the apps that consumers have come to expect. The Chinese firm is in the process of developing its own operating system, Harmony OS, but it will be no rival to the mature Android ecosystem for years to come.

Sandboxed

This means that all new Huawei phones will ship without Gmail, Google Maps, YouTube or, crucially, Google Play Store. The Play Store is what allows Android users to download apps like WhatsApp, Instagram and Facebook easily. WhatsApp in particular has become a standard mode of communication in much of the world outside America. Unless its government lets up, Huawei's new smartphones will be little more than decent cameras that make phone calls. The firm will launch the Mate 30, the first top-end phone since its blacklisting, on September 19th in Munich. Huawei claims its hardware features will buoy sales. But a phone which lacks basic functions is unlikely to be a hit. A weakened consumer business would dent profits.

Huawei's share of the Chinese smartphone market, where it has never relied on Google's apps, is growing fast. But two-fifths of its annual phone sales, or roughly $20bn, come from outside the country. Though the firm's executives repeatedly declined to share any projections, firm-wide revenue growth in the eight months to August slowed to 20%, year on year, from 23% in the first half of 2019. If the Mate 30 and its successors flop, Huawei stands to lose billions of dollars in annual revenue.

Similar supply-chain challenges affect other parts of its business. Its coders are busily writing software tools known as compilers and libraries, themselves used to create the software that powers all manner of electronic devices, not just smartphones but also networking gear. As with Android, Huawei would have to create its own version of these, and a technological ecosystem around them. Such ecosystems take years to evolve, and there is only so much one company can do to stimulate this evolution, which relies on third-party developers, with their own goals and incentives. Huawei's expertise in high, hard technology is of little use here.

And, Mr Ren's assurances notwithstanding, Huawei's finances are being squeezed. Even he concedes that its relations with large Western banks such as HSBC and Standard Chartered have been disrupted. Still, the firm has plenty of cash and he says that smaller banks remain willing to lend to it. The Chinese Development Bank, which has reportedly extended credit lines to Huawei and ZTE, a Chinese competitor, in the past, may stump up if needed. Mr Ren and his underlings repeatedly claim that cashflow is "healthy", pointing to the firm's furious building work. It has just finished a 120-hectare, $1.4bn research campus.

Huawei is being forced to transform itself from a company that makes and sells hardware into one that also makes many components that it used to buy from others. This kind of shift strains a firm. Its cash cow is under threat even as it has to invest heavily to replace the suppliers and software it can no longer get from America. Mr Ren may hope that his mooted sale of Huawei's 5G technology will give him sufficient fuel for the company to fly ever higher. But peer behind the showy frescoes in Shenzhen, and his showier gesture, and Huawei's future looks decidedly hazy. ■

Dig deeper

Huawei has made a peace offering that deserves consideration , September 12th 2019

Huawei’s founder defends Deng Xiaoping’s Chinese model , September 12th 2019
A transcript of Ren Zhengfei’s interview , September 12th 2019

Bartleby

The eyes have it

A new book reveals the excessive attention paid to how executives look

Print | Business Sep 12th 2019

PICTURE IN YOUR mind the typical chief executive. The chances are that you have thought of someone male, in a suit and distinguished-looking. In part, that is because most bosses look like that. It may also be because people instinctively defer to such types.

In their book "Messengers: Who We Listen To, Who We Don't And Why", Stephen Martin and Joseph Marks, two psychologists, outline how people respond to visual status signals. Just why are pedestrians likelier (three times as likely, according to one study) to defy traffic laws to follow a man across the road when he is wearing a suit than the same man dressed in denim? Similarly, motorists stuck at a traffic light are slower to honk their horn if the car in front has a prestige brand.

One possibility is an evolved respect for those with a higher social position. This is not just about clothes or possessions. A further piece of research cited by the authors involved undergraduates who were shown photos of 50 chief executives from the *Fortune* 1000 list of big firms. Half of these bosses were from the most profitable groups and half from the least profitable. The undergraduates were asked to judge, on looks alone, which executives had qualities such as competence and dominance. Remarkably, the students tended to pick out those executives who led the most successful companies.

It is hard to disentangle cause and effect. But it seems more probable that people with a certain type of appearance are likely to get promoted than it is to believe they are innately more competent than everyone else.

Humans tend to respect men with particular physical characteristics. When participants in a study were shown pictures of male employees of a business consultancy, with similar clothes and masked faces, they perceived the taller men more positively in terms of team leadership skills. Indeed, research has shown that taller and more attractive men earn more than their shorter and plainer colleagues.

Another business advantage for men turns out to be a face with a higher-than-average width-to-height-ratio. Research showed how square-jawed men negotiated higher signing-on bonuses for themselves than longer-faced, round-jawed peers.

Physical characteristics also affect recruitment at lower levels. A group of Italian researchers sent CVs to a range of employers, some with photos and some without. Applicants deemed attractive by independent scorers were 20% more likely to get an interview than the same application without a photo. Things are worse for the fairer sex. When photos were included, male jobseekers deemed unattractive were contacted 26% of the time, compared with 7% in the case of unattractive women.

All rather depressing, particularly for women trying to climb the corporate ladder. But there are some intriguing differences in the kind of personalities that boards tend to favour. The stereotype is that executives tend to be ruthless and egotistical—embodied by Gordon Gekko (or rather, the square-jawed Michael Douglas who played him). Not always, it turns out. The authors cite research on how boards choose chief executives. When choosing between two suitably qualified candidates to take charge of a company that is performing well, a board is likely to pick a leader who does not appear to be egotistical and self-interested. But if the company is in trouble, a narcissist stands a better chance. When the going gets tough, in other words, the board opts for a jerk.

Perhaps board members don't think of it that way. One long-established phenomenon is the "halo effect". If a person (or company) is rated highly in terms of one characteristic, they get good marks across the board. As the authors recount, this applies when employees are being assessed by their managers for qualities such as intelligence, decisiveness and leadership. Broadly speaking, managers divided staff into "good" and bad" workers; few employees were deemed to be intelligent but indecisive, for example.

What this fascinating book reaffirms is that people's assessments of others are extremely subjective, and easily led astray by appearances. That suggests a lot can be achieved by using artificial intelligence in hiring and promotion decisions, providing the programming is done correctly and focuses on candidate qualifications. A computer shouldn't be distracted by a handsome face.

Apple's cart

Tim Cook tries to reduce Apple's dependence on devices

And increase its revenues from services

Print | Business Sep 12th 2019

APPLE'S PRODUCT launches are not what they used to be. A decade ago the unveiling of a new iPhone would inspire quasi-religious ecstasy; devotees would camp on pavements outside shops as the release date drew near. At the firm's latest event, on September 10th, the format was the same: Apple's boss stood on stage, clad in a regulation black jumper, and spoke of the world-changing power of the company's latest wares. But the fizz was gone. The iPhone 11 looks like a merely incremental improvement on the models that have gone before it.

Smartphones have become boring. Consumers around the world are upgrading less frequently. Sales have stagnated (see chart). That poses a problem for Apple, which has built its success on charging eye-watering prices for aspirational, frequently replaced devices. Its response—to focus more on selling services and less on selling hardware—has been widely trailed. Those services comprise everything from extended warranties to the creation of an Apple-exclusive store for video games, and for streaming video, on which it plans to spend $6bn and which is designed to undercut rivals like Disney and Netflix.

The iPhone 11's launch shows what that strategy means for the hardware side. Apple has been raising its prices for years, but that trend has slowed. The cheapest model of the iPhone 11 is the lowest-priced phone the company has launched in two years. That makes sense: a service-focused company needs a broad user-base. But it is a delicate balancing act. If prices fall too low, the firm will lose its aspirational glow (the top-of-the-range iPhone 11 Pro Max will cost you $1,449). At the same time, Apple benefits from a captive audience. Users of Google's rival Android phones have many hardware-sellers to choose from, leading to fierce price competition. Those who prefer Apple's ecosystem must buy iPhones. That should keep margins plump for the time being.

Romancing the stones

Alrosa is betting on natural diamonds

The boss of Russia's state-controlled gem-miner flaunts the timeless appeal of real rocks

Print | Business Sep 12th 2019

FROM THE air, the mine in Nakyn looks as if a giant took an ice-cream scoop to the Earth's crust. Inside the pits, in Russia's far-eastern region of Yakutia, trucks with wheels taller than their drivers rumble along narrow dirt roads carved into the mine's walls, carrying loads of ore. The purpose of this gargantuan enterprise is something altogether more discreet. For Nakyn harbours one of the world's richest deposits of diamonds.

As incongruous, at least on the face of it, is the selling point Yakutian diamonds have for the carat-crazy. "Provenance is our competitive advantage," says Sergei Ivanov, chief executive of Alrosa, the company which owns the mine. Never mind that Alrosa's own roots look questionable in some eyes. The diamond-miner is controlled by the Russian state, viewed with suspicion in many countries for its annexation of Crimea, its backing of Bashar al-Assad's murderous regime in Syria and election-meddling in America. Mr Ivanov's father was once chief of staff to Russia's president, Vladimir Putin. But the company's gems are not directly bloodied by strife, as some of Africa's conflict diamonds are. For many bling-seekers, that is enough.

Mr Ivanov's emphasis on provenance is a response to changing consumer preferences, especially among younger buyers. This year the Gemological Institute of America has supplemented its "4C" grading scheme—colour, clarity, cut and carats—with a fifth: country of origin. De Beers, a diamond-industry stalwart (owned by Anglo American, a British mining giant), has a system for tracking diamonds from its mines to the jeweller's display cabinet. Tiffany's, an illustrious American jeweller, has rolled one out, too. In order not to fall behind, this summer Alrosa launched "electronic passports" for each gem, which tell buyers which craftsmen cut and polished it, as well as when and, crucially, where it was extracted.

That is not the only big recent change to Alrosa's business. The company is also trying to sell more of its own stones. It digs up around 10m carats a quarter, which translates to two tonnes, or about one bathtub-full. That is more than anyone else—and a quarter of global production (see chart). But for most of its history it relied on intermediaries to get its gems to the market. In 1957, after the discovery of diamond-rich kimberlite fields in Yakutia, Henry Oppenheimer, then chairman of De Beers, travelled to Moscow and convinced the authorities there to sell Yakutian diamonds secretly through a "single channel" operated by his firm. That practice continued in one form or another until 2009, when the EU ruled that it violated the bloc's competition rules. Since then Alrosa has been signing long-term contracts directly with gem wholesalers and retailers.

Mr Ivanov, who took over in 2017, has pressed on with this process, which leaves more money with the company by cutting out the middlemen. More sensible still, on his watch Alrosa is at last getting rid of pointless Soviet-era appendages. The company was "a small country", he quips, with its own energy firms, farms, hotels and an airline. Last year it sold some of these assets for 31bn roubles ($463m). Mr Ivanov has also improved financial transparency and environmental standards. And when a flood at Alrosa's flagship Mirny mine killed eight miners shortly after he arrived, he tightened safety protocols.

Rich pickings

These changes pleased outside investors, who have owned a third of the company's shares since its listing in 2013. So has Alrosa's generous dividend policy: last year it paid out all its free cashflow to shareholders. The Russian federal government, which owns or holds sway over the other two-thirds (some of which is held by Yakutia's regional and local governments), has allowed Mr Ivanov to go about his business. It helps that Alrosa has avoided Western sanctions like those placed on Russian oil and metals firms. Last year it reopened its office in America, which had been shut since 2016 for "organisational reasons". In 2018 revenue and gross operating profit rose by 9% and 23%, respectively, recouping the previous year's losses, caused in large part by Mirny's shutdown after the accident. Alrosa's market capitalisation swelled by two-fifths between late 2017 and the start of this year, to 770bn roubles.

Mr Ivanov's clean-up was long overdue. At last, says Boris Krasnojenov of Alfa-Bank, a Russian lender, "we know what Alrosa is: a pure producer of natural rough diamonds." Yet like other such producers, the company faces challenges. Diamonds are a precious commodity—but a commodity nonetheless, and so subject to price swings. A surplus of gems this year has depressed prices, which are down by 6% so far this year for rough stones. Polishers and traders in India are finding it harder to get credit as their economy sputters and the rupee loses value against the dollar. All this has weighed on miners. Alrosa's sales in the year to July were a third lower than in the same period in 2018; its share price has dropped by a quarter this year. De Beers has stumbled, too.

Another threat comes from lab-grown stones. Last year America's Federal Trade Commission declared that they are, in fact, diamonds. Although they currently represent just 2-3% of diamond sales, consultants at Bain reckon that production is rising by 15-20% an year. At this rate synthetics could shave 5-10% from demand for natural diamonds by 2030. Last year the boss of Dominion Diamond, another large miner, left to start a synthetic-diamond company. Trendsetters have embraced them. Meghan Markle donned a pair of synthetic-diamond earrings in her first official royal appearance of 2019. Perhaps seeing the writing on the wall, De Beers has launched its own line of lab-grown jewellery, called Lightbox.

Mr Ivanov has no such plans. Here, too, he believes that provenance matters—and that for many buyers the lab will never truly displace the lithosphere. Future generations of buyers, Alrosa hopes, will view Russia's diamonds as they see its caviar, vodka or ballet: timeless and pure. It is betting that investors reach the same conclusion about its business model. ■

Profit motor

Porsche is small but highly lucrative

Volkswagen's sports-car brand could be worth a fortune

Print | Business Sep 12th 2019

PORSCHE'S ALLURE to car buyers is built on the growl and scream of its internal-combustion engines. That is why the firm elected not to build the Taycan, its brand-new all-electric model, at a spacious fresh site but instead cram production into a plot at its headquarters in Stuttgart, hemmed in on all sides by suburban housing. Its boss, Oliver Blume, explains that building the Taycan next to the 911 will reassure customers that the new car will embody a sporting image to compare with the model that made Porsche famous.

Making a success of electrification is as vital to Porsche as it is to Volkswagen Group, its parent company, which also launched the ID.3, the first of a range of electric vehicles, at the Frankfurt motor show, which opened on September 10th. In some ways, Porsche is a tiny cog in Volkswagen's machine. It made 253,000 cars in 2018, out of 10.9m vehicles at VW as a whole. And it will sell 20,000 Taycans a year, compared with millions of ID cars. But it makes so much money for VW that some investors and analysts suggest only spinning it off would recognise its true value.

Porsche is VW's high-revving engine. In 2018 it accounted for 10% of the group's revenues and a staggering 30% of profits, almost what Audi, VW's premium marque, made from 1.5m cars. In an industry where operating margins are often in low single digits, Porsche's exceed 18%, with average profit per vehicle a turbocharged €16,250 ($17,900) compared with €3,200 for Audi and €960 for the mass-market VW brand.

VW picked up the firm for a modest $8bn a decade ago, after Porsche lost a bitter battle to take over the larger firm, a misadventure that left it on the brink of bankruptcy. This also left the Piëch and Porsche families, descendants of Ferdinand Porsche, the progenitor of both firms, as the biggest shareholders.

Porsche began to boom once it cannily realised that its coveted horse-and-antlers badge could adorn the bonnets of a range of less obviously sporty models. It sold 55,000 sports cars in 2002, when it launched the Cayenne, a bulky SUV. It and a smaller SUV, the Macan, now make up 64% of production. Ferdinand Dudenhöffer of the Centre for Automotive Research, a think-tank, reckons that electric cars could help Porsche double sales in five years.

Now some smaller VW shareholders think it is time to turn Porsche back into a stand-alone business. They point to the value unlocked by the spin-off of Ferrari from Fiat Chrysler in 2015. Using the Italian supercar company as a benchmark, Porsche might be worth €150bn, according to Evercore ISI, an equity-research firm. VW's entire market value is currently around half that. Frank Witter, VW's chief financial officer, last year called the notion a "legitimate question". Herbert Diess, VW's boss, has promised to assess which bits of the group are really core to VW's future. A recent partial flotation of Traton, its lorry-making arm, is a sign that he is prepared to let some parts go.

Porsche may not be one of them. The recent initial public offering of Aston Martin stands as a warning that not all luxury marques roar ahead. Its share price has plunged by 70% or so since the listing last October, as investors have come to suspect that the historic British brand is no Ferrari. Porsche's handsome returns rely in part on sharing the cost of developing new models across the wider group. The Cayenne's underpinnings, for instance, are the same as VW's Touareg and Audi's Q7. Porsche and Audi also plan to share a platform that will underpin several new battery-powered models. Philippe Houchois of Jefferies, a bank, reckons that such economies of scale are too important to jeopardise.

Another thing standing in the way of a Porsche spin-off is VW's governance structure. Through a stake that confers 20% of voting rights, the state of Lower Saxony can block strategic moves. So, too, can VW's powerful unions, thanks to representation on the company's supervisory board. Neither is likely to support breaking up VW, which would reduce their influence over Porsche's profitable operation. And it is unclear if the Porsche and Piëch families want to split up the vw juggernaut. Porsche's extraordinary performance is unlikely be relinquished by VW any time soon. ■

Sayonara

Nissan loses another leader to financial impropriety

The Japanese carmaker will have trouble shaking off a reputation for corporate misgovernance

Print | Business Sep 12th 2019

CARLOS GHOSN may have allowed himself some *Schadenfreude* this week. On September 9th Hiroto Saikawa fell on his sword after he, like Mr Ghosn, faced accusations of financial impropriety. Last November Mr Saikawa, chief executive since Mr Ghosn stepped down from that role in 2017, had been instrumental in bringing accusations of financial misconduct against the Frenchman, who was voted off the board in April.

Mr Ghosn has been under house arrest since the spring, awaiting trial on multiple charges, including underreporting his compensation by about ¥9bn ($84m) from 2010 to 2018. Nissan's board this week put the cost of the Ghosn affair at ¥35bn. The charge against Mr Saikawa—that he improperly pocketed ¥47m in performance-linked bonuses—is peanuts by comparison. He insists he was unaware he had done anything wrong, echoing Mr Ghosn's protestations that he never did anything that had not been approved by Nissan. He blames the bonus scheme on his ill-fated predecessor. It nevertheless adds to an image of mismanagement that has almost halved Nissan's share price in the past year.

In the early 2000s Mr Ghosn helped return loss-making Nissan to profitability. But recently the firm has struggled in the hyper-competitive mass market. In July it posted a 98.5% fall in first-quarter profits and said it could cut 12,500 jobs. Its partnership with Renault, a French carmaker that owns 43% of its stock, is creaky. An uneasy alliance between the two and Mitsubishi of Japan was held together by the Napoleonic Mr Ghosn's charisma.

Many shareholders wanted Mr Saikawa out for failing to heal the rift. Industry-watchers think a full Franco-Japanese merger makes sense in an industry dominated by giants like Toyota or Volkswagen, which churn out 10m cars a year and whose huge economies of scale leave more to invest in pricey electric and driverless technology. But Nissan, which makes more cars than Renault and resents the French claim on its profits, has resisted such a tie-up. With Mr Saikawa's exit, due on September 16th, it is all somebody else's problem. Nissan says that around ten candidates are in the running to inherit the mess.

Correction (12th September): A previous version of this article named Mr Saikawa as Nissan's chairman. He never held that post. Sorry

Schumpeter

The Redmond doctrine

Lessons from Microsoft's corporate foreign policy

Print | Business Sep 12th 2019

IS MICROSOFT A digital nation and does it have a secretary of state? The answer of Brad Smith, the software giant's top lawyer, is, well, diplomatic. Nation states are run by governments and firms need to be accountable to them, he says. But yes, he admits, he worries a lot about geopolitics these days.

Large companies have forever lobbied governments around the world—think Big Pharma or the oil majors. Sometimes the ties with their home countries' diplomacy are very close indeed: in 2017 the former boss of ExxonMobil, Rex Tillerson, became President Donald Trump's first secretary of state (albeit a short-lived one with a decidedly mixed record). And in a globalised world, multinationals can benefit from a "corporate foreign policy", a term coined by Stephanie Hare and Timothy Fort in a paper from 2011, to align their values and priorities across markets.

Nowhere does this ring truer than in Big Tech. Digital giants loom larger than analogue ones (Facebook has 2.4bn monthly users—two-thirds more than China has people). They upend one industry after another and penetrate every nook and cranny of society. They lord it over cyberspace and set many of its rules. Recognising this, some countries are planning to upgrade their San Francisco consulates into de facto tech embassies. Denmark was the first to send an envoy to Silicon Valley, in 2017. The European Union is considering opening a mission in the capital of tech.

The tech firms, too, are adapting—none more so than Microsoft. Mr Smith presides over an operation as big as the foreign office of a medium-sized country. Its 1,500 employees work in departments like "Law Enforcement and National Security" or "Digital Diplomacy Group". It has outposts in 56 countries, sending regular cables to headquarters in Redmond, near Seattle. Mr Smith is as itinerant as a foreign minister. In one year he visited 22 countries and met representatives of 40 governments.

Microsoft, however, differs from much of Big Tech in its approach. Most firms are, like corporations before them, students of realpolitik. Apple censors apps in China when the Communist Party tells it to. Facebook dithered when the Burmese army used the social network to spread misinformation and fuel violence against the Rohingya. Google shelved a project to create a censored Chinese search engine after an outcry from employees, but is reopening an office in Egypt, a country run by a repressive junta.

Against this cynical backdrop Microsoft's diplomatic efforts look refreshingly principled. Its worldwide antitrust fight at the turn of the century; Edward Snowden's leaks which revealed widespread surveillance by America's spooks; the rise in state-sponsored cyber-attacks—such "inflection points", says Mr Smith, forced the company to mature geopolitically, long before its rivals in the case of antitrust. In "Tools and Weapons", a new book co-written with Carol Ann Browne, a communications executive at Microsoft, he defends multilateralism—global problems caused by technology require global solutions, he says—and warns heads of state and foreign ministers (whom he meets by the dozen) that the tech cold war between America and China may split the world in two camps, leaving everyone worse off. He advocates involving non-governmental actors (including companies like his but also civil society) in decision-making, even if this "multistakeholder" process is slower than top-down government edicts.

It is not all idle talk, either. In 2013 Microsoft refused to hand over emails that sat on a server in Ireland to America's feds in a drug-trafficking case, and successfully defended its decision in court—setting political wheels in motion that led America's Congress to adopt a law allowing tech firms to challenge such warrants if they fall foul of another country's rules. It implemented changes required by the EU's tough new privacy law globally, helping the rules become a worldwide standard for many companies—and indeed countries. In 2017 Mr Smith proposed a "Digital Geneva Convention", an international treaty to protect civilians against state-sponsored cyber-attacks in times of peace. Last May he helped launch the "Christchurch Call", a pledge by 17 countries and eight tech firms to "eliminate terrorist and violent extremist content online". Google and Facebook signed it. Apple (and America) did not.

Mr Smith says a coherent corporate foreign policy is simply good business: it creates trust, which attracts customers. His doctrine indeed sits well with Microsoft's business model, based on sales of services and software. It can afford to be more of a purist on privacy and the spread of disinformation, the most politically contentious tech issues of the day, than giants whose profits come from targeted advertising on social networks.

Microsoft is not squeaky-clean. Mr Smith says it refuses to put data centres for Azure, its global computing cloud, in countries with a sketchy human-rights record. Yet it has a few of them (operated by a local partner), plus a research centre, in China. And although Microsoft has proposed sensible rules for the use of facial-recognition technology, it has previously trained its algorithms on pictures of celebrities without their knowledge.

United States of Azure

A dose of hypocrisy is perhaps inevitable in an organisation the size of Microsoft. Critics level a more fundamental charge against its foreign policy, however. Where, they ask, does it—and fellow tech giants—derive the legitimacy to be independent actors on the international stage? This is the wrong question to pose. As businesses, they have every right to defend the interests of shareholders, employees and customers. As global ones, their priorities may differ from those of their home country's elected officials. And as entities which control much of the world's digital infrastructure, they should have a say in designing the international norms which govern it. At a time when many governments refuse to lead, why should the firms not be allowed to? Especially if, like Microsoft's, their efforts blend principles with pragmatism. ■

Fannie Mae and Freddie Mac
Home truths

Home truths

Steven Mnuchin begins reforming America's giant mortgage-guarantee firms

Fannie Mae and Freddie Mac are the last unfinished business from the 2008 financial crisis

Print | Finance and economics Sep 12th 2019

"THE LAST unfinished business of the financial crisis": that is the rallying cry of those seeking to reform Fannie Mae and Freddie Mac, the two giant government-sponsored enterprises (GSEs) that back much of America's mortgage industry. In 2008, amid the wreckage of the housing market, they were bailed out by the federal government to the tune of $188bn and placed in "conservatorship", a form of government control. On September 5th Steven Mnuchin, the treasury secretary, published a long-awaited plan to reprivatise them. "We want to make sure they are not in conservatorship on a permanent basis," he told the Senate on September 10th.

Mr Mnuchin set out two alternatives. The first, more sweeping, would need congressional approval. The second could be carried out by the Treasury and the Federal Housing Finance Agency (FHFA). Mr Mnuchin says passing reform through Congress is his preferred option. A senior Treasury official says administrative actions will start promptly, in part to lay the groundwork for legislation. But the administration will proceed whether or not Congress acts. The Trump administration is presenting America's housing-finance industry with a "fork in the road", says Jim Parrott of the Urban Institute, a think-tank.

The two GSEs have been central to America's housing market for decades. Fannie was founded as a government agency in 1938, during the Great Depression, and rechartered in 1968 with private capital and shareholders. Freddie was set up by Congress as a competitor in 1970. Both buy mortgages, mainly from banks, add a guarantee to repay the principal and interest if borrowers default, and bundle them into securities. These they either retain on their own balance-sheets or sell to investors.

Their guarantees transfer some credit risk from the private sector to the government. In the run-up to the financial crisis, that transfer started to balloon. In the 1970s Fannie and Freddie held less than 10% of single-family mortgages in America. Now they hold more than $5trn of housing-related securities and guarantees, nearly half the total (see chart).

Politicians often say they want the government to get out of the mortgage business entirely. But that is a distant prospect. Taxpayers' assumption of some of the credit risk in mortgage lending is what drives the mortgage-backed-securities market (particularly since the financial crisis, which devastated private-label issuance). Investors are keen on the GSEs' securities because they isolate the interest-rate risk associated with mortgages, allowing 30-year fixed-rate loans, which are almost unknown outside America. These are hugely popular with consumers (and voters).

With exit politically untenable, the priority is cutting the pair down to size. Before the bail-out they operated as private companies with a public charter, implying that the government would bail them out if they ran into trouble. Rather than nationalising them during the crisis, the Treasury guaranteed to keep their net worth above zero. In return it took warrants representing 80% of their common stock.

The result is an even odder hybrid, with private shareholders but government-run. Under public control they have been forced to hand the Treasury the bulk of their profits—and, since 2012, the lot—to repay the bail-out. Since 2008 Fannie has returned $181bn, and Freddie $120bn. Their capital buffers have also been run down and handed to the government. Last year these fell so low that both GSEs required an injection of taxpayer cash. They now have just $3bn-worth of capital apiece.

Shareholders, whose rights were suspended in 2008, sued the government. On September 6th a panel of federal judges in New Orleans overturned a ruling that had backed the government's appropriation of Fannie's and Freddie's profits. The arrangement had been made in a time of "dire calamity", the judges acknowledged. But they added that "expedience does not license omnipotence". When markets reopened on September 9th the GSEs' share prices jumped by 40%. Mr Mnuchin has said he may appeal to the Supreme Court.

By the time the legal wrestling is over, however, the profit sweep may be, too. Instead of the government getting the lot, Mr Mnuchin wants Fannie and Freddie to pay an explicit fee for their government guarantees. For the past three years they have paid, on average, $18.2bn each year. Under the new system they would retain any earnings above the agreed amount.

Donald Layton of Harvard University says that the FHFA's proposed capital rule for Fannie and Freddie would require them to hold (very) roughly $125bn-worth of capital. It would take at least seven years—longer if the government's fee is high—to build this up through retained earnings. Though the Treasury could help by selling down its stakes, a balance will have to be struck between a fee that reflects the risk of default and allowing the GSEs to build up capital. Last May Mark Calabria, the FHFA's boss, said that retained earnings might take too long and that an IPO might come in the first half of 2020. If it were to raise the $100bn-120bn needed, it would be four to five times the size of the largest initial public offering to date: Alibaba's in 2014.

However it is done, recapitalisation would be just the first step towards reprivatisation. Mr Mnuchin wants government support for the housing market to become explicit, rather than implied, as now. He wants the securities Fannie and Freddie issue to have a "full faith and credit" guarantee, meaning the securities, not the issuers, are state-backed. He also wants such guarantees to be offered by more firms. These putative rivals for the GSEs would be chartered and overseen by the FHFA.

But all that would require congressional approval—hard when Congress is divided and elections are looming. More likely is that the administration will seek other ways to increase competition by lessening the privileges granted to the GSEs. They are exempt from onerous disclosure rules that apply to banks and issuers of mortgage-backed securities with private credit guarantees, for example. Their capital is a fraction of what banks must hold. Securitising loans with Fannie or Freddie protects banks from lawsuits brought by defaulting borrowers seeking to hold on to their properties by claiming failures of due diligence.

These privileges helped the GSEs to grow so huge. It is within the administration's power not just to end the profit sweep and conservatorship, but to level the playing field. If Congress disagrees with the administration's vision for Fannie and Freddie, it can set out its own. Either way, the mortgage monsters will soon be finding a new home. ■

Spoiler alert

Hong Kong's bourse seeks to snap up the London Stock Exchange

HKEX wants to break up the LSE's deal with data-provider Refinitiv

Print | Finance and economics Sep 12th 2019

RECENT MONTHS have been eventful for bosses in Hong Kong, including Charles Li, the head of the island's stock exchange. Last month, just days after a huge deal in his industry was announced—an agreement by the London Stock Exchange Group (LSE) to buy Refinitiv, a data provider, for $27bn—the Chinese People's Liberation Army released a video of troops performing anti-riot drills, a scenario that Mr Li had warned Beijing against. The protests continue, but Hong Kong Exchanges and Clearing (HKEX) is keeping calm and carrying on. On September 11th it made an audacious bid to scupper the Refinitiv-LSE deal and buy the British exchange for £31.6bn ($39bn) itself.

In normal times pundits might have hailed the proposal as visionary. Hong Kong is the world's fourth-largest financial centre. Combined with London, it could rival New York. It is well positioned to benefit from the strength of Asian emerging markets. In its proposal HKEX dangled the prospect of Britain capturing growth as China's currency, the yuan, internationalises—for example, with more Chinese firms listing in London.

And under Mr Li HKEX has proved an adept buyer of foreign assets. Its acquisition of the London Metal Exchange in 2012 for $2.2bn has gone well. As other exchanges have done, HKEX has diversified beyond listings into trading services, derivatives and data. Its mix of fast-growing businesses adds up to far more than an opportunistic play on China.

But most of the LSE's shareholders look likely to back the bourse's prompt rebuff of HKEX. The board will examine the bid in detail, but called it "unsolicited, preliminary and highly conditional". It reiterated its commitment to the Refinitiv transaction, which is due to be approved by shareholders before the end of the year.

The chief obstacle to the East-West tie-up is political risk. Cross-border exchange deals often founder on national sensitivities, as happened with the LSE's own attempt in 2017 to merge with Deutsche Börse. HKEX's proposal would mean a Chinese firm owning the main equity markets of Britain and Italy (the LSE bought Borsa Italiana in 2007) and key clearing infrastructure for European debt markets. British politicians and regulators, desperate to juice up the economy post-Brexit, might prove relaxed. American and continental European ones probably will not.

Mr Li is no patsy for China. Last summer he tussled with Beijing when the Shenzhen and Shanghai exchanges blocked mainland investors from buying shares in Hong Kong-listed firms with dual-class structures. Nevertheless, six members of HKEX's 13-strong board are appointed by Hong Kong's government, notes an investment banker close to the LSE. HKEX could try to increase its independence by asking the territory's financial secretary to refrain from exercising his right to choose its board members, but changing the rule itself is not on the agenda. For their part, LSE shareholders are unlikely to see HKEX's offered price, at a relatively low premium of 23%, as sufficient temptation to abandon the Refinitiv deal for one that has a serious risk of being blocked.

Backers of the agreement with Refinitiv, the owner of Eikon data terminals, are therefore confident. They note the market's welcome for the LSE's further expansion into data and analytics. The exchange's shares had risen 20% from the date of that offer to just before HKEX's bid.

The Refinitiv deal also faces regulatory hurdles, however. Like HKEX, the LSE swims in politically treacherous waters. China's desire to exert control will have been one of the motives for the Hong Kong exchange's London gambit. As for the LSE, the EU's fears that post-Brexit London will be a freewheeling offshore centre could prompt its regulators to seek to limit the British exchange's growth. The Refinitiv deal faces a gruelling competition review in Brussels over concentration of financial-data ownership. Mr Li's bid to escape trouble at home may not succeed. But the Refinitiv deal is not home and dry either. ■

Buttonwood

How rock-bottom bond yields spread from Japan to the rest of the world

Japan's impact is felt keenly in American and European corporate-credit markets

Print | Finance and economics Sep 14th 2019

IT WOULD BE hard to think of a business that is on the face of it quite as dull as Norinchukin Bank. A co-operative, it was founded almost a century ago to take deposits from and lend to Japanese farmers. Yet Norinchukin came blinking into the spotlight earlier this year when it emerged that it had been a voracious buyer of collateralised loan obligations (CLOs)—pools of risky business loans used to finance buy-outs by private-equity firms. At the last count, in June, Norinchukin owned $75bn-worth.

The escapades of Norinchukin offer a parable. One part of its lesson is that when interest rates are stuck near zero for a long time, as they have been in Japan, banks' normal source of profits comes under pressure. The other part is the lengths to which they must go to boost those profits, in this case by buying exotic foreign securities with attractive yields. Norinchukin is not alone. Japanese banks and insurance companies have been big buyers of the triple-A-rated tranches of CLOs, as well as other sorts of investment-grade corporate debt.

For this, blame negative bond yields. When the Bank of Japan's board meets on September 19th, it is not expected to reduce its main interest rate, currently -0.1%. But any increase in interest rates seems a long way off. And as long as rates are at rock-bottom in Japan, it is hard for them to rise in other places. Bond-buying by desperate Japanese banks and insurance companies is a big part of what keeps a lid on yields elsewhere.

Japan's sway on global asset markets has been felt ever since it liberalised its capital account in 1980. Later that decade Japanese investors snapped up trophy properties in America, such as the Rockefeller Centre in New York and Pebble Beach golf course in California. In the 1990s they piled into American tech firms. Both forays ended badly, but Japan's stock of foreign securities has kept growing as its surplus savings have piled up.

Japan is already the world's biggest creditor. Its net foreign assets—what its residents (government, householders and firms) own minus what they owe to foreigners—are worth around $3trn, or 60% of its annual GDP. And that understates Japan's influence on global asset markets. Since 2012 both sides of its national balance-sheet have grown rapidly (see chart), as Japanese investors borrowed abroad to buy yet more assets.

Japan's impact is felt most keenly in corporate-credit markets in America and Europe. Its pension and insurance firms, which need to make regular payments to retirees, are at least as hungry for bonds with a decent yield as are their peers elsewhere. But the grasping for yield is made all the more desperate by the struggles of Japan's banks. It is hard to make money from lending to the government when bond yields are negative. In ageing, high-saving Japan, private-sector borrowers are scarce. So bank profits have suffered. A report last year by a financial regulator found that half of Japan's regional banks lost money on their lending businesses.

Though yields in Europe are lower than in America, they are nevertheless attractive to Japanese buyers who hedge their currency risk. Most currency hedges are for less than a year and many are for three months. The cost of such hedges is linked to the cost of short-term borrowing in the foreign currency. A rising yield curve thus gives the best currency-hedged returns: the yield is high at the long end but short rates are low. For that reason, currency-hedged Japanese investors have preferred to buy corporate bonds or other credit securities in Europe rather than in America, where short-term interest rates are relatively high.

Locals lament that high-quality European and American corporate bonds are treated as safe assets, akin to sovereign bonds. Analysts' efforts to work out which companies are more or less likely to default, and so which bonds are more or less valuable, seem almost quaint. "The Japan bid is not driven by credit risk," complains one analyst. "It is all about headline yield."

Some see Japan as a template: its path of ever-lower interest rates one that other rich, debt-ridden economies have been destined to follow and will now struggle to escape. But Japan's troubles also have a direct influence on other countries. This makes itself felt through the country's considerable sway over global capital markets. The outworkings are strange and unpredictable. Who would have thought that the rainy-day deposits of Japan's farmers and fishermen would be used to fuel leveraged buy-outs in America and Europe?

A porcine phenomenon

Soaring pork prices hog headlines and sow discontent in China

The government dips into its pork reserves to quell both grumbles and inflation

Print | Finance and economics Sep 12th 2019

ECONOMISTS RARELY think about the average gestation period of pigs (115 days) or the length of time a sow needs to reach sexual maturity (roughly six months). But in China, a basic knowledge of hog-breeding cycles is part of the job. Pigs are so central to the Chinese diet that the ups and downs of pork prices have an outsized impact on inflation. Once again, porcine expertise is in demand: African swine fever has devastated China's pigs, complicating its economic outlook.

New data show that pork prices leapt by 23% in August from July, the highest monthly jump on record. On an annual basis they were up by 47%. The feed-through to broader inflation has been modest so far. But pork is certain to become more costly in the coming months, pushing consumer prices up further (see chart).

In the past, when pork prices soared farmers quickly produced more pigs. That is harder now because the population of breeding sows has collapsed. The central bank has started to ease monetary policy as growth weakens, but the spectre of pork-led inflation, even temporary, could limit its space for cutting interest rates.

China consumes 55m tonnes of pork annually, as much as the rest of the world combined. Hu Chunhua, a vice-premier, said in August that the supply shortfall this year will be about 10m tonnes, more than is traded on international markets. The government has announced subsidies and low-interest loans to encourage pig farmers to expand. But since at least a third of China's hog herd has been wiped out, these measures will not generate instant results.

Several cities have started offering limited amounts of discount pork. Others are giving cash to low-income residents. China has also started to release meat from its frozen-pork reserves—created in the 1970s for just such emergencies. But they cover barely a tenth of the shortfall. On September 10th *Life Times*, a Communist Party-managed newspaper, had an unusual banner headline: "Pork, it's better for you to eat less". It dressed up its article as healthy-eating advice, but readers surmised that it was trying to put lipstick on a very pricey pig.

Yet the government's big concern for now is affordability, not inflation. Pork, together with rice, has long been close to a daily necessity in China. The word "meat" by itself almost always refers to pork. But during the past decade pork has diminished in importance, as a share of both dinners and overall spending. Beef and fish have grown in popularity. Middle-class urbanites, not to mention the wealthy, are spending their money on much else besides. Analysts now reckon that pork is little more than 2% of China's consumer-price index, down from 3% a few years ago.

Moreover, it takes more than pork for inflation to be a problem. In 2008 and 2011, inflationary spikes followed big increases in the money supply; price rises, though pronounced for pork, were a much broader phenomenon. Over the past couple of years the money supply has grown much more slowly as regulators have pushed banks to reduce their leverage. Prices of industrial goods have fallen into deflationary territory. The central bank will thus be inclined to write off African swine fever as a supply shock. The risk is that sky-high pork prices spread to other food items, placing unwanted upward pressure on wages.

In the meantime people are adjusting. Liu Zhiqiang, a retired factory worker in Beijing, used to treat his family to pork ribs once a week. "Now I just toss some pork shavings into fried dishes and have more eggs instead," he says. Xishaoye, a restaurant chain popular for pork-filled crispy buns, said that it was researching whether it could use chicken as an alternative.

All going well, China will eventually emerge from this mess with bigger, better-managed pig farms. The hog cycle would become less volatile, and pork cease to matter as an inflation indicator. China's pigs would once more be braised by chefs rather than appraised by economists. ■

Sewn up

Kristalina Georgieva is the sole contender to be the IMF's next boss

She would be the first national from an emerging economy to lead the fund

Print | Finance and economics Sep 12th 2019

KRISTALINA GEORGIEVA has been mentioned in connection with every leadership role going at international organisations, from secretary-general of the UN to the head of the European Commission. Were the presidency of the World Bank decided on merit alone, with no consideration of nationality, Ms Georgieva, its chief executive, might have been a shoo-in. She briefly stood in as president after Jim Yong Kim resigned in January, but in April the job went to David Malpass, an American.

Now the Bulgarian seems at last to have nabbed one of the top jobs on a permanent basis. A transatlantic understanding dating back to the Bretton Woods conference in 1944 means that an American leads the World Bank while a European leads the IMF. In August Ms Georgieva became Europe's nominee to replace Christine Lagarde at the fund's helm. Despite noises from the British that they would put forward their own candidate, the deadline for submitting nominees passed on September 6th with Ms Georgieva the sole contender. Her official appointment by early October seems assured.

Since 2017 she has been responsible for much of the running of the World Bank, where, before a stint at the European Commission, she also spent many years as a staffer. As chief executive she is credited with smoothing over differences between Mr Kim and the staff, and leading negotiations with the bank's shareholders for a capital increase.

Her good relations with large shareholders, including America and China, should prove an asset to the IMF, which risks being caught in the middle of the very trade and currency wars it was set up to avert. It may also have to advise governments on coping with a global economic slowdown. Although she has less macroeconomic expertise than some other early contenders, such as Mark Carney, the governor of the Bank of England, former colleagues point out that she was active in assessing countries' fiscal positions while in Brussels, and helped beef up the European Union's bailout mechanism.

As an academic she wrote a textbook that is still used by undergraduates in Bulgaria. Her expertise in environmental economics is likely to come in handy, too. Masood Ahmed of the Centre for Global Development, a think-tank, reckons that assessing the impact of climate change on macroeconomic and financial stability will become more important for the fund.

The first half of Ms Lagarde's tenure was dominated by Europe's sovereign-debt crisis. The IMF's focus has since shifted to emerging and fragile states. Ms Georgieva will inherit a mess in Argentina (see article). One World Bank staffer notes that other European candidates would probably only have been familiar with emerging markets from their holidays.

Ms Georgieva, by contrast, has spent decades working with the poorer countries that are the target of most of the fund's programmes. And her home country made the transition from communism to a market economy in the 1990s. By the fund's own classification Bulgaria is still an emerging economy, with GDP per person less than a quarter that of France, which has supplied four of the fund's last six chiefs.

Ms Georgieva's stature and experience may explain the absence of challengers, which ensured that Europe retained the position despite fraught haggling over the nomination. It was the second such row of the summer. (The first, in June, had been over a package of top EU roles, which created the vacancy at the fund when Ms Lagarde was appointed to lead the European Central Bank.) For the IMF job eastern Europeans backed Ms Georgieva, whereas northerners preferred Jeroen Dijsselbloem, a former Dutch finance minister.

When consensus eluded them, the EU's 28 national finance ministers resorted to voting by email (though Britain abstained), at which point Ms Georgieva gained most support and Mr Dijsselbloem bowed out. Europe's choice, though the result of much wrangling, is set to prevail. One relic of the Bretton Woods era somehow continues to defy the odds. ■

Exceptionable exceptionalism

Were Mauricio Macri's mainstream policies doomed from the start?

A new paper argues that orthodoxy could have worked, had it been more stern

Print | Finance and economics Sep 12th 2019

"WHENEVER I VISIT a country they always say...here it is different," Rudiger Dornbusch, a legendary economist, once told his students at the Massachusetts Institute of Technology (MIT). "Well, it never is." For most countries, his words are a warning. For Argentina, they are a comfort. The country has lurched from one economic crisis to another, culminating in the recent reimposition of currency controls and rescheduling of debts. Its voters, who also lurch from populists to liberals and back, look poised to oust Mauricio Macri's liberal government in October in favour of a populist duo, Alberto Fernández and Cristina Fernández de Kirchner, the former president. It is therefore easy to believe that Argentina is different. Just not in a good way.

Dornbusch's words provide the epigraph for a new paper* by Federico Sturzenegger, a former MIT student and Mr Macri's central-bank governor from when he took office in 2015 to mid-2018. It makes a contrarian defence of Mr Macri's fiscal gradualism and inflation targeting. These policies worked elsewhere and could have worked in Argentina, he argues, had they been faithfully followed.

Mr Macri inherited a troublesome budget deficit. To avoid the austerity associated with previous right-leaning governments, he proposed to balance the books at a politically palatable pace. The problem was not that he reduced the deficit only gradually, Mr Sturzenegger argues, but that he did not reduce it even gradually. In his first year the primary budget deficit increased from 3.8% to 4.2% of GDP (a figure flattered by a one-time tax amnesty). The improvement in 2018 owed a lot to surging inflation, which cut the cost of public pensions indexed to price increases in 2017.

Mr Sturzenegger's second claim is more controversial. After a brief transition, Mr Macri's central bank adopted a conventional macroeconomic framework, using interest rates to target inflation and treating the exchange rate with benign neglect. By the end of 2017, Mr Sturzenegger argues, this policy was working. Core inflation had fallen by half, to below 20%. It was expected to drop below 15% the next year.

Headline inflation was, however, far higher. That gave the government an excuse to relax the inflation target on December 28th (a date on which Argentines traditionally play pranks on the unsuspecting). Analysts hoped it was merely bringing the target in line with reality. In fact, says Mr Sturzenegger, it sought a gentler pace of disinflation in order to reduce the cost of those backwardly indexed pensions. The raised target, plus two cuts in interest rates in January 2018, delivered a "permanent shock" to the central bank's credibility.

Inflation targeting appealed to Mr Macri's team partly because it was mainstream. But Argentina adopted it at a level of inflation far outside the norm. The targets also implied an unusually aggressive reduction in price pressure, points out Rafael Di Tella of Harvard Business School. He thinks the early success owed a lot to an economic contraction in 2016.

To reduce the pain, Mr Di Tella says, the government should have considered limits on inflationary wage claims. One of Mr Fernández's advisers has proposed just such a pact. Another advocate was Dornbusch himself. Keeping spending (public and private) in check is essential to killing high inflation, he argued in 1986. But the collateral damage to growth and jobs can be reduced with income policies, which serve as a co-ordination device: when inflation is high, no one will moderate their wage claims unless everyone else does too.

According to Mr Sturzenegger, Mr Macri's government rejected a wages pact because it was unorthodox. But if Mr Di Tella is right, then Argentina's self-conscious attempt to act normal may have helped prevent it from becoming so. Normal countries do not need incomes policies. But, Dornbusch might have retorted, countries in Argentina's position normally do. ■

Free exchange

The alternatives to privatisation and nationalisation

More public resources could be managed as commons without much loss of efficiency

Print | Finance and economics Sep 12th 2019

IT SOUNDS VAGUELY elvish, like something from the pages of Tolkien. In fact, the Charter of the Forest is one of Britain's founding political documents, dating from the same period as Magna Carta, the "Great Charter", as the Charter of Liberties was known to distinguish it from its sylvan partner. Whereas Magna Carta concerned the interests of a few privileged barons, the Charter of the Forest was intended to safeguard those of commoners—in particular, their time-honoured right to make a living from the bounty of the great wild commons. As an economic institution, the commons now seems as old-fashioned as constitutional documents sealed by noblemen in meadows. To many economists, the spread of private property rights was essential to the creation of the modern world. But the shortcomings of commons can be overstated. They could usefully be granted a place in public policy today.

An ecologist, Garrett Hardin, coined the phrase "the tragedy of the commons" in a (shockingly eugenicist) essay in *Science* in 1968. But the free-rider problem that afflicts public goods has been well-known to economists for a century. Consider a pasture on which every herdsman may graze his cattle. Each has an incentive to use it as intensively as possible: since it is open to all, restraint exercised by one herdsman simply frees up grass to be chomped by another's animals, leaving those who hold back worse off, not just relatively, but in absolute terms. The common pasture will inevitably end up overgrazed to the point of ruin. Many valuable public resources are similarly prone to overconsumption. Roadways become congested, waterways overfished and slices of electromagnetic spectrum crowded into uselessness, to the detriment of total social welfare.

Two possible remedies are typically proposed. Governments may regulate access to the commons, as is usually the case with airspace, for instance. Or control over it may be sold, establishing a property right where none existed before. Economists tend to prefer the latter. Private owners have an incentive to use a resource sustainably, in order to maintain its long-term value. Privatisation should boost investment and innovation, too, since the profits flow to the owner.

Many economists see the spread of property rights as essential to kindling modern economic growth. Between the 16th century and the 19th most common land in England and Wales was enclosed and deeded to private owners. Economic historians long reckoned that enclosure, though unjust and brutal, spurred progress and laid the groundwork for industrialisation. Large tracts could be farmed more productively, freeing labourers to work in urban factories while also providing food to support them. "The break-up of the peasantry was the price England paid...to feed her growing population," wrote Peter Mathias, an economic historian, in 1983. The Industrial Revolution seemed to bury the concept of the commons for good.

But such orthodoxies are being revisited. Privatising shared resources, it turns out, does not always lead to a productivity boom. More recent research suggests that enclosure may not have been such a boon for British agriculture or industry. Research by Robert Allen, an economic historian at New York University Abu Dhabi, concludes that the big, capitalist estates which resulted from enclosure were not much more productive than common land farmed by the yeomanry. Nor did the great lords who gained control of large tracts funnel their profits into industry. Most indulged in fine living; many were debtors rather than savers. As Guy Standing of the School of Oriental and African Studies in London writes in his book, "The Plunder of the Commons", property rights can create an incentive for owners to use resources well, but they also grant the liberty to squander the fruits of their holdings.

If privatising land raises productivity less than might have been expected, that could be because commons are not as doomed as used to be thought. In fact, many were well cared for. Elinor Ostrom, a Nobel prizewinner in economics, studied how rural villages around the world manage shared resources such as land or irrigation systems. The Swiss commune of Törbel, for instance, has successfully shared irrigation resources for more than half a millennium. An exclusive focus on states and markets as ways to control the use of commons neglects a varied menagerie of institutions throughout history. The information age provides modern examples, for example Wikipedia, a free, user-edited encyclopedia. The digital age would not have dawned without the private rewards that flowed to successful entrepreneurs. But vast swathes of the web that might function well as commons have been left in the hands of rich, relatively unaccountable tech firms.

A thirst for knowledge

Mr Standing thinks that the decline of commons caused useful civic concepts to fall into disuse. Medieval commoners expected both to benefit from and to help manage unowned social wealth. Prosperity today similarly depends on shared public resources, from customary behaviour that supports the rule of law to accumulated scientific knowledge to the environmental services provided by clean air, waterways and so on. Some institutional creativity might allow more resources to be managed as commons, reducing concentrations of wealth and power without much loss of economic efficiency.

A world rich in healthy commons would of necessity be one full of distributed, overlapping institutions of community governance. Cultivating these would be less politically rewarding than privatisation, which allows governments to trade responsibility for cash. But empowering commoners could mend rents in the civic fabric and alleviate frustration with out-of-touch elites. In her Nobel lecture Ms Ostrom said that public policy should “facilitate the development of institutions that bring out the best in humans”. That sounds like common sense. ■

Flying taxis
Urban aviators

Urban aviation

Flying taxis are taking off to whisk people around cities

But regulatory hurdles still remain

Print | Science and technology Sep 12th 2019

IN OCTOBER 1908, on a windy field at Farnborough, south-west of London, a handlebar-mustachioed former Wild West showman named Samuel Cody completed the first official controlled flight of a powered aeroplane in Britain. Since then many other pioneering aircraft, from Concorde to the giant Airbus A380, have flown at what became the biennial Farnborough air show. The aerospace centre that stages the show is now preparing for another sort of revolutionary aircraft to take to the sky.

These new planes are variously described as flying taxis, passenger drones or, as the industry terms them, urban air mobility (UAM) vehicles. Around 200 such craft are at various stages of development around the world, according to experts at Farnborough's first global urban air summit in early September. Some prototypes are already carrying out test flights and operators hope to begin commercial services within the next few years. Uber, which runs an app-based taxi-hailing service, aims to start flying passengers in Dallas, Los Angeles and Melbourne, Australia by 2023.

Yet a number of obstacles remain. "No one really knows exactly how it is going to happen," admits François Sillion, head of Uber's Advanced Technologies Centre in Paris. That is because the obstacles are not particularly technological, but regulatory. Regulators are still working out how to certify that these new aircraft are safe, particularly as many will be flown without pilots, carrying passengers aloft as they buzz autonomously around a city.

Although UAM designs are many and varied, they sport some common features. The aircraft are invariably electrically powered, although some are hybrids with a backup combustion engine. They usually take off and land vertically like a helicopter, but unlike a helicopter use multiple small rotors. Two- and three-seater versions can fly between 30km and 160km between charges at 100-200kph. As the multiple rotors are driven directly by individual electric motors, each rotor can be controlled by computerised flight systems. This provides a high level of stability, in theory making such aircraft easier to fly than a helicopter, and easier to automate. Reassuringly, multiple rotors also mean that such aircraft can rapidly compensate if one or more of their motors fail.

Rotary ambitions

Some aircraft are moving beyond the experimental stage. The 18-rotor VoloCity is being developed by Volocopter, a German firm, based on a prototype (illustrated above) which has flown numerous test flights. One was an autonomous flight in Dubai. On September 9th, Geely, a Chinese carmaker which also owns Volvo Cars, took a minority stake in Volocopter and led a €50m ($55.1m) funding round to help bring the VoloCity to market. The aircraft can carry two people (one of whom may or may not be a pilot) plus luggage for 35km.

Other types of air taxis use a "tilt wing". This has multiple rotors mounted on the wings, which tilt up for a vertical take-off and landing, but tilt ahead to operate like a fixed-wing aeroplane with propellers for forward flight. This saves power and increases the range of the aircraft.

Lilium, another German company, uses a variation of the theme with 36 electrically powered fan jets. These look like miniature versions of the turbofans on passenger jets, except they use electric motors. The fans are mounted on the fixed wings of its aircraft and blow downwards for a vertical take-off or landing and backwards for forward flight. The company's five-seater (pictured below) can travel 300km in an hour.

Kitty Hawk, a firm backed by Larry Page, boss of Google's parent Alphabet, has teamed up with Boeing, the world's largest aerospace company, to develop Cora. This two-seater uses 12 lifting rotors on a fixed wing and is pushed along by a rear-mounted propeller. It has a range of about 100km and will be used by Air New Zealand to run an air-taxi service.

Most UAM operators are getting into the air with experimental flying permits, which restrict how their prototypes can be flown and usually only with a pilot. Some aircraft are starting to go through full certification procedures, as all commercial aircraft must before carrying fare-paying passengers. Air-safety authorities are still establishing what the standards should be. In July the EU's Aviation Safety Agency released a "special condition" for the certification of hybrid and electrically powered vertical take-off and landing aircraft. The idea is that the rules will be developed further as flight trials continue. As with conventional aircraft, certification could take several years and cost millions of dollars.

Regulators have set strict operating conditions for people flying small drones, whether as a hobby or for commercial purposes, such as filming, surveying or delivering pizza. This usually involves drones being kept well away from people, buildings, airports and other aircraft. But as air taxis are being designed to provide journeys in just such places, from an airport to the centre of a city for example, these new aircraft will have to be integrated into air-traffic-control systems, says Jay Merkle, the executive director of the Office of Unmanned Aircraft Systems at America's Federal Aviation Administration (FAA).

See and be seen

Various efforts are under way to automate air-traffic-control systems so that air taxis, piloted or autonomous, can be merged with flights by airliners and light aircraft. Fundamental to that will be fitting all aircraft with transponders, similar to those already used on large aircraft. These transponders would transmit and receive the flight plans of other aircraft in the vicinity automatically so that pilots, or in the case of autonomous aircraft their flight computers, can see and avoid one another. Next year NASA, America's aerospace agency, will begin field tests of systems that could manage such operations in an urban environment as part of a "grand challenge" to industry to find workable solutions.

Some countries, though, are pressing ahead faster than others. Operators already complain they can use a drone to deliver blood in Rwanda but not in America, says the FAA's Mr Merkle. Working with UAM firms on flight trials and sharing information is the best way to reach global standards, reckons Tim Johnson, policy director of the Civil Aviation Authority in Britain. The agency has more than 20 groups planning air-taxi flight trials in Britain. Japan aims to undertake such flights in rural areas, where airspace is less congested, before allowing air taxis into urban locations, said Ito Takanori of the Future Air Mobility Office of his country's Ministry of Economy, Trade and Industry.

Meanwhile, Uber is trying to learn how to run an air-taxi service. To this end it has begun operating a somewhat old-fashioned helicopter service between Lower Manhattan and JFK airport in New York. One thing this has brought home to the company, says Uber's Mr Sillion, is that UAM operators will inevitably get drawn into property and infrastructure projects.

This means building "vertiports", which are landing pads with passenger facilities, parking for air taxis and recharging points for their batteries. Skyports, a London-based startup, is building a prototype vertiport due to open in October in Singapore. It will be used by Volocopter for test flights.

EHang, a Chinese dronemaker, is using a passenger-carrying version it has been testing to develop an air-taxi business in Guangzhou, a city in southern China. It is working with the municipal government to set up a command centre for flying operations and a series of vertiports.

But behind all these plans lurks one more problem. Planning permission for helicopter landing pads is hard to obtain in some cities, largely because of noise objections. Flying taxis, being electrically powered, should be much quieter than helicopters but are still likely to be heard buzzing away overhead, just as drones are. The leaders of some cities, such as Dubai, Guangzhou and Singapore, might be prepared to accept that as the sound of progress. Others might not. And noise, it should be remembered, can ground many an aviator's ambitions. Despite the allure of supersonic travel, Concorde had its wings clipped because of the noise it made going through the sound barrier. ■

Name that dune

The sound of sand reveals its source

It's all about the ancient shellfish

Print | Science and technology Sep 12th 2019

LIFT A SHELL from the sand to your ear and everyone knows you can hear the sea. But listen carefully enough and you can hear shells in the sand too. Sand, it turns out, has a signature sound of its own, and now scientists have found a way to tune in.

To the untrained eye, one bucket of beach sand looks much like another but mixed into the multitude of microscopic minerals are carbonate chemicals left behind from the shells of long-dead sea creatures such as molluscs. The carbonate concentration varies according to local geology, and Saskia van Ruth, a researcher at Wageningen University in the Netherlands, and her colleagues say this leaves each batch of sand with its own distinctive noise. The results could extend forensic techniques, providing a quick way to determine the source of disputed sand.

After water, sand and gravel are the most used natural materials in the world. But a looming global shortage has led to a boom in clandestine sand mining and even outright theft. In the southern Indian state of Tamil Nadu, authorities are battling a so-called "sand mafia" who supply the construction industry through illegal dredging of riverbanks. Last year Malaysia became the latest country in the region to ban the sale and export of its sand, demand for which has soared as Singapore seeks to reclaim land from the sea. A decade ago an entire beach, 500 truckloads, was stolen from a resort in northern Jamaica and, it is believed, sold to rival operators.

Writing in *Applied Acoustics*, Dr van Ruth's team show they can distinguish between sand samples retrieved (legally) from nine seaside spots along the Dutch coast. And armed with that information as a reference tool, they could work out which beach a given sand sample had come from.

The scientists used a technique called Broad Acoustic Dissolution Spectroscopy analysis (BARDS). It is done with a sensitive listening device that picks up changes in acoustic properties when a scoop of sand or other powder is dropped into a beaker of mild acid and mixed. Chemical changes, including the breakdown of carbonates to carbon dioxide, release bubbles that increase the compressibility of the liquid and therefore slow down the passage of sound through it. Tap the side of the beaker as the sand and acid are mixed together and the sound that emerges drops in frequency over time. After a few minutes, all of the carbonate is broken down so the production of gas slows and stops. In response, the frequency of sound passing through the liquid goes back to normal. This gives each sample of sand two distinct measurements: how quickly the sound changes pitch, and how much it does so.

Dara Fitzpatrick, a chemist at University College Cork who developed the BARDS technique, says the change, from high notes to low and then back again, can be heard when many powders dissolve and is known to physicists as the hot-chocolate effect. "You can do it in your kitchen," he says. His team is selling the kit to drug companies as a quicker and cheaper way to analyse powders. It has also been used to distinguish expensive Himalayan table salt from inferior fakes.

With sand, the more carbonate there is to produce carbon-dioxide gas, the greater the acoustic shift. That is what allows the eavesdropping scientists to pinpoint its source. They can also pick up more subtle influences, including the effect of the remains of different-shaped shells, because variations in their thickness and surface area speed or slow the release of gas.

Follow the sand

In places like the Netherlands, forensic tracing could help track the effectiveness of coastal-management practices, such as the dumping of millions of tonnes of sand to bolster natural defences against the sea. Where that sand ends up is not always clear. Placing the sand directly onto beaches is believed to be wasteful because much of it is washed back into the sea. Newer methods drop the sand into the shallow water just off the beach, allowing the tides to deposit it onto the land over time. Dr Fitzpatrick says existing methods to distinguish sand samples are crude and slow as they rely on looking at the size and shape of individual grains under a microscope. He sells sea shells as a way to see more. ■

Fountain of youth

Uncovering how the body ages is leading to drugs to reverse it

Young blood not required

Print | Science and technology Sep 12th 2019

IN 2016 A startup in California called Ambrosia began offering its customers transfusions of blood from the young. At $8,000 per litre, it was a service for the wealthy who believed that young blood could slow down or reverse the ageing process, thereby reducing their chances of developing cancers, Alzheimer's disease and heart disease.

Earlier this year America's Food and Drug Administration (FDA) cautioned potential customers that there was no proven scientific benefit to receiving such blood. In response, Ambrosia shut down its clinics. But ill-fated startups aside, there is a kernel of truth to the idea that young blood can be rejuvenating. Experiments in the early 2000s in which mice of different ages had been stitched together to share their circulatory systems, known as heterochronic parabiosis, had demonstrated dramatic improvements in the cognition, muscle repair and liver function of the elderly partners. The race this work sparked to translate the idea into something useful to humans, however, raises issues, not least in the squeamishness and hazards associated with sharing blood.

Perhaps no longer. One of the pioneers of parabiosis, Irina Conboy, a bioengineer at the University of California, Berkeley, has now developed a way to get some of the benefits of parabiosis without any of the gruesome methods. She and other scientists in the field had previously found that not only did old partners benefit from parabiosis, but young partners suffered: the old blood aged them prematurely. Some of the decline was caused by a protein called transforming growth factor beta (TGF-beta). This is normally responsible for regulating everything from cell proliferation to differentiation and death. As people age, TGF-beta accretes in the blood and this leads to problems such as inflammation or fibrosis.

In a new study published in *Ageing*, Dr Conboy describes a way to slow down this damage. Her team gave ageing mice a cocktail of oxytocin, a hormone, and ALK5 inhibitor, an enzyme. Previous studies showed that these had positive effects on some of the symptoms of ageing. By suppressing the amount of TGF-beta in cells, the ALK5 inhibitor had been shown to stimulate the growth of new brain cells and improve muscle and tissue health. And oxytocin, which activates stem-cell formation in response to tissue damage or atrophy, declines naturally with age.

However, to have any effects, ALK5 inhibitor usually had to be given at very high doses. And when researchers tried to add extra oxytocin by itself, the hormone's benefits were overwhelmed by waste accreted in old blood. By putting them together, however, it was possible to reduce the dose of ALK5 inhibitor by a factor of ten and reap the benefits of the oxytocin.

After seven days on this cocktail, the mice had less inflammation in their brains, more neural stem cells in the brain area responsible for memory and learning, and better cognitive capacity. Their livers had less scarring and fat, and their muscles healed better and faster. In short, their bodies and brains looked a lot like the old mice after parabiosis—but without the drawbacks of a blood buddy.

Because both ingredients of this chemical cocktail are already approved by the FDA, Dr Conboy's team is now planning a clinical trial of 20 volunteers over 65, to see if the cocktail's rejuvenating powers will work in people.

The latest findings have been welcomed, albeit cautiously. Scientists at the American National Institute on Ageing say the latest work may show a way forward in a field that currently seems stuck. But they think it is too early to advance the research into human trials. The concern is that the drugs being used have not previously been tested together in people. Dr Conboy points out, however, that prescribing approved drugs in multiple combinations is a standard procedure in medicine.

Entrepreneurs in Silicon Valley might have jumped the gun in selling the rejuvenating effects of parabiosis to their clients. Nevertheless, this vampire-like concept is not gone yet—and could still rise up from the dead someday soon. ■

Human evolution

Neanderthals had a propensity for earache, nudging them to their doom

A new analysis of their skulls points to an anatomical problem

Print | Science and technology Sep 12th 2019

THE LAST Neanderthals vanished from Earth about 40,000 years ago. Exactly what drove them to extinction, however, remains a mystery, with their disappearance variously attributed to anything from climate change to inferior cognitive abilities or even cannibalism.

Anthony Pagano, a medical researcher at Seton Hall University in New Jersey, has a new explanation. He thinks Neanderthals might have been unusually prone to severe ear infections, which left them struggling to compete against their *Homo sapiens* cousins. In modern humans, ear infections can happen at any age but it is mainly young children who get them; five out of six will have at least one such infection before their third birthday. In 2017 Dr Pagano suggested this could be because of the orientation of the Eustachian tube, which is located just inside the eardrum, and connects the middle ear to the back of the throat. The throat end of this tube opens when a person swallows, allowing air to be sucked in or pushed out of the middle ear so that its internal air pressure matches the outside world. This is why swallowing during take-off or landing on a plane can relieve painful pressure in the ears.

Infection hazard

When air is sucked into the tube, however, harmful bacteria from the throat can be carried along too. This is not such a problem in adults, because the Eustachian tube is oriented vertically and it is difficult for pathogens to rise upwards to reach the middle ear.

In young children, however, the Eustachian tube lies horizontally between the throat and ear, meaning pathogens can more easily get in and cause infections. "The tube doesn't take on the adult vertical form until the six-year mark," says Dr Pagano. "And at that age clinical rates of middle-ear disease drop off."

For Neanderthals that drop-off might never have come. Dr Pagano and his team examined three well-preserved adult Neanderthal skulls, two of which came from Italy and the third from Gibraltar. Their measurements, reported in the *Anatomical Record*, indicate that the Eustachian tube was horizontal in all three, suggesting adult Neanderthals may have been as likely to develop ear infections as today's infants. Long before antibiotics, those infections could have been lethal, potentially leading to meningitis or pneumonia.

Some researchers questioned whether Neanderthals could have existed for as long as they did—around 400,000 years—if they carried such a fundamental anatomical problem. Dr Pagano says that ear infections would have raised Neanderthal mortality rates only slightly, and not enough to doom the species in ordinary circumstances.

But a few thousand years before the Neanderthals vanished from Europe, modern humans reached the continent. Competition with the newcomers put Neanderthal populations under extreme pressure and, in those circumstances, small factors might have made a big difference. Ear infections can lead to deafness, for example, and that might have been significant. If Neanderthals were more likely than modern humans to have hearing problems then they would have had more trouble communicating and hunting, with dire consequences for their long-term survival. ■

Astronomy

An exoplanet in a star's Goldilocks zone is confirmed to have water

Another tick in the box for habitability

Print | Science and technology Sep 14th 2019

SINCE ITS discovery by astronomers in 2015, the exoplanet K2-18b has elicited much excitement. Swirling around a red-dwarf star about 110 light-years away from Earth, the distant world sits in a so-called Goldilocks zone—not close enough to its host star to be too hot and not far enough away to be too cold—that could allow liquid water to flow across its surface. And liquid water is a crucial condition for any sort of remotely Earthlike life.

Now astronomers have cranked up the speculation. Follow-up images taken by the Hubble Space Telescope suggest K2-18b (artist's impression below) has an atmosphere containing large amounts of water vapour—the first exoplanet in a habitable zone to have this confirmed. Most exoplanets previously found with atmospheres have been gas giants, similar to Neptune or Jupiter. K2-18b instead looks like it could be a rocky planet with between two and three times the diameter of Earth, perhaps covered in vast ice-covered seas.

To make the discovery of atmospheric water, Angelos Tsiaras, an astronomer at University College London, and his colleagues looked at how light filtered through the atmosphere of K2-18b as it passed in front of its star between 2015 and 2017. This spectroscopic technique is a common way to analyse the atmospheric composition of exoplanets, based on which wavelengths of light make it through and which are blocked. But it is difficult—especially for the relatively small and cold rocky worlds that could hold the conditions for life.

Writing this week in *Nature Astronomy*, Dr Tsiaras describes how his team wrote software that could analyse the data collected by Hubble to try to do the same job—up to a point. They were not able to pinpoint the exact form and amounts of the water they found. Instead they used computer models to simulate the most likely scenarios, and concluded that as much as half of the atmosphere of K2-18b could be water vapour. They also found evidence of large amounts of hydrogen and helium gas.

This is just the start of such study of planets beyond our solar system. Astronomers plan to launch two new orbiting telescopes in the next decade—the American James Webb Space Telescope and the European ARIEL survey—that will be powerful enough to peer into the atmospheres of exoplanets more closely. Powerful enough, perhaps, to detect telltale molecular signatures of life.

With Dr Tsiaras's analysis, K2-18b is now the best candidate for a life-supporting exoplanet out there. The temperature on the surface could be about the same as Earth and there could be similar clouds hanging in the sky. However, the planet's adjacency to the star—it whizzes around once every 33 days—could produce intense space weather from the stellar activity. And it would be advisable to pack sun cream: the ultraviolet radiation would be off the scale.

Correction (November 14th 2019)*: A previous version of this article said that K2-18b could be twice as big as Earth and that liquid water is a crucial condition for life. To clarify, K2-18b is between two and three times Earth's diameter and liquid water is a crucial condition for Earthlike life. Also, the previous title was incorrect. Many exoplanets are known to have water. This is the first such discovered in a habitable zone. Sorry.*

Books and arts

Political fiction
Return to Gilead

Return to Gilead

The sequel to "The Handmaid's Tale" explores the workings of repression

But in "The Testaments", Margaret Atwood charts a way out

Print | Books and arts Sep 12th 2019

The Testaments. By Margaret Atwood. *Nan A. Talese; 432 pages; $28.95. Chatto & Windus; £20*

THEY STOOD in a line outside the Capitol while senators considered a health-care bill that would restrict family-planning services. They reappeared in Washington to watch over the confirmation hearings of Brett Kavanaugh, a controversial Supreme Court justice. In Ohio's statehouse they sat, heads bowed, as lawmakers discussed banning a common abortion procedure. Each time the protest was silent. Their long crimson gowns and winged white headdresses made the point. The uniform, borrowed from "The Handmaid's Tale", has become a universal symbol of women's oppression.

Although Margaret Atwood's novel was published in 1985, for many readers it illuminates today's politics more than any other work of literature. Some of its dystopian predictions about the rollback of reproductive rights now seem prophetic. "While we were moving away from Gilead for a while in the 20th century," Ms Atwood told *The Economist,* referring to the oppressive theocratic state in her story, "we turned around in the 21st and started going back."

Women who agree with her have attended demonstrations across the world, dressed as her characters. At the marches for women's rights in January 2017, protesters in America and elsewhere carried placards quoting the book, or drily insisting that this work of speculative fiction is not an "instruction manual" for governments. A television adaptation, featuring those now-iconic costumes, was first broadcast a few months later; at the White House Correspondents' Dinner the next year, Michelle Wolf, a comedian, joked that if Mike Pence, America's vice-president and a zealous evangelical Christian, had not already watched the show, he "would love it".

The contemporary influence of "The Handmaid's Tale" is approaching that of George Orwell's "Nineteen Eighty-Four". Over 8m copies have been sold in English. In 2017 it was the most-read novel in America, according to Amazon. Ms Atwood quips that she "may be the only person on the planet who is such a beneficiary" of America's rancour. More than three decades after the original, a sequel to the book, "The Testaments", was published this week.

"The Handmaid's Tale" imagines that the American government has been overthrown by the Sons of Jacob, a fundamentalist Christian group. They murder the president and members of Congress—"they blamed it on the Islamic fanatics"—suspend the constitution and declare the Republic of Gilead. In this totalitarian state, men and women have strict roles. Men can be "Commanders" governing Gilead, "Eyes" (spies), "Angels" (soldiers) or "Guardians of the Faith" (sentries); some continue in professions deemed useful, such as doctors and accountants. Women can be Wives to Commanders, "Marthas" (household labourers), "Aunts" (disciplinarians for the regime) or "Handmaids" (surrogates who bear the Commanders' children). The "Unwomen" who resist these roles are executed or dispatched to the Colonies, where they farm toxic land until they die. This system is explained by Offred ("Of-Fred", the name of her Commander), a Handmaid.

When Ms Atwood was writing that book in 1984, she wanted to imbue it with an uncanny realism, and sought biblical or historical precedents for every detail and policy in Gilead, amassing a box of newspaper clippings. The past is "filled with echoes", she wrote in "The Handmaid's Tale". She had a point. The religious conservatism that was then sweeping America harked back to the country's Puritan history. Communist regimes relied on primitive propaganda. The kind of public executions that provided voyeuristic thrills in medieval times remained popular in Saudi Arabia and Iran. Meanwhile, debate raged about feminism, sexual violence and abortion.

After Donald Trump's election, Ms Atwood came to be seen by some as a soothsayer. "The Handmaid's Tale" laid out an extreme version of America's pathologies, issuing a warning that what was once shocking could come to seem normal, as outrage devolved into complacency. Speak up about injustice while you can, it seemed to say. For Gilead "may not seem ordinary to you now, but after a time it will", one character observes.

Marthas and Commanders

Given the story's status, when publication of "The Testaments" was announced last year, the reaction in the literary world was frenzied. Cyber-criminals undertook a long (though unsuccessful) campaign to hack the computers of Ms Atwood's literary agents and steal the manuscript. Only a tiny number of copies were released for publicity—including a few for the judges of the Booker prize, who last week shortlisted "The Testaments" for the award.

The new book leaps ahead of the TV series, which itself extended the drama of "The Handmaid's Tale" far beyond Ms Atwood's original novel. Set more than 15 years later, "The Testaments" has three main characters: Aunt Lydia, one of the architects of Gilead's policies towards women; Agnes Jemima, Offred's first daughter, who is still in Gilead; and Daisy, Offred's second daughter, who, like her mother, has made it to the safety of Canada. The narrative alternates between their accounts.

"The Handmaid's Tale" described the new regime's brutality from Offred's perspective only, showing how a politician's promise of a better future "never means better for everyone...it always means worse, for some". The scope of "The Testaments" is wider. It uncovers Gilead's inner workings: the ideological hypocrisies, the fragile alliances, the institutional rot. It highlights, through Aunt Lydia, the coercive tactics employed by repressive states. Having previously been a judge, when the coup takes place Lydia is imprisoned in a former stadium. She is locked in solitary confinement, tortured and given a choice that is not a choice: to co-operate or die. In these conditions, even the strongest wills can be tamed. "You take the first step, and to save yourself from the consequences, you take the next one," Aunt Lydia says.

Ms Atwood was inspired by the struggles for survival among the top brass of the Soviet Union and elsewhere. Yet fans hoping to glimpse the problems of the 21st century in the new book will be gratified, too. There are references to "the floods, the fires, the tornadoes, the hurricanes, the droughts, the water shortages, the earthquakes", and to economic problems that make citizens scared—then resentful. Gilead corrals its outcasts "like sheep into fenced-in ghost towns with no food and water". In an inversion of America's vexed relationship with Mexico, people flee, "risking their lives walking north to the Canadian border in winter". Other countries, after "refugee riots", have closed their doors to the fugitives.

For their part, the Commanders try to introduce a "Certificate of Whiteness" scheme, which fails. Women die after being forced to give birth to non-viable babies. A respected dentist is sexually abusing several young girls, but the victims feel they cannot come forward. "Even with grown women," Aunt Lydia writes, "four female witnesses are the equivalent of one male, here in Gilead."

Yet if "The Handmaid's Tale" was a warning, "The Testaments" has a more positive message. Both books end by affirming that the regime eventually falls, in epilogues which refer to a historical symposium of Gileadean studies. "The Testaments" shows that corruption and infighting help to bring about its demise from within. Ms Atwood says that it reflects a sense of hopefulness on her part. History, she thinks, proves that "you can keep some of the people down some of the time, and most of the people down most of the time, but you can't keep all of the people down all of the time." ■

The descent of man

Nicholas Lemann traces the history of American corporations

Ingenious and colourful, "Transaction Man" dodges some hard questions

Print | Books and arts Sep 12th 2019

Transaction Man. By Nicholas Lemann. *Farrar, Straus & Giroux; 320 pages; $28.*

IN THE 1970S a course on investing at Harvard Business School was nicknamed "Darkness at noon", because it was held in a basement at lunchtime and badly attended. By the mid-1990s the classes on finance were jammed with wannabe masters of the universe. That telling contrast is among the many illuminating snapshots of the past in Nicholas Lemann's ambitious new book on corporate America.

Even in the headquarters of capitalism, Mr Lemann reveals, attitudes to business have oscillated wildly, both in boardrooms and on Wall Street. His book is an unusual addition to a growing canon that seeks to explain why, for many ordinary people, the American Dream has come to seem out of reach. Rather than focusing on macroeconomic factors such as growth, productivity or unemployment, in "Transaction Man" Mr Lemann dwells on how companies are run. Its publication is timely, given the recent statement by the Business Roundtable, a group of bosses, that firms should be run for all stakeholders, not just shareholders. But for all its rich reporting and panache, it lacks rigour.

Mr Lemann splits modern American business history into three phases. In the largely benign age of Institution Man, roughly from the 1930s until the 1970s, large corporations dominate, under the control of technocrats who often adopt elements of a corporate welfare state—from job security to pensions and health care. From the 1970s onwards the malign era of Transaction Man begins, in which financial deregulation and more assertive owners see big firms broken up and managers take a more ruthless view of social obligations. In the 2000s the era of Network Man is inaugurated, led by tech firms seeking to overthrow the old order with platforms that have millions of connected users. The jury is still out on whether this latest phase is an improvement, the book suggests.

Onto this simple structure, Mr Lemann builds many narratives about individuals and institutions. Three people loom large, each representing a distinct phase: Adolf Berle, a thinker born in 1895 who wanted to harness big business for social ends; Michael Jensen, an economist who preached a radical doctrine of shareholder value in the 1970s and 1980s; and Reid Hoffman, a co-founder of LinkedIn and a Silicon Valley guru. The book also tracks the evolution of two firms, General Motors (GM) and Morgan Stanley. As if that were not enough, it follows a working-class neighbourhood on the South Side of Chicago over the decades.

As an intricate feat of storytelling, the author (who writes for the *New Yorker*) just about carries it off. There are dazzling passages. In the prologue he skewers today's elite, whose typical member "is suspicious of politics and provincial concerns; his perspective is global and based on what he regards as universal principles." He lampoons the Clinton administration's chumminess with bankers. Gems are dug from the past. Alfred Sloan, autocratic boss of GM in the mid-20th century, had a private railway carriage, with an office and bedrooms, which he used to travel the country to visit car dealers. Mr Hoffman is depicted in a Californian sushi joint, swapping vacuities with a consultant from McKinsey who proclaims, "There's a non-zero chance that AI will be smarter than humans."

Yet for all the sparkle, the book suffers from two flaws. One is a smouldering identity crisis: it can't make up its mind whether it is a polemic about how America has gone to hell or a more standard history, anchored in empiricism. As a result, the reader often has the uneasy feeling of not being given the full picture. Globalisation is barely mentioned. Mr Lemann never establishes whether the majority of the workforce, or only a small elite of workers—and their pampered, sometimes reprehensible overlords—benefited during the glory days of behemoths such as AT&T and IBM. Given his generally favourable depiction of such outfits, that is a huge omission. The description of the subprime crisis fails to tackle Fannie and Freddie, presumably because the mortgage giants were, inconveniently, government-sponsored. Mr Lemann is furious about the treatment of GM, which got a bail-out in 2009, but overlooks its inefficiency and bad management.

The second flaw is that "Transaction Man" does not furnish a considered framework for how the economy works and creates prosperity. Although it is never put this clearly, the book's dominant mental model seems to be a producer-led one in which workers make things and the gains are split between labour and capital. Consumers are an afterthought. The role of creative destruction in raising long-term living standards, partly by shrinking obsolete industries and redeploying resources to new ones, is downplayed.

The result is that the hard questions are dodged. Should inefficient firms with bad products that disadvantage tens of millions of consumers be protected in order to save hundreds of thousands of jobs? Does globalisation mean that the government must bear the burden of social obligations, because if companies do they will find their costs are too high to be able to compete with foreign businesses? Why has economic performance been dismal in many European countries that stuck with corporatism? Read this book for the vivid panorama, not for the logic of its argument. ■

The fractured lands

A technicolour history of Brooklyn

From ice sheet to hipsters

Print | Books and arts Sep 14th 2019

Brooklyn: The Once and Future City. By Thomas Campanella. *Princeton University Press; 552 pages; $35 and £27.*

THE FIRST photograph in Thomas Campanella's fascinating history of the borough of Brooklyn seems, at first glance, to have little to do with his subject. Here is the north-east coast of Baffin Island, in the high Arctic, where, looking towards the Barnes Ice Cap, you can glimpse the "rapidly vanishing last vestige of the Laurentide ice sheet". But that ice sheet was, as Mr Campanella evocatively writes, the "great sculptor" of New York state, and Brooklyn is the "long-settled western rump of that glacial pile known as Long Island", left behind when the ice retreated.

Mr Campanella, who teaches at Cornell University, aims to give an account of "the Brooklyn unknown, overlooked and unheralded—the quotidian city taken for granted or long ago blotted out by time and tide." He succeeds admirably, tracing the development of the land first inhabited by the Canarsee Indians, part of the Leni Lenape Nation of Algonquian peoples, and later by the Dutch and the English. He points to ghostly mementoes of native habitation: the present-day junction of Flatbush Avenue and Kings Highway marks the crossroads of two native trails, "which explains why both roads look like random rips in the urban fabric on a map".

Dutch settlers called the place *breukelen*, "the fractured lands", because of the many tidal inlets that scored the plain above Jamaica Bay. Those parcels of land were consolidated first into a city in its own right and then—after 1898—into a part of Greater New York. Much of the book concerns the borough's struggle against the draw of its more glamorous neighbour across the East River, and indeed against the state of New Jersey: Newark, not Brooklyn, became the home of the region's major port, and Newark airport overtook Brooklyn's Floyd Bennett Field, despite the energetic efforts of Brooklyn's boosters.

Mr Campanella's book is richly peopled with the likes of Floyd Bennett himself, a heroic and handsome aviator who flew to the North Pole in 1926, perishing two years later on another adventure. Many engaging characters feature in Brooklyn's stormy story. John McKane, a carpenter and builder, became the powerbroker behind the growth of Coney Island into a pleasure resort at the end of the 19th century (before winding up in jail). Fred Trump, the president's father, threw a party to celebrate the destruction of Coney Island's "Pavilion of Fun", which, in "an act of vandalism", he razed to make room for an abortive apartment project.

"Brooklyn: The Once and Future City" is, however, more than a story of boom and bust. It is a nuanced portrait of a diverse group of communities. Genteel farmland, then a byword for urban blight, and now the apotheosis of hipsterdom and gentrification—Brooklyn has seen it all. Mr Campanella, a native Brooklynite himself, brings both love and scholarship to his writing, revealing the true spirit of this fractured land.

The air of freedom

A counter-revolutionary love story from Hong Kong

Yonfan's "No. 7 Cherry Lane" is a rare example of avant-garde conservatism

Print | Books and arts Sep 12th 2019

DURING THE courtship at the heart of "No. 7 Cherry Lane", an animated film from Yonfan, a 71-year-old auteur, the streets of Hong Kong erupt in violent protest. Police in riot gear and gas-masks face down crowds of angry youths who are calling for the downfall of an authoritarian government. It is 1967, when Chinese Communist agitators fuelled riots that rocked the territory, then under British colonial rule. "This is revolution," marvels Fan Ziming, a university student, looking on from a safe distance. Mrs Yu, his 40-year-old love interest, is unimpressed, having lived through the civil war in China. "This is not revolution," she snaps back. "I've experienced the real thing."

The echoes of the current unrest in Hong Kong may be coincidental, but they are inescapable. "No. 7 Cherry Lane", which was screened last week at the Venice Film Festival, is a surreal, erotically charged story in which Mrs Yu competes with her 18-year-old daughter Meiling for the affections of Ziming, an English tutor. But it is also, more subtly, a conservative rebuke to youthful rebellion, and a paean to elders and to bridging differences between generations. Yonfan, who won the festival's screenplay prize, dedicated the film to Hong Kong, calling it a "love letter" to the territory. But his may not be the sort of affection that today's protesters appreciate. He loves Hong Kong both as it was in 1967, and as it is now under Chinese rule.

The director was born in China on the eve of the revolution; his family eventually settled in Taiwan, where he grew up under the dictatorship of Chiang Kai-shek. He describes breathing "the air of freedom" when, aged 16, he rode the Star Ferry after his arrival in British-controlled Hong Kong in 1964. Yonfan had been urged by friends to stay quiet about today's protests while in Venice—but he couldn't. He sees them as violent, lawless and unnecessary; he had no quarrel with the extradition bill, backed by the mainland government, which sparked the upheaval (and which Carrie Lam, Hong Kong's chief executive, finally withdrew on September 4th). He says he does not feel the tightening of liberties that has driven hundreds of thousands, even millions of people into the streets; like others sympathetic to the authorities, he disputes those high crowd counts. "In Hong Kong", he insists, "I feel free, everywhere, all the time."

Casual fans of the films Yonfan began making in the 1980s might have missed his particular strain of conservatism. For example, "Bishonen" (1998) was groundbreaking for its explicit exploration of gay romance. "No. 7 Cherry Lane", his first feature film in a decade, lingers on Mrs Yu's frank sexual fantasies in lurid dream sequences. In an early set piece, inspired by a classic Chinese story, she imagines herself as a nun who is kidnapped by a brute and taken to a forest clearing, her naked body set upon by snakes, then by her kidnapper. She tears away the brute's face to reveal Ziming. He also attracts the lustful eye of Mrs Yu's upstairs neighbour Mrs May, a transvestite and retired actor, now a recluse with her butler and cats. In another fantasy sequence, Mrs Yu stretches out languorously on a sofa, imagining a shirtless Ziming with a pair of cats scratching and licking his chest.

By contrast, Ziming's courtship of Mrs Yu is chaste and old-fashioned. Every Saturday he takes her to the cinema, where they watch matinée screenings of classic French films, all starring Simone Signoret, which reinforce Yonfan's theme of an older woman's romantic appeal to a younger man. Infatuated with Ziming herself, Meiling jealously follows her mother on these dates and almost ends up bagging him, in a rough approximation of "The Graduate" (a title which appears in the film on a cinema marquee). At one point Meiling declares that "tomorrow belongs to me".

All our yesterdays

To Yonfan, though, this is the misplaced arrogance of youth. In his telling, Mrs Robinson gets the boy. In a show of filial piety, Meiling finally gives up her pursuit and wishes her mother happiness. Tomorrow may belong to the young, Yonfan says, but they should get there in "the right way". "This is a movie of reconciliation," he explains. "Yesterday, today, tomorrow. Yesterday is the mother. Tomorrow is the daughter. But in my movie, they reconcile."

There is an acute irony in an independent Hong Kong film carrying (albeit subtly) a pro-establishment message. In the past some Hong Kong directors, including Yonfan, enjoyed a global reputation for an avant-garde playfulness with social and artistic conventions, which their inhibited counterparts on the mainland only occasionally matched. But Hong Kong's masters have receded from the international film circuit in recent years. In this century some of China's and Hong Kong's most daring film-makers have been embraced by the authorities. Critics think several have been co-opted, their films subject to official censorship as a price for access to the most lucrative Chinese-language market.

Yonfan is not in that category. As with his previous films, he took no official funding for "No. 7 Cherry Lane". He did not submit it to censors in Beijing as he is not seeking a theatrical release on the mainland (though the movie was animated in Beijing, by Zhang Gang). This time, however, his avant-garde statement is to make a film that, in its eccentric way, stands squarely in opposition to the rebellious zeitgeist of Hong Kong today. Yonfan does not care if Hong Kongers boycott his film because of his anti-protest sentiments, on-screen and off: "I made this movie for me." ■

Economic data, commodities and markets

Print | Economic and financial indicators Sep 12th 2019

100-year bonds
Austrian economics

Austrian economics

Austria's 100-year bond has delivered stunning returns

Its price will crash if interest rates rise. But most buyers won't live long enough to regret it

Print | Graphic detail Sep 12th 2019

NO ASSET SHOULD be sleepier than the sovereign bonds of rich countries. In exchange for holding "risk-free" debt, investors accept low returns. In real terms, American ten-year Treasury bonds have returned just 1.9% a year since 1900, compared with 6.4% for shares. Since 2017, however, one bond issued by one rich country has returned a whopping 75%.

The country is Austria, and the coupon on the bond is just 2.1%. The secret to its success is its unusually long term. Lenders will not get their principal back until 2117, 100 years from the date of issue.

One of the main determinants of bond prices is the gap between their fixed coupons and prevailing market rates. If a bond is sold at a 4% yield and rates fall to 2%, its price will rise, since it produces twice the income that new securities do. This effect is modest for bonds near maturity. But over 100 years, this two-point gap is multiplied by 100 payment periods. As a result, ultra-long-dated debt is highly sensitive to jitters in interest rates. When rates dip, its price soars; when they surge, its value plunges.

In the past two years, the yield on Germany's ten-year bond has fallen from 0.4% to -0.6%. Rather than pay Germany to hold their money, some lenders have flocked to Austria's "century bond", which yields 0.9%. Long-term rates are now so low that America's treasury secretary has said the country may sell its own 100-year debt.

The bond's returns have drawn broad attention. For years, analysts thought that the floor for interest rates was 0%, because creditors would rather stash cash under mattresses than accept a negative rate. Now that negative rates prevail across Europe, this theory has been disproved. And the Austrian bond is the most potent tool to bet on a further decline in rates. If the ultra-long-term market rate fell by 1.1 percentage points, the bond's value would double.

Rates may not have hit bottom just yet. In Europe economic growth is sluggish, and inflation has been tame. Germany's GDP shrank by 0.1% in the second quarter. As *The Economist* went to press, the European Central Bank was poised to cut rates, and possibly resume quantitative easing.

In the long term, demographic change weighs on interest rates. Longer lifespans and falling birth rates mean that Europe's population is ageing. This shrinks the workforce, slows GDP growth and reduces returns on capital—and thus bond yields.

However, such trends may not hold up for ever. Nor can investors be sure of the survival of the euro, or of Austria's political stability. A century before the country issued its 2117 bond, the Austro-Hungarian emperor was facing defeat in the first world war. Argentina also sold a century bond in 2017; its price has fallen by 55%.

Moreover, the Austrian bond offers no room for error. Long-term rates have been low for most of history. In 1800-1950 Britain paid around 3.5%. But they have never settled below 1%, the level that today's investors need to profit. If ultra-long rates rise to 2%, the bond would lose 40% of its value; at 5%, its price would fall by 75%. Lenders seeking safety may face a rude surprise. ■

Sources: Datastream from Refinitiv; Bank of England; Federal Reserve Bank of St. Louis; Bloomberg; OECD; *The Economist*

Robert Mugabe
Rule by the whip

Rule by the whip

Obituary: Robert Mugabe died on September 6th

The nationalist hero who destroyed Zimbabwe was 95

Print | Obituary Sep 12th 2019

BOOKS HE TRUSTED. One was usually in his hand in those first, mostly happy, years as Zimbabwe's leader. He would be home at State House by 5.30pm, slamming doors so that his beloved wife Sally would know to come rushing. They crumpled together on a low armchair, almost on each other's laps, she eating custard as he sipped tea. Then he would drape a long arm round her while turning with the other the pages of a favourite novel, usually British, often a Graham Greene.

Written words Robert Mugabe could love. It was real live people who proved difficult. A shy, surly boy, he sought no friends in Kutama, his village. Later he admitted it frankly: "I lived in my mind a lot. I liked talking to myself, reciting little poems and so on; reading things aloud to myself." A loner, he hated scrapping with sticks, running, boys' boisterous games, communal life. A brother, Donato, thought him "lazy, just reading all the time". Even at chores, in the shade of the bush while snaring birds or tramping in the dust to herd cattle, he would read. "He held the book in one hand and the whip in the other. It was a strange thing for all of us to see," recalled Donato.

The Irish priest at the Catholic mission in Kutama thought he had "unusual gravitas" and would "be an important somebody". He was at mass daily, most dutifully after his brother, Michael, was poisoned. Years of teaching study followed: first in Southern Rhodesia, then at Fort Hare, South Africa, the crucible for so many African nationalist leaders, and lastly in Ghana, where he met Sally.

As an African nationalist in Rhodesia, ruled by Ian Smith in the name of white supremacy, jail was inevitable. His 11 years behind bars he recalled as a chunk of life pointlessly stolen away. Again, books sustained him. He acquired seven degrees. As it did for Mandela, Nkrumah and Kenyatta, prison also earned him political credibility. Outdoor activity was harder. In Mozambique after his release, as his fellow liberation fighters strutted in fatigues, he sweltered in a suit.

Throughout his life, rivals somehow met timely deaths. Cars were flattened by lorries on remote roads; flames devoured a farmhouse; opponents learned to fear high open windows. Few loved him. The British sometimes sneered. At Lancaster House in London, amid talk of independence and elections, the British foreign secretary found him "reptilian", "not human". At home, voters thought otherwise. He swept to glorious, genuine victory in the first free elections in 1980. To the shock and relief of Smith and the white farmers, he let them stay on, keeping their land if they abstained from politics. Though he had declared himself a Marxist-Leninist-Maoist, he now preached reconciliation. And the teacher flourished. Zimbabweans were among the best educated people in Africa, and evenings at State House saw the prime minister personally tutoring his staff.

He blamed Britain for all ills, including his country's complete economic collapse in the first decade of this century. Inflation soared to 500trn%; a generation of people fled. The British, he claimed, had broken their word on paying for land reform. Yet he hankered for England, London shopping, Savile Row, cricket and high tea with "Johnny" Major. He was fonder still of royalty, telling with a twinkle of the queen's happiness on visits to Zimbabwe.

For all his literary habits, the whip was never far away. In the early 1980s he turned to North Korea to train soldiers to crush the main minority tribe, the Ndebele. He admitted his security men had committed some "excesses" when entire village communities were burnt in their huts. He denied talk of 20,000 victims and called himself forgiving—"otherwise I would have slaughtered lots of people". The rest of the world did not much notice, or care to bring him to book. Yet his fear of prosecution for crimes against humanity may have encouraged him to cling to office, despite his conviction that only God could remove him.

His rule grew darker, possibly because Sally had died and been replaced by Grace, an ex-secretary 40 years younger than he was, even fonder of shops and more ambitious for political power. His opponents had once been co-opted; now he crushed them. Young thugs, egged on by him, punished white farmers by taking their land away. It was given to his friends, "war veterans" like himself, whether or not they had any idea how to work it. As a farming economy, Zimbabwe collapsed.

Frugality, brutality

He never saw tragedy in his country's immiseration, only meddling by outsiders or vicious threats by rivals. The army and his Central Intelligence Organisation ensured his grip on power, rigging elections, killing opponents, closing newspapers and wiping away a generation of bright and tolerant Zimbabweans who could have led Africa. His people succumbed to hunger, AIDS, cholera and despair. Each year he held a more lavish public birthday party, beaming with delight as he cut a massive cake.

In the end it was the dismissal and flight abroad of his most trusted lieutenant, Emmerson Mnangagwa, that led to his downfall in 2017. Grace had overplayed her hand in having him sacked, and the army rolled into Harare. The generals glibly insisted this was not a coup, saying they were dealing with "traitors". By this, they did not seem to mean him. But they duly installed Mr Mnangagwa as president.

Asked why people feared him, he said he thought it was "perhaps because I'm quiet, and also because I believe in what I say." His life was mostly frugal: rising early to practise yoga; working daily at his desk, in his mustard-yellow chair beside a huge map of the world; nibbling rice and cornmeal by hand, the African way. He showed few of the vices—women, booze, feasts—associated with the caricature of an African dictator. But he had the usual vanity. Asked by *The Economist,* well into his 80s, when he would retire, he laughed that he would rule until he was "a hundred years old". The tragedy for Zimbabwe was how close he got to keeping his word. ■