

The Economist

General Motors roars back

Sequencing the world's genomes

Turkey's gamble in Syria

Skiing goes downhill

JANUARY 27TH—FEBRUARY 2ND 2018

THE NEXT WAR

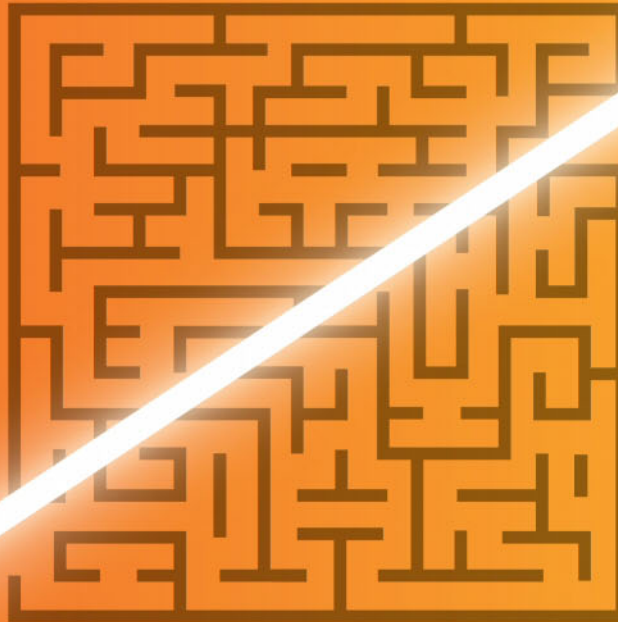


The growing threat of great-power conflict

A SPECIAL REPORT



Delivery



Design

The Brightline™ Initiative is a non-commercial coalition of leading global organizations dedicated to helping executives bridge the expensive and unproductive gap between strategy design and delivery. Brightline conducts thought leadership research and promotes best practices designed to improve an organization's ability to deliver on strategic intent.

More @ www.brightline.org

Successfully Bridging the Gap Between Strategy Design and Delivery

THE NEXT WAR

On the cover
Shifts in geopolitics and technology are renewing the threat of great-power conflict: leader, page 9. War is still a contest of wills, but its character is changing, argues Matthew Symonds. See our special report after page 42. Hope that Donald Trump is bluffing over North Korea, but do not count on it, page 17

The Economist online

Daily analysis and opinion to supplement the print edition, plus audio and video, and a daily chart Economist.com

E-mail: newsletters and mobile edition Economist.com/email

Print edition: available online by 7pm London time each Thursday Economist.com/print

Audio edition: available online to download each Friday Economist.com/audioedition

The Economist

Volume 426 Number 9076

Published since September 1843 to take part in "a severe contest between intelligence, which presses forward, and an unworthy, timid ignorance obstructing our progress."

Editorial offices in London and also: Beijing, Berlin, Brussels, Cairo, Chicago, Madrid, Mexico City, Moscow, Mumbai, Nairobi, New Delhi, New York, Paris, San Francisco, São Paulo, Seoul, Shanghai, Singapore, Tokyo, Washington DC

6 The world this week

Leaders

- 9 **The future of conflict**
The next war
- 10 **Work-place arbitration**
Shut out by the small print
- 11 **Land in South Africa**
Don't do as Mugabe did
- 11 **Investment banks**
Sorpasso on the Street
- 12 **Trade tariffs**
Duties call

Letters

- 14 **On Donald Trump, ethnic minorities, Singapore, airports**

Briefing

- 17 **America and North Korea**
Face off

United States

- 21 **Shutdown politics**
Power off
- 22 **The federal budget**
Busted
- 23 **Drug trafficking**
The powder room
- 23 **Gerrymandering**
Say goodbye to Goofy
- 24 **Thrift and profit**
Dollar General
- 26 **Race and horses**
Rodeo drive
- 28 **Lexington**
The EPA

The Americas

- 29 **Brazil**
Lula's last stand?
- 30 **Honduras**
A tarnished presidency
- 30 **Jamaica**
Bad lottery vybz
- 31 **Bello**
How the middle class votes

Asia

- 32 **Caste prejudice in India**
Unconscionable
- 33 **North Korea's conglomerates**
From planes to mackerel
- 34 **The Rohingya diaspora**
Unwanted everywhere
- 35 **Banyan**
Asia: champion of free trade

China

- 36 **Personal data**
Privacy in peril
- 37 **Chinese rap**
No swearing or else

Middle East and Africa

- 38 **The war in Syria (1)**
Turkey moves in
- 39 **The war in Syria (2)**
Precarious Rojava
- 40 **Palestinian refugees**
Stripping the Strip
- 40 **African currencies**
Franc exchange
- 41 **Integrity idols**
Good clean entertainment
- 41 **Political prisoners in Ethiopia**
Setting them free
- 42 **South Africa's land reform**
How not to do it

Special report: The future of war
New battlegrounds
After page 42

Europe

- 43 **Welfare**
Battle of the benefits
- 45 **Italy's Lega Nord**
League of sceptics
- 46 **Ukraine and Russia**
Calling a bully a bully
- 46 **Finland's president**
Mr Congeniality
- 47 **Charlemagne**
Torn over Tehran



Washington shutdown A brief government closure revealed deep splits among Democrats and an increasingly poisonous debate over immigration, page 21. America's budget process swallows time but achieves too little, page 22



EU welfare Populists are winning votes by offering more generous welfare. How can mainstream parties respond? Page 43



Syria Turkey's offensive against the Kurds complicates an already chaotic war, page 38. Can the Kurds keep control of their territory? Page 39



Skiing Global warming and ageing populations pose a double threat to winter sports. The industry's response is making it all worse, page 51



American giants GM takes an unexpected lead in the race to develop autonomous vehicles, page 55. If they are to save the firm, GE's bosses and board need better information: Schumpeter, page 62



Investment banks The battle between Morgan Stanley and Goldman Sachs is a parable of post-crisis finance: leader, page 11. Morgan's recovery is a huge achievement with, so far, modest results, page 63. Volatility has been low, and that encourages risk-taking: Buttonwood, page 64. Blame recurring financial crises on the political temptations of deregulation: Free exchange, page 68

Britain

- 48 The politics of tax**
Sacred cows no more
- 49 Northern Ireland**
A little more conversation
- 50 Bagehot**
The Midlands engine

International

- 51 Winter sports**
Skiing goes downhill

Business

- 55 The car industry**
General Uber-Motors
- 56 Qualcomm's woes**
A fine habit
- 58 WhatsApp**
Zuckerberg's other headache
- 58 Luxury goods**
Online, upmarket
- 60 The avocado market**
Lack of guac
- 61 Arbitration agreements**
Kept out of the courthouse
- 62 Schumpeter**
GE's accounts

Finance and economics

- 63 Morgan Stanley**
Tediously does it
- 64 Buttonwood**
Volatility's eerie absence
- 65 Microfinance**
Bucks after the bang
- 65 European lending**
Avoiding the banks
- 66 Nigeria's economy**
Central-banker shortage
- 67 Poverty and migration**
Bangladeshi experiment
- 67 Hyperinflation**
Bolívar blues
- 68 Free exchange**
Regulating finance

Science and technology

- 70 Genomics**
Sequencing the world
- 71 Ethnomusicology**
Beyond Babel
- 72 Medicine**
Liver in a box
- 73 Supersonic flight**
Boom boxed

Books and arts

- 74 Political thought**
Why liberalism failed
- 75 Democracy in America**
The Trump train
- 76 Profane language**
Swearing is good for you
- 77 The second world war**
A lost memoir, now found
- 77 John Ashbery**
Wordsmith

80 Economic and financial indicators

Statistics on 42 economies, plus a closer look at the world's richest football clubs

Obituary

- 82 Paul Bocuse**
The maker of chefs



Gene mapping An ambitious effort to map, store and disseminate genetic information about much of life on Earth gets under way, page 70

Subscription service

For our latest subscription offers, visit Economist.com/offers. For subscription service, please contact by telephone, fax, web or mail at the details provided below:

North America

The Economist Subscription Center
P.O. Box 46978, St. Louis, MO 63146-6978
Telephone: +1 800 456 6086
Facsimile: +1 866 856 8075
E-mail: customerhelp@economist.com

Latin America & Mexico

The Economist Subscription Center
P.O. Box 46979, St. Louis, MO 63146-6979
Telephone: +1 636 449 5702
Facsimile: +1 636 449 5703
E-mail: customerhelp@economist.com

Subscription for 1 year (51 issues)

United States	US \$158.25 (plus tax)
Canada	CA \$158.25 (plus tax)
Latin America	US \$289 (plus tax)

Principal commercial offices:

The Adelphi Building, 1-11 John Adam Street, London WC2N 6HT
Tel: +44 (0) 20 7830 7000

Rue de l'Athénée 32
1206 Geneva, Switzerland
Tel: +41 22 566 2470

750 3rd Avenue, 5th Floor, New York, NY 10017
Tel: +1 212 541 0500

1301 Cityplaza Four,
12 Taikoo Wan Road, Taikoo Shing, Hong Kong
Tel: +852 2585 3888

Other commercial offices:

Chicago, Dubai, Frankfurt, Los Angeles, Paris, San Francisco and Singapore



PEFC/29-31-58

PEFC certified

This copy of *The Economist* is printed on paper sourced from sustainably managed forests certified to PEFC www.pefc.org





Investors trust independent advisors with over \$4 trillion of their money.

That's some serious trust.

Who you put your trust in matters. Independent Registered Investment Advisors are professionals held to a fiduciary standard. They exist to serve, not sell. That's why we support independent financial advisors. And why we think it's worth your time to learn more.

FindYourIndependentAdvisor.com

Ana G. | Independent financial advisor since 2002

Charles Schwab is committed to the success of over 7,500 independent financial advisors who are passionately dedicating themselves to helping people achieve their financial goals.



charles
SCHWAB

Own your tomorrow.

Source of industry size: Charles Schwab Strategy estimates February 2016. This content is made available and managed by Charles Schwab & Co., Inc. ("Schwab"). The purpose of this information is to educate investors about working with an independent Registered Investment Advisor (RIA). The RIAs and their representatives featured here use Schwab Advisor Services™ for custody, trading, and operational support. Inclusion should not be construed as a recommendation, an endorsement, or a sponsorship by Schwab. Many independent RIAs and other financial services professionals receive compensation for services in a variety of ways. Registration does not imply a certain level of skill or training. It is the responsibility of each investor to determine which method of compensation offers the lowest total costs and best serves the interests and needs of the investor. ©2018 Charles Schwab & Co., Inc. All rights reserved. Member SIPC. (0416-F1LX) (ADP92134-00) (06/16)

Politics



Backed by air strikes, **Turkish** troops attacked the **Syrian** region of Afrin, which is controlled by a Kurdish militia allied with America. Recep Tayyip Erdogan, the Turkish president, said Turkey will extend its offensive to the town of Manbij, which could bring it into direct conflict with American troops in the area.

Abdel-Fattah al-Sisi, **Egypt's** president, said he would run for re-election. He won't face much competition. Under pressure from the government, the last two major challengers called off their campaigns.

Olusegun Obasanjo, a former president of **Nigeria**, called on the current president, Muhammadu Buhari, not to run for a second term next year. It is the strongest signal yet that Mr Buhari may fail to garner enough support to win his party's nomination.

A former warlord in the **Central African Republic** was jailed after a conviction for his involvement in multiple murders. It is the first such conviction since a coup in 2012.

Shut and open

America's government was briefly **shut down** after Democrats and Republicans failed to agree on a spending bill. They eventually reached a compromise that promises a vote on the fate of the "DREAMers", migrants who came to America illegally as children. Many Democrats opposed the compromise, which funds the government only until February 8th, fearing they had given up a bargaining chip.

Pennsylvania's Supreme Court found that the boundaries of the state's congressional districts had been configured to favour Republicans and ordered that they be redrawn soon for this year's mid-term elections. It is the second time this year that a state has been found explicitly to have gerrymandered its congressional map along partisan lines (the other state being North Carolina).

Patrick Meehan, a Republican congressman from Pennsylvania, was removed from the House Ethics Committee, which has been investigating claims of **sexual harassment**, following an allegation that he had used public money to settle claims of misconduct brought by a former aide.

She's not quite there yet

Delegates from **Germany's** Social Democratic Party narrowly endorsed an outline coalition agreement with Angela Merkel's Christian Democrats. A month of detailed negotiations will now start, but a formal agreement will still have to be endorsed by a postal ballot of all party members. That remains a big obstacle.

The Speaker of Catalonia's parliament proposed that Carles Puigdemont be reappointed as leader of the region's government, threatening a fresh crisis with **Spain**, as he is in exile and faces arrest for sedition if he returns.



In **Paris** the River Seine burst its banks following exceptionally heavy rains. There are fears that water levels in the French capital could exceed those of 2016, when the city endured serious flooding.

Sinn Fein's new president will be Mary Lou McDonald, who will replace Gerry Adams when he steps down at a party meeting in February. Ms McDonald is an MP in **Ireland's** parliament (the nationalist party's leader in Northern Ireland is Michelle O'Neill).

Down, but not out?

A federal appeals court in **Brazil** upheld the conviction by a lower court of the former president, Luiz Inácio Lula da Silva, on charges of corruption and money-laundering. Lula is the early front-runner in Brazil's presidential election, to be held in October, but the appeals court's decision may bar him from running. He says he is innocent and that the charges are politically motivated.

Bolivia's president, Evo Morales, said he will ask the legislative assembly to repeal the new criminal code after weeks of protests by doctors and other groups against it. The law punishes medical workers guilty of malpractice with jail sentences of up to nine years.

Venezuela's constituent assembly, a body created to bypass the opposition-controlled legislature, announced that presidential elections will be held by the end of April. Although the government is responsible for hyperinflation and shortages of basic goods, the president, Nicolás Maduro, is expected to win re-election. The government has banned the most popular opposition leaders from running for office.

No place like home

Bangladesh delayed the start of the planned repatriation of **Rohingya** refugees to Myanmar, on the ground that it had not compiled a list of those ready to return. It is not clear how many of the 650,000 Rohingyas who fled an army-backed pogrom want to go home, or whether they would be safe if they did so.

In two separate incidents, Islamic militants stormed an expensive hotel in Kabul and the offices of Save the

Children, a charity, in the city of Jalalabad, killing 27 people in total. Save the Children suspended its operations in **Afghanistan** in response.

America imposed sanctions on various Chinese and North Korean companies and individuals it said were helping **North Korea's** nuclear programme. America and Japan also named several ships that they said were helping the North evade restrictions on its oil imports.

A Swedish citizen, Gui Minhai, was seized in **China** by plainclothes police in the presence of Swedish diplomats who were escorting him on a train. Mr Gui was among five Hong Kong-based booksellers who were snatched by Chinese agents in 2015. He was released last October, with restrictions on his movement, and was reportedly on his way to Beijing for a medical examination at the Swedish embassy.

China said 17.2m Chinese **babies** were born in 2017, about 630,000 fewer than the year before. The drop occurred despite the ending in 2016 of the country's long-standing and highly coercive one-child-per-couple policy and its replacement by a limit of two children for most families.



Researchers in China created two **cloned monkeys** using the nuclear-transfer technique employed to make Dolly the sheep. Previous monkey clones have been created by embryo splitting, an easier trick. Until now, nuclear transfer has not worked in primates. Its success this time is leading to speculation that humans will be next.

WITH AI, THE FUTURE IS OPEN TO SUGGESTIONS

Tools have always helped us achieve great things. Hitachi's AI is the tool that's pushing businesses further. Right now, we're already achieving various business goals—helping industries improve productivity, reduce costs and increase happiness. You simply set the outcome, and together with Hitachi's AI, we'll uncover the possibilities.

social-innovation.hitachi

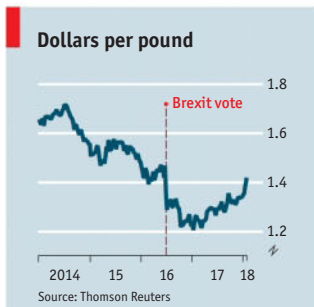
Hitachi Social Innovation



Business

The Trump administration dismayed advocates of **free trade** by slapping punitive tariffs on American imports of solar panels and washing machines, and defended the move as a way to protect American manufacturers threatened by cheap Asian goods. Chinese officials described the duties as a “misuse” of trade sanctions, but held back from imposing retaliatory measures. Meanwhile, 11 countries that border the Pacific, including Japan, Canada and Australia, agreed on the final draft of a free-trade pact, from which Mr Trump withdrew America during his early days in office.

Quids in



The **pound** breached \$1.40 for the first time since June 2016, when Britain’s vote to leave the EU prompted a sell-off in the currency. Sterling has risen against the **dollar** because markets are more optimistic that Brexit won’t end messily; the greenback has been falling steadily since Donald Trump came to power. Steven Mnuchin, the treasury secretary, welcomed a weak dollar, saying it would improve American trade prospects. After he made the remark the dollar fell to a three-year low against a basket of currencies.

The IMF issued an unusually upbeat assessment of the **world economy**, highlighting “notable upside surprises” in Europe and Asia that have helped lead to “the broadest synchronised global growth upsurge since 2010”. It revised its forecast upwards for world GDP growth in 2018 and 2019 to 3.9% for both years.

Paul Romer resigned as chief economist at the World Bank. His two-year tenure was a rocky one. Mr Romer had chided staff for their poor grammar and overuse of the word “and”, for example, and was recently embroiled in a row with staff about the methodology behind the bank’s annual ease of doing business report.

The American Senate confirmed **Jerome Powell** as the next chairman of the Federal Reserve. He will take over from Janet Yellen on February 3rd. The 84-13 vote in favour of Mr Powell was a wider margin of support than that for Ms Yellen four years ago, although several big hitters from both parties voted against him, including Elizabeth Warren, Ted Cruz and Marco Rubio.

Puerto Rico’s governor, Ricardo Rosselló, proposed privatising the island’s crippled and debt-laden electricity firm. Last year Mr Rosselló intervened to stop the utility, known as Prepa, from falling under the control of the federal oversight board that has been appointed to manage Puerto Rico’s bankruptcy. That was before Hurricane Maria. A third of homes and businesses are still without power.

The European Commission imposed a €997m (\$1.2bn) fine on **Qualcomm** for paying money to Apple between 2011 and 2016 with the aim of enticing it to place Qualcomm’s chips in all iPhones and iPads. It is the latest in a number of hefty antitrust penalties levied by various jurisdictions on Qualcomm, which is also tussling with Apple for allegedly overcharging for its intellectual-property licences.

There was no let up in **General Electric’s** misery. The troubled conglomerate reported a loss of \$9.8bn for the fourth quarter, as it booked a previously announced charge to its insurance business and took a \$3.5bn hit because of tax reform. It also revealed that the Securities and Exchange Commission is investigating its accounting practices.

Britain’s competition regulator concluded that the bid by Rupert Murdoch’s **21st Century Fox** to take full control of **Sky**, Britain’s premier subscription-tv broadcaster, would hand the Murdoch family “too much influence over public opinion and the political agenda”. Regulators may feel differently once Sky, and specifically its news channel, is in the hands of **Disney**,

which is buying 21st Century Fox’s entertainment assets, including its stake in Sky.

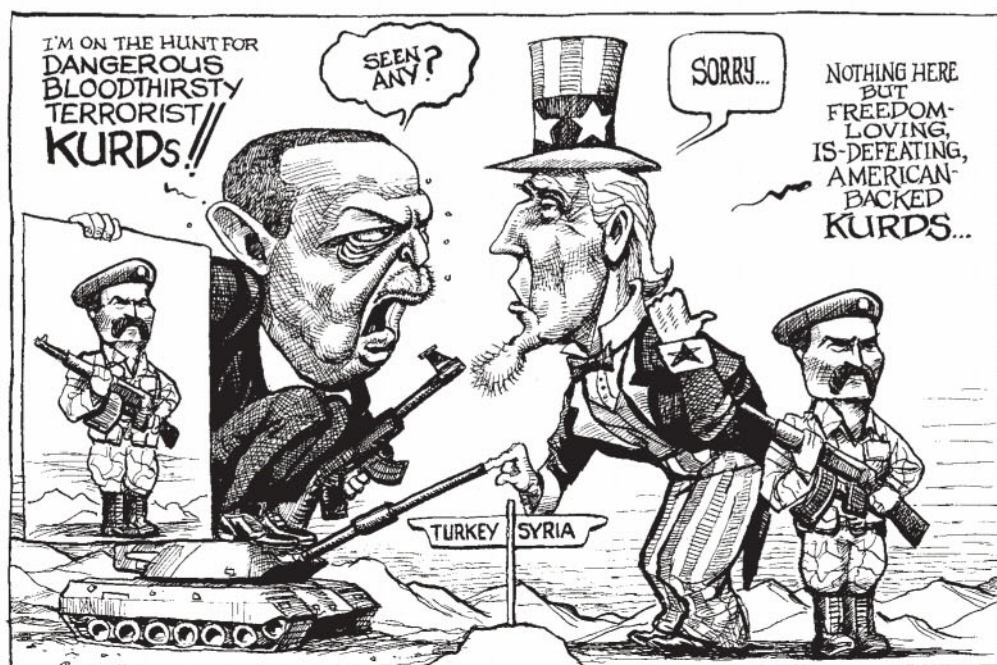
In its biggest deal for 17 years, **American International Group** agreed to pay \$5.6bn for **Validus**, a reinsurer based in Bermuda. AIG today is a much leaner insurance company than before the financial crisis; its acquisition of Validus signals the end of a long period of retrenchment for the firm.

The road ahead

Tesla Motors put forward a new ten-year pay deal for **Elon Musk** that links his compensation to very ambitious performance benchmarks. The boss of the electric-car company receives no salary, but he could be awarded up to \$55bn in share options if—a very big if—Tesla’s market value grows to \$650bn, from the \$58bn it is worth today.

As part of its restructuring process, **Toys ‘R’ Us** revealed that it will close around 180 of its 880 stores in America. Children outside the United States will be happy to hear that the company has no plans to close its more than 700 international stores, for now.

Other economic data and news can be found on pages 80-81



The next war

Shifts in geopolitics and technology are renewing the threat of great-power conflict



IN THE past 25 years war has claimed too many lives. Yet even as civil and religious strife have raged in Syria, central Africa, Afghanistan and Iraq, a devastating clash between the world's great powers has remained almost unimaginable.

No longer. Last week the Pentagon issued a new national defence strategy that put China and Russia above jihadism as the main threat to America. This week the chief of Britain's general staff warned of a Russian attack. Even now America and North Korea are perilously close to a conflict that risks dragging in China or escalating into nuclear catastrophe.

As our special report this week on the future of war argues, powerful, long-term shifts in geopolitics and the proliferation of new technologies are eroding the extraordinary military dominance that America and its allies have enjoyed. Conflict on a scale and intensity not seen since the second world war is once again plausible. The world is not prepared.

The pity of war

The pressing danger is of war on the Korean peninsula, perhaps this year. Donald Trump has vowed to prevent Kim Jong Un, North Korea's leader, from being able to strike America with nuclear-armed ballistic missiles, a capability that recent tests suggest he may have within months, if not already. Among many contingency plans, the Pentagon is considering a disabling pre-emptive strike against the North's nuclear sites. Despite low confidence in the success of such a strike, it must be prepared to carry out the president's order should he give it.

Even a limited attack could trigger all-out war. Analysts reckon that North Korean artillery can bombard Seoul, the South Korean capital, with 10,000 rounds a minute. Drones, midget submarines and tunnelling commandos could deploy biological, chemical and even nuclear weapons. Tens of thousands of people would perish; many more if nukes were used.

This newspaper has argued that the prospect of such horror means that, if diplomacy fails, North Korea should be contained and deterred instead. Although we stand by our argument, war is a real possibility (see page 17). Mr Trump and his advisers may conclude that a nuclear North would be so reckless, and so likely to cause nuclear proliferation, that it is better to risk war on the Korean peninsula today than a nuclear strike on an American city tomorrow.

Even if China stays out of a second Korean war, both it and Russia are entering into a renewal of great-power competition with the West. Their ambitions will be even harder to deal with than North Korea's. Three decades of unprecedented economic growth have provided China with the wealth to transform its armed forces, and given its leaders the sense that their moment has come. Russia, paradoxically, needs to assert itself now because it is in long-term decline. Its leaders have spent heavily to restore Russia's hard power, and they are willing to take risks to prove they deserve respect and a seat at the table.

Both countries have benefited from the international order

that America did most to establish and guarantee. But they see its pillars—universal human rights, democracy and the rule of law—as an imposition that excuses foreign meddling and undermines their own legitimacy. They are now revisionist states that want to challenge the status quo and look at their regions as spheres of influence to be dominated. For China, that means East Asia; for Russia, eastern Europe and Central Asia.

Neither China nor Russia wants a direct military confrontation with America that they would surely lose. But they are using their growing hard power in other ways, in particular by exploiting a “grey zone” where aggression and coercion work just below the level that would risk military confrontation with the West. In Ukraine Russia has blended force, misinformation, infiltration, cyberwar and economic blackmail in ways that democratic societies cannot copy and find hard to rebuff. China is more cautious, but it has claimed, occupied and garrisoned reefs and shoals in disputed waters.

China and Russia have harnessed military technologies invented by America, such as long-range precision-strike and electromagnetic-spectrum warfare, to raise the cost of intervention against them dramatically. Both have used asymmetric-warfare strategies to create “anti-access/area denial” networks. China aims to push American naval forces far out into the Pacific where they can no longer safely project power into the East and South China Seas. Russia wants the world to know that, from the Arctic to the Black Sea, it can call on greater firepower than its foes—and that it will not hesitate to do so.

If America allows China and Russia to establish regional hegemonies, either consciously or because its politics are too dysfunctional to muster a response, it will have given them a green light to pursue their interests by brute force. When that was last tried, the result was the first world war.

Nuclear weapons, largely a source of stability since 1945, may add to the danger. Their command-and-control systems are becoming vulnerable to hacking by new cyber-weapons or “blinding” of the satellites they depend on. A country under such an attack could find itself under pressure to choose between losing control of its nuclear weapons or using them.

Vain citadels

What should America do? Almost 20 years of strategic drift has played into the hands of Russia and China. George W. Bush's unsuccessful wars were a distraction and sapped support at home for America's global role. Barack Obama pursued a foreign policy of retrenchment, and was openly sceptical about the value of hard power. Today, Mr Trump says he wants to make America great again, but is going about it in exactly the wrong way. He shuns multilateral organisations, treats alliances as unwanted baggage and openly admires the authoritarian leaders of America's adversaries. It is as if Mr Trump wants America to give up defending the system it created and to join Russia and China as just another truculent revisionist power instead.

America needs to accept that it is a prime beneficiary of the international system and that it is the only power with the ability and the resources to protect it from sustained attack. ►►

▶ The soft power of patient and consistent diplomacy is vital, but must be backed by the hard power that China and Russia respect. America retains plenty of that hard power, but it is fast losing the edge in military technology that inspired confidence in its allies and fear in its foes.

To match its diplomacy, America needs to invest in new systems based on robotics, artificial intelligence, big data and directed-energy weapons. Belatedly, Mr Obama realised that America required a concerted effort to regain its technological lead, yet there is no guarantee that it will be the first to inno-

vate. Mr Trump and his successors need to redouble the effort.

The best guarantor of world peace is a strong America. Fortunately, it still enjoys advantages. It has rich and capable allies, still by far the world's most powerful armed forces, unrivalled war-fighting experience, the best systems engineers and the world's leading tech firms. Yet those advantages could all too easily be squandered. Without America's commitment to the international order and the hard power to defend it against determined and able challengers, the dangers will grow. If they do, the future of war could be closer than you think. ■

Mandatory arbitration in America

Shut out by the small print

Millions of American employees have no recourse to the courts



IN 2016 Misty Ashworth sued her employer, Five Guys, a fast-food chain, for sexual harassment and constructive dismissal. But the judge ruled that her case could not be heard in court. When she started the job, she had agreed to take any dis-

putes with her employer to private arbitration.

Ms Ashworth is not alone. Across private-sector workplaces in America, non-unionised employees are bound by mandatory-arbitration agreements. In the early 1990s such agreements covered only 2% of non-unionised workplaces; today they cover more than half.

The growing use of arbitration is partly an indictment of America's courts. Rarely is it in either side's interests to litigate for years and at great expense. Arbitration, by contrast, is quick and flexible. It lets both sides choose procedural hoops they would forgo in return for a speedy resolution. A neutral third party then hears the evidence and makes a decision.

Arbitration works well when power is balanced between the two sides: in commercial disputes between big firms, say. But the balance between an employer and an employee, particularly in low-wage occupations, is often anything but even (see page 61). And whereas the judicial system is designed, at least in theory, to treat people equally before the law, mandatory arbitration puts employees at a further disadvantage.

Arbitration clauses are often hidden in the contractual small print. Simply acknowledging the receipt of a staff handbook can count as a binding agreement to the terms it sets out. Even if workers do read everything, almost nobody starts a new job expecting to have to seek redress against their employer. When a dispute goes in front of arbitrators, their decisions are not subject to a review and, except in rare cases, cannot be appealed against. No public records of arbitration are kept. Even if a worker wins the case, confidentiality provisions can shield repeat offenders from exposure—as the ongoing wave of workplace-harassment revelations has shown.

This lack of scrutiny matters, because the incentives of those who adjudicate disputes are skewed in favour of employers. Arbitrators are extremely unlikely to come across the same employee in future cases, whereas repeat business with the employer is likely. Such a set-up could strain the neutrality of even the most upstanding arbitrator. Some large arbitration

firms do have a code of conduct, but less scrupulous firms are not policed at all. Studies suggest that repeat business is correlated with outcomes that favour the employer.

The scales appear to be tilting even further towards bosses. Mandatory-arbitration clauses are increasingly paired with bans on class-action suits by groups of employees. That raises the bar for workers to pursue complaints, by ensuring that each must establish—and finance—his or her case separately; it also lowers the risk that misconduct will damage an employer's finances or reputation. The Supreme Court is deliberating whether that violates labour rights. If past form is a guide, the court will rule that it does not: judges have consistently treated mandatory arbitration as just another contract.

How to increase the font size

Given that, and the failure of past attempts by Congress to impose bans, mandatory arbitration seems likely to stay. And indeed, it does have a part to play. Employers should be broadly free to contract privately with their workers. A default, low-cost forum for resolving disputes is a good idea—as long as it is designed to achieve fair outcomes. Fortunately, decent employers, ethical arbitrators and sensible regulation can deal with many of the problems that bedevil arbitration.

For a start, firms should aim to set up a fair process, by seeking informed consent, rather than smuggling arbitration clauses into unrelated documentation. A narrower interpretation from the courts on what constitutes consent would help, as would an opt-out period for employees. The clauses should allow workers to join together and to act collectively.

Arbitrators should be required to disclose conflicts of interest, including whether they have repeat work from the employer. Options to avoid implicit bias might include mandatory rotation of arbitration firms or a system of randomised selection. A requirement for arbitrators to offer a written justification of their decision would encourage rigorous thinking. If arbitrators get the law wrong, employees should be able to seek judicial review.

Tougher disclosure requirements ought to apply to judgments reached against the firm. Employers would be less tolerant of bad behaviour if they were required to disclose to investors how many settlements they reached and if they continued to employ repeat offenders. Make such changes, and both employees and employers could benefit from arbitration without anyone sacrificing their right to a fair hearing. ■

Land reform in South Africa

Don't do as Robert Mugabe did

To help the poor, try privatisation and property rights



OF THE many grievances from South Africa's decades of white rule, the theft of land still smarts more than most. The "Natives Land Act" of 1913 set aside 90% of the country for whites, who made up less than a third of its people. Over the next eight decades a succession of white governments evicted 3.5m black South Africans from their homes, in cities and in the countryside, prodding them onto the backs of lorries at gunpoint and dumping them in barren reservations misleadingly called "homelands". "Even criminals dropping straight from the gallows have an undisputed claim to six feet of ground," mourned Sol Plaatje, one of the founders of the African National Congress (ANC), in 1916.

When apartheid ended in 1994 the courts returned land to individuals who could show that they had been wrongfully deprived of it (a minority, given poor records and the passage of time). And the ANC, now in government, promised to buy 30% of the country's farmland at market rates to distribute to blacks by 1999 (see page 42). It has met only a third of this target and has extended the deadline for another ten years. Corruption, red tape and incompetence have hobbled land reform. Even without these problems, finding enough money to satisfy the ANC's ambition would be hard. The budget deficit is 4% of GDP and public debt has ballooned to over 50%.

Inevitably, the slow pace of redistribution is leading to calls for South Africa to take a short cut, by copying Robert Mugabe, the deposed ruler of Zimbabwe, who confiscated land from white farmers without paying. Julius Malema, South Africa's foremost populist firebrand, has urged his followers to take whatever land they fancy, because "it belongs to you." Jacob Zuma, South Africa's president, wants to change the constitu-

tion to let the state seize land without paying for it. At a conference in December the ANC voted to make this party policy.

It is a terrible idea. A central plank of the negotiated deal that ended apartheid peacefully was that property rights should be respected. If the government rips up title deeds, no sane investor will put money into South Africa and the economy will nosedive, as Zimbabwe tragically shows.

South Africa's government should certainly try to improve the lot of the poor, both because it is the right thing to do and to prevent the likes of Mr Malema from winning elections. But policy must fit South Africa as it is today. Two-thirds of South Africans now live in cities, and they are not going back to the countryside. They want jobs, schools and cleaner government, not fields to grow maize in. More than 70% list unemployment as their biggest worry. Only 2% say farming is. This is hardly surprising, as farming is about 2% of the economy.

The future is urban

Land reform is still a good idea, but it must be well-designed, cost-effective and part of a broader strategy to promote economic growth. First, the government should look in its own backyard. The state directly owns about 10% of South Africa's land. Some tracts, urban and rural, have squatters on them. Long-standing squatters should be given the land they live on. Much of the rest should be sold, and the money used to plug the deficit or improve social services. Another 15% of South Africa is "communal" land, most of which is owned by the state and which was reserved for black people under apartheid. Those who farm this land should be given title to it. This would give them an asset against which they could borrow, and the security of ownership that would encourage them to invest. Or they could sell up and move to Johannesburg. South Africa has plenty of land, but its future prosperity will be generated by clustering in cities, not scratching out a living on the farm. ■

Morgan Stanley v Goldman Sachs

Sorpasso on the Street

The battle of the investment banks is a parable of post-crisis finance



led Goldman was back in 2006. Back then, a heedless industry-wide race to win market share and raise returns was about to end in disaster. This time the industry is transformed, and the two investment banks are on strikingly different paths.

Morgan Stanley is being rewarded, above all, for its post-crisis

decision to take control of Smith Barney, Citigroup's wealth-management business. In 2012 the bank's core activity of selling and trading securities accounted for almost two-thirds of its net income, and wealth management for just over a quarter. The figures now are 55% and 40% respectively.

The mythology of Wall Street is built around big bets and contrarian calls; the business of helping the affluent manage their money lacks panache. But in post-crisis finance, glamour is out and stability is in. Wealth management offers relatively predictable returns and does not suck up too much capital. Morgan Stanley this month raised its return-on-equity targets—but only so far. On a conference call with analysts last week, the firm's bosses said that, if they achieved a return on equity ►►

▶ of more than 20%, commonplace during the go-go years, they would be doing something wrong (see page 63).

Goldman has changed much less since the crisis. James Gorman, Morgan Stanley's chief executive, made his way in wealth management; by contrast, Goldman's boss, Lloyd Blankfein, cut his teeth as a trader, and it shows. Goldman's business is lumpier and more volatile. It is more dependent than Morgan Stanley on its fixed-income, currencies and commodities (FICC) franchise. For a firm that sells itself on reading markets better than anyone else, that bet has hurt its reputation as well as its bottom line. Revenue from FICC in the fourth quarter of 2017 fell more precipitously, year on year, at Goldman than at its peers; for last year as a whole, revenue was not much more than a fifth of what it was in 2009.

The fixed-income business could yet revive, especially if interest rates rise and markets become more volatile (see Buttonwood). Regulators in America are planning to streamline the Volcker rule, a post-crisis ban on banks using their own money to trade. But the chances of the trading floors recovering past glories are vanishingly thin. Because regulators will go only so

far to loosen the shackles, the capital-intensity of businesses like FICC will still weigh on returns. And as bond markets gradually become electronic, banks' margins will shrink, just as they have in equity markets. Goldman itself openly acknowledges the need to change.

The boring companies

All of which makes Morgan Stanley's overtaking manoeuvre a parable for the industry. Lesson one is that, despite what bankers like to argue, it is possible to make a reasonable return in a more regulated environment. Lesson two is that dullness can be a selling-point. Investment banks used to promise shareholders outside returns as the trade-off for their peculiar mixture of volatility and opacity; that bargain looks much less appetising today. Lesson three is that power on Wall Street has tilted away from traders and high-octane clients like hedge funds towards a more prosaic cast of characters: brokers, passive asset managers, corporate treasurers and well-off individuals. Investment banks can still make decent returns. But not if they play by the same old rules. ■

Trade tariffs

Duties call

The Trump administration's trade restrictions are more damaging than they appear



ON TRADE, President Donald Trump has launched lots of investigations, withdrawn from one deal (see Banyan) and started the renegotiation of another. But this week is the first time he has put up a big new barrier. On January 22nd

he approved broad and punitive duties, of up to 30% on imports of solar panels and up to 50% on imports of washing machines. His backers say that the measure, which affects around \$10bn of imports, will protect American workers. His critics cling to the hope that the damage will be mild. Both are wrong.

Start with the claims made by the administration. Workers are also consumers, and Mr Trump's actions will whack them. Tariffs raise prices and dull competition. Whirlpool Corporation, the washing-machine maker which asked for the duties, knows as much. When, in 2006, it merged with Maytag, a rival, it quelled concerns about its high market share by pointing to competition from abroad. One study found that clothes-dryer prices rose by 14% after the merger. For washing machines, where import competition was fiercer, prices were unchanged.

Even if American wallets are pinched, surely American jobs are safer? Whirlpool is creating 200 new posts. Samsung and LG, two South Korean washing-machine makers, are ramping up their American production. But their deals were hatched before Mr Trump came into office, spurred in part by the logic of making heavy machines close to customers.

The solar industry is a clearer case. It has about 260,000 workers, a mere 2,000 of whom were making solar cells and panels at the end of 2016. The government reckons that the fastest-growing occupation over the next ten years will be that of solar installer. The Solar Energy Industries Association, a body that is enraged by the new tariffs, reckons that the industry will


support up to 23,000 fewer jobs because of them. Meanwhile, as if to underline the irony, the two companies that asked for protection are unlikely to be saved.

And do not forget that the tariffs may harm American industry more broadly. Restricting markets for imports tends to spark retaliation that restricts markets for exports—especially when, as with these latest tariffs, they affect everyone. China, supposedly the focus of American ire, produces 60% of the world's solar cells and is responsible for 21% of America's imports. But South Korea will also be hit, and its government is poised to dispute America's action at the World Trade Organisation. Other casualties include Mexico, Canada and the European Union.

President, not precedent

Critics of this week's tariffs draw solace from the fact that Mr Trump's actions were broadly in line with the steer from the United States International Trade Commission, a quasi-judicial review body, and in both cases were weaker than the petitioners had originally requested. They point out, too, that occupants of the Oval Office have resorted to global "safeguard" tariffs on 19 previous occasions.

That Mr Trump has stayed within the rules is small comfort: they give him enormous scope to poison world trade. And it would be wrong to skate over the differences between his administration and its predecessors. The last time this particular safeguard was applied was in 2002. It is especially belligerent. Past presidents remained wary of hurting American consumers, and mindful of international repercussions. Mr Trump, by contrast, seems to hold a steadfast belief that protectionism works. His rhetoric—and now his actions—invite aggrieved petitioners to apply for help. The logic of his stance on trade is to use tariffs not sparingly, but repeatedly and aggressively. Mr Trump is now open for business, just not the healthy sort. ■



Evolved over billions
of years...

Protecting your enterprise
in one hour.

The immune system has evolved over billions of years. But it takes just one hour to install one in your enterprise.

Using artificial intelligence, Darktrace can tell friend from foe, and catches threats that others miss. Even if they've never been seen before.

From quiet insider threats and zero-day attacks, to hacks of connected devices or industrial networks, our software sees it and responds.

Find out what's lurking inside your systems.

darktrace.com



DARKTRACE
World-Leading Cyber AI

Unhappy anniversary

I fundamentally disagree with the conclusion of your leader reviewing Donald Trump's first year in office. You let him off too lightly ("One year old", January 13th). The critical point comes in the final line of your argument: "He and his administration need to be held properly to account for what they actually do." Yet you reject what you describe as an "obsession" of Mr Trump's opponents with his character, and suggest that his lack of principles actually creates an opportunity for making deals.

In a country still torn by racial divisions, Mr Trump's comments after Charlottesville matter a great deal. In a country whose constitution enshrines free speech, labelling the press as "the enemy of the people" matters a great deal. Blatant disregard for the truth matters a great deal, as does encouraging violence by the police. The list goes on and is as long as your arm.

You are wrong to imply that calling attention to this type of behaviour is frivolous. Democracy and its institutions are fragile and precious. The presidency matters more, domestically and overseas, than the simple tally of legislative achievements. All democratically elected leaders should be held to account for their character, their honesty and their effect on the fabric of their nations. As the leader of the free world, America's president should be held to the highest standards of all.

In some ways, your arguments demonstrate the extent to which our society has been anaesthetised by Mr Trump and his kind. Many of those who hold him to account for his ethics and his words do so not "as an exercise in wish fulfilment" to remove him from office but because they have a grasp of the magnitude of the issues facing the United States, a love of their country and a belief that integrity, morality and character are important. The president's weak character and dishonesty contribute greatly to the erosion of trust in democratic

institutions, an ever-increasing partisanship, greater social divisions and the consequential breakdown in the ability of society to find solutions to pressing problems.

JONATHAN TURNER
San Francisco

Shame on you. Your blinding desire to highlight the liberal left makes you write articles, such as your piece on Mr Trump's first year, that are incorrect and totally inaccurate. Liberals (Democrats) need to learn how to lose. You'll be back in power one day and you'll have your chance once more. For the time being, let Mr Trump do his job. His potential mistakes may give you abundant ammunition to demonstrate that he is wrong, but let the guy prove you right. Be good losers and remember that the country comes before any political ideology.

ANDY VAN WALLEGHEM
Cypress, Texas

Marginalised communities

It was very welcome to see a thoughtful article on the dire situation of Gypsies and Travellers in Britain who find themselves newly ineligible to apply for an authorised encampment ("No place to roam", January 13th). The most unjust effect, however, is on the most vulnerable—those who cannot travel for reasons of ill-health or extreme old age—and who now cannot rely on any national planning advice of the sort which used to enable them to continue to live within the Gypsy and Traveller ethnic way of life.

I should add that ethnicity has been legally established, in the case of Romani Gypsies (*Commission for Racial Equality v Dutton*, 1989) and Irish Travellers (*O'Leary v Allied Domecq*, 2000), which is why they should be spelt with capitals G and T. You wouldn't want to write "jews" or "sikhs", would you?

JANET WHITAKER
Co-chair
All-Party Parliamentary Group
for Gypsies, Travellers and Roma
House of Lords
London

Singaporean values

"Rules are thicker than blood" (January 13th) derided Singapore's norms on what constitutes a family as "Victorian". Our values and social norms on what makes for a stable family unit are conservative and shape the government's policies and rules on adoption. They differ from today's Western norms, which are historically recent and by no means uncontested, even in Western societies. Singaporeans will determine their own pace of any change in family values.

A push for rapid social change, especially on contentious moral issues, risks polarising society and producing unintended results. In Singapore nearly all children are born and raised in wedlock, starkly different from what now happens in the West. We make no claim to know which values are best for every society. *The Economist* may think Singapore is quaint and old-fashioned, but time will tell if a cautious approach to social change is wiser.

FOO CHI HSIA
High commissioner for
Singapore
London

Terminal decline

The main issue that prevents America's airports from providing the best possible passenger experience is a woefully understaffed Customs and Border Protection agency ("Departure gates of hell", January 6th). To ensure greater efficiency and security, airports, including Miami International, have called for increases in CBP front-line staff, for which Congress needs to provide the funding. CBP has for years faced a shortage of thousands of officers across all our air, land and sea ports. This is a problem that will only get worse when enhanced border-security measures further delay the traffic transiting through these ports.

KEVIN BURKE
President and CEO
Airports Council International,
North America
Washington, DC

Say what you like about Washington Dulles, JFK and Miami, but you left out one American airport that has managed to earn the wrath of both Donald Trump and Joe Biden: LaGuardia. Both men have said travelling through LaGuardia is like being in the "third world".

MIKE GALLAGHER
Doha, Qatar

No list of the world's worst airports is complete without a special mention for certain terminals at Paris Charles de Gaulle. In these Houses of Dread, the ratio of border officials to passengers is sometimes one to a thousand. Pickpockets and hustlers zero in on you under the sight of unconcerned policemen. Taxi drivers insult you copiously if you want to pay by card. The airport's Wi-Fi gives you an advance taste of escargots.



ROMAIN POIROT-LELLIG
Paris



I nominate Atlanta. It has the longest queues and most bolshie officials, even by American standards. When my feisty French wife expressed concern at missing our transit flight, the gentleman replied, "Lady, at this point your only concern is: am I going to allow you into my country or not?" My British passport full of visas to Russia, Qatar and so on, required an explanation for each stamp. Yes we missed our flight. And they lost our luggage.

DAVID LING
Eguisheim, France ■

Letters are welcome and should be addressed to the Editor at The Economist, The Adelphi Building, 1-11 John Adam Street, London WC2N 6HT
E-mail: letters@economist.com
More letters are available at:
Economist.com/letters

**Deputy Director General
International and European Relations
European Central Bank**

As a successful applicant you will join the senior management team of one of the core business areas of the ECB and be able to contribute to a broad range of topics, such as the functioning of the international monetary and financial system, economic developments in advanced and emerging economies and the deepening of Economic and Monetary Union in Europe. The position will also offer you the possibility to collaborate with key central banks and international organisations and contribute to the ECB's policy positions and research agenda in international and EU/euro area issues.

Qualifications, experience and skills

- a master's degree in economics, finance or business administration, a PhD and/or a publishing record in international macroeconomics would be considered an asset
- ideally, more than ten years of relevant professional experience in the areas in which the Directorate General operates
- extensive experience, of at least five years, in leading and managing teams of highly qualified staff from diverse, preferably multinational backgrounds, and experience in leading management teams
- ample knowledge of the functioning of international and European institutions and fora, preferably drawn from your own professional experience

Application
Further information and submission of applications online via www.ecb.europa.eu/careers/vacancies by 2 February 2018. Female candidates are particularly encouraged to apply.




**Wim Duisenberg Research
Fellowship Programme
2018 - 2019**

Call for research proposals

Fellowship position

The European Central Bank (ECB) is seeking applications from leading researchers for the Wim Duisenberg Research Fellowship. Fellowships are awarded annually. Successful candidates will conduct economic research in the ECB's Directorate General Research (DG/R) for a period of two to twelve months during 2018 or 2019. The aim of the Wim Duisenberg Research Fellowship Programme, which was established in 2006, is threefold:

- promote policy-relevant research that meets the highest academic standards;
- expose ECB research staff to recent advances in economic research;
- give scholars the opportunity to gain an insight into the policy-making environment of the ECB.

Further information can be retrieved at: www.ecb.europa.eu/pub/economic-research/programmes/duisenberg/html/index.en.html

Service to provide

Research fellows will conduct their activities at the ECB in Frankfurt and will be encouraged to interact with ECB staff members from both DG/R and other business areas. While at the ECB, research fellows will be expected to complete a research paper for presentation at internal seminars and for publication in the ECB's Working Paper Series. Successful candidates will be offered a monthly allowance in line with the seniority of the described profile.

Qualifications and experience

Selected candidates shall hold a PhD from a leading university and have an outstanding publication record in top academic journals.

Application

Applications should include:

- a detailed curriculum vitae including publication record;
- a one-page research proposal;
- preferred time period.

Applications should be submitted by e-mail to WDFP@ecb.europa.eu

Deadline for applications: 30 April 2018.



Henley & Partners is the global leader in residence and citizenship planning. Each year, hundreds of wealthy individuals, families and their advisors rely on our expertise and experience in this area. Our highly qualified professionals work together as one team in over 30 offices worldwide.

The firm also runs a leading government advisory practice which has raised more than USD 6 billion in foreign direct investment. We have been involved in strategic consulting and the design, set-up and operation of the world's most successful residence and citizenship programs.

Henley & Partners is looking to appoint a new

Government Advisory Consultant

He or she will interact with governments worldwide and work with the team to strategically consult on as well as design, improve, and implement residence and citizenship programs.

For a detailed description of the expectations, responsibilities and desired qualifications, visit henleyglobal.com or email recruitment@henleyglobal.com

The Firm of Global Citizens®

A New Challenge?

Unique access to global unadvertised vacancies for Executives on £150k to £1m+

InterExec is the global leader in the confidential promotion of Top Executives to the pinnacle of their careers. Through our 12,000 strong International Network and in-depth market knowledge we act discreetly to provide unrivalled access to prime opportunities worldwide.

InterExec
UNIQUE NETWORK ♦ OUTSTANDING TALENT

london@interexec.net www.interexec.net +44 (0)20 7256 9972



COURT OF JUSTICE
OF THE EUROPEAN UNION

The Court of Justice of the European Union, Luxembourg, is inviting applications for the post of

DIRECTOR GENERAL FOR INFORMATION

The Directorate General of Information's mission is to produce, manage and store all information concerning the activities of the institution. It comprises the Directorate for Information Technology, the Library Directorate and the Communications Directorate.

Reporting to the Registrar of the Court of Justice, the Director General will be responsible, in particular, for defining and implementing a strategy for the management of knowledge and information in line with the priorities established by the institution, in particular in the light of its specific nature as a judicial body.

The successful candidate will be appointed as an official of the Court of Justice, in accordance with Article 29(2) of the EU Staff Regulations, at grade AD 15 or AD 16.

Further details, as well as information regarding the requirements for the job and the application procedure are available at :

www.curia.europa.eu/jobs

Deadline for applications is 31 January 2018.

www.curia.europa.eu



SHELTER AFRIQUE
Financing Affordable Housing for Africa

INDEPENDENT DIRECTOR

SHELTER-AFRIQUE is a regional Housing Finance Institution established by African Governments and the African Development Bank dedicated to investment in housing and urban developing in African countries. The current shareholding comprises 44 African countries, the African Development Bank and the African Re-Insurance Corporation. In order to enhance its corporate governance, the Institution with its headquarters in Nairobi would like to fill a vacancy on its Board of Directors for the position of Independent Director with speciality in investment analysis, construction finance, debt restructuring and/or capital raising from nationals of its member countries.

The Director shall be expected to:

1. Actively participate in the Board Committees and Board meetings and deliberations as any other director;
2. Provide technical, financial, and other independent expertise to the Board;
3. Reduce potential conflicts between the management and wider interest of the Company and Shareholders;
4. Provide the benefit of their experience and know-how to decision making by the Board;
5. Lead some of the Board's Committees;
6. Independent Director shall serve for a term of 3 years renewable only once;

Minimum Qualifications and experience:

1. Prospective candidates must have at least ten-year experience as a Director of the board of directors of a reputable local or International organization;
2. The Director should have qualifications and experience in investment analysis, low-income housing construction project finance, debt restructuring and/or capital raising.
3. He/She will have an MBA or other advanced business degree with at least 10 years professional experience.
4. The Independent director shall have no material relationship with the Institution beyond his or her directorship and who:
 - » Has not been an employee or an officer of Shelter-Afrique for the preceding five financial years;
 - » Has not been an employee or an officer of a company directly or indirectly controlled by the Institution;
 - » Has not been a client, or financial agent in business in relation with the Institution;
 - » Has no family links with the senior officers of the Institution;
 - » Has not, during the last five years, worked for the Institution in a professional capacity e.g. as its auditor or corporate lawyer;
 - » Has not been a director of the Institution during the last twelve years
 - » Does not represent any Shareholder or group of Shareholders;

COMPENSATION:

Shelter-Afrique shall offer competitive and attractive compensation to the Independent directors to include travel and other costs as well as sitting allowances and/or director fees for both Board and Committee meetings.

APPLICATIONS:

Applicants are invited to send a cover letter illustrating their suitability against the listed qualifications and detailed curriculum vitae as well as names and addresses of the referees to executive@shelterafrique.org and/or Shelter Afrique Center Longonot Road Upper Hill PO Box 41479-00100, Nairobi Kenya.

Applicants should indicate the position applied for as the subject line of their email submissions. The deadline for submission is **21st February 2018**. Only short-listed applicants meeting the above requirements will be contacted.

We invite you to learn more about Shelter-Afrique by accessing our website: www.shelterafrique.org



Face off

WASHINGTON, DC

Hope that Donald Trump is bluffing over North Korea, but do not count on it

THE last time that America almost risked a pre-emptive strike on North Korea the gamble offered a spectacular pay-off. Ashton Carter, a leading architect of that plan, recalls that his scheme for bombing the Yongbyon nuclear facility in 1994 assumed that in one or two days the entirety of the regime's nuclear programme could be levelled and entombed in rubble. Mr Carter, who went on to become defence secretary in the Obama administration, now thinks that an American first strike would only put "a significant dent" in North Korea's arsenal of nuclear devices and bombmaking sites. "The difference today is that the North Koreans are very good at hiding, burying and moving around their nuclear infrastructure," says Mr Carter, now at Harvard University.

If the potential upsides of a strike have shrunk, the risks have grown hugely. The crisis of 1994 saw Kim Il Sung thwart international inspections and threaten to put plutonium from Yongbyon into half a dozen primitive bombs. Since then power passed to the despot's son and in 2011 to his grandson, Kim Jong Un, a young man in a hurry who has to date never met a foreign leader, even from China, the closest his all-but-friendless kingdom has to an ally. North Korea has tested six nuclear devices between 2006 and 2017, including what ap-

peared to be a hydrogen bomb, and produced enough plutonium and uranium for possibly dozens more warheads. Its missiles credibly threaten American territory in Guam, Hawaii or even the continental United States, even if officials do not believe a North Korean nuclear-tipped rocket can yet reach an American city.

Just because war in Korea would be unspeakably dangerous does not mean that it will not happen. Sober officials with long careers in Asia policy talk of being more fearful than at any time in recent memory. America is governed by Donald Trump, who revels in matching North Korea in bluster. He has called Mr Kim "Little Rocket Man" and a "sick puppy", and promised that continued North Korean threats to America "will be met with fire and fury like the world has never seen". Mr Trump has at times called diplomacy with the Kim regime "a waste of time". He is also scornful of allies and alliances, causing one Japanese expert to identify a grave concern: "that Trump will come up with a military option and not take the costs seriously." It is not just Mr Trump. The generals seen as a steadying influence on the president have given warnings that the Kim regime cannot be permitted to build weapons that threaten American territory.

General Joseph Dunford, chairman of

the joint chiefs of staff and a man who wields his influence discreetly, last year chided anyone who thinks it unimaginable that America might use force to check a North Korean nuclear menace. "What's unimaginable to me is allowing a capability that would allow a nuclear weapon to land in Denver, Colorado," he said. In August 2017 H.R. McMaster, a lieutenant-general who is national security adviser to Mr Trump, scolded an Obama-era predecessor, Susan Rice, for suggesting that their country could contain and deter a nuclear-armed North Korea, as it did the Soviet Union. "She's not right," chided Mr McMaster, asking how "classical deterrence theory" could apply to so brutal a regime.

On manoeuvres

Even the defence secretary, James Mattis, a cerebral former Marine general who says his job is to "buy time for our diplomats" to solve the North Korean crisis, has weighed in. Put on the spot by reporters in September 2017, he insisted that there are military options that would not imperil Seoul, the South Korean capital, though its 10m inhabitants live within range of the North's artillery and missiles. Such options exist, he said, "but I will not go into details."

Others sound less certain. Mr Carter notes—with tact—that retaliating against a foreign attack is the standing policy of the North Korean armed forces. "If the us and South Korea decided to initiate a strike, we would have to make sure that we were thoroughly prepared for a full-on conflict," he says. Invited to contemplate military options that would not put Seoul in harm's way Abraham Denmark, a Pentagon official during the Obama era who worked on ▶▶

▶ Korea policy, answers simply: “I can’t imagine what those could be.”

Discussions of Korea strategy quickly drift into seemingly impossible tangles, involving deadly Stalinist court politics and fantastical perils. Official reports detail the North’s nuclear, biological and chemical arsenals, and artillery pieces in hardened bunkers just north of the demilitarised zone (DMZ) that divides the two Koreas, which some analysts estimate can fire 10,000 rounds a minute at Seoul. A Pentagon report of 2015 talks of North Korean drones, midget-submarines and of commandos who may attack targets in South Korea “via suspected underground, cross-DMZ tunnels”. Mr Mattis has said a Korean conflict “would probably be the worst kind of fighting in most people’s lifetimes”.

Still, responding to presidential demands for more and better options, officials are debating possible “preventive” strikes, a term denoting actions taken earlier than “pre-emptive” attacks in response to an imminent threat, like a missile being readied for launch.

Untangled logic

At root, however, debates about Korea strategy turn on two starkly straightforward questions, spelled out in interviews with serving and former defence and national-security officials, diplomats and spies, including several with personal experience of negotiating with North Korea. First, will China ever break decisively with North Korea, its infuriating neighbour but valued buffer against the world? Second, can Mr Kim be deterred? For if he cannot, then any responsible American president must contemplate a strike, risking what the Japanese expert summarises as “tens of thousands of casualties today to prevent millions tomorrow”.

Aides to Mr Trump boast that the president’s resolve explains China’s support for UN Security Council sanctions of unprecedented severity, including curbs on North Korean exports of coal and textiles and on flows of oil and refined petroleum from China. A senior State Department official recalls Mr Trump’s order to strike Syria with Tomahawk cruise missiles in April 2017, during dinner with the Chinese president, Xi Jinping, at Mar-a-Lago, his Florida estate. That strike, enforcing a red line over Syria’s use of chemical weapons, “put military action back into our diplomacy”, says the official. “It was an important data point that China internalised.”

In fact China has yet to abandon a long-standing hierarchy of Korean horror in which a nuclear-armed North ranks second. For China, it is pipped by the prospect of a chaotic fall of the Kim regime, followed by a reunification of the two Koreas on Western terms, lining China’s border with American allies and high-powered American radars (or worse, hulking GIS in

Oakley sunglasses).

Team Trump has tried sweet reason. Rex Tillerson, the secretary of state, joined Mr Mattis in assuring China publicly that as it pursues the denuclearisation of the Korean peninsula, America has no interest in regime change or accelerated reunification, seeks no excuse to garrison troops north of the DMZ and has no desire to harm the “long-suffering North Korean people”, as distinct from their rulers.

Revealing a once closely held secret, Mr Tillerson told the Atlantic Council, a Washington think-tank, last December about “conversations” with China about how the two countries might secure loose nuclear weapons should North Korea fall into chaos. This included assurances that American forces would retreat south of the DMZ when conditions allowed. Less sweetly, the senior official at the State Department says that when Mr Tillerson first met his Chinese counterparts, Yang Jiechi and Wang Yi, in March 2017, he told them that “we are out of time” and to drop their long-standing view of North Korea as an asset that keeps America usefully tied up.

Mr Tillerson told China that it can help America do more “the easy way or the hard way”, with the hard way meaning secondary sanctions on Chinese entities that trade with North Korea, and credible threats that Mr Trump is “serious about the military option if we cannot resolve this diplomatically”. Addressing that hierarchy of horror, the aim is to convince Chinese leaders that the very thing they fear most—instability next door, followed by an Asian nuclear-arms race—will be brought about by continued toleration of America’s

worst fear, namely North Korean nukes.

Put that way, the Korean dilemma arguably revolves around a single question: is Mr Trump bluffing? Should North Korea, China and the wider world believe that America will use force to prevent Mr Kim from building a nuclear missile that can strike Washington, DC, or Los Angeles?

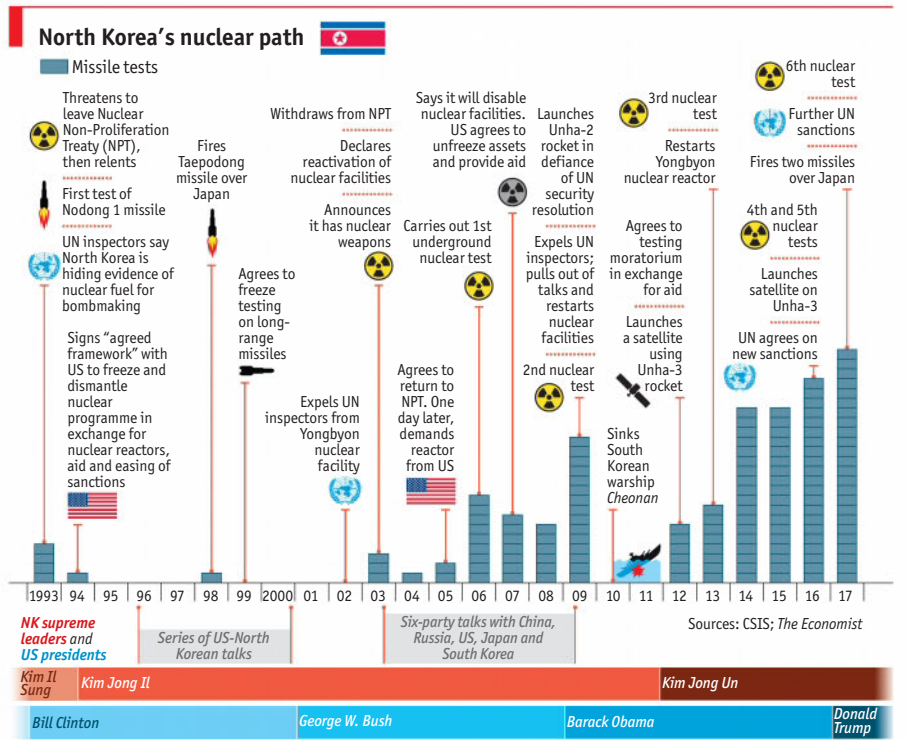
Team Trump is at pains to explain why the boss is not bluffing, and why 2018 is, in the words of one senior administration official, “a very dangerous year”. That official pointedly praises Israel for twice launching air strikes against suspected nuclear weapons sites, once in 1981 against the Osirak reactor being built by Iraq, and in 2007 against a reactor in Syria allegedly under construction with North Korean help.

Strike one, strike two...

The official calls those strikes “textbook cases” of preventive action. He draws attention to a Trump tweet in late December, linking to a television interview that Mr Trump gave as a private businessman in 1999, urging America to “negotiate like crazy” with North Korea but, if talks failed, to “do something now” before warheads are aimed at New York and other cities.

Strikingly, though, when asked point blank whether Mr Trump has already set red lines that North Korea may not cross, officials will only reply that as a general rule, they are very careful about drawing red lines. Though news outlets have reported debates about giving North Korea a “bloody nose”, an official calls that phrase “a fiction of the press”.

Insiders deny that the Trump administration is dividing into camps of hawks and ▶▶



doves, with each taking a different view of the utility of talks. A clearer divide turns on relative optimism or pessimism about Mr Kim's intentions, with Mr McMaster a leading voice of doom (he has compared this moment of geopolitical peril to 1914). In particular, pessimists doubt North Korea's claim that it wants nuclear weapons that can hit America for self-defence.

Undeterred?

Logic, and Mr Kim's own words, point to a nuclear programme with grander ambitions, perhaps to "drive the us from the peninsula" or reunify Korea under the North's flag, argues the senior administration official. "Why should a regime starve a couple of million of its own people to death, expose itself to punishing sanctions, [and] allow itself to be isolated by all its friends, merely to gain a deterrent that they already had for 60 years, from artillery pieces pointed at Seoul?"

Several officials and ex-officials who see the value of frightening Mr Kim to the negotiating table hope privately that Mr Trump is bluffing, believing that a limited strike would risk massive retaliation. Even narrowly-focused operations North of the border are deemed risky. In late 2016 Mr Obama's National Security Council organised a war game, asking military, diplomatic and intelligence officials to simulate a mission to secure nuclear weapons in a North Korea tumbling into instability.

Participants call the exercise deeply sobering, with so many American troops needed to secure the large number of nuclear sites that it could take months to build them up, losing any element of surprise, and raising seemingly insuperable questions about when to evacuate Americans from the region without triggering chaos. An unclassified letter sent by the Pentagon to Congress in November 2017 offered the assessment that only a ground invasion could find and secure all weapons sites.

A senior American official recalls being asked by foreign counterparts why Mr Kim could not simply be killed. In reply he would point to the outside world's dangerous lack of knowledge about what orders the leader's death might trigger: "We seriously don't know that there isn't some sort of automatic doomsday process that pulls down the pillars of the temple." The same official asked military colleagues for "horse's head on the pillow" options that would terrify Mr Kim without triggering a full-scale response. "Nobody I spoke to in the military had an idea that could reliably thread the needle," he says.

Scenarios for limited strikes could include the shooting down of a North Korean ballistic missile test. But a failure would damage the credibility of American defences. There is also a dangerous paradox attached to any action launched on the grounds that North Korea is deemed deaf

to reason, notes Joseph DeTrani, a former intelligence officer and commentator for "The Cipher Brief", a national-security website, who is also a semi-official envoy entrusted with meeting senior North Korean diplomats.

If trust vanishes, North Koreans "may see an imminent threat coming to them that is not an imminent threat", disbelieving assurances that a strike is limited. In his experience, the country's diplomats are professional and informed about the world. But that only helps if their advice reaches core leaders, who also hear from "hardliners in North Korea [whom] we do not know," cautions Mr DeTrani. He disagrees with colleagues (and there are many) who call Mr Trump's tweets unhelpful. On balance it is positive for North Koreans to hear directly from the president,



he says. They understand bombast.

Optimists note that America has real points of leverage, even without force. Mr Carter urges step-by-step "coercive diplomacy", setting out specific sticks and carrots for discrete North Korean actions, from missile tests to underground nuclear tests. If China proves incapable of playing a positive role, he recommends it is "sidelined".

Several officials say that China's willingness to toughen sanctions is mostly about managing America, which is seen as one of two irresponsible powers, alongside North Korea, distracting Chinese leaders from their domestic priorities. "The Chinese are more upset with the North Koreans for waking the American giant," says an American official.

China is now enforcing UN trade embargoes on North Korea more strictly, in part to ward off American sanctions targeting specific Chinese banks and oil traders, though diplomats still deplore Chinese "salami-slicing" of each new sanctions plan. By a process of elimination, China now backs "pressure that will placate the Americans without being strong enough to [make the Kim regime] collapse," says

the official. Meanwhile, China continues to argue for America to freeze military exercises and curb deployments of advanced weapons in Asia. China is always "willing to bargain away the American military footprint", growls a second official.

A final camp combines scepticism about North Korea's motives—dismissing Mr Kim's claims to need nuclear weapons as a deterrent—with (relative) optimism about sanctions. A Western diplomat says that North Korea believes that, if it can become the only nation with a long-range nuclear capability other than America, Britain, China, France and Russia, it will be welcomed to an "elite club", free of all sanctions, "which is pie in the sky".

This camp would use North Korea's ambitions against it. Daniel Russel, former assistant secretary of state for East Asian and Pacific affairs during the Obama era, shares the pessimists' belief that North Korea does not need nuclear weapons for deterrence, securing its safety with its ability to bombard Seoul. Nor does it need missiles—it can already detonate a nuclear device smuggled into South Korea, even if that would be suicidal.

Mr Russel argues that the North's goal is money and other concessions. If through sustained sanctions "North Korea is denied the pay-off, the ransom it is seeking, it hasn't actually achieved the [right] return on investment on the nuclear programme," says Mr Russel, now at the Asia Society. A sense of being squeezed without reward is spreading discontent among the elites, he says. "The ability to limit Kim's ability to govern, via sanctions, is the best leverage we have."

Ironically, given all the focus in Washington on Mr Trump's impulsive ways, insiders worry most about a crisis that is thrust upon him. They fear that China and North Korea are both waiting Mr Trump out, hoping that he loses the White House or become distracted by other crises.

Mutual incomprehension

Mr Denmark speaks for several officials when expressing dread about Mr Kim misjudging some fresh provocation. In 2010 the North sank the *Cheonan*, a South Korean patrol ship, killing 46 sailors. He fears Mr Kim trying a similar act today, thinking that America will not respond. The North might overreact to American demonstrations of will, such as bomber flights off the coast, says Mr Denmark. "What's to stop the North Koreans thinking that's the beginning of an attack? That keeps me up. Who has launch authority on the North Korean side in the middle of the night?"

On the other side stands Mr Trump, a wild card who may soon face risks he deems intolerable while lacking any good options. "The president may be forced to take action," a US official says. "The potential for conflict is very high." ■



LET'S BUILD A BETTER WORLD FOR INVESTING. LET'S MEASURE UP.

Let's make the financial world as diverse as the one we live in.
Let's put ethics at the heart of everything we do.
Let's always put investors' needs above our own.
Let's deliver real value for the investment fees we charge.
Let's create jobs, build bridges, ensure prosperity.

Let's do our part. Let's start today. Let's measure up.

Get started at letsmeasureup.org



CFA Institute
LET'S MEASURE UP™



Also in this section

- 22 Federal budgeting is busted**

- 23 Stopping the supply of fentanyl**

- 23 Gerrymandering in Pennsylvania**

- 24 Dollar General**

- 26 Race and horses**

- 28 Lexington: Salting the earth**

For daily analysis and debate on America, visit

Economist.com/unitedstates
Economist.com/blogs/democracyinamerica

Shutdown politics

Power off

WASHINGTON, DC

The brief government closure revealed deep splits among Democrats and an increasingly poisonous debate over immigration

IF YOU want to shut down a government as painlessly as possible, do it over a weekend. The federal government closed for business at 12.01am on Saturday, January 20th and reopened on Monday night, after the Senate passed a bill to fund it until February 8th. This was the ninth such shutdown since 1980. Because the party with less power in Washington can usually derail the annual budgeting process, it will not be the last. Familiarity breeds eye-rolling. It is nevertheless remarkable that the world's pre-eminent power so frequently fails to pay for its government on time. And though the shutdown is over, the disputes that provoked it remain unresolved, and look likely to recur in the coming weeks.

Republicans have an inherent advantage in shutdown politics. The party's animating philosophy is that government should be smaller and do less. A closed government does less. When Democrats back a shutdown, as happened this time, it undercuts their claim to be the non-crazy party of governance and regular order. This bias towards stability can enrage the party's left flank, whose members have a grudging respect for Republican intransigence. After the deal was done, demonstrators chanting "Undocumented, Unafraid" and "They say get back; We say fight back" packed the hallway outside the office of Charles Schumer, the Democrats' leader in the Senate.

The blockage was cleared by a face-sav-

ing manoeuvre. Democrats agreed to reopen the government without getting their chief demand—a legislative fix for Deferred Action for Childhood Arrivals (DACA), Barack Obama's executive order that shielded from deportation about 800,000 undocumented immigrants brought to America as children, which President Donald Trump cancelled last September. Republicans, for their part, loaded up the reopening bill with six years of funding for the Children's Health Insurance Programme, which provides health insurance to poor children. Mitch McConnell, the Senate majority leader, suggested he would bring a DACA bill up for a vote before February 8th.

Mindful of future primaries, and of the more than a million people who took to the streets in the Women's March two days earlier to protest against Mr Trump, Democratic senators with presidential aspirations voted no. Ben Wikler of MoveOn, a pressure group allied with the Democrats, says that once the party had made the decision to stand and fight, the best thing to do would have been to "make your case to the public... Democrats and pro-DREAMERS [as DACA recipients are known] have a winning argument to make." Polls back Mr Wikler's claim. Majorities in both parties believe that DREAMERS, who are American in all but paperwork, should be allowed to stay, either as citizens or as permanent legal residents. But Michael Steel, who was

press secretary to John Boehner, House Speaker during the last shutdown in 2013, notes that "there is a difference between popularity and intensity. Support for protecting the DREAMERS is high, but support for shutting down the government to achieve that goal is low."

To hold out longer would have carried particular risks for the ten Democratic senators up for re-election in states that Mr Trump won in 2016. Voters in five of those states received robocalls accusing their senators of having "prioritised illegal immigrants over American citizens". The longer the shutdown battle continued, the more it would have deepened the fissure between elected Democrats from safe seats and those at greater risk—and, perhaps more important, between the party's activist wing and the centrist voters it needs to take the Senate. As it is, the shutdown's brevity and the lunatic speed of news in the Trump era means it will probably be forgotten by November when the mid-term elections roll round.

Maine-stream

And yet despite all the energy of campaigners, the fraught negotiations, the posturing and the welcome emergence of a moderate caucus, huddled in the office of Senator Susan Collins of Maine, Congress is not much closer to fixing the status of the DREAMERS, which should be the easiest of immigration questions to resolve. The Republican stance on immigration seems to be hardening. Mr Trump at first urged legislators to craft a bipartisan "bill of love", which he would sign. Lindsay Graham and Dick Durbin, Republican and Democratic senators respectively, came up with a bill that gives DREAMERS a path to citizenship, funds some of Mr Trump's border wall (his insistence that Mexico will pay for it seems to have evanesced) and eliminates ►►

▶ the Diversity Visa programme, which provides green cards for immigrants from places that send few people to America. A spokesman for Mr Trump said the president would still not sign it.

House Republicans favour a bill that would give some DACA recipients legal status but not citizenship. It would also end the Diversity Visa, bar immigrants from sponsoring family members other than spouses and young children of American citizens (doing otherwise, Republicans argue, would let DACA recipients reward their parents, who decided to enter America illegally) and enact a host of other restrictions that could cut legal immigration by up to 38%. That bill would never pass the Senate.

The gap between the two parties illustrates how toxic America's immigration debate has become. During the shutdown, Mr Trump's permanent campaign released

an ad that snarled, "Democrats who stand in our way will be complicit in every murder committed by illegal immigrants." The ad conflates DREAMERS—who by law cannot have committed a felony—with criminals, just as the robocalls conflated people who willingly entered America illegally and those who came in their parents' arms.

Despite the rancour, the contours of a solutions are visible, if just faintly. Mr Trump will release a "legislative framework" on January 29th, based on four "agreed-upon pillars": a DACA fix, border security, and an ending to both the Diversity Visa and to "extended-family chain migration." The first three should be just about acceptable to most members of both parties. The last is trickier. Democrats have expressed some willingness to end family migration for DACA recipients, but not for everyone. Last weekend's brief shutdown may presage a longer one, next month. ■

Reconciliation, meanwhile, is not used to enforce fiscal discipline. Instead, it is primarily a ploy for getting legislation through the Senate with just 51 votes, rather than the more usual 60. Many significant laws from recent decades, from Bill Clinton's welfare reform to President Donald Trump's tax cuts, relied on the procedure. Lawmakers reverse-engineer the process, estimating the cost of what they want to pass in advance, and then issuing the necessary instructions. For example, at the start of 2017, Congress passed a budget resolution the sole purpose of which was to facilitate the attempted repeal of Obamacare via reconciliation.

The third strange thing about the system is lawmakers' tendency to try, unsuccessfully, to tie their own hands. For instance, in recent years, budget-making has been particularly painful because of the "Budget Control Act" of 2011, which mandated deep and indiscriminate cuts to spending should lawmakers fail to reform entitlements. They did fail. The result has been a biennial struggle to lift the law's spending caps temporarily, as happened in 2013 and 2015. Under a separate law from 2010, designed to deter unfunded legislation, Mr Trump's tax cuts might have triggered automatic offsetting cuts to Medicare and other programmes. Congress found a way to avoid that in December.

The last and worst aspect of the system is the leverage it gives minority interests. It only takes 41 or more votes in the Senate to block a budget bill, as Democrats demonstrated last week. The budget process has become a conduit for whatever dispute lawmakers are determined to have, says Molly Reynolds, of the Brookings Institution, a think-tank. In mid-2015 John Boehner, then Speaker of the House, had to pull a budget bill from consideration after a late-night amendment to ban the Confederate flag from federal cemeteries.

Proposals for reform abound. Some want Congress to move to two-year budgets. Others want continuing resolutions to apply automatically, making shutdowns impossible. But many suggested reforms would require lawmakers to limit their own bargaining power. For politicians, that is the budget that really matters. ■

The federal budget

Budgeting, busted

WASHINGTON, DC

America's budget process swallows time but achieves too little

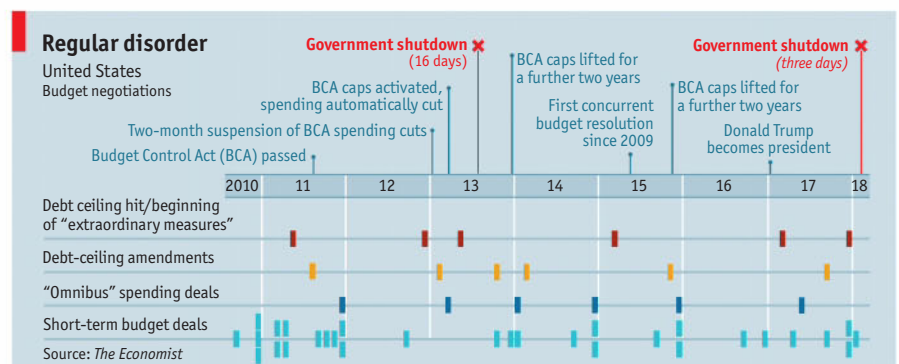
WRITING a budget should be about imposing order. In America, it frequently causes chaos. By letting funding for the federal government lapse on January 20th, Congress demonstrated, again, how hard it is for it to approve spending. The disruption might be worth it if America's budget showdowns led to better policy. But they do not. Budget-making does not bring income and outlays into line. It does not allow lawmakers much opportunity to weigh competing claims on resources. And it fails to make long-term planning easier. It is time for a shake-up.

The constitution gives Congress the power of the purse. Four things are odd about the way it uses it. First, annual budgets cover only the roughly one-third of federal spending that Congress has decided needs reapproval each year. Most entitlement programmes, such as Medicare, health care for the elderly, are automatically funded. So while budget-making provides opportunities for grandstanding by Congressmen about long-term fiscal problems, the process affords few chances to tackle the principal cause: swelling entitlement spending.

The second oddity is that the process rarely follows the script, written in the mid-1970s. Congress is meant to pass 12 separate bills funding each area of government, like housing, defence and agriculture. Each is penned by the appropriate committee. If spending gets out of hand, or

is too measly, Congress can instruct committees to write so-called "reconciliation" bills to redress the imbalance.

In reality, Congress has not passed separate appropriations bills since 1996. Doing so takes too many controversial votes. Instead, it tends to pass mammoth bills which fund everything. Often, it cannot even manage that. So it resorts to "continuing resolutions", like that enacted on January 22nd, which simply keep spending flowing at its current level while lawmakers try to work out a deal (see timeline). Because continuing resolutions mostly preserve the status quo, their prevalence makes it difficult for government departments to rejig their operations (which usually have specified funding streams). This lack of flexibility is particularly bothersome for the Pentagon.





Drug trafficking

The powder room

LOS ANGELES

Fentanyl is both lethal and almost impossible to keep out of the country

IN A cavernous warehouse near Los Angeles International Airport, United States Customs and Border Patrol (CBP) officers process six packages per second. As cardboard boxes and manilla envelopes from around the world stream through x-ray machines, officers with handguns tucked into their waistbands scan screens for anomalies in the images. Last summer officers at the warehouse found three live King Cobras coiled into aerated potato-crisp cans. On a recent morning they found nothing creepy or crawly, only bags full of dried orange skins and Chinese meat snacks disguised as candy. Mostly, however, they found drugs: counterfeit Viagra, vials of steroids and small plastic bags full of unidentified white powders.

Officers are particularly worried about one drug: fentanyl. Kevin McAleenan, the acting commissioner of CBP, says the drug is the agency's priority. A synthetic opioid, fentanyl is 50 times stronger than heroin and 100 times more potent than morphine. The drug is largely behind the increase in America's drug-overdose death rate. Between June 2015 and June 2017, overdose deaths rose by 34%. During the same period, fatalities linked to synthetic opioids other than methadone, a category dominated by fentanyl, more than tripled from 7,551 to 23,995. On January 10th President Donald Trump signed the INTERDICTION Act, a law that will provide CBP with \$9m in extra funding to look for fentanyl. On February 1st China will begin restricting two precursors used to synthesise fentanyl, which

Gerrymandering

Goofy's gonna get it

WASHINGTON, DC

Pennsylvania's Supreme Court invalidates the state's congressional map

IN 2010 Republicans won majorities in both houses of Pennsylvania's legislature, which gave them control of the state's decennial redistricting process. Like politicians everywhere, they drew districts to benefit themselves; like children left alone with a box of cookies, they went a bit too far. On January 22nd Pennsylvania's Supreme Court held that the state's congressional map "clearly, plainly and palpably" violates the state constitution, and gave legislators until February 9th to redraw it. The judges warned that if lawmakers could not come up with a map that the (Democratic) governor approved, the court would draw its own.

That the map benefits Republicans is beyond question. In 2012 Republicans won 13 of the state's 18 congressional seats despite winning just 49% of the statewide vote. They maintained this share in the next two elections with 55% and 54% of the vote.

The freakishly shaped districts—the 7th won the nickname "Goofy kicking Donald Duck"—freely cross city and county lines, dividing communities and packing Democrats into five seats that they win by large margins, while spreading the rest of the Democratic vote as thinly as possible everywhere else (a practice known as cracking). Christopher

Warshaw, a political scientist at MIT, argues that Republicans hold three or four more seats than they would have without such an extreme partisan gerrymander.

The plaintiffs, led by the League of Women Voters, contended that the map violated the state constitution's guarantees of free expression and association. The court agreed. The ruling improves Democrats' already rosy chances of picking up the 24 seats they need to take control of the House.

Some contend it also provides a blueprint for future gerrymandering challenges. Unlike cases in Maryland and Wisconsin, under consideration before the United States Supreme Court, Pennsylvania's plaintiffs relied on the state constitution. That removes it from the purview of the conservative-leaning federal Supreme Court; though the state's Republicans vowed to appeal there, it is difficult to see the grounds on which the Court could review the case.

Yet Democrats hoping to copy what happened in Pennsylvania elsewhere may be disappointed. Unlike most states, it elects partisan justices. Since 2015 Democrats have held a 5-2 majority on the state Supreme Court (this week's decision was 4-3). Few other states offer such favourable grounds.

American officials hope will stem the flow into the country.

The drug has long been used legally to treat cancer pain, but in recent years has flooded into America's black market, where it is found mixed into other drugs, punched into pills that resemble prescription painkillers or, less commonly, sold on its own. Fentanyl is very profitable for drug-traffickers: a recent Drug Enforcement Administration report estimated that a kilogram of heroin sells for \$80,000 on the street, whereas a kilogram of fentanyl can command between \$1.28m and \$1.92m. So traffickers are highly motivated to push it on their customers. Consumers often use it inadvertently, unaware that it has been stirred into their heroin or that their illicit OxyContin pills are not what they seem.

The Los Angeles warehouse represents one of the front lines in the government's fight to keep illicit fentanyl out of the country. "We and the warehouse at JFK (New York's international airport), we're ground zero," says Rolando Knight, a veteran CBP officer who supervises the Los Angeles operation. In its illegal form, fentanyl is most-

ly produced in China.

The drug's potency means it can be concealed in packets and boxes small enough to be sent by international mail. Fentanyl reaches America in two main ways. Some is posted to Mexico, where traffickers usually mix it with other substances, such as heroin and cocaine, before sneaking it across the border and into the hands of drug-dealers. In other cases, pure fentanyl is sent directly to America, where at some point it must pass through a facility like the one in Los Angeles.

Between October 2016 and September 7th 2017, CBP seized 299lb (136kg) of fentanyl sent through international postal services and private carriers such as FedEx, UPS and DHL. During the same period the agency seized 494lb of the drug on America's land border with Mexico, but it was often mixed with other substances. The average purity of fentanyl shipped into America by post is over 90%, compared with 7% for that seized on the land borders.

A visit to the Los Angeles warehouse underscores just how manual the process is. On a recent morning, an officer at the

▶ Los Angeles warehouse squinted as he noticed something fishy about a package passing through his x-ray machine. He punched a red button to stop the conveyor belt and picked up the package in question: he could tell that it had come from China, but it had no return address. He slashed the tape open with a box-cutter and found a paint-roller with dime bags of white powder taped inside.

The bags were passed to Jaime Pimentel, another CBP employee whose job is to test the substance. Behind him on a shelf sat a box of Naloxone, an opioid-overdose antidote, in case Mr Pimentel accidentally ingests fentanyl or another opioid. He pressed a machine called a TruNarc onto a

plastic bag full of powder and waited for a reading. It came back inconclusive. Then he used a metal scooper to sprinkle a small sample of the powder into a more sophisticated device called the Gemini, which resembles a clunky Gameboy. It also failed to match the substance to any of the 21 drugs in its database, so the powder had to be sent to a nearby forensic lab for further testing, which could take a few weeks. "The federal government has responded impressively quick to the fentanyl threat, which really didn't escalate until 2015," Mr Knight muses. "But we're still walking-crawling really. It's so hard to seize, that when we do we almost have to say 'Wow! Good job!'" ■

Land's End, Nine West and J. Crew, are close to bankruptcy? One reason is that it filled a void. "They set up shop where Walmart does not want to make an effort," says Christopher Merrett at the Illinois Institute for Rural Affairs, referring to the world's biggest retailer. Around 70% of Dollar General's customers live in rural places which have been slow to recover from the recession. Another reason for its success is that it caters to those who are financially stretched. Dollar General sells everything from packaged food and toys to linens and household-cleaning products, but in smaller packages for those who cannot afford to buy in bulk. And although, contrary to popular belief, not all items cost a dollar, a quarter of them do; three-quarters cost less than \$5, and most of the rest will set you back less than \$10.

Dollar General promises low prices and quick, convenient shopping, but so do other dollar stores, such as Dollar Tree, Family Dollar or the near-bankrupt 99 Cents Only. Their secret sauce, explains Mike Paglia at Kantar, a retail consultant, is to pick a good site. They vet them diligently, opening their shops next to highways, post offices, churches or schools. (A church close to the array of deep discounters in Lewisburg assures its worshippers that "God has a 100% refund policy".) In Uptown, a down-at-heel neighbourhood in Chicago that is home to one of the few Dollar Generals in big cities, the company picked a spot behind a big parking lot next to a Shell petrol station, a branch of Chase, Chicago's most popular bank, and Planned Parenthood, a non-profit offering advice on family planning.

The typical Dollar General shopper is white, working class and tends to rely on some form of government assistance. "The economy is continuing to create more of our core customer," the company's chief executive, Todd Vasos, told the *Wall Street Journal* in an unguarded moment in December. He is also likely to be a supporter of President Donald Trump, says Mr Merrett, although this is changing as rural America gains pockets of diversity, for example next to slaughterhouses such as Tyson's plant in Storm Lake, Iowa. Dollar General has tried to expand in ethnically diverse, left-leaning cities: in 2015 it tried to buy the more urban Family Dollar. Last year it took over 322 mostly urban stores from a private-equity firm that had bought them from Dollar Tree, which had trumped Dollar General in the battle over Family Dollar and needed to shrink a bit for antitrust reasons. The new urban shops will be laboratories for a different type of customer. On a frigid evening just before Christmas, the shoppers at Dollar General's Uptown outlet were mostly black or brown—and almost certainly Democrats.

Dollar General intends to continue its vertiginous expansion, with plans to open ▶▶



Thrift and profit

One buck at a time

LEWISBURG, TENNESSEE

Dollar General thrives where low-income families struggle

“THEY want to build one every four miles,” says the cashier at Dollar General, a discount shop, in Lewisburg, a small town in the rolling hills of central Tennessee. Situated on a big parking lot, next to a provider of payday loans open 24 hours a day, a supermarket chain called Priceless and Dirt Cheap, another southern chain of discount shops flogging the unsold or returned merchandise of other retailers, the shop is one of three Dollar Generals in Lewisburg. Tennessee is the home state of Dollar General, which in recent years overtook its rivals to become the retailer of choice of low-income Americans, so it has one of the denser statewide networks of shops. Yet with well over

14,000 outlets across America (about the same number as there are McDonald's restaurants) almost 75% of Americans now live within five miles of a Dollar General.

“Over the last five years a new Dollar General opened every four-and-a-half hours,” says Garrick Brown at Cushman & Wakefield, a property agent. The chain's profits have risen like a helium balloon since the recession, to more than double those of Macy's, one of the most famous brands in retail, in the past fiscal year. Its market value is a whopping \$28bn.

How does Dollar General thrive when so many other retailers are struggling, downsizing or, in the case of Sears, Bon-Ton, 99 Cents Only, Neiman Marcus,



“First Republic provides stability and clarity in an unstable world – trusted relationships matter.”

IAN BREMMER

Founder and President, Eurasia Group and GZero Media



FIRST REPUBLIC BANK

It's a privilege to serve you®

(855) 886-4824 | firstrepublic.com | New York Stock Exchange symbol: FRC
MEMBER FDIC AND EQUAL HOUSING LENDER 

▶ another 900 shops this year. Yet rural communities account for only 46m, or 15%, of the population—and they are shrinking fast. Many small towns have only 75% of the population they had 25 years ago. In 33 counties in Illinois, the population peaked over a century ago, says Mr Merrett. To keep expanding so rapidly, Dollar General will need to appeal to those with a higher income than the working poor. It has already made inroads into more affluent groups. According to Nielsen, a marketing researcher, 43% of customers with household income of \$29,000 or less but also 23% of those earning more than \$70,000 said they shopped at a dollar store in 2016. The new shop in Lewisburg is on Yell Road, which is lined with pretty houses and big

gardens; the cars parked in front of the shop are mostly gleaming SUVs and big pickup trucks. The “market” outlet offers fresh shrimp, Chobani yogurts and other fancy foodstuffs.

Walmart’s rapid rise caused resentment in rural communities as it killed smaller local shops and was said to treat its workers poorly. Dollar General, however, ventures into places where the last grocery shop often closed years ago, which is why its reception by locals tends to be much friendlier. The same is likely to be true as Dollar General expands into troubled urban neighbourhoods such as Chicago’s South Side, where rents are cheap. In these so-called food deserts, an investment by any retailer is good news. ■

west, keen to cash in on the booming ranching industry. “Ranching work was challenging, manly and allowed black people to make as much as whites. It allowed them to do something that gave their families some measure of equality,” says William Loren Katz, author of “The Black West” and 40 other books on African-American history. Historians estimate that of the 35,000 cowboys who ranged the West between 1866 and 1895, at the height of the cattle industry, between 5,000 and 9,000 were black.

During the Jim Crow era blacks were shut out of most rodeos. The cowboys in the novels and films that familiarised the rest of America with the West were almost always white. Without venues to compete in or stars to inspire young black cowboys, the tradition eroded. As Ms Vason-Cunningham waits for the Bill Pickett rodeo to begin, she estimates that fewer than 5% of cowboys in the Professional Rodeo Cowboys Association, the country’s largest rodeo organisation, are black. The organisation says it does not track the ethnicities of its riders, though it does ask about their favourite food: “I can tell you that for 99% of them it’s steak.”

Appropriately, the first event of the night in Denver is steer wrestling. Before entering the arena, Tory Johnson, a 32-year-old from Oklahoma City, secures his cowboy hat, shifts his weight from side to side in his stirrups and tightens his grip on the reins. He takes a deep breath and gives a subtle nod. The gates spring open. On a golden Palomino with a flowing mane and thick white blaze, Mr Johnson explodes forward into the dirt arena in pursuit of a steer that has been released in front of him. He tips off his mount until his arms are locked around the steer’s neck; then he kicks both feet out of his stirrups, leans into the steer and wrestles it to the ground—with no use of teeth, it should be noted. The whole ordeal takes 5.6 seconds. ■

Race and horses

Rodeo drive

DENVER

The Bill Pickett rodeo aims to restore black Americans to the saddle

APART from the Missy Elliot and Ludacris songs that blare through the speakers in lieu of country tunes, the Bill Pickett Invitational sounds and looks like a typical rodeo. In the dirt arena cowboys and cowgirls cling to bucking broncos. They rope calves and weave in and out of barrels. The stands are packed with fans decked out in cowboy hats and boots who nibble at barbecued chicken and gasp when riders are thrown to the ground. At half-time there is “mutton busting”, an event in which small children are plonked onto the backs of sheep and ordered to hang on as their fuzzy mounts dart around the ring. The biggest difference is that all the contestants—and most of the audience—are black.

The Bill Pickett Invitational, which performed in Denver on Martin Luther King Day and will visit five other places this year, is America’s only touring black rodeo. It was founded in 1984 by Lu Vason, a music-industry promoter, after he attended a rodeo in Cheyenne, Wyoming, and “didn’t see a single rider who looked like him”, recalls Valeria Vason-Cunningham, who has run the rodeo since her husband’s death in 2015. Vason decided to name the rodeo after Bill Pickett. Born in 1870 in Texas, Pickett was the son of a freed slave who invented the sport of steer wrestling, or “bulldogging”. Pickett would gallop after a cow on his horse, spring off, draw the cow’s face into his own face by its horns, and latch his teeth into its lip as he had seen herder dogs do. The bite would confuse the steer, allowing Pickett to pull it over with just his jaw, his hands held skyward.

Pickett went on to perform with the

likes of Buffalo Bill and Will Rogers under the stage-name of “The Dusky Deamon”; he was the first black man ever admitted into the ProRodeo Hall of Fame. But whereas Pickett’s talent was rare, black cowboys during his era were not. They were fundamental to the settling of the West, both as slaves and freedmen. In the first half of the 19th century, white Americans in search of cheap land flocked to Texas, which was then Spanish and, after 1821, a Mexican territory. Some brought slaves with them to work their newly established cotton farms and cattle ranches. After slavery was abolished, ranchers hired their former slaves as paid workers.

Black people from the east also flocked



Yee-haw

YOU DESERVE TRUE LOVE

WE CAN FIND IT FOR YOU.

Accomplished men and women are successful largely because they're smart enough to leverage the best resources. Introducing the Selective Search Meet Your Future® process. The process that has led to an industry high 87% success rate. Contact us today for a complimentary consultation and learn more about your best resource for finding True Love.

3,902
HAPPY COUPLES

87%
SUCCESS RATE

100%
CONFIDENTIAL & OFFLINE

SELECTIVE  SEARCH®

EXECUTIVE SEARCH MEETS PERSONAL MATCHMAKING

866.592.1200 selectivesearch.com learnmore@selectivesearch.com

Lexington | Salting the Earth

Scott Pruitt seems less deluded on global warming and more cynical. Whoopee



REPUBLICAN administrators of the Environmental Protection Agency have often sought to trim their powers. Anne Gorsuch, a Reagan appointee (and mother of Neil, a Supreme Court justice) cut the agency's budget by a fifth, before being forced out by a pollution scandal. But Scott Pruitt is the first to make a nonsense of his office. A former attorney-general of Oklahoma, with close ties to oil-and-gas lobbyists, Mr Pruitt says he does not believe global warming is caused by human activity and proposes a "true environmentalism", which chiefly involves burning more fossil fuels. Or, as he puts it, "using natural resources that God has blessed us with". Last month the EPA administrator visited Morocco on a mission to hawk American natural gas. This week he was forced by the shutdown to cancel a trip to Japan, where he was expected to visit a coal-fired power-station and tout American coal. As the protector of America's climate-stressed environment, he is either misguided or extremely cynical.

Which of those traits best describes Mr Pruitt could in theory matter a lot. The administrator has spent a year chipping away at the environmental regime of his Democratic predecessors. He has withdrawn or tried to weaken over 60 regulations, including Barack Obama's landmark effort to curb greenhouse-gas emissions from power-stations. Yet he faces stiff legal challenges to many of those actions so long as the regulatory dispensation that gave rise to them endures. This is the EPA's determination, known as the "endangerment finding", that greenhouse gases are harmful to Americans' health. To make his deregulatory onslaught stick, Mr Pruitt would need to scrap that. And indeed, if he believes what he has said about the harmlessness of carbon dioxide and other industrial emissions—which most scientists consider misguided at best—why wouldn't he try?

Sure enough, Mr Pruitt has hinted that the endangerment finding is in his sights. As a possible probing attack, he has floated an idea for a sort of climate-focused Scopes Monkey Trial, a televised debate between climate change believers and sceptics. Yet he is also giving contrary signals, which suggest his opposition to climate regulation may be more selective than it seemed. Well-placed insiders know of no plan to review the endangerment finding. Meanwhile, in arguing for regulating methane—a valuable greenhouse gas, which energy firms are therefore eager to

curb their emissions of—Mr Pruitt has recently sounded perfectly respectful towards the scientific consensus on global warming.

A similar shift, from outright rejection of climate science to a more partial, opportunistic resistance, is evident across the conservative political-business elite that Mr Pruitt represents. There are three main explanations for this change.

First, the scientific consensus on global warming has hardened, making blanket opposition to it harder to maintain. If Mr Pruitt tried to overturn the endangerment finding, for example, he would probably fail. The finding followed a two-year EPA study of warming-related risks, instigated by the Supreme Court. To have a hope of rescinding it Mr Pruitt would need to get an equivalent study to reach a less worrying conclusion, which seems unlikely. In expectation of more environmental regulation therefore, as global warming proceeds, many big emitters would rather write the existing rules into their investment plans, ideally leavened by Mr Pruitt's revisions, than suffer the uncertainty of a hapless effort to scrap the endangerment finding, which would invite a backlash from the next Democratic administration.

This was apparent in a recent debate on repealing the finding by an influential conservative policy network, the American Legislative Exchange Council. While a hard-core of ideologues and some companies—including the sort of regional operator Mr Pruitt was close to in Oklahoma—argued for repeal, bigger firms, such as Chevron and ExxonMobil, were against it. Besides thinking it fruitless, many of the holdouts, including those two, are increasingly investing in renewable energy and other schemes that benefit from the decarbonisation policies they formerly decried. This growth of new economic interests from the environmental policy regime is the second reason for the shift. Mr Pruitt's recent interest in methane regulation exemplifies that.

How to please friends and confuse the people

The third reason for the conservative elite's more nuanced view of environmental policy relates to public opinion—and is depressing. Having been subject to a decades-long misinformation campaign against climate science, conservative voters are so reliably sceptical they need no further priming. Until the mid-1990s Republicans and Democrats were similarly worried about global warming. But after a deluge of bogus science and conspiracy theories swamped right-wing media, their opinions diverged: 66% of Democrats now say they are very concerned about it; only 18% of Republicans say the same. This has transformed the issue from one of America's least partisan, to one of the most, such that the remaining 82% of Republican voters appear resistant to reasoned argument on it: climate change is something lefties worry about, so they by definition do not. That, in turn, makes life easier for opportunists such as Mr Pruitt. Where they once risked being found out by their voters, they can now make whatever reality based compromises they like, so long as they keep enraging the other side. And Mr Pruitt is expert at that.

These forces help explain Mr Pruitt's recent pragmatism, and suggest his actions will be more moderate than his sceptical rhetoric suggests. Even so, he is weakening or scrapping most of the protections he can, while also running the agency down. By one projection, the EPA will cut its 15,000 strong staff in half by 2020. An EPA official describes this approach as "salting the Earth, not burning the place down." That is hardly reassuring, considering the environmental vandalism Mr Pruitt is doing, and the vandalism to America's Enlightenment traditions he represents. ■



Brazil

Not beaten yet

PORTO ALEGRE

A court has confirmed a guilty verdict against Luiz Inácio Lula da Silva. That may not end his career

THE verdict was a bombshell but not a surprise. On January 24th, with police helicopters in the sky over Porto Alegre, a city in Brazil's south, and snipers on rooftops, a three-judge panel at a federal court unanimously upheld the conviction of Luiz Inácio Lula da Silva, a former president, on charges of corruption and money-laundering. Awaiting the decision, thousands of his supporters camped less than a mile away. They were both angry and defiant. "It's political persecution," insisted Everaldo de Souza, a construction worker from the southern state of Santa Catarina.

The court's decision has big implications for Brazil's presidential election, to be held in October. Lula is the most popular potential candidate by far. A recent poll suggested that 36% of voters would back him, double the share who support his nearest rival, Jair Bolsonaro, a right-wing extremist. The confirmation of Lula's guilty verdict will not deter him from running. Indeed, he was expected to announce his candidacy as *The Economist* went to press. The presidential campaign has, in effect, started in a courtroom.

This means that the election, thought by some to be the most important since the end of dictatorship in 1985, will be a mess. The *ficha limpa* (clean record) law, signed by Lula himself in 2010, bars candidates whose convictions have been upheld by an appeals court from running for office for eight years. If Lula finds a way around that,

and wins, Brazil may face a constitutional crisis. His candidacy would enrage voters who think the right place to send him is jail, not the presidential palace. Billboards in Porto Alegre depict him in prison uniform; 40% of Brazilians would never vote for him, the polls say. But if he is kept off the ballot in the first round on October 7th, the slightly smaller group that supports him will damn the election as illegitimate.

Lula left office at the start of 2011 with an approval rating of 83%. But in 2014 the economy entered its worst recession on record. Then, in 2016, his protégée and successor, Dilma Rousseff, was impeached. In September of that year Sérgio Moro, the federal judge in charge of Lava Jato ("Car Wash"), a vast corruption investigation, agreed to hear charges that Lula accepted a seaside apartment worth 2.2m reais (\$690,000) from OAS, a construction firm. In return, prosecutors alleged, Lula encouraged Petrobras, the state-owned oil company, to award contracts to OAS during his time in office. Last July Mr Moro found Lula guilty and sentenced him to more than nine years in jail. The judgment was suspended pending appeal. The appeals-court judges increased the sentence to 12 years, but are not enforcing it immediately.

Lula says the apartment was never his and vigorously protests his innocence. He accuses Mr Moro of plotting to deny him a third term as president.

The original guilty verdict seemed to

Also in this section

30 Honduras's tarnished presidency

30 Jamaica's lottery scammers

31 Bello: How the middle class votes

energise Lula. He embarked on a tour of Brazil, drawing enthusiastic crowds, especially in his native north-east, which benefited more than other regions from social-spending programmes that he initiated.

This week's affirmation of the guilty verdict begins a race by the courts against the electoral calendar. The *ficha limpa* law can be invoked only after Lula registers as a candidate with the supreme electoral tribunal (TSE), which must happen by August 15th. Lula can appeal against any objection to his candidacy to the TSE and then to Brazil's supreme court. In the meantime, he can campaign. If the courts move slowly, he could win the election only to have his candidacy annulled by the supreme court, perhaps triggering a new election. That dire prospect will spur the judges to act quickly, reckons Christopher Garman of Eurasia Group, a risk-analysis firm.

If they bar Lula before September 17th, his Workers' Party (PT) could replace him with another candidate. Gleisi Hoffmann, the party's president, says there is no "Plan B". In fact, the PT would probably put up another candidate should Lula drop out, perhaps Fernando Haddad, an ex-mayor of the city of São Paulo, or Jaques Wagner, a former governor of Bahia, a north-eastern state. But the longer Lula stays in the contest before withdrawing, the more votes his understudy is likely to win.

The prospect of an election without Lula has cheered financial markets, which fear that he would resume Ms Rousseff's spendthrift policies. After the news from Porto Alegre, Brazil's currency jumped by more than 2% against the dollar.

Many of Lula's foes would prefer him to stay in the race, in part to persuade his supporters to respect the outcome. "It would be better for him to be defeated politically," said Brazil's president, Michel Temer, to *Folha de S. Paulo*, a newspaper. Even rival ►►

▶ candidates may want Lula's name on the ballot. Mr Bolsonaro portrays himself, implausibly, as the only man who can vanquish him. "The chances of both are predicated on meeting each other in the second round," says Mr Garman.

That is because a less divisive candidate would probably beat either of them. Plenty of people may be thinking of offering themselves for that role, including Geraldo Alckmin, the governor of São Paulo state, Henrique Meirelles, the finance minister, and Luciano Huck, a television star. None has so far made much impression on voters. Whether he is on or off the ballot, the passions that Lula stirs up will dominate the elections. "We won't give up on him," says Danielle, a primary-school teacher who travelled overnight to Porto Alegre expecting a negative ruling by the court. "He lost the battle but hasn't lost the war." ■

Honduras

A tarnished presidency

Juan Orlando Hernández has little legitimacy, but few real foes

ANSELMO VILLARREAL was cycling past a protest in Sabá in northern Honduras on January 20th when he was shot, apparently by a member of the security forces. Mr Villarreal was the 32nd person to have died in protests against the re-election on November 26th of Juan Orlando Hernández as president of Honduras. In the country's last upheaval, a coup in 2009 against the then-president, Manuel Zelaya, 20 people died.

The post-election death toll may rise before Mr Hernández's inauguration, scheduled for January 27th in Tegucigalpa, the capital. But resistance is weaker than it looks. The opposition Alliance coalition had called for a nationwide strike, road-blocks, a shutdown of international airports and a vaguely defined boycott. So far little of that is happening. Demonstrations on January 20th in Tegucigalpa and San Pedro Sula, the second-biggest city, drew fewer than 1,000 people each. That is a far cry from the tens of thousands who came out a week after the elections.

That is not because Mr Hernández has convinced Hondurans that he won fairly. His main rival, Salvador Nasralla, a sports broadcaster, led early in the vote count. Only after a glitch interrupted the publication of results by the electoral commission did Mr Hernández pull ahead, eventually winning by 1.5 percentage points. That looked fishy. Election monitors sent by the Organisation of American States (OAS) observed widespread "irregularities and defi-

ciencies". Its secretary-general, Luis Almagro, proposed a fresh election. Many observers thought Mr Hernández's candidacy was itself illegitimate. It happened only because in 2015 the biddable supreme court ruled invalid the term limit written into the constitution.

Outside Honduras, almost no one is listening. The European Union, which also sent monitors, described the election as "well organised". The Trump administration soon recognised Mr Hernández's victory. The United States regards Mr Hernández, a tough-on-crime conservative, as an ally in its fight against drug-trafficking and migration from Central America. Some 500 American troops are stationed at the Soto Cano air base in central Honduras.

Most other countries in the Americas, including Argentina, Brazil, Canada and Mexico, also backed Mr Hernández. They dislike in general the idea of outsiders influencing countries' domestic politics. "No government... wants to have their election process challenged in the international arena," says an official at a Honduran NGO. That is especially true of the seven that are holding national elections in 2018, among them Brazil, Mexico and Colombia. Some Latin American leaders regard Mr Nasralla as a flaky leftist. The main exceptions to the regional rush to endorse Mr Hernández are the left-wing governments of Venezuela and Bolivia.

Within Honduras, the opposition is not trying very hard to overturn his victory. Though he has called on supporters to strike, Mr Nasralla has been presenting his Sunday-morning sports show on television. He appeared to concede defeat after the United States backed Mr Hernández, though without accepting the election result as fair. With Mr Nasralla's retreat his most prominent ally, Mr Zelaya, has publicly resumed his earlier role as de facto leader of the opposition.

Tegucigalpa is buzzing with rumours that he has struck a private deal with Mr Hernández. Mr Zelaya is thought to be planning a presidential run in 2021. That cause might be better served by amassing influence and money with Mr Hernández's help rather than by leading protests. The president could give Mr Zelaya a say in picking appointees to such important jobs as chief prosecutor. He could allow Mr Zelaya's Libre party, a constituent of the Alliance, to gain control of congressional committees that allocate money. In return, Mr Zelaya would wind down the protests and let Mr Hernández govern.

Mr Almagro has been the loudest dissenter, for good reason. He led international condemnation of Venezuela's drift towards dictatorship; to bless Mr Hernández's dubious victory would open him to charges that he is applying a double standard. The president's friends accuse Mr Almagro of seeking publicity to run for



Hernández, tough on crime and on voters

Uruguay's presidency in 2019.

His obdurate stand may have made trouble for MACCIH, an anti-corruption agency in Honduras set up by the OAS. On January 18th congress passed a budget that, in effect, grants congressmen elected since 2005 three years of immunity from charges of stealing public money. It hobbles MACCIH, whose mandate expires in 2020.

On January 22nd Mr Almagro appeared to give up the fight, saying the OAS would work "with the elected authorities". Perhaps he was being prudent. But his surrender leaves the country's battered democracy almost defenceless. ■

Jamaica's lottery scammers

Bad vybz

A state of emergency in a Caribbean tourist hub

MONTEGO BAY, Jamaica's tourist capital, is also a hub for call centres. Many work for American companies. But they have less respectable step-siblings: people who scam gullible Americans and brawl with each other over the proceeds. The worlds of scamming and tourism collided on January 18th, when the government declared a state of emergency in St James, the parish whose capital is Montego Bay.

Its murder rate is three times Jamaica's and 50 times that of New York City. Last year 335 people died violently in a district with a population of 185,000. Britain and Canada have told tourists to limit their movements outside gated resorts.

One cause of the mayhem is scams in which callers, using skills honed at St James's call centres and contact lists purloined from them, ring up mainly elderly ▶▶

► Americans to tell them they've won a lottery. The prize is fictitious; the fees paid by the victim to claim it are not.

The scam has lower barriers to entry than the business of shipping Colombian cocaine to the United States, another thriving activity in Jamaica. Weapons for both come from the exchange of drugs for guns with Haiti. Scammers fight over access to contact lists. Couriers bringing in cash sometimes abscond, provoking revenge killings. Gunmen rob scammers when they pick up loot at remittance agencies.

Some Jamaicans see little wrong with bilking Americans. Adidja "Vybz Kartel"

Palmer, known to his fans as the "worl' boss" of Jamaican music, sang "Dem call it scam, me call it a reparation." He is serving a life sentence in jail for murder.

The government takes a stern view of the violence that scamming leads to. Under the state of emergency, the police and army can search premises and detain suspects without a warrant. The order suspends habeas corpus and allows courts to hold trials behind closed doors. Parliament can extend it after 14 days by a two-thirds majority. That will require votes from the opposition, but it looks as if the government can count on those. The emer-

gency is popular with residents, even though few think it is a cure for violence.

Its success depends on how well the police and army put it into practice. The omens from the police are worrying. At Christmas they staged a "sick-out" to force the government to raise their pay (they failed). In January a prosecutor charged two officers and other alleged members of a gang with murder, robbery and rape.

The emergency started with the busting of a contraband-fuel racket. But after two days, gunmen killed one man and injured five at a gangland funeral. Few tourists will be tempted to explore St James just now. ■

Bello | Fear of falling

The middle class can promote stability—but not always

SOMETHING unexpected happened in Chile's presidential election last month. In the first round in November, Sebastián Piñera, a centre-right former president who was the favourite, stumbled. He won only 37% of the vote, six points less than the combined tally of two left-of-centre candidates. But in the run-off an extra 1.4m voters turned out for Mr Piñera, giving him a comfortable victory. Many of them had stayed away in the first round. Most were new recruits to Chile's middle class alarmed by the prospect of a swing to the left under Mr Piñera's opponent, Alejandro Guillier.

As Latin America begins a series of presidential elections this year against a background of sluggish economic growth and anger over crime and corruption, the Chilean result is a reminder that its middle class is bigger and more influential than ever. But its political impact is far from straightforward. And that is because the term itself requires unpacking.

What is clear is that the region's middle class has grown. The World Bank assigns this status to people who have daily incomes of \$10-50, enough to offer some security. By this measure, 34% of Latin Americans were middle class in 2015, up from 21% in 2003. A further 39% had incomes of \$4-10 a day. They were no longer poor but could easily become so again. This rise in income—the result of faster economic growth between 2003 and 2011—went side by side with a big expansion in education and in ownership of durable goods, from computers and cars to wide-screen televisions. Some 42% of respondents to Latinobarómetro, a regionwide poll, describe themselves as being "middle class".

These "middle sectors" as Ignacio Walker, a Chilean politician and political scientist calls them, are heterogeneous. In

the past, Latin America's middle class was composed of independent professionals and public employees. The new middle class tends to work in the private sector, as managers, technicians or owners of small businesses. They are "aspirational and emerging", says Mr Walker. Many have benefited from globalisation. Some may work in the informal sector; they think of themselves as self-made. Rather than being genuinely middle class, some simply have more money than they used to.

A large middle class is often seen as a guarantee of democratic stability: with much to lose, it has an interest in property rights, limits on state power and policy continuity. But turmoil can precede stability. Samuel Huntington, an American political scientist, noted in 1968 that "the true revolutionary class" in modernising societies was the middle class, but that it became more conservative as it grew.

It is not clear whether Latin America's middle class will follow the same trajectory. Historically, it tended to ally with trade unions against oligarchic rule. But it was sometimes counter-revolutionary. Military coups against left-wing govern-

ments in the 1970s were backed by a middle class fearful of socioeconomic disorder. There is an echo of that in the support that early opinion polls give among the better-off and better-educated in Brazil to Jair Bolsonaro, a right-wing populist. His supporters blame the Workers' Party of Luiz Inácio Lula da Silva for an economic slump that slashed living standards and saw a rise in crime as well as corruption. Nonetheless, many of the new lower-middle-class Brazilians love Lula, whom they associate with earlier economic growth and cheap student loans and housing credits.

In today's Latin America, the new middle classes' main demand is for better services, from higher education to health care and policing. But that doesn't necessarily imply public services, or a big state and support for the left. "They oscillate between 'Let me progress' and 'Protect me if I fall,'" says Sérgio Bitar, a Chilean former minister who advised Mr Guillier.

Take Bolivia, where a *mestizo* middle class has grown under Evo Morales, the left-wing president who has governed since 2006. It has now turned against him. After protests, this week Mr Morales withdrew a new criminal code that was seen as oppressive. In Mexico the middle class twice voted tactically to prevent Andrés Manuel López Obrador, a left-wing populist, from winning the presidency. In this year's contest Mr López Obrador is striving to appear more moderate. As less extreme candidates emerge in Brazil, its middle class may shun Mr Bolsonaro.

This electoral cycle will show whether Latin America's middle classes have matured politically. If so, they will vote for candidates of the left or right who offer a well-judged mix of opportunity, social protection and stability. If not, Mr Bolsonaro and his ilk have a chance.





Also in this section

33 North Korea's conglomerates

34 The plight of the Rohingya diaspora

35 Banyan: Asia, champion of free trade

For daily analysis and debate on Asia, visit

Economist.com/asia

Caste prejudice in India

Unconscionable

DELHI

Dalits are better off than they have ever been—but that's not saying much

FOR Dalits, these are the best of times. Once known as untouchables and reviled as ritually unclean, this sixth of India's population has never been more integrated. Since the constitution banned discrimination against untouchables 70 years ago, and with quotas for state schools, jobs and elected offices giving Dalits a leg up, gaps in education, income and health have steadily shrunk.

Dalits, who in the past feared crossing certain streets, now have their own millionaire-filled chamber of commerce, scores of energetic NGOs to promote their rights and some 84 of the 545 MPs in the Lok Sabha, the lower house of parliament. In October a board that manages hundreds of Hindu temples in the southern state of Kerala for the first time broke one of the last ancient taboos, inducting six Dalits to serve as priests. Ram Nath Kovind, who was elected India's president in July, was born into a weaver caste, making him the second Dalit to serve as head of state.

But Indian presidents hold little real power, and there has never been a Dalit prime minister. That it is the best of times for Dalits does not necessarily mean that times are very good. Reservations, as the government's quotas are known, have indeed given once-unimagined opportunity to many Dalits. "Without them we would all be cleaning shit," says one activist. Yet Dalits remain markedly poorer, worse edu-

cated and less healthy than average (see chart); they are 30% more likely than other Indians to end up in prison. Out of the 642 faculty members in the country's top management schools, which are state-run, only four are Dalits. Out of 496 vice-chancellors—in effect presidents—of state universities, just six are from "scheduled" castes, as the lowest ranks of the Hindu caste hierarchy are officially known. ("Scheduled tribes" or *adivasis*—tribal communities traditionally excluded from the caste system altogether—constitute a further 9% of In-

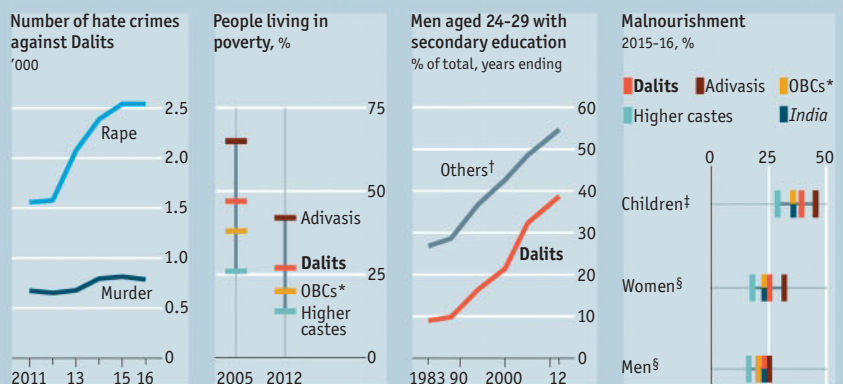
dia's 1.3bn people.)

The headlines reveal quotidian horrors. Dalit Woman Raped and Murdered, Man Poisons Well Used by Dalits, Dalits Attacked for Slaughtering Cow, Dalit Youth Killed For Watching Upper-Caste Ceremony, Dalit Forced To Shave Moustache. Protests and riots by members of higher castes typically end with politicians and officials acceding to their demands; similar actions by Dalits tend to be met with repression. Chandrashekhar Azad, a prominent Dalit activist arrested in May, was ordered to be released by a high court in November, with the judge reprimanding police for their "politically motivated" handling of his case. A day later he was re-arrested under the draconian National Security Act, intended for terrorist cases, under which he may spend a year in detention without charge.

Many Dalits have broken professional barriers, but many more are stuck doing ▶▶

All manner of abuse

India



Sources: National Crime Records Bureau; National Family Health Survey 4; India Human Development Survey; Mint

*Other backward castes †Excluding Muslims ‡Aged 6-59 months §Aged 15-49 years, BMI below 18.5

▶ jobs no one else will take, such as disposing of dead animals and cleaning sewers. In 2017 alone some 90 sewer-cleaners, all Dalits, were fished out dead from India's drains, an activist group reports. So much are Dalits associated with tidying up other peoples' mess that anthropologists have identified caste attitudes as the main reason for rural India's uniquely high rate of open defecation. It was found that many upper-caste villagers, including Dalits of higher sub-caste than the drain-cleaners, see toilets as "polluting" to their homes. Dalit parents regularly protest that schools have singled out their children to clean toilets. They also complain that state schools assign numbers to plates when handing out free lunches, lest a child whose family insists on ritual separation from Dalits be served on "polluted" crockery.

In eastern and southern parts of India the proportion of respondents who say they consider Dalits polluting can be as low as 1%. When asked more specific questions about interacting with Dalits, however, these numbers tend to rise, dramatically so in less enlightened parts of India. In the central state of Madhya Pradesh some 53% of respondents to one survey said their family tried to avoid certain forms of contact with Dalits; surveys of rural areas in nearby states found rates of 65% or more. Although 55% of Indians say they do not mind people of different castes marrying one another, only 4% say they have married someone from outside their caste.

A study in 2010 of some 1,589 villages in the western state of Gujarat identified 98 practices, from preventing access to public wells to obliging Dalits to play drums at weddings, and ranked them in order of prevalence. It found, for example, that in 91% of villages Dalits were not allowed in non-Dalit temples, and in 98% of them non-Dalits would not serve tea to Dalits in their homes. The survey also found a high prevalence of similar practices among different sub-castes of Dalits.

Yet such practices, although still widespread, are declining. Recent surveys suggest that barely a quarter of families still follow them in some form, compared with virtually all Hindus before independence. Devesh Kapur, an economist at the University of Pennsylvania, recalls visiting a rural area in the 1970s. "The kind of language that was used and the whole emphasis on purity and pollution was just nothing like as relaxed as we see now."

Mr Kapur suggests it is just as important to consider the "intensity" of practice as the prevalence. Even among families who admit to prejudices such as refusing to let Dalits into their homes, or to use the same utensils, it is likely that the number of such taboos has diminished over time. Accelerating urbanisation, bringing with it a much wider degree of anonymity, is an important factor. "Take the fast-food industry,"

says Mr Kapur. "I don't know who has touched my food anymore, and pretty soon I stop caring."

Martin Macwan, a Dalit activist and one of the authors of the Gujarat study, cites another example of change. When he started a service offering free legal advice 20 years ago all his clients were Dalits. Others did inquire, but at first balked when Mr Macwan told them they could have his services free of charge if they would drink a glass of water in a Dalit home. Now a third of his clients are non-Dalit.

Indians will not turn liberal overnight, says Mr Kapur. It happens in stages. The first is when people stop noticing who is Dalit; the second when they stop caring. The third is when they actively want to do away with untouchability. "I think we are now somewhere between the first and second steps," he says. ■



North Korea's conglomerates

From planes to mackerel

SEOUL

A new breed of company is helping to prop up the nuclear dictatorship

“A UNIQUE and sweet taste,” says a poster describing a new brand of soju, a local firewater, made by Naegohyang. The North Korean company started out making cigarettes (reportedly puffed on by Kim Jong Un, the country's dictator). It has branched out into a thicket of unrelated items, including playing cards, sanitary towels, sports kit and electronics. It advertises them in the stadium of the women's football team it sponsors.

Naegohyang, which means “My Homeland”, is one of what appears to be a growing number of large and diversified businesses in North Korea. In Kwangbok Area

Shopping Centre in Pyongyang, the capital, Naegohyang's “7.27” cigarettes compete with “Hanggong” (meaning “airline”) brand, produced by Air Koryo, the national carrier. The latter, too, appears to be expanding into several industries, from making potted pheasant and canned mackerel to operating taxis and petrol stations.

Such conglomerates are often compared to the *chaebol* of South Korea, but are best understood as “a private-public partnership” says Chris Green of International Crisis Group, a think-tank. Under North Korean law the government is the sole economic operator and private business is banned. Although these companies are nominally owned by the state, they are run mainly privately and rely, at least in part, on private funding.

After a famine caused the state rationing system to collapse in the 1990s, Kim Jong Il, Mr Kim's father and predecessor, turned a blind eye to small markets called *jangmadang*, where ordinary North Koreans bought and sold goods. Ministries were later given rights to trade in certain goods, creating opportunities for entrepreneurs down the supply chain. The government requires some state-owned companies and agricultural workers to provide fixed quotas of goods, but allows them to use the rest of their output as they see fit.

Not all the conglomerates grew out of ministries: some started as private companies but became big enough to require state patronage. North Korea's monied elite provide them with cash and cream off most of the profits. The overseeing ministry provides protection in return for a cut—a tax, in effect. It is usually a fixed sum based on expected profits.

Sanctions, ramped up in recent years, have further encouraged the development of conglomerates, says Andray Abrahamian of the Honolulu branch of the Center for Strategic and International Studies, a think-tank. He points to the example of Myanmar. Sanctions that blocked access to foreign goods and investment led, he argues, to the domination of the economy by the well-connected. In North Korea, for example, it is often relatives of powerful ministers and bureaucrats who own trading companies. Jang Song Thaek, Mr Kim's uncle, who was executed in 2013 for treason, controlled fisheries, coal mines and exports of other minerals.

Unlike his father, Kim Jong Un has not tried to roll back the development of a private economy or large, sprawling companies. Indeed, since 2013 he has stressed the parallel development of nuclear weapons and the economy. He has talked about making more domestically and giving choice to local “consumers”. In 2014 the law was changed to allow managers of state-owned firms to trade and create joint ventures with foreigners, and to accept financing from private investors at home. ▶▶

▶ The growth of conglomerates initially increased competition: in addition to Air Koryo, for example, a riding club, a ski resort and a phone company also set up taxi services. But the big firms are starting to gobble up or squeeze out the small businesses through which poorer North Koreans make a living. Seafood companies connected to the army are putting fishing co-operatives out of business.

Analysts reckon the big companies are a prop to the regime, too. They not only pay taxes, but can manufacture things that are hard for it to obtain because of international sanctions. The wealthy are presumably happy to have increased opportunities, even if they can be withdrawn at the regime's whim (one of the reasons for Jang's execution is said to have been his economic power). The Bank of Korea, in Seoul, reckons the GDP of the North increased by 3.9% in 2016.

But in the long run, a more "aspirational society" and a healthy middle class may lead to the country opening up, says Simon Cockerell, who runs Koryo Tours, a travel agency based in Beijing, and has visited North Korea 168 times. These companies have been able to grow thanks in part to a growing consumer class, albeit mainly confined to Pyongyang. Sokeel Park of Liberty In North Korea, a Seoul-based organisation, reckons the development of new centres of power, which follow economic incentives, will ultimately increase pressure on the regime. ■

The Rohingya diaspora

Unwanted everywhere

KARACHI AND KUALA LUMPUR

Life is grim for Rohingya refugees in Malaysia and Pakistan

INSIDE a cramped flat beside a motorway in Puchong, a suburb of Kuala Lumpur, 13 Rohingyas jostle for space. Rows of washing, rather than pictures, hang along grimy white walls. Rubbish is stacked on two mouldy refrigerators. The only furniture in the main room is a sideboard stuffed with bedding, for when the adults—who spend their time doing odd jobs, such as collecting waste or selling scrap—come back at the end of the day to sleep on the floor. Several are gaunt, and complain of eating only one or two meals a day. With little else to play with, a toddler sucks on a metal padlock as if it were a toy.

Rohingyas are a Muslim minority who live in Rakhine state in largely Buddhist Myanmar. Over the past five months some 680,000 of them have fled to Bangladesh to escape a pogrom conducted by the Burmese army and their Buddhist neighbours.



Lucky by Rohingya standards

They now live in crowded and unhygienic shantytown camps just over the border. In theory, the Burmese government is willing to take them back, and has even signed an agreement to that effect with Bangladesh. But few in the camps express a desire to return without plausible guarantees of safety and fair treatment in Myanmar—a far-fetched notion given the hostility of the Burmese army and public to their return. On January 22nd Bangladesh's government admitted that it could not start the process of repatriating them.

But the alternatives are hardly enticing. Some 200,000 Rohingyas who fled earlier bouts of violence are thought to remain in Bangladesh. Others have found their way to different countries. Precise numbers are hard to come by, but it is estimated that around 300,000 Rohingyas live in Pakistan, 250,000 in Saudi Arabia and 100,000 in Malaysia. All of the inhabitants of the flat in Puchong fled Myanmar in 2012, after the killing of a Buddhist woman sparked bloody anti-Rohingya riots. People-smugglers took them by boat to Thailand, from where they travelled overland to Malaysia.

Pakistan and Malaysia, however, have not signed the UN Convention on Refugees, which obliges receiving countries to help those fleeing persecution. Indeed, Rohingya refugees tend to disguise where they are from. Most Rohingyas in Pakistan made their way there via Bangladesh in the 1960s, when Bangladesh was still a province of Pakistan. Others pretend to be Indian Muslims, to take advantage of the warmer welcome Pakistan accords such people. The UN's refugee agency (UNHCR) has registered around 66,000 Rohingya refugees in Malaysia, giving them a special identity card, but that does not confer the

right to work or live in the country.

As Rohingyas in Malaysia cannot work legally, they have little option but to scratch a living collecting rubbish, or to take ill-paid informal work on construction sites and farms. They are vulnerable to abuse from both employers and corrupt officials. They have no access to public education. Although those who are registered with UNHCR get a discount on health care, the vast majority have no option but expensive private doctors.

Similarly, in Pakistan, Rohingya men tend to work illegally, as fishermen, mechanics or waiters. Few children attend school; child labour is rife. Outside a public hospital in a well-to-do neighbourhood in Karachi, a 33-year-old man is thankful that the government does not know where he is from. His two-year-old son has pneumonia, and is being treated inside. If he had admitted that he was Rohingya, rather than a *mohajir* (a Muslim refugee from India) as he had claimed, he would have had to turn to an ill-equipped private clinic.

Politicians in both Malaysia and Pakistan have been quick to condemn the recent violence in Myanmar. Najib Razak, Malaysia's prime minister, raised the plight of the Rohingyas at a meeting with Donald Trump in September and at several summits of ASEAN, a regional club of which Myanmar is a member. Khawaja Muhammad Asif, Pakistan's foreign minister, has described events in Myanmar as a "challenge to the conscience".

Yet very little is being done to make Rohingyas' lives easier. Malaysia has started a pilot scheme to get Rohingyas into work, but it has only 300 participants so far. In Pakistan the odd politician has suggested giving Rohingyas citizenship. But the people of Sindh, the province of which Karachi is capital, are not keen on the idea of competing with Rohingyas for the government's limited resources.

As the crisis rumbles on in Myanmar, the situation for Rohingya refugees elsewhere is unlikely to improve. Making noises about helping the Rohingyas may be good politics, particularly in Malaysia, where Mr Najib will face voters later this year. But the reality is that foreign governments see them as an unwelcome burden on the state. "Malaysian officials in the past have said explicitly we cannot make the situation too comfortable here, because more will come," says Matthew Smith of Fortify Rights, an NGO.

As a result, Rohingyas are typically kept in a state of deprivation and uncertainty. Surrounded by football trophies in a room in Arkanabad, a Rohingya neighbourhood in Karachi, Faisal Hussain, a 22-year-old Rohingya, admits that he often looks at images of his homeland in Myanmar. "They have greenery and lush farmlands," he says, his eyes welling up. "In my heart I want to go back but I know I cannot." ■

Banyan | Trading places

Why free trade is not a political millstone in Asia



THE obituary of the Trans-Pacific Partnership (TPP) was widely written when Donald Trump pulled America out of the 12-country free-trade deal on the third day of his presidency. Yet, a year later and against all the apparent odds, the pact lives on. On January 23rd its remaining 11 members met in Tokyo to thrash out the final details of pressing ahead regardless. The plan is to sign a final agreement in March, to come into force in 2019. It will be one of the world's most exacting trade pacts, measured by openness to investment from other members, the protection of patents and environmental safeguards.

The pact's resurrection is one of the more unlikely events in a year of surprises. After all, America accounted for almost two-thirds of the original bloc's \$28trn in annual output. Access to the vast American market was what made other members readier to open up their own. Moreover, Mr Trump's retreat had sent a dismal message about the prospects of the open, rules-based order that America had underwritten. The Asia-Pacific region had benefited more than any from that order in recent decades—yet Mr Trump was declaring multilateralism dead and signalling an intention to raise barriers to trade. Soon afterwards, he ordered South Korea to renegotiate its free-trade agreement with America. And this week he imposed punitive tariffs on imported washing machines and solar panels, aimed at South Korean and Chinese manufacturers (see page 12).

In spite of this forbidding backdrop, the dauntless 11—Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam—have regrouped. In Vietnam in November their leaders sketched out an agreement on the core features of a revised deal. The pact's name has changed, to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), in case the original had tripped too lightly off the tongue. But remarkably few (22, to be precise) of the original provisions have been frozen. The victims are mainly strictures insisted on by America. For instance, copyright has been reduced from 70 to 50 years. And special protections for biologics, a booming category of drugs, have been suspended.

A few concessions were made to those still in the pact. Malaysia will not immediately have to liberalise its state-owned enterprises. Communist Vietnam can put on hold new rules about re-

solving labour disputes and allowing independent trade unions.

The biggest foot-dragger was Canada, the second-biggest economy in the group (after Japan), which had wanted special treatment for cultural industries such as television and music—a concern for Francophone Canadians—and changes to the rules on imports of cars. Canada has a big car-parts industry, which caters mainly to American carmakers. Now that America has dropped out of the pact, fewer cars from this integrated North American supply chain will have enough content from CPTPP countries to qualify for tariff-free access to other members. But Canada will still have to open its market to Asian cars, subjecting its car-parts firms to a one-sided dose of foreign competition.

In the end Canada's concerns were met with a favourite TPP trick: "side letters" between it and other members, that are not officially part of the deal. One of them promised Canada greater access to the Japanese car market. CPTPP's members were sufficiently determined to revive the pact, in other words, that they gritted their teeth and compromised.

How does CPTPP carry on, even as multilateralism has fallen out of favour elsewhere? For some members, including Japan, which has done most to keep the show on the road, there is a strategic imperative: to prop up the old rules-based order in America's absence. (The less-welcome alternative might be an order overseen by China.) Bilahari Kausikan, a Singaporean ambassador-at-large, predicts that America will eventually return to the partnership. After all, CPTPP (and TPP before it) is not typical of the tariff-cutting deals that Mr Trump claims have shafted America. Rather, it breaks ground in setting American-inspired standards and safeguards for everything from online commerce to creative industries. Mr Kausikan believes it is only a matter of time before American firms are clamouring to take part.

Before then, others may seek to join an arrangement designed to be infinitely expandable. South Korea, Indonesia and the Philippines have expressed interest—even Britain has. And CPTPP is not the only trade deal making progress in Asia. Japan has just concluded a sweeping agreement with the European Union. The Association of South-East Asian Nations is seeking to create a vast free-trade area encompassing China and India, among others.

Fair blow the Asian trade winds

In Asia free trade is more popular than it is in America and much of Europe. The question is why. One explanation is that in the West, trade creates winners and losers; in Asia, at a lower stage of development, it mainly creates winners, though some gain more than others.

Yet that is not quite right. Asia's pell-mell development creates lots of losers. It can be traumatic to be forced off your land to make way for a palm-oil plantation or a high rise. Inefficient rice-farmers across the continent have much to fear from free trade. Even in prosperous Singapore, points out Deborah Elms of the Asian Trade Centre, an advocacy group, it is still an emotional wrench to see nearly every landmark of your childhood vanish in an orgy of rebuilding.

The difference is that most Asians don't have what Mr Kausikan calls the illusion of choice. Trade is how billions of them have attained a modicum of prosperity. And thanks to rapid, trade-fuelled growth, the drawbacks of opening markets seem relatively insignificant. For as long as wrenching change is offset by the prospect of a better tomorrow, Asia will fly the flag of global trade even when it is being furled elsewhere. ■

 Also in this section

 37 The perils of rap music



For daily analysis and debate on China, visit
Economist.com/china

Data privacy

Public pushback

BEIJING AND HONG KONG

Consumers and tech firms are taking privacy more seriously. The government is not

XU YUYU was a poor 18-year-old student from the coastal province of Shandong when, on the eve of going to university in 2016, she was defrauded of the savings that her family had painstakingly accumulated for her. She died of a heart attack that was caused, a court said, by the fraud. Ms Xu's fate sparked an impassioned debate in China about data privacy because the scammer, Chen Wenhui, had paid a hacker for stealing her personal details. He was sentenced to life in jail for theft of private information.

China has a reputation for lax controls over the gathering, storage and use of digital data about individuals. But sensitivities about such matters are growing, and not just when information is stolen.

This month a court in the eastern city of Nanjing agreed to hear a case brought by a government-controlled consumers' group against Baidu, China's largest search engine. The group claims that a Baidu app illegally monitors users' phone calls without telling them. At the same time, Ant Financial, the financial arm of Alibaba, the country's largest e-commerce group, apologised for a default setting on its mobile-money app that automatically enrolled customers in a credit-scoring scheme, called Sesame Credit, without users' consent. The third of China's big three internet

firms, Tencent, also dealt with a storm of criticism after the head of one of China's largest car firms said Pony Ma, Tencent's founder, "must be watching" all messages on WeChat, the firm's popular social-media app, "every single day".

Consumers in China have good cause to worry. Data collected through one medium can often end up in another. A man who talked on his mobile phone one day about picking strawberries said that when he used his phone the next day to open Toutiao, a news aggregator driven by artificial intelligence (AI), his news was all about strawberries. His post on the experience went viral in January. Toutiao denied it was snooping but conceded, blandly, that the story revealed a growing public "awareness of privacy".

Cultural evolution

Anxiety about it is indeed growing, but from a low base. The Chinese word for privacy, *yinsi*, has a negative connotation of secrecy. Things that in the West are taboo in conversation between strangers—for example, asking about the other person's salary—are often discussed in China.

Such traditions inform behaviour in the digital world. The Boston Consulting Group says that in a dozen countries it surveyed in 2013, three-quarters of respon-

dents outside China stated that caution was necessary when sharing personal information online. But only half of those polled in China agreed. In 2015 *Harvard Business Review*, a journal, tried to estimate what value people in different countries attached to personal data. It found that Chinese would pay less to protect data from their government-issued identification cards and credit cards than people from America, Britain and Germany. More than 60% of respondents in a large survey conducted by *China Youth Daily*, a state-owned newspaper, said that the default settings in their mobile apps allowed their personal information to be shared with third parties. Chinese law did not define what counts as personal information until a cyber-security bill took effect last year.

Two things are helping to change public attitudes. One is rising concern about online fraud, a huge problem in China. A survey in 2016 by the Internet Society of China found that no less than 84% of respondents said they had suffered from some form of data theft. The number of cases seems to be rising. In 2017, according to *Legal Daily*, a newspaper, the police investigated 4,900 cases of theft of personal information, resulting in the arrests of over 15,000 people. That is twice the number of cases and four times as many suspects as in the previous year. Worries about data theft are not the same as concerns about privacy. But the two sentiments often overlap.

The other big change is the surprising emergence of China's internet companies as lobbyists for better data protection, even though their motives are mixed. On the one hand, the data they are scooping up from consumers are becoming an ever more prized commodity. The companies ►►

▶ want to use the data in pursuit of global dominance in the business of AI. So they have an incentive to collect as much data as possible and support lax data-protection laws. On the other hand, consumers in China are demanding tighter protection, while their counterparts in the West, where the Chinese companies are trying to expand their business, have even greater privacy concerns.

For the past year, companies have been debating how to strike the right balance. Now, it seems, consumer pressure may be winning out. Frank Fan, a data-security expert, argues that recent events will prove a turning point. “In the future,” he says, “data-protection policies will determine whether a company will succeed or not.” Nie Zhengjun, Ant Financial’s chief privacy officer (yes, they have one) claims that Chinese consumers are “no longer content with preventing information from being used for fraudulent purposes...Now they want control in protecting their privacy.”

The question is how these shifts in consumer attitudes and company behaviour will affect the government, which is gathering vast quantities of personal information without the public’s consent. This includes DNA data taken from millions of people, including all inhabitants of the western province of Xinjiang. The government’s aim is to use the data to help it to strengthen social control.

In 2017 the government launched an inspection campaign examining the privacy policies of ten internet firms. At least five were found to have improved data protection by making it easier for users to delete personal information. This enabled the government to boast about the security of China’s data-protection laws and claim that it was making personal information safe from criminals.

At the same time, however, the cybersecurity law required that copies of all personal data gathered by operators of “critical information infrastructure” in mainland China must be stored there. This has fuelled suspicions that the government wants to be able to gain access to them, either covertly or by putting pressure on data-storage companies. At the end of February, Apple will comply with the new law by handing management of the data of iCloud customers in China to a state-owned company. (The American firm insists that “no back doors will be created into any of our systems” and that it will ensure “strong data privacy”.)

In the long run, the public’s growing concerns about privacy must be at odds with the government’s efforts to create a new form of surveillance state. But the Communist Party shows no sign of concern: it seems to be able to have its cake and eat it. It is tightening data-protection rules for companies, while making it easier for itself to grab more private information. ■

Music

Rappers’ knuckles rapped

BEIJING

A genre’s popularity worries officials

IN HIS bawdy rap song, “Christmas Eve”, Wang Hao (pictured) switches from Chinese to English when praising his friends as “motherfucking dope”. Mr Wang’s fans clearly think he is dope, too. In September the musician (who uses the stage name PG One) was named as the joint winner of “Rap of China”, a hip-hop-themed talent show on iQiyi, a popular video-streaming site. During its 12-episode run the contest racked up a whopping 2.7bn views, turning its contestants into household names.

This year, however, those revelling in their newfound fame are under fire. In December Mr Wang was accused of having an affair with a married actress; in an ensuing online furore, the Communist Youth League tweeted an attack on “Christmas Eve”, a three-year-old track that web users had dug out of Mr Wang’s back catalogue and that contained far coarser lyrics than anything he had aired on the show, including a reference to drug-taking. All his records have since disappeared from music-streaming services—while they are reviewed and revised, he says. Mr Wang apologised for the saltiness of his early work. He blamed it on the influence of “black music”.

Meanwhile fortunes are also shifting for Mr Wang’s fellow winner, Zhou Yan, who goes by the name of GAI. Since finding fame on the show, Mr Zhou had shown no inclination to upset prudish censors by returning to his gangsta-rapper roots. But on January 19th he failed to appear in the second episode of “Singer”, a star-studded variety show onto which he had been

booked. Netizens speculated that television bosses had been ordered to yank him from the series. Shortly beforehand China’s media regulator was reported to have circulated guidelines informing broadcasters that they should not feature hip-hop music or give airtime to people with questionable morals, undesirable ideologies or (gasp) visible tattoos.

Rap music is not new to China. Its popularity has grown in fits and starts since the 1990s. In 2014 the country’s leader, Xi Jinping, said there was a place in China for imported art forms such as rap as long as they conveyed “healthy and upbeat” messages. In recent years rap-style delivery has even been adopted by the party in its propaganda videos. “Extensive consultation, joint contribution and shared benefits” was a catchy line in a partially rapped ditty released last year in praise of China’s plans for state-led investment abroad, the Belt and Road Initiative.

Chinese rappers tend to avoid broaching sensitive political topics. Yet the authorities are clearly wary of the genre. Officials in Beijing are keen to promote Mandarin; they are not big fans of the local dialects that many rappers use. They also worry about the lewdness of some rap lyrics—a pretext that was used for blacklisting 120 rap songs in 2015 (when members of one well-known group were slung into jail for several days, apparently for being too risqué). Despite his approval of sanitised cultural imports, Mr Xi is far keener on traditional Chinese arts. Foreign pop idols are finding it harder to get permission to perform in China. Justin Bieber and Katy Perry are among the most famous to have been barred in recent months.

But the party’s puritanism is at odds with the tastes of young Chinese. It is also a headache for television producers. The creators of “Rap of China” had promised a second series. If officials persist in keeping colourful characters off-camera, making a triumphant return will be hard. ■



Hip-hop star calls music “black”



The war in Syria (1)

Into the abyss

ISTANBUL

Turkey's offensive in northern Syria complicates an already chaotic war

SEVENTY-TWO Turkish fighter jets cut through the skies above north-west Syria on January 20th, dropping bombs on the Kurdish enclave of Afrin, while thousands of Turkish troops massed at the border. They were joined by busloads of Syrian rebels, Turkey's proxies in the fight against Bashar al-Assad's blood-soaked regime in Damascus. So it was that Turkey opened a new front in the Syrian war, and in its unending conflict with Kurdish insurgents, with reverberations rippling to Washington, Moscow and Istanbul.

The offensive pits NATO's second-biggest army against a Kurdish militia called the People's Protection Units (YPG), which Turkey says is a branch of its domestic foe, the Kurdistan Workers' Party (PKK). The separatist PKK has fought an on-off insurgency against Turkish security forces for over three decades. But the YPG is best known for fighting Islamic State (IS) in Syria. American support, in the form of weapons and air strikes, helped the Kurds repel the jihadists and, to Turkey's dismay, take control of vast stretches of land in the north (see next story). When America said it would create a 30,000-strong "border-security force" in north-east Syria consisting largely of YPG fighters, Recep Tayyip Erdogan, Turkey's president, vowed to "strangle it before it is born".

The incursion, which is inexplicably

called Operation Olive Branch, appears to enjoy wide support across Turkey. The media have whipped themselves into a nationalist frenzy almost as big as the one that followed an abortive coup in 2016. Of the four main parties in parliament, only one, a pro-Kurdish outfit whose leaders have been locked up for over a year, refused to support the offensive. Mr Erdogan argues that an emboldened YPG plans to use the Syrian borderlands in the same way as the PKK has used the mountains of northern Iraq: as a launching pad for attacks against Turkey. Most Turks seem to agree with him.

The stubborn sultan

Mr Erdogan has ways of dealing with those who do not. Having caught wind of possible protests, he pledged to "crush anyone who opposes our national struggle" and warned that police would be "breathing down the necks" of those who took to the streets. Dozens of people, including at least five journalists, have been detained for social-media posts criticising the offensive. In Northern Cyprus crowds of Turkish nationalists attacked the office of a local newspaper that likened Operation Olive Branch to Turkey's invasion of the island in 1974—ie, an illegal occupation.

The precise aims (and limits) of the operation are unclear. Turkey's chief of the

Also in this section

39 The Kurds of Syria

40 Less aid for the Palestinians

40 Notes for former colonies

41 Integrity idols

41 Political prisoners in Ethiopia

42 Land reform in South Africa

For daily analysis and debate on the Middle East and Africa, visit

Economist.com/world/middle-east-africa

general staff, Hulusi Akar, has said he will push forward "until we eliminate every terrorist". Other officials liken the offensive to one in 2016 that saw Turkey wrest from IS a 100km stretch of Syrian territory west of the Euphrates river. The jihadists hardly put up a fight and local Arabs and Turkoman welcomed the Turks as liberators. (Turkish troops and Syrian rebels are still in control of the area.) "We're hoping to repeat this example in Afrin," says Bekir Bozdogan, Turkey's deputy prime minister.

But the Turks will face a much tougher fight in Afrin. Around 10,000 battle-hardened YPG fighters are in the area. Local Kurds, who are most of the enclave's 600,000 or so residents, seem uniformly hostile to the Turks and their Syrian allies. The YPG has closed roads out of the city, while the Assad regime turns back those who manage to leave. According to the Syrian Observatory for Human Rights, a Britain-based monitoring group, at least 28 civilians, 42 Kurdish fighters and 48 Syrian rebels were killed in the first five days of the operation. Officials in Ankara confirmed the deaths of three Turkish soldiers and claimed to have killed 268 militants. Rockets believed to have been fired by the YPG killed three people in the Turkish towns of Kilis and Reyhanli.

America is caught in the middle—and sending out mixed messages. The Pentagon hopes to continue using the Kurds as a bulwark against Islamist militancy in Syria. The White House, though, has disavowed plans to create a new Kurdish-led force and downplayed America's relationship with the Kurds. In general, American officials have been loth to criticise Turkey, but in a phone call with Mr Erdogan on January 25th, President Donald Trump expressed concern about the violence in Afrin. So ▶▶

says the White House, at least. A Turkish source said no such concerns were shared.

While America loses leverage in Syria, Russia is filling the vacuum. It has mended its relationship with Turkey, which reached a low point in 2015, when the Turks shot down a Russian fighter jet over Syria. Happy to stoke tension between America and its allies, Russia almost certainly gave the operation in Afrin a green light. It may be that in return Turkey looks the other way as Russian and Syrian forces pound rebels in Idlib, who are ostensibly allied with Turkey against the Assad regime. But some think the Russians will eventually turn on Turkey and cut a deal with the Kurds that hands Mr Assad control of Afrin.

A more immediate concern is whether the Turks plan to push into other YPG strongholds. America has some 2,000 troops stationed in Syria, many in the Kurdish-held north-east. If Turkish troops start shooting at YPG fighters in those areas, American soldiers could end up in the crossfire. The result could be a direct clash between NATO allies. ■

The war in Syria (2)

The precarious state of Rojava

DEIR EZ-ZOR AND QAMISHLI

Syria's Kurds try to keep control of their territory

ABU JABR waited more than three years to exact his revenge. In 2014 the jihadists of Islamic State (IS) murdered hundreds of his fellow tribesmen in the province of Deir ez-Zor. Mr Jabr returned to his village in December, leading a group of tribal fighters. Backed by American air power, his men have driven IS into the desert along the Iraqi border. The jihadists still send car bombs into his lines, but he says they will be defeated soon. American-led air strikes are said to have killed up to 150 jihadists in Deir ez-Zor on January 20th.

Mr Jabr's men fall under the command of the Syrian Democratic Forces (SDF), a Kurdish-led alliance formed to defeat IS in northern and eastern Syria. Armed and trained by America, the SDF is close to victory. Its flags flutter over a quarter of the country, much of which was once held by the jihadists. But when Turkish tanks rumbled into the Kurdish-held western enclave of Afrin on January 20th (see previous story), the Kurds suddenly found themselves fighting on two fronts.

Turkey's anger has grown as the area under Kurdish control expanded, over the course of the war, to include even Arab and Turkoman towns captured from IS (see map). In 2016 the ruling Democratic Union Party (PYD) declared the Kurdish-held terri-



tory, which abuts the Turkish border, a federal region called Rojava. It was not a move towards secession, said the PYD, but a model for the rest of Syria. The regime of Bashar al-Assad dismissed the declaration and the Turks seethed. But the Kurds, who make up around 10% of Syria's population, have consolidated their grip on the north.

Shahoz Hasan, the PYD's joint chief, refers to Rojava as a "democratic experiment". The party has empowered women and set up village committees, in line with the teachings of Murray Bookchin, an American philosopher whose writings have greatly influenced the Kurdish movements in Syria and Turkey. But Rojava is hardly pluralistic. The PYD represses critics and other Kurdish parties.

The PYD's leaders say they will never again allow Rojava to be ruled directly from Damascus. For decades the Kurds in Syria suffered under the oppression of Mr Assad and, before him, his father. Many were stripped of their citizenship and denied the right to own property. Others were booted off their land to make way for Arabs. Kurdish publications were banned and private schools were prohibited from teaching the Kurdish language. Little investment flowed into the oil- and gas-rich region. Instead the regime in Damascus milked the fertile northern plains to feed the rest of the country. As a result, the Kurds are desperately poor.

Surrounded by potential enemies and in need of support, the PYD has flirted with nearly all of the combatants in Syria. Its strongest backer is America, which views the PYD's armed wing, the People's Protection Units (YPG), as the most dependable ground force against IS. America has given it weapons and training, and deployed 2,000 of its own troops to the region. Fearing a return of the jihadists and Iranian hegemony, America has promised to stay in north-eastern Syria until a peace deal is reached. The PYD does not think it will allow the Turks to go beyond Afrin.

Russia, which backs Mr Assad, probably blessed the Turkish operation, if only to

spite America. In response, the PYD said it would probably not attend Russian-sponsored peace talks at the end of January. Still, Russia and Mr Assad may see a potential partner in the PYD, which has accepted Russian military support and maintained ties to the regime. The group is regarded as more pragmatic than the other rebel outfits. When Mr Assad's forces retreated from areas in the north, they made sure to hand them to the PYD. One could imagine the regime and the Kurds supporting a deal that keeps Mr Assad in power and grants Rojava autonomy.

But the Kurds will probably have to concede some of their gains in order to keep most of Rojava. Any deal would probably require Kurdish forces to be folded into the national army; captured oilfields to be returned to the central government; and seized Arab lands to be given up. "If real negotiations happen we will talk about all these things," says Mr Hasan. "We are always open for discussions." First, though, he must deal with the Turks. ■



Kurds curse Turkey

Palestinian refugees

Stripping the Strip

CAIRO

Is America wrong to cut aid to Palestinian refugees?

A TRIP billed as a show of support for Christians had a noticeable lack of them. On January 22nd Mike Pence, America's vice-president, landed in Israel on the last leg of a three-country jaunt. Originally scheduled for December, it was delayed after Donald Trump made the controversial decision to recognise Jerusalem as Israel's capital. When Mr Pence arrived at last, the Palestinians blackballed him. So did Christian leaders in Egypt and Jordan. Mr Pence, a devout Christian himself, did not even set foot in a church in the Holy Land.

No one was sure why he came. His meetings with Israeli and Arab leaders were routine, save for a speech in the Knesset, where he announced that America would move its embassy to Jerusalem by the end of 2019. The trip seemed to be about domestic politics: for Mr Pence, a nod to his evangelical base; for Binyamin Netanyahu, Israel's scandal-plagued prime minister, a chance to look like a statesman.

And the Palestinians got to snub an administration they now see as biased. Apart from Jerusalem, they are also fuming over cuts to the UN Relief and Works Agency (UNRWA), which aids Palestinian refugees. In January Mr Trump suspended \$65m, about half of America's next scheduled payment, plus \$45m in emergency food aid that it had pledged. The cuts will bite. In 2016 America was the agency's largest donor. It paid 30% of UNRWA's budget of \$1.2bn, more than twice as much as the EU.

The agency was founded in 1949 to offer temporary aid to 750,000 Palestinians displaced by the creation of Israel. Like so much else in this intractable conflict, it has become permanent. Because the UN deems the descendants of Palestinian refugees to be refugees, too, their number has swelled to more than 5m.

In Lebanon, most lack citizenship and live in grim camps. The government says it cannot afford to give them social services; they are also barred from some jobs. Some Lebanese fear that granting citizenship to so many Sunni Muslims would upset their country's delicate sectarian balance. Those fears may be overblown: a census released in December found that only about 175,000 Palestinian refugees still live in Lebanon, one-third of previous estimates. They have fared better in Jordan, but 400,000-plus live in camps.

Many still hope to go back to their ancestral homes. This "right of return" is among the conflict's most emotive issues.



He has nothing left to lose

Israel, worried about its own demography, will permit only a token homecoming under a future peace deal. In private, Palestinian leaders doubt their state could handle a huge influx of new citizens. Israel and its defenders often fault UNRWA for letting Palestinians nurture this distant hope.

Yet the agency also lets Israel indulge a fantasy. Since 2007 it has maintained a punishing military blockade on Gaza (as has Egypt). The consequences have been stark. Unable to export goods, hundreds of Gazan factories and farms have closed. Most of Gaza's 2m people have been unable to leave their tiny enclave for a decade. Water is undrinkable and electricity available only for a few hours a day. Even the Israeli army now reckons the blockade is ineffective at best, counter-productive at worst. Ironically, foreign aid lets it persist. Half of Gaza's people rely on UNRWA for food, 262,000 students are enrolled in its schools and its clinics handle more than 4m patient visits a year.

Pierre Krahenbuhl, UNRWA's head, calls America's cuts "abrupt and harmful". While Mr Pence was touring the region, the agency launched an appeal called "dignity is priceless." It hopes to raise an extra \$500m. Yet there is little dignity to be found in places like Gaza's Shati camp, where the smell of untreated sewage lingers over the teeming alleyways. UNRWA does admirable work in such places—literally keeping millions of people alive. It also shields all parties from the consequences of prolonging the conflict. ■

Africa's CFA franc

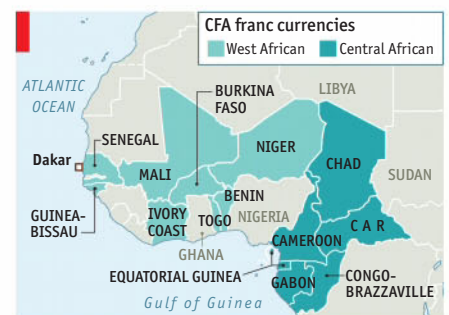
Franc exchange

DAKAR

A French-backed currency comes under fire

DEBATING the merits of the CFA franc, says Guy Marius Sagna, a Senegalese activist, "is like discussing the advantages and disadvantages of slavery." That is a ridiculous analogy. But the past year has seen protests in several cities against the currency, used by 14 countries in west and central Africa and supported by France, the former colonial power. One firebrand was deported from Senegal after burning a CFA franc note. A director of La Francophonie, a union of French-speaking nations, was suspended after writing an explosive article on the topic. The agitators are few, but they have hit a nerve.

To its critics, the CFA franc is a colonial anachronism; to its defenders, a bulwark of stability. Established under French rule, it is actually two distinct currencies. A central African bloc, oil-soaked and despotic, uses one; the other circulates in eight poorer, more open countries to the west (see map). Both are pegged to the euro, with convertibility guaranteed by France. Countries in each zone pool their foreign-exchange reserves, of which half must be deposited with the French treasury. French



delegates sit on the central banks' boards.

This peculiar system has brought stability. Over the past 50 years inflation has averaged 6% in Ivory Coast, which uses the CFA franc, and 29% in neighbouring Ghana, which does not. It eases trade with Europe, the region's biggest partner, and frees foreign investors from the risks of exchange-rate fluctuations.

Where some see an anchor, others see a millstone. To maintain the euro peg, notes Ndongo Samba Sylla, a Senegalese economist, these very poor countries must track the hawkish monetary policy of the Euro- ▶▶

pean Central Bank. Since the introduction of the euro, income per person in the franc zone has grown at 1.4% a year, compared with 2.5% in all of sub-Saharan Africa.

Blaming the currency for slow development is “absurd”, says Ismaël Dem, director general of economy and currency at the west African central bank. He argues that the exchange rate is where it should be and that countries such as Ivory Coast are booming. But the franc zone still depends, as in colonial days, on the export of raw materials. And the central African countries, despite sharing a currency, export more to France than they do to each other.

Calls for reform are becoming louder. Carlos Lopes, a former executive secretary of the UN Economic Commission for Africa, advocates tying the CFA franc to a basket of currencies, such as the dollar and yuan. Others think the exchange rate should fluctuate around a target. Radicals

want France out of the currency altogether.

Yet elites do rather well out of the system, which makes it easier to send wealth abroad. And a weaker currency would increase the cost of imported goods. The only devaluation, in 1994, sparked riots.

The recent history of the central African zone is telling. A slump in oil prices from 2014 widened fiscal and current-account deficits, putting pressure on the peg. Reserves covered just over two months of imports at the end of 2016. Yet most leaders signed onto IMF programmes to cut spending rather than move the exchange rate.

In west Africa, meanwhile, politicians pay lip service to the idea of a single currency for all countries in the region. But that would require small oil importers to throw in their lot with Nigeria, a huge oil exporter. Although the CFA franc is unloved, the alternatives are risky. It will survive for some time yet. ■

Integrity idols

Good clean entertainment

Can a reality TV show discourage corruption?

THE timing could not have been better. In the same week as two civil servants in Nigeria appeared in court for embezzling funds earmarked for International Anti-Corruption Day, the finalists of “Integrity Idol” were announced. In this reality television show, honest civil servants working in corrupt countries compete for glory, fame and, occasionally, a live chicken. The show is a hit: over 10m people have watched it and more than 400,000 have cast their votes in favour of their Integrity Idols.

“Integrity Idol” started in Nepal in 2014 and has since spread to Pakistan, Mali, Liberia, Nigeria and South Africa. Five finalists, vetted by a panel of judges, are chosen to be interviewed. They explain why they deserve the prize. “I come to work late. My boss could ask ‘Why are you late?’ (...) I say I slept a little longer. Say it the way it is! Face the consequences!” one nominee exhorts.

It is not always easy to find good contestants. The Nigerian nomination period was extended because of the poor quality of entrants. “People were nominating their auntie because she gave them money,” says Odeh Friday, who runs the campaign. Others thought they qualified because they came to work on time. One policeman was surprised by his nomination because, he explained, he was involved in shady contracts. Another nominee resigned after he realised that background checks might dig up old dirt.

“Integrity Idol” claims to steer clear of



politics. Elected officials may not be nominated. Nor, in some countries, may people in the army. Even so, the show delivers a punch in the face to crooked politicians and their cronies, sometimes just by its timing: in Liberia last year, it aired while presidential elections were embroiled in fraud investigations.

It is difficult to know what impact the show is having, though the Massachusetts Institute of Technology has begun to measure it. Change may be gradual. Gareth Newham at the Institute of Security Studies in South Africa thinks its greatest contribution will be in changing attitudes. “Too many young people believe that you can only get a job if you belong to the [ruling party]. What has been missing is a focus on the ordinary people who do good work.”

Political prisoners in Ethiopia

Setting them free

ADDIS ABABA

The regime flirts with letting dissidents speak without locking them up

LIFE in Maekelawi, a prison in Addis Ababa, the capital of Ethiopia, had a predictable rhythm. Three times a day, Atnaf Berhane and Befekadu Hailu were hauled from the dank, dark cell they nicknamed “Siberia” for three hours of interrogation and beating. Mr Hailu was flogged across his bare feet with an electric cable. Mr Berhane escaped this particular cruelty. “I was lucky,” he says.

The two Ethiopian activists, members of a blogging group known as Zone 9, were arrested in 2014. After three months in Maekelawi they were charged with terrorism. After 18 months behind bars those charges were dropped, though both are still accused of the lesser crime of inciting violence. Ethio Trial Tracker, a website, claims that 923 Ethiopians are in prison on terrorism charges. Human Rights Watch, a pressure group, counts thousands more detained for their political opinions.

The ruling Ethiopian People’s Revolutionary Democratic Front (EPRDF) has a habit, always denied, of jailing its political opponents. So many observers were surprised when, on January 3rd, the government announced plans to release some political prisoners, turn Maekelawi into a museum and “widen the democratic space”. On January 17th it freed Merera Gudina, the country’s most prominent opposition leader, along with 527 other prisoners. The attorney-general said more prisoners would be released in the coming months, including some of those convicted of terrorist offences. “If the government means what it says, then it has a chance to write a new chapter in Ethiopian history,” says Mr Merera. Since his release thousands have come to see him, some bringing oxen to slaughter in the festivities.

After years of anti-government protests and a nine-month state of emergency that was lifted last August, some detect signs of change inside the EPRDF. For months the party blamed dissent on “foreign enemies” and local malcontents. But this month it issued a statement admitting to “mistakes” and promising more democracy. The anti-terror law is being revised and other repressive bills may be changed.

Yet one should not read too much into all this. Most of the prisoners whose cases were dropped were minor figures. Prominent activists from Oromia and Amhara, the country’s two most populous regions and hotbeds of unrest, are still being held. Any changes made to draconian laws will ▶▶

▶ probably be minor. And abuses continue: on January 20th government forces killed at least seven people at a religious festival.

More significant is the power struggle within the EPRDF, a coalition of four ethnically-based parties. The Tigrayan People's Liberation Front (TPLF) has long wielded influence disproportionate to the number of Tigrayans, who are about 6% of the population. But this may change. The Oromo People's Democratic Organisation, which is also part of the ruling coalition, was seen for years as a puppet of the TPLF. Yet it has rebranded itself as a populist, quasi-opposition movement. Under Lemma Megersa, its charismatic new leader, it has adopted many of the protesters' demands, including the release of political prisoners.

The embattled prime minister, Hailemariam Desalegn, may soon resign. If so, a successor must be found before the EPRDF congress scheduled for March, but sure to be postponed. Many in Oromia want it to be Mr Lemma, the country's most popular politician. Yet the EPRDF is bitterly at odds over the succession. Fetsum Berhane, a sympathetic commentator, wonders whether it has enough zeal to reform. "I'm not sure anybody is fighting over any ideals or issues except power," he says. ■

Land in South Africa

Dreams of fields

HOEDSPRUIT

South Africa gets land reform wrong

HANNES BOOYENS, clad in the khaki shorts and shirt of the Afrikaner farmer, shows off tidy rows of trees hanging heavy with grapefruits, soon to be plucked for export. Hezekiel Nkosi, the chairman of the Moletele Communal Property Association, which owns the land and employs Mr Booyens, nods approvingly. "We are happy," Mr Nkosi says. "We need the best technology, the best farm managers. Otherwise this is a fruitless operation."

The Moletele people were forced from this land, a picturesque corner of South Africa's Limpopo province, mainly in the 1950s and 60s. They got back 7,000 hectares of citrus and mango farms in 2007 after a legal claim but struggled to run them. One of the farms collapsed. Moletele leaders went looking for help. The Vumelana Advisory Fund, a non-profit that helps land reform projects, appointed advisers to develop a commercial partnership. The Moletele community now has access to capital and expertise. Young people are being trained so they can run the farms in future. "The best way was to partner with those that have the skills," Mr

Nkosi says.

Under colonial rule and then apartheid, black South Africans were systematically pushed off the land. Whites still own much of it. Righting this historical injustice has been a creakingly slow process over 24 years of democracy. The government promised to transfer 30% of white-owned farmland to blacks by 1999; most estimates reckon it has only transferred 10%. This dawdling pace, combined with a stagnant economy and rising unemployment (it recently hit 37%), provides fertile ground for populist politicians. Loudest has been the Economic Freedom Fighters, a thuggish opposition party appealing to poor blacks with promises of nationalised banks and the confiscation of white-owned land. That, in turn, is pushing the ruling African National Congress (ANC) to sharpen its rhetoric. At a conference in December the party adopted a policy of changing the constitution to allow it to confiscate land without compensation.

Cyril Ramaphosa, the ANC's business-friendly new leader and its candidate in presidential elections in 2019, has cautiously tried to walk a tightrope between radicals in his own party and economic catastrophe. Expropriation could "make this country the garden of Eden", he has said, but with big caveats: it must not undermine the economy, agricultural production or food security.

That is code for not copying Robert Mugabe, the former president of neighbouring Zimbabwe. When Mr Mugabe started grabbing white-owned commercial farms in 2000, he destroyed far more than a successful agricultural industry. He also smashed what was once one of southern Africa's most diversified economies. Mining, tourism and manufacturing all collapsed within a few years.

For all its fiery rhetoric, the ANC government has shown remarkably little vigour in using the laws it already has. Its allocation for buying land for redistribution has slumped to less than 0.1% of the national budget. And it is sitting on as many as 4,000 farms that it has bought but not yet handed over to black owners.

The government's failures do not stop there. Many of the farms that have been handed over have since failed because the new owners do not have the skills needed to run large commercial farms. As much as 70% of the estimated 8m hectares of land transferred by the state since the end of apartheid is now fallow.

Instead of fixing its shortcomings, the government is exacerbating them. In recent years it has stopped transferring ownership of land to black farmers because it frets they may sell it to whites. Instead it now leases the land to black tenants. Without assets to borrow against, these new farmers find it difficult to get capital.

Yet if done well, land reform could salve open wounds. The question is how to do it well. Peter Setou, the chief executive of the Vumelana Advisory Fund, says that partnerships between private investors and communities that are given land seem to work. But confusion around the ANC's policy on land expropriation deters would-be investors. "We cannot have this level of uncertainty," he says.

Under another model, known as the 50/50 framework, the government buys land and leases it back to a company owned by the farmer and farm workers. Andrew Braithwaite, a fifth-generation farmer, took part in a project that saw long-time workers on his sugar cane farm in KwaZulu-Natal province become co-owners of a farming business. "People feel they have something to lose," he says. "It adds stability to the nation."

It isn't just a matter of farms changing hands. Mr Ramaphosa says that land owned by government departments and municipalities should be released for housing. That would make it easier for people to move to cities, where the jobs are.

As it is, farming generates about 2% of GDP. Voters may like the idea of land redistribution, but not as much as they want good jobs in the city. That is even true for those who were kicked off their land during apartheid: most of those who have lodged claims for restitution have asked the courts to give them cash as compensation instead of farms. ■



Who's the boss?

The
Economist

SPECIAL REPORT
THE FUTURE OF WAR

January 27th 2018

The new battlegrounds

A futuristic, tracked robot with a humanoid upper body is the central focus. It has a red glowing light on its head and is firing a bright orange energy weapon from its right arm. The background is a chaotic, war-torn city street with smoke, debris, and a soldier in the distance. A helicopter is visible in the sky. The overall color palette is dominated by blues and greys, with bright orange and red highlights from the robot's weapon and lights.

PRIDE AND PREJUDICE

The path to advocacy

May 24th 2018

Hong Kong | London | New York

Speakers include:



WEI XIAOGANG
Co-chair
Beijing Queer Film Festival
(Hong Kong event)



GERALDINE ROMAN
Congresswoman
House of Representatives of the Philippines
(Hong Kong event)



SIR NICK CLEGG
Former deputy prime minister
United Kingdom
(London event)



MOYA GREENE
Chief executive officer
Royal Mail
(London event)



ANA HELENA CHACÓN ECHEVERRÍA
Vice-president
Costa Rica
(New York event)



KENJI YOSHINO
Chief Justice Earl Warren Professor
Constitutional Law
New York University
(New York event)

TALK IS CHEAP—IT'S TIME TO ACT.

We are living in unpredictable times. Progress in countries traditionally leading LGBT equality and inclusion can no longer be taken for granted.

20% on Early Bird Rate
discount quote code ECONMAG

Offer expires February 15th 2018

Visit prideandprejudice.economist.com to find out more

@EconomistEvents #EconPride

Global supporter



Regional advocate



Regional ally



Regional supporter





The new battlegrounds

War is still a contest of wills, but technology and geopolitical competition are changing its character, argues Matthew Symonds

IN THE PAST, predictions about future warfare have often put too much emphasis on new technologies and doctrines. In the 19th century the speedy victory of the Prussian army over France in 1870 convinced European general staffs that rapid mobilisation by rail, quick-firing artillery and a focus on attack would make wars short and decisive. Those ideas were put to the test at the beginning of the first world war. The four years of trench warfare on the western front proved them wrong.

In the 1930s it was widely believed that aerial bombardment of cities would prove devastating enough to prompt almost immediate capitulation. That forecast came true only with the invention of nuclear weapons a decade later. When America demonstrated in the first Gulf war in 1990-91 what a combination of its precision-guided munitions, new intelligence, surveillance and reconnaissance methods, space-based communications and stealth technology could achieve, many people assumed that in future the West would always be able to rely on swift, painless victories. But after the terrorist attacks on America on September 11th 2001, wars took a different course.

This special report will therefore offer its predictions with humility. It will also limit them to the next 20 years or so, because beyond that the uncertainties become overwhelming. And it will not speculate about the clear and present danger of war breaking out over North Korea's nuclear weapons, which with luck can be contained. Instead, it will outline the long-term trends in warfare that can be identified with some confidence.

In the past half-century wars between states have become exceedingly rare, and those between great powers and their allies almost non-existent, mainly because of the mutually destructive power of nuclear weapons, international legal constraints and the declining appetite for violence of relatively prosperous societies. On the other hand, intrastate or civil wars have been relatively numerous, especially in fragile or failing states, and have usually proved long-lasting. Climate change, population growth and sectarian or ethnic extremism are likely to ensure that such wars will continue.

ACKNOWLEDGMENTS

As well as those mentioned in the text, the author would like to express special thanks to the following people for their help in preparing this special report: Douglas Barrie, Susanna Blume, Justin Bronk, Gen Sir Nicholas Carter, Malcolm Chalmers, Emil Dall, Robert Einhorn, Sir Lawrence Freedman, Andrew Glazzard, Mark Gunzinger, Kathleen Hicks, Karin von Hippel, Andrew Krepinevich, James Lewis, Lt Col Debi Lomax, Thomas Mahnken, Raj Shah, James Sullivan, Trevor Taylor and Andrew Tyler.

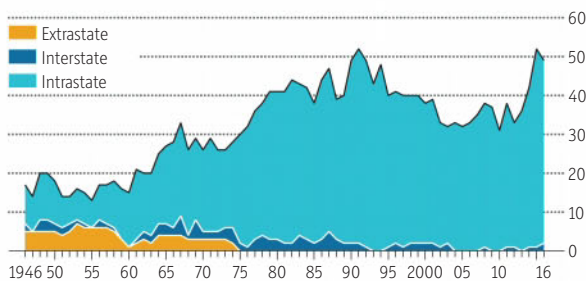
CONTENTS

- 5 Great-power conflict**
Pride and prejudice
- 7 Information war**
My truth against yours
- 8 Hybrid warfare**
Shades of grey
- 9 Cities**
House to house
- 10 Power projection**
Stay well back
- 12 Threats to nuclear stability**
Not so MAD
- 13 Military robotics**
War at hyperspeed
- 15 Autonomous weapons**
Man and machine

A list of sources is at
[Economist.com/specialreports](https://www.economist.com/specialreports)

The enemy within

Number of armed conflicts by type



Source: UCDP

Increasingly, they will be fought in urban environments, if only because by 2040 two-thirds of the world's population will be living in cities. The number of megacities with populations of more than 10m has doubled to 29 in the past 20 years, and each year nearly 80m people are moving from rural to urban areas. Intense urban warfare, as demonstrated by the recent battles for Aleppo and Mosul, remains grinding and indiscriminate, and will continue to present difficult problems for well-meaning Western intervention forces. Technology will change war in cities as much as other types of warfare, but it will still have to be fought at close quarters, block by block.

Even though full-scale interstate warfare between great powers remains improbable, there is still scope for less severe forms of military competition. In particular, both Russia and China now seem unwilling to accept the international dominance of America that has been a fact of life in the 20 years since the end of the cold war. Both have an interest in challenging the American-sponsored international order, and both have recently shown that they are prepared to apply military force to defend what they see as their legitimate interests: Russia by annexing Crimea and destabilising Ukraine, and China by building militarised artificial islands and exerting force in disputes with regional neighbours in the South and East China Seas.

In the past decade, both China and Russia have spent heavily on a wide range of military capabilities to counter America's capacity to project power on behalf of threatened or bullied allies. In military jargon, these capabilities are known as anti-access/area denial or A2/AD. Their aim is not to go to war with America but to make an American intervention more risky and more costly. That has increasingly enabled Russia and China to exploit a "grey zone" between war and peace. Grey-zone operations aim to reap either political or territorial gains normally associated with overt military aggression without tipping over the threshold into open warfare with a powerful adversary. They are all about calibration, leverage and ambiguity. The grey zone particularly lends itself to hybrid warfare, a term first coined about ten years ago. Definitions vary, but in essence it is a blurring of military, economic, diplomatic, intelligence and criminal means to achieve a political goal.

The main reason why big powers will try to achieve their political objectives short of outright war is still the nuclear threat, but it does not follow that the "balance of terror" which characterised the cold war will remain as stable as in the past. Russia and America are modernising their nuclear forces at huge expense and China is enlarging its nuclear arsenal, so nuclear weapons may be around until at least the end of the century. Both Vladimir Putin and Donald Trump, in their very different ways, enjoy a bit of nuclear sabre-rattling. Existing nuclear-arms-

control agreements are fraying. The protocols and understandings that helped avert Armageddon during the cold war have not been renewed.

Russia and China now fear that technological advances could allow America to threaten their nuclear arsenals without resorting to a nuclear first strike. America has been working at a concept known as Conventional Prompt Global Strike (CPGS) for over a decade, though weapons have yet to be deployed. The idea is to deliver a conventional warhead with a very high degree of accuracy, at hypersonic speeds (at least five times faster than the speed of sound), through even the most densely defended air space. Possible missions include countering anti-satellite weapons; targeting the command-and-control nodes of enemy A2/AD networks; attacking the nuclear facilities of a rogue proliferator such as North Korea; and killing important terrorists. Russia and China claim that CGPs could be highly destabilising if used in conjunction with advanced missile defences. Meanwhile they are developing similar weapons of their own.

Other potential threats to nuclear stability are attacks on nuclear command-and-control systems with the cyber- and anti-satellite weapons that all sides are investing in, which could be used to disable nuclear forces temporarily. Crucially, the identity of the attacker may be ambiguous, leaving those under attack uncertain how to respond.

Rise of the killer robots

At least the world knows what it is like to live in the shadow of nuclear weapons. There are much bigger question-marks over how the rapid advances in artificial intelligence (AI) and deep learning will affect the way wars are fought, and perhaps even the way people think of war. The big concern is that these technologies may create autonomous weapons systems that can make choices about killing humans independently of those who created or deployed them. An international "Campaign to Stop Killer Robots" is seeking to ban lethal autonomous weapons before they even come into existence. A letter to that effect, warning against a coming arms race in autonomous weapons, was signed in 2015 by over 1,000 AI experts including Stephen Hawking, Elon Musk and Demis Hassabis.

Such a ban seems unlikely to be introduced, but there is room for debate about how humans should interact with machines capable of varying degrees of autonomy, whether in the loop (with a human constantly monitoring the operation and remaining in charge of critical decisions), on the loop (with a human supervising machines that can intervene at any stage of the mission) or out of the loop (with the machine carrying out the mission without any human intervention once launched). Western military establishments insist that to comply with the laws of armed conflict, a human must always be at least on the loop. But some countries may not be so scrupulous if fully autonomous systems are seen to confer military advantages.

Such technologies are being developed around the globe, most of them in the civil sector, so they are bound to proliferate. In 2014 the Pentagon announced its "Third Offset Strategy" to regain its military edge by harnessing a range of technologies including robotics, autonomous systems and big data, and to do so faster and more effectively than potential adversaries. But even its most ardent advocates know that the West may never again be able to rely on its superior military technology. Robert Work, the deputy defence secretary who championed the third offset, argues that the West's most enduring military advantage will be the quality of the people produced by open societies. It would be comforting to think that the human factor, which has always been a vital component in past wars, will still count for something in the future. But there is uncertainty even about that. ■

Great-power conflict

Pride and prejudice

The great powers seem to have little appetite for full-scale war, but there is room for miscalculation

DESPITE THE EXTRAORDINARY decline in interstate wars over the past 70 years, many foreign-policy experts believe that the world is entering a new era in which they are becoming all too possible again. But there is a big difference between regional wars that might be triggered by the actions of a rogue state, such as North Korea or Iran, and those between great powers, which remain much less likely. Still, increased competition between America, Russia and China poses threats to the international order and does have a military dimension.

This special report will concentrate on what could lead to a future conflict between big powers rather than consider the threat of a war on the Korean peninsula, which is firmly in the present. A war to stop Iran acquiring nuclear weapons seems a more speculative prospect for now, but could become more likely a few years hence. Either would be terrible, but its destructive capacity would pale in comparison with full-blown conflict between the West and Russia or China, even if that did not escalate to a nuclear exchange.

The main reason why great-power warfare has become somewhat more plausible than at any time since the height of the cold war is that both Russia and China are dissatisfied powers determined to change the terms of a Western-devised, American-policed international order which they believe does not serve their legitimate interests. In the past decade both have invested heavily in modernising their armed forces in ways that exploit Western political and technical vulnerabilities and thwart America's ability to project power in what they see as their spheres of influence. Both have shown themselves prepared to impose their will on neighbours by force. Both countries' leaders are giving voice to popular yearning for renewed national power and international respect, and both are reaping the domestic po-



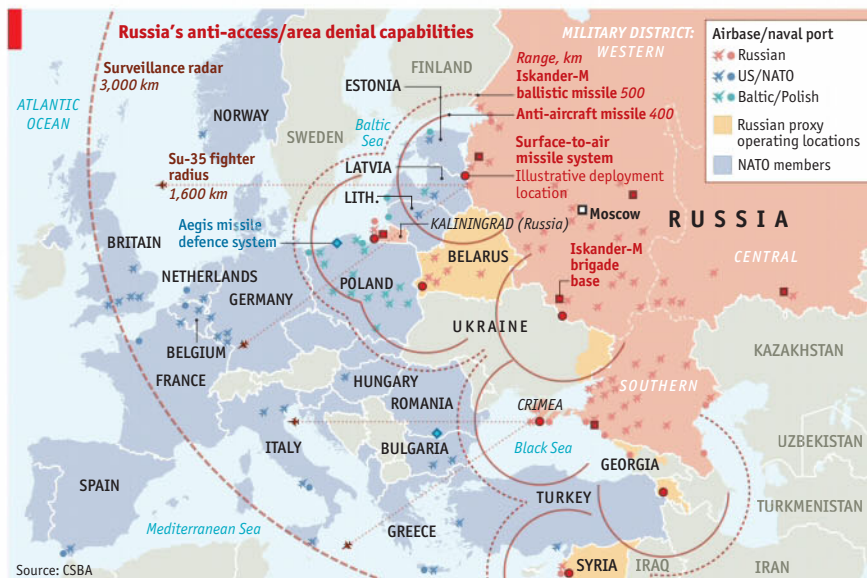
Just rattling our sabres

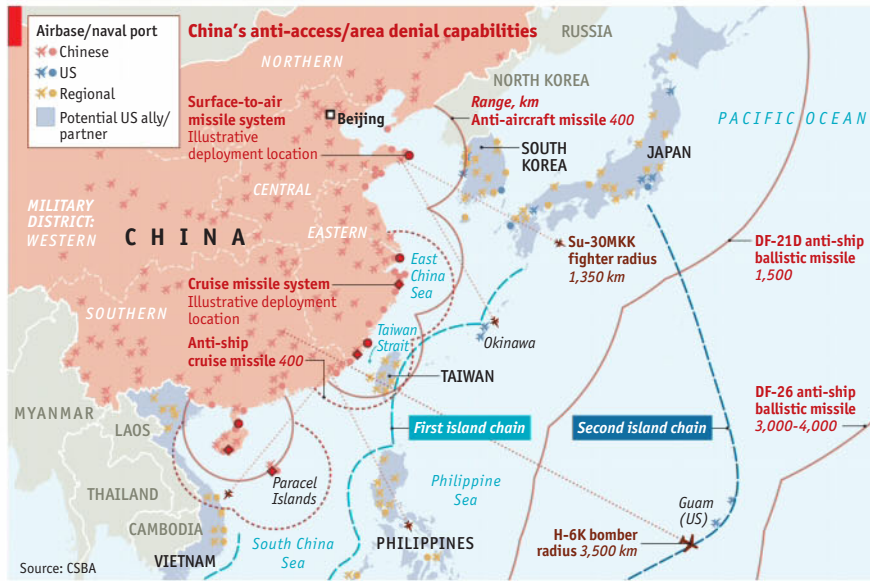
litical benefits. Where they differ is that Russia, demographically and economically, is a declining power with an opportunistic leadership, whereas China is clearly a rising one that has time on its side and sees itself as at least the equal of America, if not eventually its superior.

Russia's president, Vladimir Putin, wants to regain at least some of the prestige and clout his country lost after the collapse of the Soviet Union, an event he has described as the "greatest geopolitical tragedy of the [20th] century". He believes that in the 1990s the West rejected making Russia an equal partner, and that the European Union's and NATO's eastward expansion jeopardised Russia's external and internal security. In a statement on national-security strategy at the end of 2015 the Russian government designated NATO as the greatest threat it faced. It believes that the West actively tries to bring about "colour revolutions" of the sort seen in Ukraine, both in Russia's "near abroad" and in Russia itself.

Russia's armed forces, although no match for America's, are undergoing substantial modernisation, carry out frequent large-scale exercises and are capable of conducting high-intensity warfare at short notice across a narrow front against NATO forces. Russian military aircraft often probe European air defences and buzz NATO warships in the Baltic and the Black Sea, risking an incident that could rapidly get out of control.

War games carried out by the RAND Corporation, a think-tank, in 2015 concluded that in the face of a Russian attack "as currently postured, NATO cannot successfully defend the territory of its most exposed members". NATO has since slightly beefed up its presence in the Baltic states and Poland, but probably not enough to change the RAND report's conclusion that it would take Russian forces 60 hours at most to fight their way to the capital of Latvia or Estonia.





than currently recognised.”

Mr Allison’s prognosis, based on an analysis of past conflicts between incumbent powers and thrusting newcomers, may be too deterministic. Although China and America do not have anything like the shared international agenda that America had with Britain when the roles were reversed, they are bound together by a web of economic interests. Strategic patience and taking the long view comes naturally to Chinese leaders, and successive American presidents (except perhaps the current one) have tried hard to show that far from wanting to keep China in its box, they wish to see it playing a full and responsible part in the international system. The previous contests for hegemony cited by Mr Allison were not conducted under the shadow of nuclear weapons, which for all their risks remain the ultimate disincentive for great powers to wage war against each other.

▶ If that were to happen, NATO’s political leaders would have to choose between three bad options: launch a bloody counter-offensive fraught with the risk of escalation; exacerbate the conflict itself by threatening targets in Russia; or concede defeat, with disastrous consequences for the alliance. Domestic support for the first and second options would be fragile (in Britain and Germany a Pew survey last year found only minority backing for NATO’s Article 5 commitment to mutual defence if Russia were to attack a neighbouring alliance member, see chart). And Mr Putin’s doctrine of “escalate to de-escalate” would almost certainly bring the threat, and possibly even the use, of Russian tactical nuclear weapons to encourage NATO to throw in the towel. Mr Putin reckons, probably correctly, that he has a much higher tolerance for risk than his Western counterparts.

The probability of such a direct test of NATO members’ Article 5 promise is low. But Mr Putin has shown in Georgia, Ukraine and Syria that he is an opportunist prepared to roll the dice when he is feeling desperate or lucky. A second-term Trump administration, shorn of generals committed to NATO and with a more populist Republican party in Congress, might well tempt him, especially if low energy prices and a weak economy were creating mounting problems at home.

Some suggest that America and China are destined to go to war, falling into the “Thucydides trap” as encountered in antiquity by Sparta and Athens. In essence, the established power feels threatened by the rising power, which in turn feels resentful and frustrated. Graham Allison, the author of a popular book expounding this thesis, believes that “war between the us and China in the decades ahead is not just possible, but much more likely

Moreover, says Jonathan Eyal of RUSI, a defence think-tank, demographic factors and changing social attitudes in China suggest that there would be little popular appetite for conflict with America, despite the sometimes nationalistic posturing of state media. Like other developed countries, the country has very low birth rates, fast-decreasing levels of violence and large middle classes who define success by tapping the latest smartphone or putting down a deposit on a new car. In a culture of coddling children prompted by the one-child policy, Chinese parents would probably be extremely reluctant to send their precious “snowflakes” off to war.

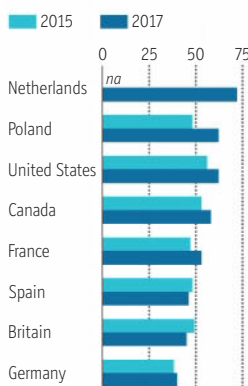
No coffins, please

Even in Russia, where Mr Putin has encouraged a revival of a more macho culture, he wants to avoid casualties as far as possible. In his view, the thousands of coffins returning from Afghanistan in the 1980s were partly to blame for the collapse of the Soviet Union, so he has gone to extraordinary lengths both to minimise and conceal the deaths of any conscripted troops in Ukraine. In Syria, he has used private military contractors wherever possible.

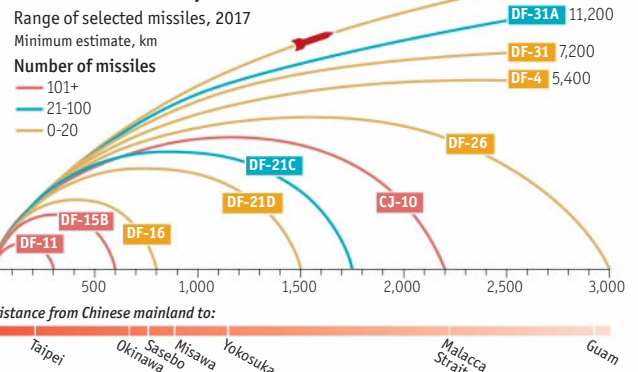
The risk that the West will run into a major conflict with China is lower than with Russia, but it is not negligible and may ▶▶

Up to a point

“Our country should use military force to defend a NATO ally if it got into a serious military conflict with Russia”, % responding yes



Chinese missile capabilities



► be growing. China resents the American naval presence in the western Pacific, and particularly the “freedom of navigation” operations that the US Seventh Fleet conducts in the South China Sea to demonstrate that America will not accept any Chinese claims or actions in the region that threaten its core national interests or those of its allies.

For its part, China is planning to develop its A2/AD capabilities, especially long-range anti-ship missiles and a powerful navy equipped with state-of-the-art surface vessels and a large submarine force. The idea is first to push the US Navy beyond the “first island chain” and ultimately make it too dangerous for it to operate within the “second island chain” (see map, previous page). Neither move is imminent, but China has already made a lot of progress. If there were a new crisis over Taiwan, America would no longer send an aircraft-carrier battle group through the

Taiwan Strait to show its resolve, as it did in 1996.

How such tensions will play out depends partly on America’s allies. If Japan’s recently re-elected prime minister, Shinzo Abe, succeeds in his ambition to change the country’s pacifist constitution, the Japanese navy is likely to increase its capabilities and more explicitly train to fight alongside its American counterpart. At the same time other, weaker allies such as Vietnam, the Philippines, Malaysia and Indonesia may conclude that bowing to Chinese military and economic power is a safer bet than hoping for a declining America to fight their corner.

The greatest danger lies in miscalculation through a failure to understand an adversary’s intentions, leading to an unplanned escalation that runs out of control. Competition in the “grey zone” between peace and war requires constant calibration that could all too easily be lost in the heat of the moment. ■

My truth against yours

The power of fake news and undue influence

THERE IS NOTHING new about either fake news or Russian disinformation campaigns. Back in 1983, at the height of the cold war, an extraordinary story appeared in a little-known pro-Soviet newspaper called the *Patriot*. It claimed to have evidence that the Pentagon had deliberately created AIDS as a biological weapon and was ready to export the virus to other countries, mainly in the developing world, as a way of gaining control over them. Within a few years the story had reappeared in mainstream publications in more than 50 countries.

In February last year, in the wake of revelations about Russia’s interference in America’s presidential election but before the full extent of its activities on Facebook, Twitter and Google had become known, the Russian defence minister, Sergei Shoigu, announced that he had created units within the army to wage an information war: “Essentially the information conflict is a component of general conflict. Deriving from that, Russia has made an effort to form structures that are engaged in this matter.” He added that these were far more effective than anything Russia had used before for “counter-propaganda” purposes. A week earlier, General Petr Pavel, the Czech head of NATO’s military committee, had revealed that a false report of a rape by German soldiers in Lithuania had been concocted by Russia.

The internet and social media are creating entirely new opportunities for influence operations (IO) and the mass manipulation of opinion. Those technologies allow IO accurately to target those people likely to be most susceptible to their message, taking advantage of the “echo-chamber” effect of platforms such as Facebook, where users see only news and opinions that



But which one?

confirm their prejudices.

Facebook now estimates that during and after the American election in 2016 a Russian-linked troll farm called the Internet Research Agency was responsible for at least 120 fake pages and 80,000 posts that were directly received by 29m Americans. Through sharing and liking, the number multiplied to nearly 150m, about two-thirds of the potential electorate. The ads aimed to exploit America’s culture wars. Similar IO have been launched in Europe, where Russia attempts to bolster support for populist movements that oppose liberal social norms.

It is not just Russia that conducts IO against other countries. Jihadist extremists and hacker groups employed by rogue states or criminal networks pose similar if lesser threats. And although the big social-media companies now claim to be working on solutions, including better and quicker attribution of messages, Russian IO techniques are

bound to adapt accordingly. Rand Waltzman, a former programme manager at America’s Defence Advanced Research Projects Agency (DARPA) and now at the RAND Corporation, explains that “when target forces start to counter these [Russian] efforts and/or expose them on a large scale, the Russians are likely to accelerate the improvement of their techniques...in other words, an information-warfare arms race is likely to ensue.”

In the future, “fake news” put together with the aid of artificial intelligence will be so realistic that even the best-resourced and most professional news organisation will be hard pressed to tell the difference between the real and the made-up sort. Official websites and social-media accounts will become increasingly vulnerable to hackers, who may be able not only to provoke stockmarket crashes and riots but even contrive crises between countries that may induce them to go to war with each other.

Hybrid warfare

Shades of grey

The uses of constructive ambiguity

A KEY ELEMENT of Chinese strategy is to “know your enemy”. The generals who worked at the Academy of Military Science in Beijing studied every aspect of America’s “revolution in military affairs” in the 1980s, driven by advances in microprocessors, sensors and communications. They concluded that although China was well placed to exploit the new technologies to create its own version of “informationised” warfare, it would not be in a position to challenge American military might directly until the middle of the 21st century. To do so sooner would be suicidal. H.R. McMaster, Donald Trump’s national security adviser, once observed: “There are two ways to fight the United States: asymmetrically and stupid.”

Accordingly, the Chinese generals and their Russian counterparts, who had been equally impressed by the precision-strike capabilities that America demonstrated in the first Gulf war, sought ways to reap some of the political and territorial gains of military victory without crossing the threshold of overt warfare. They came up with the concept of a “grey zone” in which powers such as Russia, China and Iran can exercise aggression and coercion without exposing themselves to the risks of escalation and severe retribution. Mark Galeotti of the Institute of International Relations in Prague describes this

approach as “guerrilla geopolitics”.

A key aspect of grey-zone challenges is that they should be sufficiently ambiguous to leave targets unsure how to respond. If they do too little, they will face a series of small but cumulatively significant defeats. If they do too much, they risk being held responsible for reckless escalation. As Hal Brands of the Philadelphia-based Foreign Policy Research Institute argues, grey-zone tactics are “frequently shrouded in misinformation and deception, and are often conducted in ways that are meant to make proper attribution of the responsible party difficult to nail down”. They are drawn from a comprehensive toolset that ranges from cyber attacks to propaganda and subversion, economic blackmail and sabotage, sponsorship of proxy forces and creeping military expansionism.

The clearest recent cases of grey-zone challenges are Russia’s intervention in Ukraine, China’s assertive behaviour in the South and East China Seas and Iran’s use of proxy militias to establish an arc of influence from Iraq through Syria into Lebanon. All three countries recognise and to some extent fear superior

A key aspect of grey-zone challenges is that they should be sufficiently ambiguous to leave targets unsure how to respond

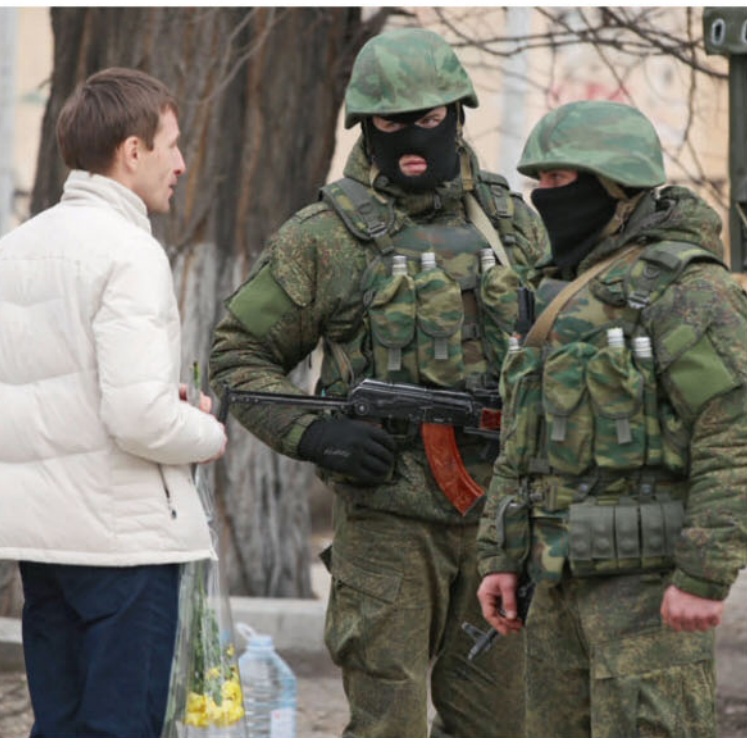
Western military power. But all of them also see vulnerabilities that they can exploit.

A Russian grey-zone strategy is to undermine faith in Western institutions and encourage populist movements by meddling in elections and using bots and trolls on social media to fan grievances and prejudice. The result, the Kremlin hopes, will sap the West’s capacity to respond resolutely to acts that defy international norms. If Russian cyber attacks did help to get Donald Trump elected, they have been astonishingly successful in their broader aim, if not in the narrower one of relieving Ukraine-related sanctions.

There is no evidence of Chinese complicity in Russian-style hacker attacks on the West, but officially sanctioned trolls send out hundreds of millions of social-media posts every year attacking Western values and pumping up nationalist sentiment. The advent of Mr Trump serves Chinese aims too. His repudiation of the Trans-Pacific Partnership removed a challenge to China’s regional economic hegemony, a key objective of its grey-zone strategy. And the American president’s hostility to free trade and his decision to withdraw from the Paris climate accord has allowed Xi Jinping to cast himself, improbably, as a defender of the international order.

As for Iran, America’s inconsistency and lack of a long-term strategy in the Middle East has offered boundless opportunities for grey-zone advantage-seeking. Both George W. Bush and Barack Obama in their different ways allowed Iran to use a combination of soft religious and hard power through well-trained and equipped Shia militias to turn first Iraq and then most of Syria into something resembling Iranian satrapies.

Grey-zone success depends on patience and an ability to blend together all the instruments of state power in ways that pluralistic, democratic societies find harder to achieve. Hybrid warfare may be as old as warfare itself, but in Ukraine Russia provided a near-textbook example of it in its modern form, using a variety of techniques: sophisticated propaganda that stirred up local grievances and legitimised military action; cyber attacks on power grids and disruption of gas supplies; covert or deniable operations, such as sending “little green men” (soldiers in un-



An unexpected bouquet for the little green men

▶ marked green army uniforms) into Crimea and providing weapons and military support to separatist irregular forces; the threat of “escalating to de-escalate”, even including limited use of nuclear weapons. All this dissuaded the West from even contemplating a military response of any kind. Whenever the sale of defensive weapons to Ukraine was mooted in Washington, Mr Putin threatened to expand and intensify a war in which he claimed not to be a participant.

Russia’s objective is not to “win” a war in Ukraine but to reverse the country’s attempt to move out of Russia’s orbit; to dis-

courage other countries, such as Belarus, from trying anything similar; and to stoke nationalist and anti-Western sentiment at home. The effort has not been without cost. Sanctions have hurt. Making Crimea a viable entity will take time and lots of money. Most important of all, NATO has rediscovered some of its sense of purpose. But neither Mr Putin nor any likely successor would hesitate to apply the same hybrid-warfare techniques in the future should the need arise.

China’s grey-zone campaign to assert uncontested control over the South China Sea and jurisdiction over disputed islands ▶▶

House to house

Much of the fighting in future wars is likely to take place in cities

DEEP IN THE southern Negev desert there is a small town called Baladia, with a main square, five mosques, cafés, a hospital, multi-storey blocks of flats, a kasbah and a cemetery. Oddly, it also has a number of well-constructed tunnels. The only people milling around in its streets are Israeli Defence Force (IDF) soldiers. Baladia, the Arab word for city, is part of the Tze’elim army base. It has been built to provide a realistic training ground for the next time the IDF is required to go into Gaza to destroy Hamas missile launchers.

Baladia is used not just by the IDF but by soldiers from other parts of the world too, including United Nations peacekeepers. Their interest reflects a growing, albeit reluctant, acceptance among Western armies that future fights are most likely to take place in cities. Megacities with populations of more than 10m are springing up across Africa and Asia. They are often ringed by closely packed slums controlled by neighbourhood gangs. Poor governance, high unemployment and criminality make them fertile territory for violent extremism.

It is hardly surprising that non-state adversaries of the West and its allies should seek asymmetric advantage by taking the fight into cities. Air power and precision-guided munitions lose some of their effectiveness in urban warfare because their targets can hide easily and have no scruples about using a densely packed civilian population as a shield.

Valuable lessons have been learned from the battle for Sadr City, a large suburb of Baghdad, in 2008, Israel going into Gaza in 2014 and the defeat of Islamic State (IS) in Mosul last year. Even with close air support, aerial surveillance and precision weapons supplied by Western allies, Iraqi security forces in Mosul (not to mention a civilian population held hostage by IS) took a terrible battering to defeat just a few thousand well-prepared insurgents. As General Mark



Dry run in Baladia

Milley, the head of the US Army, puts it, “it took the infantry and the armour and the special operations commandos to go into that city, house by house, block by block, room by room...and it’s taken quite a while to do it, and at high cost.” He thinks that his force should now focus less on fighting in traditional environments such as woodland and desert and more on urban warfare.

To that end, he advocates smaller but well-armoured tanks that can negotiate city streets, and helicopters with a narrower rotor span that can fly between buildings. At the organisational level, that means operating with smaller, more compartmentalised fighting units with far more devolved decision-making powers.

General Milley and other military professionals are well aware that many of the emerging technologies will also be available to their adversaries. Today’s smartphones provide encrypted communications that can befuddle Western forces’ intelligence, sur-

veillance and reconnaissance platforms. Quadcopter drones that can be bought from Amazon can send back live video of enemy positions. Commercially available unmanned ground vehicles can put improvised explosive devices in place.

Yet Western military forces should still enjoy a significant technological edge. They will have a huge range of kit, including tiny bird- or insect-like unmanned aerial vehicles that can hover outside buildings or find their way in. Unmanned ground vehicles can reduce the risk of resupplying troops in contested areas and provide medical evacuation for injured soldiers, and some of them will carry weapons. Worn-out or broken parts can be replaced near the front line thanks to 3D printing. A new generation of military vehicles will benefit from advances in solar energy and battery storage.

A key requirement will be for both direct and indirect fire to be highly discriminating. As General Milley says, “we can’t go in there and just slaughter people.” Part of the solution will be surveillance drones, along with more accurate small munitions. The Pentagon’s DARPA research agency has come up with a “smart bullet” which cannot be dodged.

Commanders will also rely on artificial intelligence to analyse the vast amounts of data at their disposal almost instantly. Ben Barry of the International Institute for Strategic Studies says that big-data analytics will be able to provide a picture of the mood, morale and concerns of both combatants and civilians, which he thinks is at least as important as the military side.

For all the advances that new technologies can offer, General Milley says it is a fantasy to think that wars can now be won without blood and sacrifice: “After the shock and awe comes the march and fight...to impose your political will on the enemy requires you...to destroy that enemy up close with ground forces.”

► in the East China Sea has been going on for much longer, and has turned a darker shade of grey over time as the country's confidence and power has grown. Since 2009, when China submitted a map to the United Nations showing a "nine-dash line" that supported its claim to "indisputable sovereignty" over 90% of the South China Sea (see map), it has applied what James Holmes of the US Naval War College has described as "small-stick diplomacy" (as opposed to the big stick of conventional naval power), using its highly capable coastguard and militiamen embedded in its fishing fleet to push other littoral states out of waters to which it claims ancestral rights.

It has been able to cow most of its neighbours into sulky acquiescence while avoiding a direct confrontation with American naval ships, which did not want to risk a major incident over what China portrayed as maritime policing. When in 2013 China took its provocations a step further by sending civil engineers to the Spratly and Paracel archipelagoes to construct artificial islands, Xi Jinping said China had no intention of militarising them. But in 2017, satellite images released by the Centre for Strategic and International Studies showed shelters for missile batteries and military radar installations being constructed on the Fiery Cross, Mischief and Subi Reefs in the Spratly Islands. Fighter jets will be on their way next. Mr Holmes suggests that such strategic gains cannot now be reversed short of open warfare, which means they will almost certainly not be. Unlike traditional warfare, grey-zone strategies will not produce decisive results within a defined time frame. But both China and Russia have demonstrated that hybrid warfare, if not pushed too far, can achieve lasting, if not costless, results.

Hybrid warfare is hard to deter unless the target state itself resorts to hybrid strategies. Mr Brands sees no reason why America and its allies cannot play that game too. America has potent economic and financial tools at its disposal, along with an arsenal of cyber weapons, expert special forces, a network of alliances and unmatched soft power. But the West tends to think about conflict in a binary way: you are either at war or at peace; you win or you lose. Its adversaries are more attuned to conflict somewhere between war and peace, and to blurring distinctions between civil and military assets in pursuit of their goals. So for opponents of the rules-based system, the grey zone will remain fertile territory. ■



Power projection

Stay well back

To counter regional challengers, America needs to regain its technological edge

A CRITICAL REASON for the success of Russia's and China's grey-zone strategies is that they have invested heavily in long-range sensor and precision-strike networks as well as cyber and space capabilities that can impose unacceptable costs on America projecting power in their regions. While America and its allies have spent much of the past 15 years fighting wars against irregular forces in the Middle East and Afghanistan, its adversaries have been studying the vulnerabilities in the Western way of warfare and exploiting technologies that have become cheaper and more readily available. They have also benefited from research and development passing from military institutions to the civil and commercial sectors.

Although at the strategic level American military power is still uncontested, its major adversaries' anti-access/area denial (A2/AD) investment has blunted its technology edge to such an extent that it can no longer count on local dominance in the early stages of a conflict. This means that America's adversaries are able to shelter low-intensity and paramilitary operations by carrying out small-scale but highly accurate attacks against American forces should they attempt to intervene on behalf of an ally.

It is doubtful that American commanders would recommend such a hazardous mission unless they were given the go-ahead to disable their opponents' A2/AD network (revealingly, the Chinese name for A2/AD is "counter-intervention"). That would require a major commitment of forces to strike targets inside Russian or Chinese territory, such as ground-to-air missile batteries and command, control, intelligence, surveillance and reconnaissance (C2ISR) nodes, which would probably result in heavy losses for the Americans. Even more important, such an operation would carry a risk so large as to make it infeasible. Even faced with the much less onerous task of suppressing Syrian air defences in 2012, Barack Obama was advised that 200-300 aircraft would be needed for an indefinite period.

Russia's growing A2/AD capability has received less attention than China's, but poses similar problems to America and its allies. NATO commanders fear that in the event of a crisis, missile systems in the Russian exclave of Kaliningrad and in western Russia itself could make the Baltic Sea a no-go area for its naval vessels. Similarly, albeit on a lesser scale, Iran can threaten shipping in the Gulf, including American carriers, and American air bases across the water.

Salami tactics

China's efforts are aimed mainly at degrading America's sea- and land-based air power and thus limiting the kind of war it can wage. The first step is to achieve what the Chinese call "information dominance". That means targeting America's data and communications networks, especially in space. Physical attacks on satellites, including "blinding" them with lasers, would be combined with cyber attacks on computer systems.

To prevent America from operating close to China's shore, a bristling arsenal of land-based air-defence and anti-ship missiles, along with fast missile boats, missile submarines and maritime strike aircraft, would attack US Navy vessels, as well as at US bases in Guam and Japan. In particular, China intends to push ►►



China is building a strong blue-water navy with aircraft-carriers, to which it is now adding heavily armed artificial islands in the South China Sea

▶ American carriers well beyond the unrefuelled range of their strike aircraft, such as the new F-35 stealth fighter, or risk catastrophic damage from anti-ship ballistic missiles.

The DF-21D, known as the “carrier killer”, is a ballistic missile that can travel by road. It has a range of over 1,000 miles and may carry manoeuvrable conventional warheads. It might or might not work as planned, but there is enough uncertainty to make it a powerful deterrent. At the same time China is building a strong blue-water navy with aircraft-carriers of its own, to which it is now adding heavily armed artificial islands in the South China Sea.

In response, the Pentagon in 2014 announced its “Third Offset Strategy”, concluding that if it could deter and defeat the “pacing threat” from China, it would be able to advance America’s interests and defend its allies not only in the Asia-Pacific region but anywhere in the world. The strategy focuses on areas such as autonomous learning systems, human-machine collaborative decision-making, assisted human operations, advanced manned-unmanned systems operations, networked autonomous weapons and high-speed projectiles, all of which are certain to have a major impact on the future of warfare.

The name could have been better chosen (and indeed, has been quietly dropped by the Trump administration). The first offset, in the 1950s, was America’s advantage in nuclear weapons as a way of repelling the Soviet Union’s much larger conventional forces if they were to attack Europe. The second, when the Soviets achieved nuclear parity, was the “look deep, strike deep” precision-guidance revolution of the 1980s, designed to achieve the same result without using nuclear weapons.

The third offset, like the second, aims to harness emerging technologies to restore America’s “overmatch” against near-peer adversaries, and thus its ability to project power even in highly contested environments. But whereas previous offsets secured a period of lasting technological advantage, even its most enthusiastic advocates (such as Bob Work, the deputy secretary of defence until 2017, who drove the effort for three years; or Michael O’Hanlon, a defence expert at the Brookings Institution) concede that this time America’s lead may be more fleeting.

One reason for caution is that the pace of innovation in

many of the key enabling technologies, such as artificial intelligence, deep machine learning, robotics and autonomy, has accelerated. Another is that investment in research and development is being driven by the civil sector, which is looking for quick commercial rewards.

Russia, and particularly China, are both making AI a national priority, and have far fewer qualms than the West in how they go about it. According to Jim Lewis, an expert on the impact of technology on warfare at CSIS, “when it comes to government data, the US doesn’t match what China collects on its citizens at all. They have a big sandbox to play in and a lot of toys and good people.” In China, where big data are bigger than anywhere else, privacy is not an issue, and there is no division between commercial research and military needs. By contrast, Google’s London-based DeepMind subsidiary, whose machine beat a grandmaster at the game of Go, refuses to work with the armed forces.

This is not to say that the effort to restore America’s technology edge will fail. It still spends nearly three times as much on defence as China does, and indeed more than all eight runners-up combined. Its forces have far more combat experience than any of their counterparts, and it has strengths in systems engineering that no other country can match. It continues to dominate commercial AI funding and has more firms working in the field than any other country.

More bang for the buck

But according to Bryan Clark of the Centre for Strategic and Budgetary Assessments, America’s chosen method of making a wide variety of investments and waiting to see what comes up fails to bring the most promising technologies to bear directly on the A2/AD challenge. In testimony to the Senate Armed Services Committee on the future of warfare, Mr Clark argued that America should apply new technologies to four main areas of warfare: undersea, strike, air and electromagnetic.

Quiet Chinese submarines and new active sonar systems are making it increasingly risky for American submarines to operate in Chinese coastal waters. Small, hard-to-detect unmanned undersea vehicles (UUVs) could be used to clear mines, hunt enemy submarines in shallow waters and gather intelligence. Larger ones could deploy seabed payloads such as long-endurance sensors, power packs for other UUVs and extra missiles for manned submarines.

In the air, America may try to degrade an adversary’s integrated air-defence systems (IADS) by interfering with their sensors and control systems, then send out networked swarms of small unmanned aerial vehicles (UAVs) to inflict further damage before deploying penetrating long-range stealth bombers such as the B2 and the new B21. But air supremacy of the kind it has enjoyed since the end of the cold war may be passing. To achieve even local dominance, it will need longer-range sensors and lasers to detect enemy aircraft. Manned aircraft will increasingly be platforms for sensors, data-gathering and stand-off missiles.

Dominance of the electromagnetic spectrum will become more and more important. New ways of achieving it will include stealth technologies to conceal the radar signature of ships and planes; protecting space-based communications networks from ▶▶

▶ attack; launching decoys; and defences against incoming missile salvos. For example, miniaturised electromagnetic weapons (EMW) mounted on swarms of expendable UAVs launched close to shore from a large UUV could jam an opponent's targeting sensors and communications. Electromagnetic rail guns mounted on ships, which can fire projectiles at 4,500 miles an hour to the edge of space, could counter ballistic-missile warheads.

The Pentagon's lumbering acquisition system will find it hard to accommodate any of this. To get even close to keeping up with the pace of innovation, says Mr Work, it will have to move to rapid prototyping and adopt a different attitude to testing, emulating Silicon Valley's readiness to "fail fast". It will also have to find less bureaucratic ways of doing business with firms developing key technologies. To that end, the Pentagon has established DIUX (Defence Innovation Unit Experimental) to team up with companies that would not previously have worked with it.

Finding the money will be another problem. And whereas the second offset was underwritten by the commitment of successive administrations, the third offset is no longer considered a strategy, merely a helpful way to tackle wider defence modernisation. Above all, it needs a compelling operational concept, tested in war games, that service chiefs feel able to support. The Chinese and the Russians will be watching with interest. ■

Threats to nuclear stability

Not so MAD

Mutually assured destruction has served as the ultimate deterrent, but for how much longer?

NUCLEAR WEAPONS, LIKE the poor, seem likely always to be with us. Even though arms-control agreements between America and the Soviet Union, and then Russia, have drastically reduced overall numbers, both countries are committed to costly long-term modernisation programmes for their strategic nuclear forces that should ensure their viability for the rest of the century.

Russia is about halfway through recapitalising its strategic forces, which include a soon-to-be-deployed road-mobile intercontinental ballistic missile (ICBM); a new heavy ICBM; eight new ballistic-missile submarines (SSBNs), most of which will be in service by 2020; upgraded heavy bombers; and a new stealth bomber able to carry hypersonic cruise missiles. America will replace every leg of its nuclear triad over the next 30 years, at an estimated cost of \$1.2trn. There will be 12 new SSBNs; a new penetrating strike bomber, the B21; a replacement for the Minuteman III ICBMs; and a new long-range air-launched cruise missile. As Tom Plant, a nuclear expert at RUSI, a think-tank, puts it: "For both Russia and the US, nukes have retained their primacy. You only have to look at how they are spending their money."

Other states with nuclear weapons, such as China, Pakistan, India and, particularly, North Korea, are hard at work to improve both the quality and the size of their nuclear forces. Iran's long-term intentions remain ambiguous, despite the deal in 2015 to constrain its nuclear programme. Nuclear weapons have lost none of their allure or their unique ability to inspire dread. Whether or not they are ever used in anger, they are very much part of the future of warfare.

So far, the best argument for nuclear weapons has been that the fear of mutually assured destruction (MAD) has deterred states that possess them from going to war with each other. MAD

rests on the principle of a secure second-strike capability, which means that even if one side is subjected to the most wide-ranging first strike conceivable, it will still have more than enough nuclear weapons left to destroy the aggressor. When warheads became accurate enough to obliterate most of an adversary's missiles in their silos, America and Russia turned to submarines and mobile launchers to keep MAD viable.

A more dangerous world

It still is, and is likely to remain so for some time. But disruptive new technologies, worsening relations between Russia and America and a less cautious Russian leadership than in the cold war have raised fears that a new era of strategic instability may be approaching. James Miller, who was under-secretary of defence for policy at the Pentagon until 2014, thinks that the deployment of increasingly advanced cyber, space, missile-defence, long-range conventional strike and autonomous systems "has the potential to threaten both sides' nuclear retaliatory strike capabilities, particularly their command-and-control apparatuses", and that "the potential of a dispute leading to a crisis, of a crisis leading to a war, and of a war escalating rapidly" is growing.

In a new report, Mr Miller and Richard Fontaine, the president of the Centre for a New American Security (CNAS), identify cyber and counter-space (eg, satellite jammers, lasers and high-power microwave-gun systems) attacks as possible triggers for an unplanned conflict. Other new weapons may threaten either side's capability for nuclear retaliation, particularly their strategic command-and-control centres. James Acton, a nuclear-policy expert at the Carnegie Endowment for International Peace, lists three trends that could undermine stability in a future crisis: advanced technology that can threaten the survivability of nuclear attacks; command-and-control systems that are used for both nuclear and conventional weapons, leaving room for confusion; and an increased risk of cyber attacks on such systems because of digitisation.

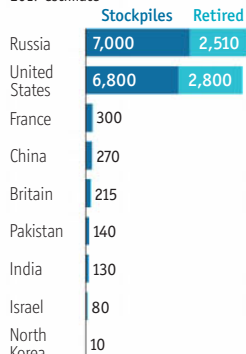
Both America and Russia rely heavily on digital networks and space-based systems for command, control, communications, intelligence, surveillance and reconnaissance (C3ISR) to run almost every aspect of their respective military enterprises. Cyber space and outer space therefore offer attackers tempting targets in the very early stages of a conflict. In the utmost secrecy, both sides have invested heavily in offensive cyber capabilities. In 2013 the Defence Science Board advised the Pentagon that: "The benefits to an attacker using cyber exploits are potentially spectacular. Should the United States find itself in a full-scale

conflict with a peer adversary, attacks would be expected to include denial of service, data corruption, supply-chain corruption, traitorous insiders, kinetic and related non-kinetic attacks at all altitudes from under water to space. US guns, missiles and bombs may not fire, or may be directed against our own troops. Resupply, including food, water, ammunition and fuel, may not arrive when or where needed. Military commanders may rapidly lose trust in the information and ability to control US systems and forces."

One problem with this is that the space architecture on ▶▶

Overkill

Number of nuclear warheads
2017 estimate



Source: US Department of State



A missile-test triumph for North Korea

▶ which America depends for its nuclear command and control, including missile early warning, is also used for conventional warfare. That means a conventional attack might be mistaken for a pre-emptive nuclear strike, which could lead to rapid escalation. Another difficulty is that an aggressor may be tempted to go after cyber and space assets in the hope of causing major damage to a target's defences without actually killing anybody. That would raise doubts over whether nuclear retaliation could be justified. A third worry is that because of the potential speed and surprise of such attacks, some responses might be delegated to autonomous systems that can react in milliseconds. Lastly, there is the possibility of "false flag" cyber operation by a rogue state or non-state hacker group.

Don't worry just yet

For now, the prospects of a successful disarming strike remain sufficiently remote to leave the strategic balance intact. Mr Miller argues that it would require a "fundamental transformation in the military-technological balance...enabled by the development and integration of novel military capabilities" to upset the balance.

Ominously, he thinks that such a fundamental transformation may now be on the horizon, in the shape of conventional prompt global strike (CPGS) and new missile-defence systems. Both China and Russia fear that new American long-range non-nuclear strike capabilities could be used to deliver a disarming attack on a substantial part of their strategic forces or decapitate their nuclear command and control. Although they would still launch their surviving nuclear missiles, improved missile-defence systems would mop up most of the remainder before their warheads could do any damage.

Still, Michael Elleman, a missile expert at the International Institute for Strategic Studies, reckons that for now those concerns are overblown. As much as anything, he says, they are talked up to restrain investment in the enabling technologies: "They [the Russians and the Chinese] are saying to the US, the trouble with you guys is that you never know when to stop."

CPGS would involve a hypersonic missile at least five times faster than the speed of sound and a range of more than 1,000 miles. This could be achieved in several ways. One would be to stick a conventional warhead on an ICBM or a submarine-launched ballistic missile—a cheap solution but a dangerous one, because defenders would not know whether they were under conventional or nuclear attack, so they might overreact.

The alternatives would be a cruise missile powered by a rocket-boosted scramjet (a supersonic combusting ramjet) en-

gine, or a boost-glide vehicle that would be launched from a ballistic missile and then fly towards its target like a paper dart. Glide vehicles pull up after re-entering the atmosphere, using the curvature of the Earth to delay detection by ballistic-missile defences. Both types would be manoeuvrable, and would be accurate to within a few metres of their target. However, they, too, could carry nuclear warheads, again leaving the target uncertain what kind of attack it was under. America first tested a glide vehicle in 2010, but seems in no rush to deploy them. Russia and China have more recently tested hypersonic glide missiles.

Current American missile-defence systems, such as Patriot, THAAD (terminal high-altitude area defence) and Aegis, provide quite effective regional defence but are not designed to cope with a salvo of ICBMs. The Ground-based Midcourse Defence system in Alaska and California is supposed to provide some defence of the homeland against a few missiles launched by a North Korea or an Iran, but it was never designed to defeat a massive salvo attack by a major adversary.

However, substantial improvements are on their way. Mr Elleman describes the SM-3 IIA interceptors, which could be deployed as soon as next year on Aegis-class destroyers, as a "big deal". They are much faster than their predecessors, and Mr Miller thinks that if hundreds of them were put on ships close to America, they might support a late midcourse defence against Russian ICBMs.

More exotic missile defences are not far behind. Mr Elleman says that in about five years' time it may be possible to put solid-state lasers on large numbers of unmanned aerial vehicles (UAVs) orbiting at very high altitude. Small missiles could also be put on UAVs as boost-phase interceptors, firing a minute or so after launch. Interception at that stage is technically much easier than later on because the target is much larger when all its stages are still intact, and moving more slowly.

Mr Elleman believes that for now the advantage is likely to remain with the attacker rather than the defender, but like Mr Miller he fears that emerging technologies could "undermine crisis stability very rapidly". Yet if arms-control agreements could be reached at the height of the cold war, it should surely be possible for America, Russia and China to talk to each other now to avoid persistent instability. ■

Military robotics

War at hyperspeed

Autonomous robots and swarms will change the nature of warfare

PETER SINGER, AN expert on future warfare at the New America think-tank, is in no doubt. "What we have is a series of technologies that change the game. They're not science fiction. They raise new questions. What's possible? What's proper?" Mr Singer is talking about artificial intelligence, machine learning, robotics and big-data analytics. Together they will produce systems and weapons with varying degrees of autonomy, from being able to work under human supervision to "thinking" for themselves. The most decisive factor on the battlefield of the future may be the quality of each side's algorithms. Combat may speed up so much that humans can no longer keep up.

Frank Hoffman, a fellow of the National Defence University who coined the term "hybrid warfare", believes that these ▶▶



Effective—and expendable

▶ new technologies have the potential not just to change the character of war but even possibly its supposedly immutable nature as a contest of wills. For the first time, the human factors that have defined success in war, “will, fear, decision-making and even the human spark of genius, may be less evident,” he says.

Weapons with a limited degree of autonomy are not new. In 1943 Germany produced a torpedo with an acoustic homing device that helped it find its way to its target. Tomahawk cruise missiles, once fired, can adjust their course using a digital map of Earth’s contours. Anti-missile systems are pre-programmed to decide when to fire and engage an incoming target because the human brain cannot react fast enough.

But the kinds of autonomy on the horizon are different. A report by the Pentagon’s Defence Science Board in 2016 said that “to be autonomous, a system must have the capability to independently compose and select among different courses of action to accomplish goals based on its knowledge and understanding of the world, itself, and the situation.” What distinguishes autonomous systems from what may more accurately be described as computerised automatic systems is that they work things out as they go, making guesses about the best way to meet their targets based on data input from sensors. In a paper for the Royal Institute of International Affairs in London, Mary Cummings of Duke University says that an autonomous system perceives the world through its sensors and reconstructs it to give its computer “brain” a model of the world which it can use to make decisions. The key to effective autonomous systems is “the fidelity of the world model and the timeliness of its updates”.

A distinction needs to be made between “narrow” AI, which allows a machine to carry out a specific task much better than a human could, and “general” AI, which has far broader applications. Narrow AI is already in wide use for civilian tasks such as search and translation, spam filters, autonomous vehicles, high-frequency stock trading and chess-playing computers.

Waiting for the singularity

General AI may still be at least 20 years off. A general AI machine should be able to carry out almost any intellectual task that a human is capable of. It will have the ability to reason, plan, solve problems, think abstractly and learn quickly from experience. The AlphaGo Zero machine which last year learned to play Go, the ancient strategy board game, was hailed as a major step towards creating the kind of general-purpose algorithms that will power truly intelligent machines. By playing millions of games against itself over 40 days it discovered strategies that humans had developed over thousands of years, and added some of its own that showed creativity and intuition.

Mankind is still a long way from the “singularity”, the term coined by Vernor Vinge, a science-fiction writer, for the moment when machines become more intelligent than their creators. But the possibility of killer robots can no longer be dismissed. Stephen Hawking, Elon Musk, Bill Gates and many other experts believe that, handled badly, general AI could be an existential threat to the human race.

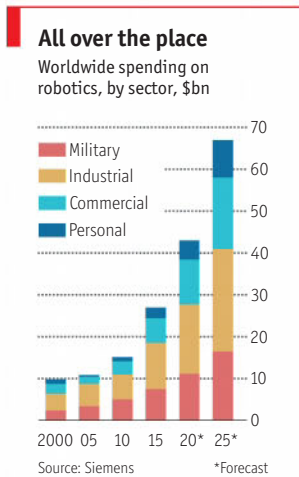
In the meantime, military applications of narrow AI are

already close to bringing about another revolution. Robert Work, the architect of America’s third offset strategy, stresses that this is not all about autonomous drones, important though they will increasingly become. His main focus has been on human-machine collaboration to help humans make better decisions much faster, and “combat teaming”, using unmanned and manned systems together.

Autonomous systems will draw on machine deep learning to operate “at the speed of light” where humans cannot respond fast enough to events like cyber attacks, missiles flying at hypersonic speed or electronic warfare. AI will also become ever more important in big-data analytics. Military analysts are currently overwhelmed by the amount of data, especially video, being generated by surveillance drones and the monitoring of social-media posts by terrorist groups. Before leaving the Pentagon, Mr Work set up an algorithmic-warfare team to consider how AI can help hunt Islamic State fighters in Syria and mobile missile launchers in North Korea. Cyber warfare, in particular, is likely to become a contest between algorithms as AI systems look for network vulnerabilities to attack, and counter-autonomy software learns from attacks to design the best response.

In advanced human-machine combat teaming, UAVs will fly ahead of and alongside piloted aircraft such as the F-35. The human pilot will give the UAV its general mission instructions and define the goal, such as striking a particular target, but the UAV will be able to determine how it meets that goal by selecting from a predefined set of actions, and will respond to any unexpected challenges or opportunities. Or unmanned ground vehicles might work alongside special forces equipped with wearable electronics and exoskeletons to provide machine strength and protection. As Mr Work puts it: “Ten years from now, if the first through a breach isn’t a fucking robot, shame on us.”

Autonomous “uninhabited” vehicles, whether in the air, on the ground or under the sea, offer many advantages over their manned equivalents. Apart from saving money on staff, they can often be bolder and more persistent than humans because they do not get tired, frightened, bored or angry. They are also likely to be cheaper and smaller than manned versions because they do not have to protect people from enemy attack, so they can be deployed in greater numbers and in more dangerous situations. ▶▶





By contrast, low-cost, expendable distributed platforms can be built in large numbers and controlled by relatively few humans. Swarms can make life very difficult for adversaries. They will come in many shapes and sizes, each designed to carry out a particular mission, such as reconnaissance over a wide area, defending ships or troops on the ground and so on. They will be able to work out the best way to accomplish their mission as it unfolds, and might also be networked together into a single “swarmanoid”. Tiny 3D-printed drones, costing perhaps as little as a dollar each, says Mr Scharre, could be formed into “smart clouds” that might permeate a building or be air-dropped over a wide area to look for hidden enemy forces.

It is certain that autonomous weapons systems will appear on the battlefield in the years ahead. What is less clear is whether America will be the first to deploy them. In July 2017 China produced its “Next-Generation Artificial-Intelligence Development Plan”, which designates AI as the transformative technology underpinning future economic and military power. It aims for China to become the pre-eminent force in AI by 2030, using a strategy of “military-civil fusion” that America would find hard to replicate. And in September Vladimir Putin told Russian children returning to school that “artificial intelligence is the future, not only for Russia but for all of mankind... whoever becomes the leader in this sphere will become the ruler of the world.” Elon Musk, of Tesla and SpaceX fame, responded by tweeting that “competition for AI superiority at national level [is the] most likely cause of ww3.”

Peter Singer is less apocalyptic than Mr Musk, but he agrees that the competition for AI dominance is fuelling an arms race that will itself generate insecurity. This arms race may be especially destabilising because the capabilities of robotic weapons systems will not become clear until someone is tempted to use them. The big question is whether this competition can be contained, and whether rules to ensure human control over autonomous systems are possible—let alone enforceable. ■

Autonomous weapons

Man and machine

AI-empowered robots pose entirely new dangers, possibly of an existential kind

MANY OF THE trends in warfare that this special report has identified, although worrying, are at least within human experience. Great-power competition may be making a comeback. The attempt of revisionist powers to achieve their ends by using hybrid warfare in the grey zone is taking new forms. But there is nothing new about big countries bending smaller neighbours to their will without invading them. The prospect of nascent technologies contributing to instability between nuclear-armed adversaries is not reassuring, but past arms-control agreements suggest possible ways of reducing the risk of escalation.

The fast-approaching revolution in military robotics is in a different league. It poses daunting ethical, legal, policy and practical problems, potentially creating dangers of an entirely new and, some think, existential kind. Concern has been growing for some time. Discussions about lethal autonomous weapons (LAWs) have been held at the UN’s Convention on Certain Conventional Weapons (CCW), which prohibits or restricts some weapons deemed to cause unjustifiable suffering. A meeting of the CCW in November brought together a group of government ►►

► Increasingly autonomous drones will be able to perform a range of tasks that will soon make them indispensable. UAVs will carry out the whole range of reconnaissance or strike missions, and stealth variants will become the tip of the spear for penetrating sophisticated air defences. Some will be designed to loiter at altitude while waiting for a target to emerge. Israel already deploys the Harop, an autonomous anti-radiation drone which can fly for up to six hours, attacking only when an enemy air-defence radar lights up. Autonomous high-altitude UAVs will be used as back-up data links in case satellites are destroyed, or as platforms for anti-missile solid-state lasers. Larger UAVs will be deployed as tankers and transport aircraft that can operate close to the action.

Underwater warfare will become ever more important in the future because the sea offers a degree of sanctuary from which power can be projected within A2/AD zones. Unmanned undersea vehicles (UUVs) will be able to carry out a wide range of difficult and dangerous missions, such as mine clearance or mine-laying near an adversary’s coast; distributing and collecting data from undersea anti-submarine sensor networks in contested waters; patrolling with active sonar; resupplying missiles to manned submarines; and even becoming missile platforms themselves, at a small fraction of the cost of nuclear-powered attack submarines. There are still technical difficulties to be overcome, but progress is accelerating.

Potentially the biggest change to the way wars are fought will come from deploying lots of robots simultaneously. Paul Scharre, an autonomous-weapons expert at CNAS who has pioneered the concept of “swarming”, argues that “collectively, swarms of robotic systems have the potential for even more dramatic, disruptive change to military operations.” Swarms can bring greater mass, co-ordination, intelligence and speed.

The many, not the few

As Mr Scharre points out, swarming will solve a big problem for America. The country currently depends on an ever-decreasing number of extremely capable but eye-wateringly expensive multi-mission platforms which, if lost at the outset of a conflict, would be impossible to replace. A single F-35 aircraft can cost well over \$100m, an attack submarine \$2.7bn and a Ford-class carrier with all its aircraft approaching \$20bn.

► experts and NGOs from the Campaign to Stop Killer Robots, which wants a legally binding international treaty banning LAWS, just as cluster munitions, landmines and blinding lasers have been banned in the past.

The trouble is that autonomous weapons range all the way from missiles capable of selective targeting to learning machines with the cognitive skills to decide whom, when and how to fight. Most people agree that when lethal force is used, humans should be involved in initiating it. But determining what sort of human control might be appropriate is trickier, and the technology is moving so fast that it is leaving international diplomacy behind.

To complicate matters, the most dramatic advances in AI and autonomous machines are being made by private firms with commercial motives. Even if agreement on banning military robots could be reached, the technology enabling autonomous weapons will be both pervasive and easily transferable.

Moreover, governments have a duty to keep their citizens secure. Concluding that they can manage quite well without chemical weapons or cluster bombs is one thing. Allowing potential adversaries a monopoly on technologies that could enable them to launch a crushing attack because some campaign groups have raised concerns is quite another.

As Peter Singer notes, the AI arms race is propelled by unstoppable forces: geopolitical competition, science pushing at the frontiers of knowledge, and profit-seeking technology businesses. So the question is whether and how some of its more disturbing aspects can be constrained. At its simplest, most people are appalled by the idea of thinking machines being allowed to make their own choices about killing human beings. And although the ultimate nightmare of a robot uprising in which machines take a genocidal dislike to the human race is still science fiction, other fears have substance.

Nightmare scenarios

Paul Scharre is concerned that autonomous systems might malfunction, perhaps because of badly written code or because of a cyber attack by an adversary. That could cause fratricidal attacks on their own side's human forces or escalation so rapid that humans would not be able to respond. Testing autonomous weapons for reliability is tricky. Thinking machines may do things in ways that their human controllers never envisaged.

Much of the discussion about “teaming” with robotic systems revolves around humans' place in the “observe, orient, decide, act” (OODA) decision-making loop. The operator of a remotely piloted armed Reaper drone is in the OODA loop because he decides where it goes and what it does when it gets there. An on-the-loop system, by contrast, will carry out most of its mission without a human operator, but a human can intercede at any time, for example by aborting the mission if the target has changed. A fully autonomous system, in which the human operator merely presses the start button, has responsibility for carrying through every part of the mission, including target selection, so it is off the loop. An on-the-loop driver of an autonomous car would let it do most of the work but would be ready to resume control should the need arise. Yet if the car merely had its destination chosen by the user and travelled there without any further intervention, the human would be off the loop.

For now, Western armed forces are determined to keep humans either in or on the loop. In 2012 the Pentagon issued a policy directive: “These [autonomous] systems shall be designed to allow commanders and operators to exercise appropriate levels of human judgment over the use of force. Persons who authorise the use of, direct the use of, or operate, these systems must do so with appropriate care and in accordance with the law of war, applicable treaties, weapons-systems safety rules and applicable rules of engagement.”

Most people agree that when lethal force is used, humans should be involved. But what sort of human control is appropriate?

That remains the policy. But James Miller, the former under-secretary of Defence for Policy at the Pentagon, says that although America will try to keep a human in or on the loop, adversaries may not. They might, for example, decide on pre-delegated decision-making at hyper-speed if their command-and-control nodes are attacked. Russia is believed to operate a “dead hand” that will automatically launch its nuclear missiles if its seismic, light, radioactivity and pressure sensors detect a nuclear attack.

Mr Miller thinks that if autonomous systems are operating in highly contested space, the temptation to let the machine take over will become overwhelming: “Someone will cross the line of sensibility and morality.” And when they do, others will surely follow. Nothing is more certain about the future of warfare than that technological possibilities will always shape the struggle for advantage. ■



Reprints

Reprints of this special report are available at US\$7.00 each, with a minimum of 5 copies, plus 10% postage in the United States, 15% postage in Mexico and Canada. Add tax in CA, DC, IL, NY, VA; GST in Canada. For orders to NY, please add tax based on cost of reprints plus postage.

For classroom use or quantities over 50, please telephone for discount information. Please send your order with payment by cheque or money order to: Jill Kaletha of Foster Printing Service. Telephone: +1 866 879 9144 Extension: 168 or email: jillk@fosterprinting.com (American Express, Visa, MasterCard and Discover accepted)

For more information and to order special reports and reprints online, please visit our website www.economist.com/rights

Future special reports

Autonomous vehicles February 24th
Technology Quarterly: Oceans March 3rd
The geopolitics of energy March 17th

Previous special reports and a list of forthcoming ones can be found online: economist.com/specialreport





Also in this section

45 Italy's eurosceptics

46 Ukraine and Russia

46 Finland's popular president

47 Charlemagne: Torn over Tehran

For daily analysis and debate on Europe, visit
Economist.com/europe

Europe's welfare states

Battle of the benefits

STOCKHOLM AND WARSAW

Populists are winning votes by offering more generous welfare. How can mainstream parties respond?

IT IS not cold inside the Municipal Family Support Centre, but Barbara Choinska keeps her coat on, in the manner of people to whom the world has been hostile. The centre is the main social-services point in Siedlce, a town 90km east of Warsaw. Ms Choinska has five children, no husband and no job. "She struggles to make sure the children are dressed and do their homework," explains Adam Kowalczyk, the centre's director. "We send someone each week to help her maintain basic standards, so they don't get taken away by the state."

One thing Ms Choinska no longer worries about is having money for food and rent. In 2016 Poland's new government, led by the populist Law and Justice (Pis) party, launched the "Family 500Plus" programme, which pays a monthly stipend of 500 zlotys (\$148) per child, starting with the second. Indigent parents like Ms Choinska qualify for their first child, too, so she gets a whopping 2,500 zlotys per month. In Poland, that is not far short of the median after-tax household income—and beneficiaries have no obligation to work.

The programme has transformed the Polish welfare state. Mr Kowalczyk's centre, which distributes the stipends, has seen its annual budget grow from about 35m to 94m zlotys. The World Bank estimates the programme has cut the rate of extreme child poverty (defined as less than 1,500 zlotys per month for a family of four)

from 11.9% to 2.8%.

500Plus is popular, especially in places like Siedlce. Many in Poland's small towns and villages felt that the previous government, led by the liberal Civic Platform party, looked down on them. Over the past two decades, the economy grew rapidly but inequality also rose, with poverty more common in rural areas. This is partly why provincial Poles voted for Pis. The 500Plus programme fits Pis's Catholic, pro-family ideology. Pis's voters are more likely than liberal ones to have two or more children—and a fixed stipend buys more in rural areas than in pricey Warsaw.

At first, liberal politicians called the programme a budget-buster. Now, seeing how

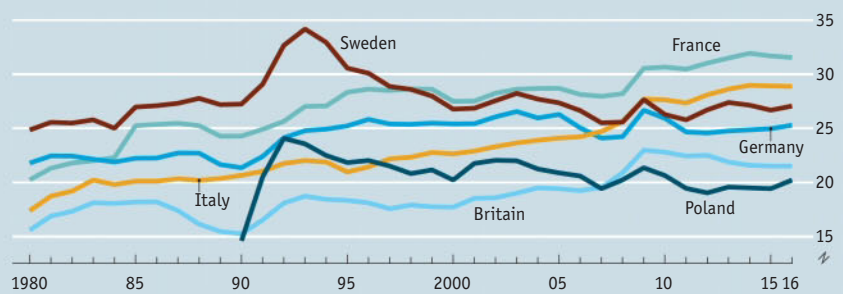
popular it is, they embrace it. Jacek Rostowski, who served as finance minister under Civic Platform, says that it is affordable: it costs about 1.3% of GDP, while the World Bank expects Poland's economy to grow by 4% this year. Civic Platform now campaigns on a promise to expand 500Plus to cover all first-born children too.

Poland's prime minister, Mateusz Morawiecki, boasts that Pis has defied conventional wisdom, favouring the "regular guy" over the "elite". In fact, child stipends are common in rich European countries such as Sweden, Germany, the Netherlands, France and Britain. Poland's 500Plus is generous relative to average earnings, but the country's overall spending on social protection is still only about 20% of GDP, well below the EU average of about 28%.

Historically, welfare-state programmes have been introduced by the centre-left (such as Labour parties in the Nordic countries and Britain) or the centre-right (the Gaullists in France, the Christian Democrats in Germany and Italy). Often they were introduced precisely in order to keep extremists from winning power. Yet in Po- ▶▶

Mostly growing

Government social spending, as % of GDP



land, it is the populist right that has seized the mantle of the party of welfare.

And not just in Poland. In Hungary the nationalist Fidesz party of Viktor Orban, the prime minister, has launched New Deal-style public-works programmes. In France Marine Le Pen's National Front defends the protections enjoyed by permanent employees against the "neoliberalism" of President Emmanuel Macron. In the Netherlands Geert Wilders's Freedom Party lambasts the government over cuts to health care. The right-wing Alternative for Germany exploits anger over unequal pensions in the country's east and west. Meanwhile centre-left parties that felt obliged to cut welfare during the euro crisis—the Dutch Labour Party, the French Socialists, Germany's Social Democrats—have been hammered in recent elections.

Since the 1990s the received wisdom in Europe has been that the post-war welfare state was past its peak. But voters often want it to be more generous, not less. In polls in 2014 and 2016, citizens in three-quarters of the EU's members named "social equality and solidarity" as their priorities for society. Western Europeans unnerved by the global financial crisis want protection against an uncertain future. Eastern Europeans with skimpy public services want the kind of security that their western neighbours seem to have. Where centrist parties have stopped championing the welfare state, populist parties are picking up the slack—and the votes. A poll in January put *pis*'s support at 44%. Its closest rivals, Civic Platform and the Modern party, were at 15% and 6%.

No farewell to welfare

Back in the 1980s, when unemployment in some European countries rose to double-digit levels, lavish welfare states were seen as one of the culprits. Generous unemployment benefits and sick leave discouraged people from working, while public spending crowded out private investment. Laws inhibiting employers from laying off workers also discouraged them from hir-



Macron turns Nordic

ing permanent staff. The response was a wave of cutbacks, from Margaret Thatcher's deregulation in Britain to Sweden, where social spending fell from a peak of 34% in 1993 to 27% by the end of the decade.

But by the late 1990s a new approach developed, spearheaded by Denmark and the Netherlands. Their "flexicurity" model sought to combine social protection, provided by the state, with more freedom for employers to hire, fire and adjust contracts. The state also expanded "active labour-market policies", such as training and job matching, subsidised daycare to help women work full-time, and required the unemployed to seek work.

Scandinavian countries, which were used to providing social benefits directly through the government, moved quickly to implement flexicurity. However, Germany and France, which relied more on protecting workers' jobs, found it harder. In Germany unemployment stayed high until Gerhard Schröder's Social Democratic government pushed through the Hartz reforms, beginning in 2003. These cut early pensions and unemployment benefits, created lower-paid job categories ("mini-jobs"), and required the unemployed to take part in job-search programmes. But in France fitful stabs at liberalisation that began in the mid-1990s were defeated or watered down by the left. The country kept a dual labour market, in which insiders have permanent contracts and full benefits and are hard to sack, and outsiders on temporary contracts have nothing. Southern European countries like Spain, Portugal, Italy and Greece have suffered from similarly rigid labour markets.

In December 2007 the European Commission adopted flexicurity as a guiding principle of its economic recommendations. The next year the global financial crisis struck, followed in 2010 by the euro crisis. Countries that had adopted flexicurity

policies often saw their unemployment rates go up faster than those which strongly protected existing jobs. Yet the crisis also drove countries like Spain and Portugal, which got bail-outs, to make their labour laws more flexible. Their jobless rates are now falling faster than those of Italy, where Matteo Renzi, the prime minister from 2014 to 2016, managed only modest labour reforms before being ejected.

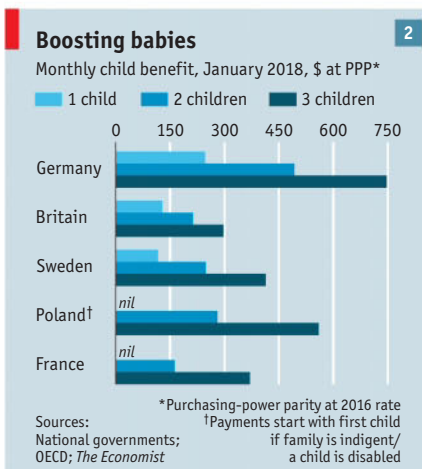
That has left the focus on France. Mr Macron's great mission is to revive the French economy by shifting its labour market to a more Nordic model. His first reforms have already been approved by the National Assembly, but many in France are sceptical. "Our system continues to be focused on getting a permanent job, so you can access pensions and unemployment insurance," says Bruno Palier of Sciences-Po, a French political science school. "Flexicurity is very far from French views."

Flexicurity's critics have some strong arguments. Some economists challenge how much active labour-market policies have contributed to Germany's recovery. The Hartz reforms accounted for only about 1.5 percentage points of the four-point drop in Germany's unemployment rate from 2005 to 2009, one study found; a bigger factor was rising global demand for German products, especially in China.

Another threat to welfare-state reforms is immigration. In Germany, France, Sweden, Britain and the Netherlands the share of foreign-born residents now ranges between 11% and 17%, comparable to those in traditional immigrant countries like America. Countries with greater ethnic diversity are usually believed to have stingier welfare states. Since the migration crisis of 2015, ethnic resentment against Muslims has become a leitmotif in debates about welfare-state policies. In Sweden, the Netherlands and Germany populist parties engage in "welfare chauvinism", railing against refugees for collecting benefits at higher rates than natives.

Yet such resentments do not seem to have affected European support for the welfare state. Indeed, France's National Front, Germany's AfD, Poland's *pis* and the like are all staunch supporters of social benefits. They use welfare-chauvinist arguments to attack immigration, not the welfare state. In a recent study of 85,000 people in regions around Europe, Bo Rothstein and Nicholas Charron, political scientists at Gothenburg University, found that ethnic diversity did not undermine support for benefits; poor governance did. In countries where citizens trusted their government, the presence of immigrants made no difference—perhaps because citizens had faith that the system would block them from free-riding.

Since the start of his presidential campaign in 2016, Mr Macron has insisted that he will balance his drive for economic effi- ▶▶



ciency with better economic protection. If he does not succeed, he could wind up as a failed reformer like Mr Renzi, leaving the terrain to figures like Ms Le Pen or the left's Jean-Luc Mélenchon. Their versions of welfare-state reform promise to render the labour market even more rigid, and to spend money that France does not have. It already spends 31.5% of GDP on social protection, the most in the OECD and nearly as high as Sweden at its peak. An electoral victory by Italy's Five Star Movement in March could have a similar effect.

As for Poland's *pis*, it shows scant concern for the long-term affordability of its welfare policies. Even as Poles rapidly age, *pis* is cutting the retirement age from 67 to 65 for men and 60 for women. That will further depress the ratio of workers to pensioners in a country that already suffers from mass emigration and a low fertility rate. But however misguided, such moves are popular. If liberal parties cannot devise their own credible alternatives, populists could end up winning and holding power in more European countries by promising welfare for all. ■

Italy

League of sceptics

MILAN AND VICENZA

Despite the fears, no one really wants Italy to leave the euro

THE man who has done more than anyone to create an air of apprehension around Italy's coming election is a genial fellow with a round face, a broad nose and silvery hair combed forward in the style of the ancient Romans. Five years ago, Claudio Borghi, a former managing director of Deutsche Bank in Italy, converted Matteo Salvini, the head of the Northern League, to the view that Italy should quit the euro.

"Salvini called me at half past one in the morning," he recalls. "But it didn't matter because I don't sleep." After two days of explanation, Mr Salvini, soon to become leader of the League, was convinced. The following year, he and his new economic adviser set off on a "Basta euro" (roughly, "dump the euro") tour.

The concern in EU governments and capital markets over the vote on March 4th centres on the possibility that the League will return to government, and the remoter, but still conceivable, prospect of Mr Salvini becoming prime minister. His party has only recently, and only barely, been overtaken in the polls by its electoral ally, Silvio Berlusconi's Forza Italia. Their alliance, which also includes a smaller far-right group, the Brothers of Italy, appears to be the only one with even a chance of win-

ning a parliamentary majority, and the three leaders have agreed that, if they gain one, the party with most votes should name the prime minister (who would, however, need to be endorsed by the president, Sergio Mattarella).

The League, which campaigns for tighter immigration controls and sits in the European Parliament with other populist parties such as France's National Front and Austria's Freedom Party, might also gain power as part of a broader coalition. Or it might join the intermittently eurosceptical Five Star Movement (M5S) in a partnership that Mr Salvini has discounted publicly, but which senior League officials are ready to contemplate privately. That is the nightmare scenario that terrifies Italy-watchers.

Mr Borghi's hostility to the euro is undimmed. "We live in a country whose direct competitor can shut down our banks if we do not obey it," he says. "Is that something a nation that is supposed to be free can endure?"

The depth of the League's commitment to leaving the euro is less clear. On January 11th Mr Salvini said Italy would need to coordinate its exit with that of "other countries in difficulty", and that the next government should anyhow focus on negotiating changes to the single currency. If conceded, they would obviate the need for leaving. That appears to kick Italy's departure a long way down the road.

There are two reasons for the League's newly cautious approach, Mr Borghi says. First, the defeat of Marine Le Pen in last year's French presidential election shattered hopes of France and Italy leaving together. Mr Borghi is working on procedures for a unilateral exit, but they would need to include, for example, measures to prevent a run on the banks. A second reason arose from the need for broad popular support for a decision, the League maintains, that can only be taken by government (M5S's

founder, Beppe Grillo, has advocated a consultative referendum, but no such proposal figures in its electoral programme, a sign of growing differences that may lie behind his decision this week to separate his blog from that of his party). The latest poll, last September, showed opinion for and against the euro to be tied.

But even in the League's heartland, grumbling about the single currency is one thing; actually quitting it another. Vicenza registered the highest turnout of any province in the Veneto region in a League-sponsored consultative referendum on autonomy last year. But its export-oriented firms are profiting handsomely from the recovery in Europe, and no one seems keen to rock the boat. Sales to the rest of the EU were up by 4% last year, says Luciano Vescovi, the local president of the bosses' association, Confindustria, who sees the euro as indispensable. Germany may be Italy's main competitor, he accepts, but in and around Vicenza it is also the main customer. Much of the leather upholstery that goes into German luxury cars is tanned at Arzignano, west of the city.

Vicenza also hosts Europe's biggest gold and jewellery show, Vicenzaoro, which closed on January 24th. Among manufacturers, attitudes to the single currency are more jaundiced, says Roberto Ciambetti, the Speaker of the regional assembly and a senior League official. The strength of the euro curbs sales outside the EU and makes exporters vulnerable to competition from Turkey. But that, he says, is a reason for revisiting the rules surrounding the euro, notably the 3% deficit limit, not for getting out.

There is plenty to fret about in Italy's election. The parties are making wild promises that, if implemented, would add substantially to Italy's already vast public debts of more than 130% of GDP. But the idea that the vote could lead to an exit from the euro looks fanciful. ■



Which way will Salvini jump?



Ukraine

Calling a bully a bully

MOSCOW

Legislators bicker, diplomats gab and conflict rolls on in eastern Ukraine

AFTER nearly four years of war in eastern Ukraine, and more than 10,000 deaths, reports from international monitors in the region sound like a grim broken record. On January 19th: 340 explosions. On January 20th: 240 explosions. On January 21st: 195 explosions and two middle-aged civilians hit by rifle fire while travelling in a bus near a separatist checkpoint in the town of Olenivka. “One had blood covering the left side of his face and was holding gauze to it and the other had gunshot wounds in his neck and left cheek,” the monitors from the Organisation for Security and Co-operation in Europe (OSCE) reported this week. One of the men ended up in hospital; the other died at the site of the attack.

The Minsk agreements, a peace plan signed in early 2015, are meant to prevent such incidents. Yet an end to the conflict in the Donbas region remains a distant dream. Russia bears the brunt of the blame for failing to rein in its separatist allies in the area and secure a ceasefire. But Ukraine in turn has balked at taking some political steps outlined in the deal, saying they are impossible until security improves; many in Kiev see the accords as a raw deal. Western negotiators hope that keeping dialogue with Russia open may yet bear fruit. A quiet day on the front on January 23rd shows “peace is possible with political will,” says America’s special representative to the conflict, Kurt Volker. On January 26th Mr Volker will meet his Russian counterpart, Vladislav Surkov, in Dubai for the first time since the American government approved plans last year to provide lethal defensive weapons to Ukraine, a move that then-President Barack Obama had long resisted.

The meeting will also come on the

Finland’s president

Mr Congeniality

Sauli Niinisto loves dogs, hates wild parsnips and won’t do anything rash

IN EUROPE’S frozen north, two presidents are standing for re-election: Russia’s Vladimir Putin and Finland’s somewhat lesser-known Sauli Niinisto. Both are likely to win with huge majorities. Some 70% of Finns back Mr Niinisto, polls say—a Putinesque level of support. Mr Niinisto looks likely to glide to victory in the first round of voting on January 28th. In a world where outsiders and populists are on the march, how does he do it? Unlike Mr Putin, he has none of the advantages of being an autocrat; Finland is one of the world’s freest democracies.

True, the Finnish presidency is mainly a symbolic role, focused on glad-handing foreigners and with little power over internal politics. Yet Mr Niinisto has a reputation for competence at both. As the Speaker of parliament, he won applause by encouraging MPs to travel second-class and book cheaper hotels. When he was finance minister in the late 1990s he slashed public debt from 60% to just over 40% of GDP, tickling the Finnish love of frugality. He also oversaw the transition to the euro.

Mr Niinisto is, besides, a skilled retail politician. He shares details of his private life in tabloids: his much younger wife, a poet, is expecting a baby; his dog recently became an internet star after trying to steal the presidential Christmas ham. Mr Niinisto once called a radio nature show, identifying himself only as “Sauli from Naantali”, to ask about invasive wild parsnips. He roller-blades, too. His closest competitor, Pekka Haavisto of the Green Alliance, has struggled to climb above 10% in the polls. Laura Huhtasaari of the populist-nationalist Finns Party (formerly

known as the True Finns) has failed to capitalise on her party’s base.

But luck also has something to do with it. Finland recently emerged from a recession, and is still riding high after the country’s centennial celebrations—which Mr Niinisto largely oversaw—in late 2017. Finland also shares a 1,300km (800-mile) border with Russia. Finns do not want a maverick wrecking the carefully balanced relationship with their scary neighbour. On the world stage, Mr Niinisto has portrayed himself as a messenger between superpowers. Last year alone he met Donald Trump, Xi Jinping and Mr Putin. Mr Niinisto says that, as president, the most important thing is to act in a way that won’t “blow the world to pieces”. He is surely right there.



heels of a contentious new Ukrainian bill aimed at redefining national policy towards the Donbas. President Petro Poroshenko, who pushed the bill, says it will “pave the way for reintegration of the occupied Ukrainian lands”. The legislation declares Russia an “aggressor”, and calls the separatist-controlled parts of Donetsk and Luhansk “temporarily occupied territories”, like Crimea—thus making it crystal clear that Ukraine blames Russia, not local elements, for the secession. It also shakes up the local command and expands presidential authority to conduct operations there without imposing martial law. Critics of Mr Poroshenko argue that the bill gives him unnecessarily far-reaching powers, and protestors clashed outside parliament ahead of its passage. Analysts expect the

measure to have little effect on the ground. Instead, it looks more like domestic political posturing by Mr Poroshenko, who faces a tough re-election fight in 2019.

Unsurprisingly, Russia reacted with indignation. “You cannot call this anything but preparation for a new war,” declared Russia’s foreign ministry, warning that the bill risked “a dangerous escalation in Ukraine with unpredictable consequences for world peace and security”. Russian officials say the bill undermines the peace plan. “Kiev has gone from sabotaging the Minsk agreements to burying them,” said Konstantin Kosachyov, chairman of the foreign-affairs committee in the Russian parliament’s upper house. Most would say the Minsk agreements have long been on life support, if they are not dead already. ■

Charlemagne | Torn over Tehran

Splits over the Iran nuclear deal are testing the transatlantic bond



PITY the poor European who seeks consistency. On January 22nd Mike Pence, America's vice-president, said that the United States was on the verge of quitting the nuclear agreement signed with Iran in 2015. At the same time Rex Tillerson, the secretary of state, was in London expressing optimism that the deal could be saved with a bit of tinkering. Foreign ministers from across the European Union were in Brussels that day; the confusion hovered above their conversation like an Amazon drone bearing either chocolates or dynamite.

Mr Trump's carnivalesque approach to the presidency has made life hard for America's allies, but his first year in office has not brought forth anything like the full horrors that some predicted. Congress has boxed him in on Russia, NATO does not yet totter and trade wars have failed to break out (although this week brought worrying news). Even if many Europeans reject Mr Trump as baffling and odious—just 25% in a recent Gallup survey express approval of his presidency—the transatlantic bond remains intact.

But the threat to the Iran deal of 2015, now hanging by a thread, could change all that. The Joint Comprehensive Plan of Action (JCPOA), to give it its full title, is the EU's signature foreign-policy achievement (some might say there are few rivals). Three EU members—Britain, France and Germany—are co-signatories, along with America, Russia and China. The EU has a formal role in overseeing its implementation. The deal eased a security threat in the Middle East, reduced the likelihood of war between America and Iran, and represented a triumph for the EU's preferred diplomatic method: dogged, law-bound and multilateral. The EU saw it as a springboard for commercial and cultural engagement with Iran and, though this was never a formal part of the agreement, a way to bring it in from the geopolitical cold.

Yet on January 12th Mr Trump threatened to reimpose sanctions on Iran within 120 days, thus nullifying America's participation in the deal, if Europe failed to fix its "terrible flaws". American worries with the deal seem to cluster around three issues: "sunset" clauses after which Iran can ramp up enrichment; Iran's ballistic-missile programme; and its mischief-making in Syria, Yemen, Lebanon and elsewhere. The Europeans, unusually united in their defence of the deal, say that its purpose was precisely to

hive off nuclear proliferation from broader concerns. But that argument seems to be losing ground in Washington.

Britain and, especially, France still hope to keep Mr Trump on board (Germany, without a proper government since September, is otherwise engaged). Diplomats say they have long leaned on Iran to curb its ballistic-missile programme. In March France's foreign minister will visit Tehran to try to talk the mullahs round; Mr Macron himself has been invited to Iran. Mr Trump has also bestowed his first state-visit invitation upon his French counterpart. Mr Macron may visit just weeks before Mr Trump is due to make his final decision on the Iran sanctions, on May 12th.

Mr Trump has left the Europeans in a tight spot, obliged to side with Russia, China and Iran against their old ally. His threats to kill the Iran deal have already left it in a "zombie state", according to a new report published by Bourse & Bazaar, a website that promotes trade with Iran. The side-deals Mr Tillerson is pushing for undermine the Europeans' strategy of predictability—and there is no guarantee that they will satisfy Mr Trump (or the Iran hawks in Congress). Beyond Iran, tensions simmer between the EU's instinct for engagement and an American approach that veers between aggression and unpredictability. This makes for some awkward conversations in a club that is not yet ready to consider life without American protection. "Trump highlights the strategic dilemma of the Europeans in a way that is very uncomfortable for them," says Jan Techau, an analyst at the German Marshall Fund in Berlin.

How should they proceed? Mr Trump's administration is clearly split on Iran. European efforts to rescue the deal would strengthen the hand of the square-jawed generals around Mr Trump who do not wish to antagonise America's allies or embolden Iran's hardliners. Yet Mr Trump has resisted pressure from his advisers before, as with his decision to withdraw from the Paris climate deal. He may well do so again.

Many argue that the Europeans therefore need contingency plans. America's biggest weapon is not reimposing its own sanctions on Iran, but slapping punitive measures on European firms and banks that do business there. Ellie Geranmayeh of the European Council on Foreign Relations, a think-tank, suggests that the Europeans should work hard with Congress to seek exemptions from such "secondary sanctions"; if that fails, she says they should threaten countervailing sanctions on American investments in Europe. Others might well argue that a tit-for-tat trade war will do no one any good.

Europe help thyself

The American security guarantee remains indispensable; the primary task for policymakers on both sides of the Atlantic must always be to lessen divisions, not to accelerate a divorce. The best way to do that would be for Europe to spend more on its own defence, undercutting those in Washington, Mr Trump included, who see the EU as a free-rider. But Europe can practise some prudent insurance, too, working to develop its own nascent security co-operation, so long as that does not divert resources away from NATO. Mr Trump is especially erratic, but Europeans cannot simply assume that his successor will restore business as usual. It is only sensible for them to gird themselves for a world in which their interests may align a bit less often with America's, whoever is in charge. Mr Trump, after all, won the presidency while holding its foreign-policy establishment in disdain. That lesson will not be lost in America; and nor should it be in Europe. ■

Also in this section

49 Northern Ireland's shutdown

50 Bagehot: The Midlands engine



For daily analysis and debate on Britain, visit
Economist.com/britain

The politics of tax

Sacred cows no more

Long-standing opposition to tax rises is slowly softening

DENIS HEALEY had a bittersweet message when he took to the stage at Labour's annual conference in 1973 with a pledge to increase taxes. There would be "howls of anguish" from the rich, the then shadow chancellor promised delegates in Blackpool. But he added: "Before you cheer too loudly, let me warn you that a lot of you will pay extra taxes, too." Pay they did. Two years later, Healey raised duties on alcohol and tobacco and increased the basic rate of income tax from 33% to 35%. It was the last time a British chancellor moved the basic rate upwards.

Today such rhetoric—and such a policy—is alien. The tax burden as a share of GDP has dropped some three points below where it stood in Healey's day. Income-tax rates have fallen steadily, as tax-free allowances have risen (see chart). The bracing, revenue-raising budgets of the past have given way to ones that trumpet tax cuts and do their best to disguise measures that might bring in more money.

Yet the long-term tax-cutting trend may be over. If the quality of public services—in particular, the National Health Service—is to be maintained, Britain faces the grim prospect of across-the-board tax increases. Healey's budget, one of the harshest in the post-war period, raised tax equivalent to 1% of GDP. According to official estimates, putting the country's finances on an even keel requires permanent tax rises in the region of 2% of GDP each decade, for many

decades to come. Political minds on the right and left are turning to the question of how to raise this kind of money.

Until recently, politicians could dodge tough decisions on tax. From the 1950s to the late 2000s, the economy in general and wages in particular grew much faster than they are growing today. That made it easier to collect extra revenues. In the decade to 2008, bankers' juicy salaries and rising employment meant that income-tax receipts rose by 60% in real terms, despite a softening of the income-tax regime.

As a result, the public is unused to the idea of structurally higher taxes. A hysterical

political culture and round-the-clock media coverage makes it hard for chancellors to take unpopular decisions, says Kenneth Clarke, who did the job in 1993-97. "A few years ago [an increase in taxes] would not have been regarded as sensational," he says. "People knew perfectly well that sometimes taxes went up and down." In 2002 Gordon Brown increased national-insurance contributions (NICs), promising the extra money for health care. But such boldness is rare. These days, governments prefer to raise money by stealth. In the Healey budget of 1975, there were eight big tax measures. In George Osborne's budget in 2016 there were 86 crafty little ones, including higher taxes on landfills.

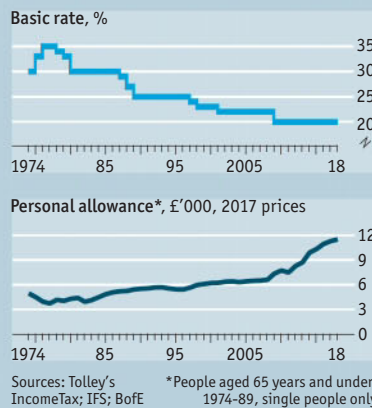
But the reality of Britain's financial straits is forcing a rethink. The best estimates say that the NHS needs another £20bn (\$28bn) per year by 2022, equivalent to 1% of GDP. Other departments are also squealing. This week the head of the army issued ominous warnings about the need for more cash. Voters will have to pay more or receive even less—and after eight years of cuts, they have no appetite for the latter.

The two main parties are responding, albeit cautiously. Labour talks boldly about raising revenues, including by reversing recent cuts to corporation tax. But even its avowedly socialist leaders blanch at increases to tax for anyone bar the rich. They have ruled out increases to the basic rate of income tax, VAT or NICs. Only those earning over £80,000 a year—about the top 4%—would face higher taxes (a policy which might not raise money at all, in part because high earners are adept at managing their finances). Recently a shadow minister raised the prospect of those in big houses paying more council tax. He was promptly forced to resign.

Among the Tories, there is a growing clamour for more spending, if not yet for ▶▶

They can't take that away from me

Britain, income tax, years ending March 31st



higher taxes. This week Boris Johnson, the foreign secretary, took a break from his day job to demand that the NHS receive an extra £100m per week. When it came to the matter of how to pay for it, Mr Johnson fell back on the idea of a “Brexit dividend”, an optimistic notion given that Brexit is expected to cost the exchequer money.

But some in his party are thinking seriously about how more revenue could be squeezed out of voters. Last year the Tories’ election manifesto promised to make asset-rich pensioners pay more towards the cost of their care in later life, by including the value of their homes in assessments of their means. The policy’s poor design meant that it was rightly criticised as a “dementia tax” on those unlucky enough to run up large bills for social care; it was hastily dropped. Yet many Tories remain open to tapping the wealthy. “There is a critical mass that tax on wealth will have to happen at some point, as the system is unsustainable. It is something the prime minister is cautiously interested in,” says Chris Wil-

kins, who was head of strategy in Downing Street until last summer.

Others, such as Nicholas Boles, a former Tory minister, have suggested raising NICS, arguing that the idea might win public support if it were made clear that the revenue went to the NHS. Various technocrats, including Nick Macpherson, a former permanent secretary at the Treasury, have given cautious backing to something akin to a hypothecated tax for the NHS, an idea normally unpopular with economists.

Tax reform is unlikely during this parliament. The legislative calendar is crowded by Brexit and the government has only a slim majority. Slowly, however, political tectonic plates are moving. The prime minister is under increasing attack for her timidity. Polls show that half of voters think taxes should rise, the highest proportion since 2004. If the public want to maintain current levels of public services, they must pay. Eventually the government, and the opposition, will have to take their lead from Healey and admit it. ■

abuses by the security services. The atmosphere was summed up by Naomi Long, the leader of the centrist Alliance Party, when she declared: “There is zero trust.”

That is partly because the negotiations have been punctuated by bouts of electoral combat. Elections to the suspended Assembly last March produced a surge in support for Sinn Fein. The general election in June saw the DUP recover, increasing its tally of MPs to ten. This proved crucial when Theresa May fell short of a majority and persuaded the DUP to prop up her government, in return for £1bn (\$1.4bn) in new funding for the province. Republicans believe that the British government’s dependence on the DUP has undermined its role as an impartial broker in the talks.

The other aggravating factor is Brexit. Most republicans oppose it, since it would weaken ties with the Republic of Ireland. Most unionists support it, for exactly the same reason.

The latest round of talks features two new figures. Karen Bradley, whom Mrs May appointed Northern Ireland secretary earlier this month, was previously the culture secretary and has no previous experience of the province. Meanwhile Sinn Fein will soon be led by Mary Lou McDonald, who will take over from Gerry Adams. Republicans hope that Ms McDonald, who has no past connection to the Irish Republican Army (IRA), will attract a new generation of voters to the party.

That ambition, and the chances of success for the talks, have been dented by the antics of Barry McElduff, a Sinn Fein MP. On January 5th, the anniversary of a massacre in 1976 of ten Protestant civilians by the IRA near the village of Kingsmill, Mr McElduff posted a video of himself larking about in a supermarket with a loaf of Kingsmill bread on his head. He was eventually forced to resign. Sinn Fein should have no problem winning the forthcoming by-election for his seat, but his behaviour has made a mockery of republican complaints about the DUP’s “disrespect” for its opponents. The contest will be bitter.

What if the talks go nowhere? With the Assembly suspended, Northern Ireland is already being governed mainly from Westminster. In the absence of a deal between Sinn Fein and the DUP, the province could revert to “direct rule” by the British. In practice that might not look very different. But the breakdown of a key part of the Good Friday Agreement is a cause for deep concern. The accord has formed the basis for Northern Ireland’s prosperity and security. During the 1990s around 550 people were killed as a result of sectarian violence. In the past decade, fewer than 30 have been. Few believe that the end of devolution could result in a return to previous levels of violence. But the longer Northern Ireland’s politicians play for time, the greater the risks they take with the hard-won peace. ■

Northern Ireland’s shutdown

A little more conversation

BELFAST

But probably no more action, as the province notches up a year in political limbo

THIS year will mark two decades since the Good Friday Agreement brought an end to years of sectarian conflict in Northern Ireland. But as the region’s politicians gathered for talks on January 24th, a grimmer anniversary was on their minds. As of this week the Stormont Assembly, set up under the Good Friday deal, has been suspended for a year, following an almighty falling out between republican and unionist parties. The latest round of discussions designed to get it back up and running does not look promising.

Senior members of the clergy painted a bleak picture in their new-year messages. Ken Good, the Protestant bishop of Derry and Raphoe, lamented that Northern Ireland “has felt more divided than for a generation.” Eamon Martin, the Catholic archbishop of Armagh, said: “We seem to have gone into a kind of vacuum at the moment, with very little sense of direction.”

Last January, Assembly proceedings shuddered to a halt when the late Martin McGuinness, Sinn Fein’s leader in the north, resigned as deputy first minister. McGuinness cited the “shameful disrespect” shown to his fellow republicans by the Democratic Unionist Party (DUP), Sinn Fein’s partner in government. Under the Assembly’s power-sharing rules, Sinn Fein’s withdrawal caused an automatic

suspension of the devolved government.

Since then the British government has hosted rounds of fruitless talks between the two parties, covering issues ranging from the rights of speakers of the Irish language to the investigation of alleged past



Sinn Fein’s leaders, in no hurry

Bagehot | The Midlands engine

Westminster may be brain-dead but some parts of Britain are buzzing with ideas



THE Palace of Westminster is one of the most depressing places on Earth at the moment. The only people in a good mood are swivel-eyed Brexiters and fever-brained neo-Marxists. Everybody else is miserable: frustrated by the intellectual vacuum at the heart of the government and worried that Britain may be drifting to disaster. Michael Heseltine, a Tory grandee, laments that “we have effectively no government”. Nicholas Boles, a former minister, says that Theresa May “constantly disappoints”.

The reason for the depression is the failure of centrist politicians to answer the questions posed by the two great wake-up calls of the past decade. The financial crisis demonstrated that Britain was dangerously dependent on a single, volatile industry. Brexit proved that millions of people felt that the country was not working for them. Mrs May has shown signs that she has heard the alarms, talking about launching a “modern industrial strategy”, helping the “just-about-managing” and spanking snout-in-the-trough bosses. But she has failed to turn words into deeds.

The comfort is that there is more to the country than Westminster. Bagehot recently escaped from London to visit the University of Warwick and discovered a world that is every bit as problem-solving as Westminster is problem-bogged. Builders are hard at work on a vast National Automotive Innovation Centre which is due to open later this year. The wider region is also enjoying a revival. In May the West Midlands acquired its first elected mayor, Andy Street. Coventry has just won a national competition to succeed Hull as Britain’s city of culture.

But this slice of Middle Britain offers more than just a collection of new buildings and initiatives. It offers the outline of a new governing philosophy. This philosophy is centrist in the sense that it tries to build on the best ideas of the past 40 years, such as recognising the creative power of business. But it is reformist in that it accepts that the old model put too much emphasis on London and finance, and forgot about making growth inclusive. Call it reform-centrism.

Reform-centrism’s starting-point is to build links between the knowledge economy and ordinary firms. Britain has an old prejudice against linking high minds with low deeds like making things. That prejudice used to be expressed in its preference for training its ruling class in subjects such as classics and history.

More recently, it has encouraged the idea that the country’s future lies in finance and other services. In 1980 Warwick attracted an academic-entrepreneur, Kumar Bhattacharyya, who thought this was nonsense and set about turning Warwick into one of the world’s leading centres for research in manufacturing. The Warwick Manufacturing Group is now an ever-expanding set of buildings housing cutting-edge research into smart cars, 3D printing, robotics, materials science, biomedicine, cyber-security and much else. It gets 95% of its funding from industry.

The focus on practical knowledge allows reform-centrism to deal with three big problems. The first is Britain’s lack of inclusive growth. Lord Bhattacharyya helped to persuade Tata to buy an ailing Jaguar Land Rover from Ford in 2008. JLR is now Britain’s largest carmaker, accounting for 30% of production. Warwick offers apprenticeships that allow students to earn degrees while working for local firms. The second is productivity growth, which has been disappointing for decades and flat since 2008. Warwick works with 1,000 world-class companies and advises more than 1,800 small and medium-sized ones. The third is regional imbalance. Stuart Croft, the vice-chancellor, talks about the importance of “place-making”—that is, building on the region’s strengths and tackling its weaknesses. He argues that Mr Street’s arrival as mayor has turbocharged place-making. The West Midlands has long suffered from regional fragmentation and political rivalry. Mr Street, a Tory mayor on Labour turf, is an “extremely energetic symbol of collaboration”.

Warwick is not alone. Dozens of universities across the country have forged close relations with business. Sheffield University’s Advanced Manufacturing Research Centre is pioneering new ways of 3D printing and building modular nuclear reactors. Manchester University is beginning to feel like a British version of MIT, with its industry-focused institutes and business-sponsored research programmes. The University of Surrey has a space centre. The West Midlands is one of six areas that acquired mayors last May, including its erstwhile rival, Greater Manchester.

Made in the Midlands, wasted in Westminster

These research centres have driven a striking manufacturing revival. Britain recently saw its longest sustained growth in manufacturing output since 1994. It is also a world leader in niches such as satellites, drones, aeroplane wings and racing cars. More Formula One teams are based there than anywhere else. Success in manufacturing is no longer a matter of economies of scale and cheap labour. Instead it relies on things that play to Britain’s advantages: bright ideas, clever design and rapid customisation.

There is only one problem. However hard you try, in an over-centralised country you cannot get away from Westminster politics. Brexit, a policy that started life as the hobby-horse of a Tory clique, could be the biggest shock to manufacturing since the second world war, disrupting supply chains, ruining just-in-time deliveries, forcing companies such as JLR to think again about being based in Britain, and, on top of all that, making it harder for universities to attract world-class academics. In launching his criticisms of Mrs May’s do-nothing government, Mr Boles borrowed one of George Orwell’s more obscure phrases about “boiled rabbits”, who lack both courage and convictions. Another Orwell phrase is perhaps even more apposite: that Britain resembles nothing so much as a “rather stuffy Victorian family”, where “the young are generally thwarted” and “most of the power is in the hands of irresponsible uncles and bedridden aunts”. ■



Winter sports

Skiing goes downhill

PUNTA SERAUTA, ST MORITZ AND WANLONG

Global warming and ageing populations pose a double threat to winter sports. The industry's response is making it all worse

THE great limestone peaks of the Dolomites glow ochre and pink in the summer sunset. The slab of the Marmolada glacier, the “Queen of the Dolomites”, glistens a regal white. But get up close and the sovereign is weeping. Countless rivulets of meltwater stream down her face.

The retreat of the Marmolada is heart-breaking. So is what she leaves behind: shrapnel, barbed wire, splinters of shacks and the other detritus of the first world war in which Italian and Austro-Hungarian soldiers battled for the controlling heights. As the glacier has shrunk, by more than half since the war, its time capsule is being opened. Last summer the ice gave up an unexploded shell. Sometimes it brings up dead soldiers, too. One appeared in 2010. Another surfaced last summer on the Adamello glacier farther west. Archaeologists describe how the ice, in its pockets, preserves not only the objects of war but also its smell, from the grease of military cableways to old sauerkraut.

Then there are the remains of a carefree and careless time, when the crevasses became dumps during the construction of cable-cars and ski lifts in the 1950s and 1960s. With its highest lift reaching 3,265 metres, the Marmolada was a spot for summer skiing. That fun ended in 2003 because of rising temperatures and costs. Much the same is happening to glacier skiing elsewhere.

The greenhouse gases emitted since the

beginning of the Industrial Revolution have so far warmed the world by roughly 1°C, on average. But the effect has been greater in the Alps, the mountain range most visited for winter sports, which has warmed by about 2°C. This has been most intense in summer, which is why the Marmolada glacier has been melting so fast. Increasingly, though, global warming is affecting the snow and ice in winters, too, with profound consequences for the winter-sports industry that has brought the high life to poor Alpine valleys.

Daniel Scott of the University of Waterloo, Robert Steiger of the University of Innsbruck, and others, have looked at this future warming in the context of the cities chosen to host the Winter Olympics, from Chamonix in 1924 to Pyeongchang in South Korea next month and Beijing in 2022. Even if emissions are cut to meet the target of the Paris climate agreement of 2015, only 13 of the 21 look certain to be cold enough to host snow-sports in the 2050s. With high emissions, the number would drop to just eight in the 2080s (see chart 1, next page). The sight of helicopters rushing snow to Olympic sites in Vancouver in 2010 may be a harbinger of the future.

A more immediate worry for the winter-sports industry is that skiing and snowboarding have peaked in the rich world. Laurent Vanat, author of an annual report on snow and mountain tourism, estimates

that the number of skier-days (visits to ski slopes for part of or a whole day) in the world's main ski destinations fell from about 350m in the 2008-09 season to about 320m in 2015-16. This includes declines in the United States, Canada, France, Switzerland, Italy and, most markedly, in fast-ageing Japan. The drop would be bigger still were it not for breakneck growth in China, where skier-days nearly tripled in the same period to 11m. American resorts (usually small ones) have been closing since the late 1980s. Those in the European Alps, which account for about 40% of skier-days, have mostly kept going, albeit with various public subsidies.

Snow country for old men

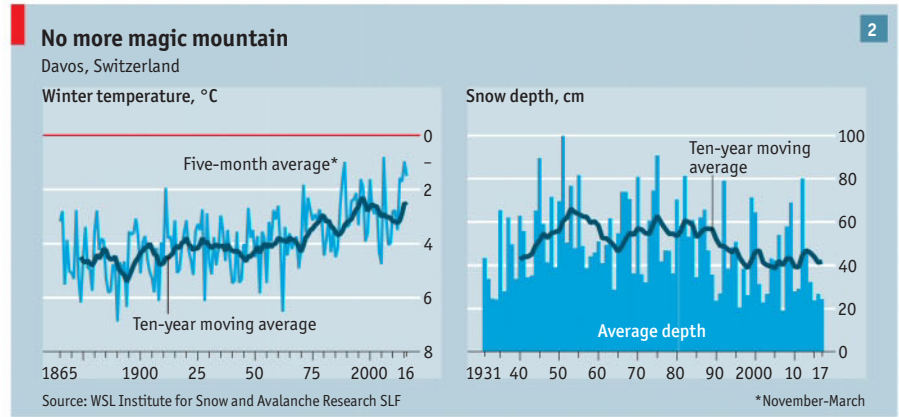
In the rich world, ageing skiers are gradually giving up the sport, although those who keep going tend to have lots of time and money to enjoy the snow. In America, over-55s make up about a fifth of skiers; the most avid are aged 72 and older. Still, their numbers are not being made up fast enough by younger skiers, for several reasons. In many places ticket prices have risen faster than inflation, although resorts offer discounts for season passes and early booking. In America, there is a trend for richer people to ski more than they used to, and poorer ones to ski less. Non-whites, a growing slice of the population, are less keen on skiing. In Europe, school trips to the slopes are less common, even in countries such as Austria and Switzerland that think of themselves as nations on skis. With global travel, those with money can just as easily fly to a beach in winter.

Mountains have only recently become playgrounds. In Mediterranean antiquity they were sacred places where the heavenly touched the earthly: Greek gods dwelt on Olympus and Moses was given the law ►►

▶ on Mount Sinai. Later they became places of dread, where monsters lurked. The highest mountain in the Alps was known as Montagne Maudite, the “cursed mountain”, before becoming Mont Blanc.

In the age of reason, mountains became natural wonders to be studied and conquered; Mont Blanc was first scaled in 1786. They grew to fascinate the romantic imagination, offering a sense of the sublime, hence visits by Lord Byron and the Shelleys in the early 19th century. Percy Shelley penned a poem that became his declaration of atheism; Mont Blanc as the antithesis of Mount Sinai. Mary Shelley brought together all three strands—the cursed, the scientific, the romantic—when Frankenstein’s monster confronted its creator on one of the mountain’s glaciers.

As the 19th century progressed, the draw of the Alps became medical, too. Davos, in Switzerland, developed a reputation for treating tuberculosis with bright sunlight and crisp air. Thomas Mann, who nursed his consumptive wife in Davos, used it as the setting for “The Magic Mountain”. St Moritz, though known for its purifying waters, chose to sell itself mainly to fun-seekers. Winter holidays were born there, according to lore, in 1864, when Johannes Badrutt made a wager with English tourists spending summer in his hotel: come back at Christmas and see the valley bathed in winter sunshine; if you are dissatisfied, I will refund your expenses. Return they did, soon followed by Europe’s high society. With the English came the love of games and competitions, starting



with ice-skating and sledding. Skiing was imported from Norway. Arthur Conan Doyle, author of the Sherlock Holmes detective novels, was among the early enthusiasts in Davos, though he thought skis “the most capricious things on Earth”.

Skiing involved hours of hard climb on foot or skis for just a few minutes of downhill thrill. Its popularisation would have to await the introduction of mechanical ascent as well as the post-war economic boom. By then antibiotics had relieved the sanatoria of their tubercular residents, allowing them to become hotels. Under its “Snow Plan” of 1964, France created a network of high, purpose-built resorts to draw foreign tourists and prevent the depopulation of Alpine valleys. Brought by Norwegians, skiing caught on in North America, too. Both the Vail and Aspen resorts in Colorado, born as mining towns, were turned into ski resorts by veterans of the 10th Mountain Division who had trained in Colorado before serving in Europe.

This expansion took place in decades of abundant snow. Mountains can still get large dumps, as delegates at the World Economic Forum in Davos this year found out. But the long-term trends are sobering. Christoph Marty of the Institute for Snow and Avalanche Research in Davos notes that the snow comes later and melts earlier, and the snowpack is thinning (see chart 2). By the end of the century there will be little snow in the Alps below 1,200 metres, and much less of it even below 1,800 metres.

In 2007 the OECD, a rich-world think-tank, sounded the alarm. It projected that, of 666 Alpine ski resorts, roughly 40% would no longer get enough snow to operate a 100-day season (a rule of thumb for making money) if the region warmed by another 2°C. Roughly 70% might go if it warmed by 4°C. The German Alps were especially vulnerable. In North America, projections suggest that resorts close to the western seaboard, especially in California, face a ruinous loss of skiing days. Skiing in Australia looks all but doomed.

Seeking colder, more snow-sure places, developers in Canada have won authorization to build a new resort in Valemout,

in the Rockies west of Edmonton, avoiding the lawsuits by environmentalists and first-nation groups that have hampered similar projects elsewhere. Meanwhile, some American resorts are trying to coax more snow out of the clouds by seeding them with plumes of silver iodide.

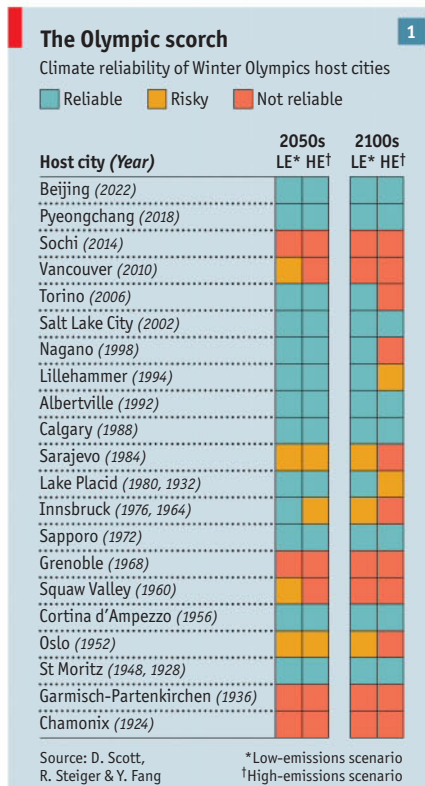
The main response of resorts has been to invest heavily in artificial snow-making. Messrs Scott and Steiger have reworked climate-model assessments to take this into account. One looks at roughly 300 resorts in the vulnerable eastern Alps (parts of Germany, Austria, Switzerland and Italy). Relying just on natural snow, about 70% of them would no longer survive with 2°C more warming, and 90% would be endangered with 4°C. But with snow-making these proportions fell to about 15% and 60% respectively (see map, next page).

Blow hard

First adopted by some American resorts in the 1950s, snow-making has evolved from patching bald ski runs to guaranteeing and extending the season, especially around Christmas. Even high stations such as St Moritz (alt. 1,800 metres) start by creating a base layer of artificial snow. In fact, operators often prefer it to the natural stuff as it is harder-wearing, and more resistant to melting. Athletes think it more reliable, too. The French resort of Les Deux Alpes has even started spraying snow on its glacier (above 3,000 metres) to preserve it. The machine-made stuff is called “programmed snow” in Italian, “technical snow” in German and “snow from culture” in French. Just don’t call it “artificial”.

Off-piste skiers cannot do without natural powder. But the mass of enthusiasts on machine-groomed runs seem indifferent to whether they are sliding on cloud- or man-made snow. Increasingly, what the heavens provide is a bonus, helping to create the winter ambience. “People do not care about the snow, they care about the sun,” says Paolo Cappadozzi, vice-president of Dolomiti Superski, a vast domain that includes the Marmolada.

Resorts in the Dolomites invested heavily in snow-making after two disas- ▶▶



What our clients are saying about Stauer Helenite jewelry:

"My wife received more compliments on this stone on the first day she wore it than any other piece of jewelry I've ever given her."

— J. from Orlando, FL
Stauer Client



This 4-carat stunner was created from the aftermath of Mount St. Helens eruption!

Famous Volcano Has Strange Effect On Women

Man and nature collaborate to create a glamorous green ring guaranteed to rock her world! Own it today for **ONLY \$99 plus FREE studs with ring purchase!**

On May 18, 1980, Mount St. Helens erupted, sending a column of ash and smoke 80,000 feet into the atmosphere. From that chaos, something beautiful emerged—our spectacular **Spirit Lake Helenite Ring**.

Created from the superheated volcanic rock dust of the historic Mount St. Helens eruption, helenite has become the green stone of choice for jewelry and fashion designers worldwide. Helenite's vivid color and immaculate clarity rivals mined emeralds that can sell for as much as \$3,000 per carat. Today you can wear this 4-carat stunner for **only \$99!**

Our exclusive design highlights the visually stunning stone with a concave cut set in .925 sterling silver loaded with brilliant white, lab-created **DiamondAura®**. The classic pairing of colors in a vintage-inspired setting makes for a statement ring that's simply impossible to ignore!

Beauty from the beast. Also known as "America's Emerald," helenite is not an emerald at all, but a brighter and clearer green stone that gem cutters can facet into spectacular large carat

weight jewelry. "It's just recently that luxury jewelers have fallen in love with helenite," says James Fent, GIA Graduate Gemologist. "Clear green color in a stone this size is rarely found in emeralds but helenite has come to the rescue."

Your satisfaction is 100% guaranteed. Bring home the **Spirit Lake Helenite Ring** and see for yourself. If you are not completely blown away by the exceptional beauty of this rare American stone, simply return the ring within 30 days for a full refund of your purchase price. It's that simple. But we're betting that once you slide this gorgeous green beauty on your finger, it will take a force of nature to get you two apart!

Spirit Lake Helenite Ring

Total value with FREE studs ~~\$478*~~

Now, Offer Code Price Only \$99 + S&P Save \$379!

1-800-333-2045

Your Offer Code: SLR520-02

You must use this insider offer code to get our special price.

EXCLUSIVE FREE Helenite Studs -a \$129 value- with purchase of Spirit Lake Ring



Stauer®

14101 Southcross Drive W., Dept. SLR520-02, Burnsville, Minnesota 55337 www.stauer.com



Rating of A+

* Special price only for customers using the offer code versus the price on Stauer.com without your offer code.

4 carat Helenite center stone • Lab-created white DiamondAura accents • .925 sterling silver setting • Whole ring sizes 5-10

Smart Luxuries—Surprising Prices™

trously snowless seasons between 1988 and 1990. Even as the climate has warmed, their ski season has lengthened. It may be no coincidence that some of the world's biggest makers of snow machines are based in the Dolomites.

As for environmentalists' accusations that ski resorts are wasting water, not to mention electricity, Mr Cappadozzi is unmoved. They account for a fraction of the water used for agriculture or industry, he argues. Most of the snow is made in a short burst at the start of the season; the water is only temporarily held on the slopes before it flows back into streams and aquifers. Even so, Mr Cappadozzi reckons snow-making accounts for about 13% of his expenditure, a cost passed on to skiers.

In some places water really is scarce. The small Kaberlaba station in Asiago (alt. 1,000 metres), in Italy, is on porous rock; water quickly drains away. Rather than make snow with expensive (and sometimes rationed) tap water, Paolo Rigoni, the manager, started to use treated municipal sewage in 2010, an idea for which he received a presidential prize. Customers do not mind skiing on recycled effluent, he insists: "It's not that different from water treatment in some American cities."

Beyond snow-making there is "snow farming", as practised in the Austrian resort of Kitzbühel. At an altitude of only 800 metres, it is often regarded as the most vulnerable of the big Alpine stations. The resort stockpiles some snow in winter and covers it through the summer for use in the autumn. This allowed Kitzbühel to open its first runs on October 14th last year, before most rivals; it hopes to keep skiers going for 200 days, its longest-ever season. Is this a marketing wheeze? No, smiles Josef Burger, boss of the Kitzbühel lift company, it is a strategy to draw keen skiers and athletes: "The early bird catches the worm."

For Carmen de Jong of the University of Strasbourg, the headlong rush into snow-making is costly, environmentally damaging and ultimately self-defeating. "Many resorts are closing their eyes to reality," she says. She advocates a "deceleration" in the winter-sports industry.

Nowhere are things more unreal than in north-east Asia. Pyeongchang, and especially the area around Beijing, are certainly cold in winter, but are largely snowless. And with relatively low mountains, new runs are being cut through forests to accommodate the Olympic downhill races.

Ski resorts are proliferating in China, including those in the Chongli district north-west of the capital that will host some of the sites for the Olympics in 2022. They are covered completely with artificial snow. This is despite the fact that the water table in Beijing has dropped alarmingly over the decades, and enormous diversion works are sending some of the Yangzi's waters to the capital. In a warming world things here

could get yet drier. Wind turbines may be spinning on ridges in Chongli to provide the snow-makers with green power; but the surreal white streaks painted on barren mountains, as if by a calligrapher's hand, seem to spell "waste".

China's golf courses, which also have an exorbitant thirst, face punitive water tariffs. The Chinese state regards golf as a source of corruption. But skiing is, for now, clean middle-class family fun, and thus gets an environmental free ride. "It is white opium. It's addictive," pronounces He Huan, a gym instructor who snowboards at Wanlong, the biggest resort in Chongli.

Xi Jinping, China's president, has spoken of 300m Chinese taking up winter sports. Where the leader points, the state follows. Skier-days are growing by 20% a year; 78 new (mostly small) resorts opened in 2016 alone, says Benny Wu, a consultant. "It could grow at this rate for another 15-20 years," he declares. Chongli is served by a four-lane highway; a high-speed railway line will be completed by next year. Soon Beijingers could live in the clean air of Chongli and commute to the capital.

Around the world, operators are hoping that just a fraction of the potentially huge cohort of Chinese enthusiasts will one day travel to their resorts. That is one reason why most will not admit that they face a bleak future. Many recognise it indirectly, though, when they speak of diversifying, particularly by expanding the summer season. In shrinking winters, they say, ski resorts compete against each other; in summer they can take a bigger chunk of the fast-growing global tourist market.

Another possibility is, like Johannes Badrutt more than 150 years ago, to lure winter visitors with no skiing at all. Rather than invest in snow-making, the operators of Stockhorn in Switzerland decided in 2004 to build a restaurant at the top of the cable-car (alt. 2,100 metres) offering visitors candlelit dinners overlooking Lake Thun. On the slopes there is winter hiking, night snowshoeing, ice-fishing, an igloo village and more. "We changed from noisy skiing to soft winter," says Alfred Schwarz, its

boss. "We have more visitors, especially in summer, and we are more profitable."

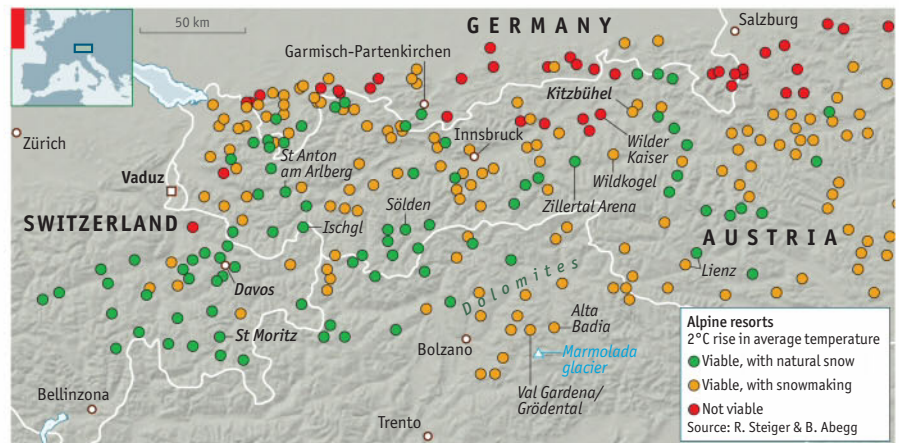
Perhaps in ever hotter summers more holiday-makers will seek the coolness that high altitudes provide. Might mountains once again become summer retreats, as in the 19th century? Chamonix, the home of mountaineering, makes almost as much money in summer as it does in winter. Chinese day-trippers, among others, are keen to glimpse Mont Blanc.

This is not a future which everyone believes in. Not every ski resort has an iconic mountain that looks wonderful in summer. And for all the golf, horse-riding and mountain-biking that may be on offer, nothing draws people quite like the thrill of snow, many resort officials say. Their mantra is: "Skiing is not everything. But without skiing there is nothing."

On top of the world

Sooner or later (through regulation and carbon pricing, or global warming) resorts will have to rethink their model. Small, low-lying stations will have to find alternatives to skiing or close. Rich ones in high places and with good sources of water and electricity may thrive. Chamonix, though at just 1,000 metres, has pistes reaching 3,300 metres. "If we will not be able to ski here any more, we will not be able to ski anywhere," says Eric Fournier, the mayor. "We may even attract more people." That may be a problem, too. The Chamonix valley is often shrouded in smog, the product of wood-burning chimneys and the exhaust fumes of lorries rumbling to the Mont Blanc Tunnel between France and Italy.

How paradoxical. Snow-sports enthusiasts think of themselves as great lovers of nature and clean air, more conscious than most people of the changing climate. Yet their sport is becoming ever more man-made, expensive and exclusive. Perversely, it is also becoming more polluting, producing ever more emissions of greenhouse gases to survive. That only hastens the melting of the snow and ice. As Victor Hugo put it: "How sad to think that nature speaks and mankind will not listen." ■





The car industry

General Uber-Motors

DETROIT

The carmaker takes an unexpected lead in the race to develop autonomous vehicles

GENERAL MOTORS reveals barn-sized truck at Detroit motor show. What else is new, you might now ask. But the launch on January 20th of the Chevrolet Silverado, a pickup that will go on sale at the end of the year, highlights a surprising turnaround for America's largest carmaker.

The good news is not just the Silverado's outsized margins, which are important for a firm that relies heavily on trucks—after Mary Barra, GM's boss, gave an ebullient performance at an investors' conference that coincided with the motor show, the release of GM's quarterly results on February 6th are likely to include record profits. It is also that the money thrown off by vehicles such as the Silverado will help the firm navigate the tricky terrain that lies ahead of all the world's big carmakers.

One task is to ensure that their current business of selling vehicles with internal-combustion engines stays healthy. At the same time, they must prepare for a future of electric and autonomous cars (EVs and AVs), which threaten to up-end business models that have endured for a century.

Not so long ago, GM and its peers seemed to be on a path to extinction. Technology firms such as Alphabet, Uber and other pushy newcomers had started a race to develop software that would control driverless cars and to offer ride-hailing and ride-sharing services that are expected to thrive at the expense of car ownership. In

April 2017 GM's market value was overhauled by Tesla's, a firm that makes just tens of thousands of flashy EVs a year, compared with the millions of vehicles rolling off GM's production lines.

Sentiment has changed dramatically. Since April GM's share price has surged by 28%, giving the firm back the lead. By contrast, Tesla has struggled with the nuts-and-bolts of carmaking. Production-line problems have hampered a big roll out of its mass-market Model 3. Analysts at Barclays, a bank, say that GM is more "evolving mammal than...dying dinosaur".

One reason for the reversal of fortunes is that GM has convinced investors that its current business is in fine fettle. The cash

Also in this section

- 56 Qualcomm's next fine
- 58 Social media and misinformation
- 58 Luxury goods go online
- 60 America's avocado dearth
- 61 Mandatory arbitration in America
- 62 Schumpeter: GE's foggy finances

For daily coverage of business, visit

Economist.com/business-finance

generated by the Silverado and a range of new pickups will help pay for big investments in EVs and AVs. It does not hurt GM's case that Ford, its main rival in Detroit, is struggling (see chart). Jim Hackett, a new boss brought in because of his technology know-how, oversaw a lacklustre relaunch in October that was sketchy on Ford's vision for the future of transport services. On January 24th the firm reported disappointing quarterly results, dashing hopes for quick improvement.

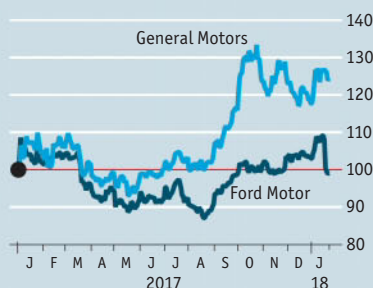
In contrast, GM is already well on the way to reshaping itself. For starters, it has diverted resources to where it is a market leader. It has got rid of unprofitable businesses around the world, a process that culminated in a decision last March to sell Opel, its loss-making European carmaker, to France's PSA. At the same time, GM has invested heavily in new pickups, such as the Silverado.

Cadillac, GM's premium brand, may look like an exception to this happy rule. Sales of just 350,000 cars in 2017 puts it far behind its German rivals. Yet sales have doubled since 2010 and it has grown faster than any of them in recent years. Although the firm does not disclose the information, analysts at Morgan Stanley reckon that Cadillac could be worth \$13bn, around 20% of GM's current value. Johan de Nysschen, Cadillac's boss, admits he runs a "challenger brand", but sniffs an opportunity. The upheaval created as carmakers grapple with new business models means that "everyone has to start again".

The most important reason for GM's comeback, though, is its success in convincing investors that it is a leader not just among established carmakers, but among tech firms, too. It has rapidly accelerated from the position of an also-ran in the field of autonomous vehicles to apparent ▶▶

Self-driving

Share prices, January 1st 2017=100



Source: Thomson Reuters

▶ leader. A scorecard issued annually by Navigant, a consultancy, puts GM ahead of the AV pack of carmakers and tech firms, with Alphabet's Waymo in second place.

That GM is ahead of Silicon Valley's risk-takers may seem surprising. But earlier investments, which were once looked on with scepticism, seem to be paying off. Alan Batey, GM's president for North America, points to the manufacturing of mass-market long-range EVs, where the firm has a lead. The Chevy Bolt, the world's first such vehicle, has been on sale for over a year, beating Tesla's Model 3 and the new Nissan LEAF to market.

The Bolt is supposed to be the basis for an ambitious autonomous ride-sharing business. On January 12th GM announced the latest version of its Cruise AV, a Bolt-based robotaxi without a steering wheel or pedals. GM plans to use it to launch a commercial scheme in several cities, starting next year. Rival tech firms and carmakers are only running, or are planning to launch, small test projects.

Revenge of the robotaxis

When GM paid \$1bn in 2016 for Cruise, an artificial-intelligence startup, many analysts wondered whether it was throwing away money. But the marriage of cutting-edge technology and large-scale manufacturing seems to be paying off. The carmaker has learned to be more nimble; Cruise has picked up how to make its fiddly technology robust enough for the open road. As a result, GM can now mass-produce self-driving cars, says Dan Ammann, second-in-command to Ms Barra. Scale will help steeply to reduce the cost of sensors, which are the key components of an AV.

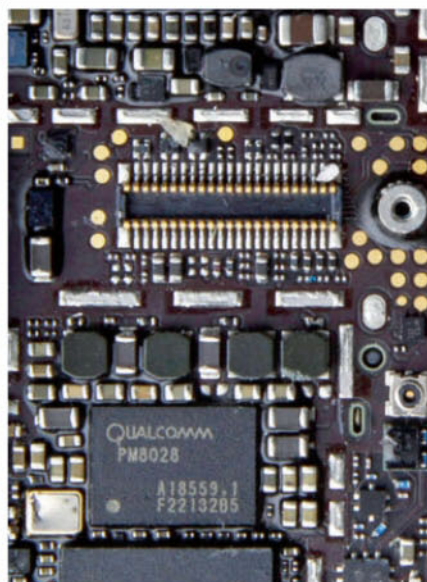
The firm is being rewarded because, unlike other carmakers, it has assembled all the parts of the puzzle you need to build new transport services, says Stephanie Brinley of IHS Markit, a consultancy. But even if GM is no longer a dinosaur, risks remain. In particular, it may be too bullish in its estimate of the market for robotaxis and it may be placing too much faith in the benefits of being the first to market.

The company expects demand to expand quickly. Costs of ride-hailing services, it predicts, will fall from \$2.50 a mile now to about \$1 as the main expense—the driver—is eliminated. In America alone it would be able to tap a market worth around \$1.6trn a year (representing three-quarters of all miles travelled) as drivers are lured from their cars to robotaxis. But what Mr Ammann calls this “very big business opportunity” comes with an inconvenient corollary. As car buyers become car users, GM's legacy business supplying vehicles to drive will decline accordingly.

Critics think that GM may have accelerated too swiftly and that it will have to endure years of losses before robotaxis take off. Even if things move fast, points out Be-

renberg, another bank, GM may not be the one to benefit. The main constraint in growing a ride-hailing business now is acquiring drivers. But when these are eliminated, capital will be the only limit. And that could mean huge fleets of robotaxis chasing passengers, forcing prices down. Riders may then choose a brand they recognise, such as Uber and Lyft, rather than Maven, GM's ride-hailing business.

If so, being first would confer little advantage. And yet, if carmakers do not want to accept their fate passively, they have little choice but to remodel themselves. The outsized Silverado and the sensor-packed Cruise AV show that GM has the present in hand—and that it is at least doing its best to safeguard its future. ■



Qualcomm's woes

A fine habit

The chipmaker is fined again for anti-competitive practices

THE tech industry hardly needs another reminder that trustbusters are on its case. But the European Commission is always happy to oblige. On January 24th Europe's executive body slapped a penalty of €1bn (\$1.2bn) on Qualcomm, one of the world's largest chip-designers, for abusing its dominance in baseband processors, a critical component in mobile phones.

Large fines are becoming something of a habit for Qualcomm, which will have paid out nearly \$1bn a year, on average, to trustbusters the world over since 2015. This week's penalty, which amounts to nearly 5% of the company's global annual revenue, is a reflection of what Margrethe Ves-

tager, the European competition commissioner, described as its “very illegal behaviour” between 2011 and 2016. During that time, according to Ms Vestager, the company attempted to shore up its dominant position—it is estimated to supply up to four-fifths of essential types of baseband chips—by paying Apple, its biggest customer, billions of dollars in return for being its exclusive supplier.

The commission ruled that the strings attached to these payments—which included a clawback of part of the money, should Apple use other suppliers—acted to shut rivals out of the market. According to internal documents from the time, Apple had long considered sourcing its chips from Intel, but it did not actually do so until 2016, after its deal with Qualcomm had expired. (The chipmaker insists that its practices did not violate European Union rules, and plans to appeal against the commission's decision.)

Qualcomm's pricing strategy, too, has won it few friends in recent years. Most contentious is the way in which it licenses its intellectual property to device-makers, charging them a percentage of the total selling price of their devices. Apple alleges that such royalties act as a tax on any innovative features it adds to its products, and is yet another way in which the chipmaker is abusing its market power. Apple is seeking damages of over \$1bn from the chipmaker in lawsuits filed both in China and California. Regulators in Taiwan, South Korea and China have already extracted penalties for the licensing model; an investigation by America's Federal Trade Commission, launched last year, is under way.

In a rare bit of good news for the chipmaker, regulators in Europe and South Korea last week gave their blessing to Qualcomm's \$47bn acquisition of NXP, another chip-design firm. Qualcomm hopes the purchase will help it to boost its business in 5G chips and the “internet of things”, as connected devices are collectively called. But Ms Vestager is not quite finished with the firm. The commission is yet to rule on whether it also engaged in predatory pricing between 2009 and 2011 by setting the prices of certain chips below cost, allegedly to force a competitor out of the market.

The continued uncertainty, and Qualcomm's hefty penalties so far, may give the company's own predator, Broadcom, a rival chipmaker, more ammunition. Its \$130bn offer for Qualcomm was rebuffed last year; a heated proxy fight at Qualcomm's annual investor meeting in March seems likely. Qualcomm argues that regulators will never bless the union, which would be the largest-ever tech deal. But Broadcom reportedly plans to end the licensing model if it is allowed to make the purchase, which would probably draw the battle with Apple to a close. That is something for trustbusters to chew on. ■

VAN GOGH



VINCENT VAN GOGH
Head of a Fisherman

Circa 1883 • Pencil and black lithographic crayon on paper
Paper: 17”h x 11”w
Frame: 23½”h x 17¼”w
#30-7152

This compelling, original drawing by the legendary van Gogh displays all the hallmarks of this acclaimed master at his best. Part of an important series of drawings dedicated to the fisherman, this rare study reveals van Gogh’s remarkable talent as a draughtsman.



Since 1912, M.S. Rau Antiques has specialized in the world’s finest art, antiques and jewelry. Backed by our unprecedented 125% Guarantee, we stand behind each and every piece.

630 Royal Street, New Orleans, Louisiana 70130 • 888-387-0963 • info@rauantiques.com • rauantiques.com

Social media

Mark Zuckerberg's other headache

WhatsApp shows that Facebook's efforts to fight fake news may fail

“THERE'S too much sensationalism, misinformation and polarisation in the world today,” lamented Mark Zuckerberg, the boss of Facebook, recently. To improve things, the world's largest social network will cut the amount of news in users' feeds by a fifth and attempt to make the remainder more reliable by prioritising information from sources which users think are trustworthy.

Many publishers are complaining: they worry that their content will show up less in users' newsfeeds, reducing clicks and advertising revenues. But the bigger problem with Facebook's latest moves may be that they are unlikely to achieve much—at least if the flourishing of fake news on WhatsApp, the messaging app which Facebook bought in 2014 for \$19bn, is any guide.

In more ways than one, WhatsApp is the opposite of Facebook. Whereas posts on Facebook can be seen by all of a user's friends, WhatsApp's messages are encrypted. Whereas Facebook's newsfeeds are curated by algorithms that try to maximise the time users spend on the service, WhatsApp's stream of messages is solely generated by users. And whereas Facebook requires a fast connection, WhatsApp is not very data-hungry.

As a result, WhatsApp has become a social network to rival Facebook in many places, particularly in poorer countries. Of the service's more than 1.3bn monthly users, 120m live in Brazil and 200m in India (see chart). With the exceptions of America, China, Japan and South Korea, WhatsApp is among the top three most-used social apps in all big countries.

Most of the 55bn messages sent every day are harmless, but WhatsApp's scale attracts all sorts of mischief-makers. In South Africa the service is often used to spread false allegations of civic corruption and hoax warnings of storms, fires and other natural disasters. In Brazil rumours about people travel quickly: a mob recently set upon a couple they suspected of being child traffickers based on chatter on WhatsApp (the couple escaped).

But it is in India where WhatsApp has had the most profound effect. It is now part of the country's culture: many older people use it and drive younger ones crazy by forwarding messages indiscriminately—sometimes with tragic results. Last year, seven men in the eastern state of Jharkhand were murdered by angry villagers in two separate incidents after rumours cir-



culated on WhatsApp warning of kidnappers in the area. In a gruesome coda to the incident, pictures and videos from the lynching also went viral.

It is unclear how exactly such misinformation spreads, not least because traffic is encrypted. “It's not that we have chosen not to look at it. It is impossible,” says Filippo Menczer of Indiana University's Observatory on Social Media, which tracks the spread of fake news on Twitter and other online services. Misinformation on WhatsApp is identified only when it jumps onto another social-media platform or, as in India, leads to tragic consequences.

Some patterns are becoming clear, however. Misinformation often spreads via group chats, which people join voluntarily and whose members—family, colleagues, friends, neighbours—they trust. That makes rumours more believable. Misinformation does not always come in the form of links, but often as forwarded texts and videos, which look the same as personal messages, lending them a further veneer of legitimacy. And since users often receive the same message in multiple groups, constant repetition makes them more believable yet.

Predictably, propagandists have employed WhatsApp as a potent tool. In “Dreamers”, a book about young Indians, Snigdha Poonam, a journalist, describes visiting a political party's “social media war room” in 2014. Workers spent their days “packaging as many insults as possible into one WhatsApp message”, which would then be sent out to party members to be propagated within their own networks. Similar tactics are increasingly visible elsewhere. Last month's conference in South Africa of the African National Congress, at which delegates elected a new party leader, saw a flood of messages claiming victory for and conspiracy by both factions. With elections due in Brazil and Mexico this year, and in India next year, expect more such shenanigans.

Governments and WhatsApp itself are keenly aware of the problem. In India authorities now regularly block WhatsApp to stop the spread of rumours, for instance of

salt shortages. Regulators in Kenya, Malaysia and South Africa have mooted the idea of holding moderators of group chats liable for false information in their groups. WhatsApp is working on changing the appearance of forwarded messages in the hope that visual cues will help users tell the difference between messages from friends and those of unknown provenance. But ultimately it will be down to users to be more responsible and not blindly forward messages they receive.

It is as yet unclear whether fake news on Facebook will be less of a problem after it changes its algorithms. The experience of WhatsApp suggests, however, that the concerns will persist. “Even with all these countermeasures, the battle will never end,” Samidh Chakrabarti, a Facebook executive admitted on January 22nd. “Misinformation campaigns are not amateur operations. They are professionalised and constantly try to game the system.” ■

Luxury goods

Online, upmarket

MILAN

Richemont, the world's second-biggest luxury firm, places a bet on digital

A YOUTUBE video featuring a woman sporting a gold watch and driving a convertible, which has been viewed online nearly 5m times. A social-media “influencer” with more than 11m followers on Instagram posting photos of herself wearing the same timepiece. A limited flash sale of the watch on Net-a-Porter, a website.

Purveyors of pricey jewellery and watches have been slow to embrace things digital. But last year's social-media campaign to relaunch Panthère, a watch made by Cartier, a French jeweller, is evidence that they are waking up to the power of the ▶▶



Clickbait for plutocrats

FREE RETIREMENT PLANNER

"When will I have enough money to retire?"



1 When can I retire comfortably?

Assess your readiness here

2 What impact will Social Security have?

Add income events to explore answers

3 What if something unexpected happens?

You can prepare for that too

4 What if I retire earlier?

Find out how different scenarios play out

5 How much money will I have to spend each month?

Make sure you save enough

6 Can I afford that splurge?

Plan for big expenses

Get answers with our free retirement planner

Try our free planner and get 65 expert money tips for an easy retirement in our free guide, *65 Ways to Retire Smart*.



PERSONAL CAPITAL
Get to know your money

TRY OUR PLANNER. **IT'S FREE.**

personalcapital.com/econ

online world. On January 22nd Richemont, a Swiss luxury conglomerate that counts Cartier among its brands, offered to buy the shares it does not already own in Yoox-Net-a-Porter group (YNAP), a leading luxury online retailer, for €2.7bn (\$3.3bn). Although the deal still faces hurdles, it is likely to go ahead.

The days of double-digit growth in the luxury industry are gone—it grew by 5%, to €1.2trn, last year. Watches, in particular, have had a rough time. Chinese demand collapsed after an anti-corruption crackdown; inventory languished, unsold. Last year Richemont's revenues dropped by 4%, to €10.6bn. But online sales of personal luxury goods have continued to rise: they now account for 9% of the total (see chart). Bain & Company, a consultancy, reckons that they will reach 25% by 2025.

Online sales of “hard luxury”, such as watches and jewellery, lag: they account for just 5% of digital revenues. But that is up from almost nothing a decade ago, and is predicted to reach between 10% and 15% by 2025. And even if purchases are made in physical stores, buying decisions are increasingly made online: 68% of millennials' luxury purchases are “digitally influenced”, according to EY, a consultancy.

Small wonder that Richemont wants to expand its footprint online. Last year the group hired a chief technology officer, as part of a management restructuring which also did away with the role of CEO. It was an early investor in Net-a-Porter, which it merged in 2015 with Yoox, another e-commerce firm; it kept a 50% stake in YNAP, the resulting combination. The hope is that owning YNAP outright will allow Richemont to learn things about the online world that it could not with a stake alone. It would also increase the Swiss firm's exposure to “soft luxury”, such as clothes and bags, a segment in which the firm has struggled, notes Melanie Floquet of JPMorgan Chase, a bank.

For YNAP itself, the deal promises added investment at a time of intensifying competition. Moët Hennessy Louis Vuitton (LVMH) has launched its own online platform, 24 Sèvres. Farfetch, another luxu-

ry e-tailer, is planning to float. Claudia D'Arpizio, a partner at Bain, suggests that Amazon, an online giant, could eventually disrupt the luxury market, too.

Not everybody is convinced a takeover of YNAP is needed. It is like buying an airline to go on holiday, says Luca Solca of Exane BNP Paribas, another bank. And the deal is not without risks. One is whether Federico Marchetti, YNAP's boss, will indeed stay on once he has sold his 4% stake (he says he will). Ms Floquet also worries that the lack of a chief executive could lead

to feuds within the management.

Such concerns do not seem to bother Johann Rupert, Richemont's founder and chairman. In a statement on the offer he mentioned how, a century ago, Alberto Santos-Dumont, a famous aviator, complained to his friend, Louis Cartier, about the difficulty of checking his pocket watch while flying. Cartier listened, and—eureka!—the wristwatch was born. Full ownership of YNAP should, Mr Rupert seems to reckon, allow Richemont to listen to its customers, in person or not. ■

The avocado market

Lack of guac

NEW YORK

Droughts, storms and global demand test America's love affair with avocado

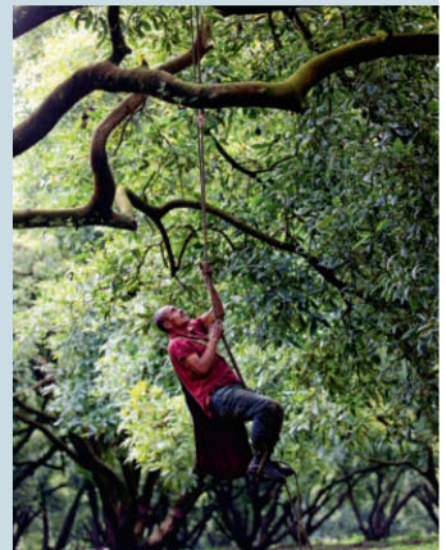
ALTHOUGH New Yorkers are not renowned for their patience, they do not seem to mind waiting their turn for a fresh serving of avocado. At Avocaderia, which claims to be the world's first avocado bar, in Brooklyn, long queues stretch from the counter outward into a large food hall.

The venue's popularity is a sign of the times: the avocado is fast becoming America's favourite fruit. Although domestic production has stayed flat, imports have more than trebled over the past ten years, according to the Department of Agriculture. It estimates that the annual consumption of the average American has increased from about one pound (0.5 kilograms) in 1989 to more than seven pounds in 2016; total consumption that year weighed in at 2.3bn pounds.

America's enthusiasm for avocados may be dented, however, by soaring prices. The wholesale price for a case of 48 avocados peaked at \$83.75 in September, up from \$34.45 a year before, according to the American Restaurant Association. Some restaurants were forced to add a surcharge on guacamole, or temporarily to scrap it from their menus altogether. Others swallowed the bill. Chipotle, a Mexican-themed restaurant chain, said that “historically high avocado costs” were a big reason why it posted disappointing financial results last year.

Supply shortfalls, brought about by droughts, storms and wildfires in California, Chile and Mexico, help to explain the jump. Production in California dropped by 44% in 2017. Harvests in Mexico that year were off by 20%. Labour strikes in the country further reduced supply.

Growing global demand is also pushing up prices. Both Chile and Peru have concluded trade agreements with China, eliminating tariffs on their avocado exports. Peru's avocado sales to China,



Looking for the last avocado

although small in volume compared with Chile's and Mexico's, surged by 3,700% in 2016. Other countries, including Canada and Japan, have also worked up their appetite, raising aggregate imports by 32% between 2014 and 2016.

Raising production will be tricky. This is because avocados are a fussy plant to grow, says Mary Lu Arpaia of the University of California, Riverside. Salinity levels need to be just right, the slope of the terrain not too steep and temperatures stable. Erratic weather conditions can easily kill the crop.

Even so, it seems a good bet that queues like the ones in Brooklyn will multiply. The founders of Avocaderia are already looking for new opportunities to expand after only having been in business for ten months. Demand is huge says one of them, Alessandro Biggi. “On opening day we actually ran out of avocados after just 90 minutes and things haven't slowed down since.”

Distinction benefits

Online luxury-goods market, worldwide, €bn



Arbitration agreements in America

Kept out of the courthouse

Bosses who behave badly are being shielded by contractual small print

IMAGINE wanting to sue your employer, because you have been harassed or discriminated against, only to find that your access to the courts is blocked. It turns out you signed away your right to use the judicial system when you started the job: somewhere, hidden in the documents that came with your employment contract, was a clause obliging you to resolve future disputes through private arbitration, rather than in court.

An increasing number of American employees find themselves in this situation. Over half of non-unionised employees are covered by arbitration requirements, estimates Alexander Colvin of Cornell University, based on a survey in 2017 of 627 private-sector workplaces. Such agreements have come under greater scrutiny after the wave of workplace sexual-harassment revelations last year. Gretchen Carlson, a former news anchor for Fox, a broadcaster, has called arbitration “the harasser’s best friend”. Prevented by an arbitration clause from suing the network, Ms Carlson sued her boss and alleged harasser, Roger Ailes, instead.

Arbitration was originally designed for commercial disputes. It has also become a common feature of consumer services: Airbnb’s terms of use include them, as do mobile-phone contracts. But such clauses increasingly show up in employment contracts, too. Back in the early 1990s, only around 2% of non-unionised workplaces used arbitration for employment disputes, says Mr Colvin. A number of Supreme Court rulings since then have encouraged its broader adoption.

The main advantage of arbitration, compared with litigating in court, is speed: a decision is reached, on average, a year before one is made in court. Instead of complicated legal procedures, the parties involved call in a neutral third person, often an expert in the industry. The arbitrator listens to the evidence and makes a decision, which is binding in most cases.

The popularity of arbitration is a sign of how very costly and technical the courts have become, says Andrew Pincus, a partner at Mayer Brown, a law firm, who advises companies on such procedures. Signing up to arbitration in advance, he argues, does away with jockeying for legal advantage over where the case is best heard, which almost always keeps the parties from settling. And it allows employees to make claims that would be too small to

justify a suit in court.

Others argue that arbitration is ill-suited to employment disputes. In many cases, it and its terms are in effect imposed on employees, says Imre Szalai of Loyola University in New Orleans. New recruits may not look at the small print, or think it will ever apply to them. “It is a fantasy of consent, rather than the real thing,” says Katherine Stone at University of California, Los Angeles.

Another concern is that the process of arbitration favours employers. They often pick the firm of arbitrators. And individual arbitrators are more likely to encounter the employer than the employee in future cases. Both features may lead the arbitrator to be unconsciously biased towards the employer, says Victoria Pynchon, a former arbitrator with the American Arbitration Association (AAA), who now runs She Negotiates, a training and consulting firm.

In some cases, biases are explicit. Ms Pynchon was warned at the start of her career that awarding punitive damages against employers could mean she would never arbitrate another case. Large arbitration groups, such as the AAA, do have codes of conduct that prohibit such partiality. But Mr Szalai, of Loyola University, questions whether these counteract implicit biases.

Unsurprisingly, perhaps, recent studies suggest that outcomes and payouts in arbitration are, on average, significantly less generous to employees than those made in

court, says Mr Colvin. But comparing arbitration and court cases is not easy: the terms of arbitration can vary widely, making generalising across them difficult.

Another criticism of arbitration agreements, voiced by Ms Carlson, the news anchor, is that they silence victims. Often the proceedings have confidentiality clauses attached that prevent the employee from speaking about the case, thereby protecting repeat offenders. Paula Brantner of Workplace Fairness, an employee-rights charity, contends that, without the threat of litigation and the negative publicity it brings, companies have less of an incentive to root out bad behaviour.

In the wake of the #MeToo movement, legislators are now taking aim at arbitration in harassment cases. A draft bill banning mandatory arbitration in such cases was introduced in Congress last month. Supporters are cheered by the fact that the bill’s sponsors span both sides of the aisle. But lobbyists warn that its broad wording could be construed as banning arbitration in all workplace disputes. Previous such proposals have never got off the ground.

Indeed, arbitration’s scope could widen further. One open question is whether firms can ban employees who are subject to mandatory-arbitration clauses from filing class-action suits. The US Chamber of Commerce says such a ban is essential to avoid needless claims. The Supreme Court is due to rule before June on whether that would violate labour rights.

Such a prohibition has already been approved by Congress in the case of arbitration in consumer contracts (reversing a decision by the Consumer Financial Protection Bureau). Firms may even start slipping arbitration clauses into IPO documents, after Michael Piwowar of the Securities and Exchange Commission welcomed the idea in a speech last year. The courtrooms may yet get emptier. ■



Schumpeter | The fog of war

If they are to save the firm, General Electric's bosses and board need far better information



IN THEIR documentary “The Vietnam War”, Ken Burns and Lynn Novick, the directors, dwell on the flawed information that American politicians got from Indo-China. The generals on the ground focused on the “kill ratio”, or the number of enemies killed per American or South Vietnamese soldiers killed. That bore no relationship to victory—North Vietnam quickly replaced its dead soldiers. And it corrupted behaviour, leading American troops to embellish numbers and count dead civilians as “wins”.

The curse of rotten information can strike companies, too. That seems to be the case with General Electric (GE), which has had a vertiginous fall. Its shares, cashflow and forecast profits have dropped by about 50% since 2015. On January 16th it disclosed a huge, \$15bn capital shortfall at its financial arm due to a revision in insurance reserves. And on January 24th it revealed a \$10bn loss for the fourth quarter. In its core industrial arm, returns on capital have sunk from 20% in 2007 to a puny 5% in 2017.

GE's boss, John Flannery, an insider who took office in August, must clear up the mess made by his predecessor, Jeff Immelt. He seems to recognise the gravity of the situation. In November he gave a frank presentation to investors. This month he suggested that GE might be broken up. Yet an unnerving sense lingers that no one fully understands what has gone wrong.

Is the conglomerate formerly known as the world's best-run firm a victim of weak demand for gas turbines, a low oil price, lavish digital initiatives, timing lags in client payments, morbidity rates, bad deals, cost overruns or a 20-year squeeze in industrial-equipment margins because of Chinese competition? You can imagine GE's 12-man board blinking at this list, like Pentagon generals huddled around maps of the Gulf of Tonkin which they are too embarrassed to admit they do not understand.

Schumpeter's theory is that GE's flow of financial information has become fantastically muddled. There is lots of it about (some 200 pages are released each quarter) and it is audited by KPMG. But it offers volume and ambiguity instead of brevity and clarity. It is impossible—certainly for outsiders, probably for the board, and possibly for Mr Flannery—to answer central questions. How much cashflow does GE sustainably make and where? How much capital does it employ and where? What liabilities must be serviced before shareholders get their profits?

Perhaps GE has a better, parallel accounting system that it keeps under wraps. But the public one reveals eight problems. First, it has no consistent measure of performance. This year it has used 18 definitions of group profits and cashflow. As of September 2017, the highest number was double the average one. There is a large gap between most measures of profits and free cashflow.

Second, GE's seven operating divisions (power, for example, or aviation) are allowed to use a flattering definition of profit that excludes billions of dollars of supposedly one-off costs. Their total profits are almost twice as big as the firm's. It is the corporate equivalent of China's GDP accounting, where the claimed outputs of each province add up to more than the national figure.

Third, GE does not assess itself on a geographical basis. Does China yield solid returns on capital? Has Saudi Arabia been a good bet? No one seems to know. This is unhelpful, given that the firm does half its business abroad and that the long-term decline in returns has taken place as the firm has become more global.

Fourth, GE pays little attention to the total capital it employs, which has ballooned by about 50% over the past decade (excluding its financial arm). Its managers rarely talk about it and have set no targets. It is unclear which parts of the firm soak up disproportionate resources relative to profits, diluting returns.

Fifth, it is hard to know if GE's leverage is sustainable. Its net debts are 2.6 times its gross operating profits, again excluding its financial arm. That is high relative to its peers—for Siemens and Honeywell the ratio is about one. Some of those profits are paper gains. And the average level of debt during the year is much higher than the figures reported at the end of each quarter.

Sixth, the strength of GE's financial arm is unclear. The new insurance loss will lower its tangible equity to 8% of assets. This is well below the comfort level, although regulators seem to have granted it forbearance in order gradually to rebuild its capital.

Seventh, it is hard to calibrate the risk this poses to GE shareholders. GE likes to hint that its industrial and financial arms are run separately. But they are umbilically connected by a mesh of cross-guarantees, factoring arrangements and other transactions.

Eighth, is GE sure that its industrial balance-sheet accurately measures its capital employed and its liabilities? Some 46% of assets are intangible, which are hard to pin down financially: for example, goodwill and “contract” assets where GE has booked profits but not been paid yet. Hefty liabilities, including pensions and tax, are also tricky to calculate. Based on GE's poor record of forecasting, it seems that large write-downs are possible. On January 24th GE said that regulators were looking into its accounting.

Time for some command and control

GE's situation is like that of the global bank conglomerates after the financial crisis. Citigroup, JPMorgan Chase and HSBC did not entirely trust their own numbers and lacked a framework for assessing which bits of their sprawl created value for shareholders. Today, after much toil, the people running these firms know whether, say, loans in California or trading in India make sense.

This does not happen naturally. If neglected, financial reporting becomes a hostage to internal politics, with different constituencies claiming they bring in sales, while arguing that costs and capital are someone else's problem. Mr Flannery is a numbers guy who wants to slim GE to its profitable essence. But he is trapped in a financial construct that makes it hard to pursue that mission intelligently. Until he re-engineers how GE measures itself, he will be stumbling about in the murk. ■



Also in this section

- 64 Buttonwood: Volatility's eerie calm
- 65 Microfinance and disaster relief
- 65 Europe's direct-lending funds
- 66 Nigeria's central-banker shortage
- 67 Poverty and migration
- 67 Hyperinflation in Venezuela
- 68 Free exchange: Bank regulation

For daily analysis and debate on economics, visit Economist.com/economics

Morgan Stanley

Tediously does it

NEW YORK

The recovery of Morgan Stanley is a huge achievement with, so far, modest results

MORGAN STANLEY emerged in 1935 out of a global financial disaster, as one of Wall Street's leading firms. In a rare shred of consistency in America's turbulent markets, history has repeated itself. But it was a close call. An ill-timed infatuation with debt ahead of the 2007-08 financial crisis threatened to add it to the industry's towering funeral pyre, which consumed all its big competitors with the exception of Goldman Sachs.

Of the two, Morgan Stanley came out of the crisis the more tarnished, less for what it did than for what it was: less profitable; less connected, through its former employees, to political power; and less respected for having evaded disaster. But after the release of financial results from the fourth quarter of 2017, Morgan Stanley's valuation has surpassed Goldman Sachs's. This reflects not only the improvement in its profitability but also investors' greater confidence in how it is managed.

Goldman, with some justice, finds the comparison unfair. The two firms make roughly equivalent returns and each is top dog in global league tables for segments of the capital markets. Goldman might easily reclaim its edge in the next quarter. But its approach has a growing legion of doubters. Fixed-income, currencies and commodities, the mysterious profit centre from which its chief executive, Lloyd Blankfein, graduated, has had a rough stretch that re-

flects more than bad luck. Its newest growth initiative—to profit from small clients it ignored in the past—has yet to prove itself more than an interesting idea.

The rising esteem for Morgan Stanley came grudgingly at first, and then fast. The firm and its chief executive, James Gorman, are seen as having attributes common in many businesses but oddly rare on Wall Street: a long-term vision; a plan to execute it; and a record of bringing it to life. All the more unusual, these attributes omit the defining trait of the historically successful investment bank—wild, euphoric, glorious years of profit (often then paid out to staff and lost in subsequent busts).

Those were the days



Since the financial crisis, Morgan Stanley's results have improved steadily, albeit only to their current level of barely adequate. Its return on equity in the recently completed year (adjusting for the oddities of America's recent tax reform) is 9.4%, not quite up to that of a run-of-the-mill utility. Mr Gorman's new targets are for 10-13%, somewhat closer to the overall market average. On a recent conference call a financial analyst asked him why the target was not higher. After all, Morgan Stanley will enjoy a big boost from the tax overhaul, which will cut its tax rate from over 30% to the mid-20s. Mr Gorman demurred, stressing that the firm would only project returns it felt were feasible even if conditions became rough. To aim higher—and in particular to replicate the pre-crisis returns on equity of more than 20%—would mean “doing something you don't want us to do”.

Some of this coyness stems from Wall Street's new arithmetic. Since 2006, Morgan Stanley's capital has grown from \$35bn to \$77bn and it has slashed its debt: that has eaten into returns on equity. Capital requirements may fall a bit as regulatory models are tweaked (see Free exchange)—Morgan Stanley has been especially affected by some of their quirks—but the permissive mood of the past is unlikely soon to return. Often, when a chief executive explains barriers to profitability, a company's share price sinks. Mr Gorman's comments had the opposite effect. Sobriety is in vogue.

Underlying the results are large changes to the firm. Its hallways still buzz with slim, well-dressed, intense people of indeterminate age. But they are not quite the self-anointed masters of the universe of the pre-crisis era. Pay as a share of investment-banking revenues has dropped from a peak of 78% in 2008 to 35% (see chart). In-▶

vestment banking itself is less important these days, accounting for about half the overall business. In contrast the firm's wealth-management income has grown sharply since the crisis, and has become even more central to its operations since it bought into Citigroup's wealth-management business in 2009. Controversial then, the move appeared foolish a year later when the process of integration faltered.

It is now cited as an obvious and unrepeatable opportunity. Revenues and profits have grown quickly. Margins, Mr Gorman said, had reached levels only ever achieved by a broker in 1999 during the dot-

com bubble (by Smith Barney, whose remnants were picked up in the Citi acquisition). That, he suggested, might mean they were peaking. In response, Steven Chubak, an analyst at Instinet, a broker, created side-by-side comparisons of the two businesses to illustrate how much their approaches differed. Three-quarters of Smith Barney's revenues, compared with a fifth of Morgan Stanley's, came from transactions, ie, from commissions on stock and bond sales, and so were highly volatile. The emphasis since has shifted.

Fees charged as a percentage of assets are the most important source of income.

But mortgages and other loans to clients, financed by deposits, are a second, fast-growing one. The loans are backed by the borrowers' securities holdings, helping explain why credit losses to date have been almost non-existent. Attracting deposits is not as hard as might be expected from the affluent customers Morgan Stanley pursues. Of course they already have bank accounts, but many conventional retail banks pay almost no interest, are starting to charge for current accounts and, in effect, are encouraging clients to look elsewhere.

As this trove of information grows, giving Morgan Stanley data on clients' in- ▶▶

Buttonwood | The times they aren't a-changing

Volatility has been low, and that encourages risk-taking

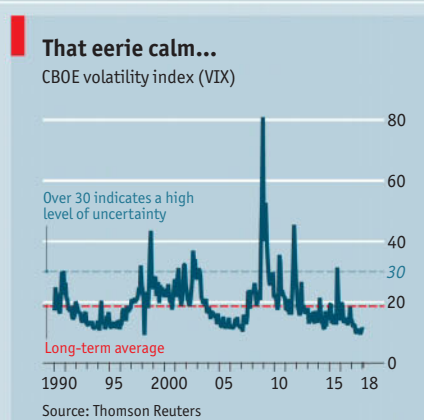
MAY YOU live in boring times. Financial markets have become dull, if profitable. The S&P 500 index, America's leading equity benchmark, has notched up its longest-ever streak without a 5% reversal. Bond yields may have inched up in recent months, but are still at the bottom of historical ranges. Institutions famed for their trading prowess, such as Goldman Sachs, have seen profits dented by the quiescence of the markets.

This lack of market volatility owes much to the steadiness of monetary policy since the depths of the financial crisis. Central banks have kept short-term rates low and have intervened to push down bond yields through their programmes of quantitative easing (QE). The classic method of pricing financial assets is to say they are worth the discounted value of future cashflows; since central banks have kept the discount rate steady, prices have been steady too.

The late Hyman Minsky, an economist, thought that long booms sowed the seeds of their own destruction. He argued that, when the economy was doing well, investors tended to take more risk (such as taking on more debt). These speculative positions are vulnerable to a shock, such as a sudden rise in interest rates, which can turn into a fully fledged crisis.

In these days of sophisticated markets, speculators are not restricted to their own capital or even to borrowed money to buy assets to bet on the good times continuing. They can use derivative instruments to bet on prices. Indeed, there is actually a market in volatility.

The steadiness of the S&P 500 shows that actual, or realised, volatility has been low. But investors can also hedge against a sharp move in the stockmarket (in either direction) by taking out an option, giving them the right to buy or sell equities at a



given price within a set period. The price, or premium, they pay for this option reflects a lot of factors. But one of the most important is how choppy investors expect the market to be in future. This measure is the "implied" volatility of the market and is the basis for the well-known Vix, or volatility index.

Speculators who believe markets will stay calm can sell (or "write") options on volatility, earning premium income. The more sellers there are, the more the price, or premium, will fall (and the lower the Vix will be). The danger, then, is that a sudden pickup in volatility could result in speculators suffering losses. A linked issue is that investment banks use a measure called "value at risk" to help determine the size of their trading positions; reduced volatility will encourage them to take more risk. Since volatility tends to rise when asset prices are falling, this could be accompanied by much wider financial distress.

Two recent papers* from the New York Federal Reserve have examined this issue. The authors point out that low volatility tends to be persistent; historical data show long periods of calm interspersed with

short spikes in the form of crises (see chart). So low volatility today is not necessarily a warning sign. The authors write: "On average, extremely low volatility today predicts low volatility in the future, not higher."

However, the Vix measures the implied volatility over just a one-month horizon. It is possible to calculate implied volatility over a two-year period, creating a slope akin to the yield curve, which measures interest rates for different lending durations. Back in 2006-07 this volatility curve was very flat, suggesting that investors thought that conditions would continue to be rosy. That may explain why so many were caught out by the problems in the subprime mortgage market.

This time, the Fed says the volatility curve is steeply upward-sloping (since 1996 the slope has been steeper only 15% of the time). This suggests that investors are not complacent at all, and think that volatility may soon return. Investors seem to think the Vix may be as high as 20% (compared with around 11% today) within the next one or two years.

The obvious catalyst for such a change is monetary policy. The Fed is pushing up interest rates and slowly unwinding QE; the European Central Bank is scaling back its bond-buying. So far, this process has occurred without any great alarms. But there may yet be a "tipping point", when higher rates cause problems for investors and borrowers. In any cycle there is always some institution that has taken a lot more risk than the rest. If a storm comes this year, the world will discover who has gone out without a coat or umbrella.

* "The low volatility puzzle: are investors complacent?" and "Is this time different?" by David Lucca, Daniel Roberts and Peter Van Tassel

come, holdings and spending, it will create new sources of value. The firm employs 16,000 financial advisers (formerly known as brokers) who, over time, may form teams made up of people with very different skills, such as in taxes or inheritance law. A linked online offering that the firm hopes will appeal to millennials was recently launched, enabling investment decisions to take into account preferences such as environmental concerns.

The firm sees its best opportunities in cossetting its clients so well that they bring in some of the vast investments they hold elsewhere. The rub is that others doubtless feel the same. Wells Fargo and Bank of America Merrill Lynch have somewhat similar approaches and are doing well, as are many independent financial advisers. Electronic start-ups such as Wealthfront and Betterment claim to do most of what the older firms do, but at a fraction of the cost. They are attracting younger customers. Betterment says its clients are, on average, 37; Morgan Stanley's are in their late 50s or early 60s. A harder-to-track cohort of investors ignore advisers altogether and instead invest directly in cheap, passively managed funds.

In short, with so many ways to fail, even Mr Gorman's decade-long record cannot quell all doubts. But scepticism is countered by the fact that it all seems to be working. And enough consistent progress has been made to suggest Morgan Stanley's returns may one day climb beyond the "barely adequate". ■

Microfinance and climate change

Bucks after the bang

Using microcredit in disaster relief

BOTH, in different ways, worry about liquidity. And global warming may, indeed, be bringing meteorologists and financiers together. On January 18th, VisionFund, a microlending charity, and Global Parametrics, a venture that crunches climate and seismic data, launched what they billed as the "world's largest non-governmental climate-insurance programme". The scheme will offer microfinance to about 4m people across six countries in Asia and Africa affected by climate-change-related calamities.

Natural disasters are becoming more frequent and severe. They disproportionately affect poor countries, where many eke livings from vulnerable agricultural land. Yet it is often in the aftermath of disaster that credit is hardest to obtain. As non-performing loans rise and the percep-



Small pots of liquidity

tion of risk increases, microfinance institutions (MFIs) rein in lending; they receive little support from donors and relief programmes, which tend to favour humanitarian aid. Stewart McCulloch, VisionFund's insurance boss, says that "recovery lending"—small loans with special terms—can act as a "safety net" by helping stricken households restart businesses.

Evidence suggests the money is usually paid back. In 2016, using a £2m (\$2.7m) grant from the British government's development arm, VisionFund's MFIs provided microloans to 14,500 families in Kenya, Malawi and Zambia hit by El Niño, a weather system that caused severe droughts and floods. In all three countries, MFIs ended up lending far more than expected. Yet 93% of loans were repaid by May 2017, and missed payments were rarer than usual. Many borrowers made their livelihoods more disaster-proof by starting more drought-tolerant activities such as trading or horticulture. MFIs, for their part, found new clients among those their normal lending criteria excluded—without jacking up interest rates.

Encouraging though this is, expanding operations at such a juncture is difficult. According to Jonathan Morduch of New York University, the effectiveness of such loans relies heavily on their speedy disbursement. Yet MFI staff often live near affected areas and so need time to get back on their feet after disaster strikes; many lack, for example, backup IT systems. Lots of lenders are inhibited from offering more flexible terms to their unfortunate borrowers by loss-provision rules and write-down formulas set by regulators.

But the biggest difficulty is in raising finance for recovery lending. Grants may not be available. This month's initiative will give MFIs prompt access to liquidity

after a disaster, helping them meet increased demand, for an annual premium of about 0.5% of the value of their portfolios, in addition to the normal cost of funds. Global Parametrics provides insurance cover through a contingency-credit facility from the InsuResilience Investment Fund (formerly known as Climate Insurance Fund), an initiative of KfW, a German government development bank, and risk capital from the Natural Disaster Fund, backed by the British government. Both also aim to raise money from private investors.

Other institutions could help. The World Bank has created a disaster risk-pooling system that covers the Pacific Islands, which are very prone to climate-related hazards. The countries pay a premium into a common pot, from which they can draw cash after a calamity. Some of the bank's programmes also include a "zero" component, where funds allocated to a project can be switched to emergency relief at the government's request, if a disaster is declared. In both cases, a share of the proceeds could go to recovery lending.

Whether MFIs would qualify for that money is up to the government. And that hints at a broader problem. Though independent, microlenders may be hindered in times of crisis if they are not part of national disaster-contingency plans, says Michael Goldberg of the World Bank. Private dollars can help make recovery lending a bigger thing. But to gain greater currency, local regulators and governments must also be convinced it works. ■

Private debt in Europe

The direct route

MILAN

Some investment funds will lend where banks fear to tread

WHEN Caronte & Tourist, a Sicilian ferry company, needs a new ship, it is cheap and easy to borrow from a bank. But in 2016, when Caronte's controlling families wanted to buy back the minority stake held by a private-equity firm, banks balked at the loan's unusual purpose. Edoardo Bonanno, the chief financial officer, also worried that the €30m (\$33m) in extra bank debt might make shipping loans harder to obtain from them in future. So he turned instead to a direct-lending fund run by Muzinich & Co, an asset manager.

Such funds are only about a decade old in Europe (and not much older in America, where they started). Assets under management at Europe-focused funds increased from a mere \$330m at the end of 2006 to \$73.3bn by mid-2017, which includes \$27.9bn of "dry powder", or funds yet to be ▶▶

lent out (see chart). In 2017 alone 24 direct-lending funds raised a record \$22.2bn. Such funds do what they say on the tin: lend directly to firms, usually in the form of big, multi-year loans. The borrowers are often either companies that are too small to raise equity or debt on capital markets, or private-equity funds buying such firms.

Blair Jacobson of Ares Management, an asset manager, says that the pummeling banks took in the global financial crisis “turbocharged” the direct-lending industry. Ares set up its European direct-lending arm, now one of the largest with \$10.8bn under management, in September 2007, as the crisis broke. Most of the other direct-lending firms moved into the business be-

cause of the crisis and the dearth of bank credit that ensued. Some were founded expressly for direct lending, notably Hayfin Capital Management in 2009, which in 2017 raised more than €3.5bn.

Despite superficial similarities, these firms are far from being banks. Many started out in more complex credit markets. ICG, for example, specialised in the riskier tranches of loans to private-equity firms. Another, BlueBay Asset Management, started as a bond-fund manager.

Direct lenders raise money from institutional investors, to whom they usually promise returns of around 10% or even 15%. So they cannot compete with the interest rates banks charge borrowers. But they do

offer speed and flexibility. In Caronte’s case, for instance, Mr Bonanno liked the flexibility of Muzinich’s loan, such as the ability to pay it back early. The largest direct lenders, like Ares or Hayfin, can also compete on their ability to write large loans, even for several hundred million euros, off their own bat. Since the financial crisis, banks’ lending limits have been reduced, and syndication to even a dozen others can be like “herding cats”, in the words of Hayfin’s Andrew McCullagh.

Direct-lending funds also differ from banks in how much of their lending goes to private-equity firms. More than four-fifths involves private equity in some way, whether to finance a buy-out or to lend money to a private-equity-owned firm.

But that is changing. Many funds have formed ties with firms that become repeat customers when they need more financing. And direct lending is becoming better known as a financing option. For certain funds, a sizeable portion of their lending now has no private-equity “sponsorship”—about 40% for Hayfin, for instance, a third for Muzinich, and nearly half in Muzinich’s separate (albeit small) Italian fund.

The industry is also expanding geographically. As recently as 2013, Britain accounted for almost half of direct-lending deals; transactions elsewhere were often done by fund managers jetting in from London. But many European countries have allowed funds to lend without a full banking licence. And the EU plans to harmonise the direct-lending market. In the first three quarters of 2017, Britain’s share of new deals fell to a shade over a third. Many firms have set up regional offices, or even country-specific funds such as Muzinich’s Italian, French and British funds.

Direct lending covers a broad spectrum of activity. At one end is Muzinich, with its strong focus on small enterprises. This is a far cry from Ares’s boasts of being able to lend €300m at short notice (although Ares does lend to smaller firms, too). Yet both are part of a continuing structural shift in Europe, as a result of which small and mid-sized firms have a viable alternative to banks as a source of credit. ■

Monetary policy

Central banking on autopilot

Nigeria is short of rate-setters

IN THEIR quest to stabilise the job market, central banks are setting a bad example. Jerome Powell, whom senators this week confirmed as the next chairman of America’s Federal Reserve, will lead an institution with three existing vacancies on its seven-member board, and a fourth that will open up imminently. Not since July 2013 has its rate-setting committee boasted the full complement of 12 voting members.

This monetary undermanning is, however, much worse in Nigeria. Its monetary-policy committee was unable to meet as scheduled on January 22nd-23rd because it lacked the six members necessary for a quorum. Five recent nominees still await confirmation by the country’s Senate. The chamber is holding up all but a few executive appointments in retaliation for President Muhammadu

Buhari’s failure to remove an official (the acting anti-corruption tsar) whom the Senate twice rejected. In the absence of a monetary-policy meeting (and the lengthy communiqué that eventually follows it), the central bank posted a brief, scanned note on its website, explaining that it would not tinker with its existing policy stance.

According to some economists, this is in fact just how monetary policy should be done. Milton Friedman, for example, thought the Fed should be replaced by a computer that would increase the money supply at a steady rate. Others have proposed more elaborate, but equally mechanical, rules. Allowing a few wise men and women to meddle with the money supply, governed by their own discretion, is more trouble than it is worth, these economists argue. The best central bankers strive, with all the benefit of their erudition and experience, to be as boring as machines anyway.

In Nigeria, sadly, central banking is far from boring. Although growth has returned and the stockmarket is booming, the country still suffers from stagflation: a weak recovery combined with stubbornly high price pressures. In such a predicament, warm-blooded policymakers sometimes rush to fight the “stag”—by cutting interest rates prematurely—before they have properly quelled the “flation”. A Friedmanite might therefore hope that Nigeria’s rate-setting committee remains inoperative for a little longer.

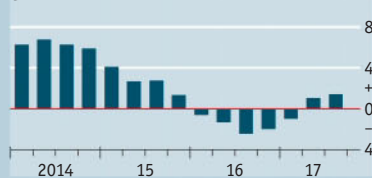
In the scanned note, the central bank welcomed recent improvements in financial conditions and promised to continue its “proactivity”. One difficult art a computer would struggle to replicate is that of irony.

Nobody minding the shop

Nigeria, % change on a year earlier



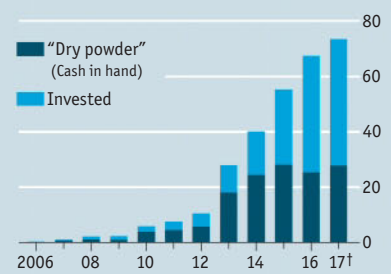
GDP



Source: Haver Analytics

One direction

Europe-focused direct-lending funds
Assets under management at year end, \$bn



Source: Preqin

†On June 30th



Poverty and migration

On their bikes

DHAKA

One way to alleviate rural poverty is to nudge people into cities

BESIDES shoes and shrimp, Bangladesh exports poverty cures. Microfinance was developed there in the late 1970s before spreading. In 2002 BRAC, a charity, started giving assets such as cows (and training in how to manage them) to desperately poor women. That approach has spread, too. The latest poverty remedy to emerge from Bangladesh is different: it targets men, and rather than trying to make people more productive in their villages, it encourages them to move.

In Rangpur, a northern district, agricultural labourers endure an annual hunger in the autumn, known as *monga*. The rice crop has been planted but is not ready to harvest, so work is scarce. Jobs abound in the cities, but poor farmers are loth to use their dwindling savings on a bus ticket. It is a good example of a poverty trap.

So, for the past ten years, researchers led by Mushfiq Mobarak, an economist at Yale University, have tried offering cash to poor households so long as somebody moves to a city to look for work. The effects of this intervention have been measured through randomised controlled trials, including a large one, covering 133 villages, which began in 2014. They turn out to be strong.

Predictably, money encourages movement. In villages where no cash was offered, 34% of poor households sent a migrant to a city during *monga*. In those where a few households were offered grants of 1,000 taka (about \$12), 59% of them sent someone to a city. But in villages where most poor households were offered cash, fully 74% of those approached sent a

Hyperinflation in Venezuela

Bolívar blues

CARACAS

As inflation soars, the currency slides

EVEN a modest rate of inflation compounds over time. This is why your tipsy grandfather might wistfully recall how little a pint of beer cost in his heyday. In Venezuela, where prices are rising at a four-figure annual rate, the good old days were last month. The defence minister, Vladimir Padrino López, on January 19th urged business leaders to peg back prices to their levels of December 15th, when presumably everything was just fine.

The spending power of the bolívar, Venezuela's currency, had collapsed long before then. *The Economist's* Big Mac Index gives a rough guide to how fast it has fallen. The index is based on the idea of purchasing-power parity (PPP), which says a fair-value exchange rate is one that leaves consumer prices the same in different countries. In our index, the price of a Big Mac is a proxy for all goods. In Caracas, this week, a Big Mac cost 145,000 bolívares; in American cities, it cost an average of \$5.28. The ratio of those prices gives a PPP exchange rate of 27,500 bolívares. Two years ago, the rate was 27 bolívares. By this yardstick, the currency has lost 99.9% of its value in almost no time.

In fact the Big Mac gauge probably understates the general rise in prices and the slide in the currency. DolarToday, a US-based website that publishes real-time quotes, puts the black-market exchange rate at around 260,000 bolívares to the dollar, and falling. This rate has become one of the few reliable yardsticks against which to peg prices in Venezuela. Have your tyre replaced in Caracas, and

the mechanic will check the DolarToday exchange rate before presenting the bill.

Imported goods, such as tyres, have a reference dollar price. But a lot of local prices do not keep up with the collapsing value of money. A monthly mobile-phone tariff is 38,000 bolívares, or 15 cents; a haircut is 25 cents. Wages tend to lag behind prices, in large part because it is so hard to keep up with them. The monthly minimum wage has just been raised for the umpteenth time, to around 800,000 bolívares. That is less than \$4 at the current black-market exchange rate. If wages were perfectly indexed, it would serve only to speed up inflation. But their slow and uneven adjustment means the pain of hyperinflation is shared haphazardly. As Juan Perón of Argentina supposedly said, if prices take the lift, wages cannot take the stairs.

Good golly, Miss Bolí!

Venezuelan bolívar to the \$
Implied PPP* conversion rate, inverted log scale



Sources: McDonald's; *The Economist* *Purchasing-power parity, based on *The Economist's* Big Mac index

migrant. That suggests a snowball effect: if lots migrate, the hesitant may follow.

Household income rises, largely because men are able to work more hours each day. Sree Jotin, an agricultural labourer with a small plot of his own in Rangpur, reckons that he earns about 250 taka a day in the fields. In Dhaka, where he worked as a cycle-rickshaw driver last November and December, he pulls in about 700. He pays 100 taka to rent a rickshaw and 110 for food, but makes far more than he could at home (he sleeps in a corner of the garage, so has no housing costs). Though he believes Dhaka's filthy air is damaging his health, he is glad he moved.

Village life is profoundly affected, and not just because more men are sending money home. With so many workers absent, agricultural wages rise. Oddly, households that are encouraged to send somebody to a city end up earning slightly more

from rural work than households in the control villages. Many men shuttle between country and town, working where they can. Researchers are now trying to work out whether urban economies have been affected. Fully 140,000 villagers were helped to move in 2017. Such a large wave could have depressed pay for unskilled work in the cities.

Could the same approach work elsewhere? Mr Mobarak points out that Bangladesh is unusually homogeneous for such a populous country. As a result, villagers can move around easily. It has several competent charities, including one called RDRS, which handed out the money in Rangpur. The government does little to curtail urban migration. Other countries where Mr Mobarak is trying to launch similar programmes may prove tougher. A trial has begun in West Timor, in Indonesia. After that, all going well, comes China. ■

Free exchange | What could possibly go wrong?

Blame recurring financial crises on the political temptations of deregulation

FOR a phenomenon with such predictably bad outcomes, a financial boom is strangely seductive. Not a decade after the most serious financial crisis since the Depression, the world watches soaring markets with a mixture of serenity and glee. Natural impulses make finance a neck-snappingly volatile affair. Governments, though, deserve heaps of blame for policies that amplify both boom and bust. As regulators begin picking apart reforms only just enacted, it is worth asking why that is so.

Finance is hopelessly prone to wild cycles. When an economy is purring, profits go up, as do asset values. Rising asset prices flatter borrowers' creditworthiness. When credit is easier to obtain, spending goes up and the boom intensifies. Eventually perceptions of risk shift, and tales of a "new normal" gain credence: new technologies mean profits can grow for ever, or financial innovation makes credit risk a thing of the past. But when the mood turns, the feedback loop reverses direction. As asset prices fall, banks grow stingier with their loans. Firms feel the pinch from falling sales, get behind on their debts and sack workers, who get behind on theirs. The desperate sell what they can, so asset prices tumble, worsening the crash. Mania turns to panic.

The pattern is an ancient one. In their book "This Time is Different", Carmen Reinhart and Kenneth Rogoff, two economists, point out that eight centuries of financial pratfalls have not persuaded investors to treat financial booms with the requisite caution. You might expect Joe Daytrader to succumb to the lure of financial excess, but the chronically poor response of governments is more perplexing. Regulators could dampen frenzies by asking banks to raise their equity-to-assets ratios or to tighten lending standards. Regulation could be "countercyclical", in other words, leaning against the natural financial cycle in order to limit excess, prepare financial institutions for bad times, and leave more room for leniency when the economy is on the ropes. Governments have got better at leaning against turns in the business cycle, so that recessions are less common and less severe than they once were. It seems strange that finance should be different.

Indeed, regulation is often "procyclical": it adds fuel to the fire. In the decade up to the global financial crisis America rolled back Depression-era bank regulations, protected liberal trading rules for derivatives, presided over a wave of banking-industry consolidation and tolerated a dangerous drop in mortgage-lending standards. The ensuing crisis prompted a wave of new financial

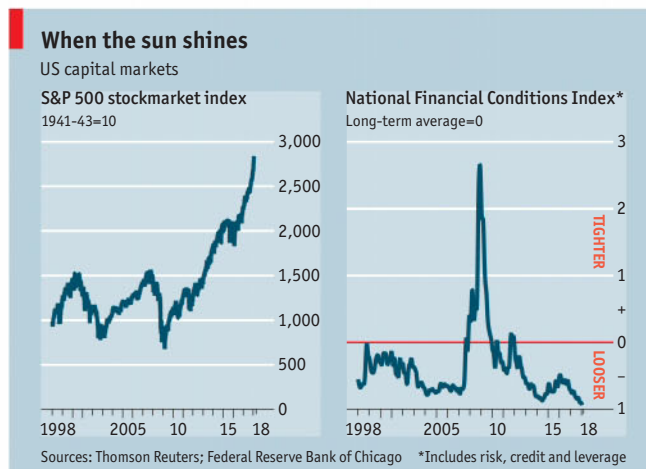
regulation, but these rules are now being weakened, even as exuberance returns. America's Congress is expected to tweak the Dodd-Frank Act in coming months to limit the application of some rules to the largest banks. Republicans seem to lack the votes to eliminate the new Consumer Financial Protection Bureau, but President Donald Trump's choice to run it, Mick Mulvane, has long expressed a desire to neuter it. The Federal Reserve is drafting plans to reduce bank-capital requirements. (Post-crisis revisions to the Basel bank-capital standards for global banks encouraged regulators to set a countercyclical capital buffer, which should rise with financial excess; the Fed's is currently set at zero.) Not every element of the deregulatory push is reckless, and America is tougher on some aspects of capital than others, but the timing is poor—coming amid historically easy financial conditions and soaring asset prices (see chart).

Technical defaults

One reason is that regulators are, like everyone else, too eager to conclude that this time is different. Many proposed post-crisis reforms offered technical solutions to the industry's problems, such as better measures of financial instability or reforms to CEO pay to improve bank behaviour (and reduce the need for robust regulation). Yet in finance, as in much of economic policy, problems that look technical are in fact political. As Charles Calomiris and Stephen Haber describe in their book "Fragile by Design", governments are not neutral observers of the financial system; they also depend on it, for their own financing needs, among other things. This co-dependency means that the evolution of banking regulation is shaped by bargaining between bankers and politicians, not all of which aims to maximise social welfare.

In a new IMF working paper, Jihad Dagher examines the political-economy elements of ten financial crises, beginning with the South Sea Bubble in Britain, and finds they had much in common. They were often preceded by periods in which light-touch regulatory thinking was in the ascendant. Such an approach becomes less tarnished as memories of past crises recede, and opening credit taps often brings short-run political rewards. As deregulation proceeds, politicians' electoral hopes—and, sometimes, their own financial interests—rely on the burgeoning booms. So they become more sympathetic to financial interests. When Britain's Parliament voted to protect the value of shares in the South Sea Company, for example, many of its members owned some. Crises are usually followed by a political backlash, which sweeps in new leadership with a mandate to regulate. Warren Buffett's famous financial axiom—that only when the tide recedes can you see who has been swimming naked—also applies to politics. At times of financial excess, voters cannot easily tell responsible leaders from reckless ones. Negligence becomes obvious only later. That makes recklessness an attractive political strategy.

Is there any hope of escaping such cycles? Central-bank independence helped depoliticise business-cycle management. Giving central banks more regulatory responsibility, as many countries did after the crisis, might therefore help (though it might also encourage politicians to meddle more with central banks). Curbing the power of the financial industry might prove more effective, but for now there is little political appetite for bold strategies such as breaking up large banks. If this time is different, it is only because the lessons of history have been discarded so quickly. ■



VT

VILLA TAMARINDO | BEACHLANDS

BEACHLANDSBARBADOS.COM



Villa Tamarindo is an exclusive, beachfront, West Coast residence close to Sandy Lane. The villa, designed by renowned architect Larry Warren, incorporates traditional West Indian architecture with world-class, contemporary interiors. This luxurious, open-plan home opens onto a covered terrace, overlooking the infinity pool with spectacular views out over the Caribbean Sea.

US \$28 million



jburdess@savills.com
+44 (0)20 3918 3778



edward.demalletmorgan@knightfrank.com
+44 (0)20 7861 1553

— ✂ —
THE LAND OF BEAUTY
YOU CAN CALL HOME.
—



Surrounded by the spectacular hills of Tuscany and located in between Florence and Pisa is the medieval resort of Castelfalfi. Here, you can enjoy the beauty of nature, play golf in one of our two courses and enjoy the best of Italy's gastronomy and culture. Our wide range of real estate options, which include apartments finished to the highest specification, fully restored farmhouses and newly built villas, will allow you to find your perfect home.

www.castelfalfi.com | realestate@castelfalfi.it



Toscana Resort Castelfalfi

HOTELS - VILLAS - GOLF



Also in this section

71 How cross-cultural is music?

72 Saving livers for transplants

73 Stopping sonic booms

Genomics

Sequencing the world

WASHINGTON, DC

An ambitious effort to map, store and disseminate genetic information about much of life on Earth gets under way

IN NOVEMBER 2015, 23 of biology's big-wigs met up at the Smithsonian Institution, in Washington, DC, to plot a grandiose scheme. It had been 12 years since the publication of the complete genetic sequence of *Homo sapiens*. Other organisms' genomes had been deciphered in the intervening period but the projects doing so had a piecemeal feel to them. Some were predictable one-offs, such as chickens, honey bees and rice. Some were more ambitious, such as attempts to sample vertebrate, insect and arachnid biodiversity by looking at representatives of several thousand genera within these groups, but were advancing only slowly. What was needed, the committee concluded, was a project with the scale and sweep of the original Human Genome Project. Its goal, they decided, should be to gather DNA sequences from specimens of all complex life on Earth. They decided to call it the Earth BioGenome Project (EBP).

At around the same time as this meeting, a Peruvian entrepreneur living in São Paulo, Brazil, was formulating an audacious plan of his own. Juan Carlos Castilla Rubio wanted to shift the economy of the Amazon basin away from industries such as mining, logging and ranching, and towards one based on exploiting the region's living organisms and the biological information they embody. At least twice in the

past—with the businesses of rubber-tree plantations, and of blood-pressure drugs called ACE inhibitors, which are derived from snake venom—Amazonian organisms have helped create industries worth billions of dollars. Today's explosion of biological knowledge, Mr Castilla felt, portended many more such opportunities.

For the shift he had in mind to happen, though, he reasoned that both those who live in the Amazon basin and those who govern it would have to share in the profits of this putative new economy. And one part of ensuring this happened would be to devise a way to stop a repetition of what occurred with rubber and ACE inhibitors—namely, their appropriation by foreign firms, without royalties or tax revenues accruing to the locals.

Such thinking is not unique to Mr Castilla. An international agreement called the Nagoya protocol already gives legal rights to the country of origin of exploited biological material. What is unique, or at least unusual, about Mr Castilla's approach, though, is that he also understands how regulations intended to enforce such rights can get in the way of the research needed to turn knowledge into profit. To that end he has been putting his mind to the question of how to create an open library of the Amazon's biological data (particularly DNA sequences) in a way that can also

track who does what with those data, and automatically distribute part of any commercial value that results from such activities to the country of origin. He calls his idea the Amazon Bank of Codes.

Now, under the auspices of the World Economic Forum's annual meeting at Davos, a Swiss ski resort, these two ideas have come together. On January 23rd it was announced that the EBP will help collect the data to be stored in the code bank. The forum, for its part, will drum up support for the venture among the world's panjandrums—and with luck some dosh as well.

Branching out

The EBP's stated goal is to sequence, within a decade, the genomes of all 1.5m known species of eukaryotes. These are organisms that have proper nuclei in their cells—namely plants, animals, fungi and a range of single-celled organisms called protists. (It will leave it to others to sequence bacteria and archaea, the groups of organisms without proper nuclei.) The plan is to use the first three years to decipher, in detail, the DNA of a member of each eukaryotic family. Families are the taxonomic group above the genus level (foxes, for example, belong to the genus *Vulpes* in the family Canidae) and the eukaryotes comprise roughly 9,300 of them. The subsequent three years would be devoted to creating rougher sequences of one species from each of the 150,000 or so eukaryotic genera. The remaining species would be sequenced, in less detail still, over the final four years of the project.

That is an ambitious timetable. The first part would require deciphering more than eight genomes a day; the second almost 140; the third, about 1,000. For comparison, the number of eukaryotic genomes se- ▶▶

quenced so far is about 2,500. It is not, though, the amount of sequencing involved that is the daunting part of the task. That is simply a question of buying enough sequencing machines and hiring enough technicians to run them. Rather, what is likely to slow things down is the gathering of the samples to be sequenced.

For the sequencing, Harris Lewin, a geneticist at the University of California, Davis, who was one of the EBP's founding spirits, estimates that extracting decent-quality genetic data from a previously unexamined species will require between \$40,000 and \$60,000 for labour, reagents and amortised machine costs. The high-grade family-level part of the project will thus clock in at about \$500m.

Big sequencing centres like BGI in China, the Rockefeller University's Genomic Resource Centre in America, and the Sanger Institute in Britain, as well as a host of smaller operations, are all eager for their share of this pot. For the later, cruder, stages of the project Complete Genomics, a Californian startup bought by BGI, thinks it can bring the cost of a rough-and-ready sequence down to \$100. A hand-held sequencer made by Oxford Nanopore, a British company, may be able to match that and also make the technology portable.

The truly daunting part of the project is the task of assembling the necessary specimens. Some of them, perhaps 500,000 species, may come from botanical gardens, zoos or places like the Smithsonian (the herbarium of which boasts 5m items, representing around 300,000 species). The rest must be collected from the field. Dr Lewin hopes the project will spur innovation in collection and processing. This could involve technology both high (autonomous drones) and low (enlisting legions of sample-hunting citizen scientists). It does, though, sound like a multi-decade effort.

It is also an effort in danger of running into the Nagoya protocol. Permission will have to be sought from every government whose territory is sampled. That will be a bureaucratic nightmare. Indeed, John Kress of the Smithsonian, another of the EBP's founders, says many previous sequencing ventures have foundered on the rock of such permission. And that is why those running the EBP are so keen to recruit Mr Castilla and his code bank.

Banking on it

The idea of the code bank is to build a database of biological information using a blockchain. Though blockchains are best known as the technology that underpins bitcoin and other crypto-currencies, they have other uses. In particular, they can be employed to create "smart contracts" that monitor and execute themselves. To obtain access to Mr Castilla's code bank would mean entering into such a contract, which would track how the knowledge

thus tapped was subsequently used. If such use was commercial, a payment would be transferred automatically to the designated owners of the downloaded data. Mr Castilla hopes for a proof-of-principle demonstration of his platform to be ready within a few months.

In theory, smart contracts of this sort would give governments wary of bio-piracy peace of mind, while also encouraging people to experiment with the data. And genomic data are, in Mr Castilla's vision, just the start. He sees the Amazon Bank of Codes eventually encompassing all manner of biological compounds—snake venoms of the sort used to create ACE inhibitors, for example—or even behavioural characteristics like the congestion-free movement of army-ant colonies, which has inspired algorithms for co-ordinating fleets of self-driving cars. His eventual goal is to venture beyond the Amazon itself, and combine his planned repository with similar ones in other parts of the world, creating an Earth Bank of Codes.

Plenty needs to go right for this endeavour to succeed, concedes Dominic Waughray, who oversees public-private partnerships at the World Economic Forum. Those working on different species must agree common genome-quality standards. People need to be enticed to study hitherto neglected organisms. Countries which share biological resources (the Amazon basin, for example, is split between nine states) should ideally co-operate on common repositories. And governments must resist lobbying from vested interests in the extractive industries, keen to preserve access to land, minerals or timber, which Mr Castilla's scheme aims ultimately to curtail.

As to the money, that is the reason for the announcement at Davos. By splashing the tie-up between the EBP and the code bank in front of many of the world's richest people, those behind the two enterprises are not so discreetly waving their collecting tins. The EBP has already been promised \$100m of the \$500m required for its first phase. The code bank, meanwhile, has piqued the interest of the Brazilian and Peruvian governments.

For the participants, the rewards of success would differ. Dr Lewin, Dr Kress and their compadres would, if the EBP succeeds, be able to use the evolutionary connections between genomes to devise a definitive version of the tree of eukaryotic life. That would offer biologists what the periodic table offers chemists, namely a clear framework within which to operate. Mr Castilla, for his part, would have rewritten the rules of international trade by bringing the raw material of biotechnology into an orderly pattern of ownership. If, as many suspect, biology proves to be to future industries what physics and chemistry have been to industries past, that would be a feat of lasting value. ■

Ethnomusicology

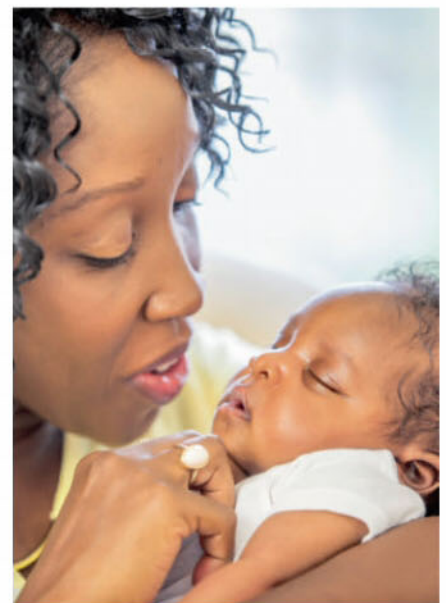
Beyond Babel

Music may be the food of love, but oddly, is not the language of it

“WHERE words fail, music speaks.” Though these words, from the pen of Hans Christian Andersen, are an appealing notion, the idea that there might be universals in music which transcend cultural boundaries has generally been met with scepticism by scholars working in the field. That scepticism may, however, be unwarranted, for research published in *Current Biology* this week by Samuel Mehr and Manvir Singh of Harvard University provides evidence that music does indeed permit the communication of simple ideas between people even when they have no language in common.

To ascertain this, the two researchers recruited 750 online volunteers from 60 countries. They played these volunteers 36 musical excerpts, each 14 seconds long, and each drawn at random from one of 118 songs in a collection of the music of small-scale societies around the world. Given the broad range of cultures and languages represented in the collection, and the ethnic diversity of the volunteers, Dr Mehr and Mr Singh could be reasonably certain that those listening were both unfamiliar with the music and unable to understand the lyrics in question.

After each excerpt had been played, volunteers were asked what they thought the song's function was, and how sure they were of that on a scale of one to six. The possibilities offered were: “for danc- ▶▶



A lullaby in any language

ing”; “for soothing a baby”; “for healing illness”; “for expressing love for another”; “for mourning the dead”; and “for telling a story”. The first four of these were real functions, as stated by the people from whom the song in question had been collected. The last two were made up, and were included as foils.

Dr Mehr and Mr Singh found that volunteers’ perceptions of a song’s function were generally in good agreement with its actual function—with one exception. Dance songs were particularly easy to identify. They rated 2.18 points higher on the certainty scale as being used “for dancing” than lullabies did; 1.38 points higher than love songs; and 1.09 points higher than healing songs. Similarly, lullabies were rated 1.53 points higher than dance songs as being “to soothe a baby”, 1.42

points higher than healing songs and 1.19 points higher than love songs.

Healing songs proved a bit more troublesome. They scored only 0.47 and 0.31 points higher than dance and love songs respectively for “to heal illness”, and were statistically indistinguishable from lullabies. The outlier, though, was love songs. Listeners could distinguish them from healing songs, but not from lullabies or dance songs.

Why love songs were hard to identify is unclear. Because such songs involve showing off to the object of one’s affections, they may require more creativity, and thus generate more variety than lullabies or dance songs. Perhaps the fact that both dancing and cooing are involved in romance confused listeners. This genre aside, however, Andersen was clearly onto something. ■

produce bile; with insulin to regulate the organ’s metabolism; and with nutrition in the form of glucose and amino acids.

Once a liver is hooked up inside a metra, its health can be tracked by monitoring things like blood flow, bile production and acidity levels. All these data permit a transplant team to see how the organ is faring. Moreover, a metra not only keeps a liver healthy but can, in some circumstances, actually improve its health. Putting a liver that has been cooled for storage into a metra can reverse damage it has sustained when cold by providing an environment in which its natural propensity to rejuvenate can come to the fore. More remarkably, metras may even be able to recondition livers that are sickly because they contain too much fat, and are thus untransplantable. Once a liver has been removed from the body that was making it fat, it will recover surprisingly quickly. A mere two days in a metra “liver spa” is enough to have a palpable positive effect on the health of such an organ.

At the moment, this last benefit is of only theoretical value, because regulations mean livers for transplant can be stored in a metra for a maximum of 24 hours. That, though, is twice the maximum a liver ought to be kept chilled for transplant, and almost three times the nine-hour limit generally preferred—hence Dr Coussios’s insouciance at the hospital back in 2013. Research on metras suggests that the 24-hour limit could safely be raised to three days, and possibly longer than that.

Twenty-four hours is, though, still long enough to conduct tests on the quality of livers that might otherwise be rejected. The existing assessment of a liver for transplant is necessarily subjective, because there is no sure way to tell if a cooled organ will work normally when it is warmed up and reconnected. Many surgeons therefore err on the side of caution, knowing that if they put a defective liver into a patient, it will probably kill him.

All this means that using metras should increase the availability of livers for transplant. Dr Coussios reckons that reducing the rate of rejection by surgeons could, by itself, double the number which can be used in Britain. Metras could also make it easier to perform the tricky operation of splitting livers in two, which is sometimes done to create a child-sized organ while still leaving enough over to transplant into an adult. The use of a metra is likely to permit these divisions to be carried out more slowly and carefully.

The metra is being commercialised by OrganOx, a firm based in Oxford. Dr Coussios estimates that the world’s hospitals have need for about 300 of the machines, but the firm says it will have reliable repeat business from furnishing the metras it has sold with the disposable plastic connectors that hook machine and organ up to ▶▶

Medicine

External organs

Livers for transplant can now be kept alive at body temperature

WHEN Constantin Coussios, a biomedical engineer at Oxford University, arrived one day in 2013 at the transplant centre of King’s College Hospital, in London, with a liver for their use, he triggered a brief flurry of panic. Two other livers had arrived at the same time. The hospital had only one operating theatre in which liver transplants could be carried out—and because livers intended for transplant can be kept in cold storage for no longer than 12 hours, the situation looked serious.

What saved the day, and possibly a patient’s life, was that Dr Coussios was bringing not a cold liver, stored on ice, but a warm one. Instead of having had its metabolism slowed, it was fully functional. This was because it was connected to a supply of blood and nutrients inside a special box known as a metra (a Greek word meaning “womb”), invented by Dr Coussios and his colleague Peter Friend. The metra even had a graphical interface to show, moment by moment, how well its cargo was faring. Dr Coussios told the surgeon to transplant the cold-stored livers first. The one he had brought would keep.

That was in the early days of metras. Now, the devices are starting to spread. So far 25 have been deployed around the world and others are about to be. There are also plans, by Dr Coussios and others, to extend the idea behind the metra to the preservation of other vital organs. If that works, it would change the transplant business by improving both the supply and the health of such organs.



Now for a bit of metra-analysis

A metra is designed to keep the organ it is nurturing supplied with the correct amount of blood—an amount which varies from one instant to the next. It detects the organ’s demand for blood by monitoring pressure in the arteries and veins going into and out of the liver. It then adjusts the power of its pump in response.

The blood in question has been tinkered with to make it more effective. It has had its white cells and platelets removed to avoid inflammation, clotting and the transfer of disease. For the further prevention of clotting, it has had anticoagulants added. And it has been boosted with special chemicals that the liver needs in order to

► together—for a replacement set of these is required with each new liver stored.

In the future, OrganOx hopes to expand its activities by building a metra for kidneys, and perhaps also one for pancreases. Meanwhile, the firm has competition in the form of TransMedics, of Andover, Massachusetts. This company is developing similar devices for livers, hearts and lungs.

Besides increasing the supply of organs,

and improving patient outcomes, metras and their competitors can also help ease the psychological burden on surgeons. One such, of some 30 years' experience, still admits to having sleepless nights after performing a liver transplant. Even if he has done the surgery perfectly, he cannot be sure that the liver he has transplanted will actually work. Metra-storage makes it quite likely that it will. ■

Supersonic flight

Boom boxed

A new idea for quietening sonic booms

WHEN a British Airways Concorde travelling from New York touched down at Heathrow airport, in London, on October 24th 2003, supersonic passenger travel came to an end. Concorde was a technological marvel, but never a commercial success. Only 14 of them entered service. Yet the idea of building a successor has never quite gone away. Aircraft-makers review the idea from time to time. A number of groups are working on small executive jets intended to travel faster than the speed of sound. The trouble is, something else has also refused to go away: the shock wave known as a sonic boom that emanates from a supersonic aircraft.

That boom was one of Concorde's failings. It rattled windows and frightened animals, which meant the plane's flights over land were restricted to subsonic speeds. Throttling back an aircraft that is designed to fly fast is inefficient and causes it to guzzle a lot of fuel. If supersonic air travel is ever to return, Concorde's successors will thus have to quieten their act.

Several groups are trying to do this by tweaking designs to take account of advances in aerodynamics. By 2021 NASA, America's aerospace agency, hopes to fly a small experimental supersonic plane fitted with some of these modifications, such as a long, slender nose and engines blended into the fuselage. The agency expects this to reduce the sound of the shock wave to what it describes as a "low boom". But John Schlaerth, an aerospace engineer based in California, thinks he can take such modifications much further. He and his colleagues have filed for a patent on a set of designs which they believe might eliminate the boom's sound altogether at ground level.

A sonic boom is the product of a series of shock waves arising from various parts of an aircraft—particularly its nose, wings and engines—as it flies faster than the speed of sound (1,240kph, 770mph or

Mach 1, at sea level). Those waves are caused because air molecules cannot get out of the way fast enough during supersonic flight, and thus build up in front of these parts of the plane. The consequent change in pressure then propagates through the air and, when it reaches the ground, is heard as a distinctive boom.

Mr Schlaerth's idea is to reflect and muffle the worst-offending waves. He would do this not by blending the engines into the fuselage, but rather by placing them well forward of the leading edge of the wing. That could be done either by mounting them on pylons extending from below the wing, or by attaching them to the fuselage. Both configurations would cause the engines' exhaust plumes to reflect any shock wave forming in front of a wing upwards—ie, away from the ground.

Further shock waves, caused by the exhaust's counter-reflection downwards by the wing's wave, could be dealt with by modifying the engine casings to create a slower-moving stream of air below the plume. This slower air should form a

boundary layer which, Mr Schlaerth says, would act as a "pneumatic cushion" that softened and impeded downward-propagating shock waves. The aircraft's long nose, meanwhile, would be shaped to direct its shock waves upwards and sideways. Waves from the engine inlets would be directed upwards too, and put to good use. Adding an appropriate downward curve to a wing would trap the wave and create an area of high pressure that would give the wing additional lift.

To find out whether all this would work, Mr Schlaerth recruited two experts in computational fluid dynamics to act as independent consultants. Tim Colonius of the California Institute of Technology and Luigi Martinelli of Princeton University each carried out a series of tests. Using sophisticated computer modelling, one test found that the shock wave from the wing could be reduced by 63% at Mach 1.5, and that a similar reduction would be expected at Mach 2 (Concorde's cruising speed). Another test showed that shock propagation below the engine was virtually non-existent. Further analysis, Mr Schlaerth says, indicates that the overall shock wave might be almost inaudible at ground level.

The next step is to replicate the computer tests using models in a wind tunnel, a task which the group hopes to take on later this year. Mr Schlaerth and his business partner, Mark Bryan, have founded a firm called New Century Transportation and Aeronautics Research to exploit the idea. If all goes well, it could lead to an experimental aircraft to demonstrate the technology.

Reducing sonic booms to an acceptable level would allow overland flights, which should make the return of supersonic passenger travel more plausible. Much would depend on the cost of building and operating such aircraft. But the prospect of being able to fly from New York to Los Angeles in less than two hours, instead of a tedious six or so, would be welcomed by many a weary traveller. ■



Tomorrow, yesterday



Also in this section

75 How democracies die

76 Swearing is good for you

77 A memoir of the second world war

77 John Ashbery, American poet

For daily analysis and debate on books, arts and culture, visit

Economist.com/culture

Political thought

The problem with liberalism

How to revive the most successful idea of the past 400 years

OVER the past four centuries liberalism has been so successful that it has driven all its opponents off the battlefield. Now it is disintegrating, destroyed by a mix of hubris and internal contradictions, according to Patrick Deneen, a professor of politics at the University of Notre Dame.

The gathering wreckage of liberalism's twilight years can be seen all around, especially in America, Mr Deneen's main focus. The founding tenets of the faith have been shattered. Equality of opportunity has produced a new meritocratic aristocracy that has all the aloofness of the old aristocracy with none of its sense of *noblesse oblige*. Democracy has degenerated into a theatre of the absurd. And technological advances are reducing ever more areas of work into meaningless drudgery. "The gap between liberalism's claims about itself and the lived reality of the citizenry" is now so wide that "the lie can no longer be accepted," Mr Deneen writes. What better proof of this than the vision of 1,000 private planes whisking their occupants to Davos to discuss the question of "creating a shared future in a fragmented world"?

Mr Deneen uses the term "liberalism" in its philosophical rather than its popular sense. He is describing the great tradition of political theory that is commonly traced to Thomas Hobbes and John Locke rather than the set of vaguely leftist attitudes that Americans now associate with the word. But this is no work of philosophical cud-

Why Liberalism Failed. By Patrick Deneen. Yale University Press; 248 pages; \$30 and £30

chewing. Most political theorists argue that liberalism has divided into two independent streams: classical liberalism, which celebrates the free market, and left-liberalism which celebrates civil rights. For Mr Deneen they have an underlying unity. Most political observers think that the debate about the state of liberalism has nothing to do with them. Mr Deneen argues that liberalism is a ruling philosophy, dictating everything from court decisions to corporate behaviour. Theory is practice.

The underlying unity lies in individual self-expression. Both classical and left liberals conceive of humans as rights-bearing individuals who should be given as much space as possible to fulfil their dreams. The aim of government is to secure rights. The legitimacy of the system is based on a shared belief in a "social contract" between consenting adults. But this produces a paradox. Because the liberal spirit mechanically destroys inherited customs and local traditions, sometimes in the name of market efficiency and sometimes in the name of individual rights, it creates more room for the expansion of the state, as marketmaker and law-enforcer. The perfect expression of modern liberalism is provided by the frontispiece of Hobbes's "Levia-

than" (detail pictured), with its sketch of thousands of atomised individuals confronted by an all-powerful sovereign.

Mr Deneen makes his case well, though he sometimes mistakes repetition for persuasion. He reminds the reader that, before the advent of modern liberalism, philosophers identified liberty with self-mastery rather than self-expression, with the conquest of hedonistic desires rather than their indulgence. He does an impressive job of capturing the current mood of disillusionment, echoing left-wing complaints about rampant commercialism, right-wing complaints about narcissistic and bullying students, and general worries about atomisation and selfishness. But when he concludes that all this adds up to a failure of liberalism, is his argument convincing?

His book has two fatal flaws. The first lies in his definition of liberalism. J.H. Hexter, an American academic, believed his fellow historians could be divided into two camps: "splitters" (who were forever making distinctions) and "lumpers" (who make sweeping generalisations by lumping things together). Mr Deneen is an extreme lumper. He argues that the essence of liberalism lies in freeing individuals from constraints.

In fact, liberalism contains a wide range of intellectual traditions which provide different answers to the question of how to trade off the relative claims of rights and responsibilities, individual expression and social ties. Even classical liberals who were most insistent on removing constraints on individual freedom agonised about atomisation. The mid-Victorians were great institution-builders, creating everything from voluntary organisations to joint-stock companies ("little republics" in the phrase of Robert Lowe, a 19th-century British statesman) that were designed to fill the space between the state and society. Later ►►

liberals experimented with a range of ideas from devolving power from the centre to creating national education systems.

Mr Deneen's fixation on the essence of liberalism leads to the second big problem of his book: his failure to recognise liberalism's ability to reform itself and address its internal problems. The late 19th century saw America suffering from many of the problems that are reappearing today, including the creation of a business aristocracy, the rise of vast companies, the corruption of politics and the sense that society was dividing into winners and losers. But a wide variety of reformers, working within the liberal tradition, tackled these problems head on. Theodore Roosevelt took on the trusts. Progressives cleaned up government corruption. University reformers modernised academic syllabuses and built ladders of opportunity. Rather than dying, liberalism reformed itself.

Mr Deneen is right to point out that the record of liberalism in recent years has been dismal. He is also right to assert that the world has much to learn from the pre-modern notions of liberty as self-mastery and self-denial. The biggest enemy of liberalism is not so much atomisation but old-fashioned greed, as members of the Davos elite pile their plates ever higher with perks and share options. But he is wrong to argue that the only way for people to liberate themselves from the contradictions of liberalism is "liberation from liberalism itself". The best way to read "Why Liberalism Failed" is not as a funeral oration but as a call to action: up your game, or else. ■

Democracy

The Trump train

Trumpocracy: The Corruption of the

American Republic. By David Frum. *Harper*; 320 pages; \$25.99. To be published in Britain in February; £20

How Democracies Die: What History Tells

Us About Our Future. By Steven Levitsky and Daniel Ziblatt. *Crown*; 265 pages; \$26. *Viking*; £16.99

FRENCH railway crossings bear warning signs that writers of books about Donald Trump should heed. "One Train Can Hide Another" their neat enamel plaques declare. The risks of Trump-distraction are great, because the 45th president is such a spectacle—a tooting, puffing, brass-and-steam-whistle commotion liable to draw all gazes, all the time. But a narrow focus on the man risks a potentially grave mistake: paying too little attention to large, slow-rolling yet remorseless political forces that



But does he love what it stands for?

were in motion long before Mr Trump chugged into view.

Two new books about the president flirt with just such an accident. For they share the same distracting aim: to prove that Mr Trump has already shown himself to be a proto-despot.

The first, "Trumpocracy" by David Frum, devotes long pages to cataloguing alarming, deceitful and plain unseemly acts and statements by Mr Trump, his cronies and enablers. Mr Frum, a centrist conservative who worked as a White House speechwriter for President George W. Bush, has a crisp way with words. "A rule-of-law state can withstand a certain amount of official corruption. What it cannot withstand is a culture of impunity," he observes at one point, as he reminds readers that Mr Trump is the first president since Gerald Ford not to release his tax returns in full, and the first ever to merge political and business interests so unblushingly. The clear prose style is just as well, for "Trumpocracy", which draws heavily on quotes from published news reports, can resemble a first draft of articles of impeachment.

Grander, more didactic ambitions underpin a second book, "How Democracies Die", by two Harvard professors, Steven Levitsky and Daniel Ziblatt. The pair are experts on populism, demagoguery and autocracy, notably in Europe and Latin America in the 19th and 20th centuries. Their aim is to warn Americans, in particular, that their republic—for all its vaunted checks and balances—is not immune to the pathologies which, over the years, have infected and diseased other democracies.

Like Mr Frum, the professors correctly stress the importance of unwritten norms that buttress the formal protections that are set out in America's constitution and legal codes. Independent courts and agen-

cies like the FBI have done much to defend the rule of law, they note. But a surprisingly thin "tissue of convention", according to Aziz Huq and Tom Ginsburg, two constitutional scholars Mr Frum quotes, together with the courage of political leaders and members of Congress, are all that stand in the way of a bad president who is determined to pack courts with loyal judges, or to appoint crooks to run nominally independent agencies.

Mr Levitsky and Mr Ziblatt go beyond anxious scanning for danger. They declare that, on the evidence, Mr Trump has probably crossed the line from rough-around-the-edges populist to would-be strongman. Mr Frum considers what is already known about Russian meddling in the election of 2016, and bluntly concludes: "A president beholden to Russia had been installed in the Oval Office."

The professors take a more scholarly approach. They offer a neat table, setting out "Four Key Indicators of Authoritarian Behaviour" to help readers decide whether Mr Trump is an autocrat. The table is enough to make Trump-sceptics leap from their armchairs in happy vindication. Under the first heading, "Rejection of (or weak commitment to) democratic rules of the game", readers find not just blatant dictator-conduct (backing military coups, cancelling elections) but a more subtle last test, "Do they attempt to undermine the legitimacy of elections, for example, by refusing to accept credible electoral results?" Mr Trump has repeatedly and falsely suggested that he would have beaten Hillary Clinton in a landslide, had millions not illegally voted. Then there are Mr Trump's attacks on the press, and his snarling promises to tighten libel laws against what he calls "fake news". Such statements trigger the professors' fourth indicator: "Readiness to ►►

▶ curtail civil liberties of opponents, including media”.

Alas, these catalogues and checklists are more emotionally satisfying for Trump opponents (see, he is a tyrant, they can exclaim) than genuinely illuminating. Mr Trump says horrible, shameful things all too frequently. But he has not actually locked up opponents or sent thugs to smash printing presses. That makes for a puzzle. Is the president an autocrat, or does he just play one on tv? The puzzle is not solved by crafting pseudoscientific tests for autocracy that give equal weight to harsh words and malign acts.

Both books are at their strongest when examining how Mr Trump flouts norms with impunity. Both ascribe the president's success to the similar insight that modern politics resembles a form of tribal warfare. What a leader does matters less than whom he is for, and above all, whom he is against.

For much of the 20th century, the professors write, politics worked because most practitioners subscribed to two vital norms. First, mutual tolerance, or the understanding that competing parties accept one another as legitimate. Second, forbearance, or the idea that election-winners exercise some restraint when wielding power, rather than treating politics like war.

Not Mr Trump. Mr Frum describes the president in near-animal terms, as sniffing out his opponents' weaknesses—“low energy”, “little”, “crooked”—in the same way that he instinctively sensed the weak point in modern politics: “that Americans resent each other's differences more than they cherish their shared democracy”.

Neither book flinches from tracing the role that race, class, education and culture play in what are ostensibly political arguments. Mr Levitsky and Mr Ziblatt offer the troubling thought that the norms of civility and compromise seen in Washington between the end of Reconstruction and the 1980s rested, uncomfortably, on racial exclusion. Southern whites did such an effective job of disenfranchising freed slaves soon after the civil war that black turnout in South Carolina plunged from 96% in 1876 to 11% in 1898, as voting curbs bit. As a result, many southern states endured what amounted to decades of authoritarian single-party rule. As the professors bluntly put it: “It was only after 1965 that the United States fully democratised.” The parties have been sorting themselves along racial and class lines ever since.

Neither book blames all American ills on racism—they are more nuanced than that. But the authors of both do argue, in effect, that America has never tried to maintain democratic norms in a demos as diverse as today's. Unless that can be fixed, it is a grave threat to the republic. Keep it in sight, even as the Trump Express flashes dangerously past. ■

Profane language

Foul play

Swearing Is Good for You. By Emma Byrne. *W.W. Norton; 240 pages; \$25.95. Profile Books; £12.99*

IN THESE potty-mouthed times, when certain world leaders sling profanity about with abandon, many observers naturally lament the debasement of speech. But instead of clutching pearls, why not find a silver lining? Learning more about when, how and why people swear offers insight into everything from the human brain to a society's taboos. Trash talking even affords some real physical and social benefits, as Emma Byrne argues in “Swearing Is Good for You”.

For all their shock value, swear words are practical and elastic, capable of threatening aggression or coaxing a laugh. Among peers, profane banter is often a sign of trust—a way of showing solidarity with a larger group. Critics may say such language reveals boorish thinking or a limited vocabulary, but swearing is often impressively strategic, and a fluency in crass language typically correlates with verbal fluency in general.

Because the language learnt in infancy

has the greatest emotional resonance, swearing in your mother tongue always feels most powerful, even among the most fluent multilinguals. As swearing functions as a complex signal, subtle enough either to amuse or to offend, these words vary according to what a culture deems unmentionable. Russian, for example, “has an almost infinite number” of ways to swear, most of them involving the honour of your mother. As for Japanese, because the culture is largely free of an excretory taboo (hence the poo emoji), there is no equivalent of “shit”. Yet the word *kichigai* (loosely translated as “retard”) is usually bleeped on television. Translators often struggle to render curse words and insults in other languages, as their emotional heft tends to be culturally circumscribed. For example, Westerners were more amused than alarmed by reports of an Iraqi minister declaring “A curse be upon your moustache!” to a Kuwaiti diplomat in 2003.

Women who curse face a double standard. Although swearing in a male-dominated profession can be a short cut to acceptance, women are also more likely to be shunned or seen as untrustworthy—even by women—when they sound like stevedores. This is not only because women are expected to be more polite than men, Ms Byrne suggests, but also because swearing tends to be associated with sexuality. Since women are judged more harshly than men for their sexual adventures, bad language leads to assumptions of bad behaviour.

Stoicism in the face of pain may seem noble, but swearing a blue streak is apparently more helpful. A study of volunteers forced to plunge their hands in ice-cold water found that those who swore kept their hands submerged for longer than those who were stuck bellowing a neutral word. By making people feel more aggressive—and therefore, perhaps, more powerful—swearing seems to improve the tolerance of pain.

A self-described swearing evangelist, Ms Byrne is certainly bullish on the merits of bad words. But in her eagerness to prove how “fucking useful” they are, she sometimes overplays her hand. She argues that swearing makes people less likely to be physically violent, but offers little evidence to back this up. She commends the way piss-taking can help people work together more effectively, but largely overlooks the way this approach can alienate minorities. She also occasionally trades empiricism for hyperbole, as when she declares: “I don't think we would have made it as the world's most populous primate if we hadn't learned to swear.”

Still, “Swearing Is Good for You” is an entertaining and often enlightening book. It may not quite stand up the bold claim of its title, but Ms Byrne's readers are sure to come away with a fresh appreciation of language at its most foul. ■





Memoirs of the second world war

Indomitable spirit

No Place to Lay One's Head. By Françoise Frenkel. Translated by Stephanie Smeed. Pushkin Press; 299 pages; £16.99

IN 1921 Françoise Frenkel, a young Polish woman of Jewish faith, opened the first French-language bookshop in Berlin. She described it as a “calling”. A friend termed it a “crusade”. The venture drew authors, artists, diplomats and celebrities. For many at the beginning, the bookshop was a vibrant hub for the exchange of ideas. For others during the darker years of eroded liberties and stifled thought, it became a haven, a place to rest the mind and breathe easy. In July 1939 Frenkel finally realised that, whereas blacklisted authors and confiscated newspapers once jeopardised her livelihood, escalating persecution and violence now threatened her life.

Frenkel shut up shop, fled the country and spent four years in occupied France. Miraculously she lived to tell her tale. “No Place to Lay One's Head” was written and published when Frenkel was in exile in Switzerland. It then disappeared for decades, resurfacing only in 2010 in a flea market, after which it was republished in French. Frenkel died in Nice in 1975. This is the first time her memoir has been translated into English.

The book's opening chapter touches on Frenkel's book-filled childhood and her studies in Paris, before covering the highs and lows of the bookshop years. The remainder—indeed the majority—of the narrative is devoted to her struggle for survival in the south of France. Relying first on her

American poetry

Wordsmithing

John Ashbery: Collected Poems 1991–2000. *The Library of America*; 838 pages; \$45

THE first living poet to have his work published by the Library of America was John Ashbery, and this is the second volume of his collected poems. He died last September, about a month after he turned 90. So this book serves as a dual celebration, memorialising his sprawling life and his many accomplishments.

The inaugural volume appeared in 2008, and it contains his first 12 books of poetry. This second volume compiles the seven collections—including Ashbery's two book-length poems from the 1990s, “Flow Chart” and “Girls on the Run”. Like the first book, it brings together a wealth of uncollected poems that answer the inevitable question of what a B-side Ashbery poem might look like. Even in the minor poems in his collections, the stamp of his voice is always present.

In the 1990s the constellation of work, as well as the variety of form and invention of Ashbery's art, shifted and grew exponentially to release more and more energy in his writing. “Flow Chart” introduced that new epoch, and lines from it begin this new volume:

Still in the published city but not yet
overtaken by a new form of despair, I ask
the diagram: is it the foretaste of pain
it might easily be? Or an emptiness
so sudden it leaves the girders
whanging in the absence of wind,
the sky milk-blue and astringent? We know
life is so busy,
but a larger activity shrouds it, and this is
something
we can never feel, except occasionally, in
small signs
put up to warn us and as soon expunged, in
part
or wholly.

Ashbery's poems carry Western thought to such an extreme that it almost begins to appear Eastern in its preoccupation

wits and later on the comfort of strangers, Frenkel moved from one refuge to another. She relates the challenge of obtaining a residence permit and the injustice of arrest. She evokes the agony of being cut off from family and friends and the horror of Nazi clampdowns and roundups. Tension mounts when she is hunted and faces deportation, leaving her no alternative but to plan a desperate escape across the border.

A preface by Patrick Modiano, a Nobel prize-winning author, and a 30-page dos-

with impermanence. His ideas are at once both inscrutable and sublime. He once said his poems aim to capture “the experience of experience”. Searching high and low through the English language, he appears to have lifted stone after stone until there was nothing left hidden. As Ashbery was originally from Rochester, New York, home to Kodak and Xerox, he was certainly no stranger to representations of representations. “Girls on the Run”, in particular, was inspired by Henry Darger, an artist who used photocopies and collage to make compositions just as Ashbery, also an accomplished collagist, did with language, as this brief passage so memorably shows:

The oblique flute sounded its note of resin.
In time, he said, we all go under the fluted
covers
of this great world, with its spiral dis-
sonances,
and then we can see, on the other side,
what the rascals are up to.



History will be a kind judge

sier add further context. However, Frenkel's story can be read without these props. It stands as both an illuminating depiction of wartime France and a gripping and affecting personal account of endurance and defiance. Frenkel writes candidly throughout about her fears and ordeals (at one point even considering taking “the ultimate way out”), but she soldiers on, refusing to be beaten. Whether she is evacuee or refugee, fugitive or captive, the reader roots for her every step of the way. ■

LIVE THE REAL THING.

Join a real MBA Class online on 12 February.

You will have the opportunity to get a feeling for the real MBA atmosphere, teaching approaches and learning processes, while living the students' in-class experience. Watch the live stream and find out the real thing.

12 February 2018, 10:15 - 11:45 am (CET) - MBA Class on Operations Strategy

Book your place: WWW.SDABOCCONI.IT/MEETMBA

1-YEAR FULL-TIME **MBA**
FOR PEOPLE WHO JUST WON'T STOP



SDA Bocconi



Bocconi
School of Management

MILANO | ITALY

Cambridge Judge Business School

REALISING SUPERIOR LEADERSHIP

The **Cambridge Advanced Leadership Programme** is designed to look beyond the functional disciplines within organisations, challenge conventional wisdom and find new, innovative ways to create sustainable advantage. Join an international group of like-minded peers for three weeks as we help you prepare for future challenges and create space to think about what really matters in a new light.

UNIVERSITY OF
CAMBRIDGE
Judge Business School

Executive Education

Find out more >>

www.jbs.cam.ac.uk/alp

The
Economist
EXECUTIVE
EDUCATION
NAVIGATOR

Find your next
programme:
econEx.ec/courses

Executive education at your fingertips

Find your next programme via The Economist Executive Education Navigator, a free directory of courses hosted by business schools from around the world



The Economist January 27th 2018



HARVARD Kennedy School
MOSSAVAR-RAHMANI CENTER
 for Business and Government

The Mossavar-Rahmani Center for Business and Government at Harvard Kennedy School invites distinguished professionals with at least 20 years of experience in government and/or business to apply for a one-year, unpaid appointment as Senior Fellow to conduct research on topics at the intersection of the public and private sectors, including regulation, corporate governance, and the role of government in the changing global economy. The Center is led by Lawrence Summers, University Professor, and has numerous Harvard faculty as members.

*Deadline for applications is **March 1, 2018.***

*For more information
 please visit*

www.hks.harvard.edu/centers/mrcbg/about/program-description



GHANA GRID COMPANY LIMITED
TENDER FOR THE SUPPLY OF OPGW AND
COMMUNICATION MAINTENANCE
MATERIALS AND EQUIPMENT
INTERNATIONAL COMPETITIVE TENDERING

The Ghana Grid Company Limited (GRIDCo) of the Republic of Ghana invites sealed tenders for the supply of OPGW and Communication Maintenance Materials and Equipment.

Details of the tender are as follows:

PACKAGE/ TENDER NUMBER	CONTRACT NAME	TENDER SALE PERIOD	TENDER PRICE	TENDER CLOSING DATE
BID No. GR/GGCL/ GD/0021/2017	Supply Of OPGW and Communication Maintenance Materials And Equipment	January 22, 2018 to March 7, 2018	USD 200.00	March 7, 2018

- Detailed specifications of the items are provided in the tender documents.
- Tendering is open to eligible private, public or government-owned legal entities.
- Tendering documents in English may be purchased from the FINANCE DEPARTMENT (PROCUREMENT SECTION), GHANA GRID COMPANY LIMITED, LOCATED TWO (2) KILOMETERS OFF TEMA MOTORWAY ROUNDABOUT TO AFLAO ROAD. (CLOSE TO TEMA STEEL WORKS) upon the payment of a non-refundable fee of USD 200.00 or its equivalent in Ghana Cedis. The method of payment will be by cash.
- Tenders would be on sale between **0900 hrs to 1500 hrs (local time)** each working day specified for the bid above.
- Tenderers shall submit with each Tender, a **Tender Security** in United States Dollars as stated in the tendering document or its equivalent in Ghana Cedis.
- Completed tenders must be addressed to:

**THE DIRECTOR FINANCE,
 GHANA GRID COMPANY LIMITED,
 P. O. BOX CS 7979,
 TEMA**

and delivered to the PROCUREMENT CONFERENCE ROOM, GRIDCo HEAD OFFICE, GHANA GRID COMPANY LIMITED, LOCATED 2 KILOMETERS OFF TEMA MOTORWAY ROUNDABOUT TO AFLAO ROAD, (CLOSE TO THE TEMA STEEL WORKS) by 10:00 Hrs GMT on the closing date stated above and in the tendering document.

Interested tenderers may also obtain information from the address above and on:

**Telephone Nos.: +233-303-318700, +233-303-304818,
 Fax: +233-303-318727,
 Email: gridcoprocurement@gridcogh.com**

- Tenderers may, if they so wish, be present at the public opening of the tenders which would be held at the PROCUREMENT CONFERENCE ROOM, GRIDCo HEAD OFFICE, GHANA GRID COMPANY LIMITED, LOCATED 2 KILOMETERS OFF TEMA MOTORWAY ROUNDABOUT TO AFLAO ROAD, (CLOSE TO THE TEMA STEEL WORKS) immediately after the close of tenders on the date stated above and in the tendering document.

Fellowships



INDIAN INSTITUTE OF MANAGEMENT KOZHIKODE
 Inviting Visiting Fellows

Indian Institute of Management Kozhikode (IIMK) is the fifth IIM established in 1996 by the Government of India. Located at the historic city of Kozhikode in the State of Kerala, it is bestowed with a lush picturesque and oxygen-rich campus with own sustainable water harvesting system.

To encourage collaborative research between scholars of international repute and its faculty members, the Institute invites applications for Visiting Fellows in various Management domains. The duration of the fellowship is for a maximum of 3 months. It includes a monthly fellowship of Indian Rupees (INR) 132500, return economy class airfare and rent free accommodation on campus.

Applicants should be tenured Associate Professors/Professors from premier institutions abroad and should have track record of consistently excellent research.

Deadline for application is March 15, 2018

Full details of the position and how to apply: <https://iimk.ac.in/visiting-fellow.pdf>



To advertise within the classified section, contact:

UK/Europe

Agne Zurauskaite
 Tel: +44 20 7576 8152
agnezurauskaite@economist.com

United States

Richard Dexter
 Tel: +1 212 554 0662
richarddexter@economist.com

Asia

Shan Shan Teo
 Tel: +65 6428 2673
shanshanteo@economist.com

Middle East & Africa

Philip Wrigley
 Tel: +44 20 7576 8091
philipwrigley@economist.com

Economic data

% change on year ago

	Gross domestic product			Industrial production	Consumer prices		Unemployment rate, %	Current-account balance		Budget balance	Interest rates, %	Currency units, per \$	
	latest	qtr* 2017 [†]	2017 [†]		latest	latest		2017 [†]	latest 12 months, \$bn			% of GDP 2017 [†]	% of GDP 2017 [†]
United States	+2.3 Q3	+3.2	+2.3	+3.6 Dec	+2.1 Dec	+2.1	4.1 Dec	-452.5 Q3	-2.4	-3.5	2.66	-	-
China	+6.8 Q4	+6.6	+6.8	+6.2 Dec	+1.8 Dec	+1.6	4.0 Q3 [§]	+121.6 Q3	+1.2	-4.3	3.87 ^{§§}	6.39	6.86
Japan	+2.1 Q3	+2.5	+1.7	+3.6 Nov	+0.5 Nov	+0.5	2.7 Nov	+198.0 Nov	+4.0	-4.5	0.07	109	113
Britain	+1.7 Q3	+1.6	+1.6	+2.5 Nov	+3.0 Dec	+2.7	4.3 Oct ^{††}	-118.1 Q3	-4.5	-2.9	1.41	0.70	0.80
Canada	+3.0 Q3	+1.7	+3.1	+4.6 Oct	+2.1 Nov	+1.5	5.7 Dec	-45.8 Q3	-3.0	-1.8	2.27	1.23	1.32
Euro area	+2.8 Q3	+2.9	+2.3	+3.2 Nov	+1.4 Dec	+1.5	8.7 Nov	+438.7 Nov	+3.2	-1.3	0.58	0.81	0.93
Austria	+3.2 Q3	+1.4	+2.8	+4.4 Oct	+2.2 Dec	+2.1	5.4 Nov	+8.5 Q3	+2.1	-1.0	0.66	0.81	0.93
Belgium	+1.7 Q3	+1.0	+1.7	+6.7 Oct	+2.1 Dec	+2.2	6.7 Nov	-3.9 Sep	-0.3	-1.7	0.83	0.81	0.93
France	+2.3 Q3	+2.3	+1.8	+2.5 Nov	+1.2 Dec	+1.2	9.2 Nov	-28.7 Nov	-1.4	-2.9	0.84	0.81	0.93
Germany	+2.8 Q3	+3.3	+2.5	+5.7 Nov	+1.7 Dec	+1.7	3.6 Nov [†]	+282.8 Nov	+7.9	+0.6	0.58	0.81	0.93
Greece	+1.3 Q3	+1.2	+1.3	+0.9 Nov	+0.7 Dec	+1.1	20.5 Sep	-1.0 Nov	-0.5	-0.7	3.70	0.81	0.93
Italy	+1.7 Q3	+1.4	+1.5	+2.2 Nov	+0.9 Dec	+1.3	11.0 Nov	+56.1 Nov	+2.7	-2.3	1.91	0.81	0.93
Netherlands	+3.0 Q3	+1.6	+3.2	+4.4 Nov	+1.3 Dec	+1.3	5.4 Dec	+80.7 Q3	+9.6	+0.7	0.61	0.81	0.93
Spain	+3.1 Q3	+3.1	+3.1	+4.7 Nov	+1.1 Dec	+2.1	16.7 Nov	+23.0 Oct	+1.7	-3.0	1.40	0.81	0.93
Czech Republic	+4.7 Q3	+1.9	+4.5	+8.5 Nov	+2.4 Dec	+2.5	2.5 Nov [†]	+9.0 Q3	+0.7	+0.7	1.78	20.5	25.1
Denmark	+1.4 Q3	-1.9	+2.2	-1.1 Nov	+1.0 Dec	+1.1	4.3 Nov	+26.2 Nov	+8.4	-0.6	0.61	6.01	6.91
Norway	+3.2 Q3	+3.0	+2.1	-4.1 Nov	+1.6 Dec	+1.9	4.0 Oct ^{††}	+21.1 Q3	+4.9	+5.2	1.77	7.76	8.32
Poland	+5.1 Q3	+4.9	+4.6	+2.7 Dec	+2.1 Dec	+2.0	6.6 Dec [§]	+1.5 Nov	+0.1	-3.3	3.34	3.35	4.06
Russia	+1.8 Q3	na	+1.8	-1.6 Dec	+2.5 Dec	+3.7	5.1 Nov [§]	+40.2 Q4	+2.5	-2.1	8.13	56.3	59.3
Sweden	+2.9 Q3	+3.1	+2.7	+6.5 Nov	+1.7 Dec	+1.9	5.8 Nov [§]	+21.1 Q3	+4.5	+1.0	0.86	7.94	8.84
Switzerland	+1.2 Q3	+2.5	+0.9	+8.7 Q3	+0.8 Dec	+0.5	3.0 Dec	+66.4 Q3	+9.6	+0.8	0.06	0.95	1.00
Turkey	+11.1 Q3	na	+6.3	+6.9 Nov	+11.9 Dec	+11.0	10.3 Oct [§]	-43.8 Nov	-5.0	-1.9	12.01	3.73	3.76
Australia	+2.8 Q3	+2.4	+2.3	+3.5 Q3	+1.8 Q3	+2.0	5.5 Dec	-22.2 Q3	-1.7	-1.5	2.83	1.24	1.32
Hong Kong	+3.6 Q3	+2.0	+3.7	+0.4 Q3	+1.7 Dec	+1.5	2.9 Dec ^{††}	+14.8 Q3	+6.1	+3.2	1.98	7.82	7.76
India	+6.3 Q3	+8.7	+6.6	+8.4 Nov	+5.2 Dec	+3.5	4.9 Dec	-33.6 Q3	-1.5	-3.1	7.28	63.7	68.2
Indonesia	+5.1 Q3	na	+5.1	+5.0 Nov	+3.6 Dec	+3.8	5.5 Q3 [§]	-13.3 Q3	-1.6	-2.8	6.18	13,314	13,331
Malaysia	+6.2 Q3	na	+5.8	+5.0 Nov	+3.5 Dec	+3.9	3.3 Nov [§]	+9.2 Q3	+2.6	-2.9	3.95	3.91	4.44
Pakistan	+5.7 2017**	na	+5.7	-2.0 Nov	+4.6 Dec	+4.1	5.9 2015	-15.2 Q4	-4.9	-5.9	8.50 ^{†††}	111	105
Philippines	+6.6 Q4	+6.1	+6.6	-8.1 Nov	+3.3 Dec	+3.2	5.0 Q4 [§]	-0.5 Sep	-0.2	-2.1	6.02	51.0	49.8
Singapore	+3.1 Q4	+2.8	+3.5	+5.3 Nov	+0.4 Dec	+0.6	2.2 Q3	+57.4 Q3	+18.5	-1.0	2.15	1.31	1.42
South Korea	+3.0 Q4	-0.9	+3.1	-1.6 Nov	+1.5 Dec	+2.0	3.3 Dec [§]	+81.3 Nov	+5.5	+0.9	2.64	1,070	1,166
Taiwan	+3.1 Q3	+6.8	+2.4	+1.2 Dec	+1.2 Dec	+0.6	3.7 Dec	+74.1 Q3	+13.2	-0.1	1.05	29.2	31.4
Thailand	+4.3 Q3	+4.0	+3.6	+4.2 Nov	+0.8 Dec	+0.7	1.1 Nov [§]	+47.4 Q3	+11.7	-2.4	2.34	31.6	35.2
Argentina	+4.2 Q3	+3.6	+2.9	+0.8 Nov	+25.0 Dec	+25.2	8.3 Q3 [§]	-26.6 Q3	-4.1	-6.1	3.44	19.5	16.0
Brazil	+1.4 Q3	+0.6	+0.9	+4.7 Nov	+2.9 Dec	+3.4	12.0 Nov [§]	-11.3 Nov	-0.7	-8.0	8.58	3.18	3.17
Chile	+2.2 Q3	+6.0	+1.4	+2.3 Nov	+2.3 Dec	+2.2	6.5 Nov ^{§††}	-4.6 Q3	-1.3	-2.7	4.54	603	654
Colombia	+2.0 Q3	+3.2	+1.6	+0.3 Nov	+4.1 Dec	+4.3	8.4 Nov [§]	-11.1 Q3	-3.6	-3.3	6.37	2,814	2,935
Mexico	+1.5 Q3	-1.2	+2.0	-1.5 Nov	+6.8 Dec	+6.0	3.4 Dec	-16.1 Q3	-1.7	-1.9	7.50	18.5	21.4
Peru	+2.5 Q3	+5.5	+2.7	-2.5 Sep	+1.4 Dec	+2.8	6.9 Dec [§]	-1.8 Q3	-1.8	-3.0	na	3.21	3.28
Egypt	na	na	+4.2	+27.1 Nov	+21.9 Dec	+26.8	11.9 Q3 [§]	-12.2 Q3	-6.9	-10.9	na	17.7	18.9
Israel	+1.9 Q3	+3.5	+3.6	+1.6 Nov	+0.4 Dec	+0.3	4.3 Nov	+10.5 Q3	+2.7	-1.8	1.68	3.41	3.79
Saudi Arabia	-0.7 2017	na	-0.8	na	+0.4 Dec	-0.3	5.8 Q3	+12.4 Q3	+3.1	-8.9	na	3.75	3.75
South Africa	+0.8 Q3	+2.0	+0.8	+2.1 Nov	+4.7 Dec	+5.4	27.7 Q3 [§]	-7.3 Q3	-2.5	-3.9	8.36	11.9	13.3

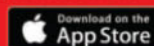
Source: Haver Analytics. *% change on previous quarter, annual rate. [†]The Economist poll or Economist Intelligence Unit estimate/forecast. [§]Not seasonally adjusted. ^{††}New series. ^{**}Year ending June. ^{†††}Latest 3 months. ^{††††}3-month moving average. ^{§§§}year yield. ^{†††††}Dollar-denominated bonds.

The Economist **1843**

The Economist's international magazine of ideas, lifestyle and culture

February/March issue of 1843 on newsstands January 31st

economistsubscriptions.com/1843

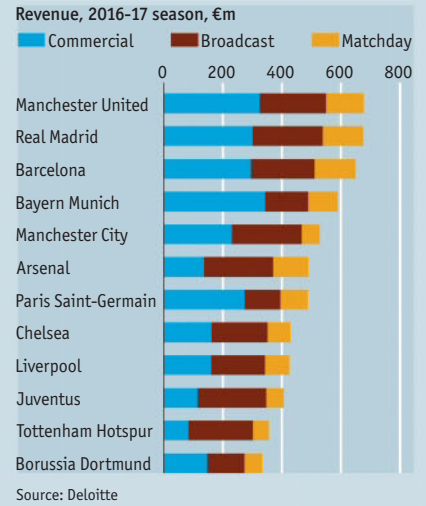


Markets

	Index Jan 24th	% change on one week	% change on Dec 30th 2016	
			in local currency	in \$ terms
United States (DJIA)	26,252.1	+0.5	+32.8	+32.8
China (SSEA)	3,728.4	+3.3	+14.7	+24.8
Japan (Nikkei 225)	23,940.8	+0.3	+25.3	+33.8
Britain (FTSE 100)	7,643.4	-1.1	+7.0	+23.2
Canada (S&P/TSX)	16,284.2	-0.3	+6.5	+15.7
Euro area (FTSE Euro 100)	1,260.4	+0.7	+13.3	+33.1
Euro area (EURO STOXX 50)	3,643.2	+0.8	+10.7	+30.0
Austria (ATX)	3,673.1	+1.2	+40.3	+64.7
Belgium (Bel 20)	4,146.8	nil	+15.0	+35.0
France (CAC 40)	5,495.2	nil	+13.0	+32.7
Germany (DAX)*	13,414.7	+1.8	+16.8	+37.2
Greece (Athex Comp)	884.0	+5.0	+37.3	+61.2
Italy (FTSE/MIB)	23,622.6	+0.5	+22.8	+44.2
Netherlands (AEX)	566.0	+0.5	+17.2	+37.5
Spain (Madrid SE)	1,068.7	+0.8	+13.3	+33.0
Czech Republic (PX)	1,138.6	+2.1	+23.5	+54.4
Denmark (OMXC20)	944.7	+0.6	+18.3	+38.7
Hungary (BUX)	40,979.8	+3.6	+28.0	+50.2
Norway (OSEAX)	939.4	+0.4	+22.8	+36.2
Poland (WIG)	67,339.2	+1.0	+30.1	+62.2
Russia (RTS, \$ terms)	1,292.3	+2.2	+12.1	+12.1
Sweden (OMXS30)	1,631.2	+0.5	+7.5	+23.1
Switzerland (SMI)	9,547.6	+1.1	+16.2	+24.8
Turkey (BIST)	119,648.3	+2.6	+53.1	+44.2
Australia (All Ord.)	6,168.8	+0.6	+7.9	+20.5
Hong Kong (Hang Seng)	32,958.7	+3.0	+49.8	+48.6
India (BSE)	36,161.6	+3.1	+35.8	+44.8
Indonesia (JSX)	6,615.5	+2.7	+24.9	+26.4
Malaysia (KLSE)	1,837.0	+0.5	+11.9	+28.3
Pakistan (KSE)	45,063.2	+3.9	-5.7	-11.0
Singapore (STI)	3,609.2	+1.9	+25.3	+38.3
South Korea (KOSPI)	2,538.0	+0.9	+25.2	+41.4
Taiwan (TWI)	11,152.2	+1.3	+20.5	+32.8
Thailand (SET)	1,839.0	+0.6	+19.2	+34.9
Argentina (MERV)	34,948.6	+4.0	+107	+67.3
Brazil (BVSP)	83,679.9	+3.1	+38.9	+42.1
Chile (IGPA)	29,149.4	+0.2	+40.6	+56.2
Colombia (IGBC)	12,314.0	+4.1	+21.8	+30.0
Mexico (IPC)	50,746.9	+2.0	+11.2	+23.8
Venezuela (IBC)	2,489.8	+7.0	7,752	na
Egypt (EGX 30)	15,170.7	-0.2	+22.9	+25.7
Israel (TA-125)	1,401.0	+0.6	+9.7	+23.7
Saudi Arabia (Tadawul)	7,479.1	-0.8	+3.3	+3.4
South Africa (JSE AS)	61,623.1	+1.1	+21.7	+39.7

Football wealth

Manchester United retained their title as football's richest club when Deloitte, a consultancy, released its annual Football Money League rankings. Despite not being in the lucrative Champions League for the 2016-17 season, the Red Devils won the Europa League, a second-tier competition and, with the broadcasting might of the English Premier League behind them, held off the Champions League and Spanish league winners, Real Madrid. English teams dominate the list. The 2016-17 season was the first of a new three-year Premier League tv deal worth around £2.8bn (\$3.9bn) per season. Such largesse may not last. Analysts warn that future football rights auctions may be less frenzied.



Other markets

	Index Jan 24th	% change on one week	% change on Dec 30th 2016	
			in local currency	in \$ terms
United States (S&P 500)	2,837.5	+1.2	+26.7	+26.7
United States (NAScomp)	7,415.1	+1.6	+37.7	+37.7
China (SSEB, \$ terms)	346.1	+0.4	+1.3	+1.3
Japan (Topix)	1,901.2	+0.6	+25.2	+33.7
Europe (FTSEurofirst 300)	1,574.9	+0.7	+10.3	+29.4
World, dev'd (MSCI)	2,232.3	+1.5	+27.5	+27.5
Emerging markets (MSCI)	1,258.7	+3.0	+46.0	+46.0
World, all (MSCI)	546.0	+1.6	+29.4	+29.4
World bonds (Citigroup)	965.7	+0.8	+9.2	+9.2
EMBI+ (JPMorgan)	831.4	-0.6	+7.7	+7.7
Hedge funds (HFRX)	1,309.8 [§]	+0.8	+8.8	+8.8
Volatility, US (VIX)	11.5	+11.9	+14.0 (levels)	
CDSs, Eur (iTRAXX) [†]	43.8	-0.9	-39.3	-28.7
CDSs, N Am (CDX) [†]	46.6	-3.0	-31.3	-31.3
Carbon trading (EU ETS) €	9.5	+11.2	+42.9	+67.8

Sources: IHS Markit; Thomson Reuters. [§]Total return index. [†]Credit-default-swap spreads, basis points. [§]Jan 23rd.

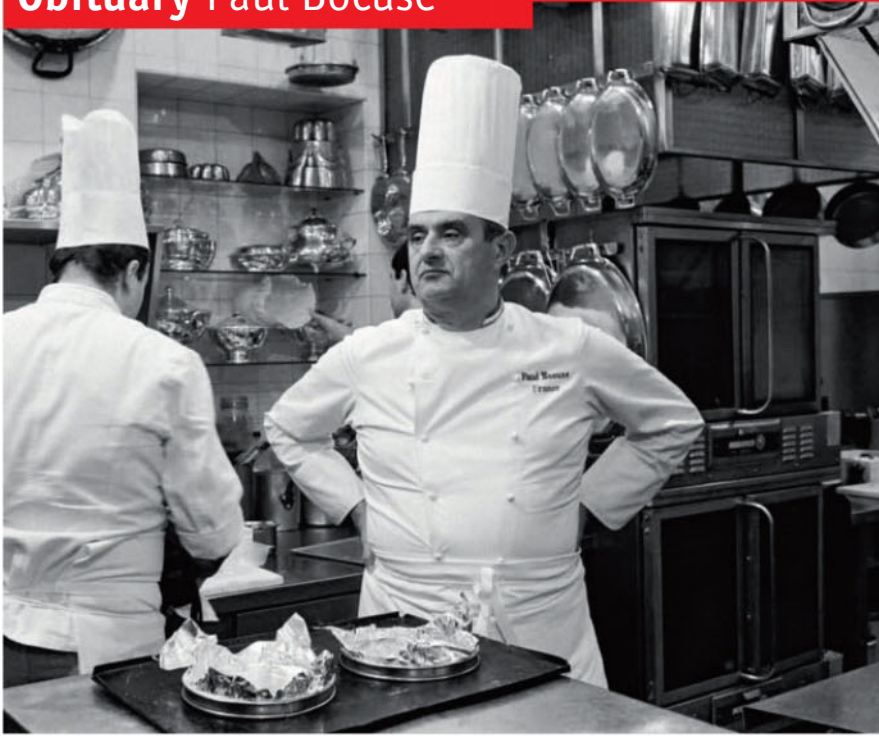
Indicators for more countries and additional series, go to: Economist.com/indicators

The Economist commodity-price index 2005=100

	Jan 16th	Jan 23rd*	% change on	
			one month	one year
Dollar Index				
All Items	149.8	151.1	+2.3	+0.8
Food	148.5	150.4	+1.9	-7.7
Industrials				
All	151.2	151.8	+2.6	+11.4
Nfa [†]	141.7	142.6	+4.2	-2.0
Metals	155.2	155.7	+2.0	+17.7
Sterling Index				
All items	197.8	196.0	-2.5	-10.2
Euro Index				
All items	152.3	152.8	-1.3	-11.9
Gold				
\$ per oz	1,335.1	1,337.3	+4.3	+10.2
West Texas Intermediate				
\$ per barrel	63.7	64.5	+7.5	+22.6

Sources: Bloomberg; CME Group; Cotlook; Darmann & Curl; FT; ICCO; ICO; ISO; Live Rice Index; LME; NZ Wool Services; Thompson Lloyd & Ewart; Thomson Reuters; Urner Barry; WSJ. ^{*}Provisional [†]Non-food agricultural.





The maker of chefs

Paul Bocuse, popularly acclaimed as the best French chef since Escoffier, died on January 20th, aged 91

IN IMPISH mood, Paul Bocuse would roll up the sleeve of his whites to reveal, on his left bicep, a tattoo of a Gallic cock crowing. An American GI had done it for him during the war, and it seemed just right for his subsequent career as France's most celebrated chef. This was a man who was called the pope, even God, by lowlier meal-makers, and whose death, said Emmanuel Macron, had chefs everywhere weeping in their kitchens.

He was the most decorated of them all, and not simply with Michelin stars, of which his restaurant, L'Auberge du Pont de Collonges "Paul Bocuse", near Lyons, had held three for over 50 years. (To match his three stars he had, for almost as long, three women, fairly harmoniously; his appetites were large.) With his whites he usually wore the tricolore collar of a Meilleur Ouvrier de France, and occasionally his Légion d'Honneur on its red ribbon. On that glorious evening in 1975, when his medal had been pinned on by the president, they had sat down to his own invention, black-truffle soup VGE, for Valéry Giscard d'Estaing. It was served ever after in his restaurant, in specially inscribed white bowls.

The cockerel proclaimed his patriotism, as if it were in any doubt; he was ever the small boy who loved to run after marching bands on the 14th of July, shouting and

singing. For what country was better provisioned than France? Her shores were washed with a seething *bouillabaisse* of fish, her gardens laden with good things; Charolais cattle grazed the fields, chickens from Bresse pecked in farmyards. And the wines! He was France's most fervent ambassador, setting up restaurants in America and Japan, and providing food both for Disney's French enterprises and for Concorde—always taking his own ingredients with him, to be sure they were the best.

Nitrogen, *pfuit!*

He could crow about French cooking, too. From Carême to Maître Escoffier to himself, there was none better. *Cuisine classique* had become over-fussy, but its fundamentals, butter, cream and wine, were so magical that nothing could replace them. (A dish of just-made *fromage frais* with cream was, for him, pure joy.) With a little simplifying, more emphasis on freshness, French cuisine would again be unbeatable. He signed on briefly to *nouvelle cuisine*, but in the end it bored him; nothing on the plate, lots on the bill, was his conclusion. Instead his menus offered the grand, substantial dishes of the decades: duck with foie gras, pike quenelles, fillet of beef Rossini, *coq au vin*. The only inventions of his own were the truffle soup and sea bass in

pastry. He was no fad-follower, no fiddler. Molecular cuisine, *bof!* Nitrogen, *pfuit!* Give him some sausage and a glass of good Mâcon, in the company of friends, any day.

What made him most content, though, were two apparently smaller things. The first was the rescue of his family name. The Bocuses had been chefs since the 18th century, always in that little auberge on the Saône: the house he had been born in, with the murmur of the river outside. There he caught fish, and in that kitchen, at nine, he had first served up veal kidneys with puréed potatoes. But the restaurant had been sold, and the name lost, by his grandfather, and not until 1959 could he get the building back. He won his first Michelin star when there were still paper cloths on the tables. Gradually it became splendid, with crimson shutters and green paint, a ceremonial courtyard and much brass. Inside, preserved as a shrine, was his grandmother's kitchen, with its battery of copper pans; and the name "Paul Bocuse" marched in neon across the roof.

The second source of pride was easier to overlook. By the 21st century, celebrity chefs were everywhere, foraging, posing, fronting restaurants, writing books. Yet when he began, just after the war, chefs toiled and broiled behind the scenes, while the owners patrolled the dining rooms. At La Mère Brazier's in Lyon, as an apprentice, he had to feed the pigs and do the laundry, as well as bring in the coal. Perhaps his chief accomplishment was to make chefs emerge, proud of themselves.

They had every reason to be, as artisans who loved their craft. A good chef like himself worked (and worked, and worked!) by instinct, accepting that a recipe would be subtly different every time. That final seasoning, with the tips of the fingers, was a beautiful gesture, his signing of the dish. And once it was done, the chef should leave the kitchen, greet the diners, present what he had made. Hence the many portraits of him in his restaurant, so that even when he was away, or no longer cooked himself, he was there. He positively encouraged his cooks to open their own restaurants, and was delighted to welcome 650 students each year to his chef's school at Écully. Even young women came—though he preferred women in bed, and smelling of Chanel rather than cooking fat.

A chef's sense of his own importance began, he insisted, with the uniform: the *calot* or the tall *toque*, the immaculate white jacket and the apron, the clothes of his trade. That moment when, preparing for his *entrée en scène*, he tied his apron ribbons round his capacious waist, was the proudest part of all. And he might just have time too to roll up his sleeve, flash a smile and cry "Cocorico!", in case anyone doubted who, and which country, ruled the culinary world. ■



A SPACE ODYSSEY: THE TOOLS AND THE VISION POWERING MAN'S NEXT GREAT LEAP

Three diverse players in human space exploration came together to discuss its future at *The Economist's* inaugural space summit in Seattle on November 9th, during a panel called "A space odyssey: the tools and the vision powering man's next great leap."

The panellists said they see public-private partnerships becoming increasingly instrumental in human progress in both low-earth orbit and deep space. Robyn Gatens, deputy director of NASA's International Space Station division, said NASA plans to open up its space station as a "national lab" to commercial markets.

"What we've been doing is identifying areas of intersection between what commercial companies are interested in doing in space, with what NASA's needs are, and that way we can leverage a public-private partnership in a sort of shared risk, shared gain model," Ms. Gatens said.

Jim Bell, president of the Planetary Society and author of "Interstellar Age", sees a future in space tourism that will create a demand for accommodation, dining and transport options. "There's going to have to be business infrastructure that supports that," he said.

The panellists highlighted the importance of re-configurability in future technologies, a feature that was demonstrated as early as 40 years ago in NASA's Voyager mission when it brought back unprecedented images of far-away planets by adapting its camera to the low-intensity light. "The ability to change the code on board...that was absolutely critical," Mr. Bell said.

Tom Bradicich, vice-president and general manager at Hewlett Packard Enterprise, announced a new initiative, "Extreme Edge", to build technologies that are both "re-configurable on the fly" and faster than fixed technologies. They will be able to adapt to unexpected problems as well as to reconfigure the actual mission workload algorithm, he said.

Mr. Bradicich emphasised that technologies must become higher-speed, lighter, smaller and lower-power.

"We're doing this to establish the extreme edges on Earth. Now we're taking it up a notch effectively, and call it the extreme edge, or sometimes the infinite edge, because what is farther out than space?" he said.

Technologies designed for space can also benefit life on Earth, the panelists said. Ms. Gatens cited examples such

When people go to Mars, there will be robots there, waiting for them...And I think that's true across the solar system.

as ground-based filtration systems for global disaster relief and pharmaceutical drugs for osteoporosis and muscular dystrophy.

The panellists agreed that robotic technology and human intervention will continue to be interdependent in space.

"I really do think that robots and human exploration are intimately tied together," said Mr. Bell. "When people go to Mars, there will be robots there, waiting for them. They'll be bringing robots with

them to help do things. They'll be up in orbit helping them out that way as well. And I think that's true across the solar system."

He said robots can conduct initial reconnaissance activities, such as determining the mass of asteroids, the molecules in an atmosphere and so on. But when it comes to questions such as "why is that there; what's the process that made that form that way; what does this mean for the evolution of our own planet," direct human intervention will be necessary, Mr. Bell said.

"There is a science threshold beyond which you really get at process, origin, evolution, implications, that requires, at least for now, the human brain," he said.

Sponsored by



**Hewlett Packard
Enterprise**

World's First "Self-Driving" Database

The logo for Oracle Autonomous Database is a red outline of a cloud shape. Inside the cloud, the words "Oracle Autonomous Database" are written in a bold, red, sans-serif font, stacked vertically.

**Oracle
Autonomous
Database**

**No Human Labor – Half the Cost
No Human Error – 100x More Reliable**

ORACLE®

oracle.com/selfdrivingdb