The Economist

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The man who would beat Le Pen

Time to be tougher on Iran

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Politics

A series of terrorist attacks struck **Pakistan**, including one on a Sufi shrine that killed 88 people. The army blamed infiltrators from Afghanistan, sealed the border and shelled what it said were terrorist bases on the Afghan side.

In **Afghanistan**, police surrounded the house of Abdul Rashid Dostum, the vice-president, in an attempt to arrest nine bodyguards, who have been accused of beating and raping a political rival.

A former policeman from the **Philippine** city of Davao claimed he had run a vigilante group that had murdered criminals at the behest of the mayor at the time, Rodrigo Duterte, who became president in June.

The IMF agreed to lend **Mongolia** $440m to help it weather a balance-of-payments crisis, paving the way for further loans from the Asian Development Bank, Japan and South Korea.

China said it would suspend imports of coal from **North Korea**, all but eliminating one of the isolated communist state's main sources of revenue. Malaysia, meanwhile, said it was looking for several North Korean officials in connection with the murder of the half-brother of Kim Jong Un, the North Korean dictator.

A court in **Hong Kong** sentenced the territory's former chief executive, Donald Tsang, to 20 months in prison for misconduct while in office. Mr Tsang was found guilty of failing to declare that he had rented a flat in the Chinese city of Shenzhen from a major shareholder in a broadcast company that Mr Tsang approved licences for.

Tightening the border

America's Department of Homeland Security published guidelines to implement Donald Trump's executive order cracking down on **illegal immigrants**. Among other things, the new rules make it much easier to deport people who cannot prove they have been living in the United States for two years.

Mike Pence went to Europe to assure America's allies that it is still committed to **NATO**, whatever his boss may have said. But the vice-president also called on Europeans to boost defence spending to honour their commitment to the military alliance.

Mr Trump selected a new national security adviser following the defenestration of Mike Flynn. Lieutenant-General **H.R. McMaster** is an army officer who was widely praised for his command during the Iraq war, where he pursued a successful counter-insurgency strategy in the city of Tal Afar.

Too close to call

Ecuador's presidential election looked likely to go to a second round in April, according to the electoral commission. With nearly all the votes counted, Lenín Moreno, the candidate backed by the president, Rafael Correa, is well ahead but appears to have fallen short of the 40% required to avoid a run-off. He will probably face Guillermo Lassom a conservative banker.

José Serra resigned as **Brazil's** foreign minister, because of health problems. He was twice an unsuccessful candidate for the presidency.

The last redoubt

Iraq's army launched its main assault on western Mosul, having captured the eastern half of the city from Islamic State last month. The fighting in the western half is expected to be harder. In **Syria**, Kurdish groups advanced against IS positions in the country.

An **Israeli** soldier who killed a wounded Palestinian attacker in Hebron a year ago was sentenced to 18 months in jail. Many were outraged, either because they thought the sentence too light; or because they thought he should not have been charged at all.

South Africa's High Court blocked a move by the country's president, Jacob Zuma, to withdraw from membership of the International Criminal Court, saying that he may not do so without consulting parliament. Some Africans see the court as targeting Africa disproportionately.

A famine was declared in parts of **South Sudan**, caused by a civil war and economic collapse. It is the first famine to be declared anywhere in the world in six years.

The centre ground

In another twist to the **French** presidential race, François Bayrou, a centrist politician, announced that he would not run but would instead back Emmanuel Macron, a former economy minister who is running as an independent. Although Mr Macron's campaign has gathered momentum, Marine Le Pen, the leader of the right-wing National Front, still leads polls for the first round.

Selahattin Demirtas, the leader of the pro-Kurdish Peoples' Democratic Party in **Turkey**, was convicted of insulting the Turkish state (ie, criticising the president). The same day, a court upheld a conviction for terrorism of the other leader of the party. The trial also began of 47 former soldiers for alleged involvement in last years' coup attempt.

Britain's Brexit bill, which will permit the government to negotiate the country's departure from the EU, was debated by the House of Lords, Parliament's unelected upper house. Theresa May raised eyebrows by perching herself on the steps of the royal throne; it is three decades since a prime minister last attended a debate in the Lords. Meanwhile, Jean-Claude Juncker, the president of the European Commission, warned Britain that it should expect a hefty bill and would not leave the EU "at a discount or at zero cost".

Cressida Dick was appointed as the new commissioner of **London's** Metropolitan Police, the first woman to head Britain's biggest force. Ms Dick was in command of a botched operation that led to the killing of an innocent man after the terrorist attacks on London's transport network in 2005. A subsequent inquiry exonerated her of any blame.

Matteo Renzi stepped down as the leader of **Italy's** ruling Democratic Party amid criticism that he has failed to meet the challenge of the Five Star Movement, a rising populist party. Mr Renzi resigned as prime minister in December.

Keeping it in the family

The president of **Azerbaijan**, Ilham Aliyev, appointed his wife as vice-president. Mehriban Aliyeva is a member of parliament who runs a foundation named after the previous president, who was Mr Aliyev's father.

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Business

As transient as it was titanic, a proposed $143bn takeover bid by **Kraft Heinz** for **Unilever** was withdrawn just a few days after it was leaked to the press. The deal would have been one of the biggest mergers on record, creating a behemoth in consumer products. Kraft's major shareholders are Berkshire Hathaway, Warren Buffett's investment company, and 3G Capital, a Brazilian private-equity firm with a reputation for stringent cost-cutting at its takeover targets. Unilever swiftly rejected its advances, but in a rapid response it launched a wide-ranging review of its business.

Discount offer

Ending months of uncertainty about a takeover deal that was signed last summer, **Verizon** said it would pay $350m less for **Yahoo** following two big cyber-attacks on the internet company's users that took place before the deal was agreed, but which came to light only late last year. The hacking of up to one billion Yahoo accounts was the largest breach of private data yet, prompting a rethink at Verizon about its offer. It will now pay $4.5bn for Yahoo.

Apple lodged an appeal at the European Court of Justice against the European Commission's ruling that the company owes Ireland €13bn ($14bn) in back taxes because of illegal state aid. Apple said, among other things, that the commission had overstepped its mark, did not understand Irish law, and denied it had received preferential tax treatment from the Irish government. Its main contention is that the centre of its profit-driving activities is America and that is where it should be taxed. A hearing will be held in the autumn.

Amazon announced that it would increase its British workforce by a quarter, adding 5,000 jobs to its current headcount. Apple, Facebook and Google have made similar commitments to increase their presence in Britain recently. American tech companies seem to be less worried than financial firms about the prospect of Britain leaving the EU.

Jio, a mobile network in India that has shaken the country's telecoms industry by offering a free service, announced that it would start charging a small fee for unlimited data. Calls will still cost nothing.

Cheap as ships

Hanjin Shipping was declared officially bankrupt and its remaining assets ordered to be liquidated. The South Korean container line filed for bankruptcy protection last August, which led to its ships being denied entry to ports in case they could not pay the port fees. Hanjin was one of the world's biggest shipping companies a decade ago. It was sunk by a worldwide glut in shipping capacity and an unsustainable debt load.

BHP Billiton, **Anglo American** and **Glencore** were the latest mining companies to report healthy profits, helped by cost-cutting and a rebound in commodity prices. Anglo American reported an annual profit of $1.6bn; in 2015 it had made a loss of $5.6bn. Core earnings for the year at Glencore, which is also a commodity trader, rose 18% to $10.3bn. BHP Billiton's profit for the last half of 2016 was $3.2bn; in the same period a year earlier it had recorded a $5.7bn loss.

Special prosecutors in South Korea questioned in custody the de facto head of Samsung Electronics, following his arrest in an influence-peddling scandal that has rocked the government. **Lee Jae-yong** is being investigated for allegedly paying $36m in bribes in order to smooth the merger of two Samsung affiliates in 2015.

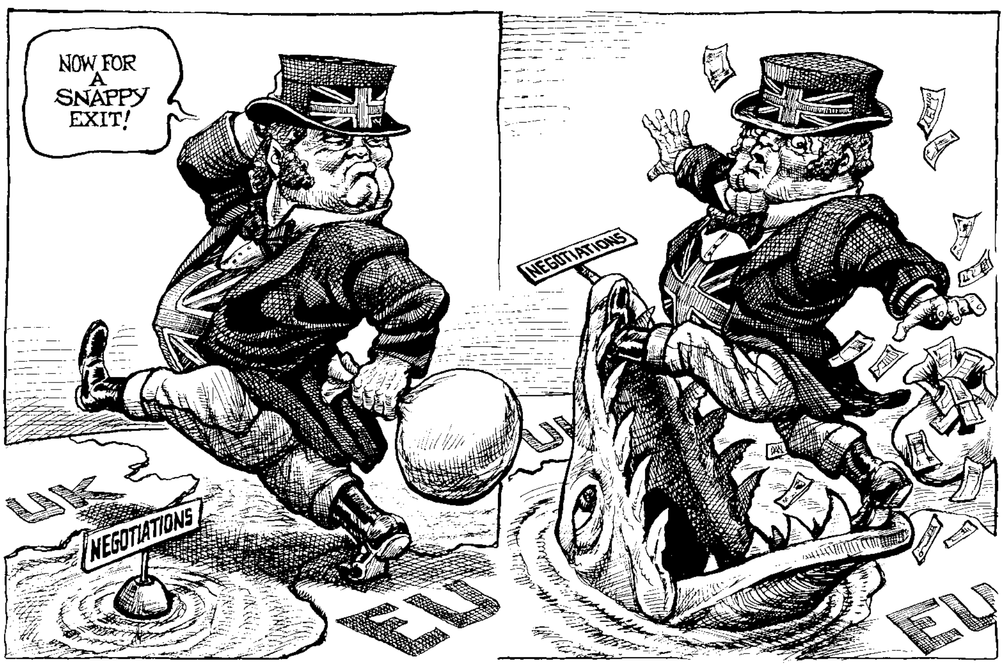
A write-down in the valuation of its Swiss private bank contributed to a 62% fall in annual pre-tax profit at HSBC, to $7.1bn. Revenue dropped, by a fifth. Meanwhile, **Lloyds Banking Group**, another British bank, made an annual profit of £4.2bn ($5.7bn), its best since 2006. The government has reduced the stake it took in Lloyds during the financial crisis and the bank is expected to return to full private ownership this year.

Alien habitats?

Astronomers discovered **seven planets** about the size of Earth orbiting a dwarf star some 380trn kilometres (235trn miles) from our own. That is 40 light years away, fairly close as these things go. Scientists think it offers the best chance yet to discover evidence of life, or why life hasn't evolved, on planets other than Earth.

Tributes were paid to **Kenneth Arrow**, who has died aged 95. His writings in economics advanced the study of game theory, social choice, majority voting, welfare theory, endogenous growth, contracts, and more. He was a co-recipient of the Nobel economics prize in 1972 for his work on the general equilibrium of markets. Then aged 51, he remains the youngest economist to be awarded the prize. At the time he was described in the *New York Times* as "a humanist, a scholar who has always tried to apply fundamental theory to…social problems".

Other economic data and news can be found on pages 72-73



Clean energy's dirty secret

The renewables revolution is wrecking the world's electricity markets. Here's what to do

ALMOST 150 years after photovoltaic cells and wind turbines were invented, they still generate only 7% of the world's electricity. Yet something remarkable is happening. From being peripheral to the energy system just over a decade ago, they are now growing faster than any other energy source and their falling costs are making them competitive with fossil fuels. BP, an oil firm, expects renewables to account for half of the growth in global energy supply over the next 20 years. It is no longer far-fetched to think that the world is entering an era of clean, unlimited and cheap power. About time, too.

There is a $20trn hitch, though. To get from here to there requires huge amounts of investment over the next few decades, to replace old smog-belching power plants and to upgrade the pylons and wires that bring electricity to consumers. Normally investors like putting their money into electricity because it offers reliable returns. Yet green energy has a dirty secret. The more it is deployed, the more it lowers the price of power from any source. That makes it hard to manage the transition to a carbon-free future, during which many generating technologies, clean and dirty, need to remain profitable if the lights are to stay on. Unless the market is fixed, subsidies to the industry will only grow.

Policymakers are already seeing this inconvenient truth as a reason to put the brakes on renewable energy. In parts of Europe and China, investment in renewables is slowing as subsidies are cut back. However, the solution is not less wind and solar. It is to rethink how the world prices clean energy in order to make better use of it.

Shock to the system

At its heart, the problem is that government-supported renewable energy has been imposed on a market designed in a different era. For much of the 20th century, electricity was made and moved by vertically integrated, state-controlled monopolies. From the 1980s onwards, many of these were broken up, privatised and liberalised, so that market forces could determine where best to invest. Today only about 6% of electricity users get their power from monopolies. Yet everywhere the pressure to decarbonise power supply has brought the state creeping back into markets. This is disruptive for three reasons. The first is the subsidy system itself. The other two are inherent to the nature of wind and solar: their intermittency and their very low running costs. All three help explain why power prices are low and public subsidies are addictive.

First, the splurge of public subsidy, of about $800bn since 2008, has distorted the market. It came about for noble reasons—to counter climate change and prime the pump for new, costly technologies, including wind turbines and solar panels. But subsidies hit just as electricity consumption in the rich world was stagnating because of growing energy efficiency and the financial crisis. The result was a glut of power-generating capacity that has slashed the revenues utilities earn from wholesale power markets and hence deterred investment.

Second, green power is intermittent. The vagaries of wind and sun—especially in countries without favourable weather—mean that turbines and solar panels generate electricity only part of the time. To keep power flowing, the system relies on conventional power plants, such as coal, gas or nuclear, to kick in when renewables falter. But because they are idle for long periods, they find it harder to attract private investors. So, to keep the lights on, they require public funds.

Everyone is affected by a third factor: renewable energy has negligible or zero marginal running costs—because the wind and the sun are free. In a market that prefers energy produced at the lowest short-term cost, wind and solar take business from providers that are more expensive to run, such as coal plants, depressing power prices, and hence revenues for all.

Get smart

The higher the penetration of renewables, the worse these problems get—especially in saturated markets. In Europe, which was first to feel the effects, utilities have suffered a "lost decade" of falling returns, stranded assets and corporate disruption. Last year, Germany's two biggest electricity providers, E.ON and RWE, both split in two. In renewable-rich parts of America power providers struggle to find investors for new plants. Places with an abundance of wind, such as China, are curtailing wind farms to keep coal plants in business.

The corollary is that the electricity system is being re-regulated as investment goes chiefly to areas that benefit from public support. Paradoxically, that means the more states support renewables, the more they pay for conventional power plants, too, using "capacity payments" to alleviate intermittency. In effect, politicians rather than markets are once again deciding how to avoid blackouts. They often make mistakes: Germany's support for cheap, dirty lignite caused emissions to rise, notwithstanding huge subsidies for renewables. Without a new approach the renewables revolution will stall.

The good news is that new technology can help fix the problem (see page 16). Digitalisation, smart meters and batteries are enabling companies and households to smooth out their demand—by doing some energy-intensive work at night, for example. This helps to cope with intermittent supply. Small, modular power plants, which are easy to flex up or down, are becoming more popular, as are high-voltage grids that can move excess power around the network more efficiently.

The bigger task is to redesign power markets to reflect the new need for flexible supply and demand. They should adjust prices more frequently, to reflect the fluctuations of the weather. At times of extreme scarcity, a high fixed price could kick in to prevent blackouts. Markets should reward those willing to use less electricity to balance the grid, just as they reward those who generate more of it. Bills could be structured to be higher or lower depending how strongly a customer wanted guaranteed power all the time—a bit like an insurance policy. In short, policymakers should be clear they have a problem and that the cause is not renewable energy, but the out-of-date system of electricity pricing. Then they should fix it. ■

Gender budgeting

Making women count

An idea to help governments live up to their promises

IT IS easy to be cynical about government—and rarely does such cynicism go unrewarded. Take, for instance, policy towards women. Some politicians declare that they value women's unique role, which can be shorthand for keeping married women at home looking after the kids. Others create whole ministries devoted to policies for women, which can be a device for parking women's issues on the periphery of policy where they cannot do any harm. Still others, who may actually mean what they say, pass laws giving women equal opportunities to men. Yet decreeing an end to discrimination is very different from bringing it about.

Amid this tangle of evasion, half-promises and wishful thinking, some policymakers have embraced a technique called gender budgeting. It not only promises to do a lot of good for women, but carries a lesson for advocates of any cause: the way to a government's heart is through its pocket.

What counts is what's counted

At its simplest, gender budgeting sets out to quantify how policies affect women and men differently (see page 60). That seemingly trivial step converts exhortation about treating women fairly into the coin of government: costs and benefits, and investments and returns. You don't have to be a feminist to recognise, as Austria did, that the numbers show how lowering income tax on second earners will encourage women to join the labour force, boosting growth and tax revenues. Or that cuts to programmes designed to reduce domestic violence would be a false economy, because they would cost so much in medical treatment and lost workdays.

As well as identifying opportunities and errors, gender budgeting brings women's issues right to the heart of government, the ministry of finance. Governments routinely bat away sensible policies that lack a champion when the money is handed out. But if judgments about what makes sense for women (and the general good) are being formed within the finance ministry itself, then the battle is half-won.

Gender budgeting is not new. Feminist economists have argued for it since the 1980s. A few countries, such as Australia and South Africa, took it up, though efforts waxed and waned with shifts in political leadership—it is seen as left-wing and anti-austerity. The Nordic countries were pioneers in the West; Sweden, with its self-declared "feminist government", may be the gold standard. Now, egged on by the World Bank, the UN and the IMF, more governments are taking an interest. They should sign on as the results are worth having.

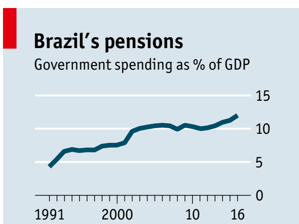
Partly because South Korea invested little in social care, women had to choose between having children, which lowers labour-force participation, or remaining childless, which reduces the country's fertility rate. Gender budgeting showed how, with an ageing population, the country gained from spending on care. Rwanda found that investment in clean water not only curbed disease but also freed up girls, who used to fetch the stuff, to go to school. Ample research confirms that leaving half a country's people behind is bad for growth. Violence against women; failing to educate girls properly; unequal pay and access to jobs: all take an economic toll.

Inevitably there are difficulties. Dividing a policy's costs and benefits between men and women can be hard. Sometimes, as with lost hours of school, the costs have to be estimated. Redesigning the budgeting process upends decades of practice. If every group pressing for change took the same approach, it would become unmanageable. In a way, though, that is the point. Governments find it easy to pay lip-service to women's rights. Doing something demands tough choices. ■

Brazil's pensions

Geronto-generosity

At last the government is trying to fix a system that threatens the country's future



BLESSED with tropical beaches, bossa nova and balletic footballers, Brazil seems like a marvellous place to be young. It is an even better place to grow old. That is because Brazil has among the world's most generous pension systems. Sadly, the past is now beginning to catch up with it.

Brazilians start drawing their pensions when they are 58 years old on average, eight years younger than Americans and 14 than Mexicans (see page 32). Members of some groups can retire even earlier. Female teachers, for example, need to spend just 25 years in the classroom to get a full pension and even fewer for a partial one; many leave before they turn 50. Widows inherit their spouses' full pension (provided they are 44 or older) without giving up their own. In the OECD, a club of mostly rich countries, pensions replace an average of around 60% of pre-retirement income; in Brazil, 80%.

Plush pensions have their origins in the constitution adopted in 1988, which sought to confer as many rights as possible on Brazilians who had suffered under two decades of military rule. The constitution also recognises rights to education and health, but giving a pensioner a monthly cheque is easier.

Geronto-generosity hurts everyone else. The pensions bill consumes more than half the government's non-interest ▸▸

spending and, if nothing is done, will within ten years gobble up 80%. As a share of GDP, Brazil spends 50% more on pensions than do members of the OECD on average. Yet it has only half as many over-65-year-olds as a share of the population. The skewed system diverts money from schools, clinics and infrastructure and lures people out of the workforce. The ongoing pension deficit from year to year accounts for more than half the budget deficit of 8.9% of GDP. That is a big reason why Brazil's benchmark interest rate is as high as 12.25%. Extravagant pensions thus make it hard for the economy to grow. The country is undergoing the longest and deepest slump on record. If Brazil is to restore confidence in its economic future, it must do something about its pensions.

A good start

Michel Temer, Brazil's president, therefore deserves credit for proposing reforms that would make a big difference. Earlier governments tweaked the system. The reforms proposed by Mr Temer, who became president last year after the impeachment of his predecessor, Dilma Rousseff, would go much further. First, they would apply a minimum pension age of 65 to almost everyone (female teachers included). The stipulation of the pensionable age would be removed from the constitution, making it easier to raise the threshold as lives lengthen. To qualify for the most basic pension, all but the poorest would have to contribute for 25 years, rather than just 15. Benefits above that floor would no longer rise in step with the minimum wage, which increased by 80% in real terms in the decade to 2015. Beneficiaries will not be able to draw more than one pension; widows will receive smaller ones.

If Mr Temer gets this through the reform-shy congress without disfiguring changes, it will be an astounding achievement. Besides mitigating the pension crisis, it would raise hopes for other reforms of Brazil's big but ineffective state, for example of labour laws and taxes. The real has appreciated against the dollar by more than any other emerging-market currency over the past year, a sign that markets are betting on success.

That is not certain. Mr Temer has already enacted one big reform, a constitutional freeze on increases in public spending above inflation, but that made nobody feel poorer. The pension plan is the main way of putting the freeze into practice. It will be felt, especially by people near retirement, who will have to work longer than they were expecting. Ms Rousseff's left-wing Workers' Party (PT), now the main opposition, hopes to fan their resentment. The PT thunders that Mr Temer is dumping the costs of the crisis on workers. The unelected president does not have the right to carry out reform, it claims.

In fact, Mr Temer won an election as Ms Rousseff's running-mate; his presidency and congress, which began debating the reform this month, are constitutionally legitimate. They have no choice but to act. The reform proposal does not fix pensions, but it is a good start. Without it, the economic crisis will deepen and Brazil's long-term prospects will darken. It is the tonic that the country needs. ■

Iran and America

No blank cheque

The Trump administration is right to keep up the pressure on a belligerent Iran

AVIGDOR LIEBERMAN, Israel's pugnacious defence minister, is not one to mince his words. Speaking on February 19th at this year's Munich Security Conference, he described the challenges facing the Middle East as "Iran, Iran and Iran". Delegates from the Arab states present might not have relished being seen to agree with the Zionist enemy, but that did not stop them. Saudi Arabia's foreign minister reckoned that the Iranians have only "stepped up the tempo of their mischief" since the negotiation in 2015 of a nuclear deal between Iran and the world's six leading powers. And the regional actors are hardly alone in their hostility. The Trump administration placed Iran "on notice" at the start of this month and imposed a limited new set of sanctions, following a medium-range ballistic missile test (see page 35); Iran responded by testing another one. Is a fresh confrontation, even a conflict, brewing again so soon after the deal of 2015 was supposed to have ushered in an era of peaceful coexistence?

Perhaps not; but that depends above all on Iran. The hardliners who are in charge in Tehran need to reconsider their priorities. Judging by their actions and rhetoric, they appear to believe that the nuclear agreement (formally known as the Joint Comprehensive Plan of Action) marked the end of a process of rehabilitation. In fact, it goes only part of the way.

The purpose of the deal was to put tight limits on Iran's destabilising enrichment programme—nothing more, nothing less. Under its terms, Iran agreed to rejig a reactor so that it can't make weaponisable plutonium. It also dismantled most of the centrifuges it had been using to make enriched uranium and eliminated almost all its stockpile of the stuff. The restrictions are to last 15 years and even after that, Iran's nuclear activities will remain under a highly intrusive inspection regime. In return, the rest of the world agreed to lift the UN-mandated economic sanctions that had crippled Iran's economy after the nuclear threat started to cause alarm in the mid-2000s.

Now for the next step

Both sides have kept their part of the bargain; the uranium and the centrifuges are dealt with, Iran shows no sign of deliberate cheating, and the UN Security Council's nuclear-related economic sanctions have all been lifted. Although Donald Trump has inveighed against the deal, in office he has shown no sign of seeking to scrap it. Most observers, including even the Israeli army and intelligence services, think it would be a mistake to do so. However—and this is a crucial point—other sanctions on Iran remain. America, in particular, still has a large array of them, imposed a decade earlier to penalise a number of Iranian transgressions, especially human-rights abuses, support for terrorism and the development of weapons of mass destruction, including the missiles that can be used to deliver them.

These sanctions were tightened several times by the generally doveish Barack Obama to punish Iran for a missile test. The law that mandates them was extended for ten more years in December. The vote in Congress was hardly a cliffhanger: the Senate backed the extension by 99-0 and the House by 419-1. American firms are still banned from doing business with Iran, though the president can always waive sanctions. After the nuclear deal, Mr Obama did so in many areas, for instance letting Boeing join Airbus in selling planes to Iran.

None of these prior sanctions had anything to do with the nuclear programme and everything to do with Iran's record of making trouble, which it continues unabated. Iran is helpful in taking on Islamic state. But, as Mr Lieberman noted, it still poses the largest threat to the stability of the Middle East. Its Shia proxy armies, aided by the Quds force, its own overseas special-forces unit, have extended its hard power far beyond its borders. Iraq is now virtually an Iranian client state. Hizbullah, an Iranian marionette, is the strongest force in Lebanon and menaces Israel. In Syria Iran props up the vile regime of Bashar al-Assad. In Yemen it arms and trains the Houthi rebels who overthrew the government two years ago. Bahrain and Saudi Arabia, which both have large Shia populations, accuse it of organising terror cells in their countries.

America should not tear up the nuclear deal. It is not perfect, but it was better than confronting an Iran only months from possessing nukes. But sticking with the nuclear deal does not stop America from being tough elsewhere. Indeed, responding to missile-tests and other transgressions signals that the world will react to nuclear breaches, too. Until Iran stops acting as though it is hellbent on recreating the Sassanian empire, Mr Trump is right to apply targeted sanctions against the individuals and companies that are helping the Middle East's chief empire-builder puff itself up. ■

Diamonds and marriage

A girl's new best friend

The diamond engagement ring may not have a future as a symbol of courtship. What could replace it?

PEACOCKS strut; bowerbirds build lovenests; spiders gift-wrap flies in silk. Such courtship rituals play an important role in what Charles Darwin called sexual selection: when the female of a species bears most of the costs of reproduction, males use extravagant displays and gifts to demonstrate their "reproductive fitness" and females choose between them. For human males, shards of a crystalline form of carbon often feature. A diamond engagement ring signals a man's taste, wealth and commitment, all to persuade a woman that he is a good bet.

This particular courtship gift was dreamed up by an ad agency for De Beers, the cartel that sold almost all of the world's diamonds throughout the 20th century. In the 1930s it started to promote a link between diamonds and marriage. Diamonds' unmatched hardness would symbolise love's endurance and their "fire", or brilliance, its passion. Two months' salary, the firm suggested, was what the ring should cost—a good investment since, as the admen said, "A diamond is forever."

Now, that promise is dimming (see page 46). Though a growing Chinese middle class will probably prop up demand for a while, millennials in Western countries seem keener on memorable experiences than on bling. Diamonds' image has been blemished by some being mined in warzones and sold to pay for the fighting. Meanwhile, laboratory-grown "synthetic" diamonds, long fit only for industrial use, are becoming good enough to compete with gems from out of the ground.

But the long-term threat to diamonds' lustre is more surprising: that their price could plummet. In recent years regulators (and market forces) have undermined De Beers's cartel by limiting the share of other producers' stones that it can buy. Now responsible for just a third of global sales, the company can no longer manage supply by stockpiling gems when demand turns down. It is spending less on advertising, since it no longer gets the lion's share of the benefits. But the very value of diamonds lies in being scarce and coveted—that is, costly. In the jargon, they are "Veblen goods", named after a 19th-century economist: prestige-enhancing trinkets for which a higher price encourages buyers. With most products, lower prices increase demand; with diamonds, they could kill it.

Greater equality for women might seem to render male-courtship displays redundant. But mating preferences evolved over millennia and will not change quickly. If diamonds were to cease being a way to signal a man's marriageability, what might take their place?

A different gift, perhaps. In China skewed sex ratios mean that a prospective bridegroom must own an apartment and shower his future in-laws with cash. But a glittering stone goes to the woman, not her family. And it is more than a gift: it is a status symbol, demonstrating that even as a man approaches the expenses of married life, he can still splash out on a bauble. Or a man could rely on more generic forms of display, such as a fancy degree, good job or sharp suit. But these can impress one woman as easily as another, or several simultaneously. He must show commitment—a need not unique to courtship. Salvadoran gangsters get extravagant tattoos; Japanese *yakuza* cut off a fingertip. These visible signs of allegiance make it hard to defect, and impose heavy costs. But as marriage proposals they would fall short. Few women would feel proud to carry around their fiancé's severed pinkie.

Love is a multifaceted thing

Many millennial women seek a mate who is creative, charitable and earns enough not to live with his parents. The millionaire founder of a startup that makes an app to teach yoga to orphans would be ideal. As a token of his commitment, a suitor might offer the object of his affections 51% of his shares—so much nicer than a joint bank account. Less eligible men could offer instead to link Uber accounts, thus entwining the couple's reputations: their joint five-star rating would be at risk if either misbehaved. Uber-linking would also allow each to keep track of the other's whereabouts, discouraging infidelity. Whatever ultimately replaces diamonds, it will surely be digital, not worn on a digit. ■

Fighting terror in Kenya

"Food for the hyenas" (February 18th) misrepresented the work carried out by the Kenyan government in battling jihadism. Our domestic security operations are not the renegade actions that you portray. They form part of a national strategy to counter violent extremism, launched in September 2016. The suggestion that they will lead to election violence is not credible. The vote in 2013 passed off peacefully despite the doom-mongering of many international observers and Kenya today is even more secure.

Our plan includes the reintegration of returning jihadists and pre-emptive anti-radicalisation measures. It is formulated in tandem with the UN Global Counter-Terrorism Strategy and integrates ideas put forward by the UN secretary-general and the African Union.

Like many countries, Kenya faces serious challenges with domestic and international terror networks. But attacks have decreased and co-operation between police and informants is on the up. We will face down extremism forcefully, diligently, and fairly.

MAJOR-GENERAL (RTD) JOSEPH NKAISSERRY
Interior cabinet secretary
Nairobi

Legal opinion

Your review of Stephen Presser's book was far too simplistic on the liberal-conservative divide over how to understand the "rule of law" ("Whose rules, whose law", February 4th). You said that Republicans see this as "based on precedent and written statutes", whereas Democrats think it should "be discretionary values and allowed to incorporate external information". But liberal legal thinkers, like conservatives, also believe in precedent and following statute. Disagreements arise over the scope of precedents and interpretation of statutes, but no one (save possibly Clarence Thomas) gives no weight to precedent.

Moreover, it was Republican appointees on the Supreme Court who abandoned a century of precedent in the *Citizens United* campaign-finance decision. The same five-to-four majority also gutted the statutory Voting Rights Act, holding its core provision to be unconstitutional based in part on the "external information" that, in the Republican appointees' view, "things have changed dramatically" 50 years after its enactment.

As for Antonin Scalia's focus on "original intent" to keep the constitution and laws from being "stretched by unelected judges", it seems impossible to adhere fully to that view. The Supreme Court's ruling in *Brown v Board of Education* (1954), holding that racially segregated public education violates the equal protection clause of the 14th Amendment, is universally accepted as the right decision. Yet when Congress sent the 14th Amendment to the states for ratification in 1866, schools in the District of Columbia, established by Congress, were segregated by race.

THOMAS ROWE
Professor of law emeritus
Duke University
Durham, North Carolina

Voting block

Being myself 15 years old, I read with interest your leader calling for the voting age to be lowered to 16 ("Vote early, vote often", February 4th). You argued that "A lower voting age would strengthen the voice of the young and signal that their opinions matter." However, you must consider precisely what citizens of my age would be inclined to vote for. For example, the vast majority of Democratic primary voters aged 18-24 supported Bernie Sanders, partly because of his irresponsible promise of free college education.

Adding a large number of people like me to the voter rolls, all of whom have little experience in the workforce, would increase support for Sanders-style populism over Clinton-style pragmatism. Job experience helps develop economic literacy. Lowering the voting age to include people who lack this would do more harm than good.

JACOB LADNER
Phoenix

The obvious answer to apathy among millennials is to turn voting into a video game. At the start players would be able to vote for, say, dog-catcher. But as they acquired more points for experience, they would be entitled to vote in more important elections.

Joking aside, there is something to be said for "earning" the right to vote by requiring at least a token effort. People who are disinclined to vote are also disinclined to study the issues. Your opinion of measures aimed at making voting effortless depends on whether you think the primary purpose of democracy is fostering the illusion of participation, or fostering good government.

CHRIS TRUAX
San Diego

Back to reality

Grand bargains are very rare in international life, and the atmospherics for one between America and Russia couldn't be worse ("Courting Russia", February 11th). Ministers and even sensible commentators talk glibly of a new cold war, without really reflecting on the costs and hazards of the old one. The relationship between Russia and the West sank dangerously low last autumn; there was a real possibility of military confrontation. We need to find a way back from all this. And the initiative will need to come from the overwhelmingly stronger, and thus less at risk, of the two sides.

The real question is not about grand bargains but whether Donald Trump should be looking for less dramatic ways to improve relations.

The list of problems where common ground is worth looking for is long: Islamic extremism, cyber-warfare, strategic arms reduction and nuclear terrorism. But the key issue where polite opinion continues to insist on obduracy is economic sanctions. Really? I have not met a Western official who can explain what sanctions are now for. They have changed Russian policy not a jot. The economy, predicted to implode, is now growing again. Vladimir Putin is still president and rides high in the polls. Indeed he may be quietly relying on the maintenance of sanctions to get those extra nationalist voters out on his behalf at the presidential election in March 2018. Are they really worth it?

SIR TONY BRENTON
British ambassador to Russia 2004-08
Cambridge, Cambridgeshire

Data is no singular exception

A letter from David Chaplin in the February 11th issue promoted the use of "data" as a singular noun. This missed the point that the word is routinely awarded its due as a plural noun in scientific and medical literature in accord with its Latin etymology. Pointing to other plurals that have been reduced to singulars is like saying that several crimes against the English language justify yet another.

The use of "datum", I admit, is unusual. However, the attribution of "data" as a singular noun would yield sentences such as "The editors of *The Economist* is uneducated in the Latin derivation of English terms."

BARRY MALETZKY
Portland, Oregon ■

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Economist.com/letters

A world turned upside down

WILDPOLDSRIED

Wind and solar energy are disrupting a century-old model of providing electricity. What will replace it?

FROM his office window, Philipp Schröder points out over the Bavarian countryside and issues a Bond villain's laugh: "In front of you, you can see the death of the conventional utility, all financed by Mr and Mrs Schmidt. It's a beautiful sight." The wind blowing across Wildpoldsried towards the Alps lazily turns the turbines on the hills above. The south-facing roofs of the houses, barns and cowsheds are blanketed with blue photovoltaic (PV) solar panels. The cows on the green fields produce manure that generates biogas which warms the *Biergarten*, the sports hall and many of the houses where the 2,600 villagers live, as well as backing up the wind and solar generators in winter. All told, the village produces five times more electricity than it needs, and the villagers are handsomely rewarded for their greenness; in 2016 they pocketed about €6m ($7m) from subsidies and selling their surplus electricity.

It hardly looks like the end of the world; but Mr Schröder, who works at Sonnen, an energy-storage firm, has a point. Many environmentalists want the world's energy system to look like Wildpoldsried's. And the things it is based on—subsidies for investment, very little spending on fuel, and moving electricity generation to the edge of, or off, the grid—are anathema to electricity markets and business models developed for the fossil-fuel age.

Few greens would mourn them. But the fall in utility revenues that comes with the spread of places like Wildpoldsried is not just bad news for fossil-fuel-era incumbents in the generation and transmission businesses. It is also becoming a problem for the renewables themselves, and thus for the efforts to decarbonise the electricity supply that justified their promotion in the first place.

In 2014 the International Energy Agency (IEA), a semi-official forecaster, predicted that decarbonising the global electricity grid will require almost $20trn in investment in the 20 years to 2035, at which point the process will still be far from finished. But an electricity industry that does not produce reliable revenues is not one that people will invest in.

Less dear, still disruptive

The fight against climate change has seen huge growth in the "new" renewables, wind and solar power, over the past decade, both in developed countries and developing ones. In 2015 governments poured $150bn into supporting such investment, with America, China and Germany taking the lead. But Wildpoldsried is still very much the exception, not the rule. In 2015 such sources accounted for only 7% of electricity generated worldwide. Over 80% of the world's energy still comes from fossil fuels (see chart 1 on next page). In terms of reducing climate risks there is a long way to go.

The good news is that a decade of subsidy-driven growth has brought with it falling costs. Renewables are still on the pricey side in many places, but they are getting less so; in some places wind, in particular, is reasonably competitive. This suggests that their growth might soon need a lot less subsidy than it has attracted to date. Robust carbon prices would give renewables further advantages, but they have as yet proved hard to provide. The EU's emissions-trading scheme is a perennial disappointment: still, hope springs eternal, as witness a recent attempt to persuade the new American administration of the benefits of a revenue-neutral economy-wide carbon tax devoted to providing $2,000 to every family of four in rebates.

But pushing renewables into the electricity market has had effects on more than their price; it has hit investment, too. In rich countries governments have imposed renewables on electricity systems that had no need for new capacity, because demand is in decline. Investment in supply beyond what the market required has produced gluts and pushed down prices. In America this has been somewhat masked by the shale-gas revolution, which has caused a bigger shift in the same direction. In Europe the glut of renewables is more starkly seen for what it is. Wholesale electricity prices have slumped from around €80 a megawatt-hour in 2008 to €30-50 nowadays.

The result has been havoc for the old-style utilities. Germany's biggest electricity ▸▸

companies, E.ON and RWE, both split in two last year, separating their renewables and grid businesses from indebted and loss-making conventional generation. EY, a consultancy, calculates that utilities across Europe wrote off €120bn of assets because of low power prices between 2010 and 2015. Investment in non-renewables is very low. “Never in recent history has the deployment of capital been more difficult than it is right now within the energy industry,” says Matt Rennie, who analyses the global-utilities market at EY.

It is not just that efforts to shift to renewable power have added new sources of supply to an already well-served market. In an industry structured around marginal costs, renewables have a disruptive punch above their weight.

Electricity markets, especially those that were deregulated in the late 20th century, typically work on a “merit order”: at any given time they meet demand by taking electricity first from the cheapest supplier, then the next-cheapest, until they have all they need; the price paid to all concerned is set by the most expensive source in use at the time. Because wind and solar do not need to buy any fuel, their marginal costs are low. They thus push more expensive producers off the grid, lowering wholesale prices.

If renewables worked constantly that would not, at first blush, look like a problem for anyone except people generating expensive electricity. But renewables are intermittent, which means that in systems where the infrastructure was designed before intermittency became an issue—almost all of them, in practice—fossil-fuel, hydroelectric and nuclear plants are needed more or less as much as ever at times when the sun doesn’t shine and the winds don’t blow. And if such plants are shut out of the market by low-cost renewables, they will not be available when needed.

In the long run, and with massive further investments, electricity grids redesigned for systems with a lot of renewable energy could go a long way to solving this problem. Grids with lots of storage capacity built in; grids big enough to reach out to faraway renewables when the nearby ones are in the doldrums; grids smart enough to help customers adapt demand to supply: all have their champions and their role to play.

But long-run solutions do not solve short-term constraints. So for now countries with lots of renewables need to keep older fossil-fuel capacity available as a standby and to cover peaks in demand. This often means additional subsidies, known as capacity payments, for plants that would otherwise be uneconomic. Such measures keep the lights on. But they also mean that fossil-fuel production capacity clings on—often in particularly dirty forms, such as German power stations powered by brown coal, or backup diesel generators in Britain.

From dull to death spiral

Properly structured capacity payments make it sensible to invest in generators that can be switched on when renewable energy is not available. But what will make it sensible to continue investing in renewables themselves?

When they are a small part of the system, renewables are insulated from the effects that their low marginal costs have on prices, because as long as there are some plants burning fossil fuels the wholesale price of electricity will stay reasonably high. So utilities could buy electricity from renewable generators, often on fixed-price contracts, without too much worry.

But the more renewable generators there are, the more they drag down prices. At times when renewables can meet all the demand, making fossil-fuel prices irrelevant, wholesale electricity prices collapse—or sometimes turn negative, with generators paying the grid to take the stuff away (the power has to go somewhere). The more renewables there are in the system, the more often such collapses occur.

Rolando Fuentes of Kapsarc, an energy think-tank based in Saudi Arabia, claims the world is caught in a vicious circle: subsidies foster deployment of renewables; renewables depress power prices, increasing the need for financial support. Theoretically, if renewables were to make up 100% of the market, the wholesale price of electricity would fall to zero, deterring all new investment that was not completely subsidised. He calls this vicious circle the clean-energy paradox: “The more successful you are in increasing renewables’ penetration, the more expensive and less effective the policy becomes.”

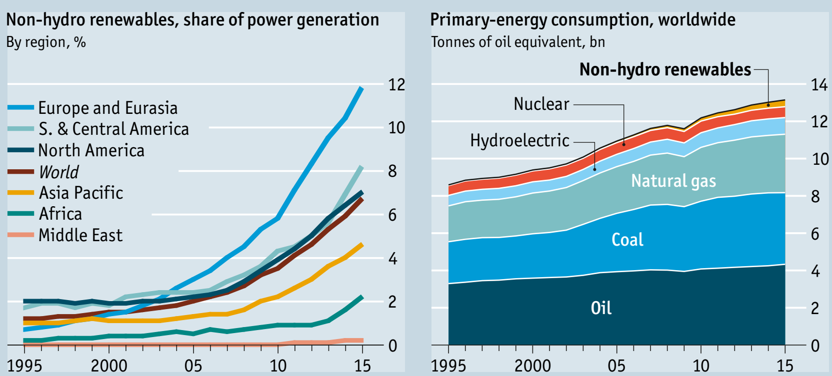
Francis O’Sullivan, of the Massachusetts Institute of Technology, says the trend is already visible in parts of America with abundant solar energy. Utilities which are required to have renewables in their portfolios, such as those in California, used to offer companies investing in that capacity generous long-term contracts. But research by Bloomberg New Energy Finance (BNEF), a consultancy, shows that, as such utilities come closer to meeting their mandates, solar-power developers are being offered shorter-term fixed prices with a higher subsequent exposure to variable wholesale prices. That reduces the incentive to invest. Solar “cannibalises its own competitiveness away,” Mr O’Sullivan says. “It eats its own tail.”

At the turn of the century, according to the IEA, one third of investment in electricity markets flowed into “competitive” sectors that were exposed to wholesale prices; the rest went into regulated utilities, transmission grids and the sort of fixed-price contracts where the renewables got their start. By 2014 the share of investment in the competitive sectors was just 10% of the total. It is a fair bet that, the more renewables are exposed to competition by contracts pegged to wholesale prices, the more people will shy away from them as well.

Ever-lower capital costs, particularly in solar, could go some way to bucking this trend, making investments cheaper even as they become more risky. But if low-marginal-cost renewables continue to push prices down, there will come a time when private investment will dry up. As Malcolm Keay of the Oxford Institute for Energy Studies puts it, “The utility business model is broken, and markets are, too.”

Renewables do not just lower prices; when used by customers, they also eat into demand. Consider Australia. It has 1.5m households with solar cells on their roofs. There are a number of reasons for this. It is a sunny place; installing PVS was until recently generously subsidised; and electricity bills are high. In part that is to pay for some of the subsidies. In part it is because they pay for the grid, which has been becoming more expensive, not least because it has had to deal with a lot more renewables. The IEA says that in parts of southern Australia, grid upgrades have doubled network costs since 2008-09. Despite cuts

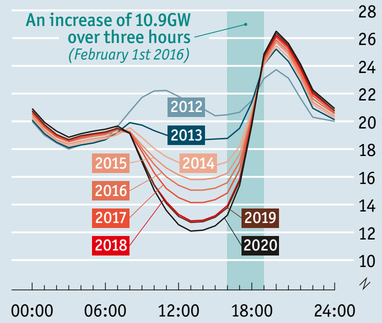
Big growth, small share 1



Source: BP

Who gets the bill? 2

California, electricity load requirement
Typical spring day, gigawatts



Source: California ISO

to subsidies, Australian PV installations are expected to triple over the next decade.

When fewer people rely on the grid, there are also fewer left to share the costs. Phil Blythe of GreenSync, a Melbourne-based company that works with utilities to moderate the fluctuations of renewable energy, warns that his country faces an incipient "utility death spiral". The more customers generate their own electricity, the more utilities have to raise prices to the customers that remain, which makes them more likely to leave the grid in turn. It won't happen overnight, he says: but it is "death by a thousand cuts".

From dromedary to duck

In California there is an icon for the effect that domestic renewables have on the demand for grid electricity, and thus on the revenues of utilities: it is called the duck (see chart 2). Every year more Californian consumers have solar cells. As a result, every year electricity demand during the day falls, and revenue falls accordingly. Similar effects are seen in Germany, where there are now 1.4m PV users—mostly domestic. It is one of the reasons—subsidies are another—why domestic electricity prices have stayed high there while wholesale prices have fallen.

These home generators are not just reducing demand for grid electricity; often they are allowed to feed surplus power from their PVs into the grid, competing with other generators. In many American states utilities grumble about the "net metering" rate they are required to pay such people—especially in states like Nevada where they have been required to credit the electricity fed in at the retail price, rather than the wholesale price. And rooftop solar installations continue to grow, with 12 states more than doubling their deployment in 2016, according to BNEF. Businesses and industrial users are also becoming big consumers of renewable energy, which potentially reduces their dependence on the grid, and thus the amount they will pay for its services.

The response to these problems is not to abandon renewables. The subsidies have helped costs of wind and solar to fall precipitously around the world. Competition is often fierce. Recent auctions for offshore wind farms in the North Sea and solar developments in Mexico and Abu Dhabi have shown developers slashing prices to win fixed contracts to supply clean electricity for decades to come. The "levellised cost of electricity" for renewables—the all-in cost of building and operating a plant over its lifetime—is increasingly competitive with fossil fuels in many places. Especially in sunny and windy developing countries with fast-growing demand, they offer a potentially lucrative, subsidy-free investment opportunity.

But it does mean changing the way the world buys, sells, values and regulates electricity to take account of the new means by which it generates it. "Thinking of wind and solar as a solution by themselves is not enough. You need flexibility on the other side. It only makes sense if this is a package deal," says Simon Müller of the IEA. Elements of that package are already appearing. Markets that sell commoditised kilowatt-hours need to be transformed into markets where consumers pay for guaranteed services. A lot more storage will be needed, with products like those of Sonnen in Wildpoldsried and the Powerwalls made by Tesla fighting for space in people's homes. Smart grids bolstered by big data will do more to keep demand in line with supply.

In Wildpoldsried Mr Schröder dreams of electricity-users inviting friends round for a glass of wine to show off their new solar kits and batteries. "We'll soon be at a point where people say, 'You're so yesterday. You get your power from the grid.'" But peer pressure is unlikely to be decisive. Bruce Huber of Alexa Capital, which helps fund renewable-energy investments, says business consumers are probably going to be more influential in driving the adoption of these technologies than households, because they will more quickly see how they might cut their bills by using demand-response and storage. "For the last 100 years everyone has made money upstream. Now the added value is coming downstream," he says.

It may not get all the way there

Waiting for enlightenment

Mr Huber likens the upheaval facing utilities to that seen in the telecoms industry a generation ago, when a business model based on charging per second for long-distance calls was replaced by one involving the sale of services such as always-on broadband. This is bad news for the vertically integrated giants that grew up in the age of centralised generating by the gigawatt. Jens Weinmann, of ESMT Berlin, a business school, names dozens of tech-like firms that are "nibbling" away at bits of utilities' traditional business models through innovations in grid optimisation and smart-home management systems. With a colleague, Christoph Burger, he has written of the "big beyond" in which domestic energy autonomy, the use of the blockchain in energy contracts, and crowdsourcing of PV installations and other technological disruptions doom the traditional utility. Already, big Silicon Valley firms such as Google and Amazon are attempting to digitalise domestic energy, too, with home-hubs and thermostats.

But how this nibbling leads to a system that all can rely on—and who pays for the parts of it that are public, rather than private, goods—remains obscure. The process will definitely be sensitive to politics, because, although voters give little thought to electricity markets when they are working, they can get angry when prices rise to cover new investment—and they scream blue murder when the lights go out. That suggests progress may be slow and fitful. And it is possible that it could stall, leaving climate risks largely unabated.

Getting renewables to today's relatively modest level of penetration was hard and very expensive work. To get to systems where renewables supply 80% or more of customers' electricity needs will bring challenges that may be far greater, even though renewables are becoming comparatively cheap. It is quite possible that, as Mr Schröder predicts, Mr and Mrs Schmidt in Wildpoldsried will lay waste the world's conventional electricity utilities while sharing Riesling and gossip with the neighbours. But that does not mean that they will be able to provide a clean, green alternative for everyone. ■

Also in this section

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Women in South Asia

The missing middle

DELHI

Powerful women have not empowered women

ON THE Indian subcontinent, as in no other part of the world, women have risen to the pinnacle of politics. Indira Gandhi of India, Benazir Bhutto of Pakistan and Aung San Suu Kyi of Myanmar are all famous names. Less well known is that Sri Lanka was the first country ever to elect a woman prime minister, or that it has also had a female president. For 22 of the past 25 years Bangladesh, a largely Muslim country with more people than France and Germany combined, has been led by a woman. And the chief ministers of numerous country-sized Indian states, from West Bengal in the east to Tamil Nadu in the south, have also been women. India's democracy is not pretty; these are the winners of bare-knuckle contests.

Yet for all such headline-grabbing successes, the fine print tells a different story. Although there has been steady progress in such things as stamping out female infanticide and spreading women's education, statistics continue to reveal a stark sex divide. At 27%, the share of Indian women who work, for instance, is less than half the level in China or Brazil (and also in neighbouring Bangladesh, although slightly higher than in Pakistan).

In 2012 a household survey found that four-fifths of Indian women needed their husband's or family's permission to visit a local clinic. A third said they would not be able to go alone. More than half also said they could not visit a shop, or even a friend, without someone else's approval. For many, the very idea of going out was alarming: 70% said they would feel unsafe working away from home, and 52% thought it normal for a husband to beat his wife if she ventured out without telling him. In November, following a shock government move to scrap higher-denomination banknotes, a domestic violence hotline in the city of Bhopal in central India registered a doubling of calls, largely from women whose spouses had discovered they had secretly been saving cash.

On your bike

For wealthy and middle-class Indian women, freedoms have steadily grown: Anubha Bhonsle, a television anchor, recalls the strangeness of being the sole female driver of a motor scooter on many streets when she started commuting 15 years ago. "No one would give a second glance now," she says. Yet in many professions women remain rarities. Barely 10% of the 700 judges in India's higher courts are female, and only 17% of the 5,000 officers in the Indian Administrative Service, the elite corps of bureaucrats that runs the country.

Women are scarce even in politics. In the lower house of India's parliament only 12% of MPs are women. State legislatures are similarly male. True, women's share of seats has risen, but slowly: 50 years ago the proportion of women in the lower house was 6%.

It is only in village and district councils that women hold much sway, but this is partly due to laws that assign either a third or half of seats to female candidates. Earlier this month tribesmen objecting to efforts to impose a women's quota in local elections rioted in Nagaland, a state on the border with Myanmar that is one of the few exceptions to such rules. Naga men insist that local custom precludes female village chiefs.

Such troubles reveal one cause of slow progress to sexual equality: Indian politicians have generally found it more rewarding to cater to subgroups defined by caste, religion, ethnicity, language or local grievance, rather than to broader categories such as women. This is equally true of female politicians, and of regional leaders less constrained by democracy. Sheikh Hasina, the current, iron-fisted prime minister of Bangladesh, has recently moved to reduce the legal age of marriage from 18 to 16. Given that child marriage is already common, especially in the impoverished countryside, women's-rights activists are upset. But analysts explain that *apa*, or "big sister", who has hounded opposition parties including Islamists, is looking for ways to deflect conservative anger.

In order to succeed female politicians in the region often make a point of acting tough. Mamata Banerjee, the diminutive but formidable chief minister of West Bengal, once dragged a male colleague out of the well of parliament by the collar when she was an MP in Delhi. Like Sheikh Hasina and Mayawati, a former chief minister of Uttar Pradesh, as well as Jayalalithaa, a recently deceased former film star and long-serving chief minister of Tamil Nadu, Ms Banerjee has carefully repressed her ▸▸

sexuality. These women are ostentatiously "married" to their cause or their party.

Such care is understandable. Male rivals have not shied from using sex to malign female politicians. One party leader in Uttar Pradesh lost his job for accusing Mayawati, who comes from a downtrodden caste, of "selling tickets like a prostitute". A colleague went further against Sonia Gandhi, the leader of the opposition Congress party. Absurdly, he accused the head of the Gandhi dynasty of having worked for a Pakistani escort agency.

With so many obstacles blocking the path to power, it is hardly surprising that so many of the region's successful female politicians got a head start. Amrita Basu of Amherst College finds that more than half of India's female MPs in the past decade had family members who preceded them in politics. Quite often such dynastic links have been dramatic. Ms Suu Kyi in Myanmar and Sheikh Hasina are both daughters of slain independence heroes. Sonia Gandhi and Khaleda Zia, a former Bangladeshi prime minister and bitter rival to Sheikh Hasina, are both widows of assassinated leaders. Both Jayalalithaa and Mayawati entered politics as devoted lieutenants to charismatic, populist politicians; in Jayalalithaa's case her mentor also played the lead in many of her films.

For women to play a more normal political role in the subcontinent, perhaps it is in films, and in popular culture in general, that change needs to happen first. All too often on the region's screens, actresses who are paid a fraction of what male stars get portray women who lack agency in their lives. There is, though, an inkling of change. This season's blockbuster and already the highest-earning film in Bollywood history, "Dangal", tells the heartwarming story of sisters who become champions in the male-dominated sport of wrestling. Yet the main hero is not one of the girls, but the father, a former wrestler, who bends them to his will. ■

Mongolia's finances

This might yurt

The IMF bails Mongolia out—again

WHEN Jim Anderson first lived in Mongolia in 1993, there was one local word foreigners could not help but learn: *baikhgui*, which translates as "absent" or "unavailable". Bread? Rice? Electricity? Often as not, they were *baikhgui*, he recounts in a blog post for the World Bank, for which he has returned to Mongolia as country director. Even those lucky enough to have American currency to spend in "dollar shops" received sticks of chewing gum as change.

Mongolia thought it had left those days far behind. A mining boom (copper, coal, gold) has transformed the country, filling the shops with goods and the cities with cranes. From 2009 to 2014, the economy grew by 70%. In 2012 alone, it attracted foreign-capital inflows equivalent to some 54% of its GDP. But since 2014 commodity prices have fallen, foreign-direct investment has reversed and a number of daunting debt payments have crept closer. Mongolia's foreign reserves have dwindled from over $4bn in 2012 to little more than $1bn at the end of September, equivalent to about four months' imports. Foreign creditors were about to learn the word *baikhgui*.

Enter the IMF. This month it agreed to lend Mongolia about $440m over three years to help it avoid default and rebuild its reserves. Assuming the agreement is approved by the fund's board, it should unlock another $3bn or so from the Asian Development Bank, the World Bank, Japan, South Korea and others.

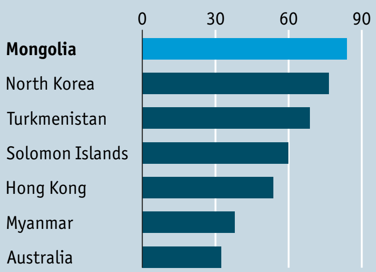
China should also help. Irked by the Dalai Lama's visit in November, it imposed new duties on Mongolian goods and delayed lorries at the border. A little over 50% of Mongolians identify as Buddhist. But almost all the country's exports (84%) are sold to China, making it the most China-dependent exporter in the world (see chart). Mongolia's government has apologised for the "misunderstanding" caused by the visit and said it will not permit a repeat. It now hopes China will extend a 15bn yuan ($2.2bn) swap line.

The strings attached to the IMF's loan are more conventional. They include keeping the central bank out of "quasi-fiscal" activities: it had bought cheap-rate mortgages worth 1.95trn togrog ($787m), helping to support a housing bubble in a country known for nomadism. At the IMF's urging, the government is also distancing itself from the management of the Development Bank of Mongolia, a state lender that accounts for over a fifth of credit in the country.

Mongolia's prospects should improve. Copper and coal prices have recovered somewhat. The economy will also benefit from heavy investment in Oyu Tolgoi, a copper mine operated by Rio Tinto. But Mongolia has turned to the IMF twice in eight years. If it does not manage the next commodity cycle better, it might find that its benefactors' patience is *baikhgui*.

The great thrall

Goods exports to China, % of total, 2015



Source: IMF

Security in Pakistan

Role reversal

ISLAMABAD

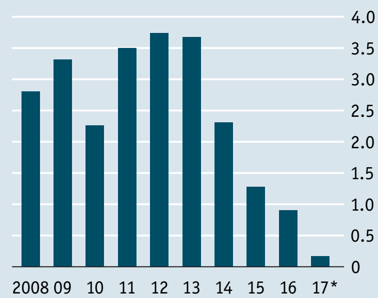
Pakistan blames Afghanistan for a spate of terrorist attacks

IN THE space of five days in mid-February, Pakistan suffered ten acts of terrorism, affecting all four of its provinces. On February 13th a suicide bomber killed 15 people outside the provincial assembly in Punjab, including two senior police officers. On February 16th more than 80 were killed and over 200 injured when another suicide bomber targeted the throngs of worshippers at Lal Shahbaz Qalandar, a Sufi shrine in the southern province of Sindh. Yet more bombs killed police and soldiers in Balochistan, Khyber Pakhtunkhwa and the Federally Administered Tribal Areas (FATA), along the border with Afghanistan.

The attacks are all the more shocking because deaths from terrorism in Pakistan have fallen dramatically in recent years (see chart), the result of a sustained counter-terrorism campaign by the security services. Swathes of territory once lost to militants have been recovered. Operation Zarb-e-Azb, launched in 2014 to retake North Waziristan, a part of FATA that had ▸▸

Waning horror

Pakistan, deaths from terrorism, '000



Source: South Asia Terrorism Portal *To February 19th become a jihadist stronghold, was a turning point. Until then, fretful politicians had postponed confrontation with the Tehreek-e-Taliban Pakistan (TTP), the Pakistani offshoot of the militant Muslim group that ruled Afghanistan until the American invasion of 2001 and threatens its government to this day.

It was a faction of the TTP that claimed responsibility for the attack on the Punjab assembly. Islamic State, the extremist group that controls parts of Iraq and Syria, said it was responsible for the bombing of the Qalandar shrine, although it is likely to have worked through a local group. But Pakistan's army identified a third culprit: Afghanistan. It said the Afghan government was not doing enough to stamp out militant groups, and that the militants, in turn, were using Afghanistan as a base to plan attacks in Pakistan. It closed all border crossings and shelled what it said were militant camps on the Afghan side of the border. The army also demanded the immediate arrest of 76 terrorists it said were living in Afghanistan.

It is true that Islamic State, the TTP and many other groups have bases inside Afghanistan. Afghan spooks may well provide them some assistance (in 2013 American special forces caught a leader of the TTP on his way to Kabul for secret talks). But the beleaguered government in Kabul, which has lost much of its territory to the Taliban insurgency, is in no position to satisfy Pakistan's demand that it detain particular militants. They are based in areas where its writ is minimal or non-existent.

Moreover, the Afghan government is beleaguered in part because the Afghan Taliban has itself long enjoyed sanctuary on Pakistan's side of the border. This week the Afghan government announced that its forces had killed Qari Saifullah Akhtar, a Taliban leader repeatedly captured and released by Pakistan. With many more of the Taliban's leaders, bomb-makers and indoctrinators beyond the reach of Afghan troops and their allies in NATO, it has proved impossible to defeat the 16-year insurgency. Yet Pakistan has shielded the Taliban because it sees the group as its only ally in Afghanistan, a country it fears is too cosy with India, its arch-rival.

While the army harasses Afghanistan, there is much that Pakistan could do to fight terrorism domestically. A National Action Plan drawn up in the wake of the massacre of more than 130 schoolboys by the TTP in Khyber Pakhtunkhwa in 2014 has not been fully implemented. Regulation and reform of *madrassas*, religious schools that foster militancy, has been half-hearted. Notorious peddlers of sectarianism remain at large. It does not help that the army wants an even bigger role in domestic security—a source of tension with the civilian authorities. There is nothing Afghanistan can do about all that. ■

Mining in South-East Asia

Shafted

JAKARTA AND MANILA

Indonesia and the Philippines tell a gift horse to open wide

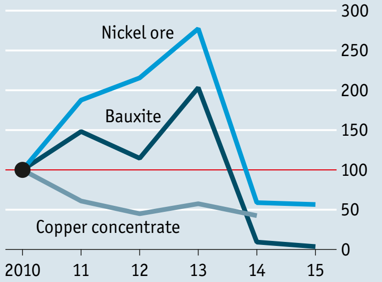
IN THE more rugged, poor and far-flung areas of the vast archipelagoes of Indonesia and the Philippines, mining is one of the few industries that shows much promise. Last year the Philippines exported nearly $1.7bn of minerals and ore—4% of the country's exports. Mining employs over 200,000 people. By the same token, the Indonesian unit of Freeport McMoRan, an American firm that operates Grasberg, a vast copper and gold mine high in the mountains of Papua, has paid more than $16.5bn in taxes over the past 16 years. Freeport plans to expand Grasberg; over the next 25 years it expects to cough up a further $40bn. Yet the governments of both countries are imperilling this bonanza.

Three years ago, in an effort to boost the economy by spurring domestic processing, Indonesia banned the export of unrefined metal ores. (Smelting copper ore adds little value, so it was exempted.) Mining collapsed: the output of bauxite, from which aluminium is refined, fell from 56m tonnes in 2013 to 1m tonnes in 2015 (see chart). Some firms did begin building expensive smelters—but not nearly enough to process all the ore that had previously been mined. Indonesia now has the capacity to process 3m tonnes of bauxite a year, for example. Instead, the law's most noticeable effects were the closure of hundreds of mines, the loss of thousands of jobs and a collapse in government revenue from mining.

In January the government—in search of jobs and revenue—relaxed the ban, allowing some exports of unprocessed nickel and bauxite for the first time in four years. But, perhaps to show that it was not a soft touch, it also insisted that all mining firms operating under an older, more secure form of mining licence, including Freeport, convert them into a newer sort in order to receive export permits. Freeport, which has a controversial history in Indonesia, has refused. It has halted production and suspended investment. It is also laying off workers. "You cannot produce a product that you are not allowed to sell," says its boss. The company has also muttered about international arbitration, eliciting splutters from the minister of mines.

In a hole

Indonesia, mining production, 2010=100



Source: United States Geological Survey

Indonesia's ore-export ban made the Philippines the world's leading nickel producer, but that may soon change. On February 3rd Gina Lopez, the environment secretary (and a longtime green activist before joining government), ordered 23 of the country's 41 mines to close permanently, ►►

and another five to suspend operations indefinitely, for alleged environmental violations. Most of the mines to be closed produce nickel, and are responsible for around half the country's annual output of 530,000 tonnes. On February 14th Ms Lopez cancelled another 75 mining projects, some still in the exploratory stage, on the grounds that they would harm ecologically sensitive areas.

The industry has cried foul. Ronald Recidoro of the Chamber of Mines in the Philippines, a trade group, said that his members had not seen copies of the audits that led to the closures, nor have there been cases filed against them for violations of the clean water and air acts (Ms Lopez has invited companies to inspect the audits in her office). He also notes that a government team that reviewed the audits recommended fines or suspensions, not closures. They fear that Ms Lopez intends to interpret environmental regulations so strictly as to make mining impossible.

Both countries may yet pull back from the brink. In the Philippines, mines remain open during what will doubtless be a lengthy appeal process. Carlos Dominguez, the finance minister, says that he reminded Ms Lopez that "it was important for her to follow due process." A lawyer in Jakarta predicts that "mine owners will be given relatively short extensions of the right to export and this will be reviewed on a regular basis with the threat of being shut down." Miners make convenient political villains. But neither Indonesia nor the Philippines can afford to let political posturing deprive them of much-needed revenue from rising commodity prices. ■

Buddhism in Thailand

The missing monk

PATHUM THANI

The junta feuds with an influential sect

SOME people think he has fled abroad. Others say he may have died. For more than a year the authorities in Thailand have been trying to get hold of Phra Dhammachayo, the reclusive former leader of a controversial Buddhist sect who is wanted for questioning in a fraud case. On February 16th a group of officers finally gained access to the vast religious complex which his Dhammakaya movement maintains on the outskirts of Bangkok. Instead of locating the septuagenarian monk—often pictured in signature sunglasses—they found an empty bed stuffed with pillows.

By February 22nd more than 4,000 police and soldiers were lingering outside the Dhammakaya compound—waiting to complete a full sweep of the massive site but apparently hindered by monks and devotees who had blocked its dozen entrances. A spokesman for the sect claimed that 30,000 people were still inside the property, having ignored orders to leave; there have been scuffles at its gates. Apiradee, a retired civil servant helping to feed Dhammakaya followers who had gathered in support outside the police cordon, said she has never seen anything like it.

Founded in the 1970s, the Dhammakaya movement claims about 3m followers around the world. It is by far the most influential temple in Thailand. It bears a loose resemblance to the evangelical mega-churches that increasingly beguile the world's Christians. Dhammakaya's mostly middle-class adherents complain that older Buddhist temples have grown complacent and materialistic. They insist, rather grandly, that the Bangkok compound, with its vast stadium, is meant to become a kind of Buddhist Vatican.

But Dhammakaya has fierce opponents both within the Buddhist establishment and outside it. Critics denounce it as a cult that peddles wacky theology, and warn that it misleads wealthy urbanites into thinking that they can purchase religious merit. (The most serious of the several allegations against Phra Dhammachayo relates to a case in which an acolyte funded a donation with cash embezzled from a credit union.) Thailand's ruling junta worries that the movement's leaders are sympathetic to the cause of Thaksin Shinawatra, a populist former prime minister toppled in 2006 whose lingering influence the generals and their backers are determined to stamp out.

Last year the junta abandoned several attempts to drag Phra Dhammachayo out for questioning, fearful of the outrage that might follow were soldiers to be pictured manhandling monks. The latest effort looks more concerted. It may not be a coincidence that the operation began shortly after the installation of a new Supreme Patriarch (Thai Buddhism's most senior monk). That job is usually filled according to a strict hierarchy but had been held open for several years after conservative clergy refused to endorse the expected successor—in part because of worries that he was too close to Dhammakaya. The junta took the unusual step of asking King Vajiralongkorn, who succeeded his father in December, to solve that dispute; he anointed a less controversial alternative, Somdet Phra Maha Muniwong, who hails from the smaller and more orthodox of Thailand's two main Buddhist orders.

Monks at the Dhammakaya temple say that they have not seen their former abbot for months. They say the real aim of the raid is to shut the entire temple down. The generals may yet decide to back away from the fight, as they have done previously. They could perhaps claim that the searches they have already conducted are enough to declare the operation complete. That might look like a defeat, but it is hard to escape the conclusion that the Dhammakaya movement is running out of powerful friends. With the royal succession—which some had feared would be tumultuous—safely behind it, Thailand's conservative establishment is reasserting itself, in religion as in politics. ■

The Vatican, Mecca...and Dhammakaya

Banyan | Pivot or pirouette?

Rodrigo Duterte, the president of the Philippines, says he is turning his back on America

FOR some relief from the congestion, fumes and hustle of Manila, take a day-cruise to the island of Corregidor. Guarding the entrance to Manila Bay, the "Gibraltar of the East" has seen the junks that brought Chinese trade and Islam, galleons that brought Spanish Catholicism and, in 1898, the warships of Commodore George Dewey that brought American rule. In 1941 came Japanese invaders who, as tour-guides tell it, made sport of throwing Filipino babies in the air and catching them on bayonets.

The shared memory of the second world war—the rearguard defence of Corregidor by American and Filipino soldiers, the horrors of occupation such as the "Bataan death-march" of POWs to distant internment camps, and the triumphant return of General Douglas MacArthur in 1944—goes a long way to explain the affection of many Filipinos for America. It is hard to imagine other former colonised peoples putting up, or putting up with, the "Brothers in Arms" statue on Corregidor: it depicts an American GI (tall and strong, with a helmet) holding up a Filipino buddy (short and wounded, with a bandana).

Such comradeship assuages some of the resentment Filipinos feel at the mix of brutality and paternalism of American rule. Seventy years after independence, the Philippines feels like an offshoot of America: in its spoken English, its system of government, its gun culture, and its love of fast food and Hollywood. The Pew Research Centre, which polls global opinion, ranks the Philippines as the most pro-American of the countries it surveys: 92% of Filipinos expressed a favourable view of America in 2015, an even bigger share than in the United States itself.

These days the expansionist power in Asia is China. A potential flashpoint for a future war lies barely 170 nautical miles from Corregidor—a ring of reefs and rocks called Scarborough Shoal. A big fishing ground, and a former bombing range for American and Filipino forces, it was seized by China in 2012. Were it to build a military base there, as it has done in the nearby Spratly Islands, Scarborough Shoal would be as a dagger aimed at Manila.

It is time, surely, for the brothers to link arms again. The trouble is, Rodrigo Duterte, the hard-man president, wants to turn his back on America. The Philippines is not a vassal state, *putang-ina* ("son of a whore"), he exclaimed when asked whether Barack Obama might object to his bloody war on drugs. A month later, on a visit to Beijing, "Rody" announced his country's "separation" from America, and its dependence henceforth on China. The Chinese leadership promised some $24 billion worth of loans and investments. High on Mr Duterte's wishlist is a new railway to connect Manila with development zones at Subic Bay and Clark Field, former American bases abandoned in the early 1990s during a previous surge of Filipino nationalism.

China in and America out: on the face of it a geopolitical revolution is under way, breaking the chain of American alliances in the Pacific that contain China. Control of Scarborough Shoal, and a friendly government in Manila, would make it easier for Chinese nuclear submarines to slip into the Pacific Ocean within missile range of America.

Yet, rhetoric aside, strikingly little has changed. American forces are still helping Filipino ones against jihadists and upgrading Filipino bases to challenge China's ambition in the South China Sea. The promised billions have yet to materialise. To some, Mr Duterte's pivot is a pirouette, intended to get both powers, and Japan, to woo the Philippines. More plausibly, he is spinning in contradictions. Mr Duterte says that only two out of five of his utterances are true, and the rest "jokes". But which is which?

Grown-ups in the cabinet are masters at managing his tantrums. The "separation" from America is recast as diplomatic "diversification", while keeping close ties with America. The threat to abandon the mutual defence treaty of 1951 is but a revision to annual joint exercises. The call to "set aside" the ruling of an international tribunal against China's trespass on the Philippines' exclusive economic zones around Scarborough Shoal and the Spratlys is no surrender, just a choice not to discuss it for now.

Mr Duterte's anti-Americanism is real enough. He bears personal grudges against Americans (and claims to have been molested as a boy by an American priest). A self-declared leftist, he blames America for the legacy of violence of his home island of Mindanao, plagued by communist and Muslim insurgencies.

But the president, although popular, is constrained by a pro-American system. Westerners are told to heed what the government does, not what Rody says. Rattled businessmen hope the harm will be limited. It helps that Mr Duterte has stopped insulting America. One reason is that he has more or less suspended his war on drugs—not because of growing qualms over the death of thousands of Filipinos, but out of embarrassment over the grisly killing of a South Korean businessman by crooked policemen.

A populist axis

The other reason is the arrival of Donald Trump, whom Mr Duterte regards as a kindred spirit. And yet, even for Mr Duterte, Mr Trump is probably a menace, not a friend. Though suspicious of China, the American president's resentment of costly alliances raises doubt about whether he would defend the Philippines. That could invite Chinese adventurism.

Mr Trump's dislike of global trade and immigration presents another danger. The gift of English has made the Philippines a winner from globalisation: remittances from millions of workers abroad (many in America), and the outsourcing of call centres and other backroom tasks by big American firms, have powered the economy. Right now, Mr Trump may care most about the loss of manufacturing jobs to Mexico and the influx of migrants from the Muslim world. But in trying to make America great again he may well make the Philippines poorer. Then Mr Duterte really would have good reason to curse America. ■

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China and North Korea

Shock and ore

BEIJING

Fed up with Pyongyang's missile tests and murders, China blocks coal imports

FEW television dramas boast a plot as far-fetched as the one that has unfolded in North-East Asian geopolitics over the past two weeks. Days after North Korea tested a ballistic missile on February 12th, two women assassinated the half-brother of Kim Jong Un, North Korea's leader, by throwing chemicals in his face at a Malaysian airport. The alleged killers said they were duped into taking part, believing the attack was a prank for a TV comedy. Malaysian police suspect that a North Korean diplomat in Malaysia may have been among the organisers, several of whom are thought to have fled to Pyongyang.

Amid such skulduggery, China's announcement on February 18th that it would suspend imports of coal from North Korea, from the next day to the end of this year, seemed a little mundane. But China's state-controlled media played up the decision. *Global Times*, a newspaper in Beijing, said the move would make it harder for North Korea to exploit international differences over the imposition of UN sanctions aimed at curtailing its nuclear programme. China appeared to be signalling to the world that it was ratcheting up pressure on its troublesome friend, as the Americans have long insisted it should.

Or it may just be posturing. On February 21st China's foreign ministry softened the message somewhat. It said imports were being suspended because China had already bought as much coal from North Korea this year as it was allowed to under the UN's sanctions, to which China gave its approval last March. But North Korea-watchers doubt that China could have imported its yearly quota of 7.5m tonnes in a mere six weeks. It had not appeared likely to reach its annual limit until April or May. And exceeding that cap had not been expected to matter much to China. In 2016 it imported about three times the permitted amount, using a loophole that allows trade if it helps the "livelihood" of ordinary North Koreans.

Advancing the date of the suspension, if that is what happened, would certainly have sent a strong message to North Korea, which depends on coal exports for much of its foreign currency. Announcing the move so publicly, and unexpectedly, will have shown to North Korea that China is ready to take the initiative instead of waiting to be prodded by America, as it usually does when North Korea offends.

The test of an intermediate-range missile will have rattled China. It suggested that North Korea has learned how to fire such weapons at short notice, from hard-to-detect mobile launchers. The murder of Kim Jong Nam may have been an even bigger blow. Mr Kim had been living on Chinese soil in the gambling enclave of Macau, probably under Chinese government protection. Some Chinese officials may have hoped that Mr Kim, who favours economic opening, would one day replace his half-brother. With his death "you lose one option", says Jia Qingguo of Peking University. It has reminded China that North Korea's dictator is doggedly determined to rule in his own way, regardless of China's or anyone else's views.

Growing frustration with North Korea is evident in China's more relaxed attitude towards criticism of its neighbour. In 2013 an editor of a Communist Party-controlled publication was fired for arguing in an article that "China should abandon North Korea." These days, academics often air that idea. Debate about North Korea now rages openly online, largely uncensored (except when people use it as a way of attacking their own regime, jokingly referred to as "West Korea"). The murder of Kim Jong Nam unleashed a torrent of ridicule towards his country by Chinese netizens. China still sees North Korea as a useful buffer against America's army deployed in the South. But it increasingly regards the North as a liability as well, says Mr Jia.

In America's court?

China would clearly like its tough-sounding approach to encourage President Donald Trump to rethink his country's strategy for dealing with North Korea. America has been reluctant to enter direct talks because the North has blatantly cheated on past deals—knowing that China would continue to prop it up. With China more clearly on America's side, the Americans would have greater confidence, Chinese officials hope. Mr Trump has previously said he would be happy to have a hamburger with Mr Kim and try to persuade him to give up his nukes. The trouble is, Mr Kim sees those weapons as the one thing that guarantees the survival of his odious regime. ■

Ethnic harmony

Journeys to the west

KASHGAR

China hopes that tourism will bind its ethnic-minority regions more closely with the rest of the country. The strategy is failing

YAKS graze on grassland near the turquoise waters of Karakul, a lake in the far western region of Xinjiang. Further south, towards the border with Pakistan, the imposing walls of a ruined hilltop fort at Tashkurgan mark a stop on the ancient Silk Road (see map). With such a rich landscape and history this region should be a magnet for Chinese tourists. Instead the area that accounts for more than one-sixth of China's land mass is better known for violent unrest. The picturesque charms of the lake and fort can be enjoyed in near solitude.

For decades Xinjiang has been racked by a low-level insurgency involving ethnic Uighurs—a mostly Muslim minority many of whose members chafe at rule from Beijing. Most recently, on February 14th, attackers with knives killed five people and injured another five in a remote oasis town. Thousands of paramilitary troops have since paraded through three cities in Xinjiang in shows of "thunderous power" aimed at Uighur terrorists.

Chinese officials have long hoped that tourism would help to reduce unrest in Xinjiang by creating jobs and boosting wealth. High-spending travellers from China's interior, they believe, can spread bonhomie and thereby strengthen "ethnic unity" between the Turkic-speaking Uighurs and the Han Chinese who make up more than 90% of the country's population. The authorities in neighbouring Tibet, where many people similarly resent the central government's control, have also looked to tourism as a salve. In both regions, however, their hopes have been dashed.

The central authorities have spent billions of dollars trying to make it work. A breathtaking high-altitude rail line linking Tibet with the national network was opened in 2006. A bullet-train service between the Tibetan plateau and Xinjiang was launched in 2014. Expressways have been built across deserts; airports opened at oxygen-starved elevations.

In Tibet, these efforts have helped to fuel a tourism boom. Visits to Tibet increased fivefold between 2007 and 2015 to 20m, according to government figures. The total number is misleading, since a tourist is often counted multiple times, when checking into a hotel or visiting an attraction, for instance. But the growth appears to be real, despite annual bans on visits by foreign tourists from late February to the beginning of April—the traditional season for protests. The impact on Tibet's stability, however, has been far less impressive. The tourism industry in Tibet is dominated by ethnic Hans, who can communicate better with the travellers. Tibetans often complain they have seen little benefit.

By official reckoning, tourist arrivals in Xinjiang have also risen fast, albeit unevenly. Numbers dropped in 2014 following attacks blamed on Uighur terrorists in other parts of the country (unrest in Tibet has tended to be more peaceful). To shore up the battered tourism industry, the government tried subsidising hotel rooms and plane tickets. It even offered cash incentives of 500 yuan ($80 at the time). This may have helped: there were nearly 60m "visits" to the region in 2015, nearly triple the number in 2007.

Few of the tourists, however, go to southern Xinjiang, the area most troubled by separatist unrest and most in need of an economic lift. Visitors' fears of violence are reinforced, not assuaged, by shows of force such as those staged by the security services in recent days. Armoured personnel carriers are a frequent sight in urban areas. Airport-style security is ubiquitous. Some buildings are fenced with barbed wire; guards check for bombs under cars entering their grounds.

In Kashgar (pictured), where separatist sentiment is strong among Uighurs and attacks blamed on terrorists have been particularly common, shopkeepers complain that the tourist trade has died. One says his family has had a hat shop in the city for 40 years, but sales are down by a third this year and prices are falling. At the "Karsu scenic area" on the edge of the Taklamakan desert the toilet and ticketing facilities have never even opened. A viewing platform, swings and a shaded area under umbrellas are used mainly by local (Han) staff and their families.

All the building of new infrastructure may be doing little to cheer Uighurs, either. Many of the workers who are upgrading the highway to Pakistan, a project due to be completed this year, are from outside the province. And as for bonhomie, evidence of its spread in Xinjiang is scant. Tourists often prefer to visit Han-dominated areas; those who visit Uighur ones sometimes offend locals by entering mosques in tight shorts or ignoring signs telling them not to climb on ancient ruins.

It does not help that Tibetans and Uighurs are unable to become part of the tourism boom themselves. Their movement within China and beyond is restricted. Many Tibetans have been refused new passports since an explosion of unrest across the region in 2008. Some have been ordered to surrender existing ones. Parts of Xinjiang launched a similar policy last year. In some areas people need official approval to travel abroad.

The police are also monitoring travel within Xinjiang more closely. This week all vehicles in Bayingol prefecture were ordered to install a satellite navigation system so people "can be tracked wherever they go", as an official put it. The authorities say the measure should "safeguard stability", because terrorists often use cars to stage attacks. Visitors to Bayingol's scenic grasslands may not be reassured. ■

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Environmental protection

Revenge of the polluters

WASHINGTON, DC

Scott Pruitt, scourge of environmental protection, takes over the Environmental Protection Agency

TO STAND on a pontoon besides the Anacostia River, which runs for 8.5 miles through Maryland and the southern part of Washington, DC, is to gauge the progress America has made in cleaning up its waterways. The Anacostia, which empties into the Potomac close to the Capitol, was once a slow-flowing garbage dump; on a recent sunny afternoon, hardly a soda can or plastic bag ruffled its sluggish brown surface, over which cormorants fizzed like arrows, rigid with intent. They are a sign that the river's ravaged fish stocks are beginning to recover. But you still wouldn't want to eat them.

Forty-five years after the federal government became obliged, under the Clean Water Act (CWA), to try to make America's main waterways "fishable and swimmable", the Anacostia is, despite the recent progress, in a disgusting state. Each year, two billion gallons of sewage and stormwater flow into it, making the water so cloudy with faeces that light cannot penetrate it. The weeds and mussels that once carpeted the river-bed are long gone. It is coated with black ooze, over ten feet deep in places, saturated with polychlorinated biphenyls, heavy metals and other industrial pollutants. Anacostia fish, often covered with toxic lesions, are poisonous, yet frequently consumed, a study suggests, by 17,000 mostly poor people.

The state of the Anacostia, and hundreds of other polluted waterways, is a rebuke to the argument, levelled by Donald Trump and other Republicans, that the EPA is running wild. At a rally in Florida on February 18th, Mr Trump said the agency was "clogging up the veins of the country with the environmental impact statements and all of the rules and regulations". Addressing staff at the EPA on February 21st, its incoming director Scott Pruitt, who as attorney-general of Oklahoma sued the agency 14 times, suggested the unclogging would involve ending the agency's regulatory "abuses". As *The Economist* went to press, Mr Trump was reported to be preparing executive decrees to begin that effort. He is expected, for example, to try to replace the Clean Power Plan (CPP), Barack Obama's main effort to reduce greenhouse-gas emissions from thermal power-stations.

This is such a familiar Republican assault—even if Mr Trump may mean to go further than his predecessors—that it is worth noting that environmental protection was once a bipartisan concern. The EPA was founded by Richard Nixon, in 1970, to implement a flurry of environmental laws, including the CWA and Clean Air Act, that were also backed by Republicans. Two decades of rapid post-war growth had put America's air and waterways under great pressure, which the states, locked in feverish economic competition with each other, had proved incapable of easing. The spread of television, which publicised such disasters as Californian peasoupers and the burning Cuyahoga river in Ohio, had helped foster public demand for action; the CWA passed the Senate 86-0.

This provoked a backlash from industry, which in turn led Ronald Reagan, and more forcefully George W. Bush, to turn against environmental protection. Both appointed weak EPA directors and tried to replace environmental rules with weaker alternatives. Yet they ended up retreating under the legal furore this caused. The political argument against environmental protection is not often legally based—as the fate of Mr Pruitt's challenges to the EPA, almost all of which were co-sponsored by representatives from industry, indicates. None of the 14 has so far succeeded.

Mr Pruitt claimed to be championing states' rights. His critics say he was an instrument of industry, and they seem to have a point. The EPA was formed, with authority to dictate standards to the states and intervene where they fail to implement them, precisely because their environmental stewardship had proved to be inadequate. Mr Pruitt's legal arguments are a mixed bag, moreover. His most important, that the CPP stretches the EPA's authority, is taken seriously by legal experts. But other challenges brought by Mr Pruitt, including a failed attempt to scupper a multi-state clean-up of Chesapeake Bay, on which some of the recent progress on the Anacostia is built, appeared frivolous.

His lack of success also indicates how hard it will be to poleaxe the EPA, as the president has vowed to do. Some of Mr Obama's recent regulations, including one to control methane leakage from drilling operations on federal lands, are liable to be scrapped by the Republican-controlled Congress, under a little-used procedure ▸▸

called congressional review. Most cannot be, however. They would have to be replaced, through a long process of drafting and review, then defended against legal challenges. To replace the CPP would take Mr Pruitt at least a couple of years.

Reducing the EPA would be easier if Congress were to amend the environmental legislation underpinning the EPA's rules—for example, by binning the provisions of the Clean Air Act on which the CPP rests. But there is currently no chance this could evade the Democratic filibuster in the Senate, and many Republican congressmen would not welcome the fight. Around 60% of Americans say they are in favour of more environmental protection.

A third possibility is more insidious. Mr Pruitt could try to sabotage his agency by ordering it to provide less regulatory oversight. That would get ugly; EPA workers are already rebellious, as illustrated by a recent protest by dozens against their new boss's nomination, in Chicago. It would also be damaging; though perhaps less so than Mr Trump might expect. Far from being the liberal attack-dog of his imagining, the agency is already thinly stretched and environmental groups correspondingly accustomed to filling in the gaps.

The most hopeful development on the Anacostia, for example, takes the form of a $2bn sewage overflow system, which is due to come into use in 2018. It has been built by DC Water, which manages much of Washington's sewage system, after it was sued over its discharges into the river by environmental groups. They had tired of the EPA's failure to take action. Though 168 drains will still flow into the river, bringing dog faeces and gasoline from the capital's roads, this should make the Anacostia swimmable for the first time in decades. "We're getting close to dramatic progress,' says Emily Franc, who serves as the Anacostia's riverkeeper, a non-governmental watchdog role. "This is no time for the EPA to pull back." ■

A new national security adviser

McMaster and servant

WASHINGTON, DC

H.R. McMaster is an improvement on his predecessor

THE 22 national security advisers who served Donald Trump's predecessors included two army or marine generals. On February 20th Mr Trump equalled that tally in less than a month, by appointing Lieutenant-General H.R. McMaster to succeed the disgraced Mike Flynn.

Like the belligerent Mr Flynn, whom Mr Trump sacked after 24 days in the job, after it was revealed that he had lied about a private conversation with a Russian diplomat, General McMaster appears to conform to the president's idea of a fire-breathing war-fighter. He is stocky, bullishly charismatic and as a tank commander in the first Iraq war was decorated for battlefield prowess. After bumping into an Iraqi armoured column, General McMaster's troop of nine American tanks destroyed over 80 Iraqi tanks and other vehicles without suffering a loss.

Also like Mr Flynn, who was once an innovative intelligence officer, General McMaster is a freethinker. His doctoral thesis in military history was a ruthless takedown of the pliant Vietnam-era military leadership, later published as a book entitled "Dereliction of Duty". Yet there the comparison ends. By the time of his appointment, Mr Flynn was known as a bad manager, obsessed with jihadism and so feverishly partisan that he represented a threat to the treasured neutrality of the armed forces. General McMaster is hugely respected by his peers, among whom he is considered one of America's most thoughtful soldiers.

He is perhaps best known for his exploits in the second Iraq war. Deployed in 2005 to the northern city of Tal Afar, in command of a cavalry regiment, he showed it was possible, at least temporarily, to pacify even the most violent and baffling parts of the country. By the time General McMaster arrived there, the city had been overrun by insurgents and retaken bloodily by the Americans, but with too few American or Iraqi troops to control it.

Acting largely on his own initiative, he proceeded to put in place a model counter-insurgency regime. He ensured his officers studied Islamic culture, which at that time few American soldiers did, used force selectively and sparingly, and took pains to understand and work with the grain of Afari ethnic politics. He was lionised by American journalists, who, it is true, tend to lose their hearts to any successful battlefield commander; Tal Afar, now the scene of a fierce battle between the Iraqi army and Islamic State, did not stay quiet for long. Yet in his hunger to listen and learn—from Iraqis, his soldiers and even visiting journalists—General McMaster stood out.

His subsequent career has if anything been more distinguished. Championed by another charismatic counter-insurgency specialist, General David Petraeus, who was also considered by Mr Trump for the vacant national security post, but in effect ruled himself out of contention by insisting he be allowed to pick his staff, General McMaster helped run operations for the NATO mission in Afghanistan, after it was reinforced by Barack Obama in 2010. More recently, as head of the Army Capabilities Integration Centre, based in Fort Eustis, Virginia, he has led an effort to design and prepare the future American force that will emerge from the two wars in which he made his name. He has received fresh plaudits in that role; David Barno, a former American commander in Afghanistan, called him perhaps "the 21st-century army's pre-eminent warrior-thinker".

This does not mean General McMaster will be a good national security adviser, a perniciously difficult job, at which only a few have excelled. And they—led by Brent Scowcroft, who advised Gerald Ford and George H.W. Bush, and Stephen Hadley, ▸▸

HR sent this guy

who steered George W. Bush—tended to be known for tact and scrupulous impartiality. General McMaster is better known as a straight talker and a risk-taker, albeit by the conformist standards of his profession. Mr Trump, who is as prickly and ill-informed about global affairs as he is admiring of generals, may not find him easy to work with. Indeed, General McMaster is so different from Mr Flynn it is tempting to wonder on what criteria Mr Trump appoints his national security advisers. Even so, at the second attempt, he has picked well.

This also points to the biggest puzzle about the 45th president. Mr Trump has surrounded himself with amateurish and ideological advisers, led by Stephen Bannon, who have been responsible for much of the administration's early haplessness. He has also hired some sensible and accomplished cabinet secretaries, such as James Mattis, the defence secretary, and, based on early reports, Rex Tillerson, the secretary of state. This group is believed to be opposed to, and possibly contemptuous of, Mr Bannon's agenda—and General McMaster looks like a fine addition to it. So whose advice will Mr Trump follow? The answer is unclear. Yet the stability of the world may depend on it. ■

Replacing Obamacare

Cost-sharing is caring

WASHINGTON, DC

The perils of replacing Obamacare's subsidies for the poor

AS REPUBLICAN congressmen were berated by constituents this week for their desire to repeal the Affordable Care Act (see Lexington), wonks in Washington continued to work on a replacement. Paul Ryan, the Speaker of the House, has promised a health-care bill soon after politicians return from their districts on February 27th. If they are to cool the protesters' zeal, Republicans must keep health insurance affordable for everyone who already has it. That means deciding what to do about the subsidies Obamacare gives to 10m low- and middle-earners who buy coverage through government-run websites. Mr Ryan promises to replace the law's means-tested tax credits with a discount for everyone, varying not with income but with age. Would such a switch work?

Republicans have always hated the ACA's handouts. Because they shrink if people earn more, they discourage toil. The Congressional Budget Office has estimated that Obamacare reduces the total number of hours worked by 1.5-2%, which is equivalent to 2.5m full-time jobs by 2024. Making tax credits universal would lessen that

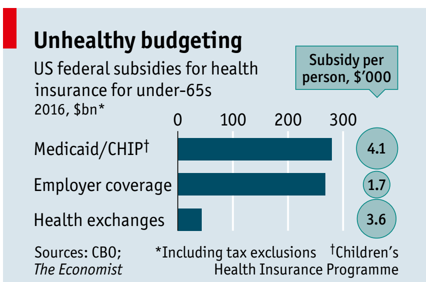
The opposition

number. And because the old pay more for health insurance than the young—a gap that will widen if the Republicans loosen restrictive pricing regulations—increasing subsidies with age makes some sense.

Such a tax credit, though, would not be generous enough for all buyers. The average Obamacare subsidy adds up to about $3,600 per person. Many receive much more. Two non-smoking 55-year-olds together earning $56,500, the median household income, get $4,800 each just to help pay for premiums, according to the Kaiser Family Foundation, a think-tank. According to *The Economist*'s calculations, if Mr Ryan spread the cash around all 22m Americans who buy health insurance directly, rather than through their employer, it would average only about $2,000 each.

That is close to what Tom Price, the new health secretary, proposed in 2015 for 35-to 49-year-olds (older folk would have got $3,000). Republicans say it is enough, because costs will fall once insurance is deregulated. But unless prices fall dramatically, many low-earners would probably have to downgrade to insurance covering only catastrophes. After deregulation, such plans might include chilling limitations, such as caps on how much insurance will pay if a person becomes chronically ill.

That would be sickening, especially as most affluent Americans benefit from subsidised health care. Fully 155m workers get health insurance from their employer without paying tax on this income-in-kind.



The tax exemption cost $268bn (1.4% of GDP) in 2016, enough to pay for Obamacare's subsidies six times over (see chart). Hated by economists, it encourages firms to give their workers more generous health benefits rather than more pay. One-third of the benefit flows to the top fifth of earners.

Unfortunately, Mr Obama could not shrink the tax-break, having vilified John McCain, his opponent in the 2008 election, for proposing to scrap it. Instead, he created the so-called "Cadillac tax" on expensive plans, which is due to come into effect in 2020. Messrs Price and Ryan would do away with that and instead cap the exemption—a simpler approach. It would be best to get rid of it completely. Doing so could fund a universal tax credit of $1,500 without touching Obamacare's means-tested payments, *The Economist* reckons. Unfortunately, killing the perk would be very unpopular. Just ask Mr McCain.

Making premiums affordable is only the first step. People must also be able to pay their medical bills up to the point where their insurance coverage kicks in. The ACA limits such payments for low-earners, and reimburses insurers accordingly. Those reimbursements, though, are currently held up in court after the House sued to stop them in 2014. On February 21st it filed to delay legal proceedings. Deciding what to do about the case—in which Mr Price is now the defendant—is yet another headache for the Republicans. ■

Deporting undocumented migrants

The dragnet and the scissors

LOS ANGELES

Congress and the courts will poke holes in the president's deportation plans

AT ONE point as a candidate for president, Donald Trump vowed to expel all 11m undocumented immigrants estimated to live in America. At other points he also talked about concentrating deportation efforts on "bad people", which is in fact a fair description of his predecessor's policy. "They will be out so fast your head will spin," he told Bill O'Reilly, a television host, last August. Two Department of Homeland Security (DHS) memos published on February 21st offer a detailed look at Mr Trump's definition of badness, and it is broad. The documents refer to the proposed wall along the southern border, reaffirm the goal of increasing the number of border patrol and immigration officers, and herald the revival of a policy encouraging local law enforcement agencies to act as immigration agents. The memos also signal an overhaul of priorities on whom to deport, with the aim of increasing the

ICE air to Guatemala

number who could be removed speedily.

Towards the end of his second term, Barack Obama ordered federal agents to focus on deporting undocumented immigrants suspected of terrorism and those with criminal convictions. In 2011 67% of those removed from the interior of the country had criminal records. By 2016 the share had increased to 92%. The new guidance says that federal agents should not target only those convicted of crimes. "Under Obama there were 2m people eligible for removal. Now the number could be between 8 and 11m. Basically everyone without papers has become a priority," says Jose Magaña-Salgado of the Immigrant Legal Resource Centre, an advocacy group.

The government plans to end a policy colloquially known as "catch-and-release". This allows unauthorised immigrants who are deemed not likely to abscond or a threat to public safety, to wait for the results of their cases outside detention. Under the new guidelines, immigrants with pending deportation cases will either be locked up or monitored, for example with ankle bracelets. The administration is also reconsidering who should be eligible for extra-swift removal.

At present, only undocumented immigrants caught within 100 miles of the border who have been in the country for less than 14 days can be deported without a hearing. The administration may change the rules so that any unauthorised immigrant who has been in America for less than two years can be deported without going before a judge. This would be much speedier than the standard deportation process, under which immigrants must receive a removal order from an immigration court. The system is a mess. Nationally there are over 500,000 immigration cases pending with around 300 judges to hear them. The average immigration case has been open for 677 days.

The president has a mandate to enforce immigration laws. The country has immigration laws that have not been enforced. But even the supposedly softer Obama regime deported hundreds of thousands every year. It spent more on immigration enforcement than on the FBI, Drug Enforcement Agency, US Marshals and Bureau of Alcohol, Tobacco and Firearms, combined. The Trump administration would spend even more: completing a border wall, recruiting 10,000 new Immigration and Customs Enforcement (ICE) officers and 5,000 border patrol agents.

Just the border-patrol part of that could add \$910m to a \$3.8bn staffing budget. A leaked DHS document suggests the wall could cost \$21.6bn. The abolition of catch-and-release policies would require more lock-ups, which now house around 40,000 detainees and cost the government around \$128 per inmate each day. Convincing Congress to appropriate enough money might prove difficult, despite Republican dominance of Congress. "This pits the traditional concerns of Republicans around government spending against their desire for border security," says John Sandweg, a former ICE chief under Mr Obama.

The courts may also take a pair of scissors to a deportation dragnet. "Embedded in the memos is the idea that the government is going to put due process to the side in order to pursue a plan of mass deportation," says Omar Jadwat, a lawyer for the Immigrants' Rights Project of the American Civil Liberties Union, another advocacy group. He says expanding the list of those eligible for speedy removal is likely to invite lawsuits. In the meantime, says Matt Barreto of the University of California, Los Angeles, the new guidance will have another effect on undocumented immigrants. They are likely to withdraw from wider society. He suspects they will be less likely to report crimes, visit hospitals, or even send their children to school for fear of being caught. ■

The future of the Democratic Party

Boot-edge-edge

CHICAGO

Who should lead the Democrats after their calamitous defeat?

"IN TERMS of the next chair of the DNC, however, the question is simple," according to Bernie Sanders. "Do we stay with a failed status-quo approach or do we go forward with a fundamental restructuring of the Democratic Party?" For Senator Sanders the way forward is Keith Ellison, a congressman from Minnesota, whom he is backing as next boss of the Democratic National Committee (DNC). The endorsement came shortly after Joe Biden, the former vice-president, announced his support for Tom Perez, a veteran of the Obama administration.

The contest for the DNC chair, which will be decided on February 25th in Atlanta, has become a proxy fight between those who believe that the party must move left to prosper and those who think this would be suicide. Mr Ellison is backed by Elizabeth Warren, the populist senator from Massachusetts, as well as the AFL-CIO, a federation of unions with 12m members, but also by pragmatic establishment types such as Chuck Schumer, the Senate's minority leader, and his predecessor, Harry Reid, who are intent on making use of the Sanders supporters' momentum. Neither Barack Obama nor Hillary Clinton explicitly backed Mr Perez, but an endorsement by the loyal Mr Biden is almost as good as a nod from the former president and the Democratic presidential nominee.

The tussle between Mr Perez and Mr Ellison, the front-runners among the nine ▸▸

Buttigieg, Maltese falcon

contenders for the job, could be a boon for Pete Buttigieg (pronounced boot-edge-edge), the 35-year-old mayor of South Bend, Indiana. “We don’t want to relive 2016,” says Mr Buttigieg, alluding to the fierce battles between Mr Sanders and Mrs Clinton in the Democratic primaries. Mr Buttigieg presents himself as the compromise candidate who can bridge the divide between the Sanders and Clinton camps, build alliances with progressive organisations such as the American Civil Liberties Union and connect with the white working class as well as minorities.

Mr Buttigieg joined the race late, but picked up momentum quickly. He bagged the endorsement of five former DNC chairs as well as nine mayors of cities such as New Orleans and Austin, Texas. Howard Dean, another former DNC chair and former presidential candidate, thinks Mr Buttigieg has a shot at winning. If he were elected, the former Rhodes scholar and Harvard graduate would be the youngest, and first openly gay, chairman of the DNC. He would bring to the job his experiences as mayor, navy officer and nerd at McKinsey, a management consultancy (a CV remarkably like that of Tom Cotton, a Republican senator with big ambitions).

How do South Benders see their mayor? Though he was not the favourite to win, Mr Buttigieg was elected with 74% of the vote in 2011 and with over 80% of the vote in 2015. Most of the struggling rustbelt city’s citizens don’t begrudge him using South Bend as a springboard for his political ambition, says Elizabeth Bennion of Indiana University, South Bend. They see the progress he has made with the demolition of 1,000 derelict houses in 1,000 days, the partnership he has fostered with Notre Dame, a rich Catholic university outside the city, and the technology and data companies he is trying to bring in. “There was always a sense that he is destined for bigger things,” says Ms Bennion.

Indiana’s Republicans pay Mr Buttigieg compliments in the form of withering remarks. He doesn’t see any political future for himself in Indiana, which is why he needs an exit, says Pete Seat, a spokesman for Indiana’s Republicans. Mr Buttigieg pitches himself as someone who can win even in a staunchly Republican state that is the home of Mike Pence, the vice-president, says Mr Seat, but South Bend has traditionally been a Democratic fief. The city last had a Republican mayor in 1972.

The victor will replace Donna Brazile, who took over as interim DNC chairman after Debbie Wasserman Schultz resigned. Her departure followed leaked e-mails from DNC staff about how to obstruct Mr Sanders when he seemed to threaten Mrs Clinton’s smooth ride to the party’s nomination. To be on the ballot, a candidate needs 20 signatures from among the 447 voting DNC members. The ballots were sent out on February 22nd, the day of a televised debate on CNN with eight contenders for the DNC’s top job. Members will vote in as many rounds as are necessary for one candidate to receive 224 votes.

Mr Sanders is right: electing Mr Ellison would mark a new chapter for a party that is trying to recover from one of the lowest points in its history. Mr Ellison is the first-ever Muslim congressman and co-chair of the Congressional Progressive Caucus. He has flirted with black nationalism and marched with the Nation of Islam, a political-religious movement founded in Detroit, his home town. An early and fervent supporter of Mr Sanders, he too favours a mix of sensible progressive proposals and Utopian schemes. He may not be best-placed to work out how to win back the statehouses and governors’ mansions Democrats have lost in recent years. The Midwestern mayor seems a better bet. ■

Wrongful convictions

Criminal injustice

Texas is generous when fixing its mistakes

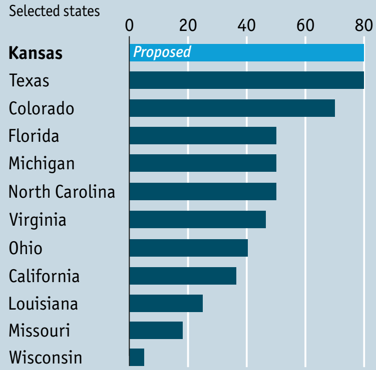
IN NOVEMBER 1999, a 25-year-old Kansan named Tom Bledsoe confessed to the rape and murder of a 14-year-old girl. Just days later, however, Mr Bledsoe recanted, pinning the crime instead on his younger brother, Floyd. When the jury gave its verdict in April 2000, it was Floyd, not Tom, who was sent to prison, a wrongful conviction that would cost him more than 15 years of his life before he was exonerated in December 2015. With cases like this in mind, Kansas legislators are considering introducing a law that would give wrongfully convicted Kansans $80,000 for each year spent in prison. At the moment, as in some other states, Floyd is entitled to nothing.

Had he been convicted in neighbouring Colorado, which passed a law in 2013 giving those exonerated $70,000 for each year they are locked up, Mr Bledsoe would have received $1.1m. Today, 31 states and the District of Columbia provide compensation in such cases. Payments vary considerably by state. In Texas, which accounted for a third of all exonerations in 2016, individuals are awarded $80,000 for every year of prison. In California, they receive $100 per day, or $36,500 per year. In Wisconsin, one of the least-generous states, exonerated individuals are entitled to just $5,000 for every year spent behind bars.

State of pay

United States, compensation for wrongful imprisonment per year of incarceration, 2017, $’000

Selected states



Sources: “Statutory compensation for the wrongly imprisoned”, by Tina Simms, 2016; press reports

Mistakes by the criminal-justice system are not uncommon. According to the National Registry of Exonerations, at University of Michigan Law School, courts overturned 165 wrongful convictions in 2016, or more than three a week. Since 1989 it has recorded a total of 1,991.

Those exonerated in Kansas and the 18 other states without compensation laws must instead seek payment through civil litigation, or by convincing lawmakers to pass separate bills on their behalf. This can yield generous payouts but is expensive, time-consuming and often unsuccessful. Adele Bernhard at New York Law School has likened it to a lottery.

Yet compensation statutes remain controversial. Some lawmakers believe that, since wrongful convictions are rare, a formal process for correcting them is a solution in search of a problem. Others argue that money would be better spent on victims of crime. Another worry is that statutes written carelessly could reward guilty individuals. These concerns have slowed the passage of legislation. Between 2000 and 2009, more than a dozen states passed compensation statutes. Since then, just four states—Washington, Colorado, Minnesota and Michigan—have passed such laws. Several others including Pennsylvania, Georgia, and Arizona have tried and failed.

The Kansas bill, which would introduce a scheme like Texas’s, faces opposition too. At a hearing on February 14th a Republican state senator asked whether the proposed law would allow someone to engineer their own wrongful conviction, serve time in prison and then prove their innocence, swindling the state out of a big payout. “With all due respect,” Mr Bledsoe told the committee, “no one in their right mind would do that.”

Lexington | Dissent in the age of Trump

Protesters are confronting members of Congress in a way not seen since the Tea Party's rise

IF THE gravest threat to democracy is indifference, have some faith in Donald Trump's America. For the president is not just good at rallying throngs of his own supporters. He is also firing up his critics in a way that offers some echoes of the Tea Party movement that sprang up to oppose Barack Obama in 2009.

Consider the long lines of constituents wrapped around a high school in Virginia Beach on February 20th, sacrificing their time on a public holiday to meet their Republican congressman, Scott Taylor. Undistracted by a mild, golden-hued evening worthy of early summer, almost 1,000 locals waited in line for seats. A minority were conservatives, wearing the Make America Great Again hats that signal Trump-allegiance or carrying signs demanding that Mr Taylor—a 37-year-old former Navy SEAL commando, elected to Congress for the first time last year—should vote to repeal the Affordable Care Act (ACA), also known as Obamacare. A larger number carried home-made signs that spoke of "resistance" to Mr Trump or demanded that Mr Taylor "Choose our Country over your Party!" Some were old hands at activism, alerted to attend by the local Democratic Party or by Indivisible, an anti-Trump group with chapters nationwide. Others used the Town Hall Project, a new volunteer-run database that logs opportunities to meet elected politicians—after rowdy meetings in places including Utah and California, some skittish members of Congress declined to hold public events in the recess that began on January 17th, or held virtual "tele-townhalls" instead.

As was the case with many Tea Party groups eight years ago, the crowd at Kempsville High School was older, whiter and more affluent than the national average. A forensic scientist queuing to see Mr Taylor held a placard opposing a wall on the Mexican border with the (tongue-in-cheek) slogan: "How Will We Get Avocados?" As in 2009, some concerned citizens noted that this was their first time at a political meeting, and expressed fears that a tyrannical president is about to wreck the country.

Back in Mr Obama's first term, Tea Party types fretted that government-run health care amounted to European-style socialism. Some muttered that the first black president might be a secret Muslim. In 2017 Trump-sceptic citizens in Virginia Beach voiced four broad worries. First, they questioned Republican promises to repeal and replace Obamacare as soon as possible, expressing special concern for people with pre-existing medical conditions, who have a right to buy insurance cover under the ACA, while paying not much more than healthy folk. A local man with a serious illness told Mr Taylor: "Without the ACA I wouldn't be alive." Second, they wanted their new congressman to back an independent investigation into Russian meddling in the presidential election, and to demand that Mr Trump release his tax returns. Third, as residents of a coastal district, they sought assurances that Mr Taylor takes climate change and the threat of rising sea levels seriously—unlike Mr Trump, who stood accused of being anti-science. Finally, a striking number of the 700 people filling the auditorium (a further 200 waited outside) queried the cost of providing Secret Service protection each time Mr Trump spends the weekend at his Florida estate, or for the president's grown sons when they go on business trips, for instance to open a golf club in Dubai—a "disgusting" expense, one constituent said.

As in 2009, forceful complaints have an impact on politicians. Mr Taylor is a fairly conventional small-government Republican who won his heavily military district by 23 percentage points. But the president won the district by only three points—in part, thinks Mr Taylor, because Candidate Trump dismayed locals by lashing out at the parents of a Muslim-American soldier killed in Afghanistan, after they rebuked him for anti-Islamic bigotry. Mr Taylor stressed moments where he has bucked his party, for instance in voting for gay rights. He emphasised his co-sponsorship of a bill to ensure that those with pre-existing conditions must be offered insurance (though his bill does not say how to make such cover affordable). He backed a bipartisan Senate probe into Russian election-meddling and called on Mr Trump to release his tax returns. He said he disagrees with Stephen Bannon, the president's chief political aide, having a principal's seat on the National Security Council. He condemned talk of Muslim travel bans as "unconstitutional", though he defended Mr Trump's right to order extra vetting for arrivals from terror-prone countries. He fudged the question of whether humans are to blame for climate change.

Herbal tea

There are also differences from 2009. In their heyday, Tea Party activists ringingly promised to take their country back, certain that America is a majority-conservative country. Jump eight years, and—at least in Republican-leaning Virginia Beach—demonstrators sounded more anxious, even defensive. They talked of preserving as much of Obamacare as they could, and of stiffening their congressman's spine to serve as a check on Mr Trump. Aware that the president has called critics "paid protesters" and "so-called angry crowds", they brought voting cards showing their local addresses and wore stickers bearing their postal zip codes. "We weren't bused in," a woman assured Lexington.

Those precautions reflect an alarming change since 2009: a collapse in belief that there is a single, shared version of the truth. Too often, today's political opponents do not just disagree, they express disbelief. "There's room for nuance," Mr Taylor pleaded at one point, defending his view that environmental regulations are necessary but can go too far. A woman silently held up a sign reading "Not True". A bloc of Trump voters, who had taken the president's description of the press as "the enemy" to heart, yelled "Bullshit!" or "Fake news!" when he was criticised. A dismayingly plausible scenario involves Mr Trump's election tearing the country further apart. Still, the deadliest foe of democracy is sullen, despairing apathy. Celebrate dissent. ■

Brazil's pensions

The burden on the young

RIO DE JANEIRO

The president has a chance to enact a landmark reform

THE faded modernist façades along Copacabana's beachfront hark back to Brazil's optimistic past. The seaside promenade, where walking sticks outnumber G-strings, offers a glimpse of its demographic future. A quarter of the inhabitants of this part of Rio de Janeiro are 65 or older, making it one of the oldest places in Brazil. But the rest of the country is catching up fast, thanks to a drop in birth rates and rising life expectancy. Over-65s, who make up 8.5% of the population now, will reach Copacabana's share by 2050. The country is dangerously unprepared for that shock.

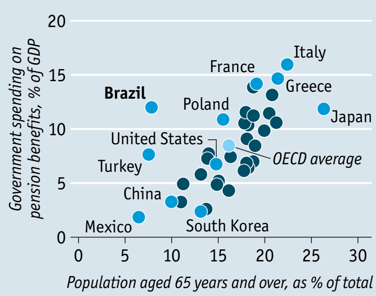
To see why, visit the Copacabana branch of the National Institute of Social Security (INSS), which administers state pensions for Brazilians employed in the private sector. Elizete Ribeiro, a vivacious masseuse, does not look ready to be pensioned off. She is just 56 years old. But, having paid into the system for 30 years, she is entitled to a basic pension worth the minimum wage (937 reais, or $304, a month). The lawyer helping her, Jorge Freire, benefits from a separate public-sector scheme. He retired as an employee of Rio de Janeiro's state court system when he was 52. His retirement cheque, at first the same as his final salary, is bumped up every time current court workers get a pay rise.

The form-filling at the INSS outpost, repeated millions of times, means trouble for Brazil. Pension spending is already the equivalent of 12% of GDP, half as much again as the average among members of the OECD, a club of mostly rich countries that have many more senior citizens (see chart). The combined annual shortfall of the pension schemes is 4.8% of GDP, equivalent to more than half the government budget deficit. The state of Rio supports more public-sector pensioners than working civil servants; for every police colonel on active duty five are retired. The state is nearly bankrupt. Without corrective action, Brazil faces an equally bleak future.

Michel Temer, the country's centre-right president, hopes to arrange for a brighter one. He took office last year after the impeachment of his left-wing predecessor, Dilma Rousseff, and in the midst of the country's worst recession on record. This month congress began debating his plan to reform the pension system. Economic recovery and Brazil's financial stability depend on its success.

Brazil's golden oldie blowout

Latest available



Sources: OECD; World Bank; Previdência Social

Brazil's geriatric generosity came from laudable impulses. The constitution adopted in 1988 sought to break away from the country's history of elitism and inequality, further entrenched under two decades of military dictatorship. Among the new rights was a basic pension for men over 65 and women over 60, whether or not they paid into the system. People who do pay in, like Ms Ribeiro, can claim benefits earlier. The government linked benefits to the minimum wage, ensuring that they would almost always go up and never down.

This has made Brazil a land of youthful and prosperous pensioners. Its citizens collect pensions when they are 58 on average; Mexicans toil into their 70s. Brazilians on average incomes get pensions worth four-fifths of their pre-retirement earnings, which is generous by most countries' standards. Widows and widowers inherit the full pensions of their deceased spouses, which they can combine with their own.

This accumulation of rights has become an economic cluster bomb. Inflated by big increases in the minimum wage, pensions now account for more than half of the government's non-interest spending. The recession has brought down the revenues to pay for them. Without a change, government pension spending could reach a fifth of GDP by 2060. Public debt will jump to scary levels sooner: by 2019 it could be 98% of GDP, up from 70% now. That prospect is one reason for Brazil's double-digit interest rates. The pension splurge hurts the economy in other ways, for example by withdrawing employees prematurely from the workforce and taking money away from education and infrastructure.

The reform Mr Temer is proposing would reduce the pension problem to more normal proportions. It would set a ▸▸

minimum pensionable age of 65 years for men and women, and oblige them to work longer than they do now in order to claim the maximum allowable pension. Future rises in the retirement age to keep up with longer lives would not require amending the constitution. Only the lowest pensions would be linked to the minimum wage. Widows' benefits would be reduced.

These and other measures would stabilise pension spending at around current levels, says Paulo Tafner, a pensions analyst. They would give the economy a short-term boost, in part by encouraging the central bank to reduce interest rates more rapidly. The stockmarket has strengthened on hopes that congress will enact it.

Because the reform requires a constitutional amendment, both houses must pass it with three-fifths majorities. Ms Rousseff's Workers' Party decries it as an attack on the poor, though it will not touch beneficiaries of the lowest pensions. A politician from Mr Temer's coalition accuses the government of "demographic scaremongering"—as if ageing were unpredictable.

Despite such grumbling, Mr Temer has a good chance of getting the reform through reasonably intact. A poll for his Party of the Brazilian Democratic Movement reportedly shows that Brazilians are split evenly for and against the reform. The government is trying to tip the balance, with adverts in newspapers and videos beamed at passengers in airports. Mr Temer himself is unpopular. But if he cleans up the pension system, Brazilians will have reason to thank him. ■

Protecting wildlife

Stand your ground beef

SAN MARTÍN, META DEPARTMENT

Cows that are good at self-defence are also good for jaguars

RANCHERS in Colombia's Meta department can be vengeful folk. From time to time jaguars emerge from a clump of forest, streak across the savannah and attack one of a panic-stricken herd of cows. When that happens, ranchers hunt the offender down and shoot it. That practice is endangering the cats' survival. Panthera, a charity that manages "corridors" for jaguars that stretch from Argentina to Mexico, guesses that just 5,000 of the cats are left in *los llanos*, Colombia's scorching savannah. It has come up with a less violent way of protecting both the jaguars and the cattle.

The idea is to teach cattle self-defence, or rather to breed the instinct into them. The cows that graze in *los llanos* are mostly Zebu, which are popular with ranchers for their fast growth, large size and white hides. But they have an unfortunate habit of fleeing in all directions when danger approaches. Panthera's idea is to replace panicky Zebu with cattle that stand their ground, or to interbreed the two. Esteban Payán, who directs Panthera's operations in northern South America, chose San Martineros, a little-known subspecies of Criollo cattle descended from Spanish fighting bulls. Few jaguars dare to challenge a massed group of 500kg (1,100-pound) San Martineros, their horns levelled. Docile with humans, they are fierce defenders of territory and their young. Mr Payán recounts that San Martineros chased away a puma before it could eat a capybara it had killed in their paddock.

Red hide, black belt

Eugenics seems to work. Since 2012 Mr Payán has been working with Eduardo Enciso, a rancher in Meta, who already had some San Martinero cattle. Mr Enciso reports that both purebred San Martinero cows and the offspring of Zebus that have been inseminated by San Martinero bulls do indeed stick together when jaguars approach. Cattle that are just a quarter San Martinero may be just as brave, says Mr Payán. No jaguars have attacked cattle on Las Pampas, Mr Enciso's 4,000-hectare ranch, since the programme began, he says. Zebu-only ranches in the area suffer a dozen attacks a year.

Panthera is trying to get other ranchers to adopt the technique, but just four have so far expressed interest. Some contend that smaller San Martinero bulls cannot mount their Zebu cows, though Mr Enciso denies this. Certainly, there is nothing wrong with their libidos, he says. Perhaps more important, butchers think San Martineros are scrawny and dislike their reddish hue (hybrids can look like either variety or a mix of both). Mr Enciso insists that San Martinero meat is more delicious than that of purebred Zebu. If diners develop a taste for it, perhaps fewer jaguars will be shot. ■

Chile's plutocrats

Bashing billionaires

SANTIAGO

A tight-knit elite provokes resentment

LAST year ended triumphantly for Andrónico Luksic, head of Chile's richest family. On December 23rd he won a slander suit against a politician who had called him a "criminal" and "a son of a whore". But his sense of vindication was clouded by pain. Four days earlier, as he left the courthouse, a mob, angry about a hydroelectric project in which he had invested, threw stones at him. One struck him on the head; police whisked him away.

Plutocrats are unpopular in lots of places, but Chileans seem to regard theirs with particular suspicion. MORI, a polling firm, asked Chileans in 2015 to choose which among five power centres had the most clout: 59% chose businessmen over the government, the presidency, congress and the media. Asked by Latinobarómetro, another pollster, if they had any confidence in private enterprise, just 32% said yes, the second-lowest rate among 18 countries. Chileans often say that seven families "own" the country. Together, their wealth is the equivalent of 17% of GDP. The Luksics alone are worth $14bn, equivalent to about 6% of GDP, according to *Forbes*.

Chile is in many ways the most modern country in South America. Its institutions function reasonably well, its educational standards are among the highest and its levels of crime and corruption are among the lowest. Yet that has not brought equality. Although poverty has fallen sharply, income distribution is more skewed in Chile than in any other member of the OECD, a club of mainly rich countries (though not unusually so for Latin America). Just 5% of Chileans regard the distribution of income as "fair" or "very fair", the lowest share in Latin America, says Latinobarómetro. "It's precisely because Chileans can see how wealthy their country is—from the Porsches and Maseratis in the streets of some areas—that they're so angry about how that wealth is shared out," says Marta Lagos of Latinobarómetro.

Mr Luksic, the grandson of a Croatian immigrant and a Bolivian heiress who settled in Antofagasta a century ago, is typical of his class. He attended The Grange, a posh private school in Santiago. The Luksics made their first fortune from mining, then expanded into banking, shipping, the media, drinks, energy and manufacturing. Antofagasta plc is listed on London's stock exchange. Other businesses are grouped into Quiñenco, a family holding company, of which Mr Luksic is chairman.

Breadth and heft attract hostility. Environmentalists say his mining and energy projects scar the landscape. Many Chileans think Mr Luksic's companies, along with all Chilean business, should pay higher taxes. Journalists say he wields undue influence. His bank made a large loan to a company owned by the Chilean president's daughter-in-law after he met with her; he later apologised. Such connections feed Chileans' suspicions that the big decisions are made by a clique over a bottle of Carmenère or a game of golf.

A series of collusion cases, often involving companies in sectors with little competition, give such suspicions weight. Firms were caught fixing prices and setting market quotas in such products as pharmaceuticals, poultry, and toilet paper. The three price-fixing pharmacy chains control 90% of the country's drugstore business; the chicken cheats sell 93% of the poultry.

A low point for the reputation of business came a week before Mr Luksic's victory in court. At the Christmas dinner of Asexma, a business association, its chairman gave the economy minister an inflatable sex doll, which he suggested might "stimulate the economy". Photographs of middle-aged men in suits chortling with a naked doll confirmed Chileans' view of the business elite as a boys' club out of touch with modern norms.

Though Mr Luksic thinks he has been unfairly maligned, he admits that he and his sort have a problem. After the politician defamed him last April he answered with a YouTube video, an unusual tactic for someone who usually shuns the limelight. While denouncing his accuser he also confessed that "we've made mistakes.... We have to be much more rigorous in how we behave." He was speaking about his business, but it sounded like a mea culpa from Chilean business at large. ■

Bello | Stop the carnage

Many Latin American governments are failing in their most basic task

THIS month police in the Brazilian state of Espírito Santo went on strike for ten days, during which 143 people were murdered and all hell broke loose in Vitória, the state capital. In Reynosa, on Mexico's border with the United States, two alleged robbers were beaten, bound with duct tape and dangled from a footbridge, with a message from a drug baron pinned to them. On February 17th a gunman killed five people and injured nine at a shopping centre in Lima. A day later in Flores Costa Cuca, a small town in western Guatemala, an 83-year-old woman and her disabled grandson were murdered, prompting calls for the army to patrol the streets.

A casual scan of newspapers in Latin America and the Caribbean in any week reveals a grave problem: violent crime has become an epidemic. The region accounts for only 9% of the world's population but 33% of its murders. Its homicide rate of 24 per 100,000 people is four times the world average. Worryingly, murders have become more common even as socioeconomic conditions have improved (see chart). Robberies are increasing, too; some 60% involve violence. No wonder polls show that crime has replaced the economy as the main public concern in Latin America.

As well as inflicting immeasurable suffering, violent crime is a big obstacle to economic development. In a pioneering report published this month, researchers at the Inter-American Development Bank (IDB) set out to measure its impact on the region's economies. In the average Latin American country the annual cost of crime is 3.6% of GDP, they reckon.

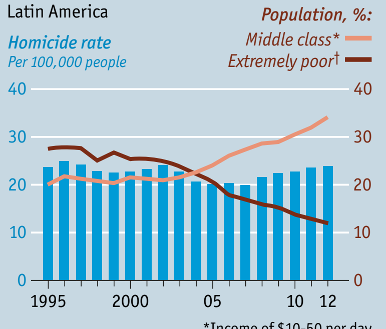
That may not sound much, but it is twice as high as the equivalent figure in developed countries and is equal to the region's spending on infrastructure and to the income of the poorest 30% of the population, points out Laura Jaitman, the report's lead author. She stresses that this is a conservative estimate: it covers only the income lost by the victims of crime and by prisoners; private spending on security by firms (in the formal economy) and households; and public spending on policing, the criminal courts and prisons. Factor in indirect costs, such as investment forgone, and the true cost of crime is higher.

The average conceals wide variations. In Honduras the cost of crime is a whopping 6.5% of GDP, for example. Chileans, by contrast, are less likely to be murdered than inhabitants of the United States. Murder rates and the cost of crime in different parts of Brazil vary as widely as they do across the region as a whole.

Organised-crime syndicates, with origins in the drug trade, help to explain why murders have soared in recent years in Mexico, parts of Central America, Venezuela and parts of Brazil. But the problem of violent crime goes well beyond the drug gangs. In some ways crime in Latin America is similar to that in the rich world. It is highly concentrated in certain parts of certain cities. The vast majority of perpetrators and victims are young men. Often they are badly educated and come from broken families.

Crime and enrichment

Latin America



Source: World Bank

*Income of $10-50 per day
†Living on $2.50 or less per day

A new report by the World Bank recommends strategies to prevent crime that have worked elsewhere—everything from early-childhood education to focusing police work on crime "hot spots". That would certainly be an improvement on the "iron-fist" approach favoured by many Latin American politicians, which involves mass incarceration for long periods in hellish prisons and the application of a de facto death penalty by security forces against young male suspects.

Yet if crime is so much more prevalent in Latin America than in other regions it is surely because the returns from it, relative to those in the legal economy, are higher and, especially, because the chances of being caught are lower. Less than 10% of murders in the region are solved.

That highlights two fundamental failures. The first is that too many young men command only low-paying and insecure legal jobs. Some 20m 15- to 24-year-olds in the region neither study nor work at all. This points to the need for targeted skills programmes.

Second, the police, the courts and the prisons often fail to do their jobs. Espírito Santo shows that even a bad police force is better than none. But not much better: last year the state's murder rate was still 37.4 per 100,000 people.

Not all is gloom. Colombia and other parts of Brazil have seen sustained falls in murder rates, partly because of better policing. In Chile this month a Spaniard was arrested for attempting to bribe a policeman (with 30,000 pesos, worth $47). Elsewhere, though, many governments are failing in their most basic duty, to keep their citizens safe.

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Iran and America

A new confrontation

How far is the new administration prepared to go?

CHAOTIC, fractious and bafflingly inconsistent though the Trump administration may be, on one issue it appears united: Iran. There is ample evidence that since the signing in mid-2015 of the deal to curb Iran's nuclear programme, known as the Joint Comprehensive Plan of Action, Iran has taken advantage of the easing of sanctions and the unfreezing of about $100bn worth of overseas assets to project its power across the region with greater boldness. Barack Obama, the new team believe, let it off the hook.

Since the deal, Iran has stepped up its support for Bashar al-Assad in Syria to the point where, with Russian air support, his regime's survival appears assured for the foreseeable future. Iran has also worked with Russia to supply Hizbullah, a Lebanese Shia militia fighting in Syria, with heavy weapons. It has poured other Shia militias into Syria from Iraq, Afghanistan and Pakistan. In Iraq, meanwhile, Iranian-backed militias are fighting alongside American-supported Iraqi security forces against Islamic State (IS). But once IS is ejected from Mosul, they will be a potent weapon in Iran's attempt to turn Iraq into a dependent satrapy. In Yemen the civil war is a proxy struggle between Sunni Gulf Arabs, who back the recognised government, against Shia Houthi rebels whom Iran supplies with training and weapons, including anti-ship missiles that have been fired at American warships in the Red Sea.

Meanwhile, Iran's elite Islamic Revolutionary Guards Corps has conducted a series of tests of ballistic missiles capable of delivering a nuclear warhead in defiance, though not clear violation, of UN Security Resolution 2231, which underpins the nuclear deal. The latest, on January 29th, resulted in the US Treasury slapping new sanctions on several Iranian individuals and companies connected to the missile programme. The response was measured (and probably dusted off from something prepared by the Obama administration). But it was backed up by a statement from the short-lived national security adviser, Mike Flynn, that Iran was "officially being put on notice" about its behaviour.

What did he mean by that?

Mr Flynn, however, was vague about what that involved. It is one thing to decide that Iran must be confronted and pushed back, quite another to know how to do it without running the risk of plunging America into another Middle Eastern war and increasing turmoil in a region that already has plenty of it.

The future of the nuclear deal is also in doubt. During the presidential campaign Mr Trump described it as the "worst deal in history", and congressional Republicans have little affection for it. But given the increased influence of James Mattis, the defence secretary, and Rex Tillerson, the secretary of state, there is little appetite in the administration for unilaterally abrogating an international agreement that has largely taken the nuclear issue off the table for the next decade or so and which has strong international support.

Instead, the emphasis will be on rigorous enforcement. Minor Iranian transgressions, such as the recent breach of the amount of heavy water Iran is allowed to hold for its reactors, will not be tolerated. Should Iran be caught deliberately cheating, America could try to persuade other signatories to the deal (France, Germany, Britain and the European Union, but probably not Russia or China) that some sanctions should "snap back".

The nuclear deal only lifted nuclear-related sanctions on Iran. Others remain in place, relating to ballistic-missile activity, support for terrorism and human-rights abuses. More could be imposed for further missile tests or violations of UN embargoes on arming Hizbullah in Syria and the Houthis in Yemen. America also maintains strict rules about illicit financial activity—Iran is believed by many to be a serial offender—and doing business with any commercial entities linked to the Revolutionary Guards, who have fingers in most of the Iranian economy. Nor does the Trump administration have to strain, as John Kerry (Mr Tillerson's predecessor) did, to reassure international banks that they would not be penalised for financing deals in Iran. Even with Mr Kerry's encouragement, the banks remained cautious.

Alongside sanctions, confronting Iran is likely to require a military component, though it, too, will have to be calibrated. Iran's aim is to establish an arc of control that runs through Baghdad, Damascus and Beirut. Mr Mattis has been told to come up with a plan to prevent this. More direct help for the Saudis and Emiratis in Yemen is likely, as is aggressive patrolling of international waters to stop supplies of weapons from Iran getting to the Houthis. American warships, dangerously buzzed by ▸▸

Iranian patrol boats, may not be as restrained in their response as before. In Syria, it looks as if there will be an attempt to prise apart the alliance between Russia and Iran. There will be an offer to Moscow of military co-operation against IS and recognition of Russia's role in deciding the terms of a future settlement. If that fails, as is probable, Mr Mattis may decide that America will need more than the handful of special forces it currently has on the ground in Syria. He was unimpressed by Mr Obama's policy to speak loudly and carry a small stick.

The biggest challenge will be Iraq. Mr Mattis, on a visit to the country this week, said that the 6,000 American forces assisting in the fight against IS would be staying on for some time after the fall of Mosul. He knows that without their presence, and the political influence it buys, there will be little to stop Iran from installing a new government of its choosing.

Iran may well be, as Senator Lindsey Graham said on February 19th, "a bad actor in the greatest sense of the word". But it is a resourceful one. Any attempt to confront it risks escalation. Mr Trump's trusted adviser, Stephen Bannon, believes that America is engaged in a civilisational struggle likely to lead to "a major shooting war in the Middle East again". It is for Mr Mattis and Mr Tillerson to plot a course that restrains Iran without fulfilling that prophesy. ■

Western Sahara

The never-ending dispute

LAAYOUNE AND RABAT

Back in the spotlight, the fate of Western Sahara is no closer to resolution

ACCORDING to the map sold in the gift shop at the airport in Laayoune, the capital of Western Sahara, the territory belongs solely to Morocco. But the airport itself contains signs that this is contested land. Planes bearing the UN's marking sit on the runway, while its soldiers, sporting blue berets, roam the arrivals hall. They are there to keep the peace between Morocco and the Polisario Front, a nationalist movement that has fought for independence for more than 40 years.

Fears are growing of a return to armed conflict. Provocations by Morocco have infuriated Polisario, which has responded in kind. Since last summer the UN has stood between the two enemies, just 120 metres apart, in the remote area of Guerguerat. Diplomats worry that an itchy trigger finger could restart the 16-year war that the UN helped end in 1991. "The threat to peace and security is probably the worst we have seen since then," says a UN official.

Hostilities between Morocco and Polisario began shortly after Spain, the colonial power, withdrew from Western Sahara in 1975, when Morocco annexed the territory. A ceasefire agreement in 1991 promised a referendum on independence, but no vote was held. Morocco was thus left in control of two-thirds of the territory, including Laayoune, while Polisario runs the remaining part. They are separated by a 2,700km (1,700-mile) sand berm, built by the Moroccan army and sown with mines.

Morocco moved south of the berm last August, when it began paving a road in Guerguerat, ostensibly to combat smuggling (but probably also to facilitate trade). Its deployment of security forces with the construction crews was seen as a violation of the ceasefire agreement. In response, Polisario also began building new structures and positioning armed elements in the area. The secretary-general of Polisario, Brahim Ghali, paid a visit to the region in December, stoking the tension.

They say they want a referendum

The standoff in Guerguerat is a symptom of much deeper problems. While Morocco's portion of Western Sahara contains valuable phosphates, oil and fish stocks, the Polisario's third provides little of value. Many Sahrawis continue to live in refugee camps in neighbouring Algeria, which supports the cause of Western Sahara. "Refugees born and raised in exile are beating the drums for war," writes Hannah Armstrong, an analyst.

Many Sahrawis also believe that the UN will not stand up to Morocco. The kingdom expelled some 70 UN workers last spring after Ban Ki-moon, then the UN's secretary general, described Morocco's presence in Western Sahara as an "occupation". (It has since let some, but not all, back in.) Morocco spends large sums of money lobbying governments, and threatens those that are unsupportive. It dressed down America's ambassador last year over a report that criticised its human-rights record. And it has reacted angrily to rulings by European courts that dismissed its claim to Western Sahara.

Some hope that Morocco's readmission to the African Union (AU) on January 31st will help to resolve the dispute. The kingdom left the AU's predecessor, the Organisation of African Unity, in 1984 after a majority of the member states recognised Polisario and granted it membership as the Sahrawi Arab Democratic Republic (SADR). By returning, Morocco is supposed to accept the AU's protocols, which state that members' borders (including those of the SADR) are inviolable.

Others, though, believe Morocco will instead work from within the organisation to undermine the AU's support for Polisario. Indeed, Nasser Bourita, Morocco's deputy foreign minister, has said as much. "Not only does Morocco not recognise—and will never recognise—this so-called entity," Mr Bourita told Le Desk, a website, referring to SADR. "It will redouble its efforts so the small minority of countries, particularly African, which recognise it, change their positions."

Morocco's claims to Western Sahara were rejected by the International Court of Justice in 1975, but most Moroccans still feel that it is part of their country and that autonomy is a fair solution—or, at least, will be when Morocco fully embraces democracy. Most Sahrawis, though, are holding out for the referendum that was promised. The alternative, some now say, is not autonomy, but a return to war. ■

South Africa

Horror show

JOHANNESBURG

The deaths of more than 100 psychiatric patients have exposed government arrogance and neglect

IT HAS been a disaster in agonising slow motion. To cut costs, health officials in Gauteng province (South Africa's economic hub, which includes Johannesburg and Pretoria) decided to transfer psychiatric patients from specialised private hospitals to care homes run by charities. Family members, psychologists and advocacy groups all warned that this could be dangerous for the patients. They pleaded with Qedani Mahlangu, the provincial health minister, and even went to court to try to stop the move, arguing that vulnerable people were being rushed into dodgy homes. Ignoring their concerns, Ms Mahlangu went ahead. Some 1,300 patients were moved over several months last year. An ombudsman's report described this process as a "cattle auction", with care homes jostling over which patients they wanted. Some sent pickup trucks to fetch them. Disabled patients were tied down with bed sheets for transport. Families did not know where their loved ones had gone. Soon, patients were dying.

The extent of the horror is still being uncovered. Last week South Africa's health ombudsman, Malegapuru Makgoba, told a parliamentary committee that more than 100 patients had died. More bodies are still unclaimed. His report into the scandal, released earlier this month, describes "negligent and reckless" conduct, including by government officials and the care homes, none of which was properly licensed. Some of the homes are described as "concentration camps": patients were skinny and starving. Freddie Collitz, aged 61, who suffered from depression, died with a head wound, blisters on his ankles and a sore on his nose. Carers told his family he had fallen on the lawn. His death was listed as due to "natural causes". Many other patients died of pneumonia, diarrhoea and dehydration. Neighbours of the Precious Angels home, where 20 people died, reported hearing screams. Bodies were stacked in a rundown morgue.

South Africans are shocked that such a tragedy could have happened despite all the warnings. "[Ms Mahlangu] and her administration knew of the risks before embarking on this project and watched as the tragedy unfolded," said Section 27, a civil-society group. "They did nothing to stop it." Another group, Treatment Action Campaign, compared it to the Marikana massacre, when 34 striking mineworkers were shot dead by police.

The deaths of more than 100 people, in appalling conditions, further dents the moral authority of the African National Congress (ANC), which has governed since the end of apartheid. The scandal may also damage the party at the polls: the ANC received a narrow 54% of the vote in Gauteng province in the 2014 elections (compared with 62% nationally). Both Johannesburg and Pretoria slipped from the party's control in last year's local polls.

Letting the vulnerable die

Ms Mahlangu has resigned—an almost unheard-of case of a South African official voluntarily stepping down as a result of scandal. Opposition parties want to press criminal charges against her. Jack Bloom, the shadow health minister for the opposition Democratic Alliance, notes that Ms Mahlangu admitted that patients had died only after he quizzed her about it in the Gauteng legislature. Her disclosure that 36 had perished led to the investigation. But even then, the ombudsman's report said, she did not grasp the full extent of the disaster: the death toll at the time was actually 77. "The horror is that this could have been covered up," Mr Bloom says. ■

The battle for Mosul

Going west

BEIRUT

Iraqi forces launch the toughest phase of their operation against Islamic State

IRAQ'S prime minister, Haider al-Abadi, had vowed to recapture Mosul from the so-called Islamic State (IS) by the end of 2016. In the weeks leading up to the battle for Iraq's second-largest city, American military commanders echoed him: victory would be swift, they pledged. But with the jihadists still in control of half the city and the hardest part of the battle yet to come, these predictions now look naive.

In the rush to dislodge IS from its largest urban stronghold, Iraq's security forces appear to have underestimated the militants' ability to cause carnage. Although vastly outnumbered, the jihadists have used snipers, booby traps, improvised landmines and hundreds of suicide-bombers to bog down Iraqi security forces. Elaborate tunnel networks have allowed IS to escape bombing runs from American warplanes and to ambush Iraqi forces in areas supposedly cleared.

The grinding urban combat has taken a heavy toll on Iraqi troops. Some units of the country's Golden Division—American-trained special forces that have spearheaded the assault on the city—have seen more than half their men killed or wounded. The UN said that almost 2,000 Iraqi troops were killed across the country in November alone, triple the number in the previous month, when the battle for Mosul began. The government refuses to release casualty figures, but in December the offensive ground to a halt as commanders waited for reinforcements to arrive.

So far Iraqi security forces, backed by American-led coalition warplanes, have captured the eastern half of the city, which is split in half by the Tigris river. On February 19th, more than four months since the start of the battle, they launched the next phase of the operation: to retake the west. The fighting will be even tougher. The old city's narrow alleyways will force Iraqi troops to dismount from their armoured Humvees, making them easier prey for IS suicide-bombers and snipers.

There is also a larger civilian population in the west, further complicating the operation. The Iraqi government has dropped leaflets urging the 750,000 or so residents to stay in their homes. But with heavy fighting and siege-like conditions taking an increasing toll on civilians, the UN believes that as many as half could flee, adding to the 160,000 who have already left the city's east and its surrounding villages since the battle began.

Still, the jihadists are slowly losing control of their caliphate. The Pentagon believes many of the group's senior bureaucrats are starting to leave Raqqa, IS's capital across the border in Syria, as air strikes on that city intensify. With Kurdish-led ground forces slowly encircling Raqqa, smugglers are helping growing numbers of IS low-level fighters flee the battlefield or defect to rival jihadist groups in Syria. The group's finances have also taken a hit, with revenue (largely from taxation, oil and ransoms) declining from up to $1.9bn in 2014 to, at most, $870m in 2016, according to a report from Kings College London.

The fall of both Mosul and Raqqa, which American commanders believe may happen within six months, will deal a huge blow to the jihadists. Even so, IS is likely to endure. It has already begun to switch to insurgent-style tactics, setting off car bombs in Baghdad and east Mosul with growing frequency. The jihadists may be down; they are far from out. ■

Education

Lessons from Liberia

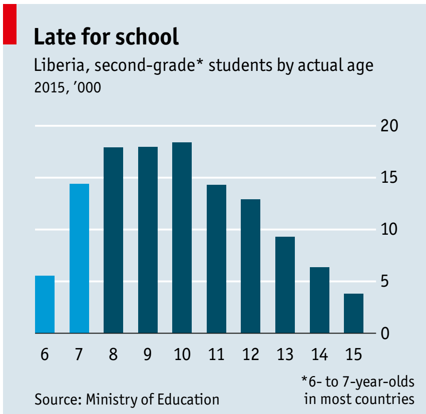
MONROVIA

A war-ravaged state where little works considers charter schools

AT A school in the township of West Point, Monrovia, a teacher should be halfway through her maths lesson. Instead she is eating lunch. A din echoes around the room of the government-run school as 70 pupils chat, fidget or sleep on their desks. Neither these pupils nor the rest of Liberia is learning much. Bad teaching, a lack of accountability and a meagre budget have led to awful schools. Fourteen years of civil war and, more recently, the Ebola virus have stymied reforms. Children's prospects are shocking. More than one-third of second-grade pupils cannot read a word; since many are held back, teenagers often share classes with six year olds (see chart). In 2014 only 13 candidates out of 15,000 passed an entrance exam to the University of Liberia. In 2013 none did.

George Werner admits that when he was made education minister in 2015, "my heart sank." But he soon got to work. He removed 1,892 dead or retired teachers from the government's payroll, saving $3.3m or 7% of the tiny education budget ($45.6m). In September Mr Werner went further, launching Partnership Schools for Liberia (PSL), a pilot which, if successful, could inspire similar innovation across Africa.

PSL is based on charter schools in America and academies in England. In each case independent operators run free schools that are at least partly funded by



the government. In the PSL scheme eight operators, three of which are for-profit groups, have taken over a total of 93 public schools. A randomised controlled trial will analyse whether their pupils do better than peers in traditional schools.

But just six months in, PSL is under fire. Education International, a global group of teachers' unions, and ActionAid, a charity, are funding an investigation into the programme. Their opposition is partly ideological: they do not like for-profit schools. But two of their concerns are pertinent—indeed, Mr Werner and the researchers evaluating the PSL project also recognise them.

The first is that the PSL schools play by different rules. There is a cap of 65 on most of their class sizes, for example, which has prompted allegations that some operators are turfing out less clever pupils. That would be unfair and against the rules of the pilot. But even if it were happening, it would not alter the results of the evaluation. Justin Sandefur of the Centre for Global Development, the research group leading the trial, notes that operators will be held accountable for the results of all children originally at the pilot schools—including any who were later turned away.


It says here, be good

The second concern is cost. The government pays for teachers' salaries. Operators also receive $50 per pupil per year from a pot of philanthropic cash managed by the ministry and Ark, a London-based education charity. Most spend extra money on top of that. Operators have submitted estimates of their costs ranging from $60 to more than $1,000 per child per year.

For Mr Werner, questions about the cost of the project are most acute when he considers the role of Bridge International Academies. Bridge, a chain of for-profit schools, has raised $140m from investors such as Mark Zuckerberg. But it is not close to breaking even, losing about $1m a month as a result of its high fixed costs, such as having a research team in America.

One way Bridge is trying to turn a profit is to run public schools as well as private ones. Liberia is thus a test case. As part of the pilot, Bridge runs 25 schools there, more than any other provider. Josh Nathan, Bridge's academic director in Liberia, said that the firm would like to cover all 2,700 schools around the country.

Charles Cooper, a Liberian businessman, speaks for many sceptics of the Bridge method. He says the scripts, which teachers read from tablet devices, are like a "lobotomy", as teachers no longer have to think for themselves. The scripts are bossy: teachers must "write today's date" and "erase the board", for example. But Bridge says these ensure that teachers teach.

Bridge's financial model is more worrying than its pedagogical one. It is seeking $9m from its philanthropic backers for its work in Liberia (about $1,000 per pupil). Around $5.5m of its proposed budget for Liberia is for staff costs for employees outside the country. The success of PSL does not rely on that of only one group, but such figures raise doubts about whether Bridge can ever run a cheap enough operation in a place like Liberia.

Susannah Hares of Ark says that higher costs in PSL's early years are not necessarily a sign of failure. Per-pupil spending should come down as costs are spread across more sites. But she adds that if the pilot is to expand widely there must be evidence that the world's fourth-poorest country can afford it, even with money from donors. (Liberia receives more in aid—$842m in 2014—than its gross national income of $720m.)

On February 22 Mr Werner announced that, from September, PSL would add another 100 or so schools. Expansion would irk critics. But they should remember how bad things are. Far too many education ministers choose to accept the status quo. PSL is an experiment, and one worth trying. Unfortunately, with an election due in October, a new government could scrap the scheme. In Liberia, where exams are proving too tough for too many, that would represent the biggest failure of all. ■

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France's Europhile candidate

The anti-Marine

PARIS AND TOULON

Emmanuel Macron has gone from no-hoper to serious candidate. Now comes the hard part

FRANCE'S most pro-European presidential candidate took his campaign to London this week to a rapturous welcome. Emmanuel Macron, a 39-year-old former Socialist economy minister, was there to court the French vote abroad, and is exactly the sort of upbeat, international-minded tech enthusiast that London's latte-drinking French voters adore. Campaigning as an independent for votes on the left and the right, Mr Macron has pulled off the astonishing feat of hauling himself up from rank outsider to joint second place in the polls. But the closer he gets to a shot at the French presidency, the tougher his campaign is turning out to be.

A few days before Mr Macron turned up in London, he had been in more hostile territory: the Mediterranean naval port of Toulon, traditionally held by the right. The entrance to his rally was blocked by scores of enraged National Front (FN) supporters and *pieds-noirs* (ethnic French who resided in Algeria during colonial rule), chanting "Macron traitor!" On a trip to Algeria that week, he had called France's colonisation of the north African country a "crime against humanity".

The rally went ahead all the same. Mr Macron told the audience that he was "sorry" if he had "wounded" anybody, but that France needed to confront all sides of its history. The venue was a little over half full, and the atmosphere flat. The crowd seemed motivated as much by curiosity as conviction. Jean-Luc, a high-school maths teacher, said he had never been to a political rally and was "intrigued" by Mr Macron. Robert, a retired salesman, said he voted for François Fillon, the centre-right candidate, at his party's primary but was now "looking for a way out". (Mr Fillon is under investigation for having employed family members on the parliamentary payroll, despite little evidence that they did much work.) It was Mr Macron's "different way of doing politics" that appealed, said a retired naval worker and Socialist voter; he was not yet sure of his vote.

With two months to go before the first round, the French presidential election has become more unpredictable than any in recent history. The only near-certainty is that the FN's Marine Le Pen will win one of the two places in the run-off. This has turned the election into a race to face her. Though she has staged almost no rallies, Ms Le Pen tops first-round polling, with about 26% of the vote (see page 40). Over three-quarters of her voters say they are sure of their choice. For Mr Macron, who is neck-and-neck with Mr Fillon in second place, this share is just 45%.

That Mr Macron is in this position is remarkable enough. This, after all, is a young man who in July 2014, after quitting his job as deputy chief of staff to President François Hollande, could be found in his top-floor office at the Elysée Palace cheerfully mulling over plans to write a book, or perhaps teach philosophy. Today, the offices of En Marche!, the movement he founded last year, are filled with young people in sweatshirts, and feel like a cross between a start-up and a student society. He has attracted policy heavyweights, such as Jean Pisani-Ferry, an economist, and the support of François Bayrou, a centrist who has declined to run himself. And he is recruiting candidates from all backgrounds to stand at parliamentary elections in June. The objective, says Mr Macron, is to reject "yesterday's choices", pursue "radical novelty" in politics, and build "a new France".

Not your regular Gilles

Yet, besides his inexperience, two obstacles in particular lie ahead if Mr Macron is to beat Mr Fillon into the second round. One is whether he can find a way to speak to a broader electorate, beyond the metropolitan voters with a university degree who favour him. "He's too intellectual," says a retired antique dealer, in a café overlooking the port in Toulon, where the aircraft carrier *Charles de Gaulle* is docked while undergoing repairs. Mr Macron's overtly pro-European politics are unfashionable in parts of France these days. His support for Germany's open-border policy towards Syrian refugees—he says it "saved our collective dignity"—collides with a popular mood of rising nationalism. And Mr Macron's embrace of technological disruption does not resonate with those who fear they will be its next victims. "He is quite weak among manual workers and employees, and it's not possible to construct a successful candidacy without them," says Jérôme Fourquet of Ifop, a polling group.

The second is how far his poll success is ▸▸

down to an engaging personality rather than a convincing programme. The country, he says, needs "vision", not scores of policy ideas that promptly get shelved by presidents in power. But his reluctance to be too precise has left Mr Macron open to the charge of ambiguity. Asked which of his policies they liked best, supporters questioned in Toulon were unable to answer. Mr Macron is due shortly to unveil more specific plans which, perhaps tactically, he has long avoided. Yet this carries fresh risks. Some of the ideas he sketched out in "Révolution", the book he published last year, are profoundly radical, certainly for France. He wants to curb the overall level of public spending; have the state take over the employer- and union-run unemployment benefit system in place since the second world war; and devolve most negotiations on working conditions to companies. He is liberal, he says, "in a Nordic sense". Getting the right balance between what France needs, and what the French will vote for, will be perilous.

A historically unusual opportunity is within Mr Macron's grasp: the chance of beating all established party candidates into the second round, and from there into the presidency. Polls suggest that he would be a more solid run-off candidate against Ms Le Pen than would the damaged Mr Fillon. Under the Fifth Republic, no independent has ever pulled off such a feat. Then again, none has had such a remarkable opportunity to do so. ■

Mme la Presidente?

France's chances

Populists are on a roll, but Marine Le Pen faces an uphill battle

JOURNALISTS often joke that three examples make a trend. Following the votes for Brexit and Donald Trump, a victory by Marine Le Pen of the National Front (FN) in France's presidential election would complete the anti-globalisation trifecta. She has dominated the polls ever since news broke that François Fillon, her centre-right rival, had paid his wife and children about €1m ($1.05m) over the years for jobs critics call fake. But a deeper analysis shows that Ms Le Pen is more likely to end the streak than to continue it.

After last year's surprises, many people stopped trusting polls. This is misguided: in both cases, surveys correctly predicted that the race would be tight. If polls in France are similarly reliable, Ms Le Pen's chances in the first round of the election are excellent. *The Economist* has aggregated 100 French polls (a technique that is still rare in France, though it is de rigueur in Britain and America). We find that if the first round were held today, Ms Le Pen would carry 26.1% of the vote. Emmanuel Macron and Mr Fillon would trail with 19.7% apiece.

These figures could change, but big shifts are rare. According to a database of French polls since 1965 compiled by two political scientists, Will Jennings and Christopher Wlezien, surveys 60 days before the first round have been off by just three percentage points on average. Using this record to run 10,000 computer simulations shows Ms Le Pen as the heavy favourite. She wins the first round 77% of the time, and is a 96% shoo-in to make the run-off.

The race for second place is much tighter. Mr Fillon's chances of making the run-off have fallen from 79% to 50%, slightly more than Mr Macron's 47%. Benoît Hamon, the Socialist candidate, manages just 5%.

However, the second round is a different story entirely. When voters are asked to pick between Ms Le Pen and Mr Fillon, she loses by 13 percentage points. Against Mr Macron, it is 20. At this stage, voters tend not to change their minds: in presidential elections since 1981, the average poll of a potential run-off 70 days out has also missed by only three points. If they are similarly reliable this time, Ms Le Pen has less than a 5% chance of victory.

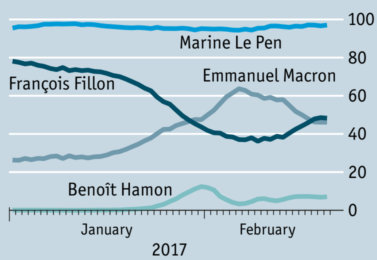
Of course, unusual events cannot be ruled out, and many voters are still uncertain. Betting markets give Ms Le Pen odds of 28%-43%. Punters may think further scandals could fell whoever faces her in the second round. Should it be Mr Fillon, leftist voters who dislike him might stay home. But such a drop in participation would have to be huge to matter. If the polls hold, even if every FN supporter actually votes, a fifth of opposing voters would have to drop out for Ms Le Pen to win. That is much larger than the shifts in Britain and America.

The most likely outcome is that history will repeat itself. In 2002 Jean-Marie Le Pen, Marine's father and the FN's founder, snuck into the presidential run-off, only to lose by 64 points. Just 14 months ago, the FN topped national first-round polls for regional elections. But its opponents teamed up, and it failed to win a single region. Perhaps this time will be different. But if Ms Le Pen wins, it will be a far bigger shock even than the votes for Brexit and Mr Trump.

Ménage à trois

France, probability of reaching second round, %*

Selected presidential candidates



Sources: National polls; W. Jennings and C. Wlezien; *The Economist*

*Based on 10,000 simulations per day

Western Balkans

Russian overtures

NIS

Moscow fights Serbia's turn towards Europe

"HERE are the Russian missiles!" chortles Viacheslav Vlasenko, co-director of the Russian-Serbian Humanitarian Centre in Nis, a town in central Serbia. He gestures at the contents of his warehouse: tents, generators, inflatable boats and other goods one would expect to use in disaster relief. The centre, which shares a building near the airport with several local IT companies, is simply a facility for responding to floods, forest fires and other emergencies, says Mr Vlasenko.

Yet Western analysts worry that it may be something more: a spying post or even a foothold for Russian intervention. As the influence of America and the European Union has receded in the western Balkans, Russia has been trying to fill the vacuum. It has stepped up military co-operation with Serbia, and may have been involved in a recent alleged coup attempt in Montenegro. Moscow's goal is to stop Serbia, Bosnia, Macedonia and Montenegro from joining NATO and to turn them away from the West.

The most striking allegations against Russia concern a purported coup attempt in Montenegro last October, on the day of the country's elections. Authorities arrested 20 Serbian suspects. On February 19th the country's state prosecutor accused Russian "state organs" of having masterminded the plot in order to prevent the country's imminent accession to NATO. Russia called the claim "absurd".

Russia also backs Serbia's refusal to recognise the secession of Kosovo in 2008. Hashim Thaci, Kosovo's president, says he fears Russian influence is growing (along with that of Islamists and nationalists) because the EU is too consumed with its own

problems to pay attention to the region.

The centre in Nis, established in 2012, is helping to win friends. Russia had already helped to clear unexploded ordnance left behind by NATO's bombing during the Kosovo war of 1999. In 2014 Russia used the centre to fly in emergency relief when floods hit the region. Since then Russia has helped put out forest fires, provided tents for migrants and trained emergency responders. Between 2014 and 2017, this aid will total $40m. A recent poll showed that Serbs wrongly believe Russia is one of their main benefactors, even though the more than €3bn ($3.16bn) that the EU has provided since 2000 dwarfs Russian aid.

Last November, Russia gave Serbia six ageing MiG-29 warplanes. This plays well among Serbs, 64% of whom see NATO as a threat. Serbia's annual military exercises with Russian troops help reassure its pro-Russian electorate, while the government-friendly media plays down the more frequent exercises with NATO. The two countries have a free-trade agreement, though it excludes Serbia's most valuable export, the cars manufactured at Fiat's Serbian plant. This is a perennial source of irritation, and probably one reason why a long-promised visit by Dmitri Medvedev, Russia's prime minister, has still not taken place.

Moscow's skilled influence-peddling groups are certainly active. A recent study found 109 organisations devoted to promoting good relations with Russia. All of the country's mainstream news outlets run stories by Sputnik, a state-controlled Russian news agency. Nationalist websites glorify Russian military might and denigrate Albanians and the West; one recently lauded Vladimir Putin for "punching" Croatia by blocking certain imports.

But it is not clear what Mr Putin can do for his local admirers. Marko Jaksic, an activist in Mitrovica, a mostly Serbian town in Kosovo, used to plaster posters of the Russian leader all over town. But Russia has done nothing to help Kosovo return to Serbian rule. "Serbs are always waiting for something from Russia," he says, "but it is hoping against hope." ■

The German left is back

Miraculous recovery

BERLIN

Martin Schulz breathes new life into the Social Democrats

THE small branch office of Dilek Kolat, a Social Democratic (SPD) politician in Berlin's Friedenau district, is packed with locals who have turned up for a discussion on the topic "What is social justice?" After two hours the answer is, unsurprisingly, unclear. But the crowd's enthusiasm is undimmed. Many sense that Martin Schulz, the SPD's candidate for chancellor, may actually defeat Angela Merkel, the Christian Democratic (CDU) incumbent, in the election on September 24th—and believe that if he does, social justice might be more than a matter for philosophical debates.

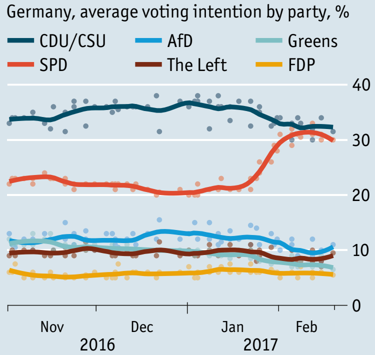
Mr Schulz's selection as candidate in late January caused an extraordinary surge in the polls (see chart). The SPD, currently the junior partner in the coalition with Mrs Merkel's conservative bloc, now runs neck-and-neck with it, each drawing just above 30%. If Germans could elect their chancellor directly, he would defeat Mrs Merkel 49% to 38%, according to Forschungsgruppe Wahlen, a pollster.

It is too early to tell whether this popularity is a "soap bubble" destined to pop, says Manfred Güllner of Forsa, another polling firm. As the former president of the European Parliament, Mr Schulz is well-known in Brussels, but he is still fresh in Berlin, untainted by domestic politics.

Yet his effect has been to awaken the base of a party that, like its centre-left cousins elsewhere in Europe, seemed to have lost its way. The SPD last won an election in 1998, when Gerhard Schröder became chancellor. Mr Schröder implemented a batch of market-friendly labour and welfare reforms. Today it is conservatives who laud this so-called "Agenda 2010" for making Germany competitive and slashing unemployment. The Social Democrats have turned against their own reforms, denouncing a neoliberal turn towards lower wages and away from social justice. Between 1998 and 2013 the number of people voting for the SPD almost halved, to 11m.

SPD-y ascent

Germany, average voting intention by party, %



Source: National polls

Mrs Merkel shrewdly helped this trend along, employing a strategy of "asymmetric demobilisation" to keep SPD voters at home. Under the rubric of modernising her Christian Democrats, she poached some leftist policies, such as eliminating the draft, scrapping nuclear power and enacting a minimum wage. And she governed, from 2005 to 2009 and again since 2013, in a coalition with the Social Democrats that made them look to many voters like an indistinguishable centrist blob.

Such disheartened Social Democrats, many of them blue-collar workers, now feel energised by Mr Schulz. His language is earthy and simple, where Mrs Merkel's is often technocratic. His grizzled looks testify to a life of hardship and perseverance. In his youth Mr Schulz dropped out of high school, hoping to play professional football. After a knee injury derailed that plan, he took to drink and even contemplated suicide. But in 1980 he turned his life around, becoming a teetotaller, a bookstore owner and later the mayor of his small home town.

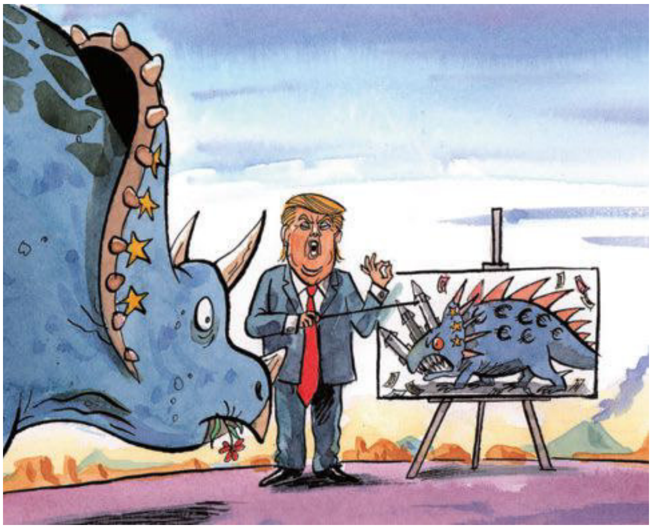
That history speaks to many voters. Mr Schulz is "an alcoholic who fell from grace but rose again", says Jan Richter, one of those attending the debate at Mr Kolat's office. He is "a man out of real life", chimes in Aurel Marx, who sports a beard and twirled handlebar moustache and makes a living running an eight-room brothel. Mr Schulz "has succeeded against the discrimination of society and now has the gall to say 'I want to be chancellor.' That rocks," Mr Marx adds.

The passion Mr Schulz inspires could make him a mobilisation machine. He has already been hinting at a rollback of Agenda 2010. The left's rising enthusiasm makes Mrs Merkel's strategy of asymmetric demobilisation impossible. Meanwhile, turning out her own base will be harder than usual. Many voters have yet to forgive her open-armed refugee policies in 2015, and the CDU's conservative sister party in Bavaria, the CSU, has spent much of the past two years criticising her.

Mrs Merkel will probably start by waiting for Mr Schulz to make mistakes. As the campaign heats up, however, she will have to play to her party's conservative base, thinks Timo Lochocki of the German Marshall Fund, a think-tank. If the bail-out of Greece, say, returns to the headlines, the CDU could take a hawkish line, while the more lenient Mr Schulz might emphasise European solidarity. And on labour-market regulations, taxes and more, Germany is in for a clearer ideological clash than in any recent election. ■

Charlemagne | The Gryfs of Europe

Donald Trump wants Europe's herbivores to spend more on defence



THE triceratops had a gentle existence that belied its fierce appearance, keeping to itself and maintaining a strict vegetarian diet. But in his neglected classic *Tarzan the Terrible*, Edgar Rice Burroughs conjured the Gryf, a horrifying dagger-toothed descendant of the three-horned dinosaur that roamed the African plains and snacked on the locals. Europe is contemplating a similar evolutionary path as it gets to grips with an American administration that has tired of playing T. Rex alone. Can the herbivorous power of the past, which has long delighted in the soft tools of diplomacy, trade and aid, really transform itself into a slavering, armed-to-the-teeth carnivore?

Donald Trump's team has spent much of the last week in Europe cleaning up the boss's mess. At the Munich Security Conference, James Mattis, the defence secretary, called NATO (which Mr Trump had written off as obsolete) "the best alliance in the world". In Brussels, Mike Pence, the vice-president, assured his audience of America's "strong commitment" to the European Union, a club the president has dismissed as a "vehicle for Germany". Europeans remain baffled by the mixed messages emanating from Mr Trump's administration. It is as if Henry Kissinger's old (and apocryphal) question about whom to call when he wants to speak to Europe has been reversed, quips Hans Kundnani, an analyst at the German Marshall Fund in Washington.

But on one issue the president is in full agreement with his team. Like his predecessors, Mr Trump grouches that America's NATO allies are not paying their bills. Only four other countries in the 28-member alliance meet its target of spending 2% of GDP on defence. Mr Trump's threat to withdraw America's security guarantee is probably a bluff. But he has other cards to play, including cuts to joint training programmes. Last week General Mattis warned his fellow NATO defence ministers that continued European miserliness might see America "moderate" its commitment to the alliance.

America is right to make these demands, say some ambassadors; in 2014 all 28 allies vowed to meet the 2% target within a decade. Indeed, Mr Trump is pushing at a partly open door. The long decline in European defence spending bottomed out in 2015. Russia and terrorism have restored history to Europe, and economies are growing again. Almost all NATO governments are raising defence spending in real terms, to the delight of Jens Stoltenberg, the secretary-general. But some, particularly in Europe's south and west, still balk at shelling out for what feel like distant threats.

Their arguments are well trodden. The 2% target is mercilessly crude. Few would argue that Greece, which meets the goal partly because its economy has collapsed, has a more effective fighting force than Norway, which devotes a large share of its 1.5% to R&D and sends hundreds of troops to places like Afghanistan. The alliance has nine specific measures for ranking its members, but they remain classified and thus less politically potent than the 2% target. Europe's problems lie in fragmentation as much as resources; NATO's European members spend over four times as much on defence as Russia, but use 27 different types of howitzer and 20 fighter aircraft. The European Parliament reckons that joining up the EU's defence market could save €26bn ($27bn) a year.

And so as the debate heats up, the herbivores are baring their wide, flat molars. Just before Mr Pence's visit, Jean-Claude Juncker, the president of the European Commission, irritated some in NATO by urging the Europeans not to bow to American pressure. A more expansive understanding of security was needed, he suggested; add development to the mix and the Europeans stack up rather better. Angela Merkel, the German chancellor, delivered a similar message, in more diplomatic terms, in Munich.

If paying for boreholes in Namibia rather than reconnaissance drones in Lithuania sounds like special pleading to America, it serves a distinct purpose in Berlin. Mrs Merkel needs a story to persuade sceptical German voters of the wisdom of ramping up military spending from its current level of just 1.2% of GDP. Warm words about preserving security through non-military means offer one. (Wolfgang Ischinger, head of the Munich conference, suggests a 3% target for military, development and humanitarian spending.) "Europeanising" defence is another. Germany is pursuing various security arrangements with other EU countries. Mr Juncker is backing an EU defence fund for common research and procurement, and for capital spending to be excluded from the commission's rules on fiscal deficits. Whatever helps the medicine go down.

Beware the German Gryf

Mr Trump cannot be accused of expedience—he has attacked security freeloaders for decades. But he is hardly assured of success. Germans in particular will chafe at devoting more money to a cause they dislike to please a foreign president they detest. Slamming American-inspired militarism could prove a useful campaign tactic for Martin Schulz, a Social Democrat who wants to thwart Mrs Merkel's bid for re-election in September (see page 41). And grand talk about joint European procurement and operations could easily be stymied by pressure from national defence champions interested only in securing the next juicy contract.

Indeed, Mr Trump's warnings could even prove counter-productive. Other European countries might grow nervous at the emergence of Germany as a military superpower with serious expeditionary capabilities, should it choose to travel down that path. Furthermore, many countries will never reach the 2% target. But threats from the White House could force them to hedge against American withdrawal, notes François Heisbourg, a French security analyst. Make NATO conditional, and you force your partners into independence, and a foreign policy that may not suit American interests. Even the gentle triceratops sometimes used its horns to charge predators. ■

Also in this section

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Reducing immigration

Keep out

Lower immigration could yet impose a big economic cost after Brexit

DESPITE its vote to leave the European Union, plenty of Europeans still seem keen to move to Britain: in eastern European cities such as Kiev and Chisinau leaflets promising "English visas" still flutter. Marion, a lawyer who recently moved to London from Paris, says that Brexit barely featured in her decision. "I guess that emotionally I still find Brexit hard to believe." Britain's government, however, is busy thinking of ways to keep them out.

Since June's referendum result, many have wondered anxiously whether Britain will remain part of the EU's single market after Brexit. The pound tumbled when Theresa May, the prime minister, said that she planned to leave it. People have worried less, however, about the economic impact of the government's post-Brexit immigration policy. This is strange: the impact of slashing the number of foreigners allowed into Britain could be as serious as anything that could happen to trade.

In the year to September net migration (immigration minus emigration) was under 300,000, split about evenly between EU and non-EU folk. It has been high by historical standards (see chart) since the mid-2000s, when citizens from new, poorer EU members acquired the right to move to Britain.

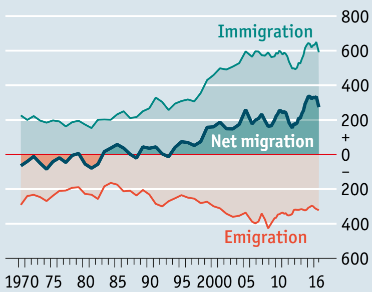
Despite the continuing influx, net migration into Britain is hardly out of control, at least compared with other rich countries. On average annually it amounts to about three times the attendance at a Manchester United football match. Compared with their population, Ireland, Australia and Canada see far more new arrivals.

But British concern about immigration has little to do with raw numbers. Even in 1995, when net migration was well under 100,000, two-thirds of Britons wanted it cut. No reference to immigration appeared on the ballot paper, but politicians believe that the Brexit vote represented a desire to "take back control" of the country's borders. Since then Mrs May and Amber Rudd, the home secretary, have repeated a long-standing commitment to cut annual net migration to the "tens of thousands".

That will be no easy task. The government will have to count on about 50,000

Up and away

Britain, long-term international migration, '000



Source: ONS

Britons continuing to quit the country each year. If settling in Europe becomes harder for Britons after Brexit, that may not happen. Even if the rules are changed, the number of non-Britons settling each year, minus the number leaving, would have to fall to around 150,000.

Net migration of family members and refugees is around 70,000. On February 22nd the government largely prevailed in a case in the Supreme Court, allowing it to set tough income requirements on those who want a loved one to join them. The ruling's wording, however, implies that tightening these rules further will be tricky. Meanwhile, reducing immigration by unskilled workers from outside the EU is difficult since it is almost non-existent, says Jonathan Portes of King's College London.

About half of the EU nationals emigrating to Britain move into less-skilled jobs. Cutting that sort might reduce net migration by EU workers to 50,000 (a slowing economy is already helping). Halving net migration of foreign students, say by restricting the growth of universities (though that would hamper a lucrative industry), might reduce it to 50,000. But that might still leave total net migration at around 150,000. If the government is serious about hitting its tens-of-thousands target, it may have to restrict skilled migration.

That would sit oddly alongside its recent white paper on Brexit, which promised to "encourage the brightest and the best to come to this country". And it would weaken Mrs May's negotiating hand. In 2015 combined net migration from America and India was about 30,000. Cutting that would be awkward for the prime minister, who is desperate to strike post-Brexit trade deals with both.

How would the economy cope if the tens-of-thousands target were reached? Firms reliant on foreigners are worried. ▸▸

Food manufacturers are vulnerable: 40% of such workers are non-British. Skilled industries would also suffer: a quarter of scientific researchers are foreign-born.

It may be for that reason that David Davis, the Brexit secretary, this week hinted that Britain is not about to shut the door even on unskilled EU migrants. Other Brexiteers, however, counter that ending the supply of cheap workers would shake up Britain's business model for the better. Firms would invest in labour-saving technology, boosting Britain's low productivity. One study of American tomato-growers finds some evidence to support this thesis. If productivity rose, those workers left behind might see higher wages. Britons might also see less competition for jobs.

But these effects are likely to be small. If the benefits of investing in technology were so great, bosses should have already done so. And many jobs—such as care work—are not easily performed by robots. In these industries, many firms will either become less profitable or go under.

Few economists see lower immigration leading to a wage bonanza for locals. One paper calculates that cutting migration to the tens of thousands could boost wages in industries most affected by it by an imperceptible 0.2-0.6% by 2018.

And these tiny increases would be dwarfed by a slowdown in the wider economy. According to research by Katerina Lisenkova of Strathclyde University, annual net migration of 100,000 would lower GDP per person by 1% in the long term. Others reckon the economic cost of lower migration could match that of the hit to trade from Britain leaving the single market.

The biggest loser from slashing immigration would be the public finances. Native Britons are ageing rapidly; the number who are of working age is shrinking. When counting only native-born folk, Britain has a higher "old-age dependency ratio" (the number of elderly people as a share of those of working age) than that of many European countries, including France, and it is worsening fast. This drives up spending on health care and pensions.

As it stands, the flow of people into and out of Britain tilts the numbers favourably, improving the dependency ratio. Britain exports old, creaky people and imports young, taxpaying ones. More than 100,000 British pensioners live it up in sunny Spain; meanwhile, up to 100,000 working-age Spaniards brave the British cold.

With low net migration, Britain's elderly would be more burdensome. Workers would need to be taxed more heavily to pay for care for their elders. The government's fiscal watchdog suggests that by the mid-2060s, with annual net migration of about 100,000, public debt would be roughly 30 percentage points higher than if that figure were 200,000. Taking back control comes with a whopping bill. ■

Agriculture and Brexit

Picking fights

BIRMINGHAM

Farmers may be among the first to feel the effects of Brexit

IF THE Church of England is the Conservative party at prayer, then the National Farmers' Union (NFU) is the party at work. Unlike the prelates, however, farmers are already grappling with the adverse consequences of the referendum vote last June to leave the European Union. Worryingly for them, Theresa May's government seems in no rush to help. Concerns are mounting among this core Tory political constituency that agriculture might turn out to be the patsy in the much-touted post-Brexit trade deals.

The greatest anxiety for farmers, and the food industry as a whole, is about access to labour. The food-processing industry is dependent on EU migrants; they represent 120,000 of its 400,000 workers. Horticultural and fruit farmers also rely heavily on both permanent and seasonal workers from the rest of the EU, to pick produce from strawberries to apples. They require about 85,000 workers annually to harvest their crops. Alison Capper, an apple farmer in Herefordshire, employs five full-time staff but 70 more seasonally; last year all 70 came from abroad. The NFU claims that the effects of Brexit are already being felt. The percentage of foreign EU workers recruited in the sector who failed to turn up for jobs they had already accepted rose from a paltry 2% at the beginning of 2016 to a worrying 8% by September.

Some European workers may be put off by the fall in the pound; others are anxious about their immigration status in Britain. Ms Capper says that the lead-times on recruitment are so long that she is already worrying about next year's harvest, never mind this year's.

With a tight labour market, few locals are available to pick fruit. Instead, farmers have proposed a revival of the Seasonal Agricultural Workers Scheme, which granted temporary visas but ended in 2013, extending it to both EU and non-EU workers. But the agriculture secretary and prominent Brexiteer, Andrea Leadsom, refused to make any promises about the prospects for such programmes when she spoke at the NFU's annual shindig in Birmingham on February 21st. Hoping for clarity, the delegates were disappointed by Ms Leadsom's reticence.

Indeed, she seemed determined to give as few details as possible about the government's intentions. Minette Batters, the deputy head of the NFU, complains that "Brexit concerns every aspect of farming, but we still have no idea what the plan is." Trade is a good example. The latest figures show that sales of British agricultural products to developing countries such as India are growing. But the EU remains a crucial market; it takes most of Britain's lamb and mutton exports, for instance.

Farmers worry that the government might concede access to Britain's domestic agricultural market in return for other countries opening up their services sectors to British banks, or their vehicle markets to car exports. For all its political clout and stewardship of the land, agriculture contributes less than 1% of GDP; manufacturing and financial services contribute 10% each. Even as they see Ms Leadsom offering them no reassurances on labour or trade, farmers are watching the prime minister making post-Brexit promises to the bosses of foreign car firms based in Britain.

Most concede that their business could be more efficient. That would reduce their dependence on cheap foreign labour. Automated milking and drones are in vogue at the moment. But delicate fruits will have to be picked by hand for the foreseeable future. Potatoes are picked by machines but actual people have to sort them to check their quality before they can be sold to supermarkets. Farmers are uncertain whether to invest heavily in new technology at the same time as they face the withdrawal of £3bn ($3.74bn) worth of EU subsidies, another subject on which Ms Leadsom was quiet this week.

Wearied by decades of excessive EU regulation, probably a majority of farmers voted for Brexit. But now that reality is beginning to bite, farmers argue that the time has come for the Tories to repay some of the loyalty that rural Britain has shown them. They might not matter much in terms of simple economics, but farmers should start getting bolshie like the French if Brexit becomes too damaging, says Ms Batters. Tractors, to the barricades. ■

Bagehot | Rebuild, and they will come

To win Britain's next EU referendum, Remainers must move on from the last

DURING his unsuccessful campaign to become president of the European Council in 2009, Tony Blair's acolytes would boast that their man could "stop the traffic" in capitals. He was box office, he could turn heads, he could make people listen. In a speech in London on February 17th the unpopular former prime minister proved he still has that quality. Where other pro-European politicians waffle and prevaricate, he was crisp and frank: Brexit will be terrible for Britain, it cannot come "at any cost", voters were "without knowledge of the terms" when they cast their ballots. Mr Blair's intervention elicited a tsunami of furious responses from bulge-eyed Brexiteers seemingly opposed to his very right to speak out. They protested too much.

To be sure, the speech was politically unrealistic. The prospects of the electorate being moved to "rise up" against Brexit in the coming months are low. The Labour Party, from right to left, is catatonic. The Liberal Democrats and the Scottish National Party, though robustly anti-Brexit, are small. Remainers on the Conservative benches are mostly cowed and Theresa May is resolute. Public opinion will probably move slowly, however disastrous the Brexit negotiations seem once the prime minister starts the two-year process on March 9th. Voters do not tend to conclude that they were "wrong"; often they are too busy with their lives to notice that their opinions are changing and simply reimagine their original position. Polls in 2003 showed a majority for Britain's involvement in the Iraq War, but most people today recall having opposed it at the time. More likely in the short term is that the negative effects of Brexit—an investment exodus, say—will be laid at the door of "Remoaners" who "talk the country down".

Yet despite this, and Mr Blair's undoubted political toxicity, his argument was important. This was the first big occasion on which a top politician had argued that Brexit should not happen despite the vote. Critics dismiss this as proof that the private-jet-bound Mr Blair is out of touch. But his logic was sound. The referendum result, now treated as a sacred unquestionable in Westminster, is only as durable and binding as the political reality it expresses. And the reality of Brexit may well change this. Anti-immigration voters will not be satisfied by whatever door-slam Mrs May achieves. The economic dislocation of pulling out of the EU's single market, combined with the falling pound, will hurt living standards. The promises of bonus billions for public services will come to look like a bad joke. These are the makings of "Bregret". Mr Blair is merely proposing to help that process along and, if he succeeds, to carry out the will of a now anti-Brexit public and stop the whole process. Bagehot can reasonably disagree only with his timing. Replace "stop" with "reverse" and you have a sensible political strategy.

There are two problems. First, the Remainers are divided. Those who stood together during the referendum campaign last summer have fragmented into five groups which, to Brexiteers, look uncannily and unfairly (because they are not progressing) like the five stages of grief. The first is denial: public figures like A.C. Grayling, a philosopher, who simply seek to stop Brexit in its tracks. The second is anger: Mr Blair and others who accept the referendum result but want to stop Brexit by changing opinions.

The third is bargaining: those Remainers who, like many of those who spoke up this week in House of Lords debates, accept that it will happen but want to moderate it or at least placate their Remainer supporters by grumbling. Many of these middle-grounders resented Mr Blair's speech as an unhelpful polarisation of the debate. The fourth category corresponds to depression: that segment of political opinion sure that Brexit will be "potentially catastrophic" (as Margaret Beckett, a former foreign secretary, put it) but convinced that little can be done. The fifth is acceptance: the stage attained most comprehensively by Mrs May, who opposed Brexit but is now enacting it in its harshest form. Even discarding the last of these scattered tribes, what hope is there of uniting them into a force that can push back Brexit?

The second problem is that many Remainers—of all descriptions—are still living last year's referendum. For those who think Brexit should proceed with limited opposition, that vote is almost all that matters in British politics today. For those who think Brexit should be smashed, it was a festival of deceit and democratic infamy that must be overcome. Both are wrong in their way. The accepters should not abandon the anti-Brexit arguments they put with such gusto during the referendum campaign. The opposers should not assume that voters will simply admit they were wrong about Brexit: shifting opinions is slow work.

So Remainers must embark on a giant job of consolidation, melding together their agendas, groups and goals. They must be realistic about the immediate future and ambitious about the long term. Yes, push for the softest possible Brexit now, but aim over the following years to negotiate a newly close relationship with the rest of the EU; perhaps gradually rejoining the single market or, one day, rejoining the union altogether.

Keep stopping the traffic

In other words, Remainers need to disengage from the last battle, the referendum, before they engage with the next, however hard it is to predict when this will come. In practice that means building the foundations of the next "In" campaign: popularising yardsticks by which Brexit's success (or otherwise) may be measured, setting expectations of Britain outside the EU, running single-issue campaigns that raise the salience of the issues at stake (investment, the benefits of migration, international influence), holding Brexiteers to account for the commitments they make, gathering e-mail addresses and nurturing the networks that might, once the time is right, take Britain back into the European fold. If the public is to turn against Brexit, it will ultimately do that on its own terms. The task of convinced Remainers is to be ready. ■

The last diamond mine

The future of forever

NORTHWEST TERRITORIES, CANADA

Production of the world's most valuable gem may be about to peak

GAHCHO KUÉ is too far north for trees. In the few snowless months, its surroundings in Canada's Northwest Territories resemble a sprawling archipelago, as much lake as land, dark ponds stretching flat to the horizon. Wolverines roam, as well as bears, foxes, hares and caribou, though the herds have dwindled. There are no roads, no pipes, no electricity cables. So it seems strange when, flying over the tundra, a giant truck appears, then another, then a steel factory, rows of trailers and a big grey pit, deepening by the day.

De Beers, the world's biggest diamond company, marked the opening of its Gahcho Kué mine in September. Local indigenous leaders prayed for the mine, beating drums. Bruce Cleaver, the firm's chief executive, and Mark Cutifani, the boss of its parent company, Anglo American, stood by a ceremonial fire, flames tilting in the wind.

Now the hard work is under way. The area is so sodden that staff bring in heavy supplies just once a year, in the depths of winter, when they can build a thick road of ice (pictured above). A caravan bearing fuel and equipment is slowly crossing the tundra. At the mine, their colleagues are working day and night to ramp up to full production, with the aim of extracting more than 12,000 carats (2.4kg) of diamonds each day. Gahcho Kué is an astonishing endeavour, the biggest new mine in the world in over a decade. De Beers has no plans for another.

It is a turning-point for one of the world's oddest industries. The diamond business gained its sparkle around 1866, when a farmer's son picked up a glistening pebble on the bank of the Orange river in South Africa. For most of the next 150 years, De Beers would dominate the global market. Success depended on manipulated supply and skilfully cultivated demand.

Square-cut or pear-shaped

Much has changed since then. De Beers can no longer control the market. Though it is the biggest producer by value, it accounts for only a third of global sales, down from 45% in 2007. It faces many uncertainties, from synthetic diamonds to changing relationships with polishers and cutters. Its loosening grip is reflected in increased volatility: its sales fell 34% in 2015, before bouncing back by 30% last year. Meanwhile the source of the demand that drives sales—the link between diamonds and love—looks weaker than it used to.

But one forecast seems solid: there will be fewer new diamonds. De Beers continues to seek new places to mine, but has slashed its exploration budget. Another big find is unlikely. The supply of new diamonds is expected to peak in the next few years, before beginning a slow decline.

Natural diamonds—as opposed to the synthetic ones mostly used in industry—were formed more than 1bn years ago deep below cratons, the oldest part of continents. There, between Earth's core and its crust, the pressure was high enough and the temperature low enough for carbon to crystallise into its hardest form. There diamonds would have remained were it not for molten rock rushing through the mantle and drawing diamonds, garnets and other minerals with it, like a furious river pulling dirt from its banks, before erupting through Earth's surface faster than the speed of sound.

Some of the gems settled in river beds, as in Brazil, or were swept to the coast, as in Namibia. Others remained encased in extinct volcanoes, or pipes, and ended up buried under soil or lakes. De Beers's richest diamond mine was found beneath sand in Botswana in 1972, within the Kaapvaal craton that spans southern Africa.

Speculation that diamonds might be found in Canada dates from the 19th century, when gems were found studded through the American Midwest. In 1888, the year Cecil Rhodes founded De Beers in South Africa, a 22-carat stone was unearthed near Milwaukee. Glaciers, it was posited in 1899, might have carried the diamonds south. It was decades before exploration took off. De Beers began quietly scouring Canada in the 1960s, but it was not until 1991 that BHP, one of its rivals, found kimberlite, an igneous rock, with enough diamonds to merit a mine. Within three years more than 100 companies had fanned out across the wilderness, rushing to claim some 200,000 square kilometres. At Gahcho Kué, geologists used aerial surveys and soil sampling to follow trails of minerals back to their kimberlite pipes.

The objects of these frenzied searches ▸▸

have intrinsic value for scientists. Gems deemed flawed by jewellers interest them most: inclusions in diamonds can carry samples from hundreds of kilometres below the surface. Evan Smith, a scientist at the Gemological Institute of America, recently studied inclusions in shards cut from diamonds of unusual size and quality. His findings, reported in *Science*, a journal, are the first proof that the deep mantle is peppered with metallic iron—a clue to the long-ago chemical reactions that shaped Earth.

But diamonds' principal value has nothing to do with science. They have long been revered for their beauty—in September Mr Cutifani reminded Gahcho Kué's visitors that the ancient Greeks regarded diamonds as the tears of the gods. Their modern status, though, is a corporate creation, a story inextricably linked with that of De Beers itself.

Diamonds had been rare before 1866; the South African finds threatened to send prices plunging. Rhodes founded De Beers to consolidate the area's mines and to restrict sales. By his death in 1902, the firm accounted for 90% of the world market. More discoveries were made in the 20th century, notably in Siberia in the 1950s, Botswana in the 1960s and Australia in the 1970s. But De Beers kept tight control of supply, both by owning mines and by buying diamonds from others.

All I need to please me

That alone would not have turned De Beers into an empire. As essential was its scheme for conjuring up demand. In 1938 the company, then led by the Oppenheimer family, hired N.W. Ayer, an advertising agency in New York, to coax Americans to buy more rocks. It dreamed up the notion that a diamond ring should be an essential display of love and status, its gift a rite of passage. In the ensuing decades De Beers and its marketers penned slogans—memorably, "a diamond is forever"—and invented social rules, urging men to spend two months' pay on a gift for their affianced. That benchmark not only permitted high margins, but suppressed the second-hand market—to the benefit of both the firm and its customers, who could be reassured their investment would hold its value.

The marketing worked. In 1939, 10% of American brides received a diamond engagement ring. By the end of the century 80% did. The result was a unique industry, controlled by a single company that was both marketer and miner, a capital-intensive business built on an ephemeral link to love, its success due to strangled supply and inflated demand.

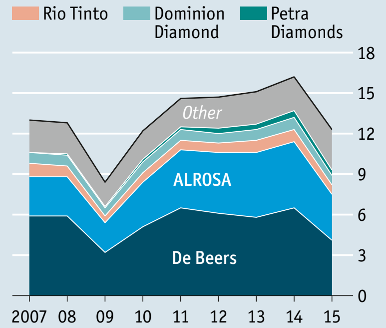
But by the 1990s De Beers's grip had started to loosen. The Argyle mine in Australia left the De Beers cartel in 1996, fed up with the giant's terms. New discoveries in Canada, a civil war in Angola and the collapse of the Soviet Union all made supply harder to manage, meaning that more diamonds were sold outside the cartel. Concern that diamond sales were financing African conflicts threatened the gem's image. In 2000 De Beers said it would no longer control the market so strictly, but sell instead to vetted buyers. Legal settlements in America and Europe followed, barring the company from monopolistic behaviour.

De Beers is adjusting to the new era. Its first challenge is an unfamiliar one: to grapple with competitors. ALROSA, Russia's state-owned diamond company, produces more stones than De Beers, though it earns less (see chart). New firms have cropped up, too, some buying mines from De Beers as it sought to shore up its balance-sheet.

De Beers's partners, meanwhile, have become more demanding. Botswana's government owns 15% of the firm; South Africa's state investment fund owns 14.5% of Anglo American. De Beers's mining operations in Botswana and Namibia are joint ventures with the governments there.

Little pets get big baguettes

Global rough-diamond sales, $bn



Source: Bain & Company

Both countries share the proceeds from sales of diamonds mined within their borders, and can also sell some diamonds independently, enabling them to test the prices that De Beers is getting and further loosening the firm's control over supply.

Even in countries where De Beers does not have a joint venture with the government, it depends on local co-operation. Winning government approval for Gahcho Kué required more than 15,000 pages of environmental reviews. The firm wanted to expand a mine in Ontario, but a nearby indigenous group withheld its consent.

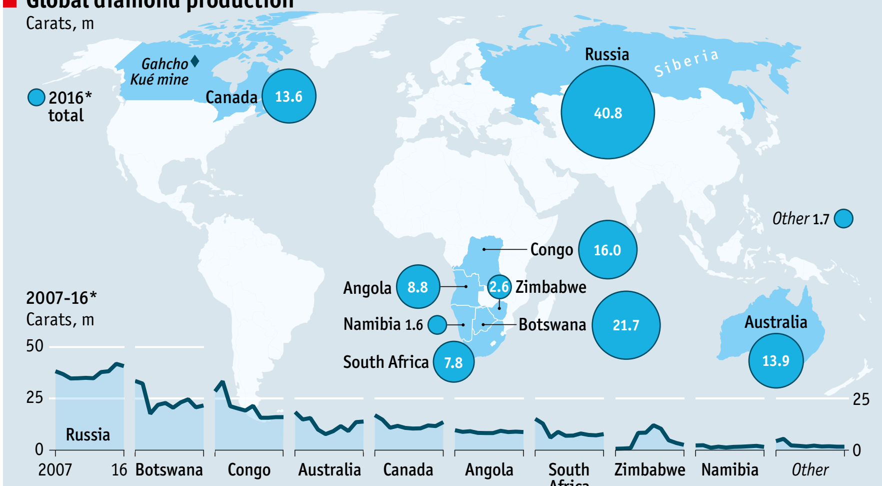
The limits of De Beers's power have been revealed in the past two years. Demand slumped in China in late 2014, prompting retailers to buy fewer polished diamonds. Companies that cut and polish stones became weighed down by excess inventory. But the tools De Beers once used to use to prop up prices were no longer at hand. There are legal restrictions on the share of excess diamonds it may buy. Because it controls just one-third of the market, any production cuts have limited effect on total supply. In fact, the firm may even have made matters worse. Contracts with its customers sometimes encourage them to overpurchase—if they turn down too many of the stones De Beers offers them, they risk being allocated a smaller share in future.

There are signs of recovery. Bain, a consultancy, estimates that rough-diamond sales rose by 20% in 2016. De Beers is becoming more flexible, easing rules for buyers of its stones. More frequent reporting of its sales should help investors understand the business. It also signals to competitors—without engaging in collusion—when the market is deteriorating, enabling them to adjust accordingly. "The value of transparency will come to exceed the value of secrecy," argues Fraser Jamieson of J.P. Morgan, a bank. Even so, excess inventory may yet drag down the market. Some jewellers have recently reported slack sales.

Mr Cleaver, an Anglo American veteran, became the boss of De Beers in July. "The fundamentals of the industry remain

Global diamond production

Carats, m



Source: Bain & Company

*Estimate

very good," he says. In the coming years, he thinks, De Beers will benefit from rising incomes, particularly in China and India. Its own research shows that diamonds still capture the imagination: 26% of young American brides say they dreamed about their future engagement rings years before beginning a relationship.

But a long-term risk looms over the industry: one day young couples may no longer want diamonds at all. They are a "Veblen good", as items that gain their value solely from their ability to signal status are named, after Thorstein Veblen, an economist who wrote about the spending of the rich. For Veblen goods, the normal law of supply and demand does not hold: higher prices support demand, rather than suppressing it. If a big gap opens up between the number of diamonds offered for sale and the number of people willing to buy them at high prices, diamonds could suffer a big, sustained fall in value and the entire business could cease to make sense.

Today's 20- and 30-somethings grew up as De Beers lost its monopoly and, wary of helping competitors, cut spending on the advertising that had done so much to create demand for diamonds in the first place. In recent years the company's marketing budget accounted for roughly 1% of sales, down from about 5% in the 1990s, according to Morgan Stanley. At the same time the notion of "conflict diamonds" percolated through the popular consciousness—a movie called "Blood Diamond", starring Leonardo DiCaprio with a Zimbabwean accent, was released in 2006. Young couples, who earn less than their parents did at their age, may prefer to spend their money elsewhere.

Complicating matters, those who do want a diamond now have an alternative. Synthetic diamonds have been available for decades, but only recently has the process become cheaper and the result more refined. In 2015 a company called New Diamond Technology made a ten-carat polished diamond of excellent quality, an unprecedented feat. Sales of synthetic diamonds are thought to amount to just 1% of the rough-diamond market. But synthetic-diamond sellers are appealing to young shoppers' concerns for social and environmental causes—Diamond Foundry, backed by Mr DiCaprio, boasts that its products are "as rock-solid as your values".

So De Beers is trying to boost the allure of natural gems. "Long-term demand is only going to be there if we continue to generate it," says Mr Cleaver. That means studying consumers; few other firms obsess over both mining-truck depreciation and romance among young Chinese.

It also means new advertisements. Some centre on De Beers's Forevermark brand, a tiny code etched in a diamond that explains the gem's provenance. Other spending is for the industry as a whole. In 2015 De Beers and other miners formed a group to pool money for generic diamond advertisements. Its first campaign ran in America before Christmas, with the slogan "Real is rare". YouTube videos show Nick Cannon, best known as the ex-husband of Mariah Carey, a singer, interviewing couples about their engagements.

It is unclear if this will persuade young romantics to spend thousands on diamonds. If synthetics grow in popularity, De Beers may need to become more aggressive. Already, it is suing a synthetic-diamond company in Singapore for infringing its intellectual property. Its own synthetic-diamond operation, for industrial uses, holds more than 450 patents.

As the company works to shore up demand, there is a source of solace. For over a century it has fretted that big new finds would lead to plunging prices. "Our only risk," Rhodes declared, "is the sudden discovery of new mines, which human nature will work recklessly to the detriment of us all." But it seems that threat is waning.

Get that ice or else no dice

In total, explorers have sampled fewer than 7,000 kimberlite pipes. Of these just 15% have held diamonds and just 1% (about 60) have held enough of them to justify building a mine. De Beers continues to explore in Canada, South Africa, Botswana and Namibia—the only thing worse than finding a big new source would be someone else finding it first. Some fancy technology is supposed to help. A "Superconducting Quantum Interference Device", for example, searches for changes in magnetic fields below Earth's surface, which might indicate the presence of kimberlite.

But De Beers regards any big discoveries, by itself or anyone else, as unlikely. "The best and easiest deposits are already found," says Des Kilalea, an analyst. The company's Canadian exploits are a reminder of just how arduous new mines can be. Mountain Province, a firm that now works with De Beers, discovered Gahcho Kué's first pipe in 1995. The intervening years brought a separate, failed mine for De Beers in Canada, lengthy negotiations with local officials and, at last, the construction of Gahcho Kué itself.

That required draining part of a lake. To bring in building supplies, the company had to build the winter road. Staff would plough snow off a pond, drill through thin ice, then pump up water to make the ice thicker, laying down a few inches at a time. This was repeated over 120km, at temperatures often plunging to -40°C, until the ice was thick enough to support a 500-tonne mining shovel, broken into dozens of pieces. In total, building Gahcho Kué cost $1bn. That was deemed worthwhile, compared with the costs of finding and opening a mine elsewhere.

Other companies have a few mines planned. De Beers is now focused on expanding existing mines, not building new ones. New technologies may help liberate more diamonds from kimberlite more efficiently. Even so, Bain estimates, production will peak in 2019. Supplies of new diamonds will then start to fall, sinking by 1-2% each year until 2030.

For now, aircraft shuttle staff to Gahcho Kué, dropping off miners to work for two-week stretches. Nearly half the staff are locals, and a fair share are indigenous. "We want jobs, just like everybody else," says Eddie Erasmus, grand chief of the Tlicho people. Among the mine's maze of trailers are features typical of any big-company workplace. There is a gym. Signs in the cafeteria remind staff to eat fruits and vegetables, though many prefer heartier fare. Rob Coolen, who oversees the ice road, began work at Gahcho Kué before the mine was built, sleeping in a tent on the tundra. Coffee and bacon, he says, are essential.

The cafeteria sometimes shudders with the reverberations of a blast from the pit. Outside, work goes on day and night. Staff pile kimberlite onto huge trucks, then haul the rocks to the processing plant. There, the ore passes through breakers, crushers and scrubbers until pebbles are sent through a series of x-rays and lasers, jets of air separating diamonds from worthless stones.

When love's gone, they'll lustre on

No workers at Gahcho Kué touch the diamonds with bare hands. Only a few see the gems before they are sent off by plane to be valued. In September Mr Coolen stood atop a steel grate in the processing plant, the platform shaking as giant scrubbers churned beneath. "Occasionally you see one," he shouted above the din, "and it's just gorgeous." The mine is expected to reach full production in March. By 2030, its diamonds extracted, it will close. ■

Also in this section

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The semiconductor industry

Silicon crumble

SANTA CLARA

How the rise of artificial intelligence is creating new variety in the global chip market, and trouble for Intel

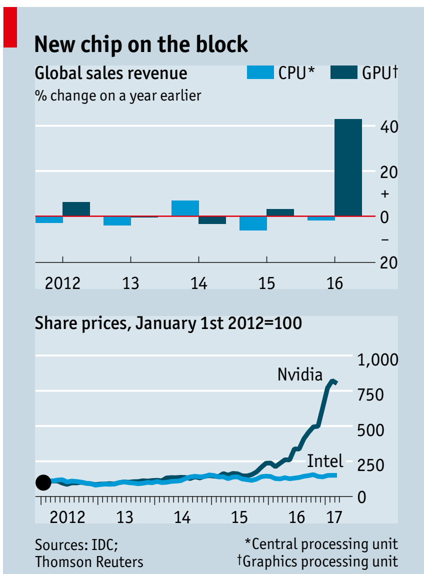
"WE ALMOST went out of business several times." Usually founders don't talk about their company's near-death experiences. But Jen-Hsun Huang, the boss of Nvidia, has no reason to be coy. His firm, which develops microprocessors and related software, is on a winning streak. In the past quarter its revenues increased by 55%, reaching $2.2bn, and in the past 12 months its share price has almost quadrupled.

A big part of Nvidia's success is because demand is growing quickly for its chips, called graphics processing units (GPUs), which turn personal computers into fast gaming devices. But the GPUs also have new destinations: notably data centres where artificial-intelligence (AI) programmes gobble up the vast quantities of computing power that they generate.

Soaring sales of these chips (see chart) are the clearest sign yet of a secular shift in information technology. The architecture of computing is fragmenting because of the slowing of Moore's law, which until recently guaranteed that the power of computing would double roughly every two years, and because of the rapid rise of cloud computing and AI. The implications for the semiconductor industry and for Intel, its dominant company, are profound.

Things were straightforward when Moore's law, named after Gordon Moore, a founder of Intel, was still in full swing. Whether in PCs or in servers (souped-up computers in data centres), one kind of microprocessor, known as a "central processing unit" (CPU), could deal with most "workloads", as classes of computing tasks are called. Because Intel made the most powerful CPUs, it came to rule not only the market for PC processors (it has a market share of about 80%) but the one for servers, where it has an almost complete monopoly. In 2016 it had revenues of nearly $60bn.

This unipolar world is starting to crumble. Processors are no longer improving quickly enough to be able to handle, for instance, machine learning and other AI applications, which require huge amounts of data and hence consume more number-crunching power than entire data centres did just a few years ago. Intel's customers, such as Google and Microsoft together with other operators of big data centres, are opting for more and more specialised processors from other companies and are designing their own to boot.



Nvidia's GPUs are one example. They were created to carry out the massive, complex computations required by interactive video games. GPUs have hundreds of specialised "cores" (the "brains" of a processor), all working in parallel, whereas CPUs have only a few powerful ones that tackle computing tasks sequentially. Nvidia's latest processors boast 3,584 cores; Intel's server CPUs have a maximum of 28.

The company's lucky break came in the midst of one of its near-death experiences during the 2008-09 global financial crisis. It discovered that hedge funds and research institutes were using its chips for new purposes, such as calculating complex investment and climate models. It developed a coding language, called CUDA, that helps its customers program its processors for different tasks. When cloud computing, big data and AI gathered momentum a few years ago, Nvidia's chips were just what was needed.

Every online giant uses Nvidia GPUs to give their AI services the capability to ingest reams of data from material ranging from medical images to human speech. The firm's revenues from selling chips to data-centre operators trebled in the past financial year, to $296m.

And GPUs are only one sort of "accelerator", as such specialised processors are known. The range is expanding as cloud-computing firms mix and match chips to ▸▸

make their operations more efficient and stay ahead of the competition. "Finding the right tool for the right job", is how Urs Hölzle, in charge of technical infrastructure at Google, describes balancing the factors of flexibility, speed and cost.

At one end of the range are ASICs, an acronym for "application-specific integrated circuits". As the term suggests, they are hard-wired for one purpose and are the fastest on the menu as well as the most energy-efficient. Dozens of startups are developing such chips with AI algorithms already built in. Google has built an ASIC called "Tensor Processing Unit" for speech recognition.

The other extreme is field-programmable gate arrays (FPGAs). These can be programmed, meaning greater flexibility, which is why even though they are tricky to handle, Microsoft has added them to many of its servers, for instance those underlying Bing, its online-search service. "We now have more FPGAs than any other organisation in the world," says Mark Russinovich, chief technology officer at Azure, the firm's computing cloud.

Time to be paranoid

Instead of making ASICs or FPGAs, Intel focused in recent years on making its CPU processors ever more powerful. Nobody expects conventional processors to lose their jobs anytime soon: every server needs them and countless applications have been written to run on them. Intel's sales from the chips are still growing. Yet the quickening rise of accelerators appears to be bad news for the company, says Alan Priestley of Gartner, an IT consultancy. The more computing happens on them, the less is done on CPUs.

One answer is to catch up by making acquisitions. In 2015 Intel bought Altera, a maker of FPGAs, for a whopping $16.7bn. In August it paid more than $400m for Nervana, a three-year-old startup that is developing specialised AI systems ranging from software to chips. The firm says it sees specialised processors as an opportunity, not a threat. New computing workloads have often started out being handled on specialised processors, explains Diane Bryant, who runs Intel's data-centre business, only to be "pulled into the CPU" later. Encryption, for instance, used to happen on separate semiconductors, but is now a simple instruction on the Intel CPUs which run almost all computers and servers globally. Keeping new types of workload, such as AI, on accelerators would mean extra cost and complexity.

If such integration occurs, Intel has already invested to take advantage. In the summer it will start selling a new processor, code-named Knights Mill, to compete with Nvidia. Intel is also working on another chip, Knights Crest, which will come with Nervana technology. At some point, Intel is expected also to combine its CPU's with Altera's FPGAs.

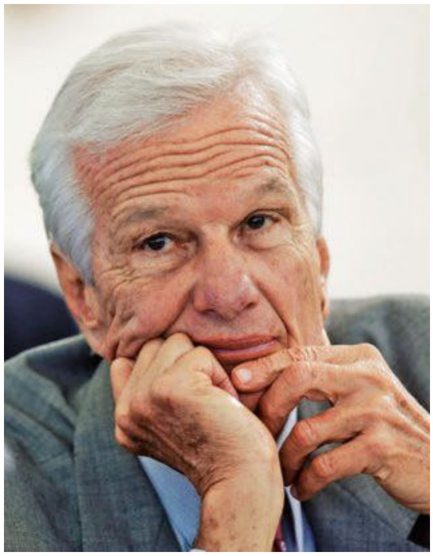
Predictably, competitors see the future differently. Nvidia reckons it has already established its own computing platform. Many firms have written AI applications that run on its chips, and it has created the software infrastructure for other kinds of programmes, which, for instance, enable visualisations and virtual reality. One decades-old computing giant, IBM, is also trying to make Intel's life harder. Taking a page from open-source software, the firm in 2013 "opened" its processor architecture, which is called Power, turning it into a semiconductor commons of sorts. Makers of specialised chips can more easily combine their wares with Power CPUs, and they get a say in how the platform develops.

Much will depend on how AI develops, says Matthew Eastwood of IDC, a market researcher. If it turns out not to be the revolution that many people expect, and ushers in change for just a few years, Intel's chances are good, he says. But if AI continues to ripple through business for a decade or more, other kinds of processor will have more of a chance to establish themselves. Given how widely AI techniques can be applied, the latter seems likely. Certainly, the age of the big, hulking CPU which handles every workload, no matter how big or complex, is over. It suffered, a bit like Humpty Dumpty, a big fall. And all of Intel's horses and all of Intel's men cannot put it together again. ■

3G's model

Barbarians at the plate

The investors who own Kraft Heinz are upending the food industry



Rejected suitor

Jorge Paulo Lemann (pictured), a Brazilian investor, is ill-accustomed to failure. On February 17th Kraft Heinz, backed by Mr Lemann's 3G Capital, said it had bid $143bn for Unilever, a maker of food and personal products. 3G has gobbled many a consumer firm, slashed costs, then bought an even bigger one. Even so, the Unilever bid was surprising in its audacity—the merger would have been the second-largest ever. As shocking, it collapsed two days later.

Kraft Heinz had hoped to continue talks in private, but news of its offer leaked out. Its management appeared to have badly misjudged the depth of Unilever's attachment to its culture and its pursuit of long-term, "sustainable" growth. Unilever's outright rejection meant that 3G and Warren Buffett, who was expected to help fund a deal, faced the prospect of going hostile against a revered firm. It was a rare stumble. But the episode doesn't spell the end of its model. More deals are likely. And Kraft Heinz is already changing how Unilever and other rivals operate.

Times are hard for big consumer companies, once among the world's most stable. Shoppers increasingly want products they deem healthier, more natural or "authentic". New competitors have emerged online. In middle-income markets, local actors are gaining ground fast—in Brazil, Botica Comercial Farmacêutica peddles nearly 30% of perfume, says RBC Capital, an investment bank, and in India Ghari Industries sells more than 17% of detergent.

Food companies are experiencing a particularly sudden shift. The volume of products sold by big American food firms has dropped even as they have cut prices for consumers, notes Alexia Howard of Sanford C. Bernstein, a research firm. This month General Mills and J.M. Smucker, two food manufacturers, lowered their estimates for future revenue. Nestlé, a Swiss food giant, has just abandoned an overly ambitious sales target which it had missed for four years in a row.

3G offers a simple answer: slash costs and merge. Its best-known strategy, "zero-based budgeting", requires managers to justify their expenses from scratch every year. After 3G applies the method at one company, it buys another and fuses them. Mr Lemann and his partners combined a striking number of big brewers to form Anheuser-Busch InBev; last year it acquired the firm's next closest rival, SABMiller. Kraft Heinz was formed through deals that also involved Mr Buffett. On February 21st another company backed by 3G said it would buy Popeyes, a fried-chicken chain, for $1.8bn.

The perception of 3G's ruthlessness comes chiefly from the fact that it has overseen the sacking of thousands of workers at the firms it owns. Kraft Heinz decided to ▸▸

close seven factories in North America, boosting its profits. Its sales have fallen in four of the six quarters since the two companies combined, grist for those who say that slashing costs limits growth.

Others deem its strategy admirably clear-eyed. 3G likes to foster an "ownership mentality" among its managers, with financial rewards linked to the company's performance. Kraft Heinz looks after promising brands, such as Heinz mustard. Where necessary, it allows ailing lines to wither. Unilever, by contrast, continues to support its declining spreads business, arguing that it still produces cash. Calls to dump the division are by now so intense that Warren Ackerman, an analyst at Société Générale, a French bank, calls the potential move "Sprexit". It is not all cuts, either: Kraft Heinz will significantly increase spending on advertising this year.

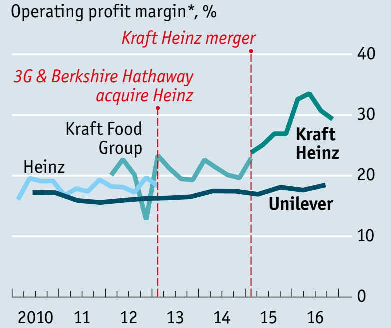
Unilever, meanwhile, is deemed an exemplar of responsible capitalism. Paul Polman, its chief executive, states that products that meet the highest standards of social and environmental sustainability perform better than products that don't. For now, though, its operating-profit margin is well below that of Kraft Heinz (see chart), a firm that advocates of sustainability in business say pays insufficient attention to questions such as water use.

In spite of the gap in culture, Unilever is one of many companies that are partly mimicking Kraft Heinz. Last year the Anglo-Dutch giant introduced some zero-based budgeting, for example for its spending on marketing. Kellogg, General Mills and Campbell Soup, all American food makers, are among those that have made similar announcements. In January Mr Polman said he planned to require managers to invest more in the company, to boost the "owner's mentality" among his staff.

Some investors are now pushing Unilever to do more. On February 22nd, with commendable speed, the company announced a wide-ranging review of its business. It said it wants to find ways to "accelerate delivery of value". In the meantime, 3G seems certain to be looking around for its next prey. ■

More Beanz

Operating profit margin*, %



Source: Bloomberg *Adjusted EBITDA

The independent-film business

Indie blues

NEW YORK

Happy endings are rarer than ever for those trying to profit from indie films

IT MIGHT seem a great time for indie cinema. The Academy Awards on February 26th will be something of a showcase for films not financed by a major studio. "Manchester by the Sea", a contender for six Oscars, including best picture, was a darling of the Sundance Film Festival last year. Kenneth Lonergan's masterpiece (one scene is pictured) about family and loss has earned $46m in cinemas in America and Canada, a spectacular return on its production costs of $8.5m. Amazon, which bought distribution rights, will benefit.

Atypical success

Movie buffs can find all manner of films online that are made more cheaply still. "The Break-In", a horror film shot by Justin Doescher on his girlfriend's iPhone for less than $20, has earned him more than $20,000, with more than half a million people having watched at least part of it on Amazon's streaming-video platform.

For every success story there are thousands of indie films that go unwatched. The digital age has made it easier than ever to make a film, but also harder than ever to break through the clutter of entertainment options to an audience. Chris Moore, a producer of "Manchester by the Sea", compares the output of indie films now to trees falling in the forest. "Nobody is making a dollar off this business", he says.

Mr Moore may be dramatising but only a little. Indie films have always been a risky bet for investors. Since 2002 the median return on investment at the box office for films released in North America with budgets of less than $10m has been 45 cents on the dollar, which is under half the median return of films with a budget of more than $100m, according to an analysis of data collected by The Numbers, a film-industry website. There are also more flops than ever before. In 2016 almost two-thirds of the 675 films that reported box office results earned less than $1m. In 2002 only half of the total released failed to reach that figure.

One problem is that fewer people are going to cinemas. Howard Cohen of Roadside Attractions, which distributed "Manchester by the Sea", worries about the young, smartphone-addicted generation that has grown up without the cinema-going habit. When they do flock to the cinema it is for blockbusters.

Another problem is that the DVD market has crashed. Sales and rentals of films in all physical formats in America plummeted from $25bn in 2005 to $12bn last year, according to The Numbers. Such ancillary income has in the past made a big difference in getting an indie film to break even. Consumers are using Netflix and sites like it instead, where they dispensed a total of $6.2bn in America last year.

Netflix and Amazon have injected cash into some of the best indie films, but their effect for lesser titles is likely to be mixed. Amazon allows filmmakers to upload titles directly to its platform to be discovered, as "The Break-In" was. But most minor films disappear online, since a viewer can scroll through only so many options. Even the streaming sites themselves, says Anne Thompson of IndieWire, a website, admit that "a cold start on one of their platforms can be very cold indeed". ■

Toy companies in Japan

State of play

TOKYO

Toymakers bounce back in the land of adult nappies

WILLIAM ELLIOT GRIFFIS, an American educator who travelled to Japan in the 1870s, noted that in the previous two and a half centuries, "the main business of this nation was play". He described toyshops filled as full as Christmas stockings and plenty of grown-ups "indulging in amusements which the men of the West lay aside with their pinafores".

Griffis would have found it familiar walking today around Hakuhinkan Toy Park, one of the largest toy stores in Tokyo. Teens, office workers and grandparents are mostly to be seen perusing its 200,000-odd knick-knacks across five floors. Its director, Hiroyuki Itoh, says he wants the store to be a place where everyone can play. After work, suited salarymen come to spend ¥200 (under $2) for a five-minute whizz around a 36-metre slot-car racetrack. ►►

In another corner a gaggle of university students fiddle with displays of toys from the era of their childhoods.

Playthings aimed at the over-20s make up 27% of Japan's domestic toy sales, according to figures from Euromonitor, a market-research firm. That grown-up portion of the market has been crucial for Japan's three biggest players, Bandai Namco, TakaraTomy and Sanrio, as the country's birth rate has slumped. Since the 1970s the proportion of under-15s has halved, to 12% of the population. By 2060 it is likely to be 9%.

Fumiaki Ibuki of *Toy Journal*, a 114-year-old trade magazine, says Japanese toy companies are pioneers in adapting to ageing. Despite a sluggish economy, the sector has, in the past two years, done its best in a decade: in the fiscal year ending in 2015, sales in core categories (excluding video games) rose by a tenth on the previous year, to over ¥800bn. Mr Ibuki says toymakers are taking a "borderless" approach: selling to a wider age range, and teaming up with trend-driven sectors like tech and fashion.

When Bandai's Tamagotchi, virtual pets housed in an egg-shaped toy, were booming in the mid-1990s, women in their 20s and 30s were big buyers. The same age-group snapped up Licca-chan, Japan's answer to Barbie, made by TakaraTomy. The firm now has an adult range; its "Cappuccino One-Piece" doll, modelling a houndstooth dress, sells for ¥12,000.

A stigma against adults having fun, strong in the aftermath of the second world war, has faded. Many want to recapture their youth, not so much by playing, but by collecting and displaying toys, says Harold Meij, the boss of TakaraTomy—so, for its premium Tomica model-car range, the company uses vintage designs that adults admired as boys. Having only one child later in life, as more Japanese now do, means that parents have more to spend on their offspring. Children are said to have "six pockets": two from their parents, and four from their grandparents. Spending on toys per child has stayed steady.

During the global financial crisis of 2008, cheap impulse-buy toys took off, such as trading cards and coin-operated machines that dispense capsules of small toys—usually of well-known characters from Japanese comic books and television series—known as *gachapon* (for the sound made when the dial is cranked and the surprise trinket falls into the receptacle).

The big themes in the toy industry are collectability and intellectual property (IP). A recent hit was a watch branded "Yo-kai", after the word in Japanese for supernatural spirits, by Bandai, which chatters when users slot plastic medals into its face. It exemplifies a popular strategy: Yo-kai, whose hero wears the watch, began as a cartoon series in 2013; was adapted for TV; and made into a hit video game. Bandai then won the merchandise rights.

The model is known as "media mix" in the industry. Toymakers are now "more like IP trading companies", says Junko Yamamura of Nomura, a securities firm in Tokyo. Bandai, which rearranged its internal divisions from product-type to character-IP groups a few years ago, manages about 200 of the latter, but only a handful are its own. It has partnered with Dentsu, an advertising giant, to promote *anime*.

Such tie-ups are also a low-risk way of trying out new figures. Gudetama, an egg-yolk character that suffers from depression and is now a millennial anti-hero, was dreamed up through a collaboration between Sanrio (best known for its "Hello Kitty" franchise) and the Tokyo Broadcasting System. Gudetama first appeared on a short televised animation, filling the gap between two daytime programmes. These usually make no profit. But when the story of a character catches on, toy- and film-makers end up splitting fat profits. It all makes for a sizzling recipe. ■

Aarusha Homes

Room to grow

PUNE

The road to Indian prosperity is paved with cheap and cheerful hostels

IF SEVERAL hundred million Indians do migrate from the countryside to cities between now and 2050, as the UN expects, it will be a fiendishly busy few decades for Vivek Aher, who runs a low-cost hostel, one of five, on the outskirts of Pune, a well-off city three hours' drive from Mumbai. A fair few of the new arrivals will have their first experience of urban living bunking in one of the hostels' 1,350 beds. Should recent experience be anything to go by, most of the new arrivals will test Mr Aher's patience by tacking posters on his hostel's walls, or endlessly complaining about the Wi-Fi.

India has two main drags on economic growth. One is the difficulty of finding a job, especially in the places people live. The other is a chronic shortage of cheap housing. Aarusha Homes, Mr Aher's employer, started in 2007 to help people seize economic opportunities far from home. Its rooms are basic and cheap. They include up to six beds, a bathroom for every three or four residents, some common areas and little else.

Rite of passage

Rent ranges between 3,500 and 10,000 rupees ($52-$149) a month including food.

Most of Aarusha's tenants are young, many of them taking first steps into the middle-class as IT or business-processing outsourcing professionals. Paying up to six months' deposit for a city flat is beyond their means, as is the down payment for a motorbike that would allow them to live far from their employer. Aarusha's successful pitch is that its hostels are safer than slums or informal "guest houses", especially for women. It now has 4,300 beds in 1,300 rooms spread out over 20 hostels in four cities. The typical tenant stays for six months. Satyanarayana Vejella, the firm's co-founder, plans to raise another $10m to increase capacity by 12,000 beds in nearly 70 new hostels, all in the next two years. Operating-profit margins are in the mid-teens.

The chain's backers include investment funds who seek social as well as financial returns. The latter would be improved if the chain dodged taxes by operating in the informal economy, like much of its competition, but it sticks to the formal side. The problems it faces are those confronted by any Hilton or Hyatt: finding properties big enough to offer over 100 beds is hard. Tenants have to be chased for payments. An attempt to cater to blue-collar workers at an even lower price didn't work out. So Aarusha is reliant on the IT and outsourcing sectors, which are hiring less eagerly than before.

Aarusha can probably depend on continuing strong demand for a room from which to make sense of it all before people can get their own places. The hostels have something of a communal feel, and parents find them reassuring because residents put up with not being able to drink, smoke, or mingle with the opposite sex. Soon enough, they will have moved on, taking their aspirations and their posters with them. ■

French entrepreneurs

Less misérable

PARIS

The rise of "deep tech" startups boosts the French capital's digital scene

EUROPE will never create a hub of tech firms and investors to rival Silicon Valley, many experts on entrepreneurship concur. Its markets are still fragmented along national lines, flows of capital into the region are limited and because of lingering, conservative attitudes to risk, few startups grow to rival American champions. "Europe is toxic", argues Oussama Ammar, an outspoken founder of an incubator in Paris. "Life that should happen, does not happen", he says.

But some digital life does flourish, spread among cities rather than fixing in one spot. Fintech firms cluster in London. Gamers and music-sharing sites do well in the Nordic countries. Berlin has a crop of companies that go beyond the kind of me-too consumer sites incubated by Rocket Internet, a notorious startup factory: new companies with expertise in the "internet of things", for example. Milan, with strong medical universities, has flourishing biotech startups.

The most striking case of fresh growth is in Paris. Mention of France has long elicited sighs from venture capitalists. Its rigid labour laws and hefty taxes on wealth and on stock options have meant that Silicon Valley has more than its fair share of entrepreneurial French immigrants. Efforts by the government to help startups with tax relief for research have mostly taught founders to complete forms rather than win clients, say observers. Genuine local successes—such as BlaBlaCar, a ride-sharing service, or Criteo, which serves targeted ads online—looked like exceptions, not evidence of wider success.

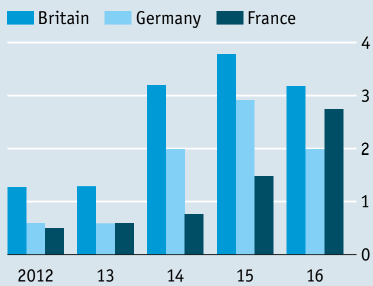
Yet recently, Nicolas Brusson, a co-founder of BlaBlaCar, says he has witnessed an upsurge in entrepreneurial ambition in France. A venture-capital investor says there has been a "huge shift in mindset" among founders of firms: they are now expert not only as inventors but as designers of business plans. Henning Piezunka at INSEAD, a business school near the capital, says that a "new vibe" and a more global attitude are also evident in the widening use of English.

Venture capital is beginning to gush. Last year France saw 590 rounds of capital raising, more than any country in Europe, according to Dealroom, which watches tech-industry trends. Although slightly more capital went to startups in Britain (€3.2bn) than in France (€2.7bn), the rate of increase in France was dramatic (see chart).

The Niel effect

Venture capital raised by European companies

€bn



Source: Dealroom

One reason for the French gains is that earlier investments in infrastructure for startups are starting to pay off. Established business figures, such as Mr Ammar and Xavier Niel, who started Iliad, France's fourth-largest mobile operator, which owns the brand Free, have set up training facilities and incubator firms that are now producing entrepreneurs. Four years ago Mr Niel (pictured) co-founded 42, a computer-programming school with a capacity of 2,500 students that charges no tuition fees. It trains programmers even from unexpected corners such as the capital's troubled housing projects, and has opened a sister campus in Fremont, California, near Silicon Valley, encouraging ties.

Mr Niel's next step, in April, will be to open what he says will be the world's largest incubator, called Station F, in central Paris. It will have over 3,000 workstations. Last month Facebook's Sheryl Sandberg said her firm will take spaces in Station F, lauding French talent. She said the country now has "some of the most innovative technology companies in the world".

The main factor behind all the new activity is a change in graduates' aspirations. A member of the board of one engineering school near the capital says that there is clearly new entrepreneurial ambition among students, especially those who do an internship with a startup abroad. He estimates that a fifth of graduates from his school now try launching their own firms, a big increase on five years ago.

Graduates are particularly keen on startups in the so-called "deep tech" sector—involving, among other things, artificial intelligence (AI), machine learning and big data. Philippe Botteri of Accel, a venture-capital fund, who oversees investments in Europe, says 80% of his firm's activity these days is in deep tech, an area in which Europeans, often in possession of specialised and further degrees in engineering and maths, have advantages. France has emerged fastest in the last few years as a top destination for capital, he says, largely because its graduates have particular strength in these fields.

Julien Lemoine, for example, co-founded Algolia, a startup with funds from Accel that provides customised search services using AI. From an office with glass walls in central Paris (and from a sister office that opened in San Francisco in 2015) his firm serves 2,300 paying clients globally—two-thirds of revenues come from America. Algolia will employ 200 people by the end of the year, up from 60-plus now. His staff only speak English. From the start Algolia sought clients globally, while tapping a local pool of recruits. Those hired in France, notes Mr Lemoine, are far more loyal than job-hopping staff in Silicon Valley.

It is a similar story at Shift Technology, a Paris-based firm founded by three maths graduates. It uses AI to detect fraudulent insurance claims on behalf of big insurers. Jeremy Jawish, one of the firm's co-founders, says Paris is a suitable space to grow simply because it is "the next AI centre". When he was in university, the dream was to be a banker in London but "now everyone is excited about AI startups", he says. Cisco and Facebook have both set up AI operations in Paris to attract local talent, he notes.

The old problems have not vanished, of course. Stiff labour laws still make firing permanent staff difficult, a particular headache for young, fragile firms. But here, too, change may be in the air. At least one candidate competing in the upcoming presidential election is well-disposed towards the technology sector. Emmanuel Macron championed digital growth when he was economy minister; this week in London he urged French expats to come home "to innovate". France might have been slow to get started, but it is catching up fast. ■

Schumpeter | A trip to the shrink

Three sanity tests for whether tech firms are living in a bubble

IS THE technology industry in La La Land? There are alarming signs. House prices in San Francisco have risen by 66% more than in New York over the past five years. Even at the height of the dotcom bubble in 2001, the gap was lower, at 58%. Shares of technology firms trade on their highest ratio to sales since the turn of the century. Four of the world's most valuable firms are tech companies: Apple, Alphabet, Microsoft and Amazon. Snap, a tiddler with $400m of sales and $700m of cash losses in 2016, is expected to list shares on March 1st that will give it a valuation of over $20bn.

For companies and investors in any industry, it is hard to work out if you are living in a bubble. To help, Schumpeter has created three sanity tests for global tech firms. These examine their cashflow, whether investors differentiate between companies, and whether forecasts of their future earnings suffer from a fallacy of composition. The exercise suggests that tech valuations are frothy, but not bubbling.

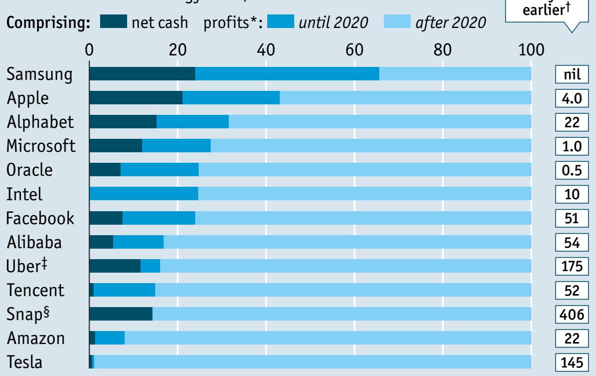
The first test is cashflow, and the industry passes it with flying colours. In 2001 about half of all listed tech firms were unable to convert their sales into hard dollars. Times have changed. In the past 12 months the biggest 150 technology companies generated a mighty $350bn of cashflow after capital expenditures—higher than the total cashflow over the same period of all the non-financial companies listed in Japan, for instance.

In a bubble, investors bid up the value of assets regardless of their quality. The prices of good and bad tulips soared alike in 17th-century Holland, and in 2008 subprime debt was almost as valuable as Treasury bonds. So the second test is whether buyers are differentiating clearly between tech firms, of which there are three broad types. Some, such as Samsung and Apple, are mature and profitable. At other firms, including Alibaba, Tencent, Facebook and Alphabet, sales are growing at an annual rate of over 20%, with high margins. Then there are "blue-sky" firms that are unprofitable but have explosive sales growth. Uber and Snap are examples.

One way to gauge whether investors are sensibly valuing each category differently is to calculate companies' duration, or how much of their current market worth is expected to be realised soon and how much relies on pots of gold being found far into the future (see chart). Schumpeter has crunched the numbers for the world's ten biggest tech firms and for three rising stars, splitting their market value into three parts: value which has already been realised in the form of net cash held, the present value of expected earnings in the next four years, and the value attributable to what happens after 2020. Samsung and Apple are not growing much but are low-risk: over 40% of their value can be explained by cash and near-term profits. The raciest firms, such as Tesla, are expected to generate over 90% of their value after 2020. These firms could well crash and burn. The good news is that investors are placing their most eye-watering valuations on a fringe of smallish companies that are growing very fast indeed.

The good, the mad and the ugly

Market value of technology firms, %



Sources: Bloomberg; company reports

*Present value †Latest ‡Implied by latest funding §Reported IPO value

The third test is whether there is a fallacy of composition. In a bubble the bullish claims of individual companies aren't plausible once you add them all up. In the dotcom era the market-share targets of internet-service providers added up to well over 100%. In the subprime crisis every bank claimed that it had offloaded its risks onto other banks. The technology industry is less vulnerable to criticism on this front. The aggregate profits of the top five tech firms are expected to rise from 6% of American corporate earnings last year, to 10% by 2025: bold, but not implausible. Managers are not anticipating the same profit stream twice. For example, Facebook is not expected to become a force in search, while Google is not expected to conquer social media.

Although the lunatics have not taken over the asylum, there are, however, pockets of excess. Even though their valuations are now starting to deflate, there are still too many privately held technology firms with stretched valuations of $1bn-10bn. Worldwide, such companies have a total worth of $350bn. When it comes to facing up to failure, too, the industry's record is bad. Twitter's sales may shrink by 14% this quarter compared with a year earlier, and it is losing money. Past company failures in the tech business suggest that once decline sets in, it takes only two years or so for a firm to lose a quarter or more of its sales. Yet Twitter is sticking to its line that rapid growth will soon return.

Truly amazing

Another worry is Amazon. It is one of the most optimistically valued firms, with 92% of its current worth justified by profits after 2020. Outside investors have a lot at stake because it is huge, with a market value of $410bn. About a third of this value is justified by its profitable cloud-computing arm, AWS. But the rest of the firm, which straddles e-commerce, television and films, as well as logistics, barely makes money despite generating large sales. Nor is it growing particularly fast for its industry. To justify its valuation you need to believe that it becomes a sort of giant utility for e-commerce which by 2025 cranks out profits of around $55bn a year, or probably more than any other firm in America.

The final worry is that technology firms are flouting the laws of corporate finance, which hold that there is a relationship between a company's market value, its profits and the sums it has invested. New entrants should be attracted by the fact that companies are winning huge valuations from tiny investments, in turn dragging profits and valuations back down. As a group, the biggest ten technology firms have $8 of market value for every dollar they have sunk in net fixed physical and intangible assets. For Snap the figure is $36, and for Tencent it is $53. If new competitors do not, or cannot, emerge, then competition authorities are likely to intervene more than they do now. It sounds odd, but the main valuation risk for many of the world's tech giants is that they rake in too much money. ■

Also in this section

Fintech in China

The age of the appacus

SHANGHAI

Good technology, stodgy banks and soaring wealth make China a leader in fintech

CHINESE banks are not far removed from the age of the abacus. In the 1980s they used these ancient counting boards for much of their business. In the 1990s many bank employees had to pass a basic abacus test. Today the occasional click-clack, click-clack can still be heard in villages as tellers slide their abacus beads up and down the rack.

But these days the abacus is mainly a symbol, more likely to be used in the branding of China's online-finance companies than as a calculating tool. At least three internet lenders have paid homage to it in their names: Abacus Loans, Small Abacus and Modern Abacus. The prominence, so recently, of the abacus is testament to how backward Chinese banking was a short time ago. The rise of the online lenders shows how quickly change has come.

By just about any measure of size, China is the world's leader in fintech (short for "financial technology", and referring here to internet-based banking and investment). It is far and away the biggest market for digital payments, accounting for nearly half of the global total. It is dominant in online lending, occupying three-quarters of the global market. A ranking of the world's most innovative fintech firms gave Chinese companies four of the top five slots last year. The largest Chinese fintech company, Ant Financial, has been valued at about $60bn, on a par with UBS, Switzerland's biggest bank.

How did fintech get so big in China? The short answer is that it was the right thing at the right time in the right place. Even after Chinese banks tucked away their abacuses, they remained remarkably unsophisticated for a high-speed economy. People accumulated wealth but had few good outlets for investing. Entrepreneurs were full of ideas but struggled to get startup loans. Consumers were spending but needed wads of cash to do so.

New technology offered a way to vault over these many contradictions. During the past decade China became the country with more internet users than any other—more than 700m. A potential revolution beckoned but plodding state-owned banks were slow to respond. The terrain was open for battalions of hungry companies. Some entrepreneurs had roots in e-commerce, others in online gaming, many were just first-timers.

Today, the promise of fintech in China is great. It is shaking up a stodgy banking system and helping build a more efficient one, especially for consumers and small businesses. But limitations are also clear. Banks are fighting back. And regulators, tolerant so far, are wading in. For years China has looked to developed countries for ideas about how to manage its financial system. When it comes to fintech, the rest of the world will be studying China's experience.

The rise of fintech in China is most notable in three areas. The first, obvious in daily life, is mobile payments. China's middle-class consumers, emerging as the internet took off, have always been inclined to shop online (see chart 1 on next page). This made them big, early adopters of digital payments. China also had a late-starter advantage. Developed economies long ago swapped cash for plastic (credit and debit cards). China was, until a decade ago, overwhelmingly cash-based.

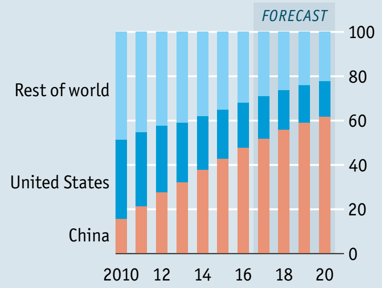
The shift to digital payments accelerated with the arrival of smartphones, bought by many Chinese who had never owned a personal computer. Today 95% of China's internet users go online via mobile devices. Alipay, the payments arm of Alibaba, an e-commerce giant, soon became the mobile wallet of choice. But it quickly faced a challenge, when Tencent, a gaming-to-messaging company, launched a payment function in its wildly popular WeChat phone app, tapping its 500m-strong user base. Baidu, China's main search engine, followed with its own wallet.

Smartpurses

Competition has sparked a stream of innovations, especially in the way mobile apps can connect online to face-to-face retail transactions. QR codes, the matrix-like bar codes that generally failed to catch on in the West, have become ubiquitous in Chinese restaurants and shops. Users simply open WeChat or Alipay, scan a QR code and make a payment. And phones themselves can serve as payment cards: with ▸▸

Clickaholics 1

Retail e-commerce sales, worldwide
Share of total, %



Source: eMarketer

another click, users display their own bar codes, which shopkeepers then scan. And it is as easy for people to send money to each other as it is to send a text message—a vast improvement over the bricks of cash that used to change hands.

Many of the payment functions within WeChat or Alipay exist elsewhere in the world, but in disaggregated form: Stripe or PayPal for online shops processing payments; Apple Pay or Android Pay for those using their phones as wallets; Facebook Messenger or Venmo for friends transferring money. In China all these different functions have been combined onto single platforms. Adoption is widespread. For about 425m Chinese, or 65% of all mobile users, phones act as wallets, the world's highest penetration rate, according to China's ministry of industry and information technology. Mobile payments hit 38trn yuan ($5.5trn) last year, up from next to nothing five years earlier—and more than 50 times the size of the American market.

Small is beautiful

A second area where China has become the global leader is online lending. In most countries, banks overlook small borrowers. This problem is especially acute in China. State-owned banks dominate the financial system, with a preference for lending to state-owned companies. The absence of a mature system for assessing consumer credit-risk adds to banks' reluctance to lend to individuals. Grey-market lenders such as pawn shops provide financing but at usurious interest rates.

Fintech has started to fill this gap. E-commerce was again the launch-pad: online shopping platforms developed loan services, and are using their customers' transactions and personal information to create credit scores. (How the government might eventually harvest data for social control is cause for concern, but for now lenders are merely trying to master the basics of credit ratings.) Shoppers on Alibaba and JD.com, China's two biggest e-commerce portals, can conveniently borrow small amounts, typically less than 10,000 yuan. According to Ant Financial (Alibaba's financial arm, spun out in 2014), 60% of borrowers in this category had never used a credit card. On their platforms, Ant and JD.com also lend to merchants, many of whom are the kinds of small businesses long ignored by banks.

However, e-commerce lending is intrinsically cautious. Its targets are clients already well-known to the big shopping platforms. For the more radical side of China's online lending, look instead at the explosion of peer-to-peer (P2P) credit. From just 214 P2P lenders in 2011, there were more than 3,000 by 2015 (see chart 2). Initially free from regulatory oversight, P2P soon morphed into China's financial Wild West, brimming with frauds and dangerous funding models. More than a third of all P2P firms have already shut down.

Yet P2P lenders still have a big role to play in China. Despite a string of headline-grabbing collapses, the industry has continued to grow. Outstanding P2P loans increased 28-fold from 30bn yuan at the start of 2014 to 850bn yuan today. The online lenders answer a basic need, like China's grey-market lenders of old, but in modern garb and, thanks to all the competition, offering credit at lower interest rates.

In other countries, P2P firms typically lend to clients online and obtain funding from institutional investors. The most successful lenders in China flip that approach on its head. Because of the lack of consumer credit ratings, they vet borrowers in person. Lufax, China's biggest P2P firm, operates shops—more than 500 in 200 cities—for loan applicants. And for funding, Chinese P2P firms draw almost entirely on retail investors. More than 4m people invest on P2P platforms, up by a third over the past year. The platforms can then divide loans into small chunks, parcelling them out to investors to disperse risks.

This points to the third area of China's fintech prowess: investment. Until recently, Chinese savers faced two extreme options for managing their money: stash it in bank accounts, where interest rates were artificially low, but it was as safe as the Communist Party; or punt on the stockmarket, about as safe as playing baccarat in a casino in Macau. "In the middle there was nothing," says Huang Hao, vice-president of Ant Financial. Fintech has opened that middle ground.

In the West asset managers increasingly worry that they face a wave of disintermediation as investors migrate online. In China asset managers barely had a chance to serve as intermediaries in the first place; the market skipped into the digital stage. In large part this resulted from a generational divide that is the inverse of the global norm: the best-paid workers in China tend to be younger, the country's first big generation of white-collar workers. They are much more likely to be willing to trust web-based platforms to manage their money. "In America people love technology, too, when they are 22. They just don't have any money," says Gregory Gibb, Lufax's chief executive.

The biggest breakthrough was the launch of an online fund by Alibaba in 2013. This fund, Yu'e Bao (or "leftover treasure"), was promoted as a way for people to earn interest on the cash in their e-commerce accounts. The appeal, though, turned out to be much broader. Invested through a money-market fund, Yu'e Bao offered returns in line with the interbank market, where interest rates float freely (see chart 3 on next page). This meant that savers could get rates that were more than three percentage points higher than those banks offered. And risk was minimal, because their cash was still ultimately in the hands of banks. Yu'e Bao attracted 185m customers within 18 months, giving it 600bn yuan of assets under management.

As is so often the case in China, new entrants soon appeared. In 2014 Tencent launched Licaitong, an online fund platform linked to WeChat. Within a year, it had 100bn yuan under management. Lufax, meanwhile, outgrew its P2P roots to transform itself into a financial "supermarket", offering personal loans, asset-backed securities, mutual funds, insurance and more. Robo-advisers (firms that use algorithms and surveys to let users build portfolios) also have China in their sights.

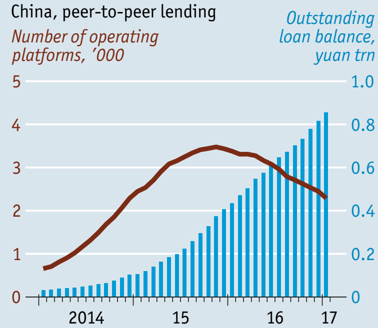
Give me your pennies

And it is not just about wealthy investors. In the West people generally need deep pockets before they can afford to buy into products such as money-market funds. In China all it takes is a smartphone and an initial buy-in of as little as 1 yuan. WeChat, with 800m active accounts, and Ant, with 400m, can afford to be generous.

How to gauge the impact of fintech in China? Measured against the rest of the country's colossal financial system, the various fintech pieces are puny. Apps and online lenders might have massive user bases, but they are mainly comprised of consumers and small businesses, not the hulking state-owned enterprises and gov-

Peerless 2

China, peer-to-peer lending



Source: Wind Info

ernment entities that form the backbone of the banking system. The outstanding balance of P2P credit is roughly 0.8% of total bank loans. Credit provided by the e-commerce firms adds up to even less. Earnings from mobile payments amount to barely 2% of bank revenues.

Wei Hou, an analyst with Bernstein Research, reckons that the fintech firms will grab less than a twentieth of banks' business by 2020. That is hardly to be sneezed at, since it comfortably equates to 1trn yuan in revenues. But it is not the kind of radical disruption that fintech's more ardent evangelists often foretell.

Nevertheless, just looking at the overall size of fintech is insufficient. In the market segments they have set their sights on, fintech firms have made a big mark. Digital payments account for nearly two-thirds of non-cash payments in China, far surpassing debit and credit cards. P2P loans make up about a fifth of all consumer credit.

What's more, fintech firms have provoked a competitive response. Take the customer experience at China's biggest banks: it has improved markedly over the past few years. Once-cumbersome online-banking portals are much easier to use.

Even more important, banks are also changing their business models. Prodded in part by the online investment funds, they have moved away from their plain-vanilla deposit-taking roots. Their focus has shifted to "wealth-management products" (WMPs), deposit-like investments which they sell to their clients, often via mobile apps. Returns are as high as anything on Alipay or Tencent. The banks' apps are not as slick, but not far off, and they feel far safer, with their reassuringly physical thousands of branches. The outstanding value of WMPs has reached more than 26trn yuan, quadrupling in five years. WMPs have brought new risks into the financial system, in particular concerns over banks' funding stability. But they have arguably done more to promote interest-rate liberalisation than any regulatory edict.

And banks have come to appreciate their own strengths: branch networks; solid reputations; and risk controls. "You can't say that banks or fintech firms are better positioned. Both need each other," says Li Hongming, chairman of Huishang Bank, the main lender in Anhui, a big central province. Fintech upstarts have also learned that lesson. Look at Wheat Finance, one of the country's earliest P2P lenders, established in 2009. Amy Huang, Wheat's CEO, says her initial goal was to challenge banks on their home turf. But she soon realised that banks have insuperable advantages, with their stable, low-cost funding bases. Instead of battling them, Wheat is becoming their partner: 70% of its revenues come from selling digital services to banks.

Regulatory attitudes are also shifting. China's government initially gave fintech companies a free hand, a striking contrast to its heavy policing of traditional banks. The hunch was that fintech firms were small enough for any problems to be manageable, and might produce useful innovations. This wager paid off: the rise of mobile payments and online lending owe much to light regulation.

But the era of benign neglect is over. In 2016, provoked in part by the P2P scandals, China introduced regulations to cover most fintech activities. Most of the rules are aimed at making fintech safer, not at curbing it. Firms can no longer pursue their most ambitious strategies. Individuals, for instance, can borrow no more than 200,000 yuan from any one P2P lender.

Some of the regulations, though, also constrain what fintech firms can hope to achieve. The central bank is overseeing the creation of an online-payments clearance platform. It wants transparency: all digital payments will be visible to the central bank. But it could neutralise one of the main advantages of Ant and Tencent, forcing them to share transaction data with banks. It seemed, for a time, that China's internet titans might go after banks' crown jewels, when they obtained licences to run online banks. But the government has required that they act in partnership with existing banks for even the most basic functions such as deposits and withdrawals.

Yet this is not the end of the road. Ant and Tencent still have hundreds of millions of users between them on apps that offer a wide range of financial services and products. They just need to persuade enough users to view them not simply as mobile wallets but as mobile brokers and lenders. As Lufax and JD.com hone their offerings, they, too, will grow more powerful. Regulations have placed speed bumps along their path. But the path is still there.

The Chinese are coming

China's fintech champions are also trying to break into new territory abroad. WeChat's mobile wallet is usable internationally, mostly in Asia for now. Ant has invested in mobile-finance companies in India, South Korea and Thailand. But replicating their successes in other markets will not be straightforward. Much of their repertoire was devised specifically to address deficiencies in China's financial system. And anything that touches on core banking abroad will require local incorporation and adherence to local regulations—headwinds against global expansion.

China's bigger impact is likely to be indirect. Its fintech giants have shown what can be done. For emerging markets, the lesson is that with the right technology, it is possible to leapfrog to new forms of banking. For developed markets, China offers a vision of the grand consolidation—apps that combine payments, lending and investment—that the future should hold.

And the biggest lesson of all: it is not upstarts versus incumbents but rather a question of how banks absorb the fintech innovations blossoming around them. China, an early adopter of the abacus, is, after a long period of dormancy, once again blazing a trail in finance. ■

Trade statistics

Lies, damned lies and…

Bilateral trade flow data are misleading. But a reported tweak will not help

MIGHT Donald Trump's promise to shake up America's trade policy extend to its statistics? According to a report in the *Wall Street Journal*, discussions are afoot on changing the way trade figures are tallied. The Bureau of Economic Analysis, the country's main statistical body, calls this "completely inaccurate". But in trade as elsewhere, the new administration seems prone to using statistics as a drunk uses a lamppost—for support rather than illumination.

The proposal reportedly involves stripping out some of America's exports from the gross numbers. America sold $1.5trn of goods abroad in 2016, but of that $0.2trn were re-exports that left the country much as they had arrived. This type of trade has been growing, reflecting America's role as a hub for North American trade. As a share of its combined exports to Mexico and Canada, re-exports rose from 12% to 20% between 2002 and 2016. Truckers and shippers benefit from this kind of trade. But critics see it as "padding", obscuring gloomier trends in "made in America" exports.

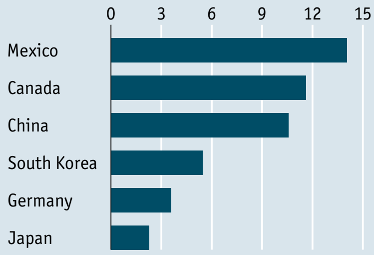
Stripping out re-exports makes no sense when thinking about the overall trade imbalance unless a corresponding adjustment is made to imports. Taking out re-exports would shrink America's recorded exports to countries like Mexico and Canada. Without reducing the import number, it would also puff up America's recorded trade deficit in goods with them, by $54bn for Mexico, and $46bn for Canada (more than triple the raw balance).

So excluding re-exports from the total would provide Mr Trump with some more eye-popping figures with which to bash Mexico. A bid to tweak trade statistics need not be politically motivated, though. It could also reflect the (correct) realisation that standard measures of imports and exports do not always capture what is really being "made in America". Statisticians do sometimes adjust for re-exports, which can mask underlying trends. For example, they routinely strip out from Hong Kong's figures its re-exports (a staggering $498bn-worth in 2016, compared with domestic exports of $13bn) to avoid double-counting China's exports in world-trade totals.

Such adjustments are supposed to deal with the underlying gripe with re-exports: that they may not reflect a country's value added. But tackling this properly involves a much deeper dig into the data. There is also foreign value added embedded in American exports, such as the Mexican parts in cars made in Michigan. The imports side is just as important. American imports from Mexico include both American value added and inputs from other countries. Accounting for all this is far more complicated than stripping out just one component.

Coming back home

United States, share of American value added in imports from:
As % of total imports, 2011



Source: OECD

Luckily for Mr Trump, trade geeks are on the case. Robert Johnson, a trade expert at Dartmouth College, talks of a "quiet revolution" in economists' thinking about trade. Aware that gross trade flows do not capture where value is being created and sent, the WTO and the Organisation for Economic Co-operation and Development, a rich-country think-tank, have painstakingly constructed the very data that Mr Trump's administration would be interested in. The latest available figures, covering 2011, suggest that foreign value added makes up 15% of the content of America's gross exports. Overall, this is offset by a corresponding adjustment to imports. America's overall trade balance with the rest of the world is not affected by a switch to a value-added measure.

Drilling down into bilateral trade relations, accounting for value added has big effects. But these data suggest that some might not be as large as often assumed. One commonly-cited factoid is that 40% of Mexican exports to America are embedded American content. New figures from the OECD put that figure at 14% (see chart).

That is still high enough to create a lot of American losers were America to sever trade relations. And the effect on the reported trade imbalance between America and Mexico is dramatic. Overall, however, switching to the more sophisticated value-added measure of trade flows would not provide political ammunition as powerful as ditching re-exports. On a value-added measure, the bilateral-trade imbalance between America and Mexico in 2011 was 43% smaller than the gross trade flows would suggest. The trade deficit with Canada would have become 39% smaller.

Focusing on value-added trade data is better than looking at the gross flows, but Mr Johnson questions whether the debate should focus on bilateral imbalances at all. When someone incurs a trade deficit with a bookshop and a trade surplus with his employer, neither matters in isolation—the overall balance is important. And for a country's trade, that will be most determined by macroeconomic factors. Fiddling the figures might move the lamppost; it will still leave the future direction of trade in the dark. ■

Securitisation in Europe

Limping along

Europe's structured-finance market fails to live up to hopes

SECURITISATION, the bundling and repackaging of income streams as tradable securities, goes in and out of fashion. America is still dealing with the fallout from the disaster in one part of the market—sub-prime mortgages—in 2008-09 (see box on next page). In Europe, the swings in popularity have been just as marked. During the crisis, European securitised assets were hit by only small losses but the market suffered from guilt by association. It has since enjoyed a limited renaissance.

Leading the revival, oddly, are European regulators. They have sought not just to rehabilitate, but indeed actively to promote such "structured" finance. As early as 2013 the European Central Bank (ECB) was effusive not only about securitisation's ability to spread risks, but also about its ability to channel funding to the economy, including small and medium-sized enterprises (SMEs). The ECB and the Bank of England even published a rare joint paper in 2014 making the case for a "better-functioning securitisation market in the EU".

This aim then became one of the main planks of the European Commission's "capital-markets union" initiative—an attempt to shift Europe away from overreliance on banks. A legislative proposal put forward by the commission in the autumn of 2015 sought to smooth the way for securitisation by setting up common rules and establishing a special category of "simple, transparent, and standardised" securitisations with fewer regulatory requirements. ▸▸

This law is still in the throes of the EU legislative process, but is nearing the end.

Yet despite their best efforts, the market in Europe remains stunted—just €227bn ($251bn) of total issuance in Europe in 2016. The amount actually available to investors is even smaller: only €88bn was "placed" with (ie, sold to) investors. This is a trend that has persisted for the past few years (see chart). Rather than bringing new assets to market, many banks, particularly in southern Europe, are securitising existing assets. Their sole purpose is to create collateral that allows them to obtain cheap funding from the ECB. Retention is particularly high in Spain and Italy, and for certain types of securitisations, such as those backed by SME loans, of which over 90% are retained Europe-wide.

Securitising assets to sell bonds on to investors is not an attractive source of funds for most banks. The ECB is simply so much cheaper. At best, banks are using the technique to offload specific risks or types of assets, such as non-performing loans. Matthew Jones, head of European structured finance at S&P Global, a ratings agency, says that the majority of securities on the placed market come from non-bank lenders or private-equity-backed deals.

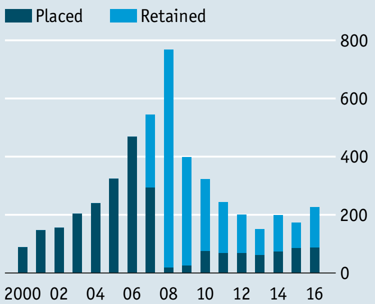
The forthcoming European law intends to spur securitisation mainly by changing rules imposed after the crisis. Rules were tightened several times, notably through the imposition in 2011 of a risk-retention requirement that issuers must hold on to at least 5% of the value of a securitised transaction. The idea was to force issuers to have an incentive to monitor the creditworthiness of borrowers, rather than simply selling all sorts of dodgy loans. Capital requirements for banks and insurers were also progressively tightened, to make holding securitised assets much more costly.

Yet even the new proposal, rather than encouraging securitisation, may have the opposite effect. The European Parliament has made a number of amendments to strengthen it, including one that would raise the risk-retention requirement to 10% or even 20%—which investors argue would stifle the market. Others would determine that only EU-based entities are eligible to invest in the securities, and impose various onerous disclosure requirements.

If securitisation looks unappealing, investors do have murkier options. There has been an increase in the number of bilateral deals, including sales of (unsecuritised) loan portfolios. "Synthetic" securitisations, where derivatives are used to transfer risks, are also gaining in popularity. Securitisation has its shortcomings, points out Alexander Batchvarov of Bank of America Merrill Lynch, but the resulting bonds are at least tradable, visible and covered by ratings agencies. In bilateral deals, the risks involved are opaque and cannot easily be quantified, nor can the exposures be easily traded. Members of the European Parliament and others worry about transparency and are still squeamish about securitisation. Substitutes for it might be even more frightening. ■

Security blankets

Europe, securitisation, €bn



Source: Bank of America Merrill Lynch

Fannie Mae and Freddie Mac

Still possessed

NEW YORK

Investors in America's housing-finance giants have a bad day in court

ONE unresolved issue from the financial crisis is the future of Fannie Mae and Freddie Mac, the two firms that stand behind much of America's housing market. Fannie and Freddie purchase mortgages, bundle them into securities and sell them on to investors with a guarantee. When America's housing market collapsed a decade ago, the government had to bail them out. Its treatment of the firms since then has created a titanic legal struggle. Shareholders have cried foul. On February 21st, a federal appeals court upheld a ruling in the government's favour.

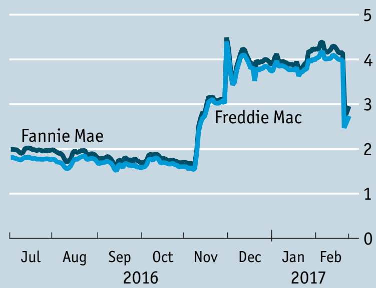
At issue is the Obama administration's decision in 2012 to hoover up all of Fannie and Freddie's profits. Until then, it had received a fixed dividend on its investment. The timing of the shift was striking—just before a surge in the firms' profitability. Since 2008 the Treasury has sucked in about $250bn from the firms, 30% more than the cost of the bail-out.

The change enraged hedge funds who had bought Fannie and Freddie's shares and found themselves expropriated. The investors' lawsuit held that the government overstepped its authority by seizing all profits. A federal court dismissed that claim in 2014; it has taken until now for an appeals court to uphold the most important parts of the decision. An odd aspect of the ruling is that it largely ignored the substantive arguments but concluded the court lacked the authority to curb the government's actions.

Its ruling sent shares in Fannie and Freddie tumbling (see chart). That reversed about half of the rally sparked by Donald Trump's victory in the presidential election. Investors reckon that Mr Trump's administration will be more favourable to Fannie and Freddie's investors. Initially Steve Mnuchin, now treasury secretary, told a business-news network that Fannie and Freddie should be privatised again. But in his confirmation hearing before the Senate in January, he seemed to roll back those remarks.

Losing appeal

Share prices, $



Source: Thomson Reuters

The firms are hardly robust. The Treasury is running down their capital by $600m a year. By 2018 they will have none left. From then on, should the firms make a loss, they will need to draw on an emergency line of credit from the government. Doing so would be characterised by some as a second bail-out.

That worrying prospect should provide some impetus to the search for an alternative solution. But it will be hard to find an ownership structure for Fannie and Freddie that satisfies everyone. The firms keep mortgages cheap by lumping taxpayers with a staggering amount of risk. (If the housing market collapsed, the cost to the Treasury could be 2-4% of GDP, according to an analysis by *The Economist*). Few will want investors to make profits on the back of such a taxpayer guarantee.

The court did allow the plaintiffs to litigate some contractual claims. And one of the three judges in this court dissented starkly from the ruling. The government, she noted, had "pole-vaulted" over its authority. The plaintiffs were "not all innocent or ill-informed investors". But they had been betting the rule of law would prevail: "In this country, everyone is entitled to win that bet."

Gender budgeting

The fiscal mystique

Designing budgets to support sexual equality is good for growth

LIKE many rich-country governments, Britain's prides itself on pursuing policies that promote sexual equality. However, it fails to live up to its word, argues the Women's Budget Group, a feminist think-tank that has been scrutinising Britain's economic policy since 1989. A report in 2016 from the House of Commons Library, an impartial research service, suggests that in 2010-15 women bore the cost of 85% of savings to the Treasury worth £23bn ($29bn) from austerity measures, specifically cuts in welfare benefits and in direct taxes. Because women earn less, rely more on benefits, and are much more likely than men to be single parents, the cuts affected them disproportionately.

The government does not set out to discriminate, says Diane Elson, the budget group's former chair. Rather, it overlooks its own bias because it does not take the trouble to assess how policies affect women. Government budgets are supposed to be "gender-neutral"; in fact they are gender-ignorant. Ms Elson is one of the originators of a technique called "gender budgeting"—in which governments analyse fiscal policy in terms of its differing effects on men and women. Gender budgeting identifies policies that are unequal as well as opportunities to spend money on helping women and which have a high return. Britain has declined to adopt the technique, but countries from Sweden to South Korea have taken it up.

Ms Elson and her colleagues argue that, once you break down public spending, the opportunities stand out. For instance, if the British government diverted investment worth 2% of GDP from construction to the care sector, it could create 1.5m jobs instead of 750,000. Many governments treat spending on physical infrastructure as an investment, but spending on social infrastructure, such as child care, as a cost. Yet such spending also increases productivity and growth—partly by increasing the number of women in the workforce.

In poorer countries, the bias can be more explicit. When Uganda first looked at its budget through a gender lens, it discovered that little of the spending on agriculture was going to support women farmers, though they did most of the work.

What may sound simply like feminism infiltrating fiscal policy is thus also about efficiency. Gender budgeting is good budgeting, argues Janet Stotsky, who led an IMF survey of such efforts around the world. You don't have to be a feminist to accept that investing in girls' education or in women's labour-force participation will generate a high return on investment.

Such a utilitarian approach appeals to finance ministries in a way that pious talk of "women's empowerment" may not. Ministries can fail to grasp how their budgets affect women and girls. In developing countries, for instance, investment in clean water and electricity eases housework, freeing time for mothers to earn money and for girls to go to school. Cutting funding may save money in the short term, but when women spend their days fetching water, growth suffers.

There are plenty of examples of the idea in action. In Rwanda spending aimed at keeping girls in school—such as providing basic sanitation—has led to higher enrolment. In India the use of gender budgeting in a state is a better indicator of girls' school attendance than higher incomes. In South Korea a lack of child care has forced women to choose between work and family. Both female labour-force participation and fertility rates are low—a poor formula for growth in an ageing country. Gender budgeting helped the government design programmes to reduce the burden of care on women. Around the world, safer transport systems can ease the vast, often unseen, burden of violence against women and girls—in medical costs, and lost productivity and labour, as they are prevented from working or learning.

Gender budgeting has won the backing of international financial institutions. Ms Elson once took the IMF and the World Bank to task for their bias, arguing that austerity forced on countries seeking funds in the 1980s imposed heavy burdens on women. Now the World Bank backs gender budgeting. The IMF used not to see promoting sexual equality as its job, but Christine Lagarde, its managing director, now wants gender-budgeting to play a role in the advice it gives to member countries.

Not everything has gone well for gender budgeting, however. Some initiatives have proved half-hearted, short-lived or prey to party politics. Egypt introduced the concept in 2009, encouraged by international donors; when the donors left, it petered out. Australia was the first country to have gender budgeting. But today's conservative government saw it as left-leaning and anti-austerity and dropped it in 2014, the year after it took office.

Going by the numbers

Other countries have issued sexual-equality statements and begun tracking data, but have not changed budget allocations. Much of their reluctance can be put down to bureaucratic inertia—and the sheer difficulty of the process of tracking who gets what. Fiscal policy is based on the market economy, which generates cash, and ignores women's unpaid labour, and the extent to which it limits their work in the market economy. Rather than rethink the system, governments rely on equal-opportunity laws to cut inequality—though the evidence is that they do not.

Professing loyalty to an idea is easier than acting on its implications. "Everyone is keen to take on gender equality if it only means marginal changes," says Ms Elson. "Root-and-branch changes to thinking about how the fiscal system supports gender equality are much more difficult." ■

A good investment

Free exchange | I, taxpayer

A tax on robots is an intriguing but misguided solution to worker woes

BILL GATES is an unlikely Luddite, however much Microsoft may have provoked people to take a hammer to their computers. Yet in a recent interview with *Quartz*, an online publication, he expressed scepticism about society's ability to manage rapid automation. To forestall a social crisis, he mused, governments should consider a tax on robots; if automation slows as a result, so much the better. It is an intriguing if impracticable idea, which reveals a lot about the challenge of automation.

In some distant future robots with their own consciousnesses, nest-eggs and accountants might pay income taxes like the rest of us (presumably with as much enthusiasm). That is not what Mr Gates has in mind. He argues that today's robots should be taxed—either their installation, or the profits firms enjoy by saving on the costs of the human labour displaced. The money generated could be used to retrain workers, and perhaps to finance an expansion of health care and education, which provide lots of hard-to-automate jobs in teaching or caring for the old and sick.

A robot is a capital investment, like a blast furnace or a computer. Economists typically advise against taxing such things, which allow an economy to produce more. Taxation that deters investment is thought to make people poorer without raising much money. But Mr Gates seems to suggest that investment in robots is a little like investing in a coal-fired generator: it boosts economic output but also imposes a social cost, what economists call a negative externality. Perhaps rapid automation threatens to dislodge workers from old jobs faster than new sectors can absorb them. That could lead to socially costly long-term unemployment, and potentially to support for destructive government policy. A tax on robots that reduced those costs might well be worth implementing, just as a tax on harmful blast-furnace emissions can discourage pollution and leave society better off.

Reality, however, is more complex. Investments in robots can make human workers more productive rather than expendable; taxing them could leave the employees affected worse off. Particular workers may suffer by being displaced by robots, but workers as a whole might be better off because prices fall. Slowing the deployment of robots in health care and herding humans into such jobs might look like a useful way to maintain social stability. But if it means that health-care costs grow rapidly, gobbling up the gains in workers' incomes, then the victory is Pyrrhic.

The thorniest problem for Mr Gates's proposal, however, is that, for the moment at least, automation is occurring not too rapidly but too slowly. The displacement of workers by machines ought to register as an increase in the rate of productivity growth—and a faster-growing economy. But since a burst of rapid productivity growth in the late 1990s and early 2000s, America's economy has persistently disappointed on these measures. Mr Gates worries, understandably, about a looming era of automation in which machines take over driving or managing warehouses. Yet in an economy already awash with abundant, cheap labour, it may be that firms face too little pressure to invest in labour-saving technologies. Why refit a warehouse when people queue up to do the work at the minimum wage? Mr Gates's proposal, by increasing the expense of robots relative to human labour, might further delay an already overdue productivity boom.

When faster automation does arrive, robots might not be the right tax target. Automation can be understood as the replacement of labour with capital. To save humans from penury, the reasoning goes, a share of the economy's capital income needs to be diverted to displaced workers. Expanding capital ownership is one strategy; people could own driverless vehicles that operate as taxis, for instance, and rely on the flow of fares for part of their income. Taxing robots and redistributing the proceeds is another.

But as machines displace humans in production, their incomes will face the same pressures that afflict humans. The share of total income paid in wages—the "labour share"—has been falling for decades. Labour abundance is partly to blame; the owners of factors of production in shorter supply—such as land in Silicon Valley or protected intellectual property—are in a better position to bargain. But machines are no less abundant than people. Factories can churn out even complex contraptions; the cost of producing the second or millionth copy of a piece of software is roughly zero. Every lorry driver needs individual instruction; a capable autonomous-driving system can be duplicated endlessly. Abundant machines will prove no more capable of grabbing a fair share of the gains from growth than abundant humans have.

A new working paper by Simcha Barkai, of the University of Chicago, concludes that, although the share of income flowing to workers has declined in recent decades, the share flowing to capital (ie, including robots) has shrunk faster. What has grown is the markup firms can charge over their production costs, ie, their profits. Similarly, an NBER working paper published in January argues that the decline in the labour share is linked to the rise of "superstar firms". A growing number of markets are "winner takes most", in which the dominant firm earns hefty profits.

DOS Kapital

Large and growing profits are an indicator of market power. That power might stem from network effects (the value, in a networked world, of being on the same platform as everyone else), the superior productive cultures of leading firms, government protection, or something else. Waves of automation might necessitate sharing the wealth of superstar firms: through distributed share-ownership when they are public, or by taxing their profits when they are not. Robots are a convenient villain, but Mr Gates might reconsider his target; when firms enjoy unassailable market positions, workers and machines alike lose out. ■

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The American Association for the Advancement of Science

Tales of wonder

BOSTON

This year's meeting of the AAAS looked at space weather, the cause of asthma, submarine mining, mosquito traps and the peopling of the Americas

SOMETIMES the sun burps. It flings off mighty arcs of hot plasma known as coronal mass ejections (CMEs). If one of these hits Earth it plays havoc with the planet's magnetic field. Such storms are among the most spectacular examples of what astronomers call space weather, a subject to which a session at this year's meeting of the American Association for the Advancement of Science (AAAS), in Boston, was devoted. A big CME can have profound effects. In 1859, for instance, a CME subsequently dubbed the Carrington event, after a British astronomer who realised its connection with a powerful solar flare he had observed a few days earlier, generated auroras that could be seen in the tropics. Normally, as the names "northern" and "southern" lights suggest, such auroras (pictured above) are visible only from high latitude. More significant, the Carrington event played havoc with Earth's new telecommunications system, the electric telegraph. Lines and networks failed, and some operators received severe shocks.

Today, the damage would be worse. A study published in 2013 by Lloyd's, a London insurance market, estimated that a Carrington-like event now would cause damage costing between $600bn and $2.6trn in America alone. A year before this report came out the sun had indeed thrown off such an ejection—though not in the direction of Earth. A much smaller storm did, however, do serious damage in 1989, by inducing powerful currents in Quebec's grid, blacking out millions of people. It would therefore be useful, Jonathan Pellish of the Goddard Space Flight Centre, a NASA laboratory, told the meeting, to be able to forecast space weather in much the same way as weather is forecast on Earth. This would permit the most vulnerable equipment to be disconnected, in advance of a CME's arrival, to prevent damaging power surges.

Sturm und drang

It sounds straightforward enough, but is harder than it sounds. Though CMEs are common, they cause problems on Earth only if they score a direct hit. The so-called "empty" interplanetary space of the solar system is, in fact, suffused by a thin soup of charged particles. These particles interact with moving CMEs in ways that are hard to predict. That makes forecasting a storm's track difficult. On top of this, CMEs themselves have magnetic fields, with north and south poles, just as Earth does. The way the poles of a CME line up with those of Earth can affect the intensity of the resulting electrical activity.

To try to understand all this better a number of satellites already monitor the sun, looking for, among other things, CMEs. These include a fleet of American environment-modelling craft and also the Solar and Heliospheric Observatory, which is a joint European-American venture launched in 1995. Several new sun-watching instruments are planned for the next couple of years. One is the European Space Agency's Solar Orbiter. Another is NASA's Solar Probe Plus. A third is a special telescope, called DKIST, to be built in Hawaii. The eventual goal, said Dr Pellish, is to make space-weather forecasts as easy and routine as terrestrial ones.

Preparing for the extraterrestrial equivalent of hurricanes in this way is surely wise. But space drizzle can cause problems too. Even when the sun is quiet, Earth is bombarded by a steady stream of high-energy subatomic particles. Some come from the sun, which is always shedding matter in small quantities even when it is not throwing off CMEs. Others are cosmic rays, which originate from outside the solar system. Both types, when they smash through the atmosphere, create showers of secondary particles in their wake. And, as Bharat Bhuva, an engineer at Vanderbilt University in Tennessee, described to the meeting, this shrapnel can cause problems with the electronic devices on which people increasingly depend.

If such a particle hits a computer chip, it can inject an electrical charge into the circuit. Since chips work their magic by manipulating packets of charge, that can create all sorts of problems. Dr Bhuva described how, in 2008, the autopilot of a Qantas airliner had been knocked out by a rogue particle. The resulting sudden plunge of about 200 metres injured many of the passengers, a dozen seriously.

Subtler effects can be just as worrying. During a local election in Belgium in 2003, a single scrambled bit of information, almost certainly caused by an errant particle, added 4,096 votes to one candidate's tally. ▸▸

Since this gave an impossibly high total, the mistake was easily spotted. But had the particle hit a different part of the circuit it might have added a smaller number of votes—enough to change the outcome without anyone noticing. Moreover, as the components from which computer chips are built continue to shrink, they become more sensitive, making the problem worse. A modern computer might expect somewhere between a hundred and a thousand space-drizzle-induced errors per billion transistors per billion hours of operation. That sounds low. But modern chips have tens of billions of transistors, and modern data centres have millions of chips—so the numbers quickly add up.

The trick is to design circuits to cope. That is where Christopher Frost, who works at the Rutherford Appleton Laboratory, near Oxford, thinks he can help. He and his team have modified some particle accelerators in a way that offers designers of electronic equipment the ability to test their products—and, crucially, to test them quickly. Dr Frost's particle beams are millions of times more intense than the radiation experienced by real-world devices. They deliver in minutes a dose that would take years to arrive naturally.

This sort of pre-emptive action makes sense. The threats from space drizzle (constant, though low-level) and from CMEs (rare, but potentially catastrophic) are real. Hardening equipment against drizzle, and developing forecasts that tell you when to disconnect it to avoid CME-induced power surges, are merely sensible precautions. ■

Asthma

Four good bugs

BOSTON

Certain bacteria protect against a disease that is a growing threat

CAN you be too clean? That is the question posed by the hygiene hypothesis, which seeks to explain why, as many illnesses have become rarer in rich countries, some have become more common. The hygiene hypothesis posits that the rise of several of these diseases, including asthma, eczema and type-1 diabetes (all of which seem associated with malfunctions of the immune system), has been caused by improvements in hygiene of the sort that have helped get rid of other illnesses. Exactly how that might happen is unclear. But at the AAAS meeting Brett Finlay of the University of British Columbia, in Vancouver, persuasively filled in some of the blanks in the case of asthma.

Asthma is caused by chronic inflammation of the airways, and inflammation is an

A bit of muck might have helped

immune response. The thinking behind the hygiene hypothesis is that a lack of exposure to parasites and pathogens in what has become an unnaturally clean environment means a child's immune system does not develop appropriately. Evidence that asthma is a consequence of overcleanliness includes the facts that farm-raised children are less prone to it than city-raised ones (farms are full of bacteria and other critters that provoke immune responses), that those born by Caesarean section are more prone than others (they do not receive an initial bacterial inoculation from maternal faeces and vaginal fluids), and that those treated with antibiotics as babies are also more prone. Dr Finlay therefore wondered if he could find bacteria which might be involved in asthma protection in the guts of children.

To this end he got in touch with the organisers of the Canadian Healthy Infant Longitudinal Development (CHILD) study, which looks at the development of children from birth to the age of five. He asked if the study's organisers could include the regular collection of faeces as part of their protocol and he thus obtained stool samples taken at the ages of three months, 12 months and annually thereafter, the bacterial contents of which he analysed.

Asthma does not normally manifest itself before a child is five, but a tendency to wheeze and a reaction to a particular skin-prick test are good indicators that the child in question will eventually become asthmatic. Recording both of these are routine parts of CHILD. Dr Finlay was therefore able to correlate the composition of an infant's gut flora with the presence or absence of these indicators. When he did so he found that children deficient, at the age of three months, in four relatively rare bacteria, *Faecalibacterium*, *Lachnospira*, *Rothia* and *Veillonella*, were 20 times more likely than those playing host to these species to manifest the two predictive indicators.

Armed with these results he joined forces with Philip Cooper, a researcher at St George's Hospital in London, to try the same thing in Ecuador. This is a country which has a similar prevalence (20%) of asthma to that in Canada. The researchers found that in Ecuador, too, infantile gut bacteria predict susceptibility to asthma—except that in this case a completely different set of bugs are responsible.

Bug hunt

How the presence in three-month-olds of particular microorganisms protects against asthma remains unknown. But the fact that two different sets of them can do so provides a way to investigate further. It is all a question of finding out what the various bugs have in common.

These discoveries, moreover, offer the possibility of treatment. If a newborn is found to be deficient in the relevant bacteria, an inoculation of them into that child's gut, perhaps in the form of an oral probiotic, might put matters right. Testing this idea would, naturally, require clinical trials, but it is a promising line of inquiry. Meanwhile, Dr Finlay's advice to parents of young children is that, though cleanliness may be next to godliness, it is possible to go too far. ■

Oceanography

Fruits de mer

BOSTON

Plucking minerals from the seabed is back on the agenda

IN THE 1960s and 1970s, amid worries about dwindling natural resources, several big companies looked into the idea of mining the ocean floor. They proved the principle by collecting hundreds of tonnes of manganese nodules—potato-sized mineral agglomerations that litter vast tracts of Davy Jones's locker. At first sight, these nodules are attractive targets for mining because, besides manganese, they are rich in cobalt, copper and nickel. As a commercial proposition, though, the idea never caught on. Working underwater proved too expensive and prospectors discovered new mines on dry land. Worries about shortages went away, and ocean mining returned whence it had come, to the pages of science-fiction novels.

Now it is back. As Mark Hannington of the GEOMAR-Helmholtz Centre for Ocean Research, in Germany, explained to the AAAS, prototype mining machines are already being tested, exploration rights divvied up between interested parties, and the legal framework put in place. Next week the International Seabed Authority, which looks after those parts of the ocean floor beyond coastal countries' 200 nautical-mile exclusive economic zones, is issuing guidelines for the exploitation of submarine minerals. In Dr Hannington's view, a gold rush is starting. And he was speaking only partly metaphorically.

One of the most advanced projects is that of Nautilus Minerals, a Canadian firm. In January 2016 Nautilus took delivery of three giant mining machines (two rock-cutters and an ore-collector) that move around the seabed on tracks, like tanks. It plans to start testing these this year. If all goes well the machines could then start operating commercially in Nautilus's concession off the coast of Papua New Guinea, which prospecting shows contains ore with a copper concentration of 7%. (The average for terrestrially mined ore is 0.6%.) This ore also contains other valuable metals, including gold.

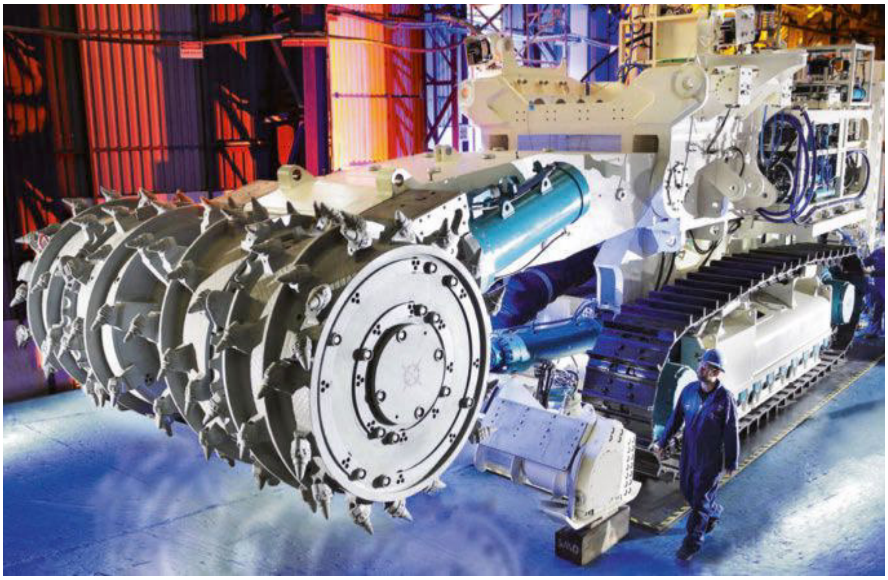
This approach (which is also that taken by firms such as Neptune Minerals, of Florida, and a Japanese consortium led by Mitsubishi Heavy Industries) is different from earlier efforts. It involves mining not manganese nodules, but rather a type of geological formation unknown at the time people were looking into those nodules—submarine hydrothermal vents. These rocky towers, the first of which was discovered in 1977, form in places where jets of superheated, mineral-rich water shoot out from beneath the sea floor. They are found near undersea volcanoes and along the ocean ridges that mark the boundaries between Earth's tectonic plates. They generally lie in shallower waters than manganese nodules, and often contain more valuable substances, gold among them.

They are not, though, as abundant as manganese nodules, so if and when the technology for underwater mining is proved, it is to nodules that people are likely to turn eventually. These really are there in enormous numbers. According to Dr Hannington, the Clarion-Clipperton fracture zone, a nodule field that stretches from the west coast of Mexico almost to Hawaii, contains by itself enough nickel and copper to meet global demand for several decades, and enough cobalt to last a century.

Mining, whether on land or underwater, does come at an environmental cost, though. This was the subject of a presentation by Stace Beaulieu of the Woods Hole Oceanographic Institution, in Massachusetts. The nature of that cost depends on the ecosystem. The deep-sea plains which host nodule fields tend not to be home to big animals, said Dr Beaulieu, but the sediments the nodules are found in play host to microscopic critters that would be most upset by the process of trawling that is needed to bring the nodules to the surface. They might take decades to recover from it.

Hydrothermal vents are an even more peculiar environment than nodule fields. Unlike almost every other ecosystem, they are based not on energy from the sun, but on chemicals—particularly hydrogen sulphide—dissolved in the ejected water that are used by specialised bacteria to power their metabolisms. This, and their isolation from one another in the manner of small oceanic islands, means vents are host to many distinct and rare species. Conservationists therefore care about them a lot.

That said, as Dr Beaulieu pointed out, vent life may be more robust than many people assume. One of the hazards of dwelling near an undersea volcano is that an eruption can destroy your home in an instant. The creatures that live around vents seem able to bounce back from such catastrophes fairly quickly, so a visit from a mining machine might not be such a disaster after all. ■



Crunch time for submarine mining

Epidemiology

Snap!

BOSTON

How to use mosquitoes to combat disease

IMAGINE a small drone that could fly around sampling animals and people in an effort to see which pathogens are present in an area, and what host species harbour them. That would be invaluable to epidemiologists seeking to understand how diseases spread, and how to predict and pre-empt their outbreaks. At the moment, such a drone is beyond human technology. But this may not matter, because nature has already come up with one. It is called the mosquito.

Mosquitoes (female mosquitoes, at any rate) draw blood from animals to feed on. While doing so, they also ingest any blood-born pathogens present in those animals. What a splendid idea, thought Ethan Jackson and Jonathan Carlson, of Microsoft Research in Seattle, to design a system that captures mosquitoes so that the pathogens they have ingested can be studied. Thus, as Dr Jackson explained to the AAAS meeting, was Project Premonition born.

The core of the project is a portable mosquito trap. The current version of this is a cylinder about 35cm high, with 64 cells the size of matchboxes arranged around its exterior. Each of these cells has a door that springs shut in a tenth of a second in response to the breaking of an infrared beam that is shining invisibly inside it. The spring is made from a shape-memory alloy—a material that, when bent into a new configuration, remains in this new shape until an electric current is run through it. Then it suddenly reverts to the old shape. Mosquitoes are lured to the cells by puffs of carbon dioxide (which mimic an animal's exhalations), or skin odours or ultraviolet light. If they enter a cell, they break the beam and spring the trap.

One crucial piece of design is that the traps can be tuned to catch mosquitoes of a single, target species. Different species carry different pathogens, so a study of certain diseases may well want to trap a particular sort of mosquito. Each mosquito species has a characteristic wing-beat frequency and the beam-detector inside a cell is sensitive enough to distinguish between these. It closes only when a member of the desired species flies inside.

Once a trap has done its job, it is picked up and taken to a laboratory where the collected insects are extracted, mashed up and analysed metagenomically. Metagenomics is a technique whereby the DNA in a sample containing material from several species is extracted and sequenced with-

Gotcha

out first being sorted in any way. All species present thus contribute to the results, which are then matched against a database of known sequences, to see what is there. In this way, Dr Jackson and Dr Carlson are able to confirm the species of mosquito captured (for, despite the clever electronics, the traps do occasionally make mistakes), and also the hosts it has fed on and any pathogens it has picked up. Even if an exact match is not possible for a particular piece of DNA (not all species are in the database), the system can make an educated guess about the genus or family it came from. Sometimes, the absence of a matching sequence will be because geneticists have not got around to sampling that particular species. Sometimes, though (particularly with abundant, tiny things like viruses), it will be because the species is previously unknown to science. It should therefore be possible to discover new potential pathogens in this way.

Dr Jackson and Dr Carlson have tested the system successfully in Grenada and in Houston, Texas, and are now refining it. One hoped-for refinement is to produce traps light enough to be carried, deployed and collected by actual, human-built drones. This will make it possible to deploy them in trackless forested areas. These are often home to wild animals that act as reservoirs for pathogens like Ebola virus, which are mainly animal infections but sometimes break out to become epidemic in people. Indeed, an important point about Project Premonition is that it is not restricted to tracking pathogens which are actually spread by mosquito but can also follow those, like Ebola, which are not. All that is required is for a pathogen to be in the host's bloodstream. Mosquito trapping thus promises to become an important tool in the monitoring and prevention of infectious disease. ■

Peopling the Americas

Checkpoint

BOSTON

The first migrants to the New World had to wait 8,000 years to be admitted

HOW America was originally colonised is a topic of perennial interest at the AAAS. Until recently, the earliest uncontested archaeological evidence of people living in the New World came from Swan Point, in Alaska. This dates back 14,400 years. Linguists, however, maintain that the diversity of native languages in the Americas could not have arisen so quickly. Conventional models of linguistic evolution assume tongues separate in the way populations of organisms do—so that the flow of vowels, words and grammatical structures between groups must cease before new languages can emerge, just as a cessation of gene flow gives rise to new species. This suggests it would take at least 50,000 years for a single population speaking a single language to diversify and spread through the Americas in a way that yielded the pattern heard today. Since Native Americans' genes do, indeed, indicate they all derive from a single population, this discrepancy in timing is a paradox.

That paradox may be close to resolution. Recent digs have pushed the physical evidence of America's settlement back in time. Meanwhile, as the meeting heard from Mark Sicoli, a linguist at the University of Virginia, in Charlottesville, a different model of linguistic evolution brings the common ancestor of Native-American tongues forward. Apply a few error bars to the results and the two estimates touch—at about 25,000 years ago.

The problem with explaining linguistic evolution in pure Darwinian terms is that words are not genes. Species, once separate, do not exchange genetic information because they do not interbreed. Languages, though, can exchange grammatical and semantic elements when they meet, which can speed up diversification. Dr Sicoli thus turned to computational phylogenetic analysis, an area of linguistic research that tries to work out whether and how such interaction may have taken place.

From the thousand or so Native-American languages he chose four dozen spoken in Alaska and northern Canada, the part of the Americas closest to humanity's point of entry from Asia. He and his colleagues created a database that recorded, for each of them, 116 linguistic features such as sounds, parts of words, the functions of these parts and the ways a language combines words into phrases. They then used this to identify the influences of languages on each other. They also added geographical information, plotting the flow of linguistic change along the Pacific coast and through the river valleys. This nearly halved the time needed to give rise to the modern situation if the languages had evolved independently from a single common ancestor. That suggests the process of divergence may have begun as recently as 25,000 years ago.

John Hoffecker, an archaeologist at the University of Colorado at Boulder, drew attention to a study of an archaeological site called Bluefish Caves. This is in Yukon, a Canadian territory that abuts Alaska. Some of the remains found in these caves date back 24,000 years. They include stone tools and the bones of horses, caribou and bison, all with marks which imply those bones have been stripped of their flesh by such tools.

A third line of evidence, a genetic analysis, adds weight to all this. It compared 31 modern genomes from the Americas, Siberia and various Pacific islands with 23 ancient genomic sequences from archaeological sites in the Americas. The comparison suggested that Native-American genomes diverged from their Siberian ancestors no earlier than 23,000 years ago. It also showed that the Native-American line was isolated for at least 8,000 years before big genetic splits within it took place as people spread through their new homeland.

Combining everything, then, it seems that the band of brothers and sisters whose descendants first populated the Americas lived somewhere between 25,000 and 23,000 years ago. Very neat, if it were not for the fact that archaeological evidence appears to show that areas outside Alaska and Yukon were colonised rapidly, starting soon after 15,000 years ago.

That could be because the ancestral band and its descendants were confined for much of the intervening period to a region known to palaeogeographers as Beringia. This was composed of what are now eastern Siberia, bits of Alaska and Yukon in the Americas, and the Bering Strait between them (which was then dry land). Parts of Beringia were habitable wetlands and grassland steppe. But the North American ice sheets to its east would have blocked any passage beyond. That could account for the 8,000 years of genetic autarky in the ancestry of Native Americans, for it was not until the ice sheets retreated (starting about 16,000 years ago), that anyone in Beringia would have been able to pass to the rest of the Americas.

To explain how languages might have continued to diversify in a genetically stable population within Beringia, Dr Sicoli suggests its members may have lived in different habitats, separate enough for linguistic diversification, but mixing often enough to maintain a single gene pool. The answer to the question, "how was America peopled?" seems tantalisingly close. ■

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Corruption

Despots' jackpots

Why it is so difficult to hold kleptocrats accountable

The Despot's Guide to Wealth Management: On the International Campaign against Grand Corruption. By J.C. Sharman. *Cornell University Press; 261 pages; $29.95 and £20.95*

CORRUPTION is never far from the front page. In recent weeks, thousands of Romanians protested against plans to decriminalise low-level graft, and Rolls-Royce was hit with a £671m ($835m) penalty for alleged bribery. Meanwhile, long-running corruption scandals continue to roil political and corporate leaders in Brazil and Malaysia. The growing attention has spurred governments to pledge action, as dozens did at a global anti-corruption summit in London last year.

Jason Sharman, professor of international relations at Cambridge University, is particularly interested in "grand corruption": the theft of national wealth by kleptocratic leaders and their cronies, often in poor (albeit resource-rich) countries. It is a subject he knows well, having spent over a decade studying the offshore centres and vehicles—shell companies, for example—that are used to hide ill-gotten gains.

The list of light-fingered leaders who feature in "The Despot's Guide to Wealth Management" is long. It includes various dead ones, such as Nigeria's Sani Abacha, Mobutu Sese Seko of Zaire, Indonesia's Suharto and Ferdinand Marcos of the Philippines (whose shoe-loving wife, Imelda, graces the book's cover). These four alone ran off with an estimated $55bn. More recent examples include the pre-Arab spring leaders of Egypt, Libya and Tunisia, and Viktor Yanukovych of Ukraine. The overall amount that has been pilfered is anyone's guess, given the murkiness of offshore finance. Estimates for Egypt under Hosni Mubarak range from $1bn to $70bn. One complicating factor is that much of the money is siphoned off through "legal corruption", in business ventures that comply with local laws, often because of legislative tinkering by pliant parliaments.

For a long time governments, even in the rich world, seemed uninterested in bringing kleptocrats to book. That began to change in the 1990s, as a result of two things. The end of the cold war took away a reason to turn a blind eye to theft by heads of client states. That coincided with a shift in thinking among makers of development policy, who began to view corruption as one of the main causes of poverty. Mr Sharman also credits the rise of anti-corruption NGOs and institutions that offer practical help to track down former leaders' loot, such as the Stolen Asset Recovery Initiative, a joint UN-World Bank project.

America has pushed the anti-corruption agenda hardest, with strong laws (such as the Foreign Corrupt Practices Act and the Patriot Act), a determination to enforce them—with help from a special anti-kleptocracy unit in the Justice Department—and congressional backing. Senate investigations have highlighted the role of banks, lawyers and other "gatekeepers" in enabling grand corruption. America, Britain and Switzerland are especially attractive destinations for foreign wealth because of their sophisticated financial centres. All three have made strides in tackling corruption, but many gaps remain.

Anonymous shell companies, dubbed the getaway cars of financial crime, are legion in America. Britain also maintains a network of opaque offshore satellites, including the British Virgin Islands. Police and regulators are keen to know more about them, but lack funding. Switzerland has shed some of its secrecy and passed laws to ease asset recovery and repatriation, but implementation tends to be patchy; Mr Sharman thinks weak laws and strong enforcement do more good than strong laws and weak enforcement. He also includes a chapter on his native Australia which, he concludes (with help from a private investigator hired to sift through corporate records), is "able but unwilling" to stop inflows of iffy money from China and Papua New Guinea.

Many of the difficulties in recovering stolen assets relate to the border-crossing nature of the theft. The "mutual legal assistance" process, used by governments to request or share information about bank accounts and company ownership, is clunky and unreliable. Mr Sharman laments the "inherent difficulty of international legal action in a world of sovereign states".

Investigations become more challenging when the country where the alleged corruption took place refuses to co-operate (usually because those under suspicion still wield power). American prosecutors made only limited headway in their high-profile case against the free-spending son of Teodoro Obiang Nguema Mbasogo, president of Equatorial Guinea since 1979. To their credit, America and Switzerland seem undeterred by such blocking tactics as they probe the still-unfolding 1MDB scandal in Malaysia.

Even when both sides are willing, difficulties abound. Mr Sharman describes a host of problems afflicting asset-recovery efforts after the Arab revolutions in 2011, from basic transliteration headaches to proving under the laws of the host country that funds in a particular account were acquired through corruption (which, given money's fungibility, is especially difficult if the account-holder also has legitimate businesses). Egypt found itself in a frustrating situation. It needed to find "the specific location and nature of stolen assets abroad to recover them", yet countries holding them would co-operate only once Egyptians had located these assets. The authorities in Cairo became so frustrated that in 2012 the government sued the British Treasury after it had denied 15 of Egypt's requests for legal assistance.

So far, little money has been returned to Cairo. This fits in with the broader pattern. As of 2014, the worldwide amount of looted state wealth that had been repatriated stood at just $4.5bn, compared with hundreds of billions believed stolen. Even seizures of criminal proceeds in America are a mere "pin prick", according to an official. But although the extra anti-corruption efforts have not translated into a big increase in recoveries, they may still have a deterrent effect—just as speed limits make a difference to people's driving, even though only a few drivers are fined.

Mr Sharman ends with some suggestions for strengthening the fight against the mega-thieves: tougher penalties for firms that help them, especially banks (fines are paltry, except in America); blacklisting of the worst kleptocracies, with their officials denied physical or financial access to the West; and greater use of tax policy, especially in light of the recent wave of international tax-transparency agreements. Like Al Capone, most corrupt officials are also guilty of a tax crime. The fact that these are still only proposals shows just how far there is to go. ■

Sleeper trains

The end of the line

Night Trains: The Rise and Fall of the Sleeper. By Andrew Martin. *Profile Books; 248 pages; £14.99*

SLEEPER trains occupy a romantic corner of any traveller's soul. One of Hercule Poirot's most gripping adventures takes place on the Simplon Orient Express, which used to run from Paris to Istanbul. A famous scene in Alfred Hitchcock's "North by Northwest" features a night train entering a tunnel. James Bond, meanwhile, detects a spy on a sleeper train after noticing him behave suspiciously in the dining car ("Red wine with fish!" Bond mutters).

In some parts of the world, the nostalgia lives on. The Caledonian Sleeper, complete with smartly dressed waiters, neeps and tatties and a selection of whiskies, is the best way to travel between London and Scotland. Elsewhere, however, sleepers are on their last legs. Flights across Europe have become so cheap that fewer and fewer travellers bother with the *wagon-lit*. Sensing that the end is nigh, Andrew Martin, a British novelist, has written an ode to the sleeper.

"Night Trains" is a potted history of the mode, combined with accounts of journeys Mr Martin has taken on sleeper routes across Europe. The reader joins him on a train to Munich, where he eats a tuna sandwich on board. Travelling from Paris to Venice, he thinks he has been robbed of €100 ($105). The service to Nice is cancelled, yet such is his love for sleeping aboard that he spends the night on the train as it sits on the platform.

These stories make clear that the golden age of the sleeper train is long past. How different things were in the 19th century, when a passenger on the Orient Express could dine on *gigot de mouton à la Bretonne*, *épinards au sucre* and champagne aplenty. The only modern-day sleeper train which comes up to Mr Martin's exacting standards is the Nordland, which trundles towards northern Norway.

Mr Martin has a singular fascination with how much sex everyone had on board. But the real question that the uninitiated most often ask sleeper fanatics is: "Do you sleep?" After a read of Mr Martin's book, the answer would seem to be a resounding "no": clanking and shunting wake him up time and again. Still, it is hard not to be won over by his enthusiasm. Catch the sleeper train, before it's too late.

Elegance on wheels

Literary biography

By the book

The Novel of the Century: The Extraordinary Adventure of Les Misérables. By David Bellos. *Particular Books; 307 pages; £20. To be published in America by Farrar, Straus & Giroux in March; $27*

"AS LONG as there are ignorance and poverty on Earth," wrote Victor Hugo in his preface to "Les Misérables", "books such as this one may not be useless." Over the 155 years since it was first published in France and then elsewhere, the novel has never lost its relevance—or its popularity.

Around 65 film versions (the first in 1909) make "Les Misérables" the most frequently adapted novel of all time. The first stage musical opened in Philadelphia in January 1863. Since 1980 Alain Boublil and Claude-Michel Schönberg's operatic melodrama has been performed more than 53,000 times in 44 countries and 349 cities. Yet, from the outset, adapters and translators cherry-picked elements from their supersized source. British admirers had to wait until 2008 for a complete English text of the novel in the order in which the author had planned it to be read. Even to lovers of "Les Mis", Hugo's world-shaking blockbuster can feel like a lost continent.

David Bellos, an English-born professor of French literature at Princeton University and an eminent translator, navigates through its five parts, 48 "books" and 365 chapters with clarity and wit. At once erudite and entertaining, he shows how the novel's magic lies in its multitasking versatility. Hugo's extraordinary feat is to deliver "an intricately realistic portrait" of France after Napoleon, "a dramatic page-turner" packed with suspense—and a demonstration of "generous moral princi-

Nothing miserable about it

ples" that readers still find appealing today.

Hugo, already the author of "Notre-Dame de Paris" and a literary superstar as a poet, playwright and novelist, began in 1845 to write his story of a former convict seeking a new life in a society rigged against the poor and outcast. Around the questing figure of Jean Valjean, freed from the prison-hulks in 1815 to make his way against the steepest odds, Hugo stitched a vast but "very tightly knit" tapestry of social strife and personal rebirth.

The revolution of 1848, in which the radical firebrand discovered that "his head was with order" although his heart "was with the poor", interrupted Hugo's mammoth project. It resumed after the exiled writer, banished by the upstart emperor, Napoleon III, settled on the Channel Island of Guernsey: no longer a "brilliant careerist" but a "stand-alone protester".

Curiously, this "tiny feudal outpost of the British crown" hosted the gestation and birth of a book that won hearts and changed minds across the world. The editing and printing of the precious manuscript depended on the schedules of Queen Victoria's Royal Mail and the Guernsey steamer timetables. In 1861 "the biggest deal in book history" saw Hugo paid the equivalent of 20 years of a bishop's stipend: enough "to build a small railway". By late 1862, the year of publication, Charles Wilbour's English translation was reported to be "the largest order ever placed for a book in America".

Save for Hugo's literary rivals (Alexandre Dumas likened it to "wading through mud"), everybody loved the long haul of Valjean's rehabilitation in the company of characters who soon entered folklore: the street-girl Fantine, her daughter Cosette, the urchin Gavroche, the student Marius. Shorn of its condemnation of slavery, the novel even circulated in a pirate edition among Confederate soldiers during the American civil war. In a weary pun on their commander's name, they dubbed themselves "Lee's Miserables".

From the humane treatment of ex-offenders to the care of street children, "Les Misérables" spearheaded calls for reform and contributed to "the future improvement of society". Few books really change the world. This one did, long before it broke box-office records on stage. In the musical Hugo's hero intones—in a song loved by television talent-show contestants—"Bring Him Home". Mr Bellos does just that, as he restores "Les Mis" to its maker and his times. ■

History and biography

Handshake with the past

This Long Pursuit: Reflections of a Romantic Biographer. By Richard Holmes. *William Collins; 360 pages; £25. To be published in America by Pantheon in March; $30*

RICHARD HOLMES is one of Britain's best-known biographers. Ever since 1974, when his first work of non-fiction, about Percy Bysshe Shelley, won the Somerset Maugham prize, he has delighted readers with his lives of the great figures of the Romantic era.

The serious biographer, he says, has to "step back, step down, step inside the story" to discover "the biographer's most valuable but perilous weapon: empathy." Mr Holmes is driven by a "strange, unappeased sense of some continuous, intense and inescapable pursuit." Biography, he says, is "a simple act of complex friendship", "a handshake across time, but also across cultures, across beliefs, across disciplines, across genders and across ways of life." The idea of a quest, which seeks both knowledge and understanding, is central to his work.

In "This Long Pursuit", which came out in Britain last autumn and is about to be published in America, the 71-year-old Mr Holmes is revisiting his old heroes, bringing them and their milieux vividly to life. In the process he does a lot to illuminate the very nature of biography itself.

He weaves his reflections around a collection of portraits that are, in essence, distilled miniatures. Among them are the familiar figures of Shelley, Samuel Taylor Coleridge, John Keats and William Blake, as well as many of the scientists who people an earlier book, "The Age of Wonder" (2008), itself a quest to uncover "scientific passion in all its manifestations".

The destructive divide between the sciences and the arts, which bedevils contemporary life, was, as Mr Holmes shows, neither a natural nor a necessary divide. (Indeed, the word "scientist" was not coined until 1833.) To prove that, Mr Holmes draws out the unity that existed between the sciences and the arts in the Romantic era. Among the many examples is the complex friendship between Coleridge and Sir Humphry Davy, the chemist who experimented with nitrous oxide (laughing gas) and whose descriptions of its effects parallel Coleridge's account of opium hallucinations in his famous poem, "Kubla Khan".

"This Long Pursuit" also explores the lives of some of the inevitably less familiar women writers and scientists who shaped this era in surprising ways, despite being excluded by statute from becoming fellows of the Royal Society until 1945. There is Caroline Herschel, an astronomer who discovered eight comets and was the first woman in British science to be awarded an official salary by the Crown. Margaret Cavendish, often caricatured as Mad Madge, wrote poetry that celebrated the wonders of astronomy and protested against the cruelty done to animals in the name of science. Mary Somerville virtually invented popular science writing. Mr Holmes argues that the history of British science needs a "subtle revision" because "precisely by being excluded from the fellowship of the Society, [women] saw the life of science in the wider world."

The biographer writes with insight about how women navigated the societies in which they lived and wrote. Mary Wollstonecraft's life—with all the "revolutionary hopes and freedoms" that it represented—provides rich material for Mr Holmes. Writer, philosopher, traveller and advocate of women's rights, Wollstonecraft was an international literary celebrity during her lifetime: "a woman of uncommon talents and considerable knowledge", read one obituary when she died after giving birth to the future Mary Shelley, the author of "Frankenstein" and the poet's wife.

Mr Holmes analyses the downs and ups of Wollstonecraft's reputation, especially in the wake of the intimate and revealing biography by her heart-broken husband, William Godwin. The personal in relation to Wollstonecraft—whose life Virginia Woolf described as "an attempt to make human conventions conform more closely to human needs"—was deeply political. For a century after her death, she was reviled; only when the feminist movement began gaining traction was her life and writing reassessed. Part of the move to bring her to wider attention was made by Mr Holmes, the biographer with the handshake across time. ■

Boris Nemtsov, the movies

A future that wasn't

Two films about a slain politician uncover the dark soul of modern Russia

A SMALL girl sits on her father's shoulders, spelling out words on a poster: *Pro-pa-gan-da u-bi-va-et* ("Propaganda kills"). Thousands of people tramp through mud, bearing Russian flags and portraits of Boris Nemtsov, a bright and honest liberal politician, who had been shot dead two days earlier on a bridge by Red Square. It is March 1st 2015, but it feels like the start of a long winter.

"Why did he take the bridge?" asks the little girl. "He was crossing the bridge on the way home, walking a bit in the evening. The view is nice from here," her father explains. "But he did good things," the little girl replies. "He did good things. We should not have let him get killed. We should have guarded him." Doing the right thing in Russia can often get you killed.

A balloon with a black ribbon flies up into the low, grey wintry sky. The camera cuts to Nemtsov at a railway station, flirting with Zosya Rodkevich, a 22-year-old anarchist and documentary-maker. She would film him for three years, not knowing that "My Friend Boris Nemtsov" would be his epitaph. "I saw the assignment as a challenge," read the film's opening words. "What could be interesting about an old, narcissistic bourgeois? He was 53…He had been deputy prime minister and the 'heir of Boris Yeltsin'. But he turned out to be cool, kind and genuine. We became friends. And then he was killed."

Death changes the view of someone's life. But Ms Rodkevich's work, one of several new films on Nemtsov, is a close-up study of a living man—boastful, charismatic, sincere—and is devoid of gloss or consideration for history. Her camera inhabits his world, both physically and mentally. Occasionally he would ask: "Why are you filming this, silly?" But the camera keeps rolling, catching him, variously, asleep on a bunk bed in a train, stripping almost naked or talking about freedom and the perverse love of state power.

Nemtsov climbs a bell tower under a blue winter sky ("Oh, I want to be the bell ringer. I will wake Russia right up"). He kisses women, talks to strangers, submerges himself in an ice-hole and gets bundled into a police van during Moscow street protests in 2012. The man in this film is not a saint, but a mortal—full of life, energy, pain and love for the country that once adored him, but was then taught to hate him.

By 2015, after Russia's annexation of Crimea, the Kremlin unleashed a wave of anti-liberal aggression that shocked Nemtsov. The former physicist who studied infrasound, laughingly explains to fellow opposition leaders: "Each person has his own resonant frequency. It depends on the size of the heart and body mass. If you strike the heart's resonant frequency, you'll have a heart attack and goodbye."

A hint of death runs through the film. In the penultimate scene, he boards a train back to Moscow from Yaroslavl where he won a seat on a local council, and hums an old Soviet tune: "Old motif of railroads, eternal youth of railway lines. It seems your whole life is ahead. Don't go wrong when you are choosing your route."

The next shot is of Nemtsov in a coffin, his mother, wife and small daughter standing by his side. The director with the nose ring stares into the camera. In the last minute of the film, a funerary violin breaks into an energetic Soviet song that accompanies a kaleidoscope of photographs of Nemtsov's political life.

Heroes don't die

That minute is expanded in another film, "The Man Who Was Too Free", made by Mikhail Fishman and Vera Krichevskaya for the second anniversary of Nemtsov's death on February 27th. It is not so much a biography as a cardiogram of Russian political life over the past quarter of a century with all its seizures and spasms. The sound of a heartbeat runs through the film, until it flatlines at the end. It would take Nemtsov's death to reveal the scale of Russia's loss.

At 32 he became Russia's youngest regional boss, in charge of Nizhny Novgorod, which had served, a few years earlier, as a place of exile for another physicist and humanist, Andrei Sakharov. Nemtsov embodied the hope for an open, democratic and optimistic Russia. His only promise to his supporters was "not to lie", which he never broke.

The film is a montage of previously unseen footage and monologues by people who knew him well. It has no narrator, allowing for constantly gnawing questions about missed opportunities and historical alternatives. What if Nemtsov had not moved to Moscow as the first deputy prime minister? What if the oligarchs who controlled the media had not set out to destroy him out of greed and arrogance? What if he had become Russia's president, as Yeltsin had originally wished? What if members of Yeltsin's family hadn't persuaded the ailing man to appoint Vladimir Putin as his successor?

The contrast between the tall, generous Nemtsov and Mr Putin is so obvious that, at a preview, a sequence showing the Russian leader made the audience burst out laughing. But it was not just the Kremlin that came to fear Nemtsov. So, paradoxically, did those who considered him an ally. Mikhail Fridman, one of Russia's richest men and a friend of Nemtsov's, candidly admits that he stopped seeing him: "I realised that my relationship with him would be toxic for my business, my partners and my colleagues."

Whereas the Russian elite shunned Nemtsov for fear of upsetting the authorities, Alexei Navalny, an opposition politician who spent a night in prison with him, shunned him for his past links to the Kremlin. "I saw him as a man of the 1990s, a good man but one who brought political problems. I did not want him to support me during the Moscow mayoral elections."

At the end, Nemtsov, who was always surrounded by people, walks alone at night on a Moscow street. His voice comes as though from the other side: "People who fought for freedom in Russia were always in a minority. They moved the country forward, often at the cost of their lives…But I will come back! Don't you worry." ■

Economic and financial indicators

Economic data

% change on year ago

	Gross domestic product			Industrial production	Consumer prices		Unemployment	Current-account balance		Budget balance	Interest rates, %	Currency units, per $	
	latest	qtr*	2016†	latest	latest	2016†	rate, %	latest 12 months, $bn	% of GDP 2016†	% of GDP 2016†	10-year gov't bonds, latest	Feb 22nd	year ago
United States	+1.9 Q4	+1.9	+1.6	nil Jan	+2.5 Jan	+1.3	4.8 Jan	-476.5 Q3	-2.6	-3.2	2.42	-	-
China	+6.8 Q4	+7.0	+6.7	+6.0 Dec	+2.5 Jan	+2.0	4.0 Q4§	+210.3 Q4	+2.4	-3.8	3.01§§	6.88	6.52
Japan	+1.7 Q4	+1.0	+0.9	+3.2 Dec	+0.3 Dec	-0.2	3.1 Dec	+190.9 Dec	+3.7	-5.5	0.10	113	113
Britain	+2.0 Q4	+2.9	+2.0	+4.3 Dec	+1.8 Jan	+0.7	4.8 Nov††	-138.1 Q3	-5.4	-3.7	1.28	0.80	0.71
Canada	+1.3 Q3	+3.5	+1.2	+1.5 Nov	+1.5 Dec	+1.5	6.8 Jan	-53.6 Q3	-3.5	-2.4	1.72	1.32	1.37
Euro area	+1.7 Q4	+1.6	+1.7	+2.0 Dec	+1.8 Jan	+0.2	9.6 Dec	+399.5 Dec	+3.3	-1.9	0.28	0.95	0.91
Austria	+1.2 Q3	+2.4	+1.5	+2.3 Nov	+2.0 Jan	+0.9	5.7 Dec	+8.0 Q3	+2.5	-1.0	0.61	0.95	0.91
Belgium	+1.1 Q4	+1.6	+1.2	+0.4 Nov	+2.6 Jan	+1.8	7.6 Dec	+3.4 Sep	+1.0	-3.0	0.74	0.95	0.91
France	+1.1 Q4	+1.7	+1.2	+1.3 Dec	+1.3 Jan	+0.3	9.6 Dec	-26.8 Dec‡	-1.1	-3.3	1.10	0.95	0.91
Germany	+1.8 Q4	+1.7	+1.8	-0.6 Dec	+1.9 Jan	+0.4	5.9 Jan	+294.5 Dec	+8.9	+0.6	0.28	0.95	0.91
Greece	+0.2 Q4	-1.4	+0.4	+2.1 Dec	+1.2 Jan	-0.8	23.0 Nov	-1.1 Dec	-0.3	-7.5	7.34	0.95	0.91
Italy	+1.1 Q4	+0.8	+0.9	+6.6 Dec	+1.0 Jan	-0.1	12.0 Dec	+50.7 Dec	+2.7	-2.5	2.19	0.95	0.91
Netherlands	+2.3 Q4	+2.0	+2.0	+4.8 Dec	+1.7 Jan	+0.1	6.4 Jan	+57.1 Q3	+8.1	-1.1	0.48	0.95	0.91
Spain	+3.0 Q4	+2.8	+3.2	-1.6 Dec	+3.0 Jan	-0.3	18.4 Dec	+24.3 Nov	+1.8	-4.6	1.75	0.95	0.91
Czech Republic	+1.6 Q3	+0.8	+2.4	+2.7 Dec	+2.2 Jan	+0.7	5.3 Jan§	+3.7 Q3	+1.7	nil	0.68	25.6	24.5
Denmark	+1.1 Q3	+1.6	+1.0	+10.0 Dec	+0.9 Jan	+0.3	4.3 Dec	+24.5 Dec	+7.3	-1.4	0.31	7.05	6.77
Norway	+1.8 Q4	+4.5	+0.6	-2.2 Dec	+2.8 Jan	+3.5	4.4 Dec‡‡	+18.0 Q3	+4.2	+3.5	1.73	8.37	8.60
Poland	+2.0 Q3	+7.0	+2.8	+9.0 Jan	+1.8 Jan	-0.7	8.3 Dec§	-2.5 Dec	-0.5	-2.5	3.90	4.08	3.96
Russia	-0.4 Q3	na	-0.5	+2.3 Jan	+5.0 Jan	+7.1	5.6 Jan§	+22.2 Q4	+2.0	-3.5	8.37	57.9	75.4
Sweden	+2.8 Q3	+2.0	+3.1	-0.9 Dec	+1.4 Jan	+1.0	7.3 Jan§	+22.2 Q3	+4.6	+0.2	0.66	8.99	8.50
Switzerland	+1.3 Q3	+0.2	+1.4	+0.4 Q3	+0.3 Jan	-0.4	3.3 Jan	+68.2 Q3	+9.4	+0.2	-0.15	1.01	1.00
Turkey	-1.8 Q3	na	+2.4	+1.2 Dec	+9.2 Jan	+7.8	12.1 Nov§	-32.6 Dec	-4.4	-1.1	10.75	3.59	2.94
Australia	+1.8 Q3	-1.9	+2.4	-0.2 Q3	+1.5 Q4	+1.3	5.7 Jan	-47.9 Q3	-3.1	-2.3	2.84	1.30	1.38
Hong Kong	+3.1 Q4	+4.8	+1.2	-0.1 Q3	+1.3 Jan	+2.4	3.3 Jan‡‡	+13.6 Q3	+2.8	+1.3	1.90	7.76	7.77
India	+7.3 Q3	+8.3	+6.9	-0.4 Dec	+3.2 Jan	+4.8	5.0 2015	-11.1 Q3	-0.6	-3.8	6.94	67.0	68.6
Indonesia	+4.9 Q4	na	+5.0	+4.3 Dec	+3.5 Jan	+3.5	5.6 Q3§	-16.3 Q4	-2.1	-2.3	7.50	13,367	13,438
Malaysia	+4.5 Q4	na	+4.3	+4.8 Dec	+3.2 Jan	+2.1	3.5 Dec§	+6.0 Q4	+1.9	-3.4	4.05	4.45	4.20
Pakistan	+5.7 2016**	na	+5.7	+7.0 Dec	+3.7 Jan	+3.8	5.9 2015	-4.9 Q4	-1.8	-4.6	7.59†††	105	105
Philippines	+6.6 Q4	+7.0	+6.9	+23.0 Dec	+2.7 Jan	+1.8	4.7 Q4§	+3.1 Sep	+0.9	-2.3	4.96	50.2	47.6
Singapore	+2.9 Q4	+12.3	+1.8	+21.3 Dec	+0.2 Dec	-0.5	2.2 Q4	+56.7 Q4	+23.6	+0.7	2.27	1.42	1.40
South Korea	+2.3 Q4	+1.6	+2.7	+4.3 Dec	+2.0 Jan	+1.0	3.8 Jan§	+98.7 Dec	+7.4	-1.6	2.25	1,143	1,234
Taiwan	+2.9 Q4	+1.8	+1.4	+6.2 Dec	+2.2 Jan	+1.4	3.8 Dec	+70.9 Q4	+12.9	-0.2	1.12	30.8	33.2
Thailand	+3.0 Q4	+1.7	+3.2	+0.5 Dec	+1.6 Jan	+0.2	0.8 Dec§	+46.4 Q4	+10.7	-2.1	2.64	35.0	35.7
Argentina	-3.8 Q3	-0.9	-2.2	-2.5 Oct	— ***	—	8.5 Q3§	-15.7 Q3	-2.7	-4.7	na	15.5	15.1
Brazil	-2.9 Q3	-3.3	-3.5	nil Dec	+5.4 Jan	+8.1	12.0 Dec§	-23.8 Jan	-1.2	-6.3	10.16	3.08	3.95
Chile	+1.6 Q3	+2.5	+1.7	+0.3 Dec	+2.8 Jan	+3.8	6.1 Dec§‡‡	-4.8 Q3	-1.6	-2.8	4.19	642	692
Colombia	+1.6 Q3	+4.0	+1.6	+2.2 Dec	+5.5 Jan	+7.5	8.7 Dec§	-13.7 Q3	-4.8	-3.8	7.00	2,893	3,316
Mexico	+2.4 Q4	+2.9	+2.1	-0.6 Dec	+4.7 Jan	+2.9	3.7 Dec	-30.6 Q3	-2.9	-2.6	7.32	19.9	18.1
Venezuela	-8.8 Q4~	-6.2	-14.1	na	na	+428	7.3 Apr§	-17.8 Q3~	-2.0	-24.3	10.43	10.0	6.31
Egypt	+4.5 Q2	na	+4.3	+17.2 Dec	+28.2 Jan	+13.8	12.4 Q4§	-20.8 Q3	-6.9	-12.2	na	15.8	7.83
Israel	+4.2 Q4	+6.2	+3.5	-1.2 Dec	+0.1 Jan	-0.5	4.3 Dec	+13.3 Q3	+3.3	-2.2	2.30	3.71	3.91
Saudi Arabia	+1.4 2016	na	+1.4	na	-0.4 Jan	+3.5	5.6 2015	-46.8 Q3	-5.7	-11.4	na	3.75	3.75
South Africa	+0.7 Q3	+0.2	+0.5	-0.8 Dec	+6.6 Jan	+6.3	26.5 Q4§	-12.3 Q3	-3.8	-3.4	8.74	13.1	15.2

Source: Haver Analytics. *% change on previous quarter, annual rate. †*The Economist* poll or Economist Intelligence Unit estimate/forecast. §Not seasonally adjusted. ‡New series. ~2014 **Year ending June. ††Latest 3 months. ‡‡3-month moving average. §§5-year yield. ***Official number not yet proved to be reliable; The State Street PriceStats Inflation Index, Jan 29.53%; year ago 30.79% †††Dollar-denominated bonds.

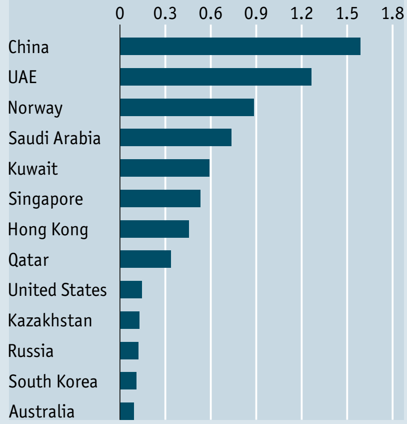
Markets

			% change on	
			Dec 30th 2016	
	Index Feb 22nd	one week	in local currency	in $ terms
United States (DJIA)	20,775.6	+0.8	+5.1	+5.1
China (SSEA)	3,414.9	+1.5	+5.1	+6.2
Japan (Nikkei 225)	19,379.9	-0.3	+1.4	+4.3
Britain (FTSE 100)	7,302.3	nil	+2.2	+3.1
Canada (S&P TSX)	15,830.2	-0.1	+3.5	+5.3
Euro area (FTSE Euro 100)	1,130.0	+0.4	+1.6	+1.6
Euro area (EURO STOXX 50)	3,339.3	+0.5	+1.5	+1.4
Austria (ATX)	2,787.1	-0.7	+6.4	+6.4
Belgium (Bel 20)	3,623.6	+0.1	+0.5	+0.4
France (CAC 40)	4,895.9	-0.6	+0.7	+0.7
Germany (DAX)*	11,998.6	+1.7	+4.5	+4.5
Greece (Athex Comp)	647.1	+3.3	+0.5	+0.5
Italy (FTSE/MIB)	18,884.9	-0.9	-1.8	-1.9
Netherlands (AEX)	499.1	+0.5	+3.3	+3.3
Spain (Madrid SE)	957.0	-1.2	+1.4	+1.4
Czech Republic (PX)	972.7	nil	+5.5	+5.5
Denmark (OMXCB)	833.0	+0.6	+4.3	+4.3
Hungary (BUX)	34,112.9	+0.4	+6.6	+6.9
Norway (OSEAX)	770.4	+0.1	+0.8	+3.6
Poland (WIG)	59,451.1	+2.7	+14.9	+17.4
Russia (RTS, $ terms)	1,146.0	-2.3	-0.5	-0.5
Sweden (OMXS30)	1,582.1	+0.5	+4.3	+5.4
Switzerland (SMI)	8,585.9	+1.2	+4.5	+4.9
Turkey (BIST)	88,531.3	+0.7	+13.3	+10.9
Australia (All Ord.)	5,850.1	-0.2	+2.3	+8.8
Hong Kong (Hang Seng)	24,202.0	+0.9	+10.0	+9.9
India (BSE)	28,864.7	+2.5	+8.4	+9.9
Indonesia (JSX)	5,358.7	-0.4	+1.2	+2.0
Malaysia (KLSE)	1,708.1	-0.1	+4.0	+4.8
Pakistan (KSE)	48,981.7	-0.5	+2.5	+2.0
Singapore (STI)	3,122.2	+1.1	+8.4	+10.5
South Korea (KOSPI)	2,106.6	+1.1	+4.0	+9.9
Taiwan (TWI)	9,778.8	-0.2	+5.7	+10.6
Thailand (SET)	1,572.0	-0.1	+1.9	+4.2
Argentina (MERV)	19,915.3	+1.3	+17.7	+20.3
Brazil (BVSP)	68,589.6	+0.9	+13.9	+20.5
Chile (IGPA)	21,870.6	+0.7	+5.5	+10.1
Colombia (IGBC)	9,929.4	-0.4	-1.7	+1.9
Mexico (IPC)	47,195.7	+0.1	+3.4	+7.0
Venezuela (IBC)	34,869.5	+1.7	+10.0	na
Egypt (EGX 30)	12,401.1	-0.4	+0.5	+15.3
Israel (TA-100)	1,289.3	+0.5	+1.0	+4.9
Saudi Arabia (Tadawul)	7,062.9	-0.2	-2.4	-2.4
South Africa (JSE AS)	52,088.6	-0.8	+2.8	+7.4

Sovereign-wealth funds

Norway has proposed changes to its $900bn sovereign-wealth fund, including increasing its stockmarket holdings by about $90bn. The fund is the world's largest, according to the Sovereign Wealth Fund Institute, a think-tank. China has the most assets under management though: $1.6trn between its four funds. Oil-and-gas-based funds make up more than half of the market by asset value and low prices have created challenges for commodity exporters. Saudi Arabia is trying to diversify away from oil and intends its Public Investment Fund to play a central role in the change. Saudi Aramco's initial public offering would swell it enormously, but the timing of the share sale is uncertain.

Assets, December 2016*, $trn



Source: Sovereign Wealth Fund Institute *Some figures are estimates

Other markets

			% change on	
			Dec 30th 2016	
	Index Feb 22nd	one week	in local currency	in $ terms
United States (S&P 500)	2,362.8	+0.6	+5.5	+5.5
United States (NAScomp)	5,860.6	+0.7	+8.9	+8.9
China (SSEB, $ terms)	349.1	+1.3	+2.1	+2.1
Japan (Topix)	1,557.1	+0.2	+2.5	+5.5
Europe (FTSEurofirst 300)	1,472.8	+0.5	+3.1	+3.1
World, dev'd (MSCI)	1,843.1	+0.5	+5.2	+5.2
Emerging markets (MSCI)	945.6	+0.4	+9.7	+9.7
World, all (MSCI)	445.9	+0.5	+5.7	+5.7
World bonds (Citigroup)	884.3	+0.3	nil	nil
EMBI+ (JPMorgan)	794.8	+0.3	+2.9	+2.9
Hedge funds (HFRX)	1,224.0§	-0.1	+1.7	+1.7
Volatility, US (VIX)	11.9	+12.0	+14.0	(levels)
CDSs, Eur (iTRAXX)†	73.5	+0.7	+1.9	+1.9
CDSs, N Am (CDX)†	62.5	-0.6	-7.7	-7.7
Carbon trading (EU ETS) €	5.1	+0.2	-22.9	-23.0

Sources: Markit; Thomson Reuters. *Total return index. †Credit-default-swap spreads, basis points. §Feb 17th.

Indicators for more countries and additional series, go to: **Economist.com/indicators**

The Economist commodity-price index

2005=100

			% change on	
	Feb 14th	Feb 21st*	one month	one year
Dollar Index				
All Items	150.7	148.6	-0.8	+17.9
Food	160.2	158.7	-2.6	+9.3
Industrials				
All	140.9	138.1	+1.4	+30.2
Nfa†	151.0	145.7	+0.1	+34.6
Metals	136.6	134.9	+2.0	+28.3
Sterling Index				
All items	220.0	216.7	-0.7	+33.4
Euro Index				
All items	177.4	175.3	+1.1	+23.4
Gold				
$ per oz	1,226.2	1,234.7	+1.8	+0.8
West Texas Intermediate				
$ per barrel	53.2	54.1	+2.8	+80.4

Sources: Bloomberg; CME Group; Cotlook; Darmenn & Curl; FT; ICCO; ICO; ISO; Live Rice Index; LME; NZ Wool Services; Thompson Lloyd & Ewart; Thomson Reuters; Urner Barry; WSJ. *Provisional †Non-food agriculturals.

The woman who never was

Norma McCorvey, the "Jane Roe" of Roe v Wade, America's most controversial court decision, died on February 18th, aged 69

SOMETIMES she just couldn't settle at anything. At ten she ran away from home to stay with a girlfriend in a motel. At 16 she married a man who took her for a ride in his black Ford car, but she left after two months because he beat her. She lived on the streets, slept with women and men, got pregnant by the men. Pot, acid, mescalin, she did it all. Work was whatever came along: barhop, carnival barker, housepainter, cleaner. She got involved in the whole abortion debate first on one side and then, when she took Jesus Christ for her personal saviour, on the other. That made her famous, though nobody knew who the regular Norma McCorvey was. And maybe they didn't care.

What her mind had been crystal-clear about though, in the last months of 1969, was that she had to get rid of her latest pregnancy. She was 22, and this was her third. The first baby, her daughter Melissa, had been taken away by her mother who said she was a filthy whore and not fit to raise her, and the second baby had been adopted by its father. Now there was another one growing in her body. The state of Texas, where she lived, banned abortions unless the woman's life was in danger. She couldn't say it was. And because she was poor, she couldn't go to Mexico (as one of her lawyers did, and never told her), or rely on some private doctor to help. When she saved up her rent money to visit the one illegal clinic she knew in Dallas, she found it had been busted the week before. Through the window she could see the dirty instruments and dried blood on the floor, roaches and creeping things. All she wanted was a clean white bed to lay down on in a safe place. She didn't have that privilege.

So when she was put in touch with two lawyers, Sarah Weddington and Linda Coffee, who wanted to change the law, she was thrilled. They met over beers and pizza, and drank to women taking proper control over their own bodies. At some point she signed an affidavit which she hoped would persuade some nice judge to give Miss Norma McCorvey, aka Miss Jane Roe, permission for an abortion right away, because she was already five months gone. But nobody was bothered about that. It turned out that she made a good plaintiff only if she was pregnant and desperate, as they could see she was with her swollen eyes and the cuts on her wrists, and the case dragged on so long that her baby was two and a half before the Supreme Court decided in January 1973 that abortion was a constitutional right for all American women. The baby had gone for adoption again, and she felt miserable, even though she hadn't wanted it.

In her sadness she ignored how *Roe v Wade* was going. She didn't testify, never went to court, and read about the decision in the newspaper like everyone else. But suddenly Jane Roe was everywhere, this unknown woman (or pawn, she felt) who had won freedom for millions of American women, or consigned millions of little American boys and girls to slaughter, depending on your view. And that was her.

She told very few people. Mostly she hid away with her cats and plants and her lover Connie Gonzales, which was difficult also, as lesbians weren't exactly welcome in Texas. In the 1980s she took work in the newly legal abortion clinics in Dallas with their safe, clean white beds, and slowly came out to the world. That made her plenty of enemies, who called her a babykiller and rammed their trolleys into her heels in the Tom Thumb store. But it didn't make her the friends she expected. She was too simple for the pro-choice people, who seemed to shun her at their rallies and sent a strong hint that she was totally stupid, though she had brains and ideas. She wasn't their special chosen Jane Roe, and they didn't want Norma McCorvey.

This unsettled things in her mind again. The Operation Rescue folks moved in right next door to the clinic, with their posters of bloody fetuses which really freaked her out, and on her smoking breaks she would see them praying for her. She began to hear infant laughter in the clinic, and when the women told her why they had come she would find herself thinking, that's not a reason. In 1995 she went to church one day and turned to Jesus right away. The ceiling didn't fall down, and lightning didn't strike when she got baptised in someone's swimming pool; just the best high of her life. Jesus forgave her for all those dead babies, and now she would help save them.

Still a street kid

For the pro-life cause she got herself arrested, campaigned against Barack Obama, testified in Congress and tried to disrupt the appointment of a pro-choice justice. But she didn't fit neatly with these people, either. Norma McCorvey was a street kid, rough at the edges and still wild inside. She still told tales. If she was going to be a trophy celebrity for the anti-abortion cause, as they wanted, she would have to be an ideologue and clean-cut like them. Even the Rev Flip Benham, who baptised her, called her a money-fisher because she charged top dollar for interviews. So what did he want her to live on? Didn't she already buy her clothes at the bargain store?

She had never been right for Jane Roe. But she wasn't wrong, either. Some poor woman would have to have represented all the rest. And Norma McCorvey was as conflicted about abortion as almost the whole of America was. ■