

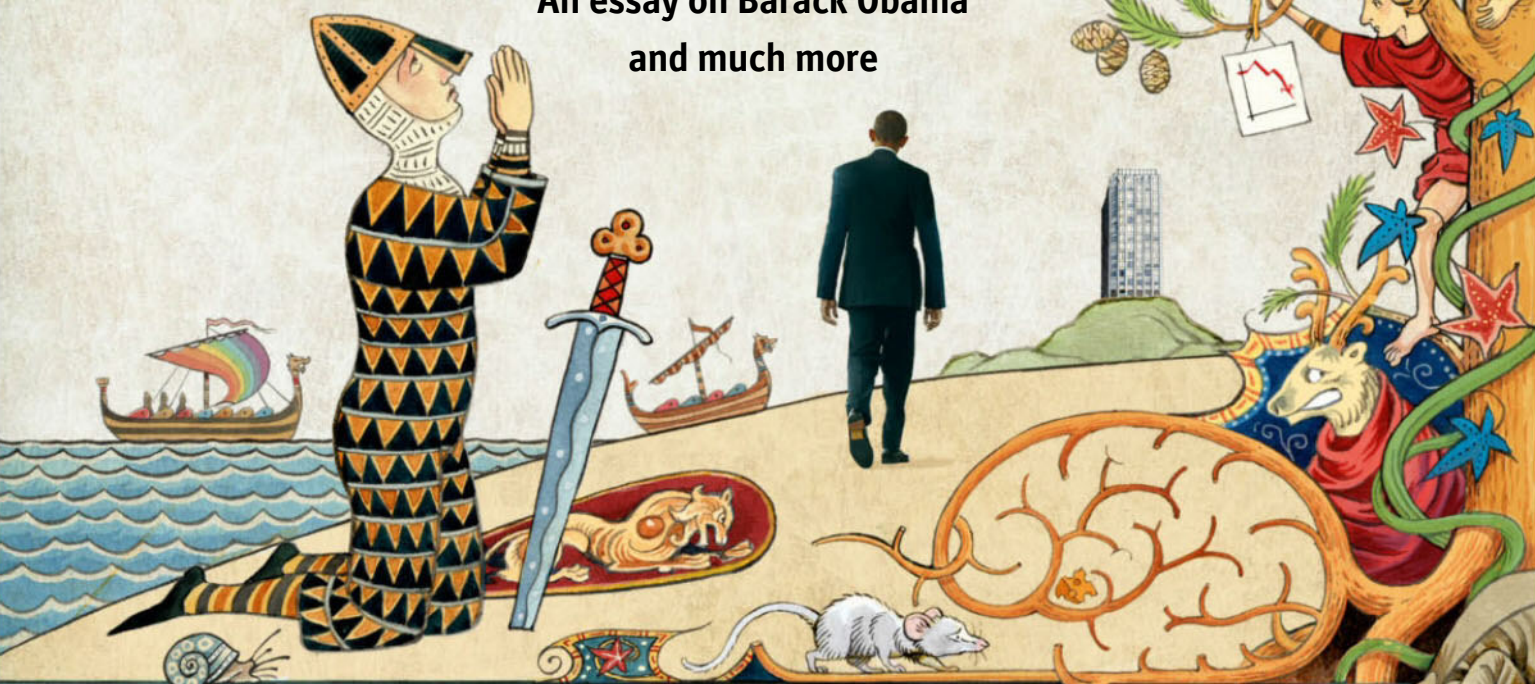
# The Economist

DECEMBER 24TH 2016–JANUARY 6TH 2017



## Christmas Double Issue

Domesday England \* Reindeer herding \* Silence \* Clothespins \* Super Mario  
Vienna's century \* Lab mice \* Prison tattoos \* Cambridge economists \* Sequoias  
India Pale Ale \* Flashman of Fleet Street \* Postcard from Dandong  
Gay bars \* Somebody else's war \* Crossword  
An essay on Barack Obama  
and much more

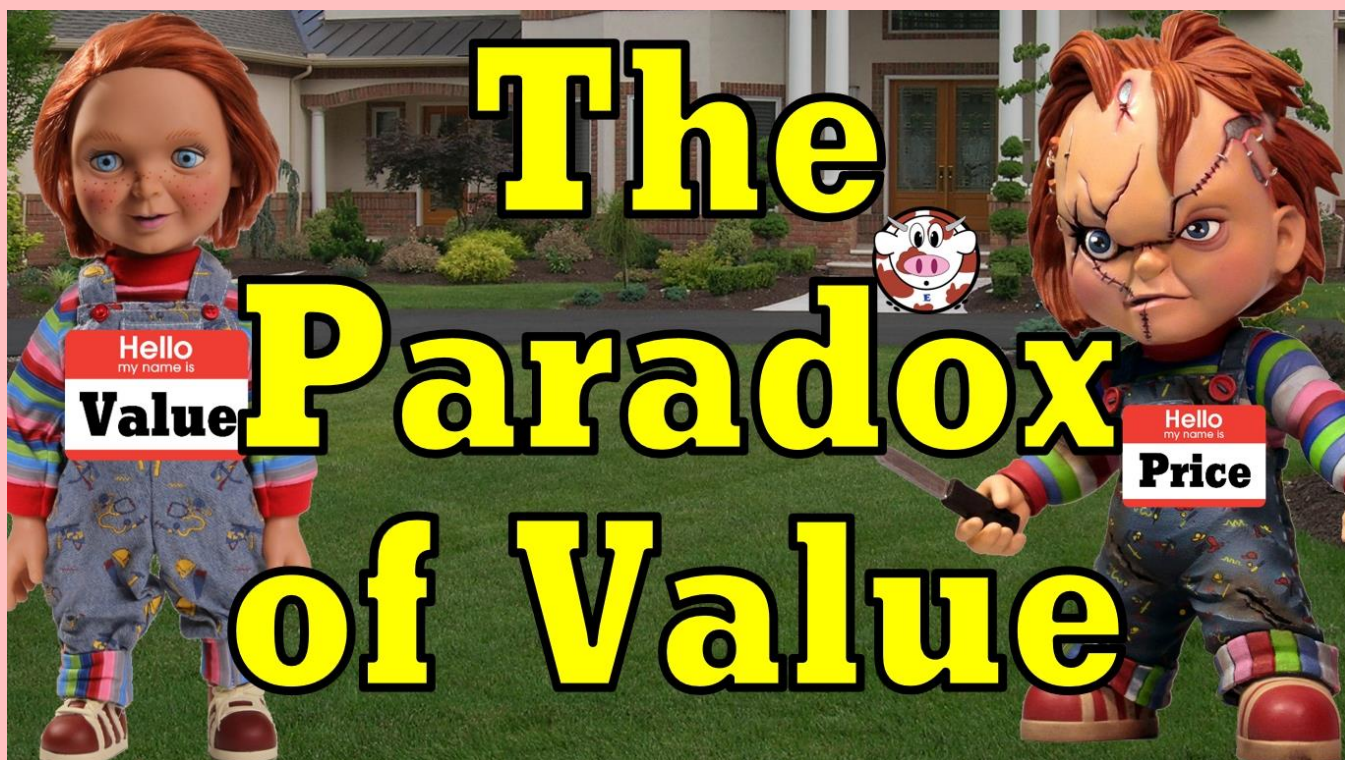




EconCow.com

Latest video (Dec 2016)

*Why Teachers Make Less Than Pro Athletes*



Sorry for this ad. I'm just a random guy on the internet. I'm also a new YouTuber who makes educational videos (mostly on economics). Please help me by checking them out and let me know how I can improve! Thank you! ☺

## 8 The world this year

### Leaders

- 11 Liberalism's future**  
The year of living dangerously
- 12 Developing-country migration**  
The hypocrites' club
- 12 Internet security**  
Breaching-point
- 14 The Chinese economy**  
Smooth sailing, until it's not
- 16 The state of states**  
Our country of the year

### Letters

- 18 On populism, flags, corporation tax, press freedom, ketchup, super-consumers**

## Britain

- 41 Brexit and Europe**  
Six months on
- 42 The Christmas strikes**  
Planes, trains and political deals
- 42 A prison riot**  
Jailhouse rocked
- 44 Bagehot**  
The parable of JD Wetherspoon

## Europe

- 45 Berlin killings**  
The spectre of terror
- 46 Assassination in Ankara**  
A Russian diplomat murdered
- 46 Christine Lagarde**  
Grace under pressure
- 47 Polish politics**  
Winter of discontent
- 48 Charlemagne**  
Stefan Zweig's Europe

## United States

- 49 Disney's Utopia on the I-4**  
Yesterdayland
- 50 Theme parks and technology**  
Tomorrowland
- 51 Partisan politics in North Carolina**  
Ungovernable
- 52 Lexington**  
Winning the country by breaking its trust

## The Americas

- 53 Mexican attitudes to marijuana**  
Northern lights
- 54 Argentina's downbeat economy**  
No growth, no votes
- 54 Paraguay's waterways**  
Ply me a river

## Middle East and Africa

- 73 Congo's president remains**  
There will be trouble
- 74 "Jungle justice"**  
Trial by fire
- 74 Donald Trump and Israel**  
An American embassy in Jerusalem?
- 75 Silencing dissent in Syria**  
Assad's torture dungeons

## Asia

- 76 Conflict in Myanmar**  
The Lady fails to speak out
- 78 Banyan**  
Indonesia's politics of insults

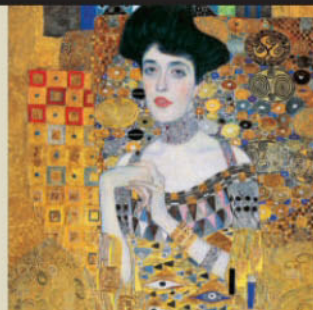
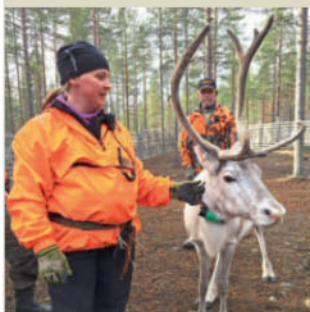
## China

- 79 Grabbing a drone**  
A message to Mr Trump
- 80 Ancient inventions**  
Harnessing the past

## \* Christmas specials



- 21 The Economist tower**  
25 St James's Street
- 26 Reindeer**  
Talo on the range



- 28 Vienna**  
City of the century
- 33 Domesday book**  
Economics of Brentry



- 35 Prison tattoos**  
Crime, ink
- 38 Chinese tourism**  
Peering in Korea
- 55 An essay on Barack Obama**  
The agony of hope



- 61 IPA**  
Beer of the world
- 63 Cambridge economists**  
Exams and expectations



- 67 Mario superstar**  
It's-a me
- 70 Flashman**  
The cad as correspondent

**International**

- 81 Migration**  
Why poor migrants go to other poor countries
- 82 Local heroes**  
Where Malians move

**Business**

- 83 Indian business**  
Aadhaar and the digit era
- 84 Work in Japan**  
White-collar blues
- 85 Tisn't the season**  
The Christmas spending bump flattens
- 85 Retailing**  
Tracking people in shops
- 86 Schumpeter**  
Creaking capitalism, dysfunctional democracy

**Finance and economics**

- 87 Japanese banks**  
Surviving low interest rates
- 88 Buttonwood**  
The year ahead in the markets
- 89 2016 in charts**  
The year of Brexit and Trump
- 90 Free exchange**  
A cooler head: Thomas Schelling

**Science and technology**

- 107 Driverless cars**  
Eyes on the road
- 108 Particle accelerators**  
Open, Sesame
- 109 Neuroscience**  
Grey mater

**Books and arts**

- 110 Astronomy in America**  
Glass universe
- 111 Cheese, glorious cheese**  
Stinky stuff
- 111 Rasputin's murder**  
The killer's story
- 112 Tehran's Museum of Contemporary Art**  
Wall-to-wall diplomacy
- 116 Economic and financial indicators**  
Statistics on 42 economies, plus a closer look at investment-banking revenue

**Obituary**

- 118 The Whitechapel Bell Foundry**  
A curfew tolls...

**Subscription service**

For our full range of subscription offers, including digital only or print and digital combined visit

[Economist.com/offers](http://Economist.com/offers)

You can also subscribe by mail or telephone at the details provided below:

**Telephone:** +44 (0) 845 120 0983

**Web:** [Economist.com/offers](http://Economist.com/offers)

**Post:** The Economist  
Subscription Centre,  
P.O. Box 471,  
Haywards Heath,  
RH16 3GY  
UK

**Subscription for 1 year (51 issues)**  
Print only UK – £145

**Principal commercial offices:**

25 St James's Street, London SW1A 1HG  
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

**\* Christmas specials**

- 72 Colouring and crossword**  
Black and white and read



- 91 Clothespegs**  
Mankind in miniature



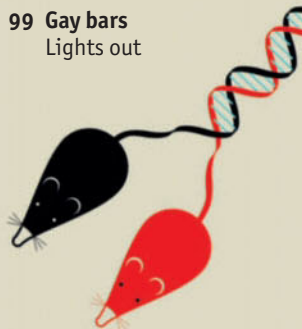
- 94 Foreign fighters**  
Somebody else's war



- 96 Sequoias**  
On a giant's shoulders



- 99 Gay bars**  
Lights out



- 101 Laboratory mice**  
Animal factory

- 104 Silence**  
Why be quiet

Many of these specials have additional content online

The  
Economist

Volume 421 Number 9021

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:**

Atlanta, Beijing, Berlin, Brussels, Cairo, Chicago, Lima, Mexico City, Moscow, Mumbai, Nairobi, New Delhi, New York, Paris, San Francisco, São Paulo, Seoul, Shanghai, Singapore, Tokyo, Washington DC



PEFC/16-33-582

PEFC certified

This copy of *The Economist* is printed on paper sourced from sustainably managed forests certified by PEFC [www.pefc.org](http://www.pefc.org)





The poll-defying election of **Donald Trump** as America's president capped a year of triumph for populists in many places. Mr Trump's rancorous campaign tore up every rule in the political handbook. He won in part by railing against the establishment and vowing to protect American jobs, which went down well in rustbelt states that had not voted Republican in decades. The world is waiting to find out just how many of Mr Trump's bombastic promises will actually become American policy. He will be inaugurated on January 20th.

### Let's go crazy

Britain faced an uncertain future because of another populist upset: **Brexit**. The government lost a referendum on whether to stay in the European Union by 52-48%. David Cameron promptly resigned as prime minister without invoking Article 50, the legal means of departure, despite saying it would be the first thing he would do if the country voted to leave. Theresa May, his successor, was left to clean up the mess. Article 50 is due to be triggered in March. Even though they won, Leavers still talk of the establishment looking to stitch them up.

The immediate reaction of investors to Brexit was to push **the pound** to a 31-year low against the dollar. The Bank of England cut interest rates for the first time in seven years as Britain's economic outlook darkened.

MPs in Britain's opposition **Labour Party** used Brexit to try to oust Jeremy Corbyn as leader. He survived thanks to the party's leftist grassroots

membership. The UK Independence Party, the catalyst for the Brexit referendum, imploded after its leader, Nigel Farage, stepped down.

**Jo Cox**, a Labour member of Parliament, was murdered by a British nationalist. It was the first killing of an MP not carried out by Irish nationalists for two centuries.

**Free trade** retreated. The proposed TTIP and TPP trade deals, respectively between America and Europe, and America and Asia-Pacific countries, were declared dead in their current form. Mr Trump's incoming cabinet has a strong protectionist flavour. Europeans also showed little taste for trade deals, especially in France and Germany.

The populist surge hit other countries, too. Rodrigo Duterte was elected president of the **Philippines** after promising to kill criminals and urging people to attack suspected drug dealers. Close to 6,000 people have been lynched since he took office. In **France** François Hollande decided not to run for a second term as president; polling showed that the National Front's Marine Le Pen would beat him to the run-off. François Fillon won the centre-right's primary and leads the race. Populist governments in **Hungary** and **Poland** continued thumbing their noses at the EU.

### When doves cry



With Russian help, the regime of Bashar al-Assad in **Syria** made big inroads into rebel-held territory, killing civilians indiscriminately, bombing hospitals and torturing suspected rebel sympathisers. As

the year ended, the main rebel stronghold in Aleppo looked set to fall. **Islamic State (IS)** lost ground in Syria, and also in Iraq, where government troops launched an offensive to retake Mosul, the jihadist group's last redoubt.

Despite its loss of territory, IS's reign of **terror** continued. As well as slaughtering Iraqis and Syrians, IS claimed responsibility for a co-ordinated attack on **Brussels** airport and the city's metro, which killed 32 people. In **Nice** a jihadist drove a lorry through crowds celebrating Bastille Day, leaving 86 people dead. In **Orlando** an IS-inspired gunman killed 49 people at a gay nightclub, America's worst attack since 9/11. IS terrorists went on a rampage in **Jakarta**, killing four people before they were shot dead by police.

**Germany's** "refugees welcome" policy was mostly unwelcomed by Germans. It was the main factor behind a drop in Angela Merkel's approval ratings. Anti-immigrant groups took advantage of a string of murders committed by lone-wolf jihadists, including an attack on a Christmas market in Berlin that killed at least a dozen people.

France got hot under the collar about the **burkini**, a full-length beach suit worn by some Muslim women. The prime minister thought the garment was such an affront to French values that "the Republic must defend itself." Dozens of seaside towns banned it, prompting a steaming debate about women's rights.

**Italians** voted against constitutional reforms backed by Matteo Renzi, the prime minister, who promptly resigned.

### New power generation

**Oil prices** sank to their lowest level in 12 years in January. As oil-exporting economies started to feel the pain (Saudi Arabia turned to international bond markets for the first time) OPEC eventually agreed to cut output in order to ease the worldwide glut and lift prices.

The first death involving a **self-driving** vehicle occurred when the driver of a Tesla car was involved in a crash. Despite a few non-fatal accidents Google's autonomous-car project clocked up 2m miles. Uber piloted a fleet of self-driving cars in Pittsburgh (albeit with an engineer and driver along for the ride in case something went wrong).

Barack Obama became the first American president since 1928 to visit **Cuba**. Fidel Castro, who outlasted ten American presidents and locked up thousands of Cubans, died, aged 90.

Hurricane Matthew, the deadliest Atlantic storm since 2005, caused 1,600 deaths in Haiti and was one of the year's worst **natural disasters**. Earthquakes in Ecuador and Italy killed hundreds.

### Sign of the times



A coup attempt by factions of the army in **Turkey** was defeated when people took to the streets to show their support for the government. President Recep Tayyip Erdogan blamed the uprising on a "parallel structure" loyal to Fethullah Gulen, an imam and former ally. He took the opportunity to have more than 150,000 suspected Gulenists and others arrested or purged from their jobs.

The world's longest-serving monarch, King Bhumibol Adulyadej of **Thailand**, died at the age of 88. A year of mourning was declared; his body will be cremated towards the end of 2017. Britain's Queen Elizabeth is now the world's longest-serving monarch; she turned 90 this year. ▶▶

America's **Supreme Court** worked for most of the year with just eight justices because the Republican-dominated Congress refused to confirm Barack Obama's nominee to replace Justice Antonin Scalia, who died in February.

### Diamonds and pearls

Some of the year's biggest **takeover** offers were in agribusiness, led by Bayer's \$66bn approach to Monsanto. ChemChina's \$43bn proposal for Syngenta was the biggest overseas bid yet by a Chinese firm. The line between telecoms and media became ever more blurred with AT&T's \$85bn bid for Time Warner. All of those deals are awaiting regulatory approval. But Pfizer called off its \$160bn takeover of Allergan, blaming US Treasury rules that curb the deal's tax-reducing benefits.

A few internet high-fliers were brought down to earth. **Twitter** was frequently rumoured to be the target of a takeover. **Yahoo** ended up selling its core business to Verizon. And **Gawker** went bust after a jury awarded \$140m to a celebrity wrestler because it had published a sex tape of him grappling with the wife of a friend.

**Central banks** kept interest rates at ultra-low and even negative levels, which their detractors say are hampering growth. That said, the Federal Reserve raised rates for only the second time since 2006.

In **Taiwan** Tsai Ing-wen became the first female president in the Chinese-speaking world. Within weeks of her inauguration China announced that it had cut off important channels of communication with her government because she refuses to accept the idea of "one China".

Democracy activists in **Hong Kong** had their own problems with "one China". A legislative election was preceded by months of wrangling about whether independence-minded candidates could stand. Lawmakers who used their swearing-in oaths to criticise

China were suspended. Many Hongkongers worry about a crackdown from Beijing.

In another first for **artificial intelligence**, a computer beat a world champion at the Asian board game of Go.

The **Colombian** government signed a historic peace deal with the FARC rebels, twice. After an initial agreement was rejected in a referendum, the government pushed a tweaked deal through congress, ending a 52-year war.

### Controversy



Rio de Janeiro hosted the Olympics, but **Brazil** was mostly in the headlines because of a different kind of sport: impeaching the president. Dilma Rousseff was eventually tossed from office, but that didn't stop corruption scandals from swirling. The

economy was stuck in recession. The year was summed up by images of police firing tear-gas at protesters obstructing the route of the Olympic torch.

Activists in **Venezuela** trying to oust the president, Nicolás Maduro, were thwarted at every turn by the authorities. Tens of thousands of Venezuelans queued to cross the border into Colombia to shop for essentials. The IMF predicted that Venezuela's inflation rate in 2017 will reach 1,600%.

Another beleaguered president, **South Africa's** Jacob Zuma, narrowly survived an attempt to remove him as party leader of the African National Congress, after a court found that 783 fraud, racketeering and corruption charges could be reinstated against him. Mr Zuma has said that when he eventually retires he would like to be mayor of a small rural town.

India's sudden cancellation of 500- and 1,000-rupee **banknotes** in an effort to deter tax evasion led to a scramble to deposit the notes in banks before a year-end deadline. Venezuela is also pulling six billion banknotes from circulation to thwart "criminals" who, the government claims, were

hoarding the hyperinflating currency. The poor in both countries suddenly found it harder to buy food.

### Pop life



"**Pokémon Go**" literally hit the streets. The augmented-reality game for smartphones guides players around cities to "capture" figures that pop up on the screen. Tales abounded of players falling off cliffs and running over pedestrians in pursuit of the characters.

**North Korea** found time between its missile-tests to claim to have invented an alcoholic drink that does not cause hangovers. Made from a ginseng extract, the liquor is unlikely to be found on supermarket shelves in time for Christmas.

**Other economic data and news can be found on pages 116-117**



# The year of living dangerously

Liberals have lost most of the arguments in 2016. They should not feel defeated so much as invigorated



FOR a certain kind of liberal, 2016 stands as a rebuke. If you believe, as *The Economist* does, in open economies and open societies, where the free exchange of goods, capital, people and ideas is encouraged and where universal freedoms are protected from state abuse by the rule of law, then this has been a year of setbacks. Not just over Brexit and the election of Donald Trump, but also the tragedy of Syria, abandoned to its suffering, and widespread support—in Hungary, Poland and beyond—for “illiberal democracy”. As globalisation has become a slur, nationalism, and even authoritarianism, have flourished. In Turkey relief at the failure of a coup was overtaken by savage (and popular) reprisals. In the Philippines voters chose a president who not only deployed death squads but bragged about pulling the trigger. All the while Russia, which hacked Western democracy, and China, which just last week set out to taunt America by seizing one of its maritime drones, insist liberalism is merely a cover for Western expansion.

Faced with this litany, many liberals (of the free-market sort) have lost their nerve. Some have written epitaphs for the liberal order and issued warnings about the threat to democracy. Others argue that, with a timid tweak to immigration law or an extra tariff, life will simply return to normal. That is not good enough. The bitter harvest of 2016 has not suddenly destroyed liberalism’s claim to be the best way to confer dignity and bring about prosperity and equity. Rather than ducking the struggle of ideas, liberals should relish it.

## Mill wheels

In the past quarter-century liberalism has had it too easy. Its dominance following Soviet communism’s collapse decayed into laziness and complacency. Amid growing inequality, society’s winners told themselves that they lived in a meritocracy—and that their success was therefore deserved. The experts recruited to help run large parts of the economy marvelled at their own brilliance. But ordinary people often saw wealth as a cover for privilege and expertise as disguised self-interest.

After so long in charge, liberals, of all people, should have seen the backlash coming. As a set of beliefs that emerged at the start of the 19th century to oppose both the despotism of absolute monarchy and the terror of revolution, liberalism warns that uninterrupted power corrupts. Privilege becomes self-perpetuating. Consensus stifles creativity and initiative. In an ever-shifting world, dispute and argument are not just inevitable; they are welcome because they lead to renewal.

What is more, liberals have something to offer societies struggling with change. In the 19th century, as today, old ways were being upended by relentless technological, economic, social and political forces. People yearned for order. The illiberal solution was to install someone with sufficient power to dictate what was best—by slowing change if they were conservative, or smashing authority if they were revolutionary. You can hear echoes of that in calls to “take back control”, as well as in

the mouths of autocrats who, summoning an angry nationalism, promise to hold back the cosmopolitan tide.

Liberals came up with a different answer. Rather than being concentrated, power should be dispersed, using the rule of law, political parties and competitive markets. Rather than putting citizens at the service of a mighty, protecting state, liberalism sees individuals as uniquely able to choose what is best for themselves. Rather than running the world through warfare and strife, countries should embrace trade and treaties.

Such ideas have imprinted themselves on the West—and, despite Mr Trump’s flirtation with protectionism, they will probably endure. But only if liberalism can deal with its other problem: the loss of faith in progress. Liberals believe that change is welcome because, on the whole, it is for the better. Sure enough, they can point to how global poverty, life expectancy, opportunity and peace are all improving, even allowing for strife in the Middle East. Indeed, for most people on Earth there has never been a better time to be alive.

Large parts of the West, however, do not see it that way. For them, progress happens mainly to other people. Wealth does not spread itself, new technologies destroy jobs that never come back, an underclass is beyond help or redemption, and other cultures pose a threat—sometimes a violent one.

If it is to thrive, liberalism must have an answer for the pessimists, too. Yet, during those decades in power, liberals’ solutions have been underwhelming. In the 19th century liberal reformers met change with universal education, a vast programme of public works and the first employment rights. Later, citizens got the vote, health care and a safety net. After the second world war, America built a global liberal order, using bodies such as the UN and the IMF to give form to its vision.

Nothing half so ambitious is coming from the West today. That must change. Liberals must explore the avenues that technology and social needs will open up. Power could be devolved from the state to cities, which act as laboratories for fresh policies. Politics might escape sterile partisanship using new forms of local democracy. The labyrinth of taxation and regulation could be rebuilt rationally. Society could transform education and work so that “college” is something you return to over several careers in brand new industries. The possibilities are as yet unimagined, but a liberal system, in which individual creativity, preferences and enterprise have full expression, is more likely to seize them than any other.

## The dream of reason

After 2016, is that dream still possible? Some perspective is in order. This newspaper believes that Brexit and a Trump presidency are likely to prove costly and harmful. We are worried about today’s mix of nationalism, corporatism and popular discontent. However, 2016 also represented a demand for change. Never forget liberals’ capacity for reinvention. Do not underestimate the scope for people, including even a Trump administration and post-Brexit Britain, to think and innovate their way out of trouble. The task is to harness that restless urge, while defending the tolerance and open-mindedness that are the foundation stones of a decent, liberal world. ■

## Developing-country migration

## The hypocrites' club

The West's immigration policies are restrictive. Those of developing countries are sometimes worse



their bags packed”?

The answer is not the National Front of France, the United Kingdom Independence Party, Jobbik of Hungary or indeed any other insurgent political party in the West. It is the ruling Bharatiya Janata Party of India. The BJP and its leader, Narendra Modi, rail against immigrants from Bangladesh, of whom there might well be more in India than there are Mexicans in America (see page 81). This nativist ranting is evidence of a nasty strain of developing-world demagoguery.

Pakistan is currently trying to evict hundreds of thousands of Afghan immigrants, some of whom have lived in the country for decades. Gabon and Equatorial Guinea are expelling migrants from central Africa. Mexico, which complains bitterly (and rightly) about the treatment of its people in America, does far too little to prevent the mass kidnapping and murder of immigrants from Central America.

All political leaders, even dictators, must take some note of how their people feel, and the citizens of poor and middle-income countries are often no better disposed to immigrants than are voters in the rich world. Besides, a government that threatens to shut its refugee camps or uproot millions of migrant workers from their homes might be able to extort some money out of Western donors. But the treatment meted out to immigrants in developing countries is nonetheless dismal—futile, illiberal and economically ruinous.

Even in rich countries, where most workers have formal

**A** POLITICAL brain teaser: which party in which country has promised “punitive measures” against illegal immigration, has threatened to disenfranchise people who arrived half a century ago and has told migrants to “be prepared with

jobs and are known to the authorities, illegal immigrants are hard to catch. In poorer countries, where the state is weak and almost everybody works informally, it is close to impossible. National boundaries tend to be porous. At about 4,100km (2,500 miles), the border between Bangladesh and India is longer than the border between Mexico and the United States. It is so thinly policed that cattle can be trafficked across it.

Like migrants everywhere, the people who cross into developing countries are nearly always trying to better themselves and their families. Unlike the migrants who make it to the West and the Gulf states, they are frequently very poor indeed. When America and Europe tighten their borders, middle-class Indians and Nigerians lose out; when India and Nigeria crack down, some of the world's most desperate people suffer.

### A populist boomerang

The astounding success of the south Asians who were booted out of Kenya and Uganda in the 1970s and ended up in Britain suggests that Africa would have done well to keep them. Migrants bring dynamism and fresh ideas to poor and middle-income countries as well as rich ones; the lump-of-labour fallacy is just as fallacious in the developing world. Sometimes governments realise this and pull back. In 2014 South Sudan unveiled a mad plan to force companies to sack their foreign workers within a month. It backtracked when firms and charities pointed out that they could not function without Kenyans and other immigrants. South Sudan is not exactly overflowing with skilled graduates who can keep the lights on.

It would be far better for the immigrants and for the countries where they fetch up if governments widened the legal routes for settlement. At present some of the world's least appealing places have the toughest visa requirements and expect economic migrants to jump through the tiniest hoops. You would think their streets were paved with gold. ■

## Internet security

## Breaching-point

Incentives need to change for firms to take cyber-security more seriously



**I**T HAS been a cracking year for hacking. Barack Obama and the CIA accused Russia of electronic meddling in an attempt to help Donald Trump win the presidency. Details emerged of two enormous data breaches at Yahoo, one of the world's biggest internet companies; one, in 2013, affected more than a billion people. Other highlights include the hack of the World Anti-Doping Agency; the theft of \$81m from the central bank of Bangladesh (only a typo prevented the hackers from making off with much more); and the release of personal details of

around 20,000 employees of the FBI. The more closely you look at the darker corners of the internet, the more the phrase “computer security” looks like a contradiction in terms.

Why, two decades after the internet began to move out of universities and into people's homes, are things still so bad? History is one reason: the internet started life as a network for the convenient sharing of academic data. Security was an afterthought. Economics matters, too. Software developers and computer-makers do not necessarily suffer when their products go wrong or are subverted. That weakens the incentives to get security right.

Unfortunately, things are likely to get worse before they get better. The next phase of the computing revolution is the “in-▶▶



Internet of things” (IoT), in which all manner of everyday objects, from light bulbs to cars, incorporate computers connected permanently to the internet. Most of these gizmos are as insecure as any other computer, if not more so. And many of those making IoT products are not computer firms. IT companies have accumulated decades of hard-won wisdom about cyber-security; toaster-makers have rather more to learn.

In November cyber-security researchers revealed a malicious program that could take control of any smart light bulbs within 400 metres. A hacked light bulb does not sound too dangerous. But such unobtrusive computers can be recruited into remotely controlled “botnets” that can be used to flood websites with bogus traffic, knocking them offline. Routers, the small electronic boxes that connect most households to the internet, are already a popular target of bot-herders. Other targets are more worrying. At a computer-security conference in 2015, researchers demonstrated how wirelessly to hack a car made by Jeep, spinning its steering wheel or slamming on its brakes. As the era of self-driving cars approaches (see page 107), the time to fix such problems is now.

One option is to leave the market to work its magic. Given the damage that cybercrime can do to companies, they have good commercial reasons to take it seriously. If firms are careless about security, they risk tarnished reputations and lost customers. A planned buy-out of Yahoo by Verizon, an American telecoms firm, may be rethought after its hacks. But these incentives are blunted when consumers cannot make informed choices. Most customers (and often, it seems, executives) are in no position to evaluate firms’ cyber-security standards. What is more, the epidemic of cybercrime is best tackled

by sharing information. A successful cyber-attack on one company can be used against another. Yet it is tempting for firms to keep quiet about security breaches.

That suggests a role for government. Researchers draw an analogy with public health, where one person’s negligence can harm everyone else—which is why governments regulate everything from food hygiene to waste disposal. Some places are planning minimum computer-security standards, and will fine firms that fail to comply. The IoT has also revived the debate about ending the software industry’s long-standing exemption from legal liability for defects in its products.

### Neither relax nor chill

The problem is that regulation is often fragmented. America has a proliferation of state-level rules, for example, when a single, federal regime would be better. Regulation can also go too far. From January financial institutions in New York must comply with a new cyber-security law that many think sets the bar for breach notifications too low. Changing the liability regime for software could chill innovation by discouraging coders from trying anything new.

Rule-makers can, however, set reasonable minimum expectations. Many IoT devices cannot have their software updated, which means that security flaws can never be fixed. Products should not be able to operate with factory usernames and passwords. No software program can be made impregnable, but liability regimes can reflect firms’ efforts to rectify flaws once they become apparent. Firms need to be encouraged to take internet security more seriously. But overly detailed prescriptions will just hack everyone off. ■

## The Chinese economy

# Smooth sailing, until it’s not

### An obsession with stable growth reinforces vulnerabilities in China



WHEN 2016 dawned the economy that investors fretted about most was China’s. Memories of a huge stockmarket crash were still fresh. Capital was pouring out of the country as savers anticipated a devaluation of the yuan. In the event,

other countries provided the year’s big upsets. And in some respects, the Chinese economy is stronger today than it has been for a couple of years. Producer prices, mired in deflation for 54 straight months, are rising at last. Corporate profits are turning up. Promises to cut overcapacity in coal and steel, and to reduce the overhang of unsold housing, have borne fruit. After three straight quarters of 6.7% annual growth, economists are converging around—you guessed it—6.7% in their forecasts for the final quarter of 2016.

However, this outward stability is misleading. Risks lurk both outside China’s borders and within them. If it does not change its attitude to reform, the Middle Kingdom could soon be atop investors’ minds once again.

One obvious source of anxiety is the potential for a trade war. Much depends on what Donald Trump does when he takes office in January. But tensions are already rising. China

had expected to win the status of a market economy in December, 15 years after its accession to the World Trade Organisation, but the West refused. Because China sees this as a broken promise, a game of tit-for-tat protectionism may well ensue.

Another flashpoint is the currency. Expectations of higher interest rates in America have strengthened the dollar, to which the yuan is partly linked. Meanwhile, Chinese companies and people want more foreign assets, pushing the yuan down. One way the government tries to make the decline gradual is with capital controls. Yet that only adds to the perception that depreciation is a one-way bet, which fuels more outflows. In addition, these controls, if persistent, will undermine confidence in the economy, a deterrent to future investment. Add in Mr Trump’s outdated assertion that China is weakening the yuan so as to help its exporters, and the government is in a bind: the right macroeconomic recipe risks a trade war.

### Locking the stable door

Even if China’s trading relations remain calm, the domestic economy suffers from enormous unresolved problems. Despite a government pledge, the country has failed to make a start on deleveraging. A mix of policies (notably, letting local governments swap loans for bonds) has made debts more sustainable. But they are still growing twice as fast as nominal ▶▶

▶ GDP. Total debt should hit nearly 300% of GDP in 2017, an unprecedented figure for a country at China's income level. Concerned about frothiness in the bond market, the central bank recently tightened short-term liquidity. When smaller firms started to suffer, it quietly ordered big banks to lend to them.

Last, property is a source of recurring concern. China imposes a bewildering array of restrictions that determine who can buy homes where and with what kind of mortgage. The country's leaders put their aim succinctly when they outlined their plans for 2017: there shall be "no big ups and downs" in the housing market. But micromanagement has led to a chronic undersupply of homes and thus to bubbly prices in big cities, where growth is strongest, and to a glut in smaller, weaker cities. Were China to heed the price signals, it would let the property market adjust to fit the population. Instead, it wants to adjust the population to fit the property market, driving peo-

ple—typically, low-income earners—out of big cities.

These trade-offs are devilishly hard to manage. And the government is even less willing to take risks than usual. In autumn 2017 the Communist Party will gather for a big quinquennial conference, where President Xi Jinping is expected to consolidate his grip on power. Before then, no one in Beijing wants to risk reforms that would spoil the occasion if they failed.

However, the pursuit of economic stability often sows the seeds of its own demise. In the case of dealing with America, incrementalism has stored up trouble: giving in to the market and letting the yuan fall may now hasten a trade war. And if officials really were to slow credit growth, the economy would soon feel it. Who would dare risk that when Mr Xi wants growth to stay at around 6.5%? Investors may like the appearance of stability. But to avoid a crash tomorrow, China must accept more bumps today. ■

## The state of states

# Our country of the year

## Which country improved the most in 2016?



**T**O WIN *The Economist's* country of the year award, it is not enough to be peaceful and rich. We aim to reward improvement. Previous winners include Myanmar and Tunisia, for escaping tyranny and building something resembling democ-

racy. Switzerland, Japan and New Zealand, which were just as lovely a decade ago, need not apply.

This year's contenders include plucky **Estonia**. Threatened by Vladimir Putin, it is one of the few NATO members to meet its obligation to spend 2% of GDP on defence. One of the poorer countries in Europe, its schoolchildren were nonetheless the continent's star performers in the most recent PISA science tests. Estonian head teachers have the autonomy to hire and fire and are held accountable for results. It is only a single generation since Estonia was a wretched colony of the Soviet Union; now it looks almost Nordic. Another small country on the shortlist is **Iceland** (population: 330,000), which was the fastest-growing rich country in 2016. Also, its footballers knocked England (population: 53m) out of a European tournament. Wags noted that the English coach was paid £3.5m a year, whereas Iceland's was a part-time dentist.

**China** may be a dictatorship with foul air, but it excels on two measures that matter a lot. A report in March concluded that its greenhouse-gas emissions may already have peaked, or will most probably do so within the next decade. And, despite slowing growth, a hefty 14m rural Chinese lifted themselves out of poverty in the most recent year for which data are available (2015), more than anywhere else. But don't forget the other, richer, democratic Republic of China, which held another free election in 2016. Voters picked a moderate, Tsai Ing-wen, as **Taiwan's** first female president. She has so far dealt well with Beijing's bullying; though she is horribly vulnerable to being let down by Donald Trump if he strikes a grand bargain with the mainland. It is tempting to offer Beijing and Taipei joint first place and call it a "One-China" award. Would they stand on

the same podium to accept it?

**Canada** has stayed sober and liberal even as other rich countries have been intoxicated by illiberal populism. It remains open to trade and immigrants—a fifth of its population is now foreign-born, twice the proportion in the United States. Its prime minister, Justin Trudeau, has negotiated a carbon-pricing deal with nearly all Canadian provinces and vows to legalise pot, too. Just what we would have asked of a former snowboarding coach.

## The dove of peace

However, our pick is **Colombia**, for making peace in 2016. This was a colossal achievement. The conflict between Colombia's government and the Marxist insurgents of the FARC lasted for half a century and claimed perhaps 220,000 lives. At one point the country was on the brink of becoming a failed state—something that is now inconceivable. FARC guerrillas murdered with abandon, recruited children and occasionally forced girl soldiers who became pregnant to have abortions. They also ran drug, kidnapping and extortion rackets to finance their war. Government troops were brutal, too. Some of them used fake job advertisements to lure innocent men to remote places. They then killed them and claimed the corpses were rebels, making themselves seem more heroic and increasing their odds of promotion.

The nightmare ended in 2016—touch wood. President Juan Manuel Santos thrashed out a peace deal with the FARC and submitted it to a referendum. When voters narrowly rejected it, because the FARC leaders were not being punished severely enough, the two sides sat down again and answered some of the objections. The new deal is being pushed through parliament. It would have been preferable to hold another referendum. But if voters want to risk a return to war, they can vote in 2018 for a presidential candidate who promises stiffer penalties for FARC bosses. Meanwhile, rebels are poised to hand in their arms. Like most negotiated peace deals, Colombia's is incomplete and involves ugly compromises. But the alternative is worse. Colombia is a worthy winner. ■

### This year's political flavour

"Popular works" (December 3rd) identified some classic books on the rise of anger at the elites. But the man who opened up this field was Vilfredo Pareto, who placed the concept of the elite at the centre of his "Treatise on General Sociology" in 1916. James Burnham followed "The Managerial Revolution" (mentioned in your selection) with "The Machiavellians", a study of Pareto and other elite theorists. George Orwell's friend, Franz Borkeanu, devoted a whole book to Pareto. The influence is evident in "Animal Farm" and "1984".

Briefly, Pareto argued that history was marked by the rise and fall, or circulation, of governing elites. Taking his cue from Machiavelli's "The Prince", Pareto contended that established elites tend over time to degenerate into "spineless humanitarians", unable to respond forcefully to challenges. They thus lose the respect of tougher-minded conservative elements in society. A mix of feebleness and detachment undermines the elite in the face of rivals who are better-attuned to the conservative masses and prepared to behave brutally.

Vladimir Putin has been the pioneering exponent of this style of politics. The leaders of the current "revolt against the elites" in the West have signalled their tough-minded approach by proclaiming their admiration for him.

MICHAEL WILLIAMS  
*Letchworth, Hertfordshire*

I was pleased to see that Christopher Lasch's "The Revolt of the Elites" made your list. The section of the book most relevant to our present post-Brexit, post-Trump, post-truth situation is on the decline in democratic discourse:

"Increasingly information is generated by those who wish to promote something or someone—a product, a cause, a political candidate or officeholder—without arguing their case on its merits or explicitly advertising it as self-interested material either. Much of the

press, in its eagerness to inform the public, has become a conduit for the equivalent of junk mail."

GRANVILLE WILLIAMS  
*Upton, West Yorkshire*

Populism in the United States, particularly the agrarian movement of the late 1800s, was not a nationalistic or nativist movement (though there were exceptions). At the height of the populist movement in the South, freed blacks worked with white farmers to develop a political programme that would benefit both races and farmers in general. Labeling what Donald Trump espouses as populism is a misreading of the roots of a movement that was progressive. Mr Trump's rhetoric is steeped in nationalism and nativism, but it is not populism.

ALLAN MCBRIDE  
Director of Political Science  
Undergraduate Programme  
University of Southern  
Mississippi  
*Hattiesburg, Mississippi*

### Flying the flag

Your fabulous obituary of Whitney Smith (December 10th) mentioned that the modern messaging power of flags was born in the Dutch revolt against Spain in the 16th century. The National Gallery in Washington, DC, displays a Dutch painting of someone who looks like a real popinjay, dressed in mauve silks and ostrich feathers, hand on hip, pouting for the painter. But no, this foppish fellow was in fact the bravest man in his resistance regiment, as he was the one who waved a big Dutch flag in battle against the Spaniards, taunting the enemy and stiffening the resolve of the Dutch freedom fighters.

Flag-bearers were chosen for their mad courage and were tasked with being as conspicuous as possible. As a result they were often wounded or slain as the enemy's targets of choice. Indeed, in their outrageous colours, they were human flags.

STEVE FRANCE  
*Cabin John, Maryland*

### Corporation tax should go

"A costly distraction" (December 3rd) did not acknowledge the many flaws of Britain's corporation tax. Only people pay taxes, and in the case of corporation tax its burden falls on shareholders, workers and consumers in varying proportions. The economic literature suggests that about half of the cost of the tax is borne by employees, in the form of lower wages because of reduced invested capital. You say the chancellor of the exchequer should focus, among other things, on increasing labour productivity. But a reduction in the rate, and the eventual elimination, of corporation tax must be part and parcel of this effort.

DIEGO ZULUAGA  
Financial-services research  
fellow  
Institute of Economic Affairs  
*London*

### Press freedoms

Unfortunately, it was not the case that "after 1945 West Germans wisely shunned the word" *Lügenpresse*, which means "lying press" ("German memes", November 26th). After the Nazis used the term in their propaganda against the Jewish, communist and foreign press, left-wing students during the protests of 1968 recycled that exact term to disparage the liberal-conservative Axel Springer publishing company. First as tragedy then as farce.

HANS RUSINEK  
Editor  
Transform Magazin  
*Hamburg*

### Sauce control

In order to get ketchup out of a bottle ("The last drop", December 3rd) I used to add a small amount of ginger ale. A little shake did the trick and the rest of the ketchup poured out. Just as air pockets on the surface of a lotus leaf prevent water droplets from adhering, carbon-dioxide bubbles have the same effect in ketchup bottles.

ARNOLD HOLTZMAN  
*Wilmington, Delaware*

I read with interest your article on using super-slippery surfaces in bottles to get the last drop of ketchup out. The "Faber Book of Useful Verse" also gives some advice:

"When you shake a ketchup bottle,

None will come then, quite a lottle."

This has been modified to account for changes in packaging technology:

"But when you squeeze the Squeezy Bottle,

Out it comes with a big splottle."

BOB ROBINSON  
*Preston, Lancashire*

### Holiday fun (for some)

I enjoyed Schumpeter's column on super-consumers, and his conclusion that firms "ignore passionate consumers at their peril" (December 3rd). I am a super-consumer of *The Economist*, and I like the idea pioneered by the *Nation* and the *National Review* of offering cruises so that dedicated readers can hang out with their writers. You should do the same so that we can hang out with other *Economist* nerds.

TARA YOUNG  
*Las Vegas*



Writing a piece on hyper-consumers during the Christmas period brought to mind this great insight from Victor Borge: Santa Claus has the right idea; visit people only once a year.

DONALD KING  
*London* ■

Letters are welcome and should be addressed to the Editor at The Economist, 25 St James's Street, London SW1A 1HG  
E-mail: [letters@economist.com](mailto:letters@economist.com)  
More letters are available at: [Economist.com/letters](http://Economist.com/letters)

Our tower

## 25 St James's Street

*After 52 years, The Economist bids farewell to an architectural chef d'oeuvre—and a formative home*

IN THE technology editor's office: two stickers depicting passenger jets, attached lopsidedly to the window by a previous inhabitant of the room about 20 years ago, perhaps while tipsy. In the business editor's office: a heap of notebooks on the floor. In the corridors: modern art bought long ago, some of it good, all of it ignored. In your correspondent's office: two out-of-date posters about African politics, blutacked to a seven-foot-tall cupboard that he has never opened.

You can work in a building for years without really seeing it. And journalists, who pride themselves on their acuity, can be especially oblivious to their surroundings. We are a cynical bunch, who refuse to be impressed by the grand offices of company bosses and politicians—so why should we pay attention to our own? Perhaps, too, Economist writers are particularly susceptible to the delusion that their business runs on pure brain power. In 1965 an architect and a psychologist came to admire our offices. They were breezily informed that most of the journalists could work just as well in a barn.

Yet we do notice some things about the building where we have worked for the past 52 years: 25 St James's Street, just south of Piccadilly in the West End of London. Most obviously, we have a fine view. From the upper floors of the Economist tower, we are surrounded by buildings only half as high. Looking north, we can see the hills of Hampstead and Highgate. To the east are the City and the Shard. Those of us who look out to the south can use Big Ben as an office clock. Particularly spectacular sunsets trigger mass e-mails enjoining everyone to head for a west-facing window.

Walking to the entrance of our building, across a rather austere plaza, we sometimes pass groups of architecture students in drab, well-cut clothes and interesting glasses. More rarely, geologists appear to scrutinise the slabs of shell-pitted dirty-white stone in which the Economist tower and two smaller neighbouring buildings are clad. The stone's strange texture tells of an ancient seabed—and also of a trade-off between a weekly newspaper that had improbably decided to become a property developer and two bold young people who were in the process of creating a soon-to-be notorious architectural style.

If we notice our surroundings rather more in the next few months, it is because they will soon change. This is our last Christmas in a tower that was created for us. Next summer we will move into the Adelphi building, a renovated 1930s hulk near the Strand. The change is exciting and disorienting. The modern, global version of *The Economist* was created in the tower, and has been shaped by it. This sublime slab of the 1960s is the only home it has ever known.

But for two German bombs, everything might have worked out differently. The first, which fell in 1941, destroyed *The Economist's* offices in Bouverie Street, near Fleet Street—the old heart of British journalism. The newspaper fled to offices near Waterloo Bridge. In 1947 it moved to St James's, into a building that was vacant because it, too, had been bombed. Number 22 Ryder Street was not London's smartest address. It had been an upmarket brothel before the war; Nancy Balfour, the United States editor,



shocked a taxi driver by asking to be taken there. It was, say the few who remember it, a pleasant jumble of offices and corridors. But by the late 1950s it had started to pinch, and *The Economist* decided to do something radical.

It was a propitious time for architectural ambition. In 1956 the London County Council relaxed its restrictions on the heights of buildings and began to grant permission for well-designed towers that were not too close to other towers. Eight years later the national government banned most office construction in central

▶ London, in an economically illiterate effort to spread wealth around. By the time that law was unpicked, Westminster was patrolled by conservationists. *The Economist* squeezed through the only gap available.

The council nonetheless imposed a severe restriction. The development was not to exceed a plot-area ratio of five to one; that is, for every square metre of land, it could build five square metres of offices and flats. So it was vital to grab as much ground as possible. That task fell to Peter Dallas-Smith, a former navy lieutenant with an injured leg who had (to his own surprise) charmed his way to the position of managing director of *The Economist*. He expertly schmoozed the paper's neighbours, including Boodle's gentlemen's club, a bootmaker, a chemist and a bank. Some he bought out; to others he promised space in a new building. He ended up with a gently sloping site of 1,820 square metres with Ryder Street to the south and St James's Street to the west.

The obvious way of dealing with a tight plot-area ratio is to maximise two valuable things: street-front property and views. *The Economist* could have erected a two- or three-storey building hard up against St James's Street, a grand thoroughfare, and popped a tower out of the top. A template for this "podium-and-tower" approach existed: Lever House in New York, built in 1952 by the firm of Skidmore, Owings & Merrill and already much copied. One architecture firm that Dallas-Smith invited to bid for the job proposed something like it.

Alison and Peter Smithson, a married couple who ran a small architecture practice from their home in Chelsea, had a drastically different idea. Instead of maximising street frontage, they proposed abolishing it. They would knock down a tall Victorian building on St James's Street and replace it with stairs and a ramp, leading to a plaza. A car park, a restaurant and shops would be swept underneath it, visible only from the back streets. From the plaza three separate buildings would rise, like the pins in a British electrical plug. *The Economist* and the Economist Intelligence Unit, a research firm, would occupy the tallest one. A smaller tower would contain rooms for Boodle's club and flats. The third building, shorter still, but broader and with grand windows, was intended for Martin's Bank.

After only a limited competition, the paper plumped for the Smithsons' plan. That decision was "an incredible act of bravery", says their son Simon Smithson, an architect at Rogers, Stirk and Harbour. It was also a puzzle, including to the architects themselves. When *The Economist* hired them, Peter and Alison Smithson had built a suburban house in Watford and a school in Norfolk, but nothing to indicate that they could handle a complicated project in one of London's most precious districts. And Peter Smithson rather doubted that their clients read the sort of Continental architecture journals that had reviewed their work.

It probably helped that an architecture critic at the *Observer* newspaper and a Cambridge University professor sang the Smithsons' praises. And it was reassuring that the building contractors, Sir Robert McAlpine, had an experienced in-house architect named Maurice Bebb, who could steer the young couple. Perhaps, too, a weekly newspaper saw something in the Smithsons that it admired. Although the couple were never prolific builders, they were prolific writers. Words poured out of them—not always intelligible words, to those outside the charmed circle of modernist architecture, but plentiful, punchy words. One word in particular would have delighted an Economist headline-writer.

In 1953 Alison Smithson had got hold of a novel Swedish term, *nybrutalism*, and applied it to a house that she had designed in west London. "New brutalism" soon became simply "brutalism". It was a clever

word, evoking *béton brut* (raw concrete) and *art brut*, the untutored art of the mentally ill. To the Smithsons and their acolytes, it meant material frankness and clarity. In a brutalist building, steel looks like steel and concrete, of which there is often a lot, looks like concrete. A water tower looks just like a water tower.

In some ways, the Economist development is brutalist. Its buildings are massive and intelligible: the Economist tower is plainly an office block. But it does not belong to what Elain Harwood, an expert on post-war architecture, calls "high brutalism". Canonical brutalist buildings like Preston's bus depot and the National Theatre in London feature large blocks of exposed concrete. The Economist tower does not. When the Smithsons proposed raw concrete their clients had retorted that they preferred a building faced with Portland stone—the Establishment rock, which adorns buildings such as Buckingham Palace, St Paul's Cathedral and the Treasury. In the end, architects and client reached a wonderful compromise.

### The roach not passed over

Most Portland stone comes from deep in the limestone beds that form the Isle of Portland, in Dorset. It is creamy, smooth and excellent for carving. But towards the top of the beds lies a metre-thick layer of messy rock known as roach. In places, roach contains fragments of oyster shells; in others, the stone is pitted with screw-shaped holes, formed when other shells dissolved *in situ*. Roach had been used as a building material since the 18th century. But it was considered more appropriate for workaday structures such as breakwaters than for fine buildings.

The Smithsons thought it just the thing. And the contrast between the rough, shelly roach and the clear glass windows of the three modern buildings in the Economist plaza is stark and beautiful. The buildings relate cleverly to each other, too. Although they differ greatly in size and shape, with floors of varying ▶▶





► heights, they appear as a harmonious group—siblings who politely downplay their differences. On a side wall of Boodle’s club, the fourth building on the site, the Smithsons added a bay window that almost seems to have been chipped off one of the towers. That pulled an older building into the modern family.

Although they adored Dallas-Smith, the Smithsons did not warm to *The Economist’s* staff. Alison Smithson later remembered the editors as “very pretentious, as though they were the intellectual cream” and described some as the kind of people who become hysterical when they have to wait for the lifts in department stores. Yet the architects listened to their clients. Tim Tinker, who worked in the Smithsons’ practice, went to see the paper’s journalists and Economist Intelligence Unit researchers in their existing offices and noted how they worked. He remembers being struck by two things: their desire for quietness and their habit of filling their working spaces with piles of paper and other “clobber”. Two-person offices were especially good, the workers told him, because if one person was out when his or her phone rang, the other could take a message. Two-person offices is what they got—and, decades later, what many of the journalists still have.

The tower opened in 1964. Geoffrey Crowther, *The Economist’s* chairman, who had championed the Smithsons, said generously that it would be the architects’ ornament. In the future, he predicted, few would remember that *The Economist* had commissioned the buildings, just as nobody remembers who asked Christopher Wren to build St Paul’s Cathedral. Architecture critics praised the towers—and the plaza between them even more. This was large and light, partly because of the buildings’ chamfered edges. The main tower and the smaller residential tower were given modest glass-walled lobbies, paved with the same stone as the plaza, that covered only a fraction of the buildings’ footprints; the plaza seemed to extend into them. Pillars for the upper stories rose straight and unencumbered from the stone below. Their stone cladding started just above the ground, revealing their concrete core—the brutalists getting the final word in.

At that heady time, it seemed possible to think that Britain’s capital might be refashioned in the style of the Economist buildings. The plaza was just a beginning, Peter Smithson had written in 1960: “The first part of a more general system of pedestrian ways at various levels which should be an essential part of London.” George Kasabov, an assistant in his office, created a photomontage in which he repeatedly superimposed the Economist development across Westminster. “Ego, I suspect,” he says now, by way of explanation.

Some things did not work. The car park leaked. The Economist Intelligence Unit, which was (and is) independent of the newspaper, did not move in after all, thinking the building too expensive. The company scrambled to find tenants for the lower floors. The pla-

Our height gives us greater confidence in handing down Olympian judgments

za disappointed, too. The architects had imagined it thick with people, even claiming it would become a tourist attraction. But few Londoners used it to cut through St James’s—hardly surprising, as the district already has lots of pleasant streets. What the Smithsons had really created, wrote Reyner Banham, an architecture critic who nonetheless admired the achievement, was just “a stretch of inviolate pavement, free from the swinging doors of Bentleys and the insolence of commissionaires”.

Still, *The Economist* was happy in its new home, and protective of it. In the early years the journalists feared to make even small changes, lest the Smithsons disapprove. In 1972 an interior designer made some unannounced alterations to the tower, plastering some walls with blue leatherette. The staff fired off a mass letter to the chairman, declaring that they “liked it just the way it was”. The leatherette came down.

### Saved by St John-Stevas

It was a former inhabitant of the tower who saw off a bold attempt to change it. In the late 1980s *The Economist* drew up plans with Skidmore, Owings & Merrill to add two stories to the top of the building. Norman St John-Stevas, once a writer on the paper and then head of the Royal Fine Art Commission, dug in against the change, as did the Smithsons. The buildings were quickly awarded a grade II\* listing—one of the first post-war British buildings to be so protected—and the company retreated. *The Economist* was, however, allowed to make some changes to the plaza and to clad its lobby in travertine. This was ill-advised. Although travertine is a pitted limestone, like Portland roach, combining the two is rather like putting patent leather shoes on a bricklayer. Yet the splash of luxury probably helped keep rents up.

The same desire to maximise returns from an increasingly valuable building lay behind an attempt to winkle the editorial offices out. Even as the journalists were enduring messy renovations to their offices, some members of the board argued that they should go somewhere cheaper. They knew it would be a tough sell. “Sentiment should not be allowed to cloud decisions”, pleaded one, fearing the “deep emotional attachment” that the staff had formed with the building. Emotion prevailed. Still, over time more of the newspaper’s non-journalistic functions were moved to offices elsewhere, and hedge funds happy to pay a hefty rent rose up the tower like a tide.

All the while, the building was working on its ten- ►►



ants. Just as the design of prisons can make rehabilitation easier or harder, and as school buildings influence how children learn, so offices mould the people who work in them. They make some kinds of interaction easy and others hard, which shapes the way of working. Over the years the building has shaped *The Economist* in several ways, some good, some less so.

Those spectacular views from the upper floors are not just a pretty sight. Out of our windows we see a vibrant metropolis, full of cranes, which reassures us (as, in a nostalgic, populist era, we need reassuring) that the free flow of capital and people are wonderful, enriching things. Perhaps our height also gives us greater confidence in handing down Olympian judgments on world affairs. And whereas other buildings treat views as status symbols, in the tower everybody gets one, be she editor or assistant. This is deliberate; the Smithsons built as egalitarians. After finishing the Economist buildings they built a housing estate in the East End of London, Robin Hood Gardens, which was supposed to dignify working-class people. It was a disaster, and will be demolished. But they did achieve a kind of social levelling in St James's.

The views are always accessible because the distance between the windows and the large service core is only a bit under 6 metres—room just for a corridor and a single row of offices. Such small strips of floor space make open-plan offices hard. So does the tower's odd system for moving air. Most office buildings have false ceilings and a void above, through which air ducts run. The Economist tower has no false ceilings and no void: the company decided on an extra floor of offices instead. So air runs through light boxes that drop from the ceiling. These seem fine when they sit above the dividers between corridor and offices; remove the dividers, though, and they look very odd.

Everybody at *The Economist* can tell stories about the people they have shared offices with over the years—their kindness, their messiness, their noisy apple-eating. From office dialogues, stories emerge. A conversation between the energy editor and the economics editor, who share an office, turned into a cover story on the economics of cheap oil. The building makes it hard to hold larger conversations, which means less useful group thinking but also fewer unproductive mass meetings.

More troubling than the partitions between offices are the divisions between floors. We are spread over four. The 11th floor is for art, fact-checking, IT and production, the 12th is for business, finance and science reporting as well as data, online news and, now, social media, the 13th houses the editor and the British and foreign news reporters and the 14th is a hotch-potch of video production, *1843* magazine, meeting rooms and the books section. An architecture critic who visited the tower in the late 1960s noticed a worrying lack of traffic between floors, and that has persisted. The division most gossiped and kvetched about is the one between the business and finance reporters of the 12th floor and the foreign news reporters of the 13th—two tribes characterised by one long-

departed editor as Roundheads and Cavaliers. But all are unfortunate.

Almost no protests were raised when we were told in 2015 that the building would be sold and that we would leave. The sale was linked to a share buy-back as Pearson, an education publisher that had lost interest in newspapers, sold the *Financial Times*, which had a 50% stake in *The Economist*. Moreover, the offices suit us less and less well. As *The Economist* has launched new multimedia products, numbers of staff have risen. New sorts of teamwork can make our two-person cells a bit more of a restraint than they used to be.

We do, however, want to bring something of the Economist tower to our new home in the Adelphi—a modernised Art Deco building that, by coincidence, is close to the offices our bombed-out forebears occupied. A questionnaire sent to the staff asking what they wanted in a new building turned up assorted requests for better bike sheds and yoga facilities. Above all, though, people said they wanted offices much like the ones many have occupied for the past 50 years.

"People always want what they have," says Mr Kasabov. Yet that is to sell short his work, and the work of the other people who created the buildings. The architects and their clients succeeded in creating offices that seem intuitive. For five decades they have mostly just worked, without drawing attention to themselves. The buildings, too, fit into St James's despite being far more rigorous and modern than their neighbours. Even their stone has spread. Portland roach now appears on a building on King Street, a block away, and at the entrance to Green Park, the local tube station. Recently it has been used on extensions to the British Museum and BBC Broadcasting House, suggesting it has itself become unimpeachably Establishment.

As *The Economist* moves on, so will our tower. The new owners, Tishman Speyer, want to bring more life to the plaza, fulfilling the Smithsons' vision. If Westminster Council and others assent, a shop or a café could be tucked in to the ground floor of the tower. Despite their narrowness, our floors will probably become open-plan—few clients want cellular offices these days. And the buildings will get a badly needed scrub. As we without them, so they will thrive without us. At some point Crowther's prediction will presumably come true, and they will stop being called the Economist buildings. But always, the tower and the newspaper will carry traces of each other. \*

## Reindeer

## Talo on the range

Finland's reindeer herders fight to keep alive their traditions



SALLA

**D**AYBREAK on the outskirts of Salla, a town in Lapland, north of the Arctic Circle in Finland, so remote that its slogan is “Salla: In the Middle of Nowhere”. The last lambent wisps of the northern lights have vanished. Outside all is quiet.

Inside, Raisa Korpela has been up for a while. As her three daughters yawn into the kitchen she grabs hats and gloves from the detritus of childhood strewn across the room. She checks homework, brews coffee, and slips wedges of cheese between slices of rye bread for breakfast. And then her partner Aarne Aatsinki walks in, clutching a bag of organs from one of his recently slaughtered reindeer: a tongue, heart and intestines floating in bright red blood.

“I don’t know where the reindeer end and he begins,” Ms Korpela says of the man she has spent 23 years with. Mr Aatsinki’s family has been herding reindeer for centuries, part of the long almost symbiotic relationship between humans and *Rangifer tarandus*. Some of the earliest images carved on stone in Europe are of reindeer. In 1751 the “Magna Carta of the Sami”, named for the indigenous people of Arctic Europe and negotiated by the Nordic countries, gave the Sami the right to follow their reindeer across borders. Only in the 19th century, after Russia hived off Finland from Sweden, was the Swedish-Finnish border closed for the Sami. By then Finns had adopted Sami practices, using reindeer

for milk, meat, transport and as decoys for hunting other animals.

But this long relationship may be drawing to a close. Mr Aatsinki is finding it harder to make ends meet. The average herder has lost money for more than a decade and earns less than one-third of a Finnish farmer’s average wage. Mr Aatsinki and Ms Korpela both have second jobs. They worry that their children may not continue in the millennia-old tradition.

Today most of Europe’s 2m reindeer live in Russia, with another 600,000 split almost evenly across Finland, Norway and Sweden. In Finland both Sami and ethnic Finns, like Mr Aatsinki and Ms Korpela, herd reindeer. Nomadic herding is no more. Since 1898 Finland has divided the area in which herding is permitted into *pa-liskunta*, or co-operatives, which today number 54 (see map on next page). At an annual “reindeer parliament” their representatives discuss how to meet Finland’s annual reindeer quota, which is meant to avoid overgrazing.

A herder can have no more than 500 reindeer. How many any particular herder has, though, is hard to say. Asking is considered rude, says Ms Korpela—like asking a city-dweller how much he earns. Faced with such affrontery, a herder will be resolutely non-quantitative: “I have reindeer on both sides of the tree,” is the most you are likely to get.

The reindeer industry comprises less than 1% of all Finnish meat production. But swish Helsinki restaurants have embraced the lean meat. Michelin-starred Chef & Sommelier has offered dehydrated reindeer heart atop a Jerusalem artichoke. Ari Ruoho, head chef at Nokka, says that his reindeer tartare tastes like tuna sashimi and goes well with a fruity Italian red. He adds that meat butchered in autumn carries the flavour of mushrooms, on which reindeer graze to build up fat for the winter.

But overall meat production is falling. Across Finland, 71,580 reindeer were slaughtered in 2013-14, versus 127,999 in 1994-95. Herders say this is because they are not the only ones after the reindeer. Their biggest worry is wolverines, which since 1995 have been protected by Finnish hunting regulations; almost as if they know this, more and more have come over the border from Russia. A family group of wolverines can get through 90-odd reindeer a year. They, like the herders, favour the calves, so to keep the herd size stable, the herders have to take less.

More predators mean more money spent protecting herds. To be fair, it also means more compensation for reindeer killed by carnivores. There were 344 reindeer claims in 1986, 4,126 in 2013-14. But to claim the compensation the herders have to find their ravaged ►►



▶ reindeer—no easy task in dark, frozen forests.

Predators also have a social effect on herders. When some lose animals but others do not, this creates tensions within the collective. And in a communal activity like reindeer herding such tensions could threaten some co-operatives' future.

All of which led your correspondent to wonder, after two days spent mostly among dead or soon-to-be dead reindeer, hearing stories about vicious wolverines and poor herders, about the practice's enduring appeal. Why were these Finns working so hard to preserve a loss-making business? A day in the company of Lauri Aatsinki, Aarne's father, Ms Korpela and other Salla herders as they searched for still-breathing reindeer provided something of an answer.

Like many Finns, the elder Mr Aatsinki, who has been herding for 70 years, is not terribly loquacious. Asked why he still goes out, at the age of 80, in sub-zero temperatures, he replies, "I just do it. This is a normal day." Questions about why he just does it provoke befuddlement, as if a swallow were asked why he heads south for the winter. "I just do it," he says. "It's not a miracle."

The other herders are similarly laconic. Stepping out of the van, the elder Mr Aatsinki and Ms Korpela greet a dozen or so of their friends heating kettles and sausages on a campfire. Lauri sits next to Mauri, an old friend whose first round-up took place in 1961, after his father had told him and his two brothers that at least one of them had to carry on his legacy.

### A natural struggle

Mauri, now retired from his other job in forestry, rarely misses a day of herding. "I don't know why I still come," he says. Ms Korpela says that for these men "it's a way of life." The younger Mr Aatsinki agrees, adding that one can only be born a herder.

At first the idea that this is simply done because it is done seems unsatisfying. Surely the opportunity to be at one with nature offers something inspiring, something sublime. But if it does, the taciturn Finns are not saying. Herders rarely mention their love of nature, says Ms Korpela. "It's obvious so we forget," adds Rainer Hourula, another herder, looking up at the cobalt sky.

Tim Ingold, a British anthropologist, has noted that the Sami and the Finns both find their identity in nature, but in different ways. The Sami derive meaning from the forest. Their landscape is benign. In Sami communities "one works with the world, not *against* it." But for Finns the forest is something to exploit, whether for lumber (the "green gold") or reindeer. "Life for [the Finns] is regarded as a struggle," Mr Ingold has written, "in which people pit their energies against nature." Through such struggles a "fiercely" Finnish form of rugged individualism emerges, something "as much emotional as rational".

And for many of the Salla herders, this struggle brings with it something special; they never feel alone. Mr Hourula, now 54 years old, took over his father's herd when he was just 15. "I am an only child," he says. "This is my extended family". Noora Kotala, the partner of Mauri's nephew, voices a similar sentiment. She shows the pendant her partner gave her, a replica of her bespoke calf marking. For a herder this is a sure sign of commitment. *Paliskunta* issue every reindeer owner a pattern that they cut into the ears of newborn calves. Today there are about 12,000 unique marks. Looking at hers, Ms Kotala says: "Once you start with reindeer then you can't give it up."

Mr Ingold wrote about the importance of the word *talo*. Roughly translated, it means house. But it also has a deeper meaning. When Finnish herders are raised in a *talo*, it is not simply that they grow up in one place. "A house," explains Mr Ingold, "is a total establishment, an organic unity of place and people, cumulatively

built up through the work of generations." It is not something that can be shaken off. When Aarne says that herders are "born" to do it he is not being flippant. Like his father, he feels he had little choice. Nor does he regret that. Raisa explains that "this is what we want to do. There's a richness to this wild way of life."

That remains true even as threats from climate change, logging and other signs of expanding human footprints impinge on their vast emptiness. But throughout the centuries herders have adapted to changes wrought from outside. They have embraced GPS tracking, all-terrain vehicles (ATVs) and drones.

After five chilly hours, the herders finally receive the call: the reindeer have been spotted. Some spring into their ATVs and drive off in clouds of dust, while others prepare to marshal the animals into the corral when they return.

Suddenly Ms Korpela leaps off the rock. "Let's go," she shouts. Approaching is a blur of brown and white, like an avalanche of dirty snow pouring through the trees. Not far behind are the cowboys driving in semi-circle formation, herding hundreds upon hundreds of reindeer. Though the forest stretches as far as the eye can see, they have managed to nudge the animals into a queue no more than 30 meters wide. Within seconds the reindeer funnel into a wooden corral the size and shape of a velodrome. The cowboys jump off their vehicles and the herders jog inside after the reindeer, shutting the fence behind them.

To the untutored observer it is all a blur. But Ms Korpela has spotted something. In the throng are familiar calf marks. They belong to a reindeer that goes by the name of Kepo (pictured, with Ms Korpela, on the previous page). She had thought this member of her herd to be lost for good. "Kepo has found her home!" she says with delight.

As friends gather around to stroke Kepo's furry antlers, it seems she is not the only one. \*



Vienna

## City of the century

*How a fin-de-siècle imperial capital produced ideas that shaped the West*

VIENNA

**A**CROSS the cobbles of Vienna's Michaelerplatz the world of empires, waltzes and mutton-chop whiskers glowers at the modern age of psychoanalysis, atonal music and clean shaves. In one corner, the monumental, neo-baroque entrance to the Hofburg palace, seat of the Habsburgs; in the other, the Looshaus, all straight lines and smooth façades, one of the first buildings in the international style. This outcrop of modernism, designed by Adolf Loos, was completed in 1911, less than 20 years after the dome-topped palace entrance it faces. But the building embodied such a different aesthetic, such a contrary world view, that some wondered whether a society that produced such opposites in quick succession could survive. The emperor Franz Joseph is said to have kept the curtains drawn so he would not have to look at the new world across the square.

The sceptics were right. Imperial Viennese society could not survive. But the ideas and art brought forth during the fecund period of Viennese history from the late 1880s to the 1920s endured—from Loos's modernist architecture to Gustav Klimt's symbolist canvasses, from Schoenberg's atonal music and Mahler's *Sturm und Drang* to Ludwig Wittgenstein's philosophy. Those Viennese who escaped Nazism went on to sustain the West during the cold war, and to restore the traditions of empiricism and liberal democracy.

This ferment was part of a generational revolution that swept Europe at the end of the 19th century, from Berlin to London. But the Viennese rebellion was more intense, and more wide-ranging. And it provoked a more extreme reaction. Hitler arrived in Vienna from the Austrian provinces in 1908 and developed his theories of race and power there. Vienna was thus the cradle of modernism and fascism, liberalism and totalitarianism: the currents that have shaped much of Western thought and politics since Vienna itself started to implode in 1916 until the present day. It has been the Viennese century.

What distinguished pre-1914 Vienna from most other European capitals, and what gave the Viennese school its particular intellectual tang, was that it was an imperial city rather than a national capital. Vienna was the heart of an Austro-Hungarian empire of about 53m people that stretched from Innsbruck in the west almost as far as the Black Sea in the east. After 1867 the empire was divided into two: a Magyar-dominated Hungary, ruled from Budapest, and a heterogeneous, multi-ethnic, multilingual other half, ruled from Vienna. In deference to its multinational character, this half was not called Austria but was often referred to as Cisleithania, named after a tributary of the Danube.

In the second half of the 19th century Franz Joseph's subjects poured into the city: Italians, Slovaks, Poles, Slovenians, Moravians, Germans and, especially, Czechs. By 1910 Vienna had a population of 2m, the sixth-biggest city in the world. Fortunes made in the fast-industrialising empire, many by Jewish and assimilated Jewish families such as the Wittgensteins and Ephrussi, changed the urban landscape. Their enormous palaces adorned the Ringstrasse, the city's most elegant boulevard. By 1914 Jews made up about 5% of Cisleithania's population. They did not enjoy rights as a nationality or language group, but benefited from full civil rights as individuals. As Carl Schorske, the greatest historian of the period has written, they "became the supranational people of the multinational state, the one folk which, in effect, stepped into the



*Interior of a Viennese café: Artist unknown*

shoes of the earlier aristocracy. Their fortunes rose and fell with those of the liberal, cosmopolitan state."

Vienna was a mixture of classes and nationalities, faiths and worldviews. Order a *Wiener melange* in a Viennese coffee-house today, suggests Steven Beller, a historian of Austria, stir the hot milk into your bitter coffee, and imperial Viennese culture emerges, a dissolving of differences to produce something fresh. The Viennese cultural elite encouraged intellectual collisions to give birth to the new. "There was sperm in the air," as the writer Stefan Zweig somewhat off-puttingly put it.

Amid a babble of peoples and languages—one in which, as elsewhere at the time, gender roles were being redefined—Viennese thinking was driven by an urge to find universal forms of communication. It aimed to discover what people had in common behind the façade of social convention, "to show modern man his true face", in the words of Otto Wagner, an architect. Out of this came some of the most important intellectual schools of the 20th century, as well as the influential, and often highly eccentric, characters who went with it. These included one Sigmund Freud, who developed psychoanalysis in Vienna, in order to expose the common archetypes of the unconscious.

Ludwig Wittgenstein's "Tractatus Logico-Philosophicus" remains the most famous text of Viennese philosophy. The pioneering logical positivism of the Vienna Circle, dominated by Moritz Schlick and Rudolf Carnap (both originally from Germany) was probably of greater influence, setting the scene for modern analytical philosophy with its strong affinity for the

▶ sciences. The most accomplished of the circle was Otto Neurath. On top of his philosophy, he revolutionised the transmission of knowledge with new ways of translating complex information into simple, graphic pictograms: to make knowledge accessible was to make it democratic. All sorts of formats for data visualisation in use today can be traced back to these “Isotypes” (example on next page).

The Viennese school also pushed into new fields, such as, famously, sex. Before Freud, there was Richard Krafft-Ebbing, who studied in Graz before coming to Vienna and in 1886 published “Psychopathia Sexualis,” the first attempt to apply some rigorous methodology to the study of sexuality. He drew on court cases to analyse homosexuality and bisexuality (albeit often in Latin). His work popularised the terms sadism and masochism. (Leopold von Sacher-Masoch, eponym to the latter and author of “Venus in Furs,” though a subject of the emperor, was not Viennese.)

It was partly the emperor himself who opened the way to modern sensibilities. Ultra-conservative in taste he may have been, but Franz Joseph’s duty was to all the peoples of his empire, and he tried to guarantee the freedoms—of movement, of religion, of the press and of equal rights—that the liberal constitution of 1867 enshrined. So Europe’s crustiest old monarchy often supported some of the most avant-garde artistic projects of the day, such as the Vienna Secession movement of 1897, in the interests of strengthening the universal language of art and architecture that might unite the empire. Secession artists were engaged to design the empire’s postage stamps and currency. The emperor might have drawn his curtains against the Looshaus, but he let it be built.

### Anschluss and after

The tensions and collisions so fruitful to the cultural life of its capital were less salutary for the empire as a whole. Assailed by the rising forces of nationalism, particularly pan-Germanism, the cosmopolitan state began to crumble. The influx of peoples to Vienna provoked increasing resentment among the German working class; immigrant Czechs in particular proved willing to work for less money in worse conditions. At the same time Czech, Serbian and other nationalists increasingly agitated for independence.

Jews, as the supranational people of the multi-ethnic state, readily became the target of every nationalist enemy of the empire. Georg Schoenerer, son of a successful Viennese industrialist, was the first to turn anti-Semitism into a political programme, denouncing the “sucking vampires” who knocked at the “narrow-windowed house of the German farmer and craftsmen”. Unemployment, rising prices and a lack of housing in Vienna fuelled the anger of many Germans after 1900, leading to frequent riots and violent attacks on other nationalities. Karl Lueger channelled Schoenerer’s anti-Semitism into a political movement, campaigning to be mayor on the slogan “Vienna is German and must remain German”. His explicit rejection of the multi-ethnic character of Vienna brought him into direct conflict with the emperor. Lueger won a majority on the city council to elect him mayor in 1895, but for two years Franz Joseph nobly refused to appoint him because of his anti-Semitism. Eventually, in 1897, Franz Joseph bowed to popular pressure, and Lueger ruled the city until 1910.

That, essentially, was the beginning of the end of liberal Vienna. After the war and the end of the monarchy there was a brief flourishing of progressive social democracy in the city, the era of “Red Vienna”. But all the time, in the new, truncated republic of Austria the more conservative provinces slowly tightened their grip on the country. In 1933 Engelbert Dolfuss seized power in the name of Austrofascism, which gave way to Nazi fascism in 1938 with the *Anschluss*.

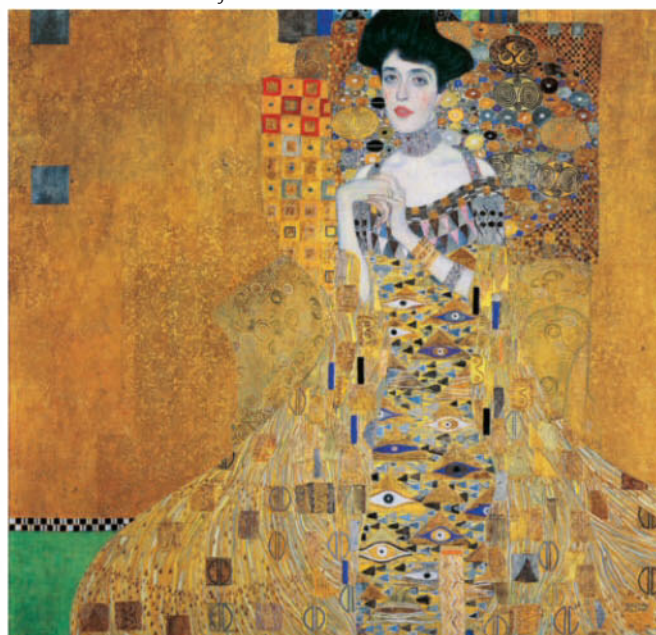
Hitler, who moved to Vienna from Linz in upper Austria, had been transfixed by Schoenerer and, particularly, Lueger. He hungrily absorbed all his hero’s complaints about the Jews and the mixing of “races”; he called the Viennese a “repulsive bunch”. Thus liberal Vienna had produced its exact opposite: militant nationalism and anti-Semitism. During the interwar years these forces gradually took hold of the new Austria and from the 1920s onwards many began to flee abroad. One of the last out, in 1938, was Freud.

Most of the exiles went to Britain and America, where they were often gratefully received. The most valuable aspect of Viennese thinking for the West at the time was the application of up-to-date “scientific” methods to fields that had previously been left to amateur theorising, or that had been altogether neglected. This transformed many aspects of life.

Take the work of Charlotte Buehler, a pioneer in child psychology. She was born in Berlin to Jewish parents, but moved to Vienna, together with her husband Karl, in 1922. At the University of Vienna, through painstaking direct observation, the Buehlers worked out their influential response-testing techniques: ways to calibrate a child’s development, through the accomplishment of gradually more complex tasks. These tests are, in effect, still in use today. By six months, an infant should be able to distinguish between a bottle and a rubber doll. At 18 months, he or she was expected to respond to the order “No”.

Often the Viennese intellectuals leapt ahead by transferring knowledge gained in one discipline to others, gloriously indifferent to the mind-forged manacles that have come to stifle modern academia and research. In America, several Viennese-trained devotees of Freud used the tools of psychoanalysis to revolutionise business. Ernest Dichter, author of “The Strategy of Desire,” transformed the fortunes of companies through marketing that purposely tapped into consumers’ subliminal desires. ▶▶

Portrait of Adele Bloch-Bauer I: Gustav Klimt



▶ Another example was Paul Lazarsfeld, the founder of modern American sociology. Born of Jewish parents, he studied maths in Vienna, completing his doctorate on Einstein's gravitational theory, and thereafter applied his expertise in data and quantitative methods to what became known as opinion, or market research—finding out what people really feel about anything from television programmes to presidential candidates. In Vienna in 1931 he conducted the first scientific survey of radio listeners, and also co-wrote a revolutionary study of the devastating social and psychological impacts of unemployment. His team of investigators conducted what is now called “field research”, meticulously recording the results of face-to-face interviews with laid-off factory workers in the town of Marienthal.

Moving to America in 1933, Lazarsfeld went on to found the Columbia University Bureau for Social Research. His team was the first to use focus groups, developed with Dichter, his one-time student, and statistical analysis to delve into the mysteries of voter and consumer preferences or the impact of the emerging mass media. Lazarsfeld and others thus helped revivify moribund, antiquarian modes of inquiry, and re-equip them with the latest Viennese techniques, often saving entire Western intellectual traditions from decrepitude, or possibly extinction.

### Pilgrims on the mountain

Of no field was this truer than political economy, where the “Austrian school” of men like Joseph Schumpeter, Ludwig von Mises and Friedrich Hayek strongly influenced the revival of liberalism and conservatism in the West after the second world war. These three were all quintessential products of late Habsburg Vienna. They were born in very different parts of the empire: von Mises of Jewish parents in Galicia (now Ukraine); Schumpeter of Catholic German-speaking parents in Moravia, now part of the Czech Republic; and Hayek in Vienna itself. Yet they were all schooled in the same liberal intellectual discipline.

Von Mises and Hayek, one of his students, saw earlier than most that by the interwar years the liberal era in Europe was being overwhelmed by the collectivism and totalitarianism of the right and the left. They subsequently devoted their lives to reversing the tide. Hayek, like the best of Vienna's intellectuals, combined technical expertise in economics with a wide breadth of inquiry; as well as economics, he published on law, sociology and more. His greatest contribution was to restore intellectual rigour to the free-market school, expositing in detail the “price mechanism” to show that socialist economics could not possibly work in theory, let alone practice.

But Hayek was not just a dry theorist. He was also a relentless circus-master for the liberal cause. Emigrating to Britain in 1931, he was the author of the first call to arms for the liberal fightback, “The Road to Serfdom,” published in 1944. This was provocatively dedicated to the “Socialists of all Parties”, implying that at the end of the second world war all Britain's political parties, including Winston Churchill's Conservatives, had drifted into collectivism by advocating the welfare state.

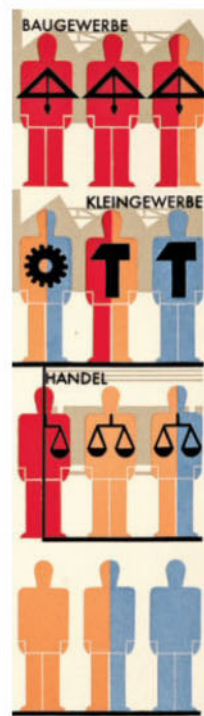
To organise the fightback he founded the Mont Pelerin Society (MPS) in 1947. Named after the Swiss mountain where the first meeting was held (simply because the founding members

couldn't agree on a more appropriate alternative), the MPS was Hayek's own Circle for liberalism. It fused the Viennese liberals in exile, including Karl Popper, who had just published *The Open Society and its Enemies*, with their embattled fellow-travellers from Germany, France, Britain and America, most notably Milton Friedman. Over the next decades the MPS spawned scores of think-tanks around the world dedicated to spreading the word of the Austrian school. Politicians often attended their meetings. The “Chicago school” of economists was made up largely of MPS members. After decades of quiet campaigning, Hayek's ideas were taken up again by a subsequent generation of politicians in the mid-1970s, including Margaret Thatcher and Ronald Reagan.

The consensus on free markets and democracy won in the 1980s remained intact for decades—a tribute, in part, to the intellectual efforts of Franz Joseph's Viennese. It also provides a clue as to why they have been so influential in the West. The Viennese school placed the lived experience of individuals—rather than the abstractions of class, race and nationalism favoured by their opponents—at the heart of their intellectual enterprises. Thus the empirical research of a Buehler or a Lazarsfeld tended to work with the “the crooked timber of humanity”, as Immanuel Kant put it, rather than trying to straighten it out, as Marxists, fascists and all systematisers try to do. After a lecture by John Maynard Keynes, always the systematiser, Vienna-born Peter Drucker, the founder of modern management theory, saw the distinction in clear relief: “I suddenly realised that Keynes and all the brilliant economic students in the room were interested in the behaviour of commodities, while I was interested in the behaviour of people.”

For this reason alone, the Viennese tended to be more persuasive than their competitors. Furthermore, the stress on the individual also chimed with the exigencies of an exhausted West taking on the Soviet Union in the cold war after 1947. The Viennese émigrés were vital in sharpening the intellectual and cultural claims of liberal democracy at a time when many young people in the West had deserted to more fashionable leftist causes. They were swiftly promoted to university posts and other influential positions by their Anglo-Saxon admirers. The Viennese could articulate a more convincing defence of freedom because they had direct personal experience of the totalitarian enemy.

However, the freedom that the Viennese espoused came at a price; self-expression could be accomplished only by intellectual rigour and self-discipline. Even at the time this was too much to bear for many of Vienna's young, several of whom committed suicide as they fell short of their own high standards—three of Ludwig Wittgenstein's brothers took their own lives. Today, if this year's elections are any guide, politicians and demagogues seem content to wrap themselves in the language of freedom while abandoning any obligations to intellectual rigour or self-discipline. The Viennese century has ended. Its legacy is fraying. \*



Isotype: Otto Neurath

## Domesday economics

## Brentry

*How the Norman conquest shaped the English economy*

BAYEUX

THE Norman conquest of England, led exactly 950 years ago by William, Duke of Normandy (“the Conqueror”), was the single greatest political change England has ever seen. It was also very brutal. The Anglo-Saxon aristocracy was stripped of its assets, and many of its members suffered the humiliation of being forced to work on land they had once owned. Even today, conquest by the French is still a touchy subject in some circles.

Nigel Farage, the on-and-off leader of the UK Independence Party, is known to wear a tie depicting the Bayeux tapestry, a 70-metre long piece of embroidery depicting the event, to remind Britons of “the last time we were invaded and taken over”. The tapestry is peppered with severed limbs and heads of vanquished Englishmen. Other supporters of Brexit–Britain’s exit from the European Union–use the language of the conquest to describe the nation’s “domination” by faceless EU institutions. Academics have held similar opinions. “[F]rom the Englishman’s point of view, the Norman conquest was a catastrophe,” argued Rex Wellton Finn of Cambridge University in 1971.

But, while the blood and guts were horrifying, the conquest also did a lot of good. It transformed the English economy. Institutions, trade patterns and investment all improved. It brought some of the British Isles into European circles of trade (“Brentry”, if you will) and sparked a long economic boom in England which made the country comparatively rich. The conquest and its aftermath also set a wealthy south apart from a poor north, a geographical divide that continues to this day. From those tumultuous decades on, England was indelibly European—and a lot stronger for it. The Norman conquest made England.

The reasons for the invasion were complex. Early in 1066 Edward the Confessor, then king of England, had died heirless, sparking a crisis of succession. His brother-in-law, Harold Godwinson, took over. But Harold’s claim to the throne was weak and he faced resistance, especially in the north of the country. William, Duke of Normandy, just across the English Channel, reckoned that he was the rightful heir: according to William of Poitiers, a chronicler, Edward had said that he wanted the young William to succeed him.

The Bayeux tapestry shows what happened next. In September William invaded from France with an enormous army. At the Battle of Hastings, on the southern coast of England, Harold was killed and his body mutilated (one account describes how a Norman knight “liquefied his entrails with a spear”). William went on to be crowned on Christmas Day, 1066.

He celebrated his coronation by going hunting and hawking, but then got down to business. The Anglo-Saxon system of government and economy was razed to the ground. The lands of over 4,000 English lords passed to fewer than 200 Norman and French barons. The English were removed from high governmental and ecclesiastical office. By 1073 only two English bishops were left, according to Hugh Thomas of the University of Miami.

The best source for assessing the impact of the Norman conquest is the Domesday Book, a survey of English wealth commissioned by William in 1085. For 13,418 places under William’s rule, Domesday Book contains data both on who the owner of the estate was and how valuable it was as measured by how much



“geld”, or land tax, it could yield in a year. For some counties, it also tallied the population, the amount of livestock and even the ploughs. Its thoroughness suggested it could have been used for a final reckoning on the day of judgment—hence the name. Its 2m words of Latin, originally inscribed on sheepskin parchment in black and red ink, were recently digitised by researchers at the University of Hull.

Respondents to the survey were generally asked to give answers corresponding to three time periods: 1066, 1086 and an intermediate period shortly after 1066, which reflects when the manor was first granted to its existing owner. This makes it possible to perform a before-and-after analysis of the conquest.

The invasion certainly caused damage in the short term. In Sussex, where William’s army landed, wealth fell by 40% as the Normans sought to assert control by destroying capital. From Hastings to London, estates fell in value wherever the Normans marched. One academic paper from 1898 suggested that certain manors in the counties around London were much less valuable by 1070 than they had been in 1066. Despite this ►►

► initial damage, however, the conquest ended up helping the English economy. Wonks have long supposed that immigration tends to boost trade: newcomers are familiar with their home markets and like to export there. The Normans were invaders, not immigrants, but Edward Miller and John Hatcher of Cambridge University conclude that the “generations after 1066 saw a progressive expansion both of the scale and the value of...external commerce.” English wool, in particular, was popular on the continent.

Brentry also helped the financial system develop. Jews arrived at William’s invitation, if not command, and introduced a network of credit links between his new English lands and his French ones. Unhindered by Christian usury laws, Jews were the predominant lenders in England by the 13th century. The discovery of precious metals from central European mines also helped get credit going. Jews settled in towns where there was a significant mint. England was still a violently anti-Semitic place, though, and its Jews were expelled by the 14th century.

The Normans took some policy decisions that would meet with the approval of modern economists: at a time of radical uncertainty, they ramped up infrastructure spending. Within 50 years every English cathedral church and most big abbeys had been razed to the ground, and rebuilt in a new continental style, says George Garnett of Oxford University. He points out that no English cathedral retains any masonry above ground which dates from before the conquest.

New castles and palaces came too. A book on churchbuilding published in 1979 documents a sharp increase in new projects in the 12th century, leading to an eventual peak of new starts around 1280. All these changes helped the economy along. Domesday Book suggests that, contrary to popular belief, the English economy had fully recovered by 1086. Data for some estates can be spotty: but a conservative reading of the book shows that the aggregate wealth of England barely changed in the two decades following Brentry. Taken at face value, total wealth actually increased. Of the 26 counties for which there are decent data, half actually rose in value.

Things only got better. Real GDP growth in 1086-1300 was probably two to three times what it was in the pre-conquest period. GDP per person grew strongly, too, perhaps from £1.70 in 1086 (in 1688 prices) to £3.30 by 1300. Mr Thomas suggests that productivity may have improved. To fund the infrastructure heavier taxes had to be levied on peasants, which “forced them to work harder”.

People had more money, and they wanted to spend it. According to a paper by John Langdon and James Masschaele, prior to the 12th century only a very small number of fairs and markets can be documented. About 60 markets are mentioned in Domesday Book. But traders and suppliers bloomed as the economy expanded: around 350 markets existed by the end of the 12th century.

The rapid commercialisation of the English economy had profound effects on workers. Slaves, a significant minority of the population before the invasion, were freed: in Essex, their number fell by a quarter in 1066-86. Lanfranc of Pavia, William’s appointee as archbishop of Canterbury, opposed the export of slaves, finds Mr Thomas; Christian thinkers tended to have “mild qualms” about slavery. By the 12th century, it had almost completely ended.

Labour became more specialised, and more people became self-employed or worked for wages. The share of the population living in towns rose from 10% in 1086 to 15-20% by the turn of the 14th century (London’s population soared). Over 100 new towns were founded in 1100-1300; the

“In mad fury  
I descended  
on the English  
of the north  
like a raging  
lion”

population of England jumped from 2.25m to 6m.

Though the country as a whole fared well, not every part of it did. The conquest was longer-lasting and more brutal in the north. People in places like Northumbria and York did not consider themselves English, let alone French (their allegiances were more with the Scots and Scandinavians). So they launched a series of rebellions shortly after the Normans took power.

William showed no mercy in crushing them. His campaigns came to be known as the “harrying of the north”. According to Orderic Vitalis, another chronicler, on his deathbed William recalled what he had done. “In mad fury I descended on the English of the north like a raging lion...Herds of sheep and cattle [were] slaughtered [and] I chastised a great multitude of men and women with the lash of starvation.”

According to Domesday Book, in 1066 estates in southern England were somewhat richer than northern ones. But with Brentry, the gap jumped: by 1086 southern estates were four times as wealthy. The scale of the destruction was astonishing. A third of manors in northern counties were marked as “waste”. In Yorkshire, the county hardest hit, 60% of manors were considered to be at least “partially waste”, while total wealth fell by 68%. The population of York, the city at the centre of the harrying, probably halved. In 1086, no part of the country north of present-day Birmingham had an income per household higher than the national average. The country grew more unequal: the Gini coefficient of English manors rose from 64 before the invasion to 71 after (a Gini coefficient of 100 would mark perfect inequality). In terms of average estate wealth, the richest county was seven times richer than the poorest in 1066, but 18 times richer in 1086.

The north may always have been destined for relative poverty: it has poorer land and a worse climate; it is farther from markets. But economic history shows that long-ago events can leave lasting scars. William’s deprivations could well explain, in part, the northern poverty that gives modern Britain Europe’s highest regional inequality. And, almost a millennium later, descendants of the conquerors still enjoy disproportionate privilege; Gregory Clark, an economist at the University of California, Davis, finds that students with Norman surnames from Domesday are still over-represented at the universities of Oxford and Cambridge. So it may not be surprising that the regions which suffered worst in the conquest were more likely to have voted to throw off the modern Norman yoke in the Brexit referendum. But expect no economic good to come from it. \*



## Prison tattoos

## Crime, ink

An analysis of the art on convicts' bodies

LOS ANGELES

IN THE mid-1990s a man named Frank, recently released from prison, came to Gregory Boyle, a Jesuit priest in Los Angeles, for help. Frank was having a difficult time finding a job, in part because of his chequered past. It probably wasn't helping that he had the words "FUCK THE WORLD" inked across his forehead.

Father Boyle hired Frank to work at a bakery he had set up to provide jobs to people trying to go straight. He also found a doctor to help remove his act of nihilistic rebellion from his face. The bakery was the first business in what is now Homeboy Industries, a non-profit which has since grown to be America's largest gang-rehabilitation centre, offering employment and other services to hundreds of former gang members. Its free tattoo-removal service has become the organisation's biggest claim to fame.

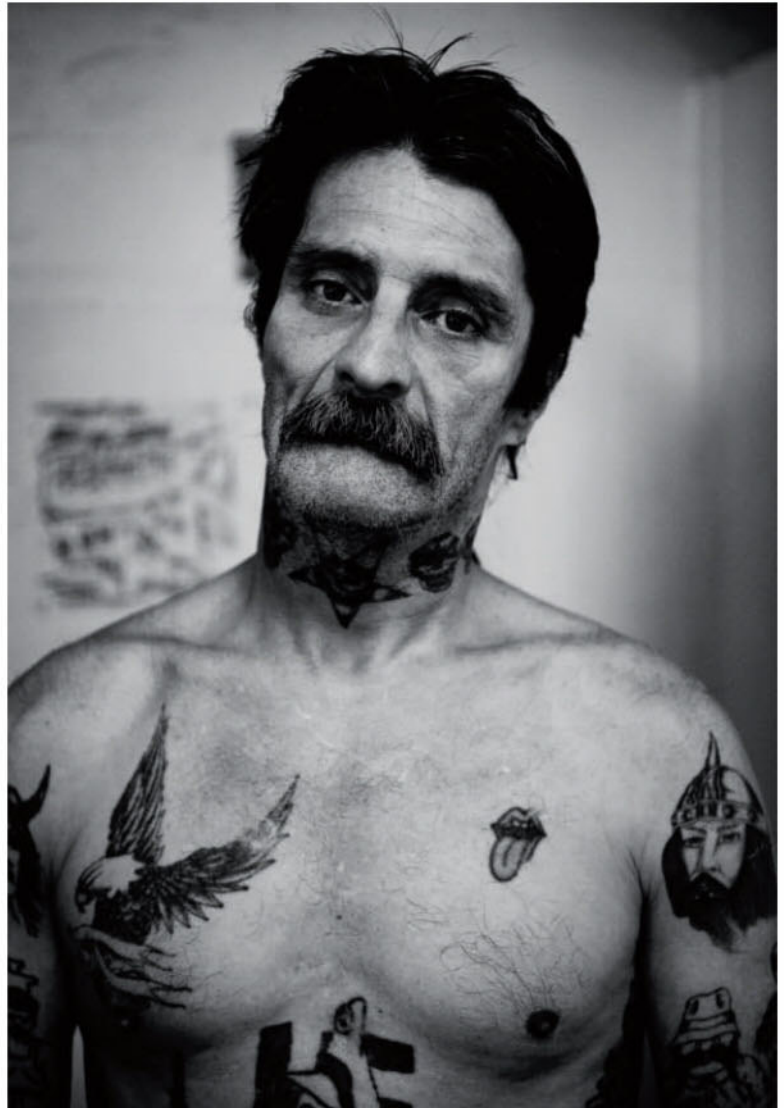
Such programmes are spreading all across America. Half a mile from Homeboy, at the Twin Towers correctional facility, a Los Angeles County jail, inmates on good behaviour are eligible to have their tattoos removed free of charge while still incarcerated. The process is painful—one ex-convict describes it as being hit by a rubber band that's on fire—and can take multiple sessions stretching over months. But many decide that changing the personal yet public messages written on their skin makes the pain worth facing.

Talking to the prisoners reveals that sometimes it is the personal that matters most. When asked what suddenly spurred him to want to erase the name of an ex-girlfriend, Edward Marron at Twin Towers responded matter-of-factly that his "baby's mom didn't like it". (On his left arm the name of another ex-girlfriend is almost but not entirely obscured by a cover-up tattoo of a tree.) Some just resent the shoddy craftsmanship of their prison ink—one inmate wants to have his Pittsburgh Steelers tattoo removed so it could be redrawn by a professional.

However, tattoo removal can be a more meaningful endeavour: zapping away an old tattoo can change how others see you. When those others are judges, or prospective employers, that can be good; when they are erstwhile gang-mates, it can carry risks. Perhaps most important, removing your tattoos can also change how you see yourself.

### The personal is statistical

Individuals choose to write stuff on their bodies—or erase it—because of what that specific tattoo means to them. But the prevalence of tattooing in America's prison population means that, in principle, it should be possible to formulate general rules about what people say on their bodies, too—to add a statistical meaning



to the tattoo's biographical, or simply graphical, one. *The Economist* decided to investigate what inferences about a life of crime it might be possible to draw from different types, and numbers, of tattoos.

The websites of many state prisons feature public, searchable databases of their inmates. The data usually include their names, height, weight, demographics, criminal histories, and, sometimes, whether or not they have any distinguishing marks, including tattoos. The most impressive of these, for our purposes, was that of the Florida Department of Corrections (FDOC): a downloadable database featuring records for all the 100,000 inmates currently incarcerated in the Florida state prison system. It provides a great deal of detail on ►►

▶ their markings as well as their ethnicity, age and crimes. With a few lines of code it is possible to discover what tattoos a particular Florida inmate has, and where on their body they are located.

The most obvious thing these data show is just how common tattoos are. Our tabulations of the data show that three-quarters of the Florida prison population has at least one tattoo; the median inmate has three. The data also confirm how generational criminal tattoos are: a whopping 85% of prisoners under 35 have tattoos compared with 43% for prisoners aged 55 and over. In the public at large the rate is 23%. The majority of these tattoos have no explicit associations with the criminal world. The most popular designs and motifs include names, animals, mythical creatures (dragons and unicorns are especially vogue) and Christian symbols such as crosses, rosary beads and scrolls with verses from scripture.

The database shows relatively few inmates with overtly criminal tattoos. For example, 15% of white inmates had heart tattoos, while just 3% had tattoos relating to the white-supremacist movement. Some tattoos reflect remorse: at least 117 inmates have tattoos with variations of the phrase “Mother tried”. Thirty-one Florida inmates appear to be big fans of the hip-hop group NWA, sporting “Fuck the police” tattoos. Some tattoos are humorous: at least seven inmates have the words “Your name” tattooed on their penises.

Different demographic groups opt for very different tattoos. Unsurprisingly, white inmates are more likely to feature images associated with the white-supremacist movement: swastikas, Iron Crosses and the like. Hispanic inmates, often raised in Catholic households, favour Christian imagery: the Virgin Mary is a common subject. Black inmates prefer words, eg “Precious”, and often carry slogans relating to gang life. Female inmates are more likely to carry tattoos of butterflies, hearts and the reminder that “This too shall pass” (“Boss bitch” isn’t often seen on men, either). Male inmates are more likely to have tattoos of images directly relating to incarceration such as prison bars and guard towers.

If people’s ethnicity and sex determines their tattoos, can the same be said of their types of crime? Using data from the FDOC, *The Economist* built a series of statistical models to predict the likelihood criminals had committed particular crimes based on their demographic traits and choices of tattoos (see table).

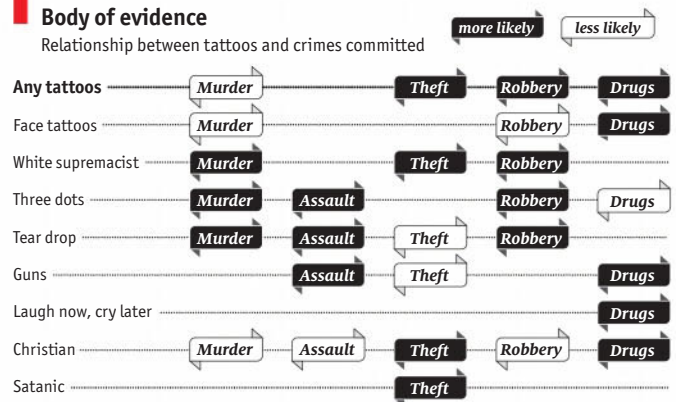
Our analysis finds that inmates convicted of property crimes and weapons-possession offences have the most tattoos, while sex offenders, particularly those convicted of paedophilia, tend to have the fewest. Inmates with at least one tattoo were actually 9% less likely to have been incarcerated for murder than those without. The effect is even more pronounced for those with tattoos on the head or face, who are around 30% less likely to be murderers. Similar associations can be found for perpetrators of domestic crimes. Those relationships hold even after controlling for age, race and sex.

Some prison-specific motifs are also more common among the less violent. These include tattoos of clocks without hands, prison walls and spider webs, all reflecting the tedium of incarceration, and a popular tattoo depicting the thespian masks of comedy and tragedy along with the slogan “Laugh now, cry later”. Such tattoos are positively associated with low-level offences, but negatively associated with homicide.

Inmates with Christian tattoos—that is, those inked with images or passages from scripture—do seem to be slightly more virtuous. They are 10% less likely to be murderers than those without (this result holds regardless of any difference in types of crime committed between Hispanic and other prisoners). But though the godly may be slightly more good, the devilish are not obviously more evil; tattoos featuring pentagrams or images of Satan are not statistically significant predictors of homicidal tendencies.

## Body of evidence

Relationship between tattoos and crimes committed



Sources: Florida Department of Corrections; *The Economist*

Kevin Waters, a criminologist at Northern Michigan University and former Drug Enforcement Administration agent, notes that understanding which tattoos are purely aesthetic and which are signals can be a lot of help to law enforcement, distinguishing truly hardened criminals from posers—gang members do not take kindly to outsiders adopting their imagery. What can tattoos more directly associated with criminality tell us about an inmate?

A common Florida prison tattoo, predominantly seen on Hispanics, features three dots between the thumb and index finger. The tattoo is shorthand for *mi vida loca*, or “my crazy life”, and its wearers are 45% more likely to have been jailed for murder. Members of the Latin Kings, the largest gang in Florida, often sport tattoos of a five-pointed crown or the letters “ALKN”, which stands for “Almighty Latin King Nation”. Our analysis shows that inmates bearing such tattoos are especially dangerous—they are 89% more likely to be killers.

## The truth in black and grey

Nazi imagery is the most obvious characteristic of white prison gangs, but they also favour classically European images ranging from four-leafed clovers to the Valknut, a Viking symbol comprised of three interlocking triangles. Perhaps because of their ubiquity, white-supremacist imagery is not as predictive of murder charges as some other tattoos—still, we find that inmates bearing such symbols were 19% more likely to be murderers.

Picking up on your cellmate’s record from his skin is doubtless a useful skill for those inside. Policymakers, though, may care more about what tattoos say about the future than what they reveal about the past. Nearly half of inmates released from federal prisons and placed under supervision, and three-quarters of those from state prisons, are rearrested within five years of release. Demographics serve as depressingly effective predictors of recidivism. At the federal level, eight years after release, men are 43% more likely to be taken back under arrest than women; African-Americans are 42% more likely than whites, and high-school dropouts are three times more likely to be rearrested than college graduates.

How do tattoos fit in the picture? In a study pub- ▶▶



lished in 2013 Mr Waters, along with fellow researchers William Bales and Thomas Blomberg, looked at the link between recidivism and the presence of tattoos in Florida prisoners. They found that after controlling for demographics and crimes committed, inmates with tattoos were 42% more likely to be re-incarcerated for committing a violent crime. A subsequent study by Kaitlyn Harger, now of Florida Gulf Coast University, found that upon release, ex-cons with tattoos could be expected to last just 2.4 years outside prison before being re-incarcerated, compared with 5.8 years for those without. The effect was especially pronounced for those with tattoos on the hands and face.

Our own analysis of Florida prison data corroborates previous research. We find that of the 60,000 first-term prisoners released between 1998 and 2002, 45% have since landed themselves back in prison. Tattoos are unreasonably effective predictors of recidivism: we find that of the inmates who have been re-incarcerated, 75% percent had tattoos. Just 30% of the former convicts who have managed to stay out of prison were noted as having tattoos. Gang life looks notably hard to escape. Eighty-one per cent of those recorded with Latin Kings tattoos were rearrested at least once after their initial release.

Predictive as they may be, it would be hard and probably foolish to argue that the tattoos cause the recidivism; far more likely that both reflect something else about character and circumstance. Similarly, tattoo-removal programmes seem unlikely in and of themselves to make anyone an intrinsically better person. But they can reflect a genuine investment in change (remember those burning rubber bands) and they may also help reduce the

amount of discrimination reformed ex-cons face.

As tattoos permeate the mainstream, though, being ink-free may mean less and less. Attitudes towards tattoos are liberalising: in a study that the Pew Research Centre, a think-tank, released in 2010 38% of Americans aged 18-29 had tattoos, compared with 15% for those aged 46-64. Indeed, an intriguing example of their mainstreaming can be seen in the influence of Californian prison gangs on tattoo culture at large.

Tattooing behind bars is prohibited. This does not come close to stopping it; but it does mean inmates must be creative when it comes to art supplies. One constraint is ink, which often has to be improvised from materials like boot polish or the soot from burned textiles—say, cotton. Such sources limit artists to monochromatic tattoos.

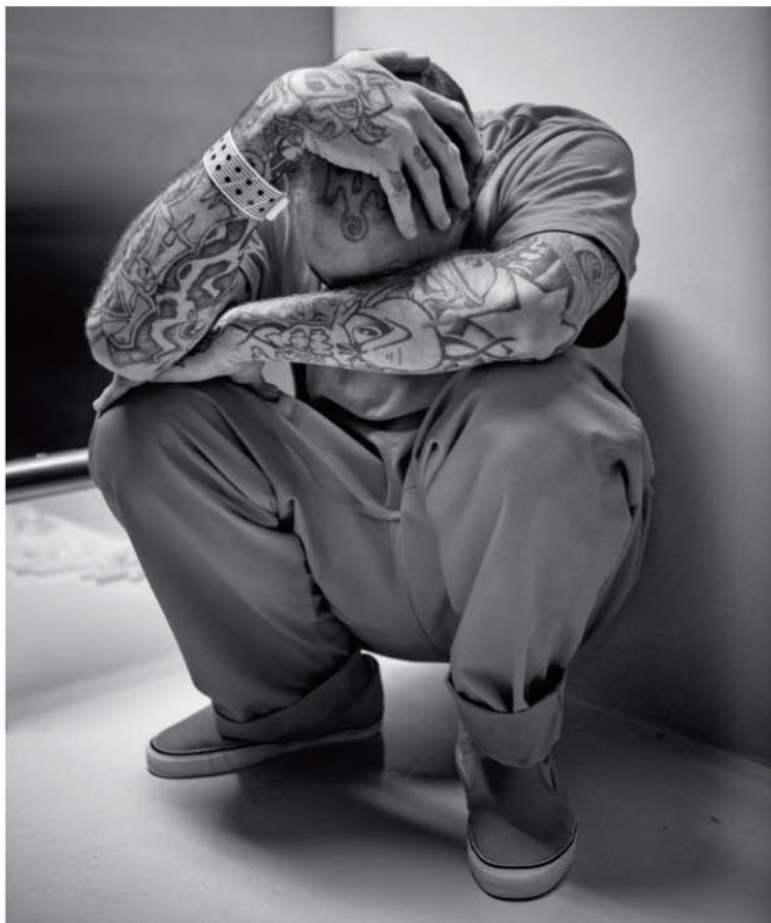
Finding the right tools can be challenging too, as hand-poking a tattoo on one point at a time can be both laborious and painful. A breakthrough came in the 1970s when inmates in California discovered how to create improvised tattoo guns using the motors from cassette players. The new gadgets made tattooing behind bars quicker, but featured only a single needle, which made drawing thick lines more difficult.

These constraints, along with the aesthetic sensibilities of Hispanic prison gangs, led to an entirely new style of tattoo—the “black and grey”. The style’s thin lines and colourless palette was put to the service of more realistic imagery than Americans had previously been accustomed to. The style quickly spread to prisons in other states—and then to the outside world.

Freddy Negrete, one of the original pioneers of the black and grey when an inmate (and the originator of the “Laugh now, cry later” motif), notes that initially, people on the outside got the tattoos so as to look as if they had been in prison. But he suspects that the hipsters and celebrities he now tattoos in the same style at his parlour on Sunset Boulevard know nothing of the style’s origin.

Nor, it seems likely, would most of them feel comfortable around the gang members from whom their style of tattoo is derived. Walking through the doors of Homeboy Industries is a jarring experience for those who have no previous experience of a life of crime beyond the occasional speeding violation: the dozens of former convicts decorated with images of skulls and Aztec warriors in the lobby look pretty forbidding. Some are inked from head to toe. Very few are keen on eye contact.

But walking through those doors for job advice, for a tattoo removal, or for any sort of help can be just as difficult. The staff, many of them former convicts themselves, are eager to help, but the criminal life is not one which fosters trust in others. Many former convicts have too much pride to ask for help. Others are convinced that they can never reform themselves. But for those who can muster up the courage, removing the marks of a prison tattoo can be the ultimate act of rebellion. \*



Postcard from Dandong

## Bright lights, big pity

*The border between China and North Korea shows how the two nations have grown apart*



DANDONG

“LOOK! There’s one!” shouts a member of the tour party as 40 people raise their phones to take a picture: “Three of them, up there on the mountain!” Commentary from another tour-boat blares out over the Yalu river: “There are two North Korean farmers. They are using their hands!” Moments later all eyes turn to watch a man sifting for shells, and then a soldier emerge from his turquoise sentry post. The Koreans are clearly used to the gawping hordes: few glance up at the boatloads of laughing, chattering Chinese.

Mao Zedong said that China and North Korea were as close as lips and teeth. Here, near the border town of Dandong, they are separated by just a few hundred metres of murky water. But the gulf between them is decades deep.

Most of the world thinks about this 1,400km-long border in terms of economic sanctions. The international community has been trying for years to constrain North Korea’s nuclear-weapons development with trade restrictions, and China is its biggest trading partner (Congo comes a distant second). In March 2016 the United Nations imposed its most severe sanctions yet after the pariah state staged a fourth nuclear test, apparently aimed at making its bombs small enough to sit on missiles. These sanctions were further stiffened in November.

Dandong, an urban backwater in the armpit of Manchuria (see map on following page), is at the sharp end of this sanctions regime. It is just one kilometre from North Korea’s sixth biggest city, Sinuiju, and it is far closer to Pyongyang, the North Korean capital, than it is to Beijing. More than two-thirds of Chinese trade with North Korea flows through it. In September America filed criminal

charges against a Dandong company and several of its citizens, accusing them of sanction-busting.

Ever stronger restrictions on the lorries carrying goods across the rickety single carriageway of Dandong’s “Friendship Bridge” might seem a worrying prospect for the city of 800,000 people. But Dandong has found another way to profit from its propinquity to North Korea. All told, trade accounts for less than a third of the city’s GDP. Tourism, on the other hand, provides half of its GDP. And as trade falls, tourism grows.

Dandong has various modest attractions. Locals boast of its sweet peaches, plentiful blueberries and wild silkworm pupae; the Qianlong emperor is said to have enjoyed its hot springs in the 18th century. Yet the vast majority of people who visit the city these days come because of what is across the river. Even the easternmost part of the Great Wall, a few kilometres to the north, is appealing mainly as a vantage point to spy on the hermit kingdom.

Just as Hong Kongers used to peek into China in the 1970s to see hard-core socialism in action, so today’s Chinese tourists troop to Dandong. Many come to gawp as at a zoo: the Chinese authorities have put up signs urging tourists not to throw objects to people on the North Korean side or “provoke” them, not to climb any fences and not to “fly sky lanterns, drones or small aircraft” near the border. Some treat it as any other out- ▶▶

ing, paying more attention to their selfie sticks and shopping than to life on the other shore. Korea (many tourists neither know nor care that there is a difference between the north and south) is just a largely unexamined backdrop against which to hang out with their friends.

For others the politics and the poverty are part of the point. They see in North Korea a reminder of their own sad past. Many look at it with a tinge of nostalgia: the uncluttered shore across the water reminds them of the Mao era, which they think of as a simpler, more equal time in China. "It's the only true Socialist country left," says the owner of an old military telescope who charges tourists 10 yuan (\$1.50) to look out at "beautiful North Korea" from the summit of the Great Wall, before returning to the war film he is watching on his phone.

### C\*A\*S\*H

The two People's Republics were born just over a year apart, that of Korea in 1948, that of China in 1949. After North Korea invaded the South in 1950 China's support was instrumental in repelling the American-led response and producing a peninsula divided into two countries. To this day, North Korea's main importance to the Chinese is as a buffer against American-backed South Korea.

The role it played in the Korean war is part of the Chinese Communist Party's sustaining mythology, a symbol of bold China going toe-to-toe with America. That, perhaps, explains why military fatigues, or rather their modern fashion incarnation, are the clothing of choice for many tourists. Sui Liufeng, from Fuxin in northern China, is finding it hard to hold her selfie stick still on a moving boat. A badge on her zip-up camouflage tracksuit reads "Hot Field Army" and an American flag is patched on to her left arm; her camouflage shoes have blue laces but the rose in her hair is regulation khaki.

It is Ms Sui's first visit. Another member of her tour group, Lu Zhufeng, wearing matching camouflage top, trousers and hat, has been to Dandong three times in two years. "Red tourism" that celebrates revolutionary history is now a huge industry in China: millions of tourists each year pay homage at sites such as Mao's birthplace or Yan'an, the Communist Party's early base. Many are pensioners who remember life under Mao. Ms Sui is typical: she retired at 50 and she has the time and money to explore.

This fast-expanding cohort is one reason China's domestic tourism has increased at 10-15% a year for much of the past decade. Only 5% of Chinese people hold a passport; Dandong gives the other 95% a chance to experience the abroad at home. A decade ago, the city had almost no tourist infrastructure. Now it is a holiday town, with a promenade, seafood restaurants and shops full of tourist tat. Touts hawk tours beside the giant Mao statue at the railway station. Visitors rent Korean dresses for photos. A "pleasure island" has a food court and performance area with a view of North Korea. The local government is building a new museum to join China's only memorial to the Korean war. Visits to the "Broken Bridge", which the Americans destroyed during the war, generate far more traffic than the Friendship Bridge just beside it.

Appealing to the better nature of Chinese tourists is good business: the skipper of a speedboat sells cigarettes to visitors who want to throw them to North Koreans. (Soldiers on the Korean shore openly beg for smokes and food.) A North Korean in khaki clothes and a blue flat cap brings his small vessel alongside a Chinese speedboat to offer ginseng, salted duck eggs and kimchi. Another trader pokes his suntanned face out from under a tarpaulin, wearing a wool coat with a resplendent white fur collar. Tourists gave them their clothes, explains the Chinese speedboat driver, who says the fur-collared man is disabled. Later that day the trader reappears by a larger tour boat: the "disabled"

man is visible in the distance, standing up in a second boat and stretching his arms to the sky.

Unlike most poor countries, North Korea is cursed neither by geography nor climate: its underdevelopment is instead a choice of its youthful dictator, Kim Jong Un, and his father and grandfather before him. Until the mid-1990s North Korea's GDP per person was higher than China's. Chinese growth took off just as the Soviet Union collapsed, dragging the North Korean economy down with it. Power cuts became widespread; the regime subjected an already calorie-poor North Korea to famine. Today, incomes in North Korea are an eighth of those in China.

The shores of the Yalu testify to the contrast. Dandong's skyscrapers are typical of any modern Chinese city. Until recently the North Korean riverfront was bare apart from a lone Ferris wheel. Now there appears to be a flashy conference centre, a water slide and a few tall buildings. That might suggest change. But the stylish blue and white tower block is in fact a facade stuck on to a much shabbier building. The Ferris wheel does not budge. The water slide has no water.

### The game of life is hard to play

After dark, Dandong's buildings and pleasure boats drip with neon. A single tacky gift shop claiming to sell North Korean souvenirs (some have "made in China" labels) shines brighter than the entire Korean shore. There, the lights are few but constant; never dimming, never changing, night after night. The message is more truthful than Mr Kim's Potemkin posturing would have it: the lights are on but no one's home.

In the early years of Kim Jong Un's rule, half a decade ago, cheap Chinese goods flooded across the border. The two sides agreed China would build a new bridge and high-speed rail links. But Mr Kim, whom the Chinese call "Kim Fatty the Third", went on to sabotage the plans. First he staged a nuclear test to coincide with Xi Jinping's accession as China's president in 2013. Then he executed his uncle, Jang Sung Taek, a powerful official who had been the main conduit between the two regimes.

Dandong New City, a few kilometres down the shore, is a monument to a trade hub that never was. Rice paddies were paved over for apartment complexes such as "Left Bank of Uptown" and "Singapore ▶▶



► City”, but only 15,000 people live in the new city, which has a capacity of 400,000. A four-lane suspension bridge straddling the Yalu was completed in 2014, but the North Koreans never built a road to meet it. A customs building with an empty rectangular space in the middle, intended to represent the Chinese character for “gateway”, instead acts as a monumental metaphor for a grand plan with a hole in it.

Trade between the two had dropped sharply from its high in the early 2010s even before the sanctions of 2016; but China is too wary of a North Korean collapse to cut its old ally off completely. Every evening lorries waiting to enter a goods yard for inspection block traffic opposite Dandong’s branches of Gucci and Max Mara. Customs officials are supposed to look for sanctioned goods, but it is hard to discern how rigorous they are. The yard is not guarded; anyone can wander in off the street. One former lorry driver says customs officers know many drivers well, so may not check every load.

Elsewhere on China’s fringe, at the borders with Laos and Myanmar in the south and Pakistan in the west, the People’s Liberation Army (PLA) has a heavy presence. Yet there appear to be few soldiers in Dandong. At a narrow point in the river known as “One Step Across” a work team of 12 North Koreans is clearly visible. But China’s fences are just six feet high, with a small roll of barbed wire above. For long stretches there are only a few metres of open water between the two countries, not even a fence. At Hwanggumpyong, where the border between the countries is on dry land, there is just a gate with a single padlock; the guard on the North Korean side has no Chinese counterpart. More surveillance cameras watch an average street in any Chinese city than survey the border in Dandong.

You might expect a constant flow of defectors from a country as unpleasant as North Korea. At times there have been. Local lore has it that in the 1990s, during the famine, a Chinese farmer could buy a Korean wife for just a sack of rice. Today, though, it seems that surprisingly few people cross over. The brokers who arrange such things are prohibitively expensive; refugees who flee to China are labelled “illegal economic refugees” or “criminals” and sent back if they are caught.

There are still some illegal Koreans in Dandong—and legal ones, too. Locals claim to be able to spot them at a glance: they have old, drab clothes, says one man; many wear a small lapel pin bearing the image of Kim Il Sung, grandfather of the current dictator. Most of those walking the streets openly are truckers, a privileged job. Local Chinese garment factories also hire teams of Koreans sent by their government to earn cash. They are cheap, stable employees. “North Korean street”, close to the goods yard, serves all these groups: it has a dog meat restaurant and a North Korean bakery with pretty but tasteless treats made of black rice, sesame and pumpkin. One block south are more prosperous shops selling products from South Korea. Even here the two Koreas are divided.

For many Chinese tourists, the crowning glory of the Dandong experience is North Korean cabaret. The government owns several restaurants in Dandong, and many more across China. They are a useful source of hard currency. Each has similar decor, pricey but mediocre food and identikit Korean waitresses in red collarless suits, all from well-connected families in Pyongyang. Most do a three-year stint: one 24-year-old says she misses her parents after two years away; she last called them in January.

Performances begin at 6.30 each evening. Two women with painted smiles wearing short, sparkly mustard dresses and five-inch platform heels slap at acoustic guitars; another lifts her saxophone high in a way only possible when the instrument is made of plastic, not brass. All look as though they have learnt how to perform by watching lip-synched 1980s pop videos. Waitresses clap and persuade middle-aged Chinese men to join them on stage. The set finishes with an anthem to the PLA. Across the river the unchanging night lights burn on. \*

Go to [Economist.com/dandong16](http://Economist.com/dandong16) for an associated slideshow






---

**Also in this section**


---

**42 The Christmas strikes**


---

**42 A prison riot**


---

**44 Bagehot: The parable of JD Wetherspoon**


---

For daily analysis and debate on Britain, visit

[Economist.com/britain](http://Economist.com/britain)
**Britain and Europe**

## Six months on

**The debate over Brexit has so far been more about process than about substance. In 2017 that will change—and the going may get tougher**

ON ONE level, much has happened since June 23rd, when Britain voted by 51.9% to 48.1% to leave the European Union. The country has a new government led by Theresa May. She has set up two new Departments, for Exiting the EU (under David Davis) and for International Trade (under Liam Fox). After years of cuts, the civil service is growing again, to tackle the challenge of disentangling Britain from Brussels. And in his Autumn Statement Philip Hammond, the chancellor, softened previous plans to cut the budget deficit by 2020.

On Brexit itself, however, Mrs May has done little beyond repeating her catchphrase that “Brexit means Brexit and we’re going to make a success of it.” She has promised a Great Repeal Bill to enshrine most existing EU rules into British law for continuity. And she has said she will invoke Article 50 of the EU treaty, the legal clause that sets a two-year time limit for Brexit, by the end of March 2017.

Indeed, most public discussion on Brexit has been procedural, not substantive. Parliamentary debates have revolved around how much information MPs will be given. Judges have become involved: in January the Supreme Court will decide whether triggering Article 50 necessitates prior authority through an act of Parliament, as the High Court has already ruled. There have been disputes over how much Mrs May should reveal of her negotiating

objectives. And all this before there is internal agreement within the government over what form of Brexit to aim for when negotiations begin.

Neil Carmichael, a pro-EU Tory MP, is hoping to see a government white paper on Brexit before Article 50 is triggered. Indeed, just after the referendum such a paper was proposed by none other than Mr Davis himself. He recently said the government would not publish anything before February, but that would still leave time for a white paper and a short parliamentary act before Article 50 is invoked.

The substance of Brexit is likely to prove more difficult than the procedure, for two reasons. One is that it will involve trade-offs that the government has so far avoided debating. Most obviously, maximising barrier-free access to the EU’s single market will make it hard to take back full control of migration and laws and to cease contributing to the EU’s budget. Many more dilemmas await: for instance, the desire to maintain security and intelligence co-operation with the EU may be hard to achieve if Mrs May sticks to her insistence on escaping completely from the jurisdiction of the European Court of Justice.

The second reason is that Britain’s 27 EU partners are likely to put a premium on unity. Mrs May was excluded from an EU summit dinner in Brussels on December 15th. There was talk of an exit bill for Britain

as large as €60bn (\$63bn), and of making clear that the negotiation of future trade relations would follow, and not run in parallel with, the two-year Article 50 divorce settlement. Other EU leaders face political pressures at home: France, Germany, the Netherlands and possibly Italy will all have elections in 2017.

Yet if the general gloom points to a harder version of Brexit, some signs point in the other direction. Mr Davis and Mr Hammond seem to be working together to minimise the shock of departure. Mr Davis has not ruled out making payments into the EU budget after Brexit. Several ministers have floated the possibility of continuing partial membership of the single market, the customs union or both. This week the Scottish government said it wanted to stay in the single market regardless of what happens to Britain.

And there is a growing recognition of the economic risks of Brexit. Brexiteers have long claimed that forecasts by Mr Hammond’s predecessor, George Osborne, were too gloomy. But the Autumn Statement made clear that Brexit has a cost. Consumption has held up but investment is being cut. Banks and others in financial services are talking of job losses as positions are transferred to continental Europe. How the economy performs matters: one recent poll for Open Britain, a pro-EU lobby group, found that half of Leave voters are not prepared to be made worse off as a result of Brexit. That could prod ministers towards a softer version.

So might more realism about immigration. Thus far, this has been presented in terms of the relationship between the single market and the four freedoms of movement of capital, goods, services and people. The implication has been that to keep full market access may require concessions ►►

on migration. But, as a report this week from the CBI, a business lobby, shows, migration is crucial in its own right to industries ranging from finance to farming. Indeed, the CBI finds several members more concerned about migration controls than about access to the single market.

Lastly, more politicians see the need for a transitional deal with the EU to avert a hard landing in March 2019. A string of recent reports from the House of Lords EU committee say this matters, especially for financial services. Mr Davis and Mr Hammond have talked up the case for transition. As Nick Clegg, a former leader of the Liberal Democrats, puts it, the fact that transition was ever controversial is “symptomatic of a strategyless approach to Brexit”. That it is now widely accepted may be a sign of growing common sense. ■

### The Christmas strikes

## Planes, trains and political deals

**Unions' economic clout has weakened but their political relevance has grown**

**C**RAMMED trains, cancelled flights, late postal deliveries: the prospect of widespread strikes threatens to give many Britons a distinctly un-merry Christmas. Drivers and conductors on Southern Rail are expected to down tools on several occasions in protest at their conditions. British Airways flight attendants may ground themselves on Christmas and Boxing Day over “poverty pay”. Post Office workers are also walking out.

Those stuck in departure lounges or with presents in the post may doubt it, but Britain's trade unions are a dwindling force. Since peaking in 1979 their membership has fallen by nearly half, from 13m to 7m (even as the workforce has grown).

Members are older: between 1995 and 2014 the proportion over the age of 50 rose from 22% to 38%. The average member strikes about a tenth as often as in the 1970s. We estimate that December will see fewer than 100,000 working days lost to strikes. That is many more than the monthly average for 2016, yet very few compared with November 2011, for instance, when more than 1m public-sector workers went on strike over austerity. Comparisons to the “winter of discontent” in 1978-79, when rubbish piled up in Leicester Square, are wide of the mark: in the worst month of 1979 nearly 12m working days were lost.

So why the fuss? Despite general decline, certain industries have managed to maintain 1970s-style levels of unionisation. Many of them, including transport, are those whose workers run a service that no one else can offer (walkouts by train drivers or flight attendants cause unavoidable chaos in a way that those by waiters, say, don't). The most militant unions have fared especially well. The National Union of Rail, Maritime and Transport Workers, which is involved in the Southern Rail strike, has seen its membership increase by almost a fifth since 2004.

Today's strikes have added political significance. Theresa May's spokesperson accused the strikers of showing “contempt for ordinary people”. Chris Philp, a Tory backbencher, has called for strikes in industries such as transport to be legal only if at least 50% of services are maintained. Grandees from Lord Heseltine, on the party's pro-European left, to Lord Tebbit, on its Brexiteer right, have spoken out for a crackdown. Some 20 MPs have reportedly endorsed these calls in private meetings with the pugnacious transport secretary, Chris Grayling.

The preternaturally cautious prime minister is allergic to anything that might weaken her focus on the impending Brexit talks, as a war with the unions surely would. Moreover, the rules are already being tightened: next year ballot thresholds

for strikes will rise under legislation enacted by David Cameron, her predecessor.

Yet the temptation to pick a fight is great. Labour's far-left leader, Jeremy Corbyn, is close to the most militant unions. At a Christmas party of Momentum, his cheer-leading faction in Labour, guests toasted “so many strikes coming up right now” with bottles of beer bearing Mr Corbyn's face. The man himself appeared on stage at the Christmas bash of ASLEF, one of the unions behind the Southern Rail interruptions. His front-bench allies refuse to condemn the strikes. Labour moderates, who grasp the toxicity of this comradeship among voters shivering on packed station platforms, privately despair.

By taking on the unions and raising the salience of these matters, Mrs May would thus further divide Labour. She also would lower the chance of its unpopular leader being dislodged. Len McCluskey of Unite, Britain's biggest union, which is at the centre of the threatened British Airways strike, is Mr Corbyn's most powerful supporter. On December 6th Mr McCluskey resigned as Unite's leader to trigger a fresh election within the union, with the aim of securing his own job until 2022. That would enable him to help keep Mr Corbyn at Labour's helm until the next general election (due in 2020) and influence any succession battle afterwards. Any move by Mrs May to restrict strikes in “critical” sectors could hand Mr McCluskey, whose calling card is windy talk of fighting the government, victory on a plate.

Such is the prime minister's calculus. A war with the angry rump of the union movement could jam up Britain's infrastructure at a time when its governmental capacity and economic competitiveness are under strain as rarely before. But it could prove a political manoeuvre of exquisite effectiveness: rallying her party, energising her leadership, dividing Labour and shoring up its unpopular leader. Even the cautious Mrs May must be considering the gamble. ■

### Jailhouse rocked

In November Liz Truss, the justice secretary, promised the greatest overhaul of prisons in a generation. Reform looks increasingly pressing. On December 16th more than 600 inmates at HMP Birmingham rioted for over 12 hours, some taking “cellfies” of their antics. Around 240 of those involved have since been moved elsewhere. But trouble has already broken out at the prison in Hull where 15 were sent. Such disturbances are increasingly common, judged by call-outs of the prisons' riot squad. Falling officer numbers may mean the teams are in greater demand when cons rise up.

England and Wales, National Tactical Response Group call-outs to prisons



Source: House of Commons

\*To August



# Bagehot | The parable of Spoon's

How the chain pub became an essential British institution



**H**OW easy it is to dislike chain pubs: those samey, cheap, airless booze hangars that uglify the High Streets of the nation like a slick of vomit up the side of a taxi. A *Telegraph* columnist describes one specimen as “horrific”; a writer in the *Spectator* calls its kind “grim”; Will Self, an author, terms them “shit, brown dollops of establishments smeared incontinently across our cities.” Such places are murdering good old-fashioned boozers with their discounts on bulk-bought fizzy slop. And as if these were not sins enough, Tim Martin, the mulleted owner of JD Wetherspoon, used his most prominent of pub corps to shunt the nation towards the chaos and impoverishment of Brexit. He advocated it in the chain’s magazine and slathered the tables of his almost 1,000 branches with beer mats reviling Europhile elites (“Why should we trust the IMF?” bellowed one). It was with glee that liberals observed that the vote on June 23rd had wiped millions off the value of his company. Chain pubs: just too ghastly.

Bagehot begs to differ. Join him, if you will, in Ebbw Vale at 11 o’clock on a weekday morning. In this depressed former steel town in the Welsh valleys the local Wetherspoon branch—named the Picture House after the cinema that once occupied it, but known as “Spoon’s”—hums with life. A pleasant light, both dusky and hourless, filters through stained-glass windows. Young mothers huddle around a table looking at holiday snaps. An elderly couple nurse cups of tea. In the gallery teenagers flirt, one table of boys and one of girls. The old codgers sit by the window, working on the first pints of the day. Those who enter process up the central aisle between the tables towards the bar, waving at familiar faces. Backs are slapped and babies cooed over; a civilised babble fills the space. On the walls are displays featuring Nye Bevan (the Welsh father of the National Health Service), old photos of the town and histories of its long-gone industry.

The tableau is sociable and cross-class in a lonely and fragmenting society. It is unfussy in a country whose metropolitan food culture increasingly involves infantile gimmicks: dishes served on bricks, in jam-jars and the like. It is authentically inauthentic, sporting the same menus and wall-mounted bric-a-brac as hundreds of other outposts of Mr Martin’s empire, yet curiously honest about the fact.

In your columnist’s travels about Britain he has often encoun-

tered the same scene. Visit an old mill town, a tired seaside resort or fishing port, a former coal-mining village, a faded dormitory settlement. Typically the working men’s club, the library and the church will be closed, or open only sporadically. But there will probably be a chain pub in a converted theatre, music hall, bank, church or post office. Often it will be architecturally captivating. Almost always it will be busy.

Even the complaints about such places contain arguments in their favour. On Friday and Saturday nights, it is true, the conviviality your columnist encountered in Ebbw Vale gives way to that other British crowd scene: underdressed youngsters staggering onto the streets as early as 8pm and redistributing the contents of their stomachs onto pavements, walls and hedgerows; “Gin Lane” with alcopops. Meanwhile small, independent pubs struggle to compete with the chains. By lunchtime the Picture House is packed but its rival, the Bridge, is still shut and its curtains are closed. Yet both of these objections are really tales of displacement. Cheap chain-pubs socialise private drinking (supermarkets can undercut the cheapest of them). And the good old-fashioned boozers are often grim places—sticky carpets, expensive drinks, naff music—that are unable to compete in an age when people’s homes are nicer than in the past and alternative leisure pursuits more plentiful. They would fail anyway.

To dig below the snobbery about pub chains is to witness a clever business at work. Mr Martin opened his first branch in London in 1979 and named it after a teacher, Mr Wetherspoon, who had told him he would never amount to anything. That it grew into a national institution, he says, comes down to three points.

## A very British brew

First, stay close to the ground. Mr Martin spends two days a week visiting his pubs. There he interrogates landlords and mingles with punters, doing so alone to ensure he is “exposed to what people really think”. To such conversations he attributes innovations like the absence of music, the mellow lighting and the early opening hours in his chain (the cooked breakfast is the best-selling dish). “When things go wrong at big retailers it’s usually because they’ve lost that connection” with customers, he says. Second, keep things simple: “The commercial world is full of daft ideas”. Years ago, he explains, he was mocked for eschewing market-segmentation studies. But today pubs aimed specifically at women, old people and other groups are failing while his everyman pubs are booming: “A pub is best when it’s a melting pot.”

Third, bear down on prices. Many small businesses in Britain fail because they charge too much in the country’s wage-stagnant economy. But Mr Martin treats “Made In America” by Sam Walton (the founder of Walmart) as a sort of Bible, revering cost control. He reckons his use of grand old civic buildings makes the difference. These combine a stay-and-linger atmosphere (“the x-factor”, he calls it) with huge spaces, producing the self-reinforcing cycle that lies at the heart of his business: large sales begetting the decent profits that make possible low margins that further drive sales.

There is a parable in all this. Capitalism in Britain today is like Mr Martin’s pubs: often seen as soulless, homogenising and exploitative. Wetherspoon and other chains like it tell the other side of that story. Unfashionable they may be, but their vocation is also noble: they give people what they want. They lower prices and in the process beget life, buzz and, to use the politician’s cliché, a sense of community. ■




---

**Also in this section**


---

**46 Assassination in Ankara**


---

**46 Christine Lagarde's problems**


---

**47 Authoritarian creep in Poland**


---

**48 Charlemagne: Stefan Zweig's Europe**


---

For daily analysis and debate on Europe, visit  
[Economist.com/europe](http://Economist.com/europe)

**Attack in Berlin**

## The spectre of terror

BERLIN

**Killings at a Christmas market test Germany's nerve**

**I**N THE aftermath, police officers with automatic weapons guarded a cordon 300 metres around the Breitschiedplatz, a busy junction in the middle of Berlin's shopping district. Beyond the barricades twinkled the sparkly lights on the roofs of little wooden chalets offering *Glühwein*. A screen normally used for adverts urged people to go home and ignore rumours. Other Christmas markets and some bars had emptied as the news filtered through. In train stations, armed police officers outnumbered passers-by. By late in the evening of December 19th the streets in the normally restless, insomniac German capital were eerily quiet.

All of which contrasted starkly with the carnage and chaos of a couple of hours previously when, at 8.15pm, a lorry had sped into the throng of the Christmas market at Breitschiedplatz. Jan Hollitzer, the deputy editor of *Berliner Morgenpost*, whose offices are nearby, told Canada's CBC television that he heard noise and screaming from a group of destroyed huts. "Then I saw lights, many Christmas lights, that were shaking. Then the truck came out of the Christmas market again, destroyed some small houses and came out on the street." By the morning 12 people had died and about 50 were wounded, many seriously. The lorry carried a dead Polish citizen in the passenger seat, perhaps its original driver, who had been shot. A man suspected of being the perpetrator was lat-

er arrested nearby. As *The Economist* went to press German media reported that he was a Pakistani asylum-seeker who had arrived in Germany in the past year.

Angela Merkel, the chancellor, said: "We have to assume we are dealing with a terrorist attack. I know that it would be particularly hard to bear for all of us if it was confirmed that the person who committed this crime had asked for protection and asylum in Germany."

The attack resembled one in Nice on July 14th, when 86 people were murdered at Bastille Day celebrations by a Tunisian, inspired by Islamic State, who drove a heavy lorry through the crowds. The location of the Berlin killings was significant: the market is in the shadow of the Kaiser-Wilhelm Memorial Church, preserved in its bombed-out state since 1945 as a symbol of Germany's yearning for peace.

It comes amid fears about jihadist extremists slipping into the country with the influx of refugees admitted under the "welcome culture" of Mrs Merkel. Unlike other European countries, Germany had not in recent years seen an attack on the scale of these killings. But for months evidence had been mounting about potential jihadist plots. In the autumn several men were arrested on suspicion of planning violence. In November America's State Department warned travellers in Europe about plans to attack Christmas markets (such threats go back at least to 2000, when

a plot to bomb the market in Strasbourg was foiled). Hence the impression in Berlin on December 19th of an establishment that had long readied itself for this moment.

The incident highlights the tensions within Germany. Markus Pretzell, a member of the European Parliament for the right-wing Alternative for Germany (AfD) party, tweeted that the victims were "Merkel's dead". Rumours rippled across the web suggesting that the perpetrator might be Chechen or even Kurdish, and circulating photos of unconnected men. All of which comes near the start of a German election year made unusually unpredictable by the rise of the AfD.

**No longer the exception**

In recent months Mrs Merkel has stabilised her position following the peak of the refugee crisis: pleasing her party's base by flirting with a burqa ban and talking tough on the numbers of failed asylum-seekers deported. Before December 19th her approval ratings were rising again and her party's rift with the Christian Social Union, its more conservative Bavarian sibling, was closing. But this progress is unsteady, and vulnerable to events.

To be sure, for now Germany's authorities feel in charge of things. "Berliners, like Londoners, are pretty resilient. I expect they will take this on the chin," says Constanze Stelzenmüller of the Brookings Institution, a think-tank. But if the attack in Berlin marks the start of a French-style jihadist campaign in Germany, it could herald a turning point in the country's politics. Conscious of its historical burden and bound by its political system to put moderate, consensus-oriented coalitions into power, Germany is unusually immune to populist sensationalism compared with many of its neighbours. But that may not last if the killing goes on. ■



## Terrorism in Ankara

## Overspill from Syria

ISTANBUL

**The murder of an ambassador may push Russia and Turkey closer**

ANDREI KARLOV, the Russian ambassador to Turkey, was only moments into his speech at an art gallery in Ankara, Turkey's capital, on December 19th when the man standing behind him, disguised as a member of his security team, fired the first bullet into his back. His assassin, identified as an off-duty Turkish police officer, claimed to be retaliating for Russian war crimes in Syria. "We die in Aleppo, you die here," he shouted. He also repeatedly invoked the Prophet Muhammad, before dying in a shoot-out with other policemen.

The attack came amid largely peaceful protests in Turkish cities against Russian military intervention to prop up President Bashar al-Assad in Syria.

Recep Tayyip Erdogan, Turkey's president, and his Russian counterpart, Vladimir Putin, both referred to the shooting as "a provocation" and pledged to strengthen co-operation against terrorism. The Turkish foreign ministry said it "would not allow" the assassination to damage relations, while officials also confirmed that a meeting between the Turkish, Russian and Iranian foreign ministers to discuss the situation in Syria, scheduled to take place on December 20th in Moscow, would go ahead.

Mr Karlov was posted to Ankara in 2013 and remained there even after Turkey's air force shot down a Russian fighter-jet near the Syrian border in November 2015. Mr Er-

dogan apologised for the incident and met Mr Putin in St Petersburg over the summer. The two sides have since initiated a rapid detente, signing a pipeline deal and pledging to upgrade economic relations.

They have also found some common ground in Syria. That has been no easy task. Turkey has backed Islamist rebels against the Assad regime since the start of the war. Russia has bombed them for over a year. Yet it was with Russia's blessing that Mr Erdogan's troops were able to enter northern Syria in August, pushing Islamic State (IS) jihadists—and Kurdish fighters—from the border area. More recently they negotiated a ceasefire and an evacuation from east Aleppo, besieged for months by Syrian and allied forces.

As *The Economist* went to press, it remained unclear whether Mr Karlov's killer had been out to avenge Russia's actions in Syria, as he proclaimed, or to subvert ties between Turkey and Russia, as officials on both sides suggested, and whether he had acted alone. Some Turkish officials immediately pointed a finger at the Gulen movement, a sect accused of spearheading a failed coup attempt that killed 270 people in July.

Turkey has been reeling from terrorist violence since 2015, when an IS suicide-bomber helped bring down a fragile ceasefire between security forces and Kurdish insurgents. Mr Karlov's murder, the first of a foreign envoy on Turkish soil, may have wider ramifications. Western countries are right to worry about the extent of Turkey's rapprochement with Russia, yet they have even more reason to hope that Mr Erdogan and Mr Putin do not come to blows. The two strongmen appear to be doing the their best to contain tensions. Their relationship may emerge from the ambassador's death stronger than ever. ■

## Christine Lagarde

## Grace under pressure

PARIS

**A French court convicts the head of the IMF of negligence**

AS A teenager, Christine Lagarde represented France as a synchronised swimmer, a sport that demands endurance and flexibility. She may need those skills again. Ms Lagarde, who has been the boss of the International Monetary Fund (IMF) since 2011, was convicted on December 19th by a court in Paris in a case related to her spell as French finance minister nearly a decade ago. But because its ruling looks half-hearted—it imposed no fine or prison term—she may keep her post at the fund.

Few expected a guilty verdict. Ms Lagarde's supporters say it is a political vendetta: even the prosecutor had tried to withdraw the case after more serious charges were dropped. But the Court of Justice of the Republic, which is made up of more politicians than judges and tries only senior political figures, ruled it should proceed. It found that she had been negligent in the use of public money over her decision, in 2008, to allow an out-of-court settlement in a legal dispute between the government and a businessman, Bernard Tapie. That settlement appeared questionable because Mr Tapie had backed Nicolas Sarkozy, then president of France and Ms Lagarde's boss, in his election campaign. Arbitrators initially awarded Mr Tapie €403m (\$626m) in compensation.

No one suggests Ms Lagarde sought or gained any personal benefit from the episode—and she maintains she acted in good faith. Within hours of the verdict, France's government said it had full confidence in her ability to lead the fund. Inside the organisation support for Ms Lagarde is strong—staff see her as popular, professional and reliable, and she is said to be well-liked by representatives from Europe, America and emerging markets. In the aftermath of a much more unsettling scandal involving her predecessor, Dominique Strauss-Kahn, who stood down after he was accused (but never convicted) of sexual assault in 2011, she has been seen as competent and calm.

The fund's board met on December 19th, confirming that it backed her. It had confirmed her for a second five-year term earlier this year, when the prospect of her trial in Paris was already understood. The fund wants to avoid upheaval: this would be an awkward moment to cast around for a new boss. At both the fund and the World Bank there is anxiety about China's ambition to promote alternative international financial bodies, such as the Asian Infrastructure Investment Bank. A search for a ▶▶



Outraged by Aleppo

▶ new IMF boss would inevitably rekindle old debates about the over-representation of European and other rich countries in global bodies. Ms Lagarde is the 11th European in a row to run the fund.

Such a debate might be manageable in normal times. But insiders have little idea what role Donald Trump might play in choosing a new IMF chief. His views on the global financial architecture are hard to

discern. Under Ms Lagarde the fund has taken strong stances on matters such as climate change, expressing views that Mr Trump may not share. Ms Lagarde herself has assailed Mr Trump's trade policies, without naming him. The IMF board is probably anxious to keep a low profile until the fuss over Ms Lagarde's conviction passes. This may be the moment for Ms Lagarde to hold her breath and hope. ■

interview with *Politico* Mr Walesa said the EU should eject Poland. In a speech on December 17th Donald Tusk, the president of the European Council and former Polish prime minister, warned about the dangers to democracy.

Pis's tentacles are spreading from the government and media to civil society. In a recent interview Beata Szydlo, the prime minister, claimed that "billions" of zlotys of public funds are going to NGOs loyal to opposition politicians. To correct this, Ms Szydlo wants to set up a National Centre for the Development of Civil Society that will take over the management of funds for NGOs. Adam Bodnar, Poland's national human-rights defender, finds this alarming. Liberal NGOs are terrified of being frozen out. In November a series of animated diagrams on state television's evening news portrayed NGOs as a crony network that grew rich on taxpayers' money. Arrows linked these allegations to George Soros, a Jewish philanthropist and supporter of many left-liberal organisations.

Recent events seem to have galvanised both PO and Nowoczesna ("Modern"), two centrist parties. If they could work together, they might be able to hold the ruling party to account. Recent polls suggest that their combined support is bigger than Pis's. And the economy faces headwinds. It grew at an annualised rate of 2.5% in the third quarter, the slowest since 2013. Foreign investors are wary. EU bodies are still mulling over how to deal with the changes to the constitutional tribunal.

Pis supporters argue that the reactions to recent events have been overdone. The party, which leads in the polls, still has the support of many voters, particularly outside Warsaw, thanks to popular policies such as a cash hand-out for parents and slashing the retirement age. But it is skating on thin ice. ■

## Polish politics

# Winter of discontent

WARSAW

## Protests grow as Poland's nationalist government gets nastier

POLAND'S populist government, led by the Law and Justice (Pis) party, has seen its fair share of protests since coming to power in late 2015. Demonstrators gathered on the streets of Warsaw when the government sought to weaken the constitutional tribunal and pack it with loyalists. They did so again when it purged more than 130 journalists from the state media. Thousands of black-clad women took to the streets against a plan to make it even harder to get an abortion. But the wave of protests since December 13th, including a parliamentary sit-in by opposition MPs, suggests that discontent is still growing.

The latest discord started on December 13th, the 35th anniversary of martial law in communist Poland. That day the government passed a law restricting freedom of assembly. Sites for demonstrations can be reserved for up to three years, it says, but preference will be given to "cyclical" rallies marking "especially...important events for Poland's history" (rather than, say, protests against the actions of the government). Any counter-protests have to be at least 100 metres away. Thousands marched in the freezing cold to denounce the reform.

Discontent spread more spontaneously a few days later when the government proposed restricting the movement of journalists in parliament. Rather than mingle with MPs in the corridors, reporters would be confined to a separate media centre. Only the government media, now stuffed full of Pis supporters, would be allowed to record inside the parliamentary chamber.

In protest, Michal Szczerba, an MP from Civic Platform (PO), one of the two main opposition parties, stood up to speak with a note emblazoned "free media in the Sejm [parliament]". He was reprimanded by the speaker of the house and barred from the debate. Dozens of other politicians joined him on the podium, where they then sat for several days (see picture).

This caused the parliamentary session

to be moved to another room, where Pis politicians pushed through a budget. Other MPs say there were no opposition members present; some claim that they were not allowed into the room. "We do not know who voted, whether they really had a quorum," says Rafal Trzaskowski, a PO politician. The vote was illegal, he thinks.

### The turning point

The kerfuffle in the Sejm marks a new stage in Polish politics. It follows months of growing dismay at the increasingly cranky government. In July the European Commission declared that the changes made to the constitutional tribunal endangered the rule of law. Pis had three months to respond, but merely shrugged.

Well-known politicians, including Lech Walesa, a former president whose Solidarity movement brought down communism, complain that Poland is reversing two decades of democratic progress. In an



More hacks please, we're Polish

# Charlemagne | A warning from the past

Why Europeans are reading Stefan Zweig again



**A**FTER this bleakest of years for Europe, glib talk of the 1930s is in the air. The bonds of trust between nations are fraying, and the old saw that the European Union advances only in times of crisis is being tested to destruction. Populists are on the march. Britain is on the way out. And Europe's neighbours are either menacing it (Russia) or threatening to flood it with refugees. One hyperventilating Eurocrat recently confided to your columnist that he feared another Franco-German war.

Small wonder that gloomy Europeans are starting to dust off their Stefan Zweig. A prolific and, in his time, wildly popular author of novels, biographies and political tracts, Zweig incarnated the interwar ideal of the cultivated European. A Jew who saw his books burned by the Nazis, he was exiled first from his Austrian home, in 1934, and then from Europe. Zweig's literary star was eclipsed by contemporaries such as Thomas Mann and Joseph Roth. But his witness to Europe's catastrophe, and his dedication to the cause of its union, have helped restore him to popular affection. ("The Grand Budapest Hotel", a 2014 film inspired by Zweig's writing, may also have had a hand.)

Zweig held the aesthete's distaste for the grub and grind of politics, but his calls for European unity grew more urgent throughout the 1930s as the continent stumbled towards war. When it finally came, Zweig could not muster the hope he had encouraged in others. In "The World of Yesterday", a lament composed towards the end of his life for the cosmopolitan *fin-de-siècle* Vienna of his childhood, Zweig declares Europe "lost" to him as it tears itself apart for the second time in living memory. In 1942 Zweig and his young wife committed suicide in their adopted home of Petrópolis, nestled in the hills above Rio de Janeiro.

In the harsh assessment of John Gray, a critic, Zweig showed too little courage in life for his death to be considered tragic. But there is no hiding the irony in what was to follow. Less than a decade after his suicide six European countries agreed to unify their steel and coal production, establishing a club that was to evolve into the European project which Zweig had for so long urged into being. An organisation built on such prosaic foundations would doubtless not have excited the high-minded scribbler's imagination (and for all its pan-European commingling, Brussels will never match Zweig's Vienna). But it sought to achieve via bureaucrat-

ic means what Zweig had hoped to attain through education and culture: to make war between France and Germany not just unthinkable but impossible.

That founding myth of what was to become the EU still animates its leaders today. In a recent speech Donald Tusk, the president of the European Council, nodded to Zweig's warning that those caught up in historical change never notice its beginnings. Mr Tusk deplored the "trap of fatalism" that, he argued, had ensnared today's moderate politicians facing the threat of populism. In Zweig's time, he added, liberals gave up "virtually without a fight, even though they had all the cards".

Old-timers in Brussels lament the lack of vision among today's crop of leaders, as if a transplanted Kohl, Mitterrand or Delors would be enough to restore Europe to health. But it is not only politicians whose memories of the 1940s are fading. By rendering war among its members unimaginable, the EU has undercut its own support. Without such an animating mission, some question the sacrifices of sovereignty that EU membership demands.

The crises of recent years provide one answer. Although some of the EU's woes can be traced to mistakes of its own making—the integration by stealth that sometimes treated voters as inconvenient, or the design flaws of the single currency—others came from outside and called for a co-ordinated reaction. Without the EU, the Russian threat would loom much larger and squabbling governments would have struggled even more to respond to the migration crisis. Problems like climate change and terrorism demand joint management. For all the EU's missteps, Europe's problems would be harder to solve in its absence.

## Beware of pity

Zweig's message is doubly seductive. His insistence on the pendulum-like nature of European history, swinging back and forth over centuries between prickly tribalism and the craving for co-operation, reassures the fearful that today's disunity may prove temporary. His attacks on the small-minded politicians of his age satisfies the disdain in which contemporary pro-Europeans hold their leaders. "The European idea", Zweig wrote, is "the slow-ripened fruit of a more elevated way of thinking." Plenty in Brussels find this supercilious thought admirable.

But as Zweig acknowledged, a supranational club can never command the affection of citizens as a nation can. His own remedy—a rotating European capital with events and festivities to ape national spectacles—eventually came to pass, albeit in diluted form. But the European Capital of Culture, alas, has not yet lifted Europeans to the state of elevated consciousness Zweig hoped for. The enduring tug of national allegiance still provides the best means to mobilise Europeans to action. If those who dream of a federal European superstate, as Zweig did, have lost the argument, better to work with the grain of national politics than to rue the idiocy of those who won.

Ten years ago the danger for Europe was of courtly decline into irrelevance. Since then the tempo of events has quickened and the risk of disintegration deepened. The EU, that most peculiar of institutions, has not yet worked out how to leaven the need for a central authority with the democratic energy of nation-states. Today's emergencies make the task more pressing. But the challenges in today's rich, free, democratic and largely peaceful Europe are not those of the 1930s. Zweig began "The World of Yesterday" with a suggestion from Shakespeare: "Meet the time as it seeks us." On that, at least, he had a point. ■



## Disney's Utopia on the I-4 Yesterdayland

CELEBRATION, FLORIDA

**What a city of the future, built to look like the past, says about the present**

OUTSIDE the white fence is all strip malls, motels and resort villages. Come off the six-lane highway at the spaghetti junction where Interstate 4 meets Highway 192, go past the ornamental water tower, and you are in Celebration, a town of the sort that America stopped building in the 1950s. Most of its 4,000 homes are small by suburban standards, jutting up against narrow streets. Children walk to school. The small downtown has no chains, apart from an obligatory Starbucks. Its 10,000-odd residents are mostly white, white-collar and Republican. In some ways it is a vision of America's past. Yet Celebration is only 20 years old.

The town was developed by Disney as an antidote to the isolation of the suburbs. By the 1970s more Americans lived in suburbs than either in cities or in rural areas. Two decades later there were more cars than drivers in America. By the turn of the century, SUV-driving suburbanites became the majority, outnumbering rural and city folk combined. The wholesale shift to the suburbs, ever-longer commutes and the rise of shopping malls and big-box stores fractured community life, as downtowns emptied and commerce shifted to the edges of highways.

Disney offered Celebration as an antidote to all this, selling the development on nostalgia for an old-timey America where, as its adverts read, "neighbours greeted neighbours in the quiet of summer twilight". It would be built around five corner-

stones: in addition to "a sense of place" and "a sense of community", the small town, which was planned to grow to 20,000 residents, would also offer progressive education, world-class health facilities and cutting-edge technology. Michael Eisner, who ran Disney at the time, believed it would be a "community of tomorrow".

### House mouse

Disney's interest in town development started with its founder. In a filmed appearance on October 27th 1966, Walt Disney laid out his vision for the 27,400 acres of land he had secretly acquired in central Florida. It would include a theme park, an industrial park and an airport. At its heart would be an "experimental prototype community of tomorrow", or EPCOT (see



### Also in this section

50 Theme parks and technology

51 Shenanigans in North Carolina

52 Lexington: Winning by breaking

For daily analysis and debate on America, visit

[Economist.com/unitedstates](http://Economist.com/unitedstates)

[Economist.com/blogs/democracyinamerica](http://Economist.com/blogs/democracyinamerica)

box). This community would have 20,000 residents, a central business district and futuristic public transport. Cars and lorries would be hidden away underground. It was planned as a showcase of modern technology and "the ingenuity and imagination of American free enterprise". Two months later Disney died of lung cancer. The plan was shelved.

In 1971 Walt Disney World opened on the land. By 1985 it was home to two theme parks with a third under construction (a fourth was added later), hundreds of hotel rooms and plenty of land to spare. But changes in Florida's environmental laws had Disney executives worried that the state would reclaim some of their property unless it was put to use. The contentious land was an alligator-infested swamp, cut off from Disney World by a highway and unsuitable for another theme park. It seemed a shame to waste it. Executives approached Mr Eisner, who was keen on urban planning, with the idea of building a town. He agreed—but only once he was convinced that it would not be yet another suburban tract of homes attached to a golf course, with the Disney logo slapped on it.

Around the time that Disney started working on its town-building project, a movement called new urbanism was taking off. Its big success came with the development of Seaside, Florida, a picturesque resort village which many years later became the setting for "The Truman Show", a dystopian film set in a perfect town. New urbanism advocated building on a human scale, planning for walking and mixing residential and commercial zoning. Celebration's developers set out to adapt that ethos to their town. Though brand new, the town would look like a charming mid-Atlantic city, such as Savannah, Georgia or Charleston, South Carolina.

Judged as an investment, Celebration was a blockbuster. Demand for the first set ▶▶

of lots was so high that Disney had to hold a lottery. Prices started at \$120,000 for the smallest homes and at \$300,000 for bigger ones; the median house price in the surrounding area was \$80,000. Disney invested \$100m in the project but it had bought the land for next to nothing. Construction was left to contractors, and money for roads and lighting came from municipal bonds that were paid back by residents.

Judged as an attempt to recreate a quasi-mythical past, things did not go so smoothly. Part of Celebration's appeal was that it would offer a public school with a private education. "What was promised was a revolution in education," says Lawrence Haber, whose family was the first to move into Celebration, on June 18th 1996. Disney gathered experts from Harvard and Johns Hopkins universities, among others, to design the curriculum. There would be no grades. Classes would be mixed, with children of different age groups studying together. It proved a disaster. Kids slacked off. Without test scores, parents were unable to track their children's progress. Arguments and fist-fights broke out between parents. The school eventually separated into two more conventional public schools. Mr Haber says he might not have moved to Celebration were it not for the school. Many early settlers felt the same way. Some left.

#### Town cat

The promises of high technology fared little better. The original vision involved fibre-optic cables to every home. It never happened. Neither did elaborate plans that resembled an ambitious early Netflix or those for community services online. A scheme in which residents got free computers in exchange for allowing their browsing activities to be tracked fizzled out once AT&T, Disney's corporate partner for technology in the town, realised it had no use for the data, write Douglas Frantz and Catherine Collins in "Celebration, USA", an account of their first year living in the town in the late 1990s. Only the health centre was an unequivocal hit. The hospital, run as a non-profit by the Seventh-Day Adventist church, feels like a resort hotel. It includes a gym and a spa.

Some of the early shortcomings could be put down to teething troubles. But at Celebration's core was nostalgia, making the last two cornerstones, "sense of place" and "sense of community", the most important. Celebration certainly feels different from the rest of American suburbia. Disney invested in building the downtown area so it would be open the day the first families moved in. It commissioned famous architects to build the town hall, the post office, the cinema and other communal buildings. It invited doctors to live in the town so there would be, for example, an optometrist. It located the town centre, quaintly, in the centre of town even

though putting it by the highway would have made more economic sense.

Yet the cinema, a towering faux-art-deco edifice designed by César Pelli has been closed for several years. Locals complained that the downtown lacked basic necessities such as a hardware store or a hairdresser. The small town-centre grocery store shut too, replaced by a big-box supermarket by the highway. The downtown area, which was sold by Disney in 2004, is in poor repair. One block of flats is being entirely renovated, another is held up by wooden support columns, a third is covered with tarpaulin to prevent leaks. Resi-

dents of the downtown condominiums complain that they face huge extra fees for repairs despite having paid for maintenance. A lawsuit is in the works.

To the extent that Celebration can boast of a sense of place, it is opposition to Osceola county, of which it forms a part, where median incomes are about half as big. Celebration voted for Donald Trump; both the district and county it is in voted Democrat. Celebration is cute and orderly; the surrounding areas are covered in strip malls and fast-food chains. The median house price in Celebration is \$345,700, more than twice that of the nearest town and far high- ▶▶

#### Theme parks and technology

## Tomorrowland

EPCOT, DISNEY WORLD

At Walt Disney World, the future is already here

WHEN the EPCOT Centre opened in 1982 it could not have been farther removed from Walt Disney's original vision. Disney had wanted to build an "experimental prototype community of tomorrow", or EPCOT, a Utopian town of 20,000 where a towering city centre would be covered by a dome, where there would be full employment and where new ideas and technologies were always being tested. When Disney died in 1966 that dream died with him. His successors turned EPCOT into a theme park that resembled a permanent world's fair. Half of it was given over to visions of the future sponsored by corporations. The other half was a "world showcase" containing national pavilions with reproductive architecture—a faux-English pub in Britain, a miniature Piazza San Marco in Italy.

More than three decades after it opened, EPCOT remains hugely popular. It is the sixth-most-visited theme park in the world. It caters mostly to adults: bachelor parties and 21st-birthday drinking binges come for the "drink around the world" challenge, which involves drinking at each nation's pavilion (avoid the Norwegian aquavit). The technological showcases have withered. The town became Celebration, an idyllic old-timey town a few miles south (see article).

Yet EPCOT, along with the rest of Disney World, has quietly become a proving ground for the future. In place of tickets, most families receive a rubber wristband when they book their holidays to Disney World. The device, which is smaller and lighter than a fitness tracker, contains a radio chip that unlocks hotel rooms, serves as an entry ticket to the parks, lets people onto rides and allows them to buy food and drinks. Disney photographers stationed around



Park life

the park will tap the wristband and later send the images to a connected mobile app. It is so seamless as to be barely noticeable. It is the sort of technology that Apple and Google have been striving to bring to the wider world. More than 10m of the things have been given out.

Like much modern technology, it is also creepy. Sensors scattered around Disney theme parks allow its computers to keep track of everyone in the park. Each band is personalised. At the main gates, visitors submit fingerprints that are tied to the bands. Yet the families and children at the happiest place on earth barely seem to notice. The bands ease movement and transactions—it is easier to spend money when all it requires is a wave of the wrist. It isn't quite what Walt had in mind. But with its blend of technology, commerce and entertainment, he would approve.

er than any other settlement in the county, according to Zillow, a real-estate company.

The disparity has tugged away at the communal ethos Disney hoped to foster. Old-timers talk up shared experiences, the town foundation that helps out the poor, the many community groups. Newer residents are less enthused. Many parents send their children to private schools elsewhere, blaming an influx of kids from outside Celebration. A quarter of pupils at Celebration School and two-thirds at Celebration High School qualify for free or subsidised lunches, a proxy for poverty. Many of them come from the nearby Highway 192, where motels have turned into rent-by-the-week homes for transient minimum-wage workers.

The well-intentioned hope to recreate some version of America's past has been defeated by the country's present. The parks, pools and playgrounds in Celebration belong to the residents' association and are off-limits to non-residents. Sitting on a park bench is considered trespassing. Residents complain about tourists peeking over their fences or the thousands of children from neighbouring areas who descend on them at Halloween. Celebration was founded by Disney on the principle of openness—the school and utilities are public, and the county sheriff's office provides police patrols. Yet it has become a gated community, just without the gates.

### In Disneyworld

Yet for all its failings, Celebration has changed America. It provided a prototype for mixed-use development that encouraged more permissive zoning laws, says Robert Steuteville of the Congress for the New Urbanism. Baldwin Park, a successful residential development with a commercial heart, in nearby Orlando, was a refinement of the idea. Celebration demonstrated that suburban cities could market themselves to house-buyers by evoking urbanity. These days all suburban developers talk about “place-making” and “urban-style” living, and fostering a sense of community. Celebration got them talking that way.

A big part of Celebration's success came from its association with Disney. “People had an impression that if they moved their kids to a Disney town, their lawns would never get any weeds and their children would never get anything but ‘A’s,” says Peter Rummell, who led the development for Disney. Mike Harford, until November's election the county commissioner for the district that includes Celebration, grew up in Osceola county when “there was nothing but cows.” “If it had stayed that way, I would have had to go somewhere else,” he says. In the land of fresh starts, nostalgia can be the most effective marketing pitch for a new future, in property development as in politics. ■

### Politics in North Carolina

## Ungovernable

ATLANTA

**If you can't beat 'em, take away their power**

WHEN, almost a month after the vote, Pat McCrory admitted defeat in North Carolina's governor's contest, abandoning his graceless demand for a recount, it looked as if Republican efforts to sway the state's elections were finally exhausted. A voter-ID rule, and other restrictions passed by Republican legislators, had been scotched by a federal court that found they targeted black voters “with almost surgical precision”; but, say voting-rights activists, limits on early voting opportunities still suppressed black turnout. Gerrymandering had already helped to assure Republican supermajorities in the state legislature. That means lawmakers will be able to override the veto of Roy Cooper, the incoming Democratic governor—a reason, some observers thought, that they might not be too concerned by his victory.

That overestimated their maturity. Instead they called a special session of the General Assembly, in which they summarily diluted the power of the governorship before Mr Cooper assumes it in January. Mr McCrory, the defeated incumbent, has begun to sign the measures into law in the dying days of his tenure.

The changes include a requirement for the governor's cabinet picks to be approved by the state Senate (hitherto they have been made at his discretion), plus a cut in the overall number of officials he appoints by around two-thirds. The clout of the incoming superintendent of education

(unsurprisingly, a Republican) would be augmented at the governor's expense. Mr Cooper will lose control of the state election board, which will nominally become bipartisan, its chairmanship alternating between the parties—but serendipitously falling to Republicans in the years most elections are held. The court system has been rejigged. All this will hamper Mr Cooper's efforts to pursue his agenda, while boosting statehouse Republicans' ability to advance theirs without his consent.

In some young democracies, it is normal for politicians' views of the proper power of any given office to depend on their chances of occupying it. But, in Raleigh, this constitutional sabotage caused outrage. It has re-energised protesters who for years have objected to reactionary initiatives on voting rights, abortion, health care and other neuralgic policies. Dozens have been arrested (including one in a Santa costume). As Mr Cooper said, the sneak attack on his authority recalls the most scandalous of those moves: when, in another hastily scheduled session, lawmakers rushed through the so-called “bathroom bill”, which meddled with transgender restroom use and municipal anti-discrimination rules.

A backlash against that law cost the state investment, jobs and beloved sporting events—and helped Mr Cooper narrowly see off Mr McCrory, in a state Donald Trump won soundly. As *The Economist* went to press, legislators at last seemed set to repeal it. But they seem not to have been chastened by the fiasco, nor by the federal-court judgments against both their voting machinations and gerrymandering, which was recently ruled unconstitutional, too. When voters demur, evidently their strategy is retain power by fixing the system: a terrible harbinger for America's broader, dismally partisan politics. ■



Power from the people

# Lexington | Winning by breaking

Donald Trump's most damaging legacy may be a lower-trust America



AT THE height of Silvio Berlusconi's power, as the billionaire-politician brushed scandals and lawsuits aside with the ease of a crocodile gliding through duckweed, a professor at an Italian university described to *Lexington* how the terms *furbo* and *fesso* helped explain the then-prime minister's survival. In those bits of Italian society from which Mr Berlusconi drew his strongest support, it is a high compliment to be deemed a *furbo*, or a sly, worldly wise-guy. The *furbo* knows how to jump queues, dodge taxes and play systems of nepotism and patronage like a Stradivarius. In contrast the *fesso* is the chump who waits his turn and fails to grasp how badly the system is rigged, or how much of his taxes will be stolen. The *fesso* might cheer a new clean-air law in his city, naively taking an announcement by the elites at face value. The *furbo* wonders who in the environment department may have a brother-in-law with a fat contract to supply chimney scrubbers. Mr Berlusconi's fans saw him as the *furbo* to end all *furbi*. He showed that he heard them, offering them crude appeals to wise-guy cynicism, as when he asserted that any Italians who backed his centre-left opponents were not just mistaken, but were *coglioni* or, to translate loosely, "dickheads", who would be voting "against their own interests".

Living in that sort of society comes with costs. For decades anthropologists and political scientists have weighed the advantages of living in a high-trust, highly transparent country like Sweden, and measured how corruption and squandered human capital harm places like Sicily. "Trust", a book published by Francis Fukuyama 20 years ago and now sadly topical again, suggested that America and its distinctive model of capitalism flourished because strangers learned to trust one another when signing contracts, allowing them to do deals outside the circles of family, tribal or in-group kinship relied upon in low-trust societies.

As the Trump era dawns in America, the composition of the cabinet and inner circle taking shape around Donald Trump is too ideologically incoherent to define the next president's policy agenda. There are bomb-throwers and hardliners in Team Trump, including cabinet secretaries who have called for the federal agencies they will run to be hobbled or abolished, and an alarming number of men who see no harm in threatening a trade war or two. But it also has figures from the oak-panelled, marble-pil-

lared heart of the Republican establishment.

When it comes to national security, Mr Trump's nominee to run the Pentagon is a retired general, James Mattis, who has called Russia's annexation of Crimea a "severe" threat and accused President Vladimir Putin of wanting to "break NATO apart". His pick to run the State Department, Rex Tillerson, is CEO of an oil firm, ExxonMobil, that argued against sanctions imposed on Russia after the Crimean invasion. Mr Trump's Office of Management and Budget is to be run by a shrink-the-government fiscal conservative, Representative Mick Mulvaney of South Carolina, while his chief strategist, Stephen Bannon, has called for a trillion-dollar infrastructure plan that will drive conservatives "crazy". It is equally easy to imagine headlines, years from now, that call President Trump a revolutionary who took America down the path to hard-edged nationalism, as it is to imagine a hapless incompetent paralysed by factional in-fighting and plunging poll ratings.

If Mr Trump's policies are a mystery, his approach to politics is not. The Republican won office by systematically undermining trust in any figure or institution that seemed to stand in his way, from Republican rivals to his Democratic opponent, leaders of Congress, business bosses, the news media, fact-checkers or simply those *fessi* who believe in paying taxes. Accused of avoiding federal income taxes during a debate with Hillary Clinton, he growled: "That makes me smart."

Mr Trump will not be able to stop that destructive mission to make America less like Sweden and more like Sicily. He has too many promises that he cannot keep. He must betray those supporters whom he wooed with a conspiracy theory dressed up as an economic policy, backed with crude invective worthy of an American Berlusconi. He spotted a market opportunity: millions of Americans with conservative instincts, notably working-class whites in the Midwest, who felt ill-served by both major parties and could conceive of no benign explanation for social and economic changes that angered and dismayed them. Mr Trump ignored transformational forces, such as automation or global competition. He dismissed the notion that foreign policy is filled with complex trade-offs. Instead Mr Trump told voters a story about "stupid" and feckless elites who had given away what was rightfully theirs: from manufacturing jobs to traditional values or a border secure against illegal immigrants and Muslim terrorists. Just give him power, and all would be well.

## Get smart

Fomenting cynicism and partisan divisions is not a flaw in Mr Trump's approach to politics: it is his best chance of surviving the next four or eight years, as reality bites. That is why he has told his supporters not to believe the CIA, when American spy chiefs accuse Russia of working to disrupt the election by hacking e-mails sent by bosses at the Democratic National Committee and the Clinton campaign. It is why Mr Trump has recently held rallies in states that he won, telling supporters, "We are really the people that love this country" and breezily saying of crowd chants to lock Mrs Clinton up: "That plays great before the election, now we don't care." As a man about to break his word, Mr Trump needs an America in which all morals are relative, facts are written by winners and principles count for less than winking appeals to partisan loyalty. Most of the Trump legacy is still unknowable. Some of what he does will be reversed by the next president when the electoral pendulum swings the other way, as it usually does. A lower-trust America will be harder to fix. ■



Also in this section

54 Argentina's becalmed economy

54 Paraguay's waterways

Bello is away

Marijuana in Mexico

# Northern lights

MEXICO CITY

Mexican attitudes to cannabis are mellowing as America liberalises

IN NOVEMBER 57% of Californians voted to legalise the growing and use of marijuana for recreational purposes. Americans in seven other states and Washington, DC, are now, or soon expect to be, free to puff away at leisure, but liberalisation in the most populous border state will be felt acutely down south. Mexico has just marked the tenth anniversary of a war on drugs. It has spent millions of dollars on eradicating cannabis. Now it will abut a huge regulated market for the stuff—and one where 30% of the population is Mexican or Mexican-American. Changes in the United States may be prompting a rethink in Mexico, too—among ordinary people, policymakers and purveyors of pot alike.

Start with the citizens. Nearly a third of voters in Mexico currently support legalising marijuana for recreational use. Attitudes are mellowing: in 2008 only 7% approved of legal pot (see chart). Many Mexicans associate the herb with the horrors of the drug war, estimated to have cost more than 80,000 lives. For some this is a reason to crack down harder on it; for others, to take it out of the hands of criminals.

Mexico's president, Enrique Peña Nieto, has proposed decriminalising the possession of 28 grams or less of pot for recreational purposes (the current limit is five grams). On December 13th, in an important step towards detoxifying the drug, the senate voted to legalise medical marijuana. This partial liberalisation is popular: 98 out

of 127 senators backed it, with just seven votes against. Newspapers are filled with stories of cannabis's potential in the treatment of a host of conditions. Even the Catholic Archbishop of Mexico City gave his imprimatur to the bill. The lower house is expected to approve it in early 2017.

Like a pothead's bedroom, though, the path to full legalisation is strewn with obstacles. Mr Peña's Institutional Revolutionary Party (PRI) is torn between pandering to its traditional base and appealing to younger Mexicans who, like their peers elsewhere, are more relaxed about cannabis. The PRI's poor performance in June's governors' elections was partly blamed on Mr Peña's proposed reforms of marijuana and gay-marriage laws, which may have

alienated social conservatives. Since then decriminalisation has been delayed.

Then there is Donald Trump. Possession of marijuana is still illegal under federal law in the United States. The teetotal president-elect's views are unclear: he has said that pot policy should be left to the states and legalisation "should be studied", but also that the drug should not be legalised now. His nominee for attorney-general, Jeff Sessions, is an old-fashioned drug warrior, who has railed against Barack Obama's "lax treatment" of marijuana. He may enforce federal rules more eagerly in California and elsewhere. Or not.

Nothing is likely to reverse the trend towards liberalisation, which reflects a secular shift in American attitudes. But Mr Sessions could slow its progress, and perhaps discourage it south of the border.

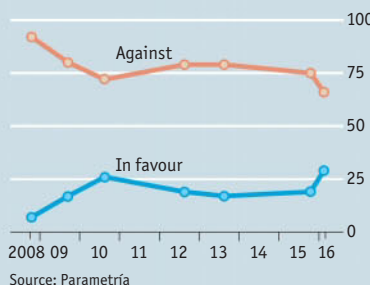
### Smoking and the bandits

For the time being, the Mexicans perhaps most affected by changes up north belong to the country's notorious drug gangs. Seizures of marijuana on the United States' south-western frontier by its Border Patrol, a useful proxy for the activity of Mexican gangs, suggest traffickers are being squeezed by legally grown American crops. In the three years after Colorado became the first American state to legalise recreational pot in 2012, seizures dropped from 1,000 tonnes to 700 tonnes.

Criminals have responded in two ways. They are selling more spliffs to their compatriots, who light up relatively little and so present an alluring growth market. Gangs are also switching to harder drugs. "Drug-trafficking is about managing routes," observes Antonio Mazzitelli, the regional head of the UN Office on Drugs and Crime. As demand for illegal marijuana dwindles, Mr Mazzitelli says, traffickers will move to methamphetamine, cocaine ▶▶

### Joint response

Mexico, % replying  
Are you in favour of or against the legalisation of marijuana?





▶ or opiates. The fight to control new lines of business may be one reason for the renewed violence in Mexico's border areas.

Further loosening of American drug laws, to allow regulated sales of hard drugs, too, would hurt illegal suppliers by providing lawful alternatives. Sadly, it is not on the cards. Eventual legalisation in Mexico—starting with marijuana—would in time have a similar effect. But regulation is hard. Tax pot too heavily and the gangs will dominate the bootleg trade, just as they do around one-sixth of Mexico's tobacco market. Tax it too lightly and many more Mexicans will get stoned.

Politicians are unlikely to race far ahead of public opinion. But California may hint at things to come: 46% of Latinos there voted in favour of legalisation in 2010. This time exit polls put the figure at 57%. ■

### Argentina's economy

## No growth, no votes

BUENOS AIRES

### An end to a reformist president's long honeymoon

ASKED recently to rate his first year as Argentina's president, Mauricio Macri gave himself eight out of ten. Some immodesty is justified. Almost overnight after taking office Mr Macri dismantled the populist policies of his predecessor, Cristina Fernández de Kirchner. He eased currency controls; had the national statistics institute stop massaging inflation figures; and resolved a dispute with holders of overdue government debt, restoring Argentina's access to capital markets.

Argentines have been less generous with praise. Mr Macri promised that by now confidence would be back and healthy growth would ease the pain of his reforms. Instead the economy remains sickly: GDP will shrink by 1.8% in 2016, says the IMF. In October industrial production fell by 8%, year on year; construction collapsed by 19%. One in 12 Argentines is out of work. Inflation may no longer be misreported, but looks stuck at 35%. With incomes crimped, households are spending 7.5% less on basic goods than in 2015, estimates CCR, a consultancy.

Lacking a majority in congress, until recently the president could at least count on disarray among rivals. The dominant Peronist movement once held together by Ms Fernández fractured after her candidate's defeat by Mr Macri: moderates backed some of his ideas; hardliners refused to. With growth prospects receding, the two camps have put their differences aside.

In November Sergio Massa, a moderate Peronist, proposed raising the amount of

### Paraguay's waterways

## Ply me a river

PUERTO FÉNIX

### Ebbs and flows in an unlikely marine superpower

LANDLOCKED Paraguay is sometimes called the "heart of South America". If so, two great rivers are its arteries. Besides abundant hydropower, the Paraná and the Paraguay provide the lifeblood of the small, open economy—trade. In the absence of railways or good roads, it would seize up without the waterways. Improbably, Paraguay (population: 7m) boasts the world's third-biggest fleet of tug-propelled barges, behind the United States (319m) and China (1.4bn).

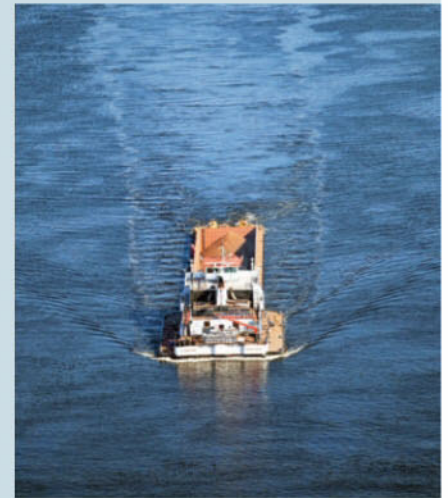
On the outskirts of the capital, Asunción, a mountain of soyabean flour in a massive silo awaits loading. On the dock outside, a crane busily unpacks Japanese Isuzu lorries from a container vessel. In Puerto Fénix, business is up 75% in the past eight years, says Pablino Gómez, its operations manager.

Puerto Fénix is private, like most Paraguayan ports. In contrast to many countries, liberal Paraguay lets anyone purchase riparian property to set one up. Many have, so competition is fierce. Across the fence, Mr Gómez's enterprise is flanked by two rivals. Margins have been squeezed, Mr Gómez admits, but larger volumes have made up for it.

Thank the landlubbers on Paraguay's booming farms. Twenty years ago 15-odd convoys of 20-30 barges each plied the route from Brazil through Paraguay, to the sea in Uruguay and Argentina, recalls Fernando González of Naviship, a shipper. Today, 200 tugboats push round 2,200 barges, mostly brimming with soybeans and other crops. Many are owned by foreign firms, including some from Argentina, domiciled in Paraguay to take advantage of its low taxes. It isn't all

plain sailing. Rock-bottom tax bills also mean fewer resources for public services. When local authorities left a dirt road linking Puerto Fénix to a motorway untended, the port paid to have it paved. Barges sometimes run aground, causing days of congestion, when the government fails to dredge some critical bend.

Waters have grown choppy, too. Since the Brazilian economy started sinking in 2014, upstream merchandise trade has foundered, even as farm exports downriver have held up. Convoys must typically sail full both ways to turn a profit. Some now struggle to stay afloat. In March and April Naviship had so few manufactures to tug back to Asunción, where most would be loaded onto lorries headed for Brazil, that it had to anchor two of its three container vessels.



Tugging at South America's heart

income exempt from tax by 60%. This would please cash-strapped voters, but stretch the budget by 0.6% of GDP, equivalent to a year's spending on public works. The opposition pushed the measure through the lower house on December 6th. The senate may do so on December 21st.

That would leave Mr Macri in a bind: signing the bill would scotch his plans to trim the deficit in 2017 from 7.2% to 6.8% of GDP; a veto may fuel a public backlash. He has been courting the country's governors, hoping they talk sense to senators. Provinces stand to lose out if Mr Massa gets his way: income taxes are shared between the federal and regional governments.

A compromise, perhaps involving a lower threshold, is not out of reach. But the episode has already cast doubt over Mr

Macri's ability to complete the reforms—to rigid labour rules or bloated bureaucracy—that Argentina still needs. Observers see it as a portent that his *Cambiamos* (Let's Change) coalition cannot live up to its name, says Jimena Blanco of Verisk Maplecroft, a consultancy.

Mr Macri may be hoping that opponents will find it harder to obstruct his proposals once economic revival proves these are working. The government forecasts growth of 3.5% in 2017, helped by farm exports and an end to a wrenching recession in Brazil, Argentina's biggest trading partner. But neither looks assured. Brazil's recovery has disappointed. And trade may suffer as more countries turn protectionist. Mr Macri's second year may be more testing than his first. ■

Barack Obama

## The agony of hope

*He was constrained by his opponents and his inhibitions, but some of Barack Obama's accomplishments will endure*

CHICAGO, HONOLULU AND WASHINGTON, DC

### 1 "A skinny kid with a funny name"

Watch it again. He is unusually stilted at the beginning, as you might expect of a debutant on the autocue and the national stage. But soon he finds his rhythm, those crescendos alternating with electric pauses, ecclesiastical notes chiming with his scholarly charisma in a musical voice. Grippingly, he recounts the story of his life, in his telling a parable of unity in diversity—a moral he was still pushing 12 hard, disillusioning years later. "We are Americans first," he urged in the Rose Garden on the day after Donald Trump was elected.

In fact, by the standards Barack Obama subsequently set—in a presidency defined by its speeches, and perhaps to be best remembered for them—his turn at the Democratic convention in 2004 was mundane. But his ascent will still be dated from the moment he loped onto that stage in Boston, with the rangy gait that became as familiar as his smile: an unknown politician from Illinois, soon to be the country's only African-American senator, before, in short order, becoming its first black president. The paean he offered to America, a country that had embraced him as "a skinny kid with a funny name", was also a kind of dare; the self-deprecation camouflaged a boast, since many in his audience saw the obstacles he faced as clearly as he did. "I'm the African-American son of a single mother," Mr Obama reportedly told Binyamin Netanyahu when, years later, Israel's prime minister lectured him on the world's hazards, "and I live here, in this house. I live in the White House."

His presidency will be counted in speeches because its trials proved harder to overcome than the barriers he scaled to attain it. Often he spoke as no other president could, becoming, through his identity and eloquence, a receptacle for the hopes of Americans and of—and for—the world. Think of his speech in Berlin in 2008, when he extolled multilateralism and the rule of law, or his now-defunct conciliation in Cairo the following year. Think of his eulogy after the Charleston killings. Yet posterity might score him higher on a broader metric had he been as effective in the more intimate persuasions of Congress, as consistent in projecting empathy as at exhortation, or more resolute abroad; had he been as adept at championing legislation or facing down tyrants as he could be at stirring hearts.

He proposed bold reforms, but some were never enacted, while others seem set to be undone; his flickering diplomatic bravery was offset by a sort of rash timidity. He was an incarnation of racial healing, yet at the end of his tenure the civil-rights triumphs of the 1960s seem more remote, to some African-Americans, than the civil war of the 1860s. Preternaturally though typically calm (too calm, for some tastes), the ratiocination almost visible in his composed features, he was obliged to welcome into the Oval Office a successor who, by spearheading the "birther" movement,



had contested his right to occupy it. His critics called his an imperial presidency, and he did indeed govern more by executive authority than he would have liked and than others have before. But in truth his presidency demonstrated the erosion of that office's power, and maybe of the power of America itself.

### 2 "Inaction tears at our conscience"

Barry Obama, as he was then known, practised relentlessly on the outdoor basketball courts at Punahou, the idyllic private school he attended in Honolulu. "He loved the game of basketball as much as any player I've ever had," says Chris McLachlin, his coach. He made the all-conquering team less than he hoped, but when he played, says Alan Lum, a team-mate and now a teacher at the school, he was "a fighter". Arne Duncan, his longtime education secretary and a regular in White House games, agrees. "He plays to win," Mr Duncan says. "He might have a nice smile, but he's a killer at heart." The court is "one of the few places he could be Barack Obama, and not be the president."

The escapism of basketball, and the tenacity he brought to it, are not the only continuity between his ►►

► presidency and his old Honolulu neighbourhood, where the modest apartment he shared with grandparents, his school, the Baskin Robbins in which he once worked and the hospital of his birth are bounded by a few blocks, but the views sweep out over the city below and the mountains beyond. His Kenyan father's absconson, and the extended absences of his adored Kansan mother, left him prematurely self-reliant. He developed, says Maya Soetoro-Ng, his half-sister, "an air of independence which is misinterpreted as aloofness," a strength and liability which was another of the traits that he carried on to the mainland and into office. As one former White House official observes, he "doesn't need or show a lot of love".

As unlikely an origin as any modern president's, this was an upbringing at once blissful and claustrophobic, privileged and marginalised. It was worldly in its Asian components yet sheltered from the harshest aspects of America, including, for the most part, its racism—even if, in Mr Obama's recollections, Hawaii's live-and-let-live multiculturalism was less accommodating of his blackness than his peers assumed. As with many driven outsiders, this alienation supercharged his ambitions. His background also shaped the internationalist world view that guided him after those ambitions were realised.

By virtue of his age, Mr Obama was less influenced by the second world war and the cold war, and less devoted to the alliances they nurtured, than were his immediate predecessors. His sense of the wideness of the world was extended by a childhood spell in Indonesia. Both time and place, then, made him a man of the Pacific. That orientation was manifest, in office, in the pivot towards Asia that he hoped would be a centrepiece of his foreign policy—though he failed to deliver its central element, America's participation in the Trans-Pacific Partnership. An ingrained sympathy for imperilled, maritime places was manifest in his concern for climate change—though the international deal on carbon emissions that he finalised in Paris is in jeopardy too.

Any president elected in 2008 would have been subject to certain inexorable forces: a shift in global heft to China; a popular demand for retrenchment after George W. Bush's adventurism. But, more than others, Mr Obama looked aslant at American power, seeing a need, as he put it in his first inaugural address, "for the tempering qualities of humility and restraint". "If you are willing to unclench your fist," he told America's foes, "we will extend a hand." And he did. He shook Raúl Castro's hand at Nelson Mandela's funeral, and restored relations with Cuba. He patiently negotiated sanctions on Iran, then courageously closed a deal to constrain its nuclear programme—a pact that could, at a minimum, delay a military confrontation and may stand as his biggest achievement. These moves helped to revive the world's opinion of America, which the Pew Research Centre's surveys suggest is warmer in many countries than when Mr Obama came in.

### What is it good for?

What will survive of him otherwise, though, are the wars that he reluctantly fought, and the wars that he declined to. He was awarded the Nobel peace prize in the first year of his administration; in his second inaugural address he declared to applause that "A decade of war is now ending." But on his watch his country has fought ceaselessly.

The great unknown unknown of his presidency was the Arab Spring, which helped ensure that the wars were inescapable. He had opposed the invasion of Iraq, and as he had promised he brought the troops home from there, perhaps prematurely, in 2011. But the subsequent inferno has sucked them back in. As Islamic State metastasised, he tried—and failed—to make his countrymen see it in a long perspective which, to many of them, seemed naively otherworldly. The "just" war in Afghanistan also proved inter-



minable. In 2016 America has bombed seven countries, often from unmanned drones, his preferred instrument of destruction.

"Inaction tears at our conscience," he said in his Nobel acceptance speech, "and can lead to more costly interventions later." Yet, over Syria, that is what Mr Obama chose. The crunch point came in 2013, when he decided not to enforce the "red line" he drew the previous year to deter Bashar al-Assad's use of chemical weapons.

Mr Obama didn't miss his chances in Syria, his admirers say; he didn't dither. Rather he turned them down. This, after all, is the man who approved the raid on Abbottabad that killed Osama bin Laden—a gamble that might have ended his presidency, as the botched rescue of the Iranian hostages holed Jimmy Carter's. (As Leon Panetta, a former director of the CIA and defence secretary, says of Abbottabad, "there was a certain attraction to just blowing the hell out of the place.") Mr Obama believed that bombing Syria for the sake of credibility was dangerous and "dumb", and that further involvement would enmesh America without saving civilians. He still thinks that. One former adviser predicts he will regret what he did in Libya—helping to overthrow Muammar Qaddafi, but replacing him with chaos—more than what he refused to do in Syria.

No one knows what might have been. What is clear is that the Middle East, convulsed by Mr Obama's blundering predecessor, is even more wretched after his tumultuous reticence. A terrible war, millions of refugees: Admiral Michael Mullen, a former chairman of the joint chiefs of staff, describes Syria as "Obama's Rwanda". And into the Syrian void stepped Vladimir Putin, the anti-Obama who has shadowed his presidency, profane, unrestrained by scruple and supremely unilateral. Some trace a direct line from that unenforced red one over chemical weapons to Russia's seizure of Crimea and to China's island-building in the South China Sea. As Mr Panetta says, the episode "raised questions about whether or not the United States would stand by its word."

Martin Indyk, a former ambassador and envoy for Mr Obama now at the Brookings Institution, sees, as an underlying rationale, a switch in emphasis from traditional geopolitical rivalries to global concerns such ►►

▶ as climate change and nuclear proliferation—which require co-operation with the likes of Mr Putin or China’s Xi Jinping. Mr Obama’s successful, and thus overlooked, handling of the Ebola outbreak in West Africa fits into this category. He beseeched other nations to jointly address these borderless issues, by agreeing and observing enlightened worldwide rules.

But his allies wavered, while his adversaries saw in his yen for collective action an admission of American retreat. And perhaps, in a way, they were right. His record does indeed imply a humble view of both America’s interests and its influence: a fatalistic accommodation with what he sees as a tragically intractable world. A more introverted (if snarling) America, and a more uncertain, leaderless global order, may be part of his legacy, too.

The simplest explanation of his wariness abroad is that he wanted to concentrate on his domestic policies and the change they could bring. “The problem”, says Mr Panetta, “was the world wouldn’t allow him to do that”. As it turned out, his opponents at home showed just as much reluctance.

### 3 “Sing it, Mr President”

“He fought for that,” says Cheryl Johnson, pointing to the bigger library that in the 1980s replaced the titchy one in Altgeld Gardens—a low-rise housing project on Chicago’s far South Side, polluted then and still by landfills, industrial sites and shoddy construction. Barack Obama is remembered as a young organiser whose grit overcame the wariness caused by his Olympian bearing, the air of a person born to more privilege than he was. He helped to get rid of the noxious fibreglass insulation in the project’s attics, Ms Johnson recalls, collaborating with her mother Hazel Johnson, founder of a pioneering community group, People for Community Recovery.

In Chicago, thinks Reverend Alvin Love, pastor of Lilydale First Baptist Church and an old friend and ally of Mr Obama, he “became the person he was meant to be.” Landing there after student stints in California and New York, he met and married his wife and, later, cut his teeth in politics, including an improvingly failed run for Congress. He found his faith and joined a congregation, immersing himself in the black church and the civil-rights tradition it incubated, such that the cadences and motifs of both thereafter suffused his rhetoric. In Chicago he faced doubts over whether he was “black enough”, a question that overlapped, in a complicated way, with the poisonous and more enduring allegation that he wasn’t truly American. “Chicago is his real birth place,” Mr Love says.

Some Obamaphiles bristle at the idea that he should be thought of principally as a black president—assessed in a segregated category of one. Yet race has been essential to his career, as well as to his finest oratory. The emergency remarks he made, in 2008, after the circulation of radical comments by his pastor, Jeremiah Wright, anticipated his address on the 50th anniversary of the Selma march. In both he advanced a dialectical view of history that transmuted racial traumas into occasions for collective progress, the landmarks of black liberation into milestones in America’s pursuit of perfection. If the story of race is America’s story, his trailblazing role in it must rank among his most lasting contributions.

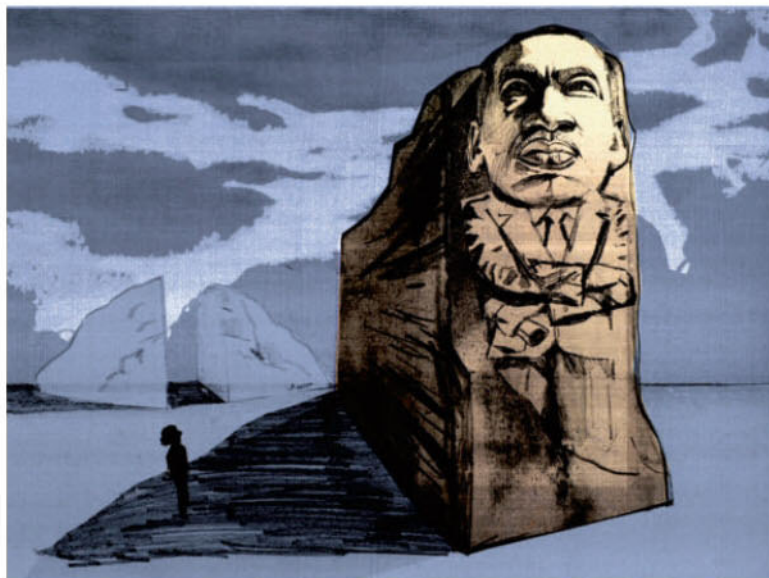
In “Dreams from my Father”, his memoir, Mr Obama wrote that on leaving Chicago for Harvard Law School he planned to

bring the power he would acquire “back like Promethean fire” to communities like Altgeld. And he has—too much for some tastes, not enough for others. His Justice Department strove to protect voting rights (with no help from the Supreme Court). Punishments for cocaine and crack offences were made more proportionate. He pushed for policing reforms. Well before he took office, however, he had eschewed most explicitly race-based policies. “White guilt has largely exhausted itself in America,” he wrote in his second book, “The Audacity of Hope,” an insight amply corroborated by recent events. He believed the best way to help struggling African-Americans was to help strugglers everywhere.

He helped them, vitally but to little recognition, in his handling of the crisis he inherited. The bail-outs and stimulus implemented in his first, fraught months in office not only averted economic catastrophe, saving the banks (eventually at a profit) and the car industry: the slant towards tax credits and welfare spending arrested what might have been a gruesome rise in poverty. David Axelrod, Mr Obama’s long-term adviser, laments a “collective amnesia about just how perilous these times were”: the most dangerous circumstances for an incoming president, he thinks, since Franklin Roosevelt’s in 1933. The changes Mr Obama oversaw, says the White House, will by 2017 have boosted the after-tax income of the bottom 20% of Americans by around 18%, relative to the policies that obtained at the start of his presidency.

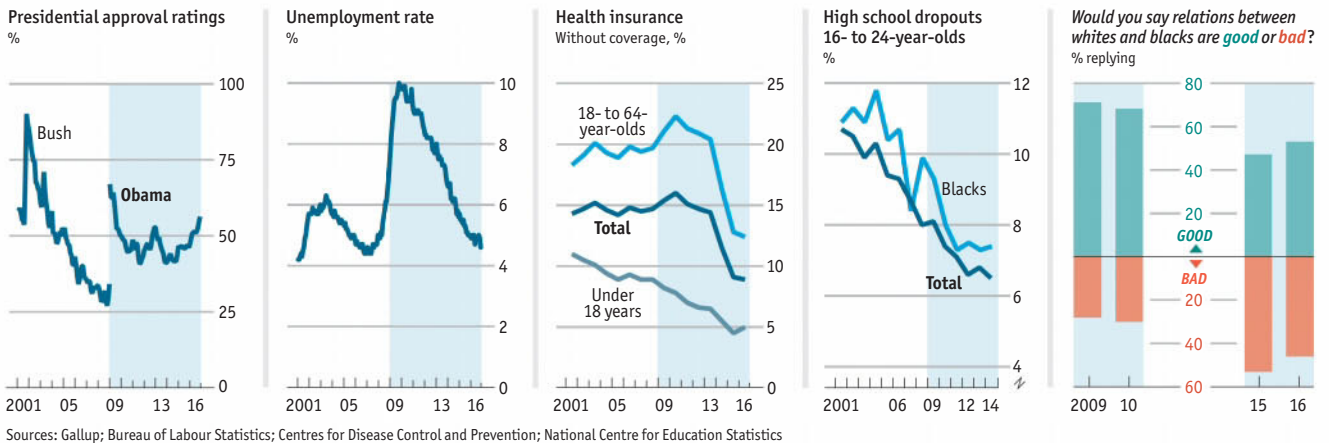
The Affordable Care Act helped, too. Without it, says Ms Johnson in Chicago, “I wouldn’t be able to afford my blood-pressure medicine.” Before, she didn’t have health insurance; many people in the neighbourhood used the emergency services as their basic care. “It was a blessing.”

Nonetheless a visit to Altgeld suggests the Promethean fire sputtered. Not far from that library, etched into the crumbling wall of a shopping precinct, is a long list of locals who, Ms Johnson explains, have died at police hands or of environment-related illnesses. ▶▶



## The virtues of gradualism

United States



► “There goes another black brother,” concludes the inscription. All the shops bar the liquor store have closed. “Don’t nobody have nothing to do,” says a reformed troublemaker from elsewhere on the South Side, except “standing on the corner selling drugs, or gangbanging.” Those careers end two ways: “You either gonna get caught, or you gonna get killed.” “Hopelessness,” thinks Ms Johnson, “is a mental illness.”

The black experience in America is as multifarious as the white one, and there is no racial monopoly on poverty; most poor Americans are white. Nevertheless, African-American communities continue to suffer disproportionately from the sort of problems that afflict parts of the South Side. For all the improvements in America’s schools, they are still one of the places the trouble starts.

After knowing the president in Chicago, says Mr Duncan, “if he would have asked me to come and take out the garbage at the White House, I’d have said, ‘I’m in.’” As it was, his long spell as education secretary saw many more minority students go to college, more generous student aid and improved early-childhood provision. The gulf between black and white high-school drop-out rates narrowed (from 5.1 percentage points in 2008 to 2.2 in 2014). But, as Mr Duncan acknowledges, “the achievement gap is still unacceptably large,” not least because, under the prevalent localised funding model, “the kids who need the most, get the least.” Among hard-pressed families, de facto school segregation is rising: the number of students attending schools in which over 90% of students are Latino or black, and over 90% are poor, doubled between 2001 and 2014.

The disparities widen in adulthood. Blacks still earn less than whites, even in similar jobs and with comparable qualifications. They are around twice as likely to be poor or unemployed. The net wealth of a median white household is 13 times higher than a black one, reflecting the particular havoc wreaked by the housing crunch on black families, who tended to have lower home equity. Black men remain wildly over-represented in prison.

Many African-Americans expected faster progress. Some folks, says Mr Love—whose church is in a Chicago neighbourhood where 54% live below the poverty line—thought Mr Obama would ensure their economic rights, as Martin Luther King secured their civil rights. The disenchanting anger has been fiercest over police shootings of young black men in dubious circumstances: an old outrage, but now widely publicised by cell-phone footage, and denounced by a generation of black activists who grew up with the seeming reassurance of a black man in the White

House. Michael Brown, Tamir Rice, Alton Sterling—their names form a litany which, along with the protests their deaths inspired, has been part of the soundtrack of the Obama years.

“None of us can or should expect a transformation in race relations overnight,” Mr Obama said at the funeral of Clementa Pinckney, a victim of the racist massacre in Charleston in 2015, before unforgettably leading the mourners in “Amazing Grace.” (A microphone captured the moving entreaty, “Sing it, Mr President.”) To some activists, he seemed to have swallowed what MLK called “the tranquillising drug of gradualism”. As a result, the kind of implacability Reverend Wright once espoused is more widespread now than when Mr Obama was elected.

### Elation deflated

Some white Americans, meanwhile, are irked by the persistent talk of discrimination, believing, as Carol Anderson of Emory University paraphrases, that “You got a black president, there is no racism,” and that African-Americans’ misfortunes stem from their own failings. Thus for all the elation about race relations that Mr Obama initially encouraged, the share of Americans who worry about them “a great deal” has almost doubled since 2008. Surveys by Pew record the bleakest outlook among blacks; whites, conversely, are far likelier to think race receives too much attention. In Dallas this July, in what may have been the last great display, in office, of his amphibious rhetorical power, Mr Obama grieved the murder of five policemen in terms that resonated more widely. It felt, he said, as if “the deepest fault-lines of our democracy have suddenly been exposed, perhaps even widened.”

Amid the gloom, though, are reasons for optimism; because it bespeaks high expectations, the disappointment may even be one of them. One view, advanced by Mr Love, is that race relations are “not worse but more visible,” Mr Obama’s presidency forcing Americans to grapple cathartically with their prejudices. And, from a historical perspective, change of the kind he represented was always liable to rile those who, as Ms Anderson puts it, “see American society and its ►►

rights as a zero-sum game.” Mr Obama, remember, was a symbol of change as well as its agent: not just a black president but the harbinger of a demographic shift that will relegate non-Hispanic whites to a minority in the country by the middle of the century. In 2009 talk-show hosts ranted about black retribution. Many people told pollsters they were afraid—a fear which, in a generous interpretation, has always been an inverted form of guilt.

The bloodshed that followed emancipation in the 19th century, and that accompanied the civil-rights movement of the 20th, suggests a backlash was unavoidable. That halting pattern, which retards but does not cancel progress, may have been on Mr Obama’s mind when he spoke, after November’s election, of the zig and zag of American history. As Reverend William Barber, a latter-day civil-rights leader in North Carolina, says of reactionary schemes to rig his state’s voting rules: “A dying mule kicks the hardest.” Sometimes it kicks very hard indeed.

#### 4 “A hard particle of reality”

As a teenager, says Eric Kusunoki, one of Barry Obama’s teachers, “he was a very good listener,” skilled at negotiating the schoolyard cliques. From there, to Harvard Law School, to the Illinois state senate, his polymathic intelligence and flexible, Hawaiian charm neutralised adversaries and forged alliances. Literary critics admire his summer reading selections, musicians his playlists, scientists and tech entrepreneurs his acumen and curiosity. He is a talented wrangler of small children. Yet despite that wide-ranging appeal, his presidency has been among the most divisive in American history. “We cannot mistake absolutism for principle,” he said in his second inaugural, “or treat name-calling as reasoned debate.” He was already too late.

Listening to politicians in Washington account for the rancour of the past eight years is like documenting irreconcilable sides of a terrible war. “I don’t wake up in the morning, ever,” insists Bob Corker, a Republican senator, “thinking that my goal that day is to stick it in their eye.” The trouble, he reckons, was that the Democratic majorities Mr Obama initially enjoyed in Congress bequeathed a “tremendous laziness” over bipartisan outreach (though he stresses that when the president did dabble in persuasion, he did an “exemplary job”). “It was, ‘Here’s the cake, eat it,’” complains Charlie Dent, a moderate Republican congressman. “It wasn’t, ‘will you help me bake the cake.’” Mr Obama, he thinks, “holds Congress in contempt.”

Some Democrats, disappointed with Mr Obama’s communication with them, too, admit he could have been more affable. But others echo Steve Israel, a now-retiring Democratic congressman, who cites “the poison the Republicans injected into the atmosphere on day one.” In this telling, Mr Obama solicited Republican input on his fiscal stimulus, but they rejected his plan out of hand. The president “extended an olive branch,” says Mr Israel, and they responded “with a baseball bat.”

This is the more convincing version. After all, Mitch McConnell, now the majority leader in the Senate, said in 2010 that his party’s top priority ought to be seeing that Mr Obama served only a single term. Some Republicans came to believe that defaulting on the country’s debts was a legitimate tool in their campaign against him, kamikaze tactics that presaged the wrecking ball of Trumpism. One speech of Mr Obama’s will be remembered less for what he said than what a listener did: the time, in 2009, when a congressman yelled “You lie!” during a presidential address. “No other president in history has given a speech to Congress and en-

gendered that kind of reaction,” says Mr Axelrod.

Republicans didn’t like the Dodd-Frank financial-regulation bill. They thought Mr Obama antagonistic to business. (Noting record-high share prices and strong corporate earnings, one official jokes wryly that “In our efforts to destroy the stockmarket, we failed miserably.”) Above all, they loathed Obamacare. They loathed it so much that, in 2010, not a single Republican voted for the Affordable Care Act; so much that they have tried more than 60 times to repeal all or some of it; so viscerally that, in 2013, some engineered a partial shutdown of the federal government in a quixotic bid to undo it. Some Republican governors turned down the federal money it made available to expand Medicaid in their states.

Again, accounts of this reaction diverge. Senator Corker criticises Mr Obama’s timing. The early months of his presidency were, he says, “a hair on fire moment”, at which health reform was a mistaken priority. Mr Obama, he says, brought the Tea Party insurgency in the mid-term election of 2010, and the implacable mood of Congress thereafter, on himself. (Mr Axelrod says waiting would have meant Obamacare never happened: “If it didn’t get done in the first two years, it wouldn’t get done.”) Then there are the flaws and frictions intrinsic to a mash-up of a private health-care market with state subsidies and mandates. In a mildly redistributive system, some premiums are rising; adverse selection has led some insurers to withdraw.

Most of these glitches are fixable. None makes Obamacare the un-American, socialist anathema of Republican imaginings. Meanwhile, as Mr Obama often points out, the law provided health insurance for around 20m people who, like Ms Johnson in Chicago, didn’t have it. The proportion of Americans without coverage is now the lowest in history—though many seem fated to lose it again. The ferocious antagonism was less a reasonable critique of an imperfect scheme than a self-interested bid to squish his presidency, gratifying the incandescent Republican base even if doing so harmed the nation.

#### The limits to power

Many democratic leaders leak political capital as they govern, their clout declining in office even as their proficiency improves. Republican election victories and recalcitrance meant that, in Mr Obama’s case, that process was rapid and costly, for him and for the country. America’s finances were patched rather than mended. Immigration remains unreformed. Gun regulations were not tightened, even after the slaughter of children at Newtown, Connecticut, in 2012—for Mr Obama the worst day of his presidency. Each new, avoidable massacre elicited condolences from him that escalated in tearful fury before towards the end subsiding into despair. (“He has to make the speech,” says Reverend Love, “but he can’t make the law.”) The oubliette at Guantánamo Bay remains in operation, despite the closure order he signed on his second day in the job and a last-ditch rush to depopulate it. On Mr Trump’s watch it may fill up again, just as the torture Mr Obama repudiated may be revived.

Unable to pass laws, Mr Obama turned to executive decrees and regulations much more frequently, ►►



► notes one old acquaintance, than he would have countenanced in his days as a constitutional-law professor. He used them to advance transgender rights and gay rights: after it was legalised, his support of same-sex marriage was emblazoned in rainbow lights on the White House façade. He used them to improve the lot of federal workers, protect consumers and shield some undocumented immigrants from deportation. He needed them to implement America's commitments under the Paris climate-change deal, limiting emissions from power plants and cars. Benign as these edicts often were, this path was doubly risky. Many will be undone (some have stalled in court); and they set a precedent for President Trump.

Did the colour of Mr Obama's skin sharpen Republican resistance? Race has infected discussions of public expenditure in America so insidiously and for so long that it is fair to wonder whether Obamacare would have aroused the same passions had its progenitor been white. Mr Obama was not really an American, a few Republicans maintained, so never really the president.

Nonsense, insist most of his opponents, in what, without prying into their hearts, must be an insoluble debate. In any case, wider factors contributed to the bitterness. Every statesman's record is a compound of leadership and events, his own decisions and external trends he strives to harness. Mr Obama identified one that would define his own presidency a decade ago, in "The Audacity of Hope": the way a canard "hurled through cyberspace at the speed of light, eventually becomes a hard particle of reality." He was the first president of the Twitter age, in which the bully pulpit shrank, partisanship intensified and Americans settled into separate intellectual universes, immured in adamant opinions and, ultimately, discretionary facts.

At the same time he governed through the fallout of the financial crash and the ongoing derangements of globalisation, with the rising feeling it induces, as he put it in the same book, "that America seems unable to control its own destiny". Those forces have unbalanced economies and polarised politics across the world. He met them with the same analytic reasonableness which helped him navigate many crises soundly. That was not always the demeanour the country looked for in its therapist.

## 5 "That was me"

Like all presidents, Barack Obama has aged in public. Americans have measured his years in the White House, and perhaps the passage of their own lives, in the greying of his hair. Still, at 55, he leaves office 15 years younger than his arriving successor. He has plans. He will continue to be involved with My Brother's Keeper, a public-private initiative that aims to steer disadvantaged youngsters away from trouble and into work. ("Guess what?", Mr Duncan recalls him saying, on school visits, to pupils from broken homes. "That was me.") He is writing another book. His family will stay in Washington until his younger daughter finishes high school in 2019; his library and foundation will be in Chicago. But according to the capital's scuttlebutt he longs to spend more time in Hawaii—eating the icky shave ice which is a local delicacy, bodysurfing with the daredevils on Sandy Beach. "He didn't want the job to be his whole self," says his half-sister, Ms Soetoro-Ng, who still lives there. He is, she says, "remarkably unchanged."

Given the Democratic Party's denuded leadership and Mr Trump's agenda, he might feel obliged to intervene in politics more than he intended. The startling trajectory of his approval ratings suggests that many Americans will listen. He and the obstructionism he endured disappointed some, others never embraced him; plainly the affection he commands was not transferable to Hillary Clinton. For all that, and notwithstanding the anti-incumbency mood, he is twice as popular as George W. Bush was at the

end of his second term, and roughly as well-liked as Ronald Reagan; the only two-term president in recent history to leave office more popular was Bill Clinton. "The last time I was this high," Mr Obama joked at his last White House correspondents' dinner, another forum in which his versatility shone, "I was trying to decide on my major."

The uptick in the economy doubtless helps: median incomes are finally rising; the unemployment rate is below 5%. But so must the absence of scandal in his White House, an exemplary probity that may seem even more of a recommendation in the years ahead. So does his unfeigned devotion to his wife and children, a commitment by no means universal among politicians, and which, say those who know him well, is a reaction to that childhood loneliness. Then there is his civility, even when insulted or traduced—another virtue burnished by comparison—plus his generosity. In 2008 he told Coach McLachlin, who he thought left him out of the basketball team too much, to look him up if he came to Washington. Mr McLachlin assumed he would be too busy; the president saw him five times. He wrote to Mr Kusunoki when he retired, and when he lost his wife. Unpublicised loyalty to old acquaintances is a fair indicator of character.

And maybe the standards applied to him have, as Mr Axelrod puts it, been "rightsized". He tells a story of the campaign of 2008, in which, arriving at a rally, Mr Obama worried that he could not bear the weight of expectation he had inspired. There is wisdom in the adjustment from hero-worship to realism, but there is also sadness. On the night of his first victory he spoke of "unyielding hope" in "a place where all things are possible." Yet for all his achievements, his intellect and his grace, his eight years in office imply that even the most powerful leader in the world—a leader of rare talents, anointed with a nation's dreams—can seem powerless to direct it.

From the ruins of Syria to the barricades in Congress and America's oldest wounds, sometimes nothing has been the best he could do. Sometimes it was all he could do. The possibilities seem shrunken. After its collision with history, so might hope itself.\*





IPA

## Beer of the world

*Lagers are ubiquitous; but India Pale Ales are the authentically global beers—and always were*

BURTON-ON-TRENT

**B**EER is for drinking. But beer is also an occasion for conversation—and, if good enough, a subject for it, too. That is where India Pale Ales, or IPAs, come into their own. Few beers incite and enrich conversation as much. Their distinctive character—the “firm bitterness [that] lingers long and clean” in one, the “complex aromatic notes of citrus, berry, tropical fruit and pine” in another—spur discussions that spill over from tap rooms to websites with ease. The plethora of craft brewers that has sprung up over the past few decades provides ample scope for arguments about the relative merits of local brews and far-flung ones—with far-flung, these days, meaning from more or less anywhere on Earth.

And then there is the beer itself. A child of Britain’s industrial revolution and imperial expansion that rose to world-straddling greatness, IPA went on to be humbled by its upstart rival, lager. It had all but vanished when plucky supporters restored it to life and once more put the world at its feet. Here is a beer with a back story.

In the 18th century the British East India Company, originally set up to trade spices, turned its attention increasingly to importing fine cotton and silk from India. Its East Indiamen, “lords of the ocean” bigger than any other sailing vessels at the time, brought holds full of fabric back to London from Bengal, Bombay and Madras. But on the outward journey the holds were largely empty. A generous outbound allowance of cargo, eventually up to 50 tonnes each, was offered to officers and crew as a perk.

Boredom between the comings and goings of the ships led company men in India to make an “art-form of feasting and boozing”, according to Pete Brown, whose book “Hops and Glory” tells the story of IPA. To help this art-form along, wily entrepreneur-seamen packed the holds with hams and cheeses, crockery and glassware and good supplies of drink, mainly beer and wine, sometimes madeira picked up en route. The Company encouraged the imports, even taking an interest in guaranteeing their quality. After all, if the men’s carousing was not supported by wholesome supplies from home they might turn to local alternatives such as arak, which would surely send them mad.

By the late 18th century George Hodgson’s Bow Brewery had become the main supplier to this trade. The brewery was close to the East India Company’s headquarters at the confluence of the Lea and the Thames in east London, so Hodgson could schmooze captains and crew in local taverns. He offered them beer on generous credit terms—necessary given that the round trip could put off payment for a year or more.

The troops in India may have preferred darker, sweeter porter, but the wealthier traders hankered after more refinement. Hodgson’s version of pale ale—a lighter-coloured bitter that was a recent

innovation—gave them what they wanted. Its (relative) pallor came from its malt, which is a grain, usually barley, which has been heated and dried. Sometimes called the “soul of beer”, malt imparts sweetness, colour and the starch that is broken down into alcohol.

Until the 17th century the kilns used for malting were fired with wood or straw, which gave beers a smoky flavour, a deep brown colour, and a devilish lack of consistency. The development of coke, a coal from which impurities have been baked out, changed all that. Histories of the Industrial Revolution rightly point to coke’s importance in ironmaking. But as coke-fired blast furnaces began to produce cast iron in the early 18th century coke also found its way into maltings. Its clean burning produced a paler, subtler and more consistent product, and though darker, sweeter styles still predominated, brewers started to aim those pale ales at the palates of wealthier drinkers.

### Pales into significance

Hodgson’s pale ale was strong and heavily dosed with hops, which are a preservative as well as a bitter counterpoint to the sweetness of the malt. Its strength and savour allowed it to withstand a long voyage in the bowels of a ship. Indeed its drinkers believed the beer got better and better as it withstood the buffeting of the waves and the wild swings in temperature on a journey around the Cape of Good Hope and up to the Bay of Bengal. On those occasions when the beer fell foul of bacterial infection—plenty of ales turned up “sour” in India—the pungent hoppiness went some way to disguising the problem.

The generous credit Hodgson offered, along with his willingness to flood the market with cheap booze when competitors tried to gain a foothold, gave him something close to a monopoly. Then he overreached. First he tightened the credit terms offered to his ad hoc salesforce of seafarers. Second, he started to export the beer in his own ships to exert more control over the trade and expand his business. Setting up as a rival trader, albeit in the opposite direction, changed the light in which the East India Company saw him.

In 1822 Campbell Marjoribanks, one of the Company’s directors, sat down to dinner with Samuel Allsop, a brewer from Burton-on-Trent, hoping to clip ▶▶



▶ Hodgson's wings. Burton, in England's Midlands, was already an important centre for beer. Its waters contained minerals so amenable to brewing that to this day beermakers the world over "Burtonise" their water by adding salts to ensure that it mimics that which is drawn from the town's wells.

In the 18th century Burton had set up a valuable bilateral trade with Russia, which provided the wood in which Burton's beer was barrelled; Catherine the Great was said to be "immoderately fond" of its strong, sweet, dark-brown beers. But exports to the Baltic came to a sudden end with the Napoleonic wars, and when trade was set to recommence the Russian court decided to encourage a home-grown brewing industry by slapping prohibitive duties on imported beer.

Allsop needed a new export market; Marjoribanks needed beer. However he also knew that Burton's sweet ale was unlikely to find favour in India. So after the pudding had been cleared the Company man poured the brewer a glass of Hodgson's ale, promising him a fortune if he could brew something similar. Even if he could, he faced problems. Getting the beer from Burton to London added to the costs. Hodgson, who had a well-established brand, would probably swamp the market when he got wind of the plan. All this, though, was overcome. The beer from Burton proved excellent and arrived in tip-top condition. Burton's other brewers, jealous of Allsop's success, joined the party and the Burton-brewed beer drove Hodgson's out of favour.

As British interests in India grew so did the market, and more brewers started to make "East India ales" or "Ales for the Indian Market". From Burton there was Bass, the town's biggest brewer, and Worthington, another name still familiar to older British drinkers. Charrington of London (which later opened a brewery in Burton) and Tennents of Glasgow joined in, too. By the 1830s IPA began to supplant madeira and claret.

As IPA conquered taste buds in India it spread around the world, turning up in America, Australia and South-East Asia. Its popularity spread in Britain as empire-builders returning from India wanted to keep drinking it. Bass's pale ale (in style, an IPA) made it Britain's biggest brewery and its red triangle logo appeared round the world—some call it the first global brand. Its bottles were to pop up in Manet's "A Bar at the Folies-Bergère" and many pictures by Picasso.

### Ice and a slice

Burton's global dominance was short-lived. Other drinks came along to challenge its hot-climate stronghold. Tonic water, which became available in 1858, went nicely with gin and the quinine it contained warded off malaria. The growing availability of ice made brandy and soda a more acceptable drink for the tropics. Most damagingly, in the late 19th century industrial refrigeration made it possible to brew beers year round (it had previously been a seasonal business unsuited to summers) and to make more beers of the crisp, light lager style popular in Germany and Bohemia. In the tropics, a beer that was refreshing when cold and could be brewed nearby had a lot going for it. In America, European immigrants brought a taste for such things with them. The brewers of Burton remained committed to IPA, and missed the boat.

Even at home IPA fell from favour. In 1870 William Gladstone, the prime minister, introduced the first excise duties to tax beer on its strength, penalising heady IPAs. Further tightening of taxation encouraged ever weaker beer that required no ageing and brought bigger profits. During the first world war grain was commandeered for food, and beers became weaker still. Beer with less alcohol did not require ageing so needed less hopping, saving brewers money. Burton's brewers fell into the arms of larger competitors, later to close down altogether. The immense brick shells of the great Victorian breweries still dominate the town; but only Coors, an American interloper, still makes beer there at scale.

The rout of IPA was not complete. Deuchars, in Edinburgh, and Greene King, in Suffolk, continued to make authentic IPAs, though

the beers lacked the kick of hops and alcohol that their forerunners boasted. Ballantine, founded in New Jersey in 1840 and modelled on the breweries of Burton, survived America's turn to lager and, worse, prohibition, which did for many other American brewers. According to Mitch Steele, former brewmaster at Stone Brewery and author of another book on IPA, Ballantine's was the single most important influence on the craft-beer movement that grew up after America's prohibition-era restrictions on home brewing were relaxed in the 1970s, allowing a new generation to embrace beer first as hobby, then as trade.

The movement's subsequent rise was driven by a fascination with history, with taste and with authenticity—that proved easily marketed to people who wanted beers they could talk about and savour. Many of its early beers were influenced by IPAs; the first to embrace the name was Grant's IPA, in 1983. The new brewers relished the opportunity the style presented for showing off their skills, running wild with new varieties of hops—which turned out to grow very well in the Pacific Northwest—in search of distinctive personality. And IPA had the added attraction of being a forgiving beer. In weaker brews imperfections are shown up in sharp relief. Just as in Hodgson's day, heavy hopping—adding different hops to the beer at various stages of brewing—can cover flaws.

As the craft-beer boom gathered pace, some sought to differentiate their brews by adding ever more hops. In 1994, Blind Pig Inaugural Ale marked the birth of the double IPA (with double the hops). Stone and Ballast Point in San Diego saw this hop-head market emerging and triple IPAs were born. West Coast IPA, fresh and fruity, has become a distinct style of beer.

Not all beer aficionados are pleased. Big, brash American hops like Cascade, Centennial, Columbus and Chinook lack the subtlety of their British cousins. Some IPAs are now almost undrinkably bitter. And the name is now applied willy-nilly. Red IPAs, wheat IPAs and black IPAs are really other styles of beer but with the hop count turned up.

Such are the bandwagon-jumping burdens of success. The flagship beers of small brewers are, more often than not, IPAs; almost every brewery makes one. They account for one in three craft beers sold in American bars; for many tipplers they are synonymous with craft beer itself. And as the movement has spread abroad, so has the inclination to make the heady, hoppy IPAs. It is the "global craft brew", says Mr Brown.

Born in monopoly, IPA is triumphing through diversity. Everyone can have a home-town brew and an opinion. That is bad news for the vast brewers that dominate the large but shrinking global lager market. The competition flourishes at a local level and on a modest scale that the big brewers hardly know how to understand. The beer giants can, and do, buy up smaller "craft brew" IPA-makers; but there is always the risk that discerning drinkers could switch allegiance from their mass-produced lagers. The tipples that helped create the world's first brewing giants could yet undermine the beer-making behemoths of today. \*



The red triangle logo appeared round the world—the first global brand

## Cambridge economists

## Exams and expectations

*The history of a famous faculty shows that the way economics is taught depends on what you think economists are for*

**I**N 1924 John Maynard Keynes, who invented macroeconomics, used a biographical essay about his mentor Alfred Marshall to muse on the qualities of a good economist.

He must be mathematician, historian, statesman, philosopher—in some degree. He must understand symbols and speak in words. He must contemplate the particular in terms of the general, and touch abstract and concrete in the same flight of thought...No part of man's nature or his institutions must lie entirely outside his regard. He must be purposeful and disinterested in a simultaneous mood; as aloof and incorruptible as an artist, yet sometimes as near the earth as a politician.

Such paragons were hard to come by, Keynes sighed: "Good, or even competent, economists are the rarest of birds." But there can have been no doubt in his mind that the likeliest place to find them roosting was among the sandstone crenellations of Cambridge colleges. The Cambridge economics department, founded by Marshall and home to Keynes, was at that time the world's leading school of economics. It not only taught bright young people from around the empire. It also made them into what its faculty thought economists should be: technically accomplished purveyors of policy advice, dispassionate but engaged.

The goal can be seen in the exam questions of the time. Students were expected to combine economic principles with a strong grasp of current affairs. In 1927, for example, one paper on public finance asked students to explain the size and reasons for the main areas of British government spending. They were expected to have the skills of an essayist, spending one three-hour exam on a single question such as the future of gold, the rights and duties of shareholders, or alternatives to democracy. Cambridge economics considered itself to be an analytical science but calculation was not of the essence. A module in statistics produced a page-long test for final-year students; all the other papers were bare of mathematical symbols.

Compare this with the exams of today. Charlotte Grace, a student in the third year of the economics tripos (as undergraduate degrees are known in Cambridge), says she could have passed all the questions she faced in her first year without reading a newspaper. And though the five-page final-year macroeconomics exam

that was set in 2015 asked about some contemporary policy conundrums, like which features of the euro zone may have contributed to its sovereign debt crisis, most of the paper sought to test students' knowledge of tricky, algebra-heavy models. Three-hour pontifications on a single topic have been ditched in favour of a compulsory dissertation in which original empirical analysis is encouraged.

These tests reflect changes in the discipline. Students must master the technical apparatus of a highly specialised field. The maths they need to know and apply is sufficiently taxing as to barely leave time for history. Evidence-based conclusions are preferred to arms-length analysis; economists should know the limits of their expertise, and shy away from political judgments as they think through the effects of whatever policy tweaks providence might throw at them.

The mathematical precision and rigour is appealing to some. On a bright day in October, the first day of lectures this academic year, Angus Groom, a fresh-faced 18-year-old, comments that his first lecture, on macroeconomics, was "the kind of stuff I've read about before, but really coming at it from a rigorous perspective." He is grateful to get beyond the wishy-washy stuff he studied at school.

The structured discipline Mr Groom is studying is a long way from the messy stew Mr Marshall faced when he first conceived of the economics tripos. When he was appointed to the university's chair of political economy in 1885 economics was nestled in the "moral sciences" tripos along with psychology, logic, ethics and other fields. Marshall argued that "a lad, coming from school to this large and heterogeneous mass of difficult notions entirely strange to him, is bewildered", and would be left "unripe".

"The status of economics...appears to have been at a rather low point," Neil Hart writes in the forthcoming ▶▶



ing “Palgrave Companion to Cambridge Economics”. It was looked on as “a minor and disputed area of study, with many of its lecturers and professors recruited or ‘borrowed’ from other established disciplines.” Exam questions reflected the fuzziness of the field’s boundaries. One paper in 1871 asked students to consider whether political economy had more to learn from ethics or vice versa. As was the way of the times, economic issues were seen through the lenses of personal, national and, particularly, class advantage. For example: “If any one had private information that war was about to break out between England and America, what sort of changes in his investments might it be prudent for him to make?” And: “Examine the probable results, to the different classes of English society, if the anticipated decline and ultimate exhaustion of our coalfields were to commence at once.”

Not good enough, Marshall thought. The complexities of the first globalised economy and the accompanying intensification of social problems meant the empire needed more and better economists. Cambridge, he argued, should meet that need by producing professionals with “three years’ scientific training of the same character and on the same general lines as that given to physicists, to physiologists or engineers.” His textbook of 1890, “Principles of Economics,” offered a tidy blueprint.

### The Principled stand

Marshall’s book established the use of diagrams to illustrate economic phenomena, inventing the demand and supply curves familiar to fledgling economists ever since. And it provided a view of the economy as a dynamic system akin to a physical one, so complicated that it was best broken into parts. Its partial equilibrium analysis, which held some bits of the economy constant to clarify movements in the others, gave economists a way to carve smaller questions from the complex whole. Along with David Ricardo’s “On the Principles of Political Economy and Taxation” and Karl Marx’s “Capital” it was one of the three most influential economics books of the 19th century.

The independent tripos Marshall wanted finally got off the ground in 1903. Its courses were not all curves and equations. His first syllabus expected students to know about the British constitution and to opine on topics like “the use of the term ‘natural’ in economic writings” or “economic aims as a factor in international politics”. But it was already more practical. In a module from 1907 called “Advanced economics: mainly realistic” students were asked to “give some account of industrial arbitration in New Zealand.” The overall idea was to cultivate economics as no more, or less, than “a study of mankind in the ordinary business of life.”

In 1908 Marshall handed over the reins to Arthur Pigou. A shy 30-year-old and keen mountaineer, Pigou had something of the 19th-century polymath about him. He had started off studying history and had won the university’s poetry prize for his ode to Alfred the Great before switching to the moral-sciences tripos in 1899 to study economics and ethics. Known around Cambridge—originally and, one imagines, rather unhelpfully—as “The Prof”, he had a reputation as one of the city’s worst-dressed men. Marshall was once horrified to see him in a Norfolk jacket with holes in both elbows: “So bad for the economics tripos!”

Whatever his sartorial shortcomings, Pigou’s academic brilliance made him an obvious heir to Marshall. And as the author of “The Economics of Welfare”, he furthered Marshall’s cause by helping economists turn nettlesome political controversies into technical problems. Before he came along, decisions to meddle in markets were seen as helping one constituency over another, at the cost of inefficiency. He himself railed against the protectionism and imperial preference of the time, worrying that they were bungs to a small segment of the population.

In other cases, though, he showed that when there are external costs to someone’s actions, a bit of meddling might improve on the market outcome. For example, those who ignore the effects of their pollution on others will pollute too much. A nifty tax to align



Marshall was horrified to see Pigou in a Norfolk jacket with holes in both elbows: “So bad for the economics tripos!”

the individual’s incentives with those of society can mean better outcomes for everyone. Armed with this idea, economists could argue for intervention on technical grounds of efficiency.

Marshall championed Pigou; but his favourite student was Keynes, who came to one of Marshall’s courses after taking his mathematics degree in 1905. In 1909 Keynes returned to lecture on monetary economics. When he spoke in his essay on Marshall of a master economist as “mathematician, historian, statesman, philosopher” Keynes could have been describing himself (and perhaps he was: modesty was certainly not part of the recipe). Hopping between roles as an academic, civil servant, government adviser and journalist, he took vigorous part on the biggest topics of the day; his pamphlet arguing against self-defeating economic reparations on Germany, “The Economic Consequences of the Peace”, made him rich and famous.

Like Pigou, Keynes emphasised that individually sensible decisions might be disastrous for society. He did not have the troves of data that economists have today,

but could see that the mass unemployment of the 1930s was the result of a deep market failure: the queues of people on the dole were unwillingly unemployed. In defiance of the consensus that overall the economy would right itself, he thought that economies could end up trapped in deep and nasty slumps simply because of self-fulfilling losses of confidence. The solution was government intervention, in the form of an injection of public spending and confidence. His work justified policy intervention as an antidote to capitalism’s imperfections, to save it rather than to replace it; and it did so, as Pigou’s had, with the help of apparently dispassionate technical argument.

### Technical fixers

Keynes and Pigou established economics as a toolkit to be used by policymakers, and pioneered the role of government economic advisers. Keynes famously remarked that “practical men who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist”; his policy activism was designed to replace that unexamined received opinion from the past with explicitly stated apposite analysis from the present. When the British government created a Committee of Economists to advise it in 1930, Keynes and Pigou were both appointed to it. Meanwhile Cambridge strove to produce more of their ilk. Through the 1920s and 1930s Keynes delivered eight lectures a year on his work in progress, “The General Theory of Employment, Interest and Money”, and created an intellectual hub of economic disciples, known as the “Cambridge circus”. A group of younger members of the faculty began meeting in 1930 to discuss Keynes’s “A Treatise on Money,” published that same year. Specially selected undergraduates could go along too.

Students were by this time expected to take on board a lot more mathematics and theory than they had before. When he visited Cambridge in the 1940s, shortly before Keynes’s death, Harry Johnson, a Canadian economist, was struck by how much more de- ▶▶

▶ manding the tripos had become. Once, he wrote, all you had to do to pass the exams was read Marshall's "Principles" over the course of the year and the *Times* at breakfast every morning; the rest of the day was free for being "out on the river with God". By the time he arrived, finalists had to read Keynes's "General Theory" from cover to cover, and digest intellectual debates such as those between Keynes and D.H. Robertson, a close collaborator who became an intellectual rival, on the "liquidity preference" and "loanable funds" theories of interest. (The heat of debate spilled over into exams: a student of 1947 asked to consider the criticism that "Lord Keynes' doctrine of liquidity preference 'seems to leave interest hanging by its own bootstraps'" might reasonably have wanted to know who the examiner would be before answering.)

### The flatter world

The Cambridge faculty, though still impressive, has inevitably fallen back from the dizzy heights it occupied from the 1920s to the 1940s. Keynes shook up the settled consensus, codifiable in the textbooks of Marshall and Pigou. The next time a consensus settled within economics, it was forged in a different Cambridge, that of Massachusetts. A post-war intellectual backlash against Keynesianism relegated the original Cambridge to a dissident backwater, condemned to critique the mainstream from outside.

Today the faculty no longer nurtures its own school of thought, but it still suffers from the post-imperial shift towards America's high-paying universities. Yet even among them, none towers as the Cambridge of Pigou and Keynes once did. The general success of the profession, and the institutional growth that has gone along with it, have made it hard for any single school to achieve true pre-eminence. Nor are battle lines drawn as once they were. Economists have largely fulfilled Marshall's aim of rising from muddy ideological debates; the biggest fights today are between methodologies, not ideologies.

Keynes and Pigou transformed the discipline with new grand theories of how the economic system works while taking an active part in policy and encouraging others to do the same. The role for economic advice thus created has remained. But in Britain, in particular, the settled opinions of the broad church mean that such advice has been to some extent commoditised. Philosophers and grand debaters have been replaced with specialists building ever more intricate models and finding increasingly sophisticated ways of drawing lessons from data.

Hamish Low, a Cambridge professor who works in applied economics, does not mourn the loss of philosopher kings' grand

intellectual debates. "Now we need to be much more evidence based", he says. But the discipline's development has come with a cost. The specialisation associated with expertise can encourage narrow thinking. "Disciplines are now defined too much by methods rather than by questions", Low says. This narrowness feeds through to policy advice, which too often applies established models to current circumstances, rather than considering fundamental reinterpretations of the issues. Economists can give you an estimate of how much revenue a tax increase will raise, the income loss associated with Brexit, or the employment effects of a minimum wage rise. It calls to mind another aphorism from Keynes about economists being at their best as "humble, competent people on a level with dentists", using their technical skill to solve pressing problems within a limited area of expertise.

Underlying this intellectual timidity is a bigger failing. After his enjoyably rigorous lecture on macroeconomics, Mr Groom's second taste of his department comes from Ha-Joon Chang, author of popular books such as "23 Things They Don't Tell You About Capitalism". At the heart of Marshall's desire to separate economics from politics, Mr Chang explains to his rapt audience, lay a contradiction: "Economics is about economic policy, whose making is political." The new space Marshall carved out for economics, and his new way of teaching it, left the discipline better equipped to inform politics disinterestedly. But the politics were always already there. As the discipline focused more and more on technicalities and models this persistent presence slipped from view. But though it was hidden, its power remained—all the more pernicious for being unseen and thus unquestioned.

As Mr Chang explains to his students, seeing politics as an external factor affecting how economic theory translates into policy can be a useful approximation. But that approximation ignores the rest of the system—the part where economic theory and politics influence each other's evolution. So, for example, economists have busied themselves constructing models of preference without asking through what exercise of power those preferences were formed. While some spotted the colossal rise in income inequality that took place in Britain and America from the 1980s, they have, until quite recently, tended to dismiss it as primarily a political issue. They are all too often silent on just the sort of questions the tripos used to see as crucial: the rights and duties of shareholders; alternatives to democracy; the effect of the exhaustion of fossil fuels; the meaning, if any, of the word "natural".

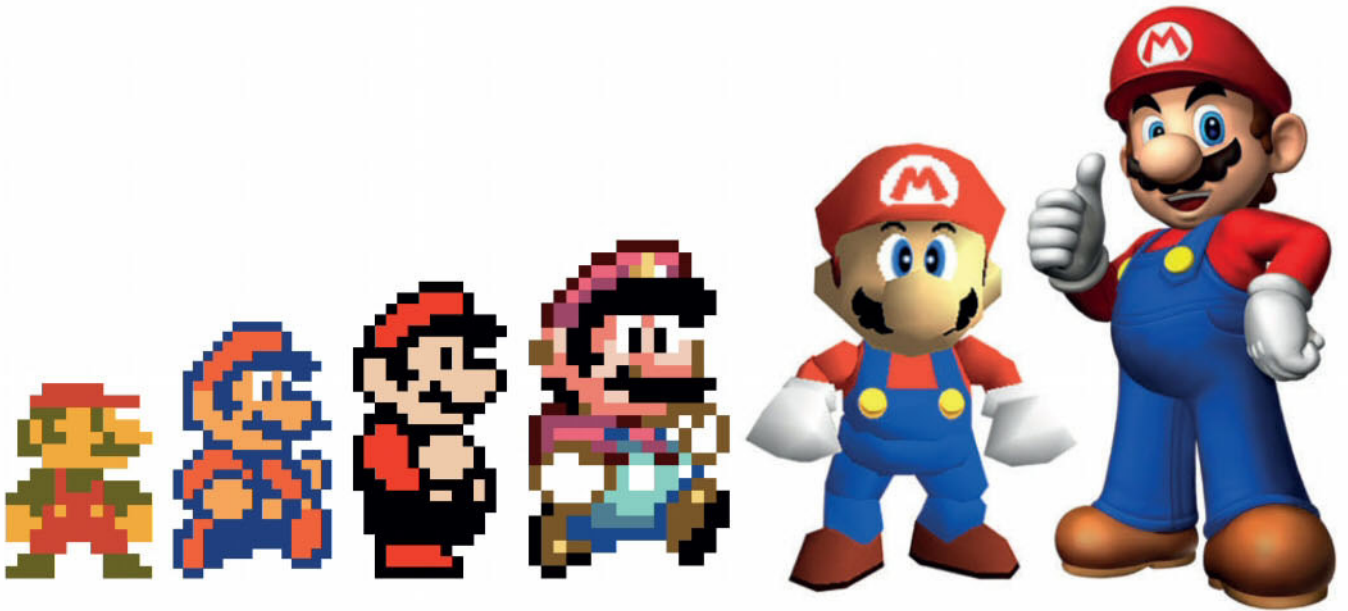
If economists really were dentists, this might be fine; no one needs a political ideology of cavities to perform a root canal. And living without dentistry is a dreadful thing. But Keynes at best only half believed his dentist conceit. He also wanted the "mathematician, historian, statesman, philosopher": aloof; earthy; purposeful. Not every economist can be all those things, nor could they ever. But if the old aspiration to try and be so is lost, so is part of Marshall's original dream of economists seeking not merely to apply their ideas in a worldly way, but to produce both better ideas and, in the end, a better world. \*



Mario

## It's-a me!

How a pudgy plumber from Brooklyn became one of the world's most loved characters



TOKYO

THE *izakaya* has a name, but it cannot be published. Its location is a closely guarded secret. Entry is restricted to members—celebrities, media types and *otaku*, a particularly devoted kind of pop-culture geek. They do not come for the food, though it is excellent, nor for the drinks, which are well mixed. They come for Toru “Chokan” Hashimoto, the Nintendo alumnus who runs the place, and for his friends and their memories. On one wall is a sketch of Pikachu, a popular character in Pokémon games, drawn by its creators when they dropped by. On another is the original sheet music from a classic Nintendo game, a gift from the composer. Front and centre is a drawing of Mario signed by Shigeru Miyamoto.

Mario, an extravagantly mustachioed Italian-American plumber from Brooklyn, is Mr Miyamoto's most famous creation. He is also the foundation of Nintendo's fortunes; David Gibson, an analyst at Macquarie Securities, a broker, reckons that his antics account for a third of the company's software sales over the past ten years. Games in which he features have sold over 500m copies worldwide. His image appears on everything: not just T-shirts and mugs, but solid gold pendants.

At the closing ceremony of the Rio Olympic games, Shinzo Abe, the prime minister of Japan, made his grand entrance dressed as the chubby plumber. Some of the worldwide audience was doubtless bemused. But most, surely, smiled the way that one must when something is both unexpected and utterly fitting. In what better guise could Japan have welcomed the world to Tokyo, venue of the next summer games, than as the world's most recognised everyman? Eating at a Singapore restaurant soon after, Mr Abe was recognised by fellow diners. Look, they whispered to each other, it's Mario.

“Donkey Kong”, the game in which Mario first appeared, was born of failure. In 1980 Nintendo, a toy company, was trying to break into America's \$8bn arcade-game market. But “Radar Scope”, the “Space Invaders” knock-off on which the company

had pinned its hopes, was a flop. Hiroshi Yamauchi, Nintendo's patriarch, gave Mr Miyamoto the job of making it into something better.

Yamauchi had hired Mr Miyamoto as the company's first staff artist three years before. Mr Miyamoto had not been terribly keen on a corporate job. Nintendo had had no need for a staff artist. But Mr Miyamoto's father arranged a meeting between them, and Yamauchi took a liking to the shaggy-haired young man with a taste for cartoons and bluegrass music.

The first idea for the “Radar Scope” makeover was to draw in the audience by licensing Popeye, a sailor man, to act as the game's main character. But the licensing deal fell through, and Mr Miyamoto had to invent a new character from scratch. In doing so he had a pretty free rein. The game's plot—hero rescues girl from gorilla—did not require back story or motivation from its protagonist. Mostly, he just jumped.

Mr Miyamoto wanted his character to be a regular guy in a regular job, so he made him a chubby, middle-aged manual worker—originally, a carpenter. Some design decisions were dictated by the technical limitations of low-resolution displays: the hero got a bushy moustache so that there would be something separating his nose from his chin; he got a hat because hair presents problems when your character has to fit in a grid just 16 pixels on a side; he got bright clothes so they would stand out against the black background.

His name was an afterthought. Top billing on the game was always going to go to the gorilla. (“Kong”, in the context, was more or less a given; “Donkey” was found by consulting a Japanese-English dictionary for a word meaning silly or stupid.) The protagonist was simply called “Jumpman” for the one thing he was ►►

▶ good at. But Minoru Arakawa, the boss of Nintendo in America, wanted a more marketable name. Around that time, writes David Sheff in “Game Over”, an authoritative account of Nintendo’s rise, Mr Arakawa was visited at Nintendo’s warehouse outside Seattle by an irate landlord demanding prompt payment. He was called Mario Segale, and he had a moustache. Thus does destiny call.

“Donkey Kong” was a colossal hit. Nintendo had shifted just 1,000 “Radar Scope” arcade cabinets in America; in its first two years “Donkey Kong” sold more than 60,000. Sequels followed, including, in 1983, “Mario Bros.”, in which the game moved to the sewers of New York. Mario traded in his notional hammer for a figurative wrench and became a plumber; he also gained a brother, Luigi.

### Let’s-a-go!

In the same year Nintendo released the Family Computer, or Famicom, in Japan. The maroon-and-white console, which allowed gamers to play arcade titles in their own homes, was a massive hit. Mr Hashimoto, who joined the company in 1984 (and now runs that secret Tokyo bar) says demand was so intense that engineers from Nintendo’s Kyoto headquarters were sent to stores to help with sales. By 1985 two in every five households in Japan had one.

In 1985 Famicom was released in America as the Nintendo Entertainment System, with “Super Mario Bros.” included in the price. The new game revolved around Mario’s quest to rescue Princess Peach from Bowser, a giant evil turtle. But if the set-up of damsel distressed by unfeasibly large animal seemed familiar, very little else did. The game took place under a clear blue sky at a time when most games were played on a space-y black background. Mario ate magic mushrooms that made him bigger, or “Super”, and jaunted from place to place through green pipes. “Super Mario Bros.” offered an entire world to explore, replete with mushroom traitors (“Goombas”), turtle soldiers (“Koopa Troops”) and man-eating flora (“Piranha Plants”). It was full of hidden tricks and levels. It was like nothing anybody had ever seen.

Mr Miyamoto called it “a grand culmination”, taking the best elements of gameplay from Nintendo’s other titles to produce something that invited hours of immersion and lots of return visits. Children—and their parents—lost days of their lives inside Mr Miyamoto’s kingdom. “Super Mario Bros.” sold 40m copies and the Mario franchise never looked back; it went on to produce more than 200 games, several television shows and one memorably lousy movie. By 1990 American children were more familiar with Mario than with Mickey Mouse.

In the 1990s and 2000s Nintendo continued to be a profitable maker of games, home consoles and hand-held gaming systems. To begin with, it was highly admired as such. In 1991, the president of Apple Computer, when asked which computer company he feared the most, replied “Nintendo”.

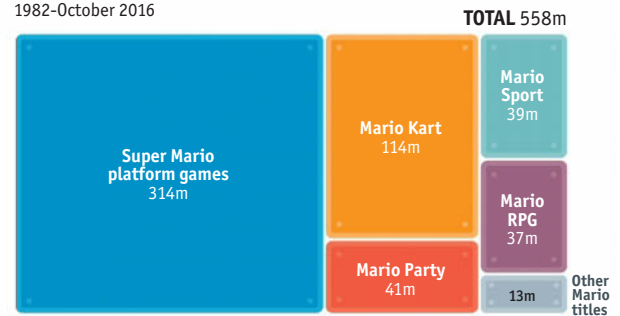
The two companies were in some ways similar. Just as Apple’s operating systems are made available only on phones and laptops that it designs and sells, Mario and his extended family could be found only on Nintendo’s hardware. That strategy, combined with the company’s policy of appealing to the mass market of families and casual gamers—rather than the smaller niche of “hard-core” gamers targeted by its rivals—made Nintendo a big success through the 2000s. But where Apple kept innovating, creating whole new categories of product, Nintendo brought out only one big innovation; its Wii console, released in 2006, which liberated living-room game players from the couch



“He doesn’t do much plumbing, or talk about his heritage”

### Super Mario chart

Nintendo’s Mario franchise games sales, units  
1982–October 2016



Source: VGChartz

and let them use more than just their thumbs.

The original Wii was a hit. But soon one of Apple’s new categories of product cut the Japanese company’s world out from under it. The iPhone and its successors saw casual gamers abandon dedicated devices for mobile phones. By 2012—five years after the launch of the iPhone and, not coincidentally, the first year in its history as a public company that Nintendo posted a loss—the market for games on mobiles was already worth \$13.3bn, about half as much as the market for home consoles and hand-held gaming systems. By 2018, reckons Macquarie’s Mr Gibson, it could be worth half as much again as the market for dedicated gaming consoles.

Nintendo has released only one new console in the iPhone era, the Wii U. It flopped. It has made some wonderful new games, such as “Splatoon”, a critical and commercial success, which came out in 2015. But with console sales sluggish, few new gamers ever encounter them. “Switch”, a hardware offering Nintendo will release in spring 2017, does double duty as a home console and a hand-held device, letting gamers take their games with them on the go. But a glance around the Tokyo metro confirms that the Switch is solving a problem that does not exist: carriages are crammed with men and women staring into their phones, playing “Candy Crush” or “Puzzles and Dragons”.

So Nintendo is changing its strategy. Under Satoru Iwata, who took over from Yamauchi in 2002, the company avoided mobile games on the basis that they were low-quality and their pay-as-you-go model was exploitative of children. But in the summer of 2016 the surprise success of “Pokémon Go”, a mobile game developed by Niantic, an American company spun off from Google, confirmed Nintendo’s previously rather tentative decision to change tack. In a PR master stroke Nintendo sent Mr Miyamoto to Apple’s annual autumn press event to announce “Super Mario Run”, a new game for the iPhone.

This is not the only way that Nintendo is exploiting the value its intellectual property can realise when allowed off the company’s own hardware. Universal will invest \$350m in a Nintendo-themed attraction at its amusement park in Japan. Nintendo is once again considering Mario movies.

Not before time. Recognisable characters are one of the most sought-after resources in the entertainment ▶▶

▶ industry: from Hollywood's superhero franchises to theme parks to video games, a name the public knows is perceived as the best way to reduce the risk of expensive failure. This is especially true of smartphone games. Early on it was possible to introduce novelties, such as "Angry Birds", an early runaway hit. But competition has got very intense. In 2008, a year before those Angry Birds were hatched, some 250 games were submitted to Apple's app store every month. Now more than 700 games are submitted every day.

Today the business thinks that success is contingent on familiarity. "Pokémon Go" was a moderately successful game, called "Ingress", before its creators rebranded it with Pokémon, cute little monsters part-owned by Nintendo. It was subsequently downloaded onto half a billion devices. "Stardom: Hollywood" was a mediocre game about going from wannabe to celebrity until it signed on Kim Kardashian and morphed into "Kim Kardashian: Hollywood", an instant blockbuster.

### Okey Dokey!

In this climate the success of "Super Mario Run" is hardly up for debate. But will it introduce a new generation to the Mario franchise, or simply delight those already familiar with it? Early indications suggest the latter. The game, released on December 15th, is a delightful rendering of the essence of Mario—which is to say, jumping—tailored to the small screen. But at \$10, it is comparatively expensive (though there are no hidden extras in the form of in-game purchases). And for now it is also available only on iPhones. Both decisions rule out big emerging markets.

In the 1990s Nintendo's nugatory presence outside developed countries was no obstacle to Mario's global charm offensive. Cheap knock-offs of Nintendo consoles made in Hong Kong and Taiwan flooded poor countries, and Mario went with them—often quite literally the only game in town. Now no one with a phone who wants games lacks them; and those who have only ever gamed on phones feel no burning need for Mario. In China, the world's biggest gaming market, Mario is practically unheard of, says Serkan Toto, a Tokyo-based games consultant.

Phone-based follow-ups to "Super Mario Run" may yet take off; Mario's charm is not to be sniffed at. But it is of a peculiar sort. "On one level he is very specific: an Italian-American plumber from Brooklyn, America", says Jeff Ryan, the author of "Super Mario", a history of the character. "On the other hand he doesn't do much plumbing or talk about his heritage. He's just an avatar." That does not mean you can replace him with any other avatar. He is particular, and distinct. It's just that there's nothing to being Mario other than being Mario.

Ray Hatoyama, who led the global expansion of Hello Kitty, a cute, mute cat-like character whose image rakes in several billion yen every year, likens the global success of characters such as Mario and Hello Kitty to the export of rice. It is easier to sell an ingredient to a foreign culture; they can add the spices and herbs to their taste, he says. By contrast fully cooked stories with a specific setting, such as "Doraemon", set in a Japanese school, are a harder sell abroad. The contexts are too different. If Mario's plumbing and heritage mattered, he would be a lot less successful.

There is one aspect of his context, though, that matters: fun. Mr Abe turned up in Rio dressed as Mario not just because Mario is instantly recognisable around the world. He embodies the delight of play. Talking to the *New York Times* in 2008 the reclusive Mr Miyamoto explained that

people like Mario and his ilk "not for the characters themselves, but because the games they appear in are fun. And because people enjoy playing those games first, they come to love the characters as well." When "Super Mario Bros." came out, it was the game that children and adults fell in love with. Mario's cheerful face on the packaging of its sequels and spin-offs guaranteed further high-quality fun. His success became self-reinforcing. If "Super Mario Run" takes off among phone gamers for whom Mario is a vaguely recognised but arbitrary pop-culture emblem, it will be because it is a really good game.

According to Mr Hashimoto, who worked with Mr Miyamoto, Nintendo's characters are always at the service of the game, rather than vice versa: "Whatever fits better." Splatoon is a case in point: it features an all-new cast of humanoids and squids. "We weren't invested in creating a new character. We just set out to create a game with a new structure," Hisashi Nogami, Splatoon's producer said in a company chat. Before they settled on squids, Splatoon's creators considered making the characters rabbits or blocks of tofu. But they decided that squids worked best.

Good gameplay is not enough. Strange though the world is, it is hard to imagine tourists in Tokyo dressing up as tofu to drive around in go-karts, as those entranced by the "Mario Kart" driving games do. The middle-aged men who put on blue dungarees and fake moustaches to watch India beat the English at cricket would probably not dress up as squids to the same end, whatever video games they might remember from their youth. Star Club, a Mario-themed bar in Tokyo's Shinjuku nightlife district (and the retro-gaming themed 8-bit Cafe, around the corner), would do less business with foreign fans and Japanese *otaku* alike were it not for the cheery moustachioed presence. The Mario-ness of Mario does matter.

But at Mr Hashimoto's place, among the true cognoscenti, for all the affection in which the characters and their creators are held, the game's the thing. \*



Flashman

## The cad as correspondent

Victorian England's foremost rotter would have made a great journalist



**R**EBELS had captured the dam that supplied electricity to Kinshasa and turned off the lights in the Congolese capital. Now they were marching on the city. Panic reigned. Pro-government thugs were going around lynching suspected rebel spies. Some they hacked to death. One they tossed off a bridge and shot as he bobbed in the river. A city under siege, full of power-drunk kids with Kalashnikovs, is no place to be. Your correspondent was there, and feeling frightened. Which reminded him of one of the great cowards of English literature. He asked himself: in this situation, what would Flashman do?

For readers who have not yet met him, Flashman was the villain of “Tom Brown’s Schooldays”, a pious novel about life at a British boarding school published in 1857. The author, Thomas Hughes, portrayed him as a bully who roasted small boys over open fires but ran away snivelling from anyone bigger than him.

A century later, a Scottish journalist called George MacDonald Fraser wondered what happened to Flashman after he was expelled from school. He answered his own question with a series of wickedly comical historical novels. In Fraser’s telling, the adult Flashman was every bit as horrible as the schoolboy, but through

sheer luck and sleazy charm became one of the most decorated heroes of the Victorian era: Brigadier-General Sir Harry Flashman, VC, KCB, Legion of Honour, San Serafino Order of Purity and Truth (4th class), etc.

His career took off when, having joined the army because the uniform attracted women, Flashman found himself besieged in a fort in Afghanistan. He feigned sickness to avoid fighting. When all the other defenders were killed or wounded, he grabbed the British flag and, pleading for mercy, offered it to the Afghan warriors surging over the walls. Just then a big explosion marked the arrival of a British relief force. Flashman was found unconscious, draped in the flag and surrounded by dead Afghans. Everyone assumed he was defending the colours, not surrendering them, and he won the first of many medals.

Morally, it would be hard to find a worse role model. Over the course of 12 books Flashman bullied underlings, betrayed friends, cheated on his wife Elspeth and stabbed in the back anyone who blocked his escape route. Yet there is much that this fictional Victorian rotter can teach modern reporters. Though he was leery of journalists (“[t]ricky villains, especially if they work for the *Times*”), he would have made an outstanding one.

Flashman’s first instinct was for self-preservation. This is a useful (and underrated) trait for journalists. Had he been stuck in Kinshasa in August 1998, Flashman would have headed for the best-guarded hotel and hung out in the bar by the swimming pool. That is what your correspondent did, and it proved an excellent policy. The beer was refreshing, the *brochettes de boeuf* delicious and the conversation high-

ly informative. All the powerbrokers, spies, money-men and diplomats passed through. By listening to them, your correspondent gleaned a fuller picture of what was going on than if he had ventured out to the front line, which would have involved a lot of hiding in ditches and trying unsuccessfully to figure out who was shooting at whom.

Hang back from the shooting and you often get a better view. During the Crimean war of 1853-6 Flashman used all his wiles to hang back, describing the campaign with colour and precision from safe hill-tops. Unfortunately for him, he was then caught up in the most foolhardy manoeuvre of the entire war. His horse bolted towards the Russian cannons, causing Flashman unwillingly to race out ahead of the Charge of the Light Brigade. British newspapers interpreted this as “Flash Harry” up to his usual heroics.

Your correspondent has never galloped into a Valley of Death, but he has occasionally blundered into sticky situations. Once during the civil war in the Ivory ►►



▶ Coast he ran into a rebel roadblock—a heap of branches and a broken fridge with a cow’s skull on top. The youngsters manning it were stripped to the waist, armed with rocket-propelled grenade-launchers and drunk at 10.30 in the morning.



### In some ways being a scoundrel made Flashman a better reporter

Flashman, faced with superior firepower in unsteady hands, would have smiled, made himself pleasant to his captors and tried to buy time. That is what your correspondent did, swigging *koutoukou* (a fiery spirit distilled from palm wine) out of a shared plastic jerrycan. Eventually he was rescued by a French army officer, who persuaded the rebels that journalists are not spies.

Modern reporters use all sorts of methods to stay safe. They hire fixers. They go on “hostile environments” courses. They send back a barrage of WhatsApp messages describing where they are. None of this is as effective as Flashman’s nose for danger and intense desire to avoid it. Nor can any course teach his genius for getting out of it. Which is probably just as well: throwing one’s lover off the back of a sled to lighten its load and escape pursuing Cossacks is hardly cricket.

Flashman also immersed himself in the local culture. He picked up foreign languages absurdly quickly. By the end of a long career, he was fluent in nine and could rub along in another dozen. He never learned much in a classroom—Latin and Greek bored him senseless. Rather, he learned by listening to native speakers and catching the rhythm and feel of their dialect.

Usually he did this in bed. Tall, handsome and effusively whiskered, Flashman was successful with women from a wide variety of cultures. Not all ended up hating him. On one occasion, to pass the time in a dungeon in Gwalior in India, he tried to count his conquests and arrived at a figure of 478. That was in 1857, when he was only 35; he lived to 93.

Speaking multiple languages often saved his skin. Locked up during the Second Opium War, he was the only British prisoner who understood that their Chinese jailer planned to execute one of them. Asked to translate, he lied that the jailer planned to send one of them with a message to the British and French forces besieging the town. Eager for freedom, a soldier who was blackmailing Flashman pushed to the front—and was conveniently beheaded.

A good foreign correspondent networks with powerful people, the better to understand the motives behind important policies. Flashman rubbed shoulders with Wellington, Lincoln and Bismarck (though Bismarck loathed him and tried to have him killed). His accounts add fistfuls of spice to the historical record.

Indeed, the Flashman Papers can be useful background reading during reporting trips. It was thanks to Flashman that your correspondent understood, when visiting the Summer Palace in Beijing, the scale and scandal of its destruction by British troops in 1860. When covering a flood in Madagascar, he could find no better short history of the island than Flashman’s Malagasy adventures. And Flashman would have chuckled to learn that lotharios are now known there as *bananes flambés*, after a popular dessert.

The Flashman Papers purport to be written by Flashman himself—the secret, honest memoir of a garlanded rogue, discovered in a Leicestershire saleroom in 1965 and “edited” by Fraser, with helpful historical footnotes. The books are so well researched that, to naïve readers, they can appear genuine. When “Flashman” was first published in America, about a third of the 40-odd reviewers took it at face value. One called it “the most important discovery since the Boswell papers”. Fraser laughed till it hurt.

Strenuous research (Fraser was a keen amateur historian) and dollops of first-hand observation (he was an energetic traveller, too) are the raw materials of great journalism. To this Fraser added a crackling prose style and a gift for storytelling. As an observer, Flashman was often caustic but never blinded by the pieties of his age. He believed neither in the civilising mission of the British em-

pire, nor in the myth of the noble savage. So whether he was observing Englishmen, Sikhs or Zulus, he recognised fools, heroes and charlatans for what they were.

In some ways being a scoundrel made Flashman a better reporter. Many modern correspondents tend to preach. This quickly becomes tedious. Journalists who profess outrage at every minor politician’s off-colour remark soon run out of words to describe real outrages. Flashman did not have this problem. He was callous and made no effort to pretend otherwise. This made his prose more convincing, for he let the facts speak for themselves. On the rare occasions when he was moved to make a moral judgment, the effect is electrifying. One such instance occurred when he was press-ganged onto a slave ship, where he saw Africans branded, chained and crammed below decks.

“The crying and moaning and whimpering blended into a miserable anthem that I’ll never forget, with the clanking of the chains and the rustle of hundreds of incessantly stirring bodies, and the horrible smell of musk and foulness and burned flesh. My stomach doesn’t turn easy, but I was sickened...when you’ve looked into the hold of a new-laden slaver for the first time, you know what hell is like.”

He admitted that, if someone had approached him in his London club and offered him £20,000 to authorise a shipment of slaves, he would have taken the money. Out of sight, out of mind: this was also the attitude of many of his respectable contemporaries to buying slave-made sugar or cotton. Fraser did not need to remind readers that Flashman—a sociopath—was in this respect little worse than millions of 19th-century British tea-drinkers.

### Laptop, flak jacket, condoms

Being a foreign correspondent is the most enjoyable job there is. The men and women who are lucky enough to do it today travel the world, meet new people, sample exotic new dishes and grapple with new ideas. Even when it is uncomfortable it can be exciting. To make the most of a posting, journalists must be open to new experiences and skilled at seeking them out. It helps to have a fat expense account.

Flashman sometimes had no money at all, but made up for it with resourcefulness. When fleeing from angry gun-toting slave-owners in New Orleans, he crept into the French Quarter and inveigled his way into a luxurious brothel by seducing the madam, who fell in love with him and asked her butler to ply him with fine wine and Cajun delicacies.

Your correspondent had a more austere time in the Big Easy in 2005, after Hurricane Katrina. At one point he too had to beat a tactical retreat from an angry gun-toting homeowner. Alas, with all the hotels in town closed by floodwater, the only place to sleep was in a cramped, sweaty caravan with half a dozen other hacks, some of whom snored.

Whenever your correspondent visits a place where the ultimate cad once trod—Harper’s Ferry, Isandlwana, even west London—the relevant passage from the Flashman Papers comes easily to mind. Such memorability sets a standard that journalists rarely match. Most of his own work, he knows, is written in haste and soon forgotten.

As he writes this, he is about to head for Afghanistan, where Flashman earned his first laurels. In his luggage will be the first “Flashman” on his iPad. And at the first whiff of danger, he will bolt. \*



Also in this section

74 "Jungle justice" in Nigeria

74 America's embassy in Jerusalem

75 Silencing dissent in Syria

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

[Economist.com/world/middle-east-africa](http://Economist.com/world/middle-east-africa)



The Democratic Republic of Congo

# There will be trouble

KINSHASA

The constitution says Joseph Kabila is no longer president. He begs to differ

**C**AN a thin blue line stop a revolution? In Kinshasa, the capital of the Democratic Republic of Congo, police are doing their best. On December 19th, the last day of Joseph Kabila's final presidential term, they stood on street corners and at petrol stations, wrapped in body armour and clutching rifles. They arrested dozens of political activists and surrounded the houses of opposition politicians. The message was clear: stay at home, or risk being shot. Three cops took a short break to rob your correspondent, but most concentrated on suppressing dissent.

For now Mr Kabila, who has ruled Congo since inheriting the job from his dad in 2001, has the upper hand. But Congo, an unstable country of 80m, is plunging into a political no-man's-land. No head of state since independence has left office peacefully after an election. The war that followed the overthrow in 1997 of Mobutu Sese Seko, a tyrant who had ruled for three decades, led to the deaths of hundreds of thousands or possibly millions, mostly from hunger and disease. One victim was Mr Kabila's father, who was assassinated.

Tension has been building since it became clear that Mr Kabila would neither hold elections in November nor step down. By law presidents are limited to two terms of five years each. Mr Kabila says that since elections have not been held—a failure for which he is largely to blame—he should stay in power until they are. In-

deed, for him to leave "would be a violation of the constitution", said Kikaya Bin Karubi, an ally of Mr Kabila's, at a press conference on the 19th.

In the days before the deadline flights out of Kinshasa were packed with wealthy Congolese and foreign workers. At the ferry port where rusting speedboats cross the river to neighbouring Congo-Brazzaville, an expensively dressed family clambered out of a blacked-out SUV, their luggage carried by six porters. "We are leaving because of the 19th," said a small boy clutching an iPhone.

Parts of Kinshasa had seemed primed for revolution. "They will put police there to shoot us, but we won't be afraid," said a

32-year-old man called Jean-Claude, on a street corner in Limite, an opposition district. Another man, Malu, wearing a necklace emblazoned with UDPS, the initials of an opposition party, thrust a leg out to show a bayonet scar. "What Mr Kabila's police did to us, we will do to him. Even if it takes days, at the end, the police will be running from us."

Yet on the day itself the opposition, which had promised to rally against Mr Kabila's refusal to quit, was largely mute. Étienne Tshisekedi, an elderly but influential politician who returned from exile in July to be greeted by adoring crowds, did not say a word. Moïse Katumbi, a wealthy former ally of Mr Kabila who fled into exile in May, sent a dull video message from Brussels. "We do not have the power to tell the people of Congo what to do," complained Martin Fayulu, an opposition leader who, in September, personally organised and led protests.

Having faced down the Kinshasa street, Mr Kabila may be even less willing to compromise. Certainly he will continue his "glissement", or slippage. He has promised to organise elections by April 2018. That gives him time to find a way to change the constitution to stay in power, or else to line up a replacement who can be trusted to protect his health and his family's wealth.

Jason Stearns, an analyst at the Congo Research Group, a watchdog in New York, reckons that the next year will be punctuated by protests. With so many people unhappy, riots could start over almost anything, from a wrongful arrest to the price of sweet potatoes. Already, the economy is weakening, and with it the patronage that Mr Kabila can dispense. Congo makes most of its hard currency from copper and other minerals, so it has been clobbered by the commodities slump. Over the past year the black-market exchange rate of the Con- ▶▶



golese franc has fallen from around 900 per dollar to 1,250. Civil servants are not being paid. Traders grumble. “Nobody has any money”, says Jean Kaninda, who sells toothpaste and detergent. “I have to pay for my stock in dollars but I cannot raise my prices in francs.”

If protests erupt and are bloodily put down, international isolation may follow. On December 12th America imposed financial sanctions on Kalev Mutondo, Mr Kabila’s chief spy. The EU has placed travel bans on seven other bigwigs. Angola, Congo’s neighbour, has suggested that the president should find a way to step down.

The question now is how long the peace can hold. In Limite a man calling himself Jerry predicts that an opposition victory will not come quickly—but it will surely come. “We are tired of Kabila...He kills us every day. But Kabila will die, day-by-day, week-by-week, but he will die.” ■

### “Jungle justice”

## Trial by fire

LAGOS

### Why Nigerian criminals prefer the cops to the mob

**I**N A sweaty restaurant in Lagos, Ajayi Oluwatosin David, a member of a government-affiliated paramilitary group, displays a picture on his cell phone of three alleged kidnappers lying naked before the feet of a crowd.

A day earlier, security guards had caught the trio, stripped them, taken photographs and turned them over to the police. Had Mr David’s colleagues not been on the scene, the mob might have beaten the suspects, wrapped them in petrol-soaked car tyres and set them ablaze. That is what happened in April to a robber caught stealing a television in a slum in Nigeria’s commercial capital.

Vigilante killings of suspected criminals happen often enough in Nigeria that they have their own moniker: jungle justice. Some are the result of hasty verdicts and mistaken identities: in 2012 four college students were wrongly accused of theft and killed by riled-up neighbours near the southern city of Port Harcourt.

Police and politicians condemn these and other killings, and the Nigerian senate is considering a bill aimed at cracking down on mob justice. But experts say they go on because crime is rampant and many people do not trust the law. Security firms say Nigeria is Africa’s kidnap capital and that policemen are often involved.

“The feeling is that by handing this suspect over to the police, the police will release them and collect money from them,”

### Donald Trump and Israel

## An American embassy in Jerusalem?

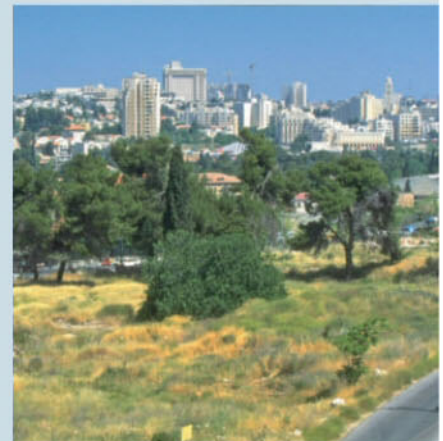
JERUSALEM

### The president-elect is shaking things up

**A**PINE grove in south Jerusalem has remained untouched for decades. This is the site reserved for America’s embassy in Israel (pictured). But like every other country that recognises the Jewish state, America has its embassy in Tel Aviv rather than the holy city. Donald Trump may change that.

He was not the first American presidential candidate to promise to move the embassy to Jerusalem in line with the Jerusalem Embassy Act, which was passed by Congress in 1995. But every president since has signed a national-security waiver suspending the act, arguing that Jerusalem’s status will be determined only after a peace agreement between Israel and the Palestinians. Although Israel has considered Jerusalem to be its capital since December 1949, most other countries cling to the UN resolution from 1947 that divided Palestine to create the Jewish state. It said that Jerusalem should remain a *corpus separatum*, or separate entity belonging to no country.

Mr Trump’s representatives have, however, said that he intends to move the embassy. Last week he named David Friedman as ambassador to Israel. A bankruptcy lawyer, Mr Friedman is an outspoken supporter of the Israeli far right, has donated money to Jewish settlements in occupied territories and says that members of J Street, a liberal Jewish organisation, are “far worse than *Kapos*” referring to Jewish collaborators in Nazi concentration camps. On October 27th Mr Friedman told a gathering in



A Zionist plot

Jerusalem that the State Department “has been anti-Semitic and anti-Israel for the past 70 years”. If its staff were to oppose moving the embassy, they would be fired by Mr Trump, he said.

The prospect of the embassy’s move has been greeted with jubilation by members of Binyamin Netanyahu’s cabinet and by dire warnings from the Palestinians. Saeb Erekat, a Palestinian Authority official, said it would “destroy the peace process” and launch the region on a “path of chaos”.

Yet it may also revive moribund talks. “Trump has already shown he is prepared to shake things up,” says a veteran Israeli diplomat. “Maybe moving the embassy could actually be shock therapy to the peace process and bring the sides back to the table.”

says Innocent Chukwuma, a public-safety and security expert. There is some truth to this: Nigerian law does allow certain criminal suspects to post bail, and the police are staggeringly corrupt. Many officers spend their days mounting roadblocks to extort cash from drivers. People who report a crime are often told to pay up or the cops won’t investigate it.

Aware of its poor reputation, in 2015 Nigeria’s constabulary put together a unit to probe complaints against officers. Thus far none of the grievances reported to it has been resolved, says Okey Nwanguma of the Network on Police Reform in Nigeria, a pressure group. “People don’t have confidence in the police so they prefer to take laws into their own hands and dispense mob justice,” says Mr Nwanguma.

When they do, there is usually someone nearby with a camera to record the

macabre episode. In October, for instance, horrific photographs circulated on social media showing a beaten and bloody suspect hogtied and suspended from a beam in Benin City, east of Lagos. Other photographs doing the rounds in recent months show people being burned alive after being accused of crimes ranging from rape to the theft of a television.

Mr David’s security organisation, called Man O’War, patrols markets and neighbourhoods in Nigeria and detains suspected criminals before handing them over to the police. He says it is essential to strip and photograph suspects so that people will recognise them if they return. Beatings by bystanders are also justified, in his view. “The civilians have the right to beat a criminal if they caught [him], because he’ll be struggling,” Mr David says. But the public has no right to kill suspects, he says. ■

## Silencing dissent in Syria

## Assad's torture dungeons

GAZIANTEP

## Dissidents are dying in the Syrian despot's jails

IT WAS clear that Hamza Ali al-Khateeb had been tortured before he died. Returned to his family a month after he was arrested at a peaceful protest in April 2011, the 13-year-old boy's dead body was covered with cigarette burns and lacerations. His jaw and both kneecaps had been smashed and his penis had been cut off.

As demonstrations against the regime's rule spread across the country, the boy's death at the hands of the regime's security forces became a powerful symbol of its brutality. "I can only hope that this child did not die in vain but that the Syrian government will end the brutality and begin a transition to real democracy," said Hillary Clinton, who was America's secretary of state at the time. During the early days of the uprising many shared her hope.

Almost six years on that hope has been crushed. The scale of the killing carried out inside Syria's torture dungeons is difficult to gauge: human-rights groups say the regime has tortured to death or executed between 17,500 and 60,000 men, women and children since March 2011. The dead, often buried in mass graves or incinerated, are rarely returned to their relatives. The official death certificates that are sometimes handed to relatives typically say that the victims died from natural causes.

Tracking the number of people in detention is also difficult. Mr Assad's security forces have converted sports stadiums, abandoned homes, hospitals and schools into jails. Loyalist militias from Iraq, Lebanon and Iran also operate their own secret sites. At least 200,000 people are thought to remain in detention, most of them in government facilities that are closed to the International Committee of the Red Cross.

What little is known about Mr Assad's torture machine comes from survivors swapped in prisoner exchanges or released after bribing officials. Relatives of the dead, defectors and hundreds of thousands of government files smuggled out of the country by activists add to their accounts. Together, they paint a picture of a regime that has tortured and murdered on an industrial scale to silence dissent.

Take the case of Muhannad, a 28-year-old university student who organised some of the first peaceful protests in Aleppo. He was arrested in 2011 by agents from air-force intelligence, blindfolded and taken to a cell where he was strung from the ceiling by his wrists. He was tortured for eight days until he signed a false confes-

sion that he had killed regime soldiers with the help of his mother.

After that he was moved to an air-force intelligence base near the presidential palace in Damascus, where he underwent two years of almost daily interrogation and torture. Sometimes, for amusement, the prison guards would force the inmates to strip naked and play at being dogs. As they drank alcohol and smoked water pipes, the guards stubbed out cigarettes and tipped hot coals over the prisoners' backs. "You have to work hard to amuse them or you get beaten," he says.

**Murder for fun**

Death at the al-Mezzeh Air Force Intelligence prison was routine. Muhannad remembers how, during the month of Ramadan in 2012, the guards killed 19 prisoners in a single night. "They had brain seizures, severe bleeding from the torture," he says.

On another occasion, a teenage boy returned to his prison cell in tears. "They'd executed his brother in front of him. Then they'd bent him over a table and raped him with a stick. They were laughing and saying 'a new woman has been opened.'" Two other cellmates were beaten to death by guards as they waited to have their hair cut.

When the infection from an open wound in his leg spread, the guards took Muhannad to a nearby military hospital. Patients were forced to sleep with shoes in their mouths. If the shoe fell, nurses beat them with stiff plastic pipes. Muhannad says he saw a nurse club a patient to death

in his bed after he asked for medicine.

It was here, at Hospital 601, that a forensic photographer working for Syria's military police force photographed the bodies of more than 6,000 people killed in government detention facilities between 2011 and 2013. The images show rows of naked, emaciated corpses with numbers written on their foreheads. Most bear signs of torture. Smuggled out of the country on flash drives, these images provide some of the most damning evidence of the regime's systematic use of torture.

There is little that can be done to bring Mr Assad and his thugs to justice. The UN says the regime's use of torture and the "mass death of detainees" inside its prisons amount to crimes against humanity. Yet rights groups say that the UN, in its drive to negotiate an end to the conflict, has largely ignored the regime's atrocities. The Security Council's last attempt to refer Syria to the International Criminal Court failed when Russia and China objected.

"For nearly six years the Syrian people have watched Mr Assad butcher his own people. They look at him and think, 'This person took away my son.' How do you expect them to accept any deal that keeps the regime in power?" says Saeed Eido, who chronicles atrocities for the Syrian Institute for Justice, set up in Aleppo in 2011.

On December 2nd Syrian intelligence officials returned the dead body of Ibrahim al-Ahmed to his family. They were told that the 25-year-old, who had been missing for four years, had died of a heart attack. Yet his emaciated body, which the family barely recognised, was disfigured by missing teeth, a leg broken by a blunt tool, deep lacerations across his back, bruises and cuts. "There was no funeral. We took him straight from the fridge to the grave," says Ibrahim's brother. "When people in Syria know their relative has been killed in prison, they don't make any noise about it, but it is impossible to forget." ■



No justice, no peace




---

**Also in this section**


---

**78 Banyan: Crying blasphemy in Jakarta**


---

For daily analysis and debate on Asia, visit  
[Economist.com/asia](http://Economist.com/asia)

**Conflict in Myanmar**

## The Lady fails to speak out

COX'S BAZAR, NAMTU AND SITTWE

**Aung San Suu Kyi says she wants peace. She has made a bad start**

**S**YED, a 33-year-old Muslim religious teacher, feared the worst. On October 9th Rohingya militants attacked border posts near Maungdaw, a township in the north of Rakhine state in western Myanmar, killing nine Burmese border guards. Syed, himself a Rohingya from Rakhine, was sure that a vicious crackdown by Myanmar's army would follow. So he put on non-religious clothes and shaved his beard. Along with 16 others he left his home village. For days the group hid in a forest. Eventually they crossed the Naf River, which separates Myanmar from Bangladesh, and found their way to the sprawling, ramshackle Kutupalong camp near the coastal town of Cox's Bazar.

Syed's fears were justified. Myanmar's army has blocked access to much of Maungdaw, keeping away journalists, aid workers and international monitors (troops claim to be searching for stolen guns and ammunition). But reports have emerged of mass arrests, torture, the burning of villages, killings of civilians and the systematic rape of Rohingya women by Burmese soldiers. At least 86 people have been killed. Satellite imagery analysed by Human Rights Watch suggests that soldiers have burned at least 1,500 buildings—including homes, food shops, markets and mosques (one devastated area is pictured). The organisation says this could be a conservative estimate; it includes only buildings not obscured by trees. Amnesty Inter-

national says the army's "callous and systematic campaign of violence" may be a crime against humanity. Myanmar's government denies all such allegations, dismissing many of them as fabrications.

Around 27,000 Rohingyas—members of a Muslim ethnic group native to Rakhine—have recently, like Syed, fled to Bangladesh. But about 1m of them remain. Before the recent turmoil, tens of thousands of Rohingyas in northern Rakhine relied on aid for food, water and health care. The blockade has severed that lifeline.



Such brutality does not reflect well on Aung San Suu Kyi, a winner of the Nobel peace prize who has led Myanmar since her party's resounding electoral victory in 2015. Neither does ethnic conflict, which has been intensifying on the other side of the country, speak well of her skills as a peacemaker. She entered office saying her priority was to resolve Myanmar's decades-long civil wars. Recently, however, a long-running insurgency in Shan and Kachin states has spilled into the area's towns for the first time in years (see map). It involves the Northern Alliance, a group comprising the Kachin Independence Army (KIA), the Arakan Army, the Ta'ang National Liberation Army and the Myanmar National Democratic Alliance Army. The alliance accuses the national army of detaining, torturing and killing locals, despite the government's pledge to "resolve [problems] through a peace dialogue."

This is par for Myanmar's post-independence course: the country has long been racked by civil conflicts fuelled by an army operating without any civilian constraint. But Miss Suu Kyi was supposed to change this grim status quo. The recent violence shows how far she has to go. A solution will require Miss Suu Kyi to rethink the country's ethnic policies and restrain an army that is still reluctant to accept civilian command. It is far from clear how committed she is to trying.

Hopes were high when Miss Suu Kyi convened four days of peace talks in Naypyidaw, Myanmar's capital, beginning in late August, with representatives of 17 of the country's 20 insurgent ethnic groups. The event was described as the "21st Century Panglong Conference"—a reference to one held in 1947 at which Miss Suu Kyi's late father, General Aung San, a hero of the country's fight for independence from Britain, agreed to give the minority Shan, Ka- ▶▶

chin and Chin populations “full autonomy in internal administration”. (Miss Suu Kyi, like nearly 70% of Myanmar’s population, is ethnic Bamar—the group from which the country’s old name, Burma, is derived.)

This year’s gathering achieved nothing so momentous. Miss Suu Kyi made grandiose statements, the army chief made vague promises, the ethnic-army leaders stated their positions and everyone promised to meet again early in 2017. Encouragingly, the ethnic armies reassured the government that they wanted not secession, but more freedom within a federal state. Miss Suu Kyi and the Burmese army also voiced support for federalism. But what that might mean in practice, and what the army is willing to cede, remain unclear. The army has enriched itself by grabbing land and resources in ethnic regions; it shows little sign of wanting to give them back. The military-devised constitution, imposed on the country after a sham referendum in 2008, gives Miss Suu Kyi’s civilian government no real power to compel the army to do so.

No wonder, then, that disenchantment with state-led peace efforts is growing among minorities. Although the KIA attended Miss Suu Kyi’s Panglong gathering, the Burmese army has been pounding it for months, reportedly seizing the Kachins’ mountain outpost of Gidon this month. The Northern Alliance has recently attacked Burmese army and police forces along the Chinese border. At times it has claimed to hold various border towns. The fighting has driven thousands of people to seek refuge in China, which has reportedly beefed up its military presence along the frontier. The alliance may hope that a riled China will put pressure on Myanmar to make concessions to the ethnic groups (the Kokangs are ethnic Chinese). So far, however, China has not risen to the bait.

Those caught up in the conflict feel let down by all sides. Miss Suu Kyi’s party, the National League for Democracy (NLD), “made a big noise but now, where are they? We cannot see them,” says an ethnic-Shan resident of one strife-torn town, Namtu. Sai Philip, a Catholic of Indian descent, says tactics used by ethnic groups to sustain the fight, such as the occupation of villages, forced recruitment and heavy taxation, have alienated many people.

But, to the ethnic armies, popular support matters less than it once did. The Northern Alliance groups—three of which did not attend the Panglong talks and have signed no ceasefire agreements—are not really fighting for a cause. Instead, they and the army are trying to maximise their gains on the ground in readiness for eventual negotiations to end the fighting. That is driving them further apart. The Burmese-army-dominated Shan state parliament has labelled the Northern Alliance “terrorists”. In response, a broad coalition of ethnic groups has blamed the army for the

current hostilities, and Miss Suu Kyi for failing to live up to her own rhetoric.

In Rakhine state, the Rohingyas have not even received a rhetorical acknowledgment from Miss Suu Kyi of their plight. She has kept shamefully silent about it, fearful, perhaps, of upsetting ethnic Bamar, who are mainly Buddhists and many of whom look down on the Muslim Rohingyas. They see them as outsiders, culturally linked more to Bangladesh. Even though Rohingyas have been living in Rakhine for well over a millennium, most are denied citizenship. Miss Suu Kyi is sensitive to international criticism of her government’s stance: on December 19th she convened a meeting in Yangon of foreign ministers from the Association of South-East Asian Nations in an attempt to assuage their concerns. She has also appointed two commissions to investigate abuses in Rakhine state. But she avoids using the word “Rohingya”, calling it “controversial”. The minority is not one of Myanmar’s officially recognised ethnic groups.

This matters because some of the rights guaranteed by Myanmar’s constitution, such as to health care and education, are only conferred on citizens. When the government insists that soldiers in Rakhine are acting in accordance with the “rule of law”, it may be telling the truth: the constitution does not protect non-citizens from arbitrary detention, so mass arrests of Rohingyas may not violate the law. Neither, the government would say, does keeping them in camps, where around 120,000 Rohingyas in central Rakhine have been held since communal riots four years ago. Last year thousands of them took to the sea in rickety boats, but that escape route has been disrupted by Thailand’s crackdown on people-smuggling networks.



In Bangladesh, unwanted by Myanmar

The country’s ethnic policies are a relic of the colonial era. They accord each of eight “major national ethnic races” a designated statelet. The rest of the 135 officially recognised groups are classified as sub-categories of these. Many ethnic Rakhines worry that if Rohingyas are recognised as such a group and granted citizenship, they will start agitating for their own homeland—which would come out of Rakhine state. As U Thein Maung, an NLD member of Rakhine’s parliament, puts it: “I have nothing against any religion or any kind of people. But I will not accept a single inch of my fatherland becoming Rohingya land.” Such fears—and Myanmar’s preference for talking about the rights of ethnic groups rather than of individuals—make the conflict even more intractable, as they do in other border areas.

Yet talk of recognising the Rohingyas is rare. Mr Thein Maung seems moderate compared with some other ethnic Rakhines. A woman who works in a tea-shop on the outskirts of Sittwe, the state’s capital, says that Muslims and Buddhists could never live together because “Muslims do not know what goodness is.” Maung Hla Kyaw, an older man, says that because “Muslims slaughter their chickens by themselves, that means they will not hesitate to kill us fiercely.” U Pinya Tha Myint, the head monk of a monastery in Sittwe, wants foreign powers to “help the Bengali non-citizens to leave for abroad to any Islamic country that wants to take them.”

### The danger of inaction

Myanmar’s ethnic crises may demand more political capital than Miss Suu Kyi is willing to spend. But if left unresolved they risk creating huge problems for her country. One is the possible growth of jihadism. So far the Rohingyas have shown little interest in Islamist extremism. But many of them see a bleak, hopeless future in Myanmar. The International Crisis Group, a think-tank, reckons the attacks in October by Rohingya militants were planned by a well-funded insurgent group whose leaders had been trained in guerrilla-war tactics. Defending Rohingyas from persecution could become a tempting new cause for disaffected young Muslims around the world. Miss Suu Kyi fears paying a political price for speaking out, but silence carries costs.

Another danger is that an upsurge of fighting will impede Myanmar’s economic development, not least by rendering large, resource-rich chunks of the country off-limits or unappealing to investors. The ceasefires that the previous government signed with many, but not all, ethnic armies, look hollow by the day—as does Miss Suu Kyi’s ability to achieve peace and tame the army. The fewer good jobs are available to young men, the more tempting it will be for them to take up arms. ■

# Banyan | The politics of taking offence

Why the absurd blasphemy prosecution of Jakarta's governor carries risks for Indonesia



WHEN the citizens of Jakarta, Indonesia's capital, voted for Basuki Tjahaja Purnama as their vice-governor in 2012, it seemed a hopeful moment. He and his popular boss, Joko Widodo, had promised a bold programme of urban renewal to save the creaky, sinking and car-clogged metropolis. What's more, the world's largest Muslim-majority democracy seemed to enhance its reputation for tolerance. Mr Basuki, known as Ahok, is ethnic Chinese and a Christian: rarely before had an Indonesian from a minority community and religion risen so high.

Suddenly, Indonesia's reputation for tolerance is in question. After Mr Joko, or Jokowi, ran for president and won by a landslide two years ago, Ahok assumed the Jakarta governorship. Just three months ago, Ahok still looked to be a shoo-in for the gubernatorial race next February. Since then, however, huge rallies organised by hardline Islamist groups have brought hundreds of thousands of anti-Ahok protesters to central Jakarta. Because of those protests, he himself is in court on blasphemy charges.

Ahok is arrogant, impatient and coarse—offending courteous Javanese manners. But he is effective: Jakartans credit him with improving congestion, flood control and health care. In September he told some fishermen that he understood why some would not vote for him, because they were deceived by those claiming that the Koran forbids Muslims to be governed by a *kafir*. Islamists promptly accused Ahok of insulting the Koran. The rallies they organised around the National Monument were huge. One on November 4th, with about 200,000 protesters, turned violent. The most recent, a rally and mass prayer meeting on December 2nd, was twice as big, but ended peacefully after Jokowi came to address it. By then it was clear that the protesters had got their way and that Ahok would be prosecuted and probably jailed.

It is all regrettable. Ahok was extremely tactless. But if he is guilty of a crime, it is hard to see who the victim is. Jokowi was reluctant to see his former sidekick prosecuted, but ultimately seems to have relented. The police were sharply divided, too, over whether to prosecute. The country's biggest mainstream Muslim organisation, Nahdlatul Ulama, made itself scarce. The bookish leader of the next biggest complained that it was easier to get people to go to a demonstration than to a library.

This left the hardliners to make the running, led by the thug-

gish, hypocritical Islamic Defenders' Front (FPI) (who do not hassle police-run brothels). Through social media, they stirred up vitriol aimed at ethnic Chinese. The FPI's footsoldiers have fanned out into Jakarta's *kampung* (village-like settlements). One of the places to which they took money and aid is Pasar Ikan, a flood-prone area near the old port that Ahok cleared of tenants in April with little warning or compensation. Some of the families have since returned to adjacent land and, with FPI help, rebuilt their mosque. Only its name has changed: from al-Ikhlâs—"sincerity"—to al-Jihad.

None of this means that Indonesia is lurching in a violently Islamist direction. For instance, although the jihadists of Islamic State have claimed a handful of adherents among young Indonesians, the organisation and its methods are condemned even by FPI hardliners. Yes, the aims of those hardliners include changing the constitution to force Muslims to follow Islamic law and curbing minorities' rights. But little suggests that most recent protesters cared about such things. Many attended the gathering on December 2nd out of pride at taking part in such a vast communal prayer meeting. And in Pasar Ikan residents who attended the protests claim that their problem with Ahok is certainly not that he is ethnic Chinese; nor, really, because of his perceived blasphemy; but simply because of his callous treatment of them. If the FPI hoped for fertile ground, they will have to look elsewhere.

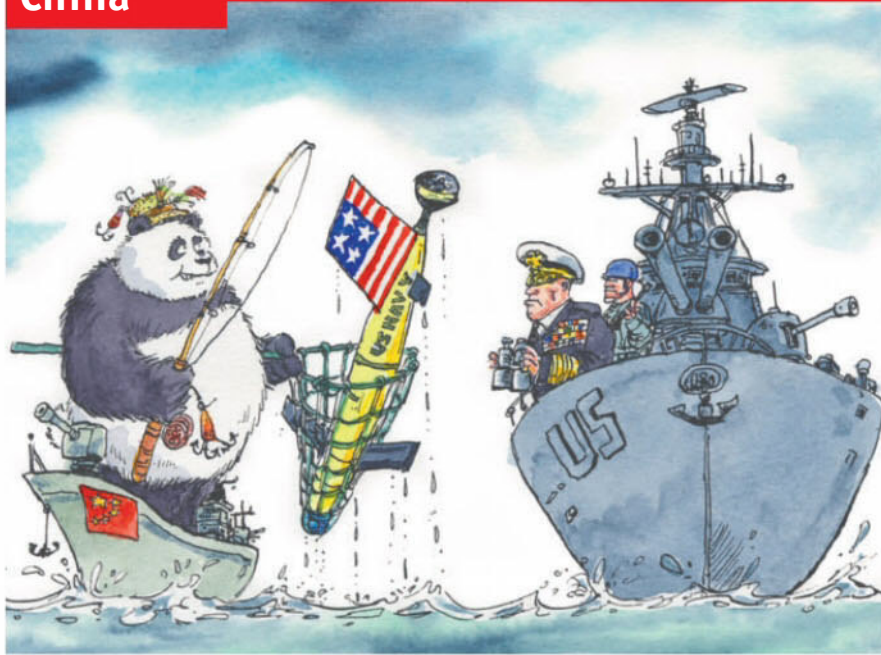
Yet, for two reasons, the implications of the Ahok saga will be long-lasting. First, however much they deny it, Ahok's rivals in the governor's race gain from his travails. And that race is fast becoming a proxy for the next presidential one, in 2019. At the moment Jokowi's popularity is sky-high. The only way for presidential hopefuls to dent him is to link him to his former vice-governor. As it is, the governor's race was transformed in September when Agus Harimurti Yudhoyono resigned his army commission to run for the job. The telegenic, Harvard-educated 38-year-old is the elder son of the previous president, Susilo Bambang Yudhoyono. His family has national aspirations for him.

## Who are the real fifth columnists?

Second, and of much more concern than the likelihood of politicians using Ahok's predicament for political gain, are machinations by army generals. The FPI itself is a creation of the security forces, after the dictatorship of the late Suharto, to counter leftist students. Today, it remains useful for the army to back the FPI as a way of reasserting the domestic influence it lost after democratisation in the late 1990s. Many generals, like the FPI, see enemies everywhere, including ethnic Chinese Indonesians who control successful businesses, some of them close to Ahok. Meanwhile, the ambitious if somewhat eccentric army chief, Gatot Nurmantyo, sees China as a hostile power waging a "proxy war" aimed at corrupting Indonesia's youth. He also accuses China of seizing the economy's commanding heights (Jokowi has encouraged a lot of mainland Chinese investment in infrastructure).

In this context, the growing insinuation that Ahok is in some sense a Chinese fifth columnist is disturbing. Parts of the army were behind bloody riots aimed at ethnic-Chinese Indonesians in 1998, and the army was central to the vast anti-Chinese pogroms of 1965. At best, Ahok's persecution represents a blow to the rights of all Indonesian minorities—Ahmadiyah, Christians and indeed gay people. At worst, the risk of communal bloodshed like that of two decades ago is closer. Indonesians should jealously guard their hard-earned reputation for tolerance. ■





## Also in this section

## 80 What China claims to have invented

For daily analysis and debate on China, visit  
[Economist.com/china](http://Economist.com/china)

## China and America

## Warning shot

BEIJING

By seizing an American underwater drone, China has sent a signal to Mr Trump

IT WAS an operation carried out with remarkable cool. On December 15th, less than 500 metres away from an American navy ship, a Chinese one deployed a smaller boat to grab an underwater American drone. The object was then taken to the Chinese ship, which sailed off with it. Point deftly made. The incident occurred in the South China Sea, in which China says the Americans have no business snooping around. By seizing the drone, it has made clear that two can play at being annoying.

Mercifully no shots were fired. After remonstrations by the Americans, China agreed to give the drone back “in an appropriate manner”. It chose its moment five days later, handing the device over in the same area where it had snatched it. The Pentagon, though clearly irritated, has downplayed the drone’s importance, saying it cost (a mere) \$150,000 and that most of its technology was commercially available. The drone was reportedly carrying out tests of the water’s properties, including salinity and temperature.

But it may turn into less of a game. Relations between the two nuclear powers, never easy at the best of times, are under extra strain as Donald Trump prepares to take over as president on January 20th. Mr Trump has already angered China by talking on the phone to Taiwan’s president, Tsai Ing-wen, and challenging China’s cherished “one-China” policy, crucial to

which is the idea that Taiwan is part of it.

The capture of the drone took place on the outer perimeter of China’s expansive claim to the sea, about 50 miles (80km) from the Philippine port of Subic Bay, which was once home to a large American naval base (see map). It appeared calculated to show China’s naval reach, with only minimal risk of any conflict—the American ship that was operating the drone, the *Bow-*

*ditch*, is a not a combat vessel. Once in office, however, Mr Trump could face tougher challenges, exacerbated by China’s growing presence in the South China Sea: it appears to be installing weapons on islands it has been building there.

His two predecessors were each tested by a dangerous military standoff with China in their first months in office. With George Bush it involved a mid-air collision in April 2001 between an American spy-plane and a Chinese fighter-jet off China’s southern coast. The Chinese pilot was killed and the disabled American plane made an emergency landing at a Chinese airfield. There the crew of 24 was released after 11 days of painstaking diplomacy. The aircraft, full of advanced technology, was returned—in pieces—months later.

In March 2009 it was Barack Obama’s turn. According to the Pentagon, an American surveillance ship, the *Impeccable*, was sailing 75 miles from China’s coast when it was buzzed by Chinese aircraft and then confronted by five Chinese ships. First the Chinese forced it to make an emergency stop, then they scattered debris in front of the American ship as it tried to sail away. They also attempted to snatch sonar equipment it was towing. The *Impeccable* soon returned—this time in the reassuring company of an American destroyer.

For now, feuding between Mr Trump and China is less nail-biting. In Twitter messages, Mr Trump bashed China for taking the drone and later said China should keep it. Chinese media have in turn bashed Mr Trump. One newspaper said he had “no sense of how to lead a superpower”. *Global Times*, a nationalist newspaper in Beijing, said that China would “not exercise restraint” should Mr Trump fail to change his ways once in the White House. He would be wise to study the form. ■



## History

## The mother of invention

XI'AN

China is harnessing its ancient achievements to serve the present

**E**IGHT is a lucky number in China. How fortunate it was, then, that a team of more than 100 scientists was able, after three years of research, to declare that ancient Chinese had achieved no fewer than 88 scientific breakthroughs and engineering feats of global significance. Their catalogue of more than 200 pages, released in June, was hailed as a major publishing achievement.

All Chinese schoolchildren can name their country's "four great inventions": paper, printing, the compass and gunpowder. Now it appears they have a lot more homework to do. The study purports to prove that China was first with many other marvels, including the decimal system, rockets, pinhole imaging, rice and wheat cultivation, the crossbow and the stirrup.

It is no coincidence that the project, led by the prestigious Chinese Academy of Sciences, got under way a few months after Xi Jinping took over as China's leader in 2012. Mr Xi has been trying to focus public attention on the glories of China's past as a way to instil patriotism and provide a suitable historical backdrop for his campaign to fulfil "the Chinese dream of the great rejuvenation of the Chinese nation".

Mr Xi is building on a long tradition among the Communist Party's propagandists of claiming world firsts. "China invented Lassie," ran a headline in *Global Times*, a party-controlled newspaper, about dogs being domesticated in China 16,000 years ago (another group of scientists reckon China first did this 33,000 years ago). In 2006 official media shocked the Scots with an assertion that China invented golf a millennium ago, hundreds of years before the game took off in Scotland.

As a lover of football, Mr Xi likes drawing attention to China's pioneering of that sport, too. On a visit to Britain in 2015 he stopped at one of the country's most famous football clubs, Manchester City. There he was presented with a copy of the first rules for the modern game (drawn up by an Englishman in 1863). In return, he handed over a copper representation of a figure playing *cuiju*, a sport similar to football invented by China 2,000 years ago (see picture, from a football museum in Shandong province). It was apparently popular both among urban youths and as a form of military fitness training. Mr Xi would like a great rejuvenation of this, too. In 2014 he announced plans to put football on the national curriculum. The aim is to make Chi-

na a "first-class power" in football by 2050 (it has a long way to go).

The growing attention that China pays to its ancient achievements, real and exaggerated, contrasts with the almost total rejection of them by Mao Zedong after he seized power in 1949. In Mao's China history was not something to celebrate. A central aim of his Cultural Revolution was to attack the "four olds": customs, culture, habits and ideas. Many Chinese dynasties destroyed some glories of the previous one, but the Communists took this to new extremes. Across the country state-sponsored vandals destroyed temples, mansions, city walls, scenic sites, paintings, calligraphy and other artefacts.

That began to change after Mao died in 1976. Now Mr Xi claims that Chinese civilisation "has developed in an unbroken line from ancient to modern times". He glosses over not just the chaos and destruction of the Mao era but the long centuries when the geographical area now called China was divided into many parts, and even run by foreign powers (Manchu and Mongol).

The party also wants to use ancient prowess to boost China's image abroad and to counter widespread (and often unfair) impressions in the West that the country is better at copying others' ideas than coming up with its own. The four great inventions were one of the main themes at the opening ceremony of the Olympic Games in Beijing in 2008, an event that China saw as



China 1, Britain 0

its global coming-out party after decades of being treated with suspicion and contempt by foreign powers.

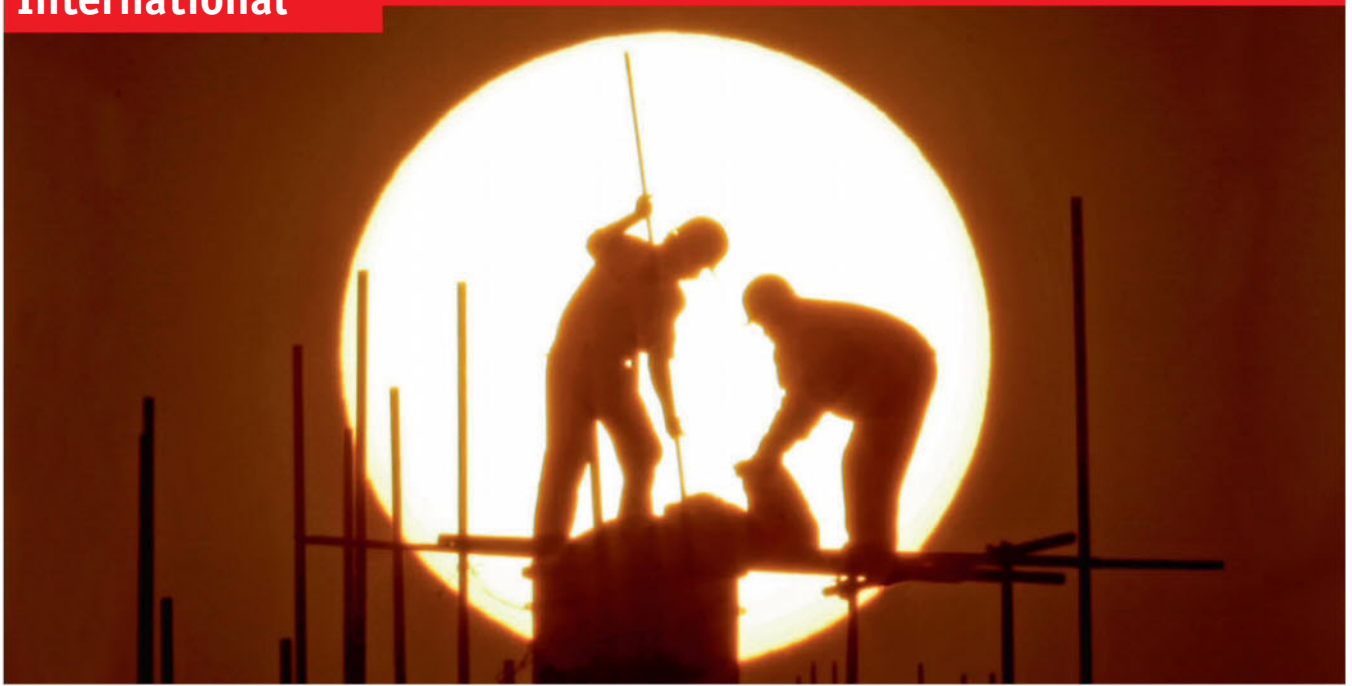
Envy of the West's rapid gains in technology since the 19th century has been a catalyst of Chinese nationalism for over 100 years. It fuels a cultural competitiveness in China that turns ancient history into a battleground. This was evident in China's prickly response to a recent documentary made by the BBC and National Geographic, which suggested that China's famous terracotta warriors in Xi'an showed Greek influence. Some people interpreted this as a slight. One Chinese archaeologist dismissed the theory as "dishonest" and having "no basis"; another said that foreign hands could not have sculpted the figures because "no Greek names" were inscribed on their backs. Likewise in 2008 Boris Johnson, then mayor of London, was derided for saying that table tennis originated not in China but on Victorian dining tables and was known as whiff-whaff.

## Just a slight inconsistency

The publication of the 88 achievements, however, has drawn attention again to an enduring mystery: why, after a long record of remarkable attainment in technology, did Chinese innovations largely cease for the 500 years or so leading up to the collapse of the last imperial dynasty in 1911? As state media observed, few of the inventions on the new list belong to this period. This puzzle is often referred to as the "Needham question", after a British scientist and Sinologist, Joseph Needham. (It was he, in his study of China's ancient science in the 1950s, who first identified the four great inventions—before then most people thought they had emerged in the West.) A member of the team that produced the list said the question deserved "deep reflection" and would be a topic of future research.

Mr Xi skates over this. He lauds Zheng He, a eunuch who launched maritime voyages from China across the Indian Ocean from 1405, as one of China's great innovators—an early proponent of a vision of China that Mr Xi would like to recreate: prosperous, outward-looking and technologically advanced (the admiral's massive boat is number 88 on the list). Yet he fails to point out that soon after Zheng He's explorations China turned inward, beginning its half-millennium of stagnation.

In this 15th-century turning point, reformists in China see an obvious answer to Needham's question: isolation from the rest of the world is bad for innovation. They take heart in China's efforts since the 1970s to re-engage with the West, but lament the barriers that remain. With luck, it will not take 100 state-sponsored Chinese scientists another three years to reach the same conclusion. ■



### Poor-world migration

## The beautiful south

ABIDJAN AND MUMBAI

**Truly poor people rarely migrate to rich countries. Instead they go to other poor countries—in huge numbers**

**I**N MOST ways, it is a typical immigrant success story. Ouesseni Kaboréq was once a butcher in Burkina Faso, a poor, landlocked west African country. Encouraged by an uncle who was flourishing abroad, he left his country in search of better-paying work. He has done so well that he now employs 41 people. All but two are immigrants like him. The natives cannot bear to get their hands dirty, he says.

But Mr Kaboréq did not migrate to Paris or New Jersey. Instead he crossed just one land border, into neighbouring Ivory Coast. He works in the large meat market in Port Bouët, on the outskirts of Abidjan, near a store that demonstrates its classiness with a picture of Barack Obama on the awning. Mr Kaboréq is not the kind of immigrant whom economists obsess over, nor the kind who irks voters and brings populists to power in the West. But his kind is already extremely common, and is set to become more so.

International migration can be divided into four types. The most important is the familiar one, from developing countries to developed ones. About 120m people alive today have made such a move, calculates the McKinsey Global Institute, an arm of the consultancy—from Mexican grape-pickers in California to Senegalese street vendors in France. But the second-largest flow is between developing countries (see

chart). Between 2000 and 2015 Asia, including the Middle East, added more immigrants than Europe or North America.

Some are war refugees, like the Syrians who live in Jordan and the Somalis in Ethiopia and Kenya. But many developing-world migrants are like Mr Kaboréq: people who leave a poor country for a somewhat less poor neighbouring one in search of higher wages. The World Bank estimates that 1.5m migrants from Burkina Faso alone live in Ivory Coast. Relative to Ivory Coast's population of 23m, Burkinabé immigrants are more numerous than Indians in Britain, Turks in Germany or Mexicans in America.

Ivory Coast is still very poor—about as

poor as Bangladesh. It is, however, better off than Burkina Faso. Batién Mamadou, a farm labourer who works 120km north-west of Abidjan, says wages are at least twice as high. And Ivory Coast is a much better place to start a business. The contrast between the two countries is like the difference between a grand African home and the White House, says Bernard Bonané, who fled Burkina Faso following a coup in 1987 and now runs a security firm.

Mr Bonané, who lives in a stylish house in a street crawling with guards, says that few of his neighbours are immigrants. That, he thinks, is because most new arrivals send money home rather than splashing out on property. The World Bank estimates that \$343m in remittances flowed from Ivory Coast to Burkina Faso in 2015. The exact amount is unknowable, not least because the two countries share a currency, meaning money can easily be moved across the border in ways that officials do not notice. But the importance of these short-range remittances is plain. Ivory Coast is thought to account for fully 87% of all remittances to Burkina Faso.

Rather little of the cash that flows out of the world's richest countries ends up in the poorest ones. Gulf states such as Dubai and Saudi Arabia take in millions of remittance workers from lower-middle-income countries such as India, but hardly any from really poor ones such as Chad and Malawi. The world's poorest people cannot afford to travel to the West or the Gulf.

They can, however, hop on buses bound for nearby countries. "The poorer the people, the shorter the distance they want to travel," says Dilip Ratha of the World Bank. Such migrants might not be able to send much money home, but what they do send is badly needed. Whereas ►►

### Merry-go-round

Migrant population by destination and origin 2015, m



Source: McKinsey Global Institute

fairly poor countries like Nigeria can send many people to the West, households in very poor countries like Mali depend on workers who have migrated within west Africa (see chart on this page).

Neighbouring countries often share a language and sometimes a currency. Tribes often span borders, too: national boundaries in Africa were drawn to suit colonial powers, not to accord with cultural and ethnic divisions. All that smooths the migrant's path. And although south-south migrants tend to have informal jobs, as farm labourers, builders, market traders and so forth, this is no special hardship. In rich countries, where most workers have above-board jobs, informal work is precarious and exploitative. In poor and middle-income ones it is the norm.

Widespread though migration is in west Africa, it cannot match the mighty human rivers of Asia. In November India's home-affairs minister, Kiren Rijiju, declared that about 20m people from Bangladesh were living illegally in India. Sanjeev Tripathi, the former head of India's Research and Analysis Wing, thinks that an overstatement. His estimate, based on census data, is that more than 15m Bangladeshis are living in India. If either is right, the Bangladesh-to-India migration corridor is the largest in the world.

It is also one of the most fraught. Immigration from Bangladesh not only raises anxieties about national security; it also suggests to those who worry about such things that a predominantly Hindu society is being diluted. In the 1980s students in Assam, a state that touches Bangladesh, led a revolt against mass migration and forced the national government to introduce tougher laws. Nationalist politicians still make hay out of the issue. Narendra Modi, India's prime minister, has accused Bangladeshis of "destroying" Assam and has insinuated that rhinos are being killed to make space for immigrants.

In fact Bangladeshis are spread across India. One of them is Salma, a young woman living in Navi Mumbai, a suburb of India's commercial capital. She was brought to India as a child by her parents, who later returned to their farm in Bangladesh. She is married to an Indian man and has children, who go to school in India. She even has Indian identity papers, which say, falsely, that she was born in Kolkata. Sometimes she is turned down for jobs when she tells people her name. But many Mumbai employers are too hungry for workers to care. Salma was recently hired to work in one house on the condition that she stay out of the kitchen.

Sometimes Indian police officers round up Bangladeshi immigrants and push them over the border. "But they often come back," says a cop in Mumbai. "They have to earn a living." Even in Assam, where feelings run high, just 2,442 illegal immigrants

were deported between 1985 and 2012, according to a report by the state government. Asked for their papers, suspected illegal immigrants say they will fetch them, then disappear. Or they produce false documents. "If you pay money, you'll get any papers you want," says Mr Tripathi.

The World Bank estimates that more money is remitted to Bangladesh from India—\$4.5bn in 2015—than from any other country. As in west Africa, this is an economic lifeline. Remittance workers tend to respond quickly to economic shocks in their home countries: the flow of money to Nepal jumped after the Gorkha earthquake in April 2015, for example. And studies of other countries show that remittances are commonly invested, especially in children's education.

### Following footsteps

It is likely that developing-world migration will become even more important. In the 1970s the world looked fairly simple, point out Gordon Hanson and Craig McIntosh, both academics at the University of California, San Diego, in a new working paper. The global south was poor and had lots of children; the global north was rich and had few. People tend to move not just from poorer countries to richer ones but also from countries with high birth rates to those with low ones. The imbalance between North America and Latin America fuelled the northward migration that so distresses some American voters.

By mid-century China, India and almost all of Latin America, including Mexico, will be members of the low-fertility club. Only sub-Saharan Africa will still be having a baby boom. If UN projections are right, in 2040 more than a third of all children under the age of 14 will be living in Africa. Mr Hanson and Mr McIntosh predict

huge pressure for migration from Africa to Europe, making the Mediterranean into a new (somewhat wider) Rio Grande.

Yet that pressure will not necessarily find an outlet, says Michael Clemens of the Centre for Global Development, a think-tank. European voters are not keen even on current levels of immigration and will be still less enthused by a doubling or even a tripling of their immigrant populations. So there will be an enormous number of potential African migrants and not enough places for them in the West. They are highly likely to head for other African countries, for the Middle East and perhaps even for Asia. Countries such as China and South Korea have resisted mass immigration, but they badly need more young people. In short, says Mr Clemens, south-south migration is likely to grow a lot.

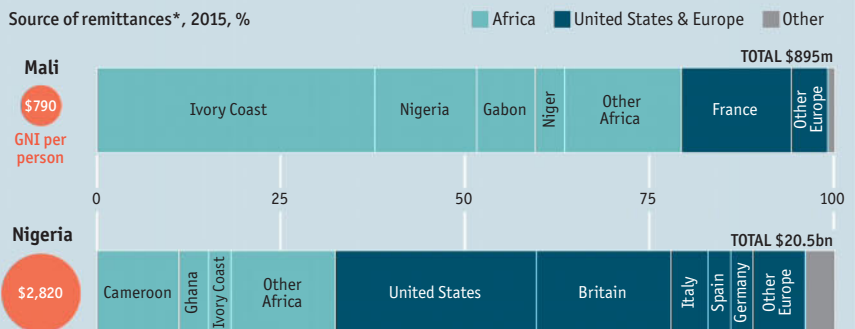
Many poor countries are unprepared for an influx, and unwilling too. Purges of migrants are already common. Pakistan is trying to evict hundreds of thousands of Afghan migrants; Gabon is kicking out immigrants from central Africa; Thailand has expelled Cambodians. But many slip the net. Many Burkinabé migrants were pushed out of Ivory Coast during the civil war that erupted in 2002, only to return. Burkina Faso is too poor, too politically unstable and, for people who have lived in Ivory Coast for years, too foreign.

"They will never go back," says Moumouni Pograwa, who runs a mining and construction company in Abidjan and is an unofficial spokesman for Burkinabé. Recently Mr Pograwa offered to help immigrants whose homes had been demolished in a slum clearance. Would any of them perhaps like a bus ticket to go back to Burkina Faso? Of perhaps 4,500 people who had been evicted, just two took him up on the offer. ■

### Local heroes

Viewed from the West, Mali and Nigeria are both poor. In fact Mali is much poorer: its gross national income per head is barely one-quarter as high as Nigeria's. The people who leave Mali in search of work seldom make it far. Most of the remittances sent to the country come from elsewhere in west Africa, although some come from France—the former colonial power. By contrast, wealthier Nigeria has a large diaspora that is spread across the rich world. They send the big bucks.

Source of remittances\*, 2015, %



Source: World Bank

\*Estimated



### Also in this section

- 84 Retraining Japanese salarymen
- 85 Bah humbug: seasonal shopping
- 85 Tracking shoppers as they browse
- 86 Schumpeter: Capitalism and democracy

For daily coverage of business, visit

[Economist.com/business-finance](http://Economist.com/business-finance)

### Indian business

## The digit era

BANGALORE

### Businesses are looking to tap into a national fingerprint-ID system

THERE are two ways to sign up to Jio, a new and irresistibly priced mobile-telephony service which Mukesh Ambani, the boss of Reliance Industries, a conglomerate, launched in September 2016 and which is luring tens of millions of new customers each month. One way requires a wad of documents, multiple signatures and plenty of patience, since Jio takes days or weeks to go through “know-your-customer” procedures. The second way is magically simple: the person rests a finger on an inch-wide scanner, and if the print matches the identity the customer is claiming, Jio downloads the information it needs from the Indian authorities and activates the phone line within minutes.

Jio is tapping a database called Aadhaar, after the Hindi word for “foundation”. It is a cloud-based ID system that holds the details of over a billion Indians. The government’s purpose in setting it up in 2009 was to help the state correctly direct welfare payments to those entitled to them. By early 2017 all Indian adults should have provided their fingerprints, iris scans, name, birth date, address and gender in return for a single, crucial, 12-digit number.

In the public sphere Aadhaar helps to distribute subsidies worth about \$40bn a year. Around 300m biometric entries are

linked to citizens’ bank accounts, so that money can be paid to them direct. Billions of rupees used to be lost each year through “leakage” of benefits—a euphemism for fraud in India’s often corrupt bureaucracy. Aadhaar has already saved perhaps \$5bn, says the government.

But the system was designed with more than just the needs of the state in mind. The team of techies behind the project, led by Nandan Nilekani, a founder of Infosys, a champion of Indian IT, from the outset understood the importance of making Aadhaar available to all who might be able to

use it, not just official departments. Aadhaar is open-access and can be used by third parties free of charge. By now, fingerprint readers are a common sight in phone shops, insurance offices, banks and other sellers of regulated products.

Some firms, such as Jio, will use Aadhaar to save huge amounts of time for their customers—not to mention a small forest’s worth of paper. The architects of Aadhaar reckon that is just the beginning. On the top of it, India is building a complex public digital infrastructure, called “India Stack”: a series of connected systems that allow people to store and share their data. These could include bank statements, medical records, birth certificates or tax filings. When connected up to a new payments system called the Unified Payments Interface (UPI), the potential is huge.

Already, businesses ranging from Bangalore startups to international banks operating in India are looking to build new businesses on the capabilities of Aadhaar and the coming India Stack. Venture-capital firms are funding hackathons to encourage software developers to come up with new ways to use the technology.

Any firm can “ping” Aadhaar to see, for example, if a job applicant is who he claims to be. One Bangalore startup, Babajob, does this for the service staff it connects to employers. It can instantly verify if a potential employee’s name and age matches that attached to the phone number he is calling from, that is in the Aadhaar database (or he must supply a code number received by text). It can be done remotely, an advance over card-based ID schemes. A similar, more secure check, using iris scans or fingerprints, can be done with mo- ▶▶

### The touchable system

Cumulative Aadhaar\* registrations, bn

INDIA'S POPULATION  
2016: 1.3bn



Source: National statistics \*Unique identification number

▶ bility phones or tablets with Aadhaar-compatible iris scanners (at under \$200).

This is no small feat: merely establishing someone's identity is grit in the wheels of commerce. A typical firm in India spends some 1,500 rupees (\$22) obtaining and validating client data, be it to bring a taxi driver onto a ride-hailing platform or to accept a new mutual-fund customer. Bringing down the cost can vastly expand a firm's target market. If a lending outfit, for example, can afford to spend only 0.5% of the value of a loan on such tasks, its smallest credit will be 300,000 rupees, an amount which will limit it to the richest 15m Indians, says Sahil Kini of Aspada, a venture-capital firm. Reduce the validation cost to 10 rupees—the figure many in Aadhaar circles use—and you can viably lend to over 500m people.

The benefits of cheap, secure ID could go further. Mr Nilekani argues that verifying identity, and in turn reputation, is ever more important in business: consider star-rating systems devised by firms such as eBay, an auction giant, or Uber, a ride-hailing firm. Web users now often establish their identity using logins for Facebook, Google or WeChat to access third-party services such as newspaper websites. But none can claim to rest on a person's real, verified legal identity in the way Aadhaar-accessed services can.

### It all stacks up

For now, the Aadhaar system is used chiefly to confirm identity (which has been done 3bn times since 2010) and to share know-your-customer information such as someone's address (300m times in the past year). But since any information can be linked to a sort of digital "locker" tied to each Aadhaar ID, there are more possibilities. A file of past digital interactions—a sort of eBay star system accumulated over different services—could also be attached. This would most obviously be useful in financial services, particularly among those who have little or no access to them now.

A potential borrower could allow a lender to have access to anything linked to his Aadhaar number: his bank statement, utility-bill payments, life-insurance policy, university diplomas and much else besides. "It increases trust," says Mr Nilekani. "You can combine proven legal identity with lots of data. You become trustable." Sean Blagsvedt, the founder of Babajob, compares India Stack to the advent of the social-security number system in America, which paved the way for credit bureaus, credit cards, mail-order services and, later on, e-commerce.

The economic consequences are sizeable. Instead of borrowing against assets, as is currently the norm in India, people could borrow against projected cashflows proven by past tax returns, for example. Better yet, "digitally driven" credit would

shift people into the formal economy and away from the informal realm where nine in ten Indians currently work.

Another element of India Stack, the UPI, a payments system, was launched in August. Under pressure from regulators, banks have agreed to let their customers send or receive money not just through their banks' apps but through third-party ones as well. A client of State Bank of India, for example, can just as easily make payments from his account through PhonePe, a subsidiary of Flipkart, an e-commerce website, or any other of about two dozen UPI-based apps. Mr Nilekani speaks of a "WhatsApp moment" for Indian banking, in which newcomers usurp sleepy banking incumbents, much as the American messaging app deprived telecoms operators of revenues from text messages.

Techno-optimism always warrants some caution. Just because Aadhaar has succeeded in slashing subsidies fraud does not mean the products built atop it will catch on. The UPI apps received a one-off boost from the government's push forcibly to "demonetise" the economy (it cancelled banknotes representing 86% of all cash on November 8th), but other, private PayPal-like services did much better.

Still, other public technologies have prompted big leaps when opened to private enterprise. Once available to the general public from 2000, the GPS location system (previously reserved for the American military that developed it) did more than merely disrupt map-making firms. In time, GPS spawned Google Maps, which in turn facilitated Uber. Backers of Aadhaar argue that no one can imagine what will be built around the platform in years to come any more than the internet's pioneers three decades ago could foresee social media or bitcoin, a digital currency.

Privacy campaigners worry that it has Orwellian overtones. In theory it remains voluntary to enroll in Aadhaar. In practice it is compulsory, since it is becoming the only way to gain access to important social services. Wary of relying on a state-backed scheme, American tech giants have treated it cautiously. Google has expressed enthusiasm for its potential, but it and Apple have yet to agree to install Aadhaar-compatible scanners on their phones.

For India's citizens, who can use Aadhaar and India Stack to mobilise their data for their own benefit, the advantages are clearer, starting with access to cheaper credit. Some of the system's teething problems—one hurdle has been that the hands of many manual labourers are so worn that Aadhaar cannot register their fingerprints—show just what an advance the technology could be. Indian businesses will have the chance to serve and make sense of legions of new customers. Like the scanners it utilises, the scheme's potential is not hard to put your finger on. ■



### Work in Japan

## White-collar blues

TOKYO

### Retraining salarymen isn't easy

THE Institute of Social Human Capital in Tokyo is an unusual sort of business-training school. Those who attend it (two-thirds are men) have mostly quit or taken redundancy packages from big Japanese firms, and are trying to start again. Shedding the habits of a lifetime begins by breaking down barriers: former salarymen laugh nervously as they share a bento-box lunch with strangers, blindfolded (the idea is that they must use their other four senses to communicate).

The way to prepare them for a second career is to get them interacting as individuals, not as corporate workers or business partners, says Matsuhiko Ozawa, a director of the Institute, which specialises in this sort of course. In a country that sets great store by formal introductions, the students have not even exchanged business cards. Names, titles and personal information are banned (the ex-salarymen use made-up names) to avoid reproducing the old office hierarchies that exist outside the classroom. "We start from scratch and help these people find themselves again," says Mr Ozawa.

For years, the salarymen rode a career escalator that rewarded them less for skills than for loyalty and doggedly hard work. Though often attributed to centuries-old Japanese traditions of duty, the salaryman system was a post-1945 creation, says Naohiro Yashiro, a former adviser on economic policy to Shinzo Abe, the prime minister. During the post-war boom years, firms took on workforces of permanent employees, who were hired for life. All that was ▶▶

needed to get paid more was to grow older. In return, the employers' extravagant demands had to be met. Salarymen could not refuse a transfer—often at a few days' notice—to a subsidiary hundreds of miles from home. Children grew up largely without fathers. Work, rather than family, was the main supplier of emotional support. Full-time Japanese employees still clock 400 more hours per year than their counterparts in Germany or France, according to Kazuya Ogura, a labour specialist at Waseda University in Tokyo.

The salaryman remains stubbornly dug in across most industries. Mr Abe has promised as part of his growth-boosting reforms to give more rights to those at the bottom of the hierarchy—part-time and temporary workers with much lower pay—but has stopped short of radical steps, such as legislation to make firms give equal pay for equal work. Even so, for many, lifetime employment is ending earlier than it used to, because lots of companies cannot afford such workers all the way to retirement. Many are surplus to requirements in declining industries such as consumer electronics, and can be hard to retrain. The system worked well when people lived until around 70, says Mr Ozawa, but many firms are now offering permanent employees generous packages to leave early.

Many more leave voluntarily. Hiroyuki Ito, a student at the Institute, stepped off the salaryman escalator at the age of 45, after 23 years at his firm. He quit because the work was boring. "You don't get to take risk or have adventure," he says. He now attends the Tokyo school—there are several like it in Japan—and hopes for a second career as a teacher. The retraining takes time. Ex-salarymen usually come twice a week for five months to shed their old mindset. After decades of monotonous overwork, that must seem like the twinkling of an eye. ■

Retailing

# Following the fashion

The new retail trend is to watch shoppers inside stores

“LOOK up there,” says Edward Armishaw of Walkbase, a Finnish retail-analytics firm, as he points to a small white box above a column clad in mirrors. The sensor—and over a hundred others like it hidden around this department store in London's Oxford Street—tracks the footsteps of customers through the pings their smartphones emit in search of a Wi-Fi network. Quite unaware, a shopper in a silver puffa jacket ambles past and over to the fitting room. Whether she moves to the till will be logged by Walkbase and its client.

Think of it as footfall 2.0. For many years shops used rudimentary “break-beam” systems—lasers stretched across their entrances—to count people in and out. Only recently have they begun to follow customers inside their buildings, says Nick Pompa of ShopperTrak, an American firm whose work with 2,100 clients worldwide, including malls in Las Vegas and in Liverpool, makes it a giant in the area.

Tracking technologies are ingenious. Some flash out a code to smartphone cameras by means of LED lighting; others, such as IndoorAtlas, a startup with headquarters in California and Finland, monitor how devices disrupt a store's geomagnetic field. With smartphone ownership rising, the market for tracking phones indoors could grow fivefold between now and 2021, to a total of \$23bn, says Research and Markets, a market-research firm.

What do retailers hope to gain? The an-

swer depends on how far they push the technology. On the most basic level, a store might notice that people often walk from “frozen goods” to “alcohol”, and then bring the two closer together. A retailer could also gain more insight into which departments are best at promoting goods—all without knowing anything about shoppers beyond where their legs take them.

If stores can persuade clients to reveal personal information, too, they stand to profit more. Some 200,000 shops around the world now have systems to track phones, including free Wi-Fi, according to ABI Research. The often-overlooked terms and conditions for Wi-Fi typically allow stores to see a shopper's online search history as well as track their location. This can open up a “gold mine” of data, points out Dan Thornton of Hughes Europe, a network provider. Daring retailers already use it to target extremely personal, location-based advertisements to customers' phones. If someone googles a rival while in a suit shop in one of Australia's Westfield shopping malls, for example, Skyfii, the startup that provides their internet service, is ready to send a wavering client a discount on the spot.

But the speed of travel towards a world in which Gap, a retailer, can greet each customer individually, as in the 2002 film “Minority Report”, has been much slower than expected, says Tim Denison of Ipsos Retail Performance, a British firm. That is partly because most shops are wary of tracking people quite so closely. European ones are particularly worried that they could spark a backlash over privacy.

Soon, though, such concerns may be swept away. Apple and Google have built up their own expertise in indoor location, and to Patrick Connolly of ABI Research, it is clear that they plan to drop a “bombshell” on the retail industry. Currently an iPhone or Android handset can direct its owner to the shops, but not inside them, let alone to the nearest pair of blue underpants. That is because GPS satellite signals bounce off walls, depriving a smartphone of what it needs to locate itself.

Now both firms are beginning to offer indoor-location services to retailers that use the motion sensors already in handsets. These can see where their owners are, and where they are moving to, using a map of existing Wi-Fi or radio-frequency signals. Shops would not need to set up systems to follow their customers' phones. Around a third of the 100 biggest American stores are experimenting with some mapping technology from either Google or Apple, says Nathan Pettyjohn of Aisle411, another indoor-positioning firm. So the world of physical shopping may come to resemble that online. At the centre of it will be your phone, knowing exactly what you want, and able to lead you to within 30cm of it. Try that on for size. ■

## Tisn't the season

The holiday season's hold on Americans is getting weaker. In 1994, according to the Census Bureau, retailers earned \$82bn (in 2015 dollars) more in sales during November and December than they would have without the seasonal effect of the holidays. That worked out at \$310 per person. In 2015 seasonal sales during these months were just \$76bn, or \$240 per person. The decline in seasonal shopping is steepest in December. For that, blame three things. The growth of e-commerce has made it easier for people to shop for seasonal gifts whenever they want. Gift cards under the Christmas tree push purchases into January. And millennial shoppers are having an impact on sales: they tend to prefer experiences to yet more stuff.



# Schumpeter | Capitalism and democracy

The West confronts a future of slow growth, social division and populist revolt



**I**T WAS in 1942 that Joseph Schumpeter published his only best-seller, “Capitalism, Socialism and Democracy”. The book was popular for good reason. It was a tour de force of economics, history and sociology. It coined memorable phrases such as “creative destruction”. But it was a notably dark book. At a time when people were looking for hope during the life-and-death struggle with Nazism, Schumpeter offered only gloom. “Can capitalism survive?” he asked. “No, I do not think it can.”

This column was inspired by the young Schumpeter’s vision of the businessperson as hero—the *Übermensch* who dreams up a new world and brings it into being through force of intellect and will. On its debut in September 2009, we argued that Schumpeter was a perfect icon for a business column because, unlike other economists, he focused on business leaders rather than abstract forces and factors. But as Schumpeter grew older, his vision darkened. He became increasingly preoccupied not with heroism but with bureaucratisation, and not with change but with decay. The same is true of the outgoing author of this column.

It would be going too far to echo the master and warn that capitalism cannot survive. The socialist alternative that loomed large back in 1942 has imploded. The emerging world has capitalism to thank for its escape from millennia of poverty. But in the West the problems that led Schumpeter to worry have grown. And to them are appended new difficulties that he never foresaw.

His biggest worry was that capitalism was producing its own gravediggers in the form of an anti-capitalist intelligentsia. Today that very elite, snug in Los Angeles canyons and university departments, has expanded. Hollywood studios denounce the wolves of Wall Street and the environmental vandals at large in the oil industry. The liberal sort of academic (meaning the type that favours big government) far outnumber the conservative kind, by five to one, according to one recent study.

Another of Schumpeter’s concerns was that the state activism of Roosevelt’s New Deal was undermining the market. But in 1938 the American government was spending only a fifth of GDP. Today it is spending 38%—and that constitutes neoliberalism of the most laissez-faire kind compared with Italy (51% of GDP) or France (57%). Big regulation has advanced more rapidly than big government. Business is getting visibly flabbier, too. European industry

has been old and unfit for years and now stodge is spreading to America. The largest firms are expanding and smaller ones are withering on the vine. The share of American companies that are 11 years old or over rose from a third in 1987 to almost half in 2012.

There is nothing necessarily bad about this. One of Schumpeter’s great insights, from his later years, was that big firms can be more innovative than startups if given the right incentives. But today’s incentives favour stasis. Many big firms thrive because of government and regulation. The cost per employee of red tape—endless form-filling and dealing with health-and-safety rules—is multiples higher for companies that have a few dozen staff than for those with hundreds or thousands. Schumpeter called for owner-entrepreneurs to lend dynamism to economies. Today capitalism exists without capitalists—companies are “owned” by millions of shareholders who act through institutions that employ professional managers whose chief aim is to search for safe returns, not risky opportunities.

Some light flickers on the horizon. America’s economy is beginning to stretch its limbs. High-tech companies are overhauling an ever wider slice of the economy, including shopping and transport, which should be good for growth (though it also means power is being concentrated in the hands of fewer big firms). But these are mere flashes in the advancing darkness. The rate of productivity growth across the rich world has been disappointing since the early 1970s, with only a brief respite in 1996-2004 in the case of America. There, and in other rich countries, populations are ageing fast. Meanwhile, the fruits of what growth there is get captured by an ever narrower section of society. And those who succeed on the basis of merit are marrying other winners and hoarding the best educational opportunities.

At the same time democracy is becoming more dysfunctional. Plato’s great worry about representative government was that citizens would “live from day to day, indulging the pleasure of the moment”. He was right: most democracies overspend to give citizens what they want in the short run (whether tax cuts or enhanced entitlements) and neglect long-term investments. On top of that, lobbyists and other vested interests have by now made a science of gaming the system to produce private benefits.

## Storm clouds gather

The result of this toxic brew is a wave of populism that is rapidly destroying the foundations of the post-war international order and producing a far more unstable world. One of its many dangers is that it is self-reinforcing. It contains just enough truth to be plausible. It may be nonsense that “the people” are infallible repositories of common sense, but there is no doubt that liberal elites have been smug and self-serving. And populism feeds on its own failures. The more that business copes with uncertainty by delaying investment or moving money abroad, the more politicians will bully or bribe them into doing “the right thing”. As economic stagnation breeds populism, so excessive regard for the popular will reinforces stagnation.

These comforting thoughts are the last that this columnist will offer you as Schumpeter, though not his last as a scribe for *The Economist*. From April he will write the Bagehot column on Britain and its politics. One of the many extraordinary things about joint-stock firms is that they are potentially immortal: the people who run them come and go but the company itself keeps going. The same is true of our columns. The Schumpeter column will return in 2017 with a new (and possibly more optimistic) author. ■






---

**Also in this section**


---

**88 Buttonwood: The year ahead**


---

**89 2016 in charts**


---

**90 Free exchange: Thomas Schelling**


---

For daily analysis and debate on economics, visit  
[Economist.com/economics](http://Economist.com/economics)

**Japanese banks**

## Low and lower

TOKYO

**The biggest lenders can largely shrug off negative interest rates. For many smaller ones, it's not so easy**

**B**ANKS the world over are wrestling with low interest rates. Nowhere have they grappled for longer than in Japan. Although the Bank of Japan (BOJ) introduced negative rates only in January, almost 20 months after the European Central Bank, its rates have been ultra-low for years: they first hit zero in 1999. In its long battle against deflation, it pioneered “quantitative easing”—buying vast amounts of government bonds—which depresses longer-term rates and thus banks’ lending margins. Since September the BOJ has also aimed to keep the ten-year bond yield at around nought, while holding its deposit rate at -0.1%.

Banks have had some relief lately: since Donald Trump’s election in November, the yield curve has steepened slightly—and share prices have leapt—as American interest rates have risen and the yen has tumbled. But on December 20th the BOJ kept policy on hold.

For Japan’s biggest lenders, negative rates are “an irritant, not a catastrophe”, says Brian Waterhouse of CLSA, a broker. Every tenth of a percentage point below zero, he estimates, shaves 5% from the earnings of the three “megabanks”: Mitsubishi UFJ Financial Group (MUFG), Mizuho Financial Group and Sumitomo Mitsui Financial Group. For smaller fry, sub-zero rates are more painful.

With rates ultra-low and the economy becalmed, pickings from lending to Japa-

nese companies have been thin. The three megabanks reported spreads from domestic lending to corporate customers of only around 0.5 percentage points in the six months to September. Cheap money has not stirred up demand for credit: Ryoji Yoshizawa of S&P Global Ratings notes that Japanese companies have been net savers since the late 1990s.

However, domestic lending accounts for only one-sixth of the megabanks’ profits, against more than three-fifths at the 100-odd regional banks, calculates Katsunori Tanaka of Goldman Sachs. Some regionals have moved into consumer lending, a field that was dominated by (at times shady) specialists until caps on interest rates and the size of loans got in the way.

**Home and away**

Big lenders are chasing non-interest income, too. Mizuho, for one, styles itself as a “financial-services consulting group”, cross-selling investment products to bank customers. “The quantity of the Japanese market is shrinking. However, the quality is changing positively,” says Koji Fujiwara, the chief strategy officer. He expects, for example, that to pay for care in old age people will shift money from deposits—over half of households’ financial assets—into higher-yielding investment funds. Through tax breaks, the government is trying to give share-buying a shove. If a falling yen helps

keep inflation above nil, real interest rates will be negative, sharpening the incentive.

The megabanks have also made a determined push abroad. Since 2012 the share of foreign loans has risen from 19% to 33%, according to Moody’s. This brings higher returns but has also meant more risk, for instance from lending to American oil producers. And although they have foreign-currency deposits—notably, in America MUFG owns Union Bank, which has around \$80bn in the vaults—their stable funding does not match their lending.

True, the gap has narrowed as the pace of foreign lending has slowed and the banks have built up deposits. But it remains; and the cost of bridging it with short-term borrowing has climbed. This reflects both tighter American money markets and a breakdown of “covered interest parity”, the principle that the difference between spot and forward exchange rates should mirror the interest-rate differential between the currencies. “If shocks happen in the financial markets,” says Shinobu Nakagawa, a BOJ official, “they may face difficulty in funding.”

Regionals’ prospects are bleaker. Under the BOJ’s policy banks are sure to be less profitable, says Isao Kubota, chairman of Nishi-Nippon Financial Holdings, in Fukuoka on the south-western island of Kyushu. But he avers that close ties to corporate clients remain a big advantage. He adds that life is harder for the smaller co-operative banks, and insurers and pension funds, with lots of long-term liabilities.

Mr Kubota spies danger in the government’s encouragement of savers to switch to shares: if it succeeds, banks’ funding will become “much more unpredictable”. Hence Nishi-Nippon’s enthusiasm for its own securities arm, set up in 2010; it is now involved in an asset-management venture ►►

▶ with six of its peers. Through another subsidiary, Kyushu Card, it has branched into credit cards and consumer loans, too.

Combined with declining rural populations, digital technology and encouragement from bank supervisors, negative rates may force long-overdue consolidation on regional lenders. Matt Sweeny and his colleagues at Bain, a firm of consultants, reckon that by 2025 their number may dwindle by half, to 50 or so. The buyers likeliest to do well, Mr Sweeny believes, will be acquirers that cut their teeth on smaller deals before taking on larger ones. Those with foreign shareholders, who

tend to be less patient than domestic investors, will be under more pressure to act.

Lately there has been a rash of deals: in 2016 in Kyushu alone Nishi-Nippon joined forces with Bank of Nagasaki and Fukuoka Financial, a bigger neighbour, agreed to buy Eighteenth Bank. Yet there is less to some of this than meets the eye: a popular device is to create a holding company, under which banks operate independently, alongside subsidiaries selling other services. That can limit potential gains.

Perhaps more should imitate one thriving regional. A quarter of a century ago Suruga Bank, from Shizuoka, 180km south-

west of Tokyo, moved from corporate lending to higher-yielding mortgages and later to personal loans: the two categories make up 89% of its book. The share of company loans has shrunk to 10%, from 80% odd in the 1980s.

Suruga was thus well equipped for Japan's long sojourn in the low-rate realm. Its loans on cash-advance cards, the juiciest category, yield 11.1%. The gap between its average loan and deposit rates is 3.49% and rising; regionals average 1.25% and falling. "Other banks have been trying to copy us," says Akihiro Yoneyama, Suruga's president, "but unsuccessfully." ■

## Buttonwood | Seeing through a glass darkly

### What might be the big market surprises of 2017?

**I**F 2016 was a year of shocks, what will the next 12 months bring? It is time for the annual tradition (dating all the way back to 2015) when this column tries to predict the surprises of the coming year.

By definition, a surprise is something the consensus does not expect. A regular survey of global fund managers by Bank of America Merrill Lynch (BAML) points to what most people believe. Following the election of Donald Trump, investors are expecting above-trend economic growth, higher inflation and stronger profits. They have invested heavily in equities and have a much lower-than-normal exposure to bonds.

So it is not too difficult to see how the first surprise might play out. Expectations for the effectiveness of Mr Trump's fiscal policies are extraordinarily high. But it takes time for such policies to be implemented, and they may be diluted by Congress along the way (especially on public spending). Indeed, it may well be that demography and sluggish productivity make it very hard to push economic growth up to the 3-4% hoped for by the new administration. Neither fiscal nor monetary stimulus has done much to lift Japan out of its torpor, after all.

American profits, which were falling in early 2016, seem certain to rebound, particularly if the new administration pushes through corporate-tax cuts. But with the market priced on a cyclically adjusted price-earnings ratio of 28.3, according to Robert Shiller of Yale, a lot of good news is priced in. The ratio, which averages profits over the past ten years, is 70% above its long-term average.

Meanwhile, the Federal Reserve is pencilling in three rate increases in 2017, something that will probably push the greenback higher (and reduce the dollar value of foreign profits for American mul-



tinational). So the surprise might be that Wall Street will not be that great a performer in 2017.

By extension, the second surprise may be that government bonds do not do that badly. The yield on ten-year Treasury bonds is already approaching the top of the 1.5%-3% range in which it has been trading in recent years. Private-sector borrowing costs, including corporate bonds and fixed-rate mortgages, tend to move in line with Treasury yields. Increased borrowing costs would have an adverse effect on economic activity. As a result, sharp rises in bond yields are often self-correcting, since weaker economic data tend to drive yields back down.

The third potential surprise of the year might be a dog that doesn't bark. The biggest worry of the fund managers polled by BAML is that of EU disintegration. As a result they have a lower-than-normal holding in European shares. But the EU might get through the year unscathed if Marine Le Pen is defeated in France's presidential vote and Angela Merkel is re-elected in Germany. Populism does not win every time, as the recent Austrian presidential

poll demonstrated. Indeed, the euro-zone economies could grow at a respectable 1.6% next year, the OECD forecasts. The continent might even seem a safe haven, given events elsewhere.

Another potential surprise in 2017 could come from a big market disruption. There have been a few of these events in the past—from flash crashes to sudden leaps in bond yields. They seem to be the result of computer programs that trigger sales when specific price points are reached and a retreat by banks from trading, which has made markets less liquid. The trillions that flow through financial markets every day are also a tempting target for cyberwarfare and cybercrime. The big story of 2017 could be an inexplicable (if temporary) crash in a vulnerable market, such as high-yielding corporate bonds.

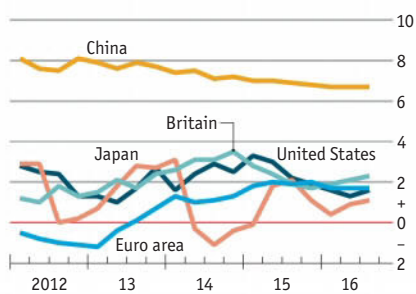
The final surprise may be served up by that most enigmatic of metals—gold. Working out a target price for gold is a mug's game. You can understand why investors bought gold when central banks started expanding their balance-sheets after 2008. But it is harder to explain why the price more than doubled in less than three years before falling back since 2011.

As investors' inflation expectations have risen since the American elections, gold might have been expected to rally. Instead, it has fallen sharply—perhaps because investors see the metal as an inferior alternative to the surging dollar. But gold is not just a hedge against inflation, it is also sought out in periods of political risk. And with the Trump administration apparently poised to pursue a more aggressive approach towards China and Iran, it is hard to believe that gold won't find a few moments to shine in 2017.

2016 in charts

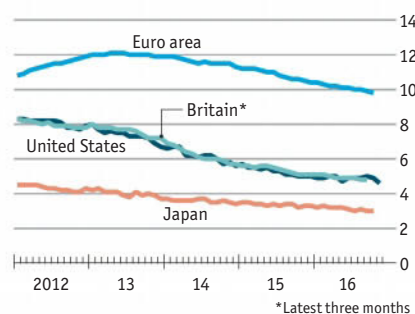
# The year of Brexit and Trump

**GDP**  
% change on a year earlier



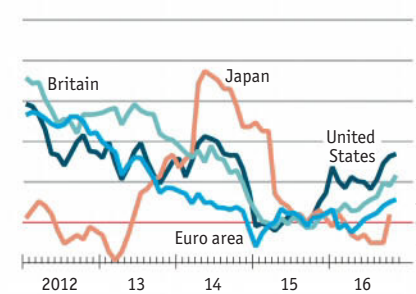
Despite the Brexit vote, growth in Britain outpaced the euro area, again. America's steady recovery continued, while Japan's faltered. China's slowdown was stately.

**Unemployment rate**  
%



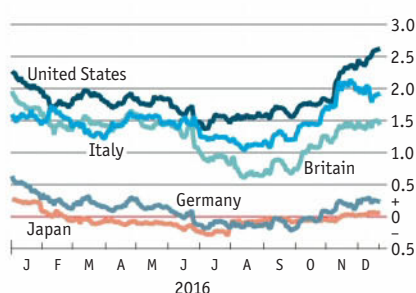
After staying steady for months as fewer of the unemployed left the labour force, America's unemployment rate is falling again. In the euro area, it remains close to 10%.

**Consumer prices**  
% change on a year earlier



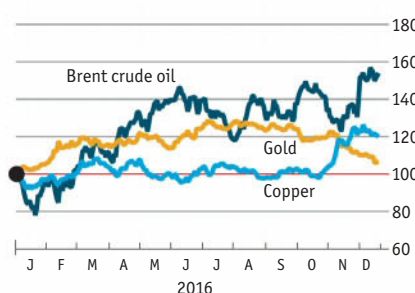
In America, annual consumer-price inflation approached 2%. Elsewhere too, higher oil prices and a stronger dollar nudged prices up, though Japan still flirts with deflation.

**Ten-year government-bond yields**  
%



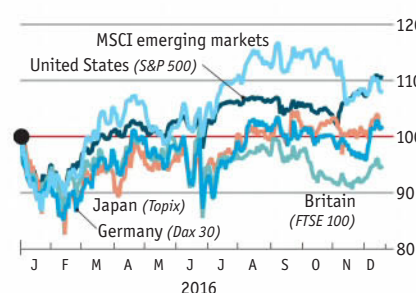
Some analysts declared an end to the 30-year bull market in government bonds as yields picked up at last, most notably after Donald Trump's election victory. They may be premature.

**Commodity prices**  
January 1st 2016=100, \$ terms



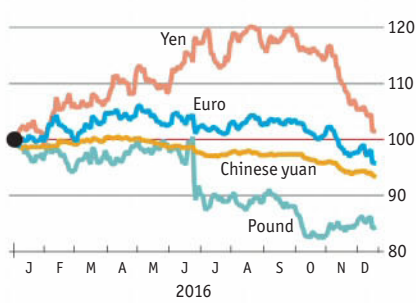
The oil price spiked after OPEC in November agreed to cut output. Gold's advance was stemmed by the American election. China's economic resilience bolstered the copper price.

**Stockmarkets**  
January 1st 2016=100, \$ terms



It was a good year for investors in emerging-market equities, and in America, especially after Donald Trump's victory. Foreign investors in British equities were hit by the weak pound.

**Currencies against the dollar (1)**  
January 1st 2016=100



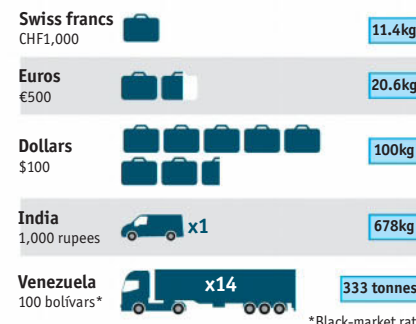
The pound was pummeled by Brexit; the dollar boosted by expectations of the Trump presidency. China spent some of its reserves to slow the yuan's depreciation against the dollar.

**Currencies against the dollar (2)**  
January 1st 2016=100



The Donald Trump effect thumped the Mexican peso. Other emerging-market currencies flailed, including Turkey's and Malaysia's. The oil-reliant rouble bucked the trend.

**Demonetisation**  
How to carry \$10m in large banknotes

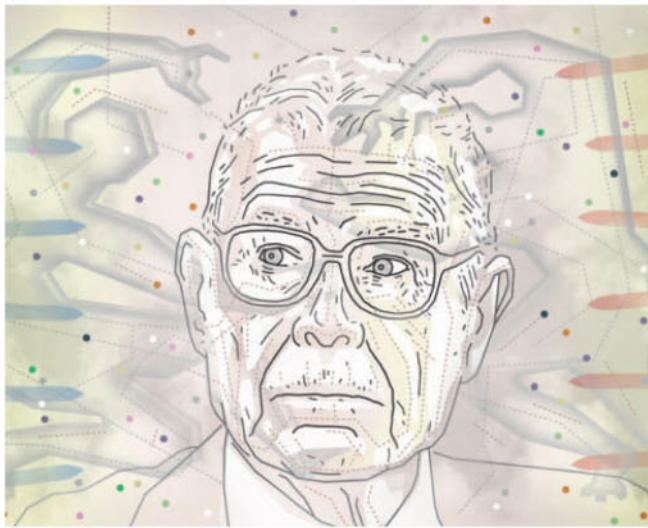


To catch holders of "black money", first India and then Venezuela courted chaos by cancelling high-denomination banknotes. The Venezuelan bolívar was already worthless.

Sources: Haver Analytics; Thomson Reuters; The Economist

# Free exchange | A cooler head

Thomas Schelling, economist and nuclear strategist, died on December 13th, aged 95



**W**ITHIN half an hour of waking up on October 10th 2005, Thomas Schelling received four phone calls. The first was from the secretary of the Nobel Committee, with news that he and Robert Aumann had jointly won that year's prize for economics. During the fourth call, when asked how winning felt, he answered: "Well, it feels busy." He was nothing if not truthful. He also confessed to feeling confused about which bit of his work had won the prize.

It might have been his work on addiction—flicked off like ash from his own struggles with smoking. Economists must understand, he wrote, the man who swears "never again to risk orphaning his children with lung cancer", yet is scouring the streets three hours later for an open shop selling cigarettes. Mr Schelling's work laid (largely unacknowledged) foundations for future behavioural economists. In his thinking, addicts have two selves, one keen for healthy lungs and another craving a smoke. Self-control strategies involve drawing battle lines between them.

The prize could also have been for his work on segregation, showing how mild individual preferences could lead to extreme group outcomes. Even if people do not mind living in a mixed community but have just a slight inclination to live near others like themselves, that could lead to deep racial segregation.

By the time Mr Schelling arrived in Sweden in December 2005, he had worked out what the prize was for. His acceptance speech observed that "the most spectacular event of the past half century is one that did not occur. We have enjoyed 60 years without nuclear weapons exploded in anger...what a stunning achievement—or, if not achievement, what stunning good fortune!" If achievement was the word, the credit was partly his.

Like so many of his generation, Mr Schelling was drawn to economics by the horrors of the Depression in the 1930s. By the time he had finished his PhD in 1948, the agenda had changed. With the wounds of the second world war still fresh, the priority was to prevent a third. He dipped into government, gaining first-hand experience of negotiations, such as those that established NATO. Then in the 1950s he began publishing academic work on bargaining, using his crystal-clear prose to formalise concepts that gifted negotiators knew instinctively, and shunning what Richard Zeckhauser, a colleague, called the "Journal of Advanced

Economic Gobbledygook".

The conflicts Mr Schelling considered transcended the case of two parties scrapping for a bigger slice of a fixed pie. The richness of his subject lay in the truth that "in international affairs, there is mutual dependence as well as opposition." As neither America nor the Soviet Union wanted to be engulfed in a nuclear mushroom cloud, there was scope for military strategy involving wit, not weaponry. In 1960 he set out his ideas in a book, "The Strategy of Conflict", which showed how the advantages of co-operation could overcome antagonism, even without a formal bargain.

"Any time somebody talks about deterrence, they're influenced by Schelling," says Lawrence Freedman, author of "Strategy: A History". This deterrence could take several forms. Counter-intuitively, limiting your options can strengthen your hand, by convincing the enemy of your seriousness. Applied to nuclear strategy, Mr Schelling saw that it was important to persuade the opposition that in the event of a nuclear attack, there would be a counter-strike. Weapons that would retaliate automatically if the country was attacked could deter nuclear aggression in the first place, so defending such weapons was the best way of defending civilian lives. The important thing was to avoid a situation in which one side attacked so as to offset the other's perceived first-mover advantage.

Mr Schelling also promoted the importance of reputation as a useful deterrent. Richard Nixon understood this with what he called his "madman theory": the idea of making the North Vietnamese enemy believe he was capable of anything, including pressing the nuclear button. But consistent behaviour can have as deterrent an effect as erratic unpredictability: if your adversaries believe that you will keep your word, then your word can shape their actions. The danger of this approach, however, is that it could lead to perseverance with a stupid strategy, just to save face.

## United we stand

Mr Schelling was often referred to as a game theorist, despite not calling himself one. His methods marked him apart. Mathematical minds had proven elegantly that Mr Schelling's games would always have solutions. There would always be at least one set of strategies where each side was playing its best possible response to the other. When whittling down the number of options, however, the mathematical approach was to chuck more assumptions and equations at the problem. Mr Schelling, in contrast, thought that just as one could not deduce logically whether any given joke will make people laugh, so it was ludicrous to deduce what people might think in a nuclear war from logic alone.

Mr Schelling looked to the real world for help, and argued that shared norms were the answer. When he asked his students to pick a meeting place in New York, unco-ordinated, most would settle on the clock at Grand Central station. In his prize lecture, Mr Schelling used this idea to help explain why nuclear weapons had not been used on the battlefield for so long: their use was a taboo, so the world could settle on a focal point.

On that busy morning of October 10th, when pressed by the third journalist of the morning, Mr Schelling refrained from advising young people. "I wouldn't necessarily try to talk somebody into...becoming an economist." Instead of being confined by any academic discipline, he led by example, tackling some of the world's most worrying—and most intractable—problems. ■

Clothespins

## Mankind in miniature

*A simple, oddly modern, oddly mystical machine*



THE clothespin has an ancient look. The simplest sort, with rounded head and body carved from a single piece of wood, might have come from an Egyptian tomb or a Mesopotamian midden. Their shape is vaguely anthropomorphic, like a forked mandrake root (“dolly peg” is the name in commerce), suggesting an offering to the gods of fertility, or of nature. It would be no surprise to find one in an Iron Age settlement, still attached to an Iron Age loincloth.

Odd, then, that the first such peg is not recorded until the early 19th century. The Roman soldiers at Vindolanda, on Hadrian’s Wall, did not peg up the thick socks for which they wrote desperate letters home; Lady Macbeth’s maid did not peg up the damp, still-spotted gown. Even Samuel Pepys did not expect to see his shirt, soused after a session at the Cock in Fleet Street, tethered with small wooden clips to a line. Instead, the clothespin came only just in time to pinion Shelley’s tear-stained handkerchiefs from the wild west wind.

Before this, it appears, drying garments were simply hung over a line (as painted on a wall in Pompeii), or spread out on grass, as shown in illuminated manuscripts of surprisingly tranquil and unsteady laundry days. For John Clare, the peasant-poet of industrialising England, hedges were as likely to be blowing with underwear as with the blossoms of the sloe or the wild cherry. The fierce spines of the blackthorn or hawthorn held a petticoat as well as anything.

Some say fishermen first thought up pegs, to clip their nets to the rigging. But only one name emerges from the sea-fog, that of Jérémie Victor Opdebec, who took out a patent for the dolly peg in

1809, and of whom nothing else is known. He sounds Belgian. According to a charming fake biography by a mid-20th-century French cabaret group, Les Quatre Barbus, he had a scientific bent from boyhood, inventing devices to de-pip currants and to muzzle ants, but it was the desperate sight (and the faint song) of too-light lingerie fluttering perilously on the line that inspired his biggest brainwave.

Time, and the market, were just about ripe for him. People were cramming into cities, the drying grounds and hedges were receding, and clotheslines crisscrossed like cats’ cradles between slum windows. Besides, once the nifty little device became common, uses far removed from laundry could be found. When Charles Dickens suffered a seizure, a clothespin was thrust between his teeth to stop him biting his tongue. In Louisa May Alcott’s “Little Women”, Meg slept nightly with a peg on her nose to try to make it thinner (a method tried, too, by Diane Keaton). Cartoon characters found them a hands-free way of keeping nasty smells at bay. They are now used to keep food fresh and tablecloths flat, clip gels or diffusers to film lights, correct the hang of curtains, hold lit matches longer, squeeze out the last bit of toothpaste from a tube; in short, for so many essential tasks that humans may well wonder how they ever managed without them.

Practical and relatively newfangled they may be; but pins also carry overtones of ancient mystery. In ►►

▶ Britain they were made from two woods, willow and hazel, with magical associations. (Americans prefer ash and beech.) Willow is therapeutic, and soothes pain. In many cultures it is a tree of conversation and communion, of secret answers shrouded by leaves beside singing rivers. Its wood has something of the spring of water in it: that same elasticity that allows it to be woven into fences, baskets and traps, and can be sensed when a cricket bat, the finest use of willow, shivers under the ball. Hazel is watery, too: the favourite wood for dousing. The dowser's forked stick is like nothing so much as a larger-scale peg, with the legs pulled outward.

Britain's early pegmakers were woodland bodgers in open-sided shacks, farmers keeping idle hands busy in winter, and, especially, gypsies. Like the other items in the gypsy's basket—lucky charms made of recycled tin, bunches of white heather tied with a ribbon and artificial orange flowers, somewhat like chrysanthemums, created by whittling slivers from an elder branch—pegs carried a hint of ancient magic. Gypsy pegs had a streaked, rough-hewn look, as if brushed with ash from the open fire, and a little ring of reclaimed tin near the top to hold the wood together. In other ages and places gypsies had been smiths and metalworkers, implying brief spells of settlement; the tin ring was a relic of old trade. In modernising Britain, where they were continually moved on by the police, they relied for their livelihood on roadside, riverbank or passing woods: itinerant production from whatever grew wherever they chanced to be.

In this uneasy coexistence between Travellers and settled society, pegs became the currency of choice. It was an odd exchange. Consumers did not ask for them, and those who produced them barely used them themselves. They were things the gorgios, or non-gypsies, were thought to want, like fortune-tellings and palm-readings, which after a while became a habit. They were cheap as words.

Pegs were also seasonal; almost as much so as primroses or acorns. They underpinned the gypsy economy in months when they could not pitch their caravans at the edge of fields or orchards, tying wheat or picking hops. In the 1870s it was reckoned gypsy women could make 12-18 shillings a week hawking pegs in cities and towns, more than enough to live on. By the 1930s the going rate for pegs was tuppence a dozen, and shopkeepers would sometimes order them by the gross, exchanging them for goods rather than cash. In the 1950s the author of this piece—with the pram in which she was sleeping—was wheeled off by a gypsy in exchange for a wand of pegs in Maidstone High Street. Their value was clearly judged equivalent. Perhaps sadly (for a gypsy upbringing was still judged romantic then), both items were swiftly handed back again.

### The currency of wanderers

The author's uncle, a sheep-farmer on Romney Marsh (which, like Maidstone, is in Kent), makes pegs any time he spots a good side-branch, though it's best in spring when the sap is up and the bark falls off almost by itself. The only wood for him is grey willow, common round the ditches of the marsh. You never get a splinter, he says, out of a good grey-willow peg; with use, his grandmother's became as smooth as silk. Farmers who disliked gypsies (sadly, an undying breed) used to root out grey willow deliberately to thwart them.

Pegs take no time to make once he gets going. The side-branch naturally provides a knob at the top to stop the splitting; he uses a pair of pliers to pinch under the knob, then splits up with a sharp knife until the two sides start, just, to spring apart. Then he prises the sappy centre out. His preferred tool is an ivory-handled Victorian penknife with a large blade and, inevitably, a gadget for getting stones out of horses' hooves. The cleaned-up pegs, still damp, are pushed on a thin stick. They will be dry by morning, and an evening will provide a bucketful.

Men being what they are, though, they could not leave the

“Nothing grows in our garden, only washing. And babies”

clothespeg alone. Simplicity, surely, could be improved on with artful complication. The first American patent, dating from 1832, articulated a bent hickory stick with a wooden screw, which didn't work. As the century passed, American inventors added extra legs or bits of metal to a device which, in the right hands, was just natural wood doing its own thing. By 1887, 146 peg-patents had been applied for. A display in the Smithsonian Museum in Washington shows several of the patentees, tied to labels as large as themselves, with their designer's names and dates in proud copperplate.

It could be argued—and still is—that a metal adjunct is not an invention, merely a modification. Nonetheless David M. Smith's “new and useful or improved...spring clamp for clothes lines” (1853) made him the inventor of the modern articulated peg. His design, as he described it in almost erotic detail, featured two levers conjoined with a spring so that “the two longer legs may be moved toward each other and at the same time move the shorter ones apart”, in harmonious opposition. His last diagram showed Opdebec's design, “the common wooden clothes pin in common use”, as he scornfully described it. It was inferior because it had to be pushed on garments like a prong. By contrast, his own peg delicately clipped them to the line.

Inevitably that too was improved, by Solon E. Moore in 1887, with a “coiled fulcrum” of wire. Both inventors were Vermonters, and their brainwaves fired up industrialisation in the state: Montpelier versus Waterbury, the United States Clothespin Company versus the National Clothespin Company, with both vying (given the latitude) to produce pins that “cannot freeze or lock on the line, as they will open at the top and let the snow and ice out”. By the early 20th century the equivalent of 500,000 board-feet of lumber (perhaps 700 tonnes) a year, in the form of sawmill waste, were being pulled from the Green Mountains to make pegs at a rate of more than 20,000 a day.

The Smith-Moore peg is a triumph of design, equally pleasing when mini (to clip a sprig of lavender to a martini glass, or a favour to a wedding menu) or when maxi, as in Claes Oldenburg's 14-metre-high steel “Clothespin” in Philadelphia. In 150 years, this item has not been improved on. Scott Boocock of Alice Springs has just invented the Heg, a plastic peg with hooks, inspired by his struggles to pin out his wife's cocktail dress; but something much like it, in dark Victorian wood, sits in the Smithsonian.

The motive behind all this is control: to win man's, or usually woman's, eternal contest with the wind. Smith's patent claimed to offer protection against the “evil” of things blowing off the line: not merely inconvenience, but existential disorder and wrong. Wind would now be put in its place. Although pegs might suggest domestic servitude and toil, they also asserted possession, tidiness and small, quick triumphs: a full, billowing clothesline is a victory of sorts. Hence the hymn of praise to Opdebec set by Les Quatre Barbus, its French original vaguely fitting the main theme of Beethoven's Fifth Symphony: for though hurricanes might thunder and storms might rage, the humble peg was a beacon of hope, holding everything together. It might be the saviour not merely of a row of shirts, but of human civilisation.

True, the sheer joy of seeing laundry blow safe-anchored on a line is regularly dashed by having to run outside, when the clouds mass, and grab tumultu- ▶▶

ous armfuls as the first drops fall. But even that loss of command can now be remedied: the Omo laundry company has devised a smartpeg called Peggy, of red plastic, which can send messages from your washing line to your smartphone informing you when the sheets are dry, and when it is going to rain.

Balancing this conquest of the elements, however, came loss of social control. In cities and, especially, suburbs, a clothesline is a semaphore of gossip and the pegs little telltales, wagging their knowing heads. A sudden parade of nappies, a startling array of saucy smalls (impossible without pegs), the vanishing of a man's overalls, even the sad listing of sparse pegs on a line that was full before, may all announce what has not been publicly admitted. "Nothing grows in our garden, only washing. And babies," sighs the simple but luscious Polly Garter in "Under Milk Wood". The voice of the First Drowned faintly asks whether washing is still on the line in the world above, as though with his own death it must have disappeared.

### Flapping in the trade winds

Through this cosy domesticity, as the years ran on, the winds of globalisation and technological change blew as coldly as elsewhere. In sunny cities such as Naples and Valencia, the clothesline still reigned supreme; but by 1920 America's wooden-clothespin-makers were struggling, crying fruitlessly for protective tariffs against the Swedes and the Chinese. Flat-dwelling, and the sighing boom of the tumble-drier, gradually cut deep into demand. In 2009 the last domestic peg clattered off the production line, and the last owner of the National Clothespin Company was buried under a five-foot reclining version, in grey granite, that looked as dead as he was.

Odd then, but true, that at the same moment, in various places, sales of pegs began to soar. In 2007 Asda, a supermarket chain, reported that British sales had risen by 1,400% in the first four months of the year compared with the year before. Such a spike was mystifying, and a shock. Moreover, plastic pegs (which degraded in sunlight) were losing out to traditional wooden ones. The switch to wood was a by-product of nascent hipster culture, with its love of beards, craft beer, bicycles-with-baskets, milk-rounds and all things retro; the return to pegs, though, seemed part-caused by guilt at the amount of carbon dioxide, 1.5kg, emitted by each cycle of a tumble-drier. The two trends together resulted in a renaissance. Along the back-roads of both New and Old England, smaller companies sprang up again to make thousands of wooden artisan pegs of good hazel and ash. Modern craft fairs now seem to be held together by them.

Much comes down, again, to their anthropomorphic charm. Along with pegs has come a revival of peg dolls, dressed up, with scraps of cloth, into the tiny forked humans they so strongly resemble. One of the few things that could be said of their mysterious and possibly fictitious creator, Opdebec, was that his name rhymed most usefully with *mec* (roughly "bloke"), a hard little word somehow apt, too, for his hard little wooden inventions. For all their mass-production and plastic incarnation, pegs may also be a charm or totem after all. Even those massed plastic Chinese legions lie in their packs like tomb soldiers, ready to be deployed.

The claims made for Oldenburg's "Clothespin", however, show that their significance can go way beyond that. This apotheosis of the peg began in a fittingly ordinary way. In 1967, as he left one day for the airport, Oldenburg slipped a clothespeg into his pocket. As his flight approached Chicago shortly afterwards, he held up the pin against the skyscrapers below and thought it could



Clothespin: Claes Oldenburg

vie with them. Sketches followed, in which colossal pegs of "a certain Gothic character" stood with their heads in windblown clouds. Yet the more he considered the two leaning parts, joined by metal rings, the more Oldenburg compared them to Brancusi's cubist stone lovers in the Philadelphia Art Museum. ("Cpin=kiss", he scribbled on the print.) From this thought, sown in the public consciousness, flowed a dozen others. The immense clothespin, according to the city's boosters, links Philadelphia's colonial heritage to its difficult present; it reflects the city's efforts to close the gap between rich and poor; and in its evocation of simple, domestic things it brings all men and women together.

Chief in the mind of the sculptor remained the simple thought of two lovers embracing. The same idea seems to have drifted through Smith's mind as he wrote his patent proposal, and through the minds of many pegmakers, dealing with the simple spring and return of a piece of cloven wood. From this elemental urge to get together sprang all humankind—with its triumphs, its failures, its endeavours and its ingenuity. \*

## Foreign fighters

# Somebody else's war

*What makes someone leave a comfortable life in London to fight in northern Iraq?*



ERBIL

“ANOTHER Christmas out there, another bowl of soup, that’s the plan,” declares Tim Locks, a former nightclub bouncer and a self-styled warrior. “Out there” is the unrealised state of Kurdistan.

The Kurdish Regional Government (KRG) does not know precisely how many foreign fighters have joined its ranks. There are certainly fewer than have joined Islamic State (IS)—the force that men like Mr Locks yearn to fight. More than 3,000 people have joined IS from Europe, according to estimates from the Soufan Group, a consultancy, and around 150 from America. The people from beyond the region who have joined the Kurds, on the other hand, probably number in the hundreds: perhaps 1,000 all told.

In February 2015 Mr Locks became one of them. A rough childhood left him with a loathing for bullies, and, he says, “there’s no bigger bully in the world than Daesh” (a term for IS much disliked by the group, and so used by those who fight them). He regrets not having joined the British Army, but at the age when he might have done, as he explains, “suddenly you get a driving licence and there’s girls and clubs and things to go and do”. If he had joined up, he might not have felt something was missing as he neared 40.

In August 2014 IS captured Sinjar, a town in northern Iraq. They drove its Yazidi population on to a nearby hill; they massacred thousands. Like most people, Mr Locks had never heard of the Ya-

zidi, ethnic Kurds persecuted by some Muslims as devil-worshippers for revering an angel who takes the form of a blue peacock. But he had followed the rise of IS with bewildered anger. The slaughter on Mount Sinjar proved more than he could bear. “I just thought right, that’s enough, I don’t know what I can do, but unless I’m there I can’t do anything.” He rang an estate agent and put his house on the market.

He found a Facebook page for the “Lions of Rojava” (Rojava being the part of northern Syria the Kurds claim as their own). An American who fought with the Kurds created the page to let others follow him. It had information on how to join the fight and gave Mr Locks, and anyone else who was interested, a chance to chat with fighters in the field.

### Online to front line

There were many such sites on various social networks, some just offering information and contacts, some looking for money. To help defray costs, foreign fighters had learned to crowdfund their war using Instagram, Facebook and YouTube. In exchange for a sense of what the war was really like, the fighters asked ►►



► for donations via PayPal. In effect, they sold their war.

The accounts the fighters used were sometimes blocked: Instagram and PayPal won't let their platforms be used to buy weapons. But funds reached them anyway, to be spent not just on weapons, but also on food, water, cigarettes and energy drinks. In return the accounts provided a window on war in its entirety: loafing; feeding rations to stray dogs; mocking the enemy. But the images that got the most response show blood. In one photo on Instagram an IS fighter lay twisted and dead, his bullets near him, blood flowing through the long hair typical of jihadists. It was liked by over 16,000 people. A video of an IS fighter who had been shot by a foreign fighter getting medical care received over 300,000 views.

Mr Locks had no idea how to shoot someone, but he reckoned that any skill could be learned. Online he discovered a firearms course in Poland. Out in the forests no law prevented him from training with pistols and rifles loaded with live ammunition. It was expensive, but he felt it was money well spent.

Reaching Iraqi Kurdistan proved surprisingly easy: flights went from London, with a visa available on arrival. The hard part was getting out of Britain, where the authorities tend to take a dim view of people leaving to fight in Iraq. Mr Locks booked a business-class flight to allay suspicions. At the airport in Sulaymaniyah, near Iraq's border with Iran, he called contacts he had made online. A driver picked him up and delivered him to his unit, called Dwekh Nawsha ("the self-sacrificers", in Aramaic).

There were former American soldiers who felt that the war in Iraq had not ended, there were others like him, there were outright fantasists. One of his more striking comrades was Gill Rosenberg, a former soldier from the Israeli Defence Forces who had come looking for redemption after she had served a prison sentence in America for fraud.

The volunteers had to pay their own way. There were plentiful AK47s for just \$300 each, but they weren't accurate at long distances. M16s, the American army's standard rifle, were better but more expensive—up to \$2,500 each—and harder to find; most of those available had been abandoned by Iraqi troops. Some of the fighters also carried pistols so that, if they thought they were about to be captured by IS, they could take their own lives first. A reliable Austrian Glock purchased to this end would cost \$3,000.

After helping the team buy weapons, Mr Locks was still far from the front. That was no accident. The Kurdish forces were keen to avoid the public-relations nightmare of western volunteers getting killed, and so did their best to keep foreigners behind the lines. But after weeks of negotiations he got himself sent forward.

He did not get to Syria; few of the volunteers do. Instead, he ended up in a patch of rough desert near an Assyrian Christian village called Baqofa. Telegraph poles ran into the distance on one side; on the other was a water tower flying the black flag of IS. That was the village of Batanya, once also the home of Assyrian Christians. His mission was to hold the line. On his first day, he narrowly missed getting killed by a mortar. From a rooftop perch he saw sand rising in ominous clouds as the shells dropped closer and closer. At first he froze. Then he ran from the roof and tried to bury himself in the ground. It made him smile. He was an ordinary man who had decided that he would not sit in comfort while people were being slaughtered. Sand in his face, he realised, was what he had come for.

He scrapped with other soldiers whose motives he disliked. One self-proclaimed "Soldier of Christ" had a tattoo on his back of the archangel Michael, a Bible full of notes and highlighter marks; he saw the war as the latest Crusade. Some fighters were taking the opportunity to set up security companies. Others played music or used their mobile phones when they were supposed to be watching for the enemy.

Not all phone use was frowned on. Officers who grumbled if

anybody spent too much time on YouTube made an exception for instructional videos; Mr Locks learnt how to use a mortar from them. But the professionals worried about how much of the war appeared on social media. Some heard that IS used Kurdish soldiers' posts to gather intelligence. Others worried about reliability. How could a soldier know, for instance, that the "weapons expert" telling him how to use a rocket launcher was not an IS intelligence cell providing dangerous misinformation?

### Missing Mosul

Western and other intelligence services were certainly paying attention in the online world. Several volunteers had agreed to provide intelligence to their home countries and stayed in touch with law enforcement using secret WhatsApp groups to relay troop movements and enemy positions, including the locations of foreign fighters on the IS side.

Mr Locks left after five months. He had come under mortar fire, been shot at and shot back. He had not paddled an inflatable across the Tigris to get into Syria like Mark Ayres, a Londoner of more or less the same age who had spent four and a half years as an infantryman with the Royal Green Jackets in his teens and had felt himself called to the fighting. He had not stripped copper from electrical transformers under IS fire to sell so the Kurds could buy armaments, as one Norwegian volunteer did. But he felt he had helped. And unlike Reece Harding, an Australian who left the Gold Coast to fight without telling his parents, he was still in a position to go home. Harding was just 23 when he was killed after stepping on a landmine.

Mr Locks always thought he'd return to the battlefield, though; maybe not, next time, as a volunteer, but as a bodyguard. He particularly wanted to be part of the force that took the Iraqi city of Mosul back from IS.

In November the battle started without him. But it started without all the people like him who had stayed in the country, too. Days before the attack the KRG announced that, though Kurdish forces would be taking and holding surrounding villages, none would enter Mosul. Foreign fighters were almost all to be kept back. Some foreigners who had been fighting in Kurdish units for nearly two years managed to get close to the action, but still had to stand by and watch the Iraqi army take over what they wanted to be their operation.

The dispirited foreigners trickled back from the front lines to Erbil, the capital city of Iraqi Kurdistan in taxis playing Dabke music. They returned to the down-at-heel Christian district of Ainkawa—in particular to the hidden German beer gardens near a statue of the Virgin Mary, where there were pitchers of lager and bottles of Lebanese wine. As they drank they heard Chinook helicopters clatter overhead carrying special forces west for the fight. As they passed, they threw chaff into the night.

Mr Locks still wants to go back. He wants to see IS fall. He wants the dull desert, the searing heat, the smiles of the Kurds, the stock of the AK47, the sound of a bullet loading more than he wants a house. He wants the nights lying on a rooftop watching for the enemy across a strip of no-man's-land, feeling that this was all bigger than him, but that he could squeeze a trigger and send a bullet into the quiet.

The experience changed him and tired him. It did not satisfy him. He had come home. But he wants to go back: perhaps for others; perhaps for himself. \*

*At first he froze. Then he ran and tried to bury himself in the ground.*

## Sequoias

## On a giant's shoulders

The world's biggest tree has played an outsized role in America's environmental history. That will not save it from global warming

SIERRA NEVADA, CALIFORNIA

**H**IGH in the Sierra Nevada, in Calaveras Big Trees State Park, the last rays of the day are turning the topmost branches of a giant sequoia golden brown. The bark, much thinner up here than it is lower down the trunk, appears to be flowing around the massive boughs in liquid whorls of pink, brown and cream. It is rough to the touch and exquisite, especially viewed with the sniper-like focus that comes with bright sunlight, high adrenalin and the extreme exposure of the perch.

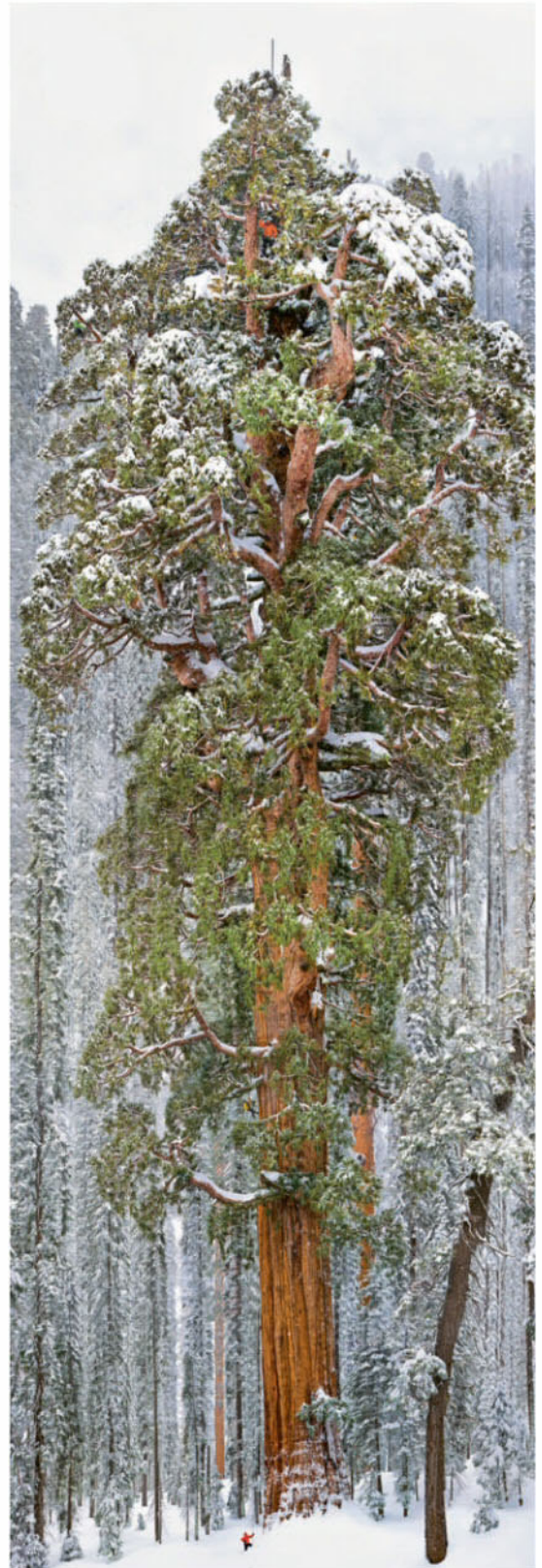
Swaying just perceptibly in a light breeze, the sequoia is over 83 metres high, about the height of a 27-storey building. Anthony Ambrose, a tree-climbing botanist from the University of California, Berkeley, estimates the tree—which he has named Munz, after a celebrated 20th-century botanist—is around 1,500 years old. That is middle-aged for a sequoia. The oldest known specimen, measured by the rings in its stump, was more than 3,200 years old when it fell—so already 700 when work was begun on the Parthenon. The surrounding pines, which appeared vast from the ground, are mere weeds by comparison. Looking straight down in the fading light, through a murk of green needles and hulking boughs, the forest floor is too distant to make out.

The massiveness of the sequoia, a species of cypress which is endemic to just 75 groves in the Sierra Nevada, is not easy to comprehend. That is in part because it is rather hard to observe. Up close, the viewer gawps at the vastness of the trunk, a great pillar rising into the sky, typically branchless for almost half the tree's length. The bole of the biggest living sequoia, the General Sherman tree, is over 30 metres (100 feet) in circumference; it takes 17 adults with their arms outstretched to encircle it. Yet to see the tree's distant crown, a mass of huge and shaggy boughs, curling downwards under their own weight, it is necessary to stand much further back. Excluding some subterranean fungi, the sequoia is the biggest organism ever known to have existed.

## Twizzling in mid-air

Mr Ambrose, a 47-year-old scientist with a watchful manner and diamond stud glinting in one ear, is one of a tiny cabal of botanists whose research mingles science with extreme sports. He has climbed several hundred giant sequoias (*Sequoiadendron giganteum*) and coastal redwoods (*Sequoia sempervirens*)—another California species, slightly taller than the giant sequoia but usually more slender—over the past decade. Yet his wonder is undimmed. “God, I love these trees!” he exclaimed periodically, on a field-trip in November, while unpacking climbing gear, fiddling with solar panels and trying to take his mind off the wreckage some curious bears had made of some of his humidity sensors.

He and his colleague, Wendy Baxter, had come to Calaveras to take down some instruments they had installed in a pair of trees, part of a six-year study into the microclimates of sequoia groves. It was a fine autumn day. A pale blue sky showed through the forest's old-growth conifers—sugar and ponderosa pines, Douglas firs and incense cedars—as the researchers tramped over dry ground, carpeted with dead needles and cones. At the study site they set to work with quiet efficiency, sorting out ropes and carabners. Mr Ambrose and Ms Baxter are partners as well as colleagues, which is not uncommon among tree-climbing scientists. The most celebrated, Steve Sillett, who pioneered canopy research in giant trees, also met his wife clambering aloft. Mr Sillett is known among his peers for opening a new realm of tree science. But he is perhaps most famous, thanks to “The Wild Trees”, a book about redwoods by Richard Preston, for having got married and had sex in a tree. It was a perilous undertaking. ▶▶



▶ For those without amorous intent, the most dangerous part of climbing a giant tree is the first ascent, which is carried out, Swiss-Family-Robinson-style, by first shooting a crossbow bolt with fishing-line attached to it over the highest possible branch. Once the bolt is retrieved, a length of yarn is run up after the line. A rope is then run up after the yarn.

One end of the rope is made fast to a nearby tree. The other hangs free to the ground, where it can be clipped onto and climbed up, using grips that can be slid up the rope but not down it. One grip is attached to a climbing harness, another to a pair of foot slings. By sliding one up after the other, first the foot grip, then, after lurching to full height in the slings, the hand grip, the climber rises up the rope.

As the lowest branch of the Munz tree is 35 metres off the ground, this at first involves a lot of twizzling in mid-air, a metre or two from the tree, as the forest floor falls sickeningly away. At around 10 metres, or the height of a three-storey building, the vastness of the trunk, with its massive bark flutes, runnels and crevasses, the skinniness of the rope, and the extreme exposure of the climb become powerfully evident. There are 73 metres to go.

### Mammoths and mothers

The first reports of monster trees out West, sent by the European trappers and gold prospectors who flocked to California in the mid-19th century, carried a familiar ring of dragons and sea monsters. They sounded incredible. Then, between 1853 and 1855, sections of bark were cut from two colossi in Calaveras, the Mammoth Tree and the Mother of the Forest, and exhibited in San Francisco, New York and London. The husk of the Mother was celebrated as the “eighth wonder of the world”; over 7,000 New Yorkers went to see it on the first day of its display. Even then the *New York Times* was doubtful: “We have no assurance, from seeing this clothed skeleton, that the tree was actually so large,” it opined.

Felling the Mammoth had taken five men working with drills and wedges almost a month. The tree’s stump was used as a dance-floor, big enough to accommodate 40 people. The biggest part of its fractured bole was used as a bowling alley. Thus did the sequoia enter American culture, as a tall story, a popular attraction and, in due course, a source of intense national pride.

At a time of territorial expansion, America’s natural bounty struck some as a God-given substitute for the ancient culture which was the only thing the country seemed to lack (if, that is, you ignored its native American heritage, as most Americans did). For John Muir, a Scottish-American naturalist who lived in the Sierra Nevada and introduced it to the world in his florid writings, the sequoias were “nature’s masterpiece”. Indeed, they were like the Parthenon, with “massive columns from the swelling instep to the lofty summit dissolving into a dome of verdure”.

This exalted status, unusual for a plant, would ensure for the sequoia an important role in two historic debates that began around this time, in both of which Muir had a hand. One was over the competing claims of development and conservation, especially in the West. The other concerned the acceptance by American scientists of Darwinism.

By the time the Mother was shown to New York the rate at which America’s forests were being cleared for fuel and timber was already worrying some people. The sequoia exhibits added a less utilitarian concern. Cutting down such giants was wrong in itself, an act of national self-harm, sacrilegious even, and must be stopped. “Unless the Goths and Vandals are arrested in their work, the destruction of the incomparable forest will probably go on till the last vestige of it is destroyed”, the *New York Herald* railed in December 1855. “The state of California and the Congress of the Union should interpose to preserve these trees, as the living proofs that the boasted monarchs of the wood of the Old World are but stunted shrubbery compared with the forest giants of our own country.”

It would be long before this notion seriously threatened Amer-

icans’ sense of manifest destiny. In the second half of the 19th century loggers felled around a quarter of the sequoias. It was rarely worth the effort involved. Unlike fine redwood timber, sequoia wood is too fibrous and brittle to be much use for anything except matchsticks and fence-posts. Partly for the same reason, the trees also tended to shatter when felled; it was reckoned that half of any felled giant was thus wasted.

Not until 1909, after nearly 1.5m people signed a petition beseeching President Theodore Roosevelt to intervene, was the Calaveras grove purchased by the federal government to prevent it being logged. Yet slow though it may have been to grow, the conservation movement behind that petition was nonetheless rooted in the husk of the Mother. John Conness, a senator from California, referred to that very tree when urging his fellow senators to pass a bill to protect the nearby Yosemite Valley in a speech now considered a milestone in American conservation. The bill in question, he argued, would at least “preserve one of these groves from devastation and injury”, which, again, national pride demanded. Even more than the painful felling of the Mother, Conness seemed motivated by his sense of pique at “the English who saw it [and] declared it to be a Yankee invention”, not, as the good senator understood the fallen tree, a “specimen of American growth”.

Muir, one of the most celebrated Americans of his time, added impetus to the conservationist movement. The son of a Presbyterian preacher, who, at the age of 11, could recite most of the Bible by heart, he became an evangelist for nature. He believed that wilderness, uncorrupted by civilisation, revealed God. “Do behold the King in his glory, King Sequoia!” he wrote, “Some time ago I left all for Sequoia and have been and am at his feet; fasting and praying for light, for is he not the greatest light in the woods, in the world?” By soaking sequoia cones in water, Muir brewed for himself an arboreal communion wine: “I wish I were so drunk and Sequoical that I could preach the green brown woods to all the juiceless world”

John the Baptist...crying, Repent, for the Kingdom of Sequoia is at hand!”

He got his wish. In 1903 Roosevelt spent three days with him in Yosemite, staring at its sequoias, and the preacher convinced the president of the need for preservation. Roosevelt signed into existence five national parks, 18 national monuments, 55 national bird sanctuaries and wildlife refuges and 150 national forests. Muir’s vision of wilderness preservation was not unchallenged; a rival “conservation” movement, led by Gifford Pinchot, the first boss of the United States Forest Service, argued for America’s natural resources to be protected for sustainable exploitation, rather than for their own sublime sake. But when it came to the “gigantically wasteful lumbering of the great Sequoias” Pinchot was with Muir: “I still resent the practice of making vine stakes hardly bigger than walking-sticks out of these greatest of living things.”

An earlier trip to the sequoias with Muir, undertaken in 1872 by Asa Gray, a celebrated botanist, was influential in a different way. A friend and advocate of Darwin, Gray argued that natural selection was consistent with a divine creator. Having rehearsed his ▶

▶ views with Muir, who, with some quirks, broadly accepted them, Gray outlined them in an influential speech he delivered soon after on the distribution of trees in the present and the past, making the sequoia his prime example. As the world changed, Gray argued, so its flora did, with species sometimes adapting well and sometimes being out-competed by others. The sequoia had not fared well since the most recent ice age. Having once been widespread, changes in its range had left it only restricted areas to grow in, and in these territories lesser species that reproduced faster, such as sugar pines and incense cedars, could “overpower” it. “Certain if not speedy”, Gray expounded, “is the decline of a race in which a high death rate afflicts the young.”

### A tree for all seasons?

Mr Ambrose’s climate study is in a way testing Gray’s hypothesis—but in the more recent context of anthropogenic warming. The work received particular attention (and a dollop of needed funding) in 2014, near the height of California’s now five-year drought, after half the foliage on some sequoias suddenly died. Mr Ambrose found that the affected trees were in fact no worse off than apparently healthy ones. Though water-stressed, all the sequoias were to some degree mitigating the effects of the drought by shedding foliage and shutting off some of their stomata to conserve water. It is a trick sequoias turn out to be especially good at, which illustrates a paradoxical truth about the giants. Coeval with dinosaurs, once widespread across the northern hemisphere, but now reduced to refugia that cover a total range of just 150 square kilometres (38,000 acres), they are plainly sensitive to climate change. Yet they are also extremely resilient.

Some of their defences against the buffeting of geological time were revealed during your correspondent’s ascent of the Munz tree. The shaggy thickness of its bark, up to a metre deep, and, as the rope angled in towards the trunk, not uncomfortable to bounce off, protects it against the fiercest wildfires. This was especially apparent in the crown, where a fold of pinkish new growth was slowly overlapping a branch killed by fire. The damage had been done, Mr Ambrose estimated, 200 years ago; the heat of the blaze, raging at the height of a modest skyscraper, must have killed most of the trees in the forest at the time.

Besides a few ants and spiders, the tree was also surprisingly devoid of creepy-crawlies. The sequoia’s tannin-rich wood is unappetising, which has spared it from another warming-related blight, the bark beetles and other pests currently ravaging America’s West. In the Sierra Nevada, more than 66m trees are estimated to have been killed by bugs and drought since 2010.

Sequoia wood resists rot; scratch away the muck and charcoal from a stump which took root three millennia ago and the wood beneath is intact. As a result the trees are not particularly welcoming to other plants, either. In their more humid, coastal conditions, redwood canopies tend to be thick with epiphytic lichens, bryophytes and even small trees, growing in pockets of rotted wood. The Munz tree was barren by comparison: a stunted sugar pine, sprouting from a fire scar about 50 metres up, was its only large epiphyte.

With such advantages, the sequoias are playing only a minor role in a third great public debate, over climate change. Even as the pines succumb to beetles and the firs go up in smoke, the giants look able to endure—at least for a while. Yet there will be a limit to that. Sequoias need vast quantities of water; Mr Ambrose and Ms Baxter calculate they use more than two tonnes a day in summertime. And there are multiple indicators, including drought, dieback, shrinkage of the Sierra Nevada’s snowpack and a slight retreat of the sequoia’s southern range, to suggest such volumes could soon be unavailable to them. “I worry about them. I worry about them a lot,” said Mr Ambrose, working deftly to dismantle his scientific rig from the very top of Munz, while being peppered with journalistic questions from a neighbouring branch.

At that highest point on the tree, illuminated in crystalline detail by the explosive last rays of the dying sun, I noticed a single thread of spider’s silk. It was snagged on a piece of bark, and trembling in the delicate breeze. It was powerfully beautiful. It also seemed for all the world like a sign. \*



Gay bars

## Lights out

*The disappearance of gay bars and clubs is an unhappy side-effect of a far more cheering trend*



LONDON, NEW YORK AND WASHINGTON, DC

**D**APHNE SUMTIMEZ, a drag queen, dances so vigorously that it looks as if she might bring the low-slung ceiling down. It is the last Friday night of This N That, a gay dive in Brooklyn, New York. Essentially a long brick tunnel, the venue has a bar running down one side and disintegrating leather banquettes along the other. Covered in sparkle, Daphne gyrates and does the splits; her diamante belt flies off, to the delight of her audience. A young man in a black skirt and cracked leather boots pounds the stage with appreciation. “We’re here, we’re queer and that’s what makes us family,” she sings in elegy for This N That over music from “Beauty and the Beast”. A fairy tale is ending.

Punters take their final photos of the wall beside the stage, where a mural depicts skyscrapers, warehouses, robots, a rainbow, a walking pizza slice and a joyful unicorn. “It’s gonna be turned into stores,” says one regular, in the smelly toilets where all genders pee together. “I heard a sports bar,” sighs another.

For its regulars This N That was its own particular place; one in which to dance, hook up and be as outrageously camp as possible. But the experience of going out to a gay bar is an almost universal one for homosexual men and lesbians in the rich world. They are places that contain memories of first kisses or heart break; they are where people, often persecuted or misunderstood by others, made friends and felt accepted at last. As such, they became central points for gay people. This is why, when 49 people were killed by a homophobic shooter at the Pulse gay nightclub in Orlando in June 2016, it carried such an emotional burden. Thousands of people conducted vigils in their local gay bars in America, Britain and elsewhere. Outside the Admiral Duncan pub in London’s Soho,

where a nail bomb killed three people in 1999, hundreds of people came together as they had that night, waving rainbow flags and holding one another in grief.

And yet despite their importance, gay bars are vanishing. A month before Daphne wiggled her hips at This N That the aptly-named One Last Shag, also in Brooklyn, shut down. Dozens of others have disappeared from cities over the past decade. At least 16 bars closed in London between 2014 and 2015, though the number is likely to be higher. The disappearance of these bars and clubs is upsetting to some past and present patrons. But their decline also points to a larger, and overwhelmingly positive, trend.

Places in which gay men and women can gather have long existed in different shapes and forms over the centuries. In 18th-century London taverns known as “molly houses” were places in which men could meet, dress in women’s clothes and conduct “marriage ceremonies” (although they were not technically brothels, sex often took place in them too). In the Weimar Berlin of the 1920s freewheeling transvestite shows, colourful drag revues and bars for men and women all jostled for attention, buoyed by a steady influx of foreigners escaping persecution elsewhere. In Paris gay life flourished in the decadence of Montmartre, with its Moulin Rouge cabaret and rows of smoky cafés and bars.

In America these bars popped up more and more after the second world war, during which millions of people, many of whom were from small towns or suburbs, were posted in big cities such as New York and San Francisco. When the war ended many gay people wanted to stay together. This is partly how homosexual districts, such as the Castro in San Francisco and Greenwich Village in New York, developed. In these neighbourhoods gays and lesbians had their own restaurants, book shops, church groups and newspapers.

Along with being places to hook up, the bars in these districts also let gay people try on new identities, says Jim Downs, a historian at Connecticut College who has written about the gay-liberation movement. Some men went to bars dressed as police officers or leather-clad motor bikers. Others preferred the “ballroom scene”, in which they wore extravagant dresses and competed to throw the wittiest put-downs at each other. Lesbians could be “butch dykes” or “femmes”. Hairy, burly men called themselves “bears”. Such subcultures still exist (“for bears and their admirers”, reads the slogan for XXL, a London nightclub).

More important, these bars were where many gay people finally felt they belonged. Andrew Solomon, a writer and psychology lecturer, writes about “vertical” and “horizontal” identities in his book, “Far From the Tree”. Vertical identities are those that come di- ▶▶

rectly from one's parents, such as ethnicity and nationality. Horizontal ones—such as sexuality—may put a child at odds with his family. For many homosexuals, the experience of going to a gay bar for the first time was a nerve-racking one, but also one in which they finally felt accepted, finding those with the same horizontal identity.

"This place got me through the most difficult part of the past eight years," says Leigh Gregory, a patron of London's Queen's Head pub, which closed in September 2016. In Washington, DC, Judy Stevens, who has worked in gay bars for 50 years, "sits with the drinker when business is slow and you become friends," says Victor Hicks, a long-time patron of bars in the city. "My partner and I actually went to her for her blessing when we first started dating. There was no one else's approval we cared about above hers."

### Radical drinking

It is this sense of community that drew members of the gay-friendly Metropolitan Community Church together for their weekly worship, held at the Upstairs Lounge, a gay bar, in New Orleans every Sunday in the early 1970s. They gathered there to pray and sing together. On June 24th 1973, an arson attack on their congregation consumed 32 lives, including those of the assistant pastor and his boyfriend. Their death pose, frozen by the flames, showed them cradling each other.

From the start, the existence of these bars was precarious. Police raids were common: in Paris in 1967 412 men were arrested in one month. But rather than stop patronising them, many gay people used these bars as a space for resistance. "NOW is the time to fight. The issue is CIVIL RIGHTS", shouted the text on a flyer that was distributed in bars in Los Angeles in 1952, to drum up support for Dale Jennings, a 35-year-old man who had been charged with soliciting sex from a plain-clothed police officer in a toilet. In 1966 a "sip-in" took place at Julius, a bar in New York's West Village, in protest at a rule prohibiting bartenders from serving so-called "disorderly" clients. The most famous incident took place at the Stonewall Inn in New York in 1969, when its patrons (including Stormé DeLavarie, a butch lesbian from New Orleans who performed as a drag king) fought back against a police raid. The protest lasted for six days and sparked the start of the modern gay-liberation movement in America, which led to the repealing of homophobic laws and, eventually, to same-sex marriage.

In the rich world it is no longer raids that threaten gay bars; the biggest problem facing most is rent. These places are often in scruffier parts of cities. As cities become wealthier, and as pressure on space intensifies, they are squeezed out. In Brooklyn the Starlite Lounge, which had been open since the 1950s, faced a rent rise in 2010. The managers were forced to close despite a campaign to save it. Today the building is occupied by a local deli, the owner of which also says that his rent has become too steep. In London the Candy Bar, a lesbian venue, closed in 2014 after two decades of serving drinks to women in a dark, rather dingy space when its landlord increased the rent. In an ironic twist, the bar is now a lap-dancing club.

Another pressure is increased competition in the hook-up trade. Technology means like-minded people are just a tap away more or less wherever you are: mobile-phone apps such as Grindr for men and Her for women have eliminated much of the need to lock eyes across a crowded room. Instead potential partners can be found while at home or in the lunch-break at work by "swiping" to find people nearby. Some 2m men use Grindr globally. The app allows them to see and talk to other men who are online nearby, to either forge relationships or have casual sex. Other apps allow people to search for people in other countries, suddenly making the gay bar global. "The efficiency is unparalleled," boasts



*"We're here, we're queer and that's what makes us family."*

Robyn Exton, the founder of Her, which has 1.5m users.

But perhaps the biggest reason gay bars are disappearing is because of increased acceptance of homosexuality in the rich world. According to a study in September from Pew Research Centre, an American think-tank, 87% of those asked knew someone who was gay or a lesbian. One in five American adults say their views on homosexuality have changed over the past five years (most have become more accepting). Similarly in Britain, views on homosexuality have become markedly more tolerant. This means that many gay men and women, particularly youngsters, do not feel the need to congregate in one spot. In big cities such as London or New York they can display affection in many bars and pubs, while they frequently live in areas of cities that are more diverse. According to research by Amy Spring, a sociologist at Georgia State University, who looked at 100 American towns between 2000 and 2010, the vast majority of gay men (87%) and lesbians (93%) living with partners now live in neighbourhoods where gay and straight people increasingly live side by side.

This does not make the disappearance of gay bars in the West any less painful. Indeed, many gay people are trying to fight the trend. In 2015 campaigners managed to save the Royal Vauxhall Tavern, a former Victorian music hall in London which hosts drag shows and cabaret nights, from demolition by getting the building listed as a heritage site. Similarly in San Francisco patrons of The Stud Bar formed a co-operative to raise money to secure the lease, after its rent increased 150% earlier this year. Many European cities are now appointing "night mayors" to try to prevent music venues, clubs and bars (both gay and straight) from closing in cities such as London and Amsterdam.

And while these places close down in the rich world, they remain as important as ever in the developing world. In Kampala, the capital of Uganda, where homosexuality is illegal, a gay club night takes place at a particular restaurant every Sunday evening. "We dress up, cross dress, dance, dance, dance," says Frank Mugisha, a gay-rights activist. "But you wouldn't know about it unless you knew someone who goes," he adds. These places are facing many of the problems that gay bars in New York or London experienced four decades ago. In August the Ugandan police stormed a gay and transgender fashion show, beating the participants and locking them up in jail for a night. Similarly in Yaoundé in Cameroon, where homosexuality is also illegal, police officers surrounded Mistral Bar in October, holding the patrons inside for some time before arresting all of them.

That such seemingly ordinary bars—often rather scruffy, with peeling leather seats and the sodden smell of stale alcohol—can offer so much to their patrons is perhaps remarkable. But it is the other people in the room who make them special. Many remember their first experience of going into a gay bar with affection: "I was...visiting my [gay] uncle in New York," says Stavros, a 24-year-old from London. "It got to 1am one night and he said, 'Let's go out'. It just blew my mind. It was the first time I saw guys kissing. It was more than I dreamed of." Generations to come may not experience the same sense of release when they enter a gay bar, if they go into them at all. But, in the rich world, they are also less likely to feel alone. \*

Laboratory mice

# Animal factory

*The evolution of a scientific mainstay*


BAR HARBOR, MAINE

**A**N ARROW conveyor belt runs between a lorry and a set of pallets stacked ten-high with shoebox-sized containers. Inside each of them is a clutch of mice ready for dispatch to some distant laboratory, along with enough food and water-laden gel to sustain them on their journey. Most of the containers have five occupants; some special bloodlines, for example those that have been bred to be diabetic, and thus pee more, travel in smaller numbers. “Feels like the first time”, by Foreigner, may be playing unobtrusively in the background, but the loading of the lorry is utterly routine. All told, 3m mice a year ride this conveyor belt.

Plenty of other creatures do their bit for science, from yeast to flatworms to zebra fish to marmosets and, unhappily, chimpanzees. But mice and rats make up the overwhelming majority of the vertebrates used in research. And they cannot be just any old rodents. Lab mice mostly come from specific strains that have been deliberately inbred, with siblings mated to each other generation after generation until the whole bloodline is genetically very much of a muchness. Once your lab is used to working with a particular strain, you will tend to keep coming back to it—or, perhaps, to variants of it that have a specific set of genes “knocked out” or rewritten. When you need more mice, you will send off for some as similar as possible to the ones you already have. And for a great many labs, the rodents that they get delivered will have passed through this loading bay. The Jackson Laboratory, in Bar Harbor, Maine, is one of the world’s biggest suppliers of laboratory mice.

Both in academia and among pharma companies life without mice from JAX, as everyone here calls it, or one of its competitors is inconceivable. But the mouse’s position as the researcher’s best friend is not without problems. More than 80% of the candidate drugs that make it into clinical trials because they worked in mice do not go on to work well in humans. What’s worse, it has recently become clear that attempts by one lab to go back and replicate mouse studies carried out by another fail much more often than one would wish. Despite the best efforts of JAX and its ilk, the world’s lab mice are both mimicking the biology of sick humans with insufficient fidelity and responding to experiments with insufficient uniformity.

A lot of the poor reproducibility—and thus, presumably, many

of the unhelpful results—rests on details of the way that researchers keep their animals, or run their experiments. However reliably uniform the mice are when they are shipped off from JAX, if they do not get handled in the same ways later on they will not produce the same results. Aspects of the care and feeding of mice that were previously seen as insignificant are turning out to matter a lot.

But there is a deeper problem, too. The mice used to model a particular human disease often offer only the roughest sketch of the malady the researchers are trying to address. And in many cases the inbred nature of lab mice makes them a poor guide to what will go on in a broader, more genetically diverse population. The underpinnings of life have complexities that the sought-after simplicities of the laboratory mouse have not come close to cracking. So JAX is using new genetic technologies, cunning statistics and mouse-breeding projects of unprecedented ambition to crack further.

## Earth-born companions

Mice are small, cheap to rear and don’t mind living crammed together, whether in a lab enclosure or under a barn floor. They’re quick: quick to reach sexual maturity and quick to gestate (you can get a new generation every three weeks). Quick to die, as well; a lifespan of two years or so makes studies of a whole life, or of multiple generations, quite easy.

On top of all these natural advantages, when modern biology laboratories started looking for a workhorse in the early 20th century the mouse had something extra going for it. For decades European and Japanese mouse “fanciers” had been breeding animals with interesting behaviours or particular coat colours. Mouse genetics was not a science, but it was a well-practised art. When Clarence Cook Little, who founded the Jackson Laboratory, started looking into the causes of cancer in humans in the 1900s, appropri- ►

▶ ately-bred mice were the obvious way forward.

Once scientists took their murine turn, the benefits of continuing down that road were self-reinforcing; the more they learned to do with mice, the more they wanted to do. At JAX and elsewhere mice were used to study cancer, immunology, diet, neuropathology and more. In the 1970s biotechnology opened up new possibilities—putting in specific human genes to make them better models for specific diseases, knocking out particular genes to try and work out what purpose they serve. JAX was at the forefront of the technology, doing on a large scale what individual labs would struggle to do on their own.

Lab mice became a commodity, one that scientists ordered in from afar and that they defined by their bloodlines and genes. But not all mice are equal, even if their genomes are. If you do an experiment on a set of mice that are littermates and on another set raised apart, they will respond differently. If, as some labs do, you use only males for experiments, you may get different results from those in co-ed labs.

Trouble with reproducing laboratory results is not confined to mouse studies, or even to biology. Journals are, in general, not interested in negative results, so the scientific literature lacks mention of failure. Scientists are unwittingly biased toward results consistent with their hopes and expectations, and may suffer from perverse incentives. Take those failed clinical trials: testing a drug on humans and finding out it doesn't work costs a lot of money. But being the person who kills a promising drug that colleagues have been working on for years, on the basis of some borderline results in mice, takes a lot of character.

A fundamental problem in irreproducible research is that crucial details about how experiments are done are often omitted from published papers. Sometimes this is sloppiness—not noting down things that are known to make a difference. But sometimes it is nescience—not noting down things that everyone has assumed will not make a difference but which, in fact, do. Mouse studies are currently confronting a number of areas where such unknowns have been rife.

### Nature's social union

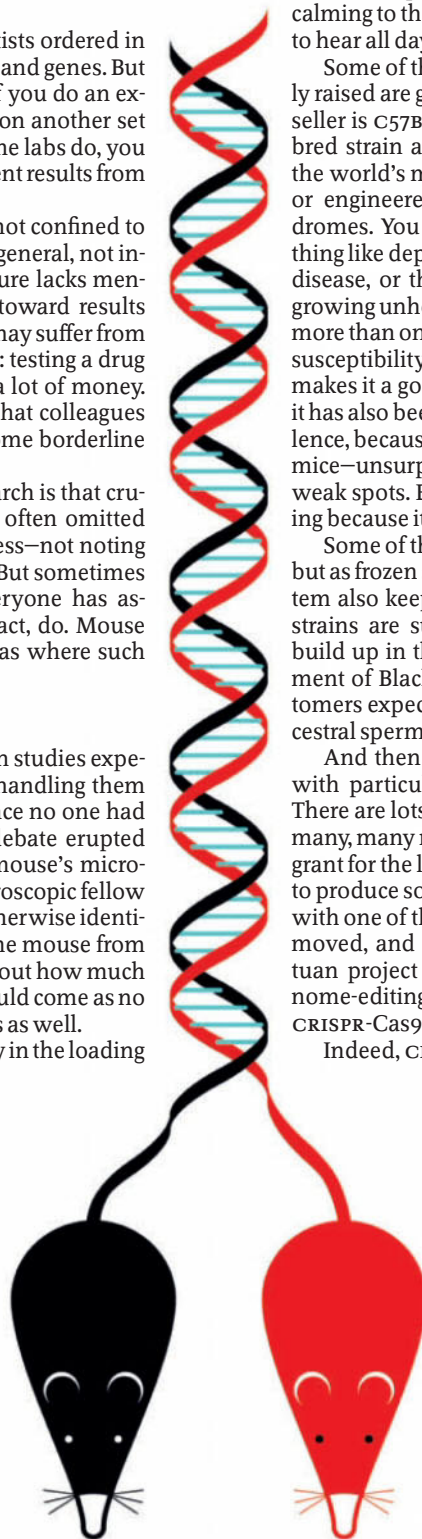
A study published in 2014 showed that mice in pain studies experienced extreme levels of stress if the researchers handling them were men, but not if they were women—a difference no one had thought to look for, or report. In 2016 a furious debate erupted about how studies might be affected by the lab mouse's microbiome, the bacteria that live in and on it. These microscopic fellow travellers differ among strains of mice, or among otherwise identical mice bred in different places, or even in the same mouse from one season to the next. Science is just now figuring out how much difference these bugs make to human health; it should come as no surprise that microbiomes influence mouse studies as well.

At JAX they take bacteria seriously. Near the lorry in the loading bay sit racks of mouse chow waiting to be sterilised in a nearby autoclave—in essence, an oven big enough for a couple of cars. Everything the mice will be exposed to from the moment they are born until a researcher pops open the box they travel in will be similarly sterilised.

Bacteria are not the only intruders the lab wants kept out. The mousetraps in the hallway are there to forestall incomers, not escapees; the joke goes that local mice have heard how cushy things are inside. The air that flushes through the little transparent apartments housing one male and two females in rigidly controlled polygamy is impeccably filtered.

The technicians who wander around removing newly weaned pups and replen-

Not all a lab's mice are equal, even if their genomes are



ishing food and water are dressed head to toe in cleanroom suits, hands gloved and feet bootied, peering out through visors. Tubes coming from their headgear reveal that their air supply is filtered, too. Music—at the moment, the breathy intro to Jethro Tull's "Cross-Eyed Mary"—is piped in constantly to stop the mice from being spooked by any loud noises. The soft-rock playlist balances what is perceived to be calming to the mice and what the technicians can bear to hear all day long. Think dentist's office.

Some of the mice being so carefully and protectively raised are good for a range of work. The lab's biggest seller is C57BL/6, or "Black Six", a long-established inbred strain also available elsewhere, which is by far the world's most popular lab mouse. Others are bred, or engineered, to show specific symptoms or syndromes. You can buy a mouse that is given to something like depression, or to something like Alzheimer's disease, or that just sits around like a couch potato, growing unhealthier by the day. Some mice can model more than one thing. A red-eyed albino called *sjl* has a susceptibility to nervous-system inflammation which makes it a good model for multiple-sclerosis research; it has also been used as a model for calming down violence, because males are particularly aggressive. Some mice—unsurprisingly, given the in-breeding—have weak spots. Black Six is a poor tool for studying hearing because it tends to grow deaf.

Some of the less-used strains are stored not in cages but as frozen sperm and eggs. This genetic back-up system also keeps the bestselling strains straight. Inbred strains are subject to "genetic drift" as fluctuations build up in the gene pool. To ensure that every shipment of Black Six and *sjl* does exactly what the customers expect the lab back-crosses its strains with ancestral sperm every five generations.

And then there is the creation of new mice—mice with particular genes added, or removed, to order. There are lots of such mice already; soon there will be many, many more. In August 2016 JAX received a \$28m grant for the latest part of a grand international project to produce some 20,000 new strains of Black Six, each with one of the 20,000 genes in the mouse genome removed, and see what ails them. It seemed a gargantuan project ten years ago; now, thanks to new genome-editing techniques, especially one called CRISPR-Cas9, its later stages border on the routine.

Indeed, CRISPR may usher in the era of true designer mice. If you want a beastie that's particularly wee, sleekit, cowering and timorous, for example, you could ask for mutations in the *Ghrhr* gene, which can govern size; *Foxq1*, which makes coats shiny; and *Lypd1* and *Atcay*—mutations that provide, respectively, a fearful nature and general skittishness.

Poetically satisfying though such polygenic high-jinks might be, in general mouse research has tended to go a gene at a time: "That's what we can do easily," says Nadia Rosenthal, JAX's scientific director. And for some diseases, such as ▶▶



▶ muscular dystrophy or cystic fibrosis, a single gene is all it takes to capture pretty much everything, since the disease is caused by a single-gene mutation in humans. But the role genes play in most diseases is a lot more complex. Trying to understand them, and thus model them, on a gene-by-gene basis quickly gets researchers into what Dr Rosenthal calls “unfeasibly tricky genetics”.

Tricky as it may be, though, somehow this work has to get done if the research is to provide both an understanding of the underlying mechanisms and new ways of intervening. And getting that sort of understanding means embracing what labs like JAX have largely tried to dispose of: genetic diversity. Only with diverse populations can you pick up the subtle relations between genes which influence the most common and debilitating conditions.

This was the idea behind Collaborative Cross, an effort begun at JAX in 2004 and since developed by a community of researchers spread all around the world. (The outcomes of research carried out at JAX are not patented: every new model or bloodline created here is open-source.) The ambitious project started with a “founding population” of five standard laboratory strains and three more-or-less wild ones that, between them, contained all the genetic diversity that the mice known to science have to offer. From these the researchers produced hundreds of new inbred lines. Within each line diversity is very low, but between them it is high. “Outcrossing” these lines with each other produces more diverse populations in a controlled way, with detailed knowledge of the progenitor lines allowing the new combinations of genes to be tracked. Lots of diversity, lots of replicability: the best of both worlds.

Working with mice that differ, albeit in very well understood ways, allows you to see which of the differences matter, and thus trace the complex ways that different genes work together—or fail to. “You can come to profound insights about genetic interactions, which is very hard to do if you put one mutation in one mouse, and another, and a third, and look at three mice to try to figure out if those things are related,” says Dr Rosenthal. “This way you let the genetics tell you how things are related by simply allowing the population to reveal the important genetic components.”

### Man’s dominion

“Simply” may not strike all researchers as the right word. The power of this new technique comes with significant costs: you have to do more experiments and master more demanding statistics. To help other researchers make the leap to the new techniques, researchers at JAX and elsewhere are working on new software to do the statistical heavy lifting. This has its risks. Researchers relying on computer programs to do statistical tests they do not fully understand has proved to be a problem in a wide range of recent research.

If the research is harder, though, the results may be correspondingly more rewarding. And CRISPR makes them easy to build on. Sarah Stephenson came to JAX from Australia to use its Collaborative Cross mice in research on Parkinson’s. Having traced the network of genes involved she might go on to use CRISPR to see what actually happens when some or all of those genes are changed or deleted. There is a good chance that some of them will model particular aspects of Parkinson’s better than anything available now. Other researchers will then be able to use those mice to look for therapies and drugs.

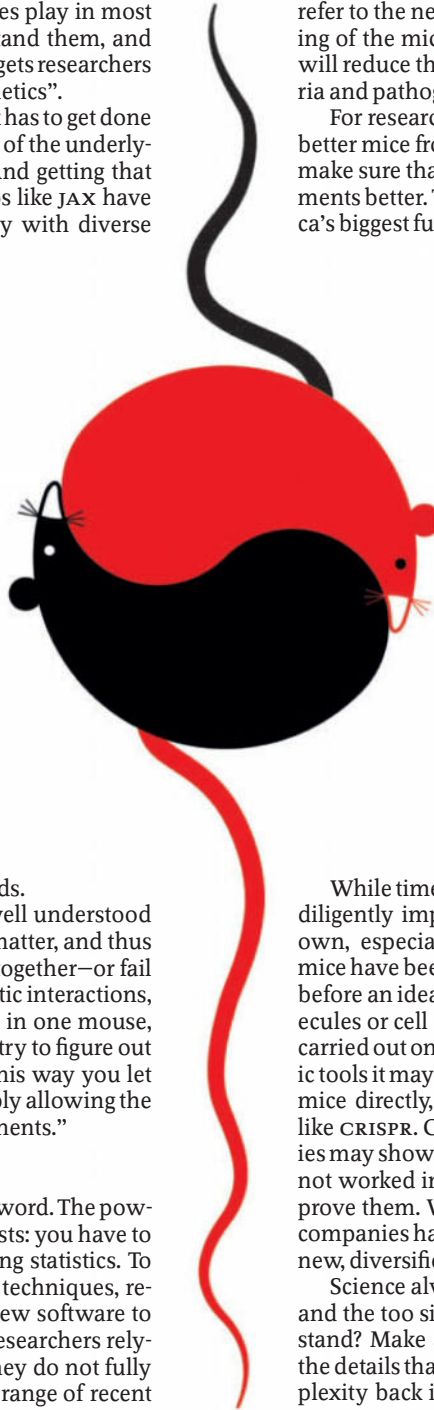
The sound of “Start me up” now echoes around the loading bay; the lorry has departed. Soon this production facility will

move 32km away from JAX proper, establishing itself in a recently vacated Lowe’s hardware store (the staff refer to the new digs as “J-Lowe’s”). The care and feeding of the mice there will be more automated, which will reduce their stress levels. Their exposure to bacteria and pathogens will fall yet further.

For research to get better will not just require ever-better mice from JAX. Various efforts are under way to make sure that researchers design their mouse experiments better. The National Institutes of Health, America’s biggest funder of health research, is developing an experimental-design checklist to make sure that lab animals are properly randomised, the researchers properly blinded to the results and the methodology of the whole operation reported in more detail. Assiduous book-keeping needs to become the norm, recording not just an experiment’s particulars but also, for example, who has handled the mice, details of their microbiome, where precisely their cage was—not just everything that is already known to have a potential confounding effect but also factors that have yet to emerge as significant. Computers will keep track of it all, as they do of the genetics; one way or another, unexpected effects and influences will have fewer places to hide.

While time-honoured approaches to the mouse are diligently improved, new ones may come into their own, especially in drug development. For decades mice have been one link in a chain, the last thing to test before an idea that started out in studies of single molecules or cell cultures finally becomes a clinical study carried out on humans. But with more powerful genetic tools it may be possible to look for drug targets in the mice directly, following up hopeful leads with tools like CRISPR. One enticing possibility is that such studies may show why some plausible-looking drugs have not worked in the past—and what can be done to improve them. With this in mind, a few pharmaceutical companies have set up camp at JAX to make use of the new, diversified mice and the lab’s expertise.

Science always rocks between the too complicated and the too simple. Real world too complex to understand? Make a simple model. Model doesn’t capture the details that turn out to be most salient? Let the complexity back in. Bank some progress and repeat. This process can, at times, get ugly. As oversimplifications from the past are unmasked there is bewilderment and recrimination. So there will be as studies that use mice evolve, and some accepted wisdom is undermined. But Dr Rosenthal is sure that progress will win out. “I think we’re going to be unpleasantly surprised, but I don’t think that all of biology is hopelessly variable”, she says. “There will be some things that stand the test of time, simply because the tests we were doing were so crude that you get a black and white answer anyway.” \*



## Silence

## The rest is...

Where, how and why to be quiet

MINGALADON TOWNSHIP

IF YOU had heard it on one of Yangon's chaotic streets you would have paid it little mind. It would have been a euphonious whisper swiftly lost in a cacophonous torrent. But in the pre-dawn quiet of the monastery it was as piercing as an air-raid siren. Shortly before 4am a monk struck two gongs, one about a second after the other. They sounded two different notes, the second just short of a fourth higher than the first. Then, pausing for a few seconds, the monk struck the gongs again. He did this several times.

The monastery began to stir: soft footsteps and the rustling of clothes—no voices. Most of the monks, nuns and lay worshippers filed out of their cells and into the *dhamma* halls—one for men and one for women—for an hour of seated meditation before the first of the day's two meals. Some instead did an hour of walking meditation: slow, deliberate, measured steps forward, hands clasped either in front or behind. After the morning meal the day's meditation, eating, sweeping, cleaning were done slowly, deliberately, and, for most lay worshippers, in complete silence.

The silence of this monastery, like most silence outside the fanciest anechoic chambers, is an aspiration rather than a fact. Not that long ago the chanting of the monks of Mingaladon would have carried over nothing but the fields and farms of what was then a rural township of Yangon, with little more than the crowing of cocks and lowing of cattle flowing back the other way. No longer. Though there are still farms in Mingaladon, it is also home to Myanmar's biggest and busiest airport, which is set to get even busier as the ever-less-secluded country assumes its place on the trails of backpackers and adventurous investors. Highway Number 3, a tributary to the busy Yangon-Mandalay Highway, bisects the township; in the monastery monks and laypeople alike meditate to the constant thrum of passing traffic.

But the silence of not speaking, as opposed to that of not hearing, persists. And, if anything, it gets more attractive as the noises outside the walls mount up. For someone whose working days are relentless blizzards of phone calls, e-mails, tweets and deadlines, and whose home life is filled with the constant screeching and breaking that only children at the demon-puppy stage can provide, a week spent in silent meditation within the monastery's walls sounded heavenly. No demands, an inward focus, time to breathe and reflect.

In fact, the plunge into silence proved powerfully disconcerting: like a cartoon character shoved over a cliff, running fruitlessly in mid-air. Your correspondent's modern mind craved stimulation; the sought-after silence brought only soured boredom. This, say meditation enthusiasts, is just the first stage: you have to push through it to reach something worthwhile on the other side. It turned out to be easier said—or easier to recall, in silence, someone else once saying—than done.

The quiet, once you are in it, is difficult. Saying you want it is easy, and commonplace. After the age of 30, if you tell any friend that you are in need of peace and quiet he is likely to nod in recognition. The demand is high enough that silence of all sorts is for sale. Noise-cancelling electronics, first discussed in public as a throwaway joke by the science-fiction author Arthur C. Clarke,



Green, Blue, Green on Blue: Mark Rothko

now sit in hundreds of millions of dollars-worth of high-end world-excluding headphones. The intrepid, tight-lipped tourist can choose from silent retreats on six continents; many of the growing number headed for the seventh, Antarctica, probably do so in part out of yearning for a great white silence. Smaller doses of silent meditation, in the guise of mindfulness, are cropping up in secular school curricula across the Western world.

Finland boasts of its rural wooded silence as other countries sing the praises of their beaches or mountains: it markets itself as a silent tourist destination. Gordon Hempton, an "acoustic ecologist" (he records natural sounds) has designated a small chunk of territory deep in Olympic National Park in Washington state, far from roads and flight paths, "One Square Inch of Silence". He believes it is the quietest place in Amer- ►►

► ica's lower 48 states, and wants to keep it that way. He monitors the area for noise pollution, and tries to track down the offenders and ask them to quieten down.

Obviously, the inch is far from silent. The forest is alive with the whispers of nature: frogs and crickets, distant streams, squirrels and deer running over fallen leaves. This is the contradiction built into the pursuit of silence; the more sources of noise are stilled, the more the previously imperceptible rises to the level of perception. This was the essence of the silence that John Cage, a composer, used in several of his works, most famously "4'33", a composition for piano that consists of three movements. At the beginning of each the pianist opens the instrument's lid, and at the end of each he closes it. No notes are played. The piece allows an audience to attend to the sounds around them and the questions within.

What the silence reveals can be grim. Samuel Beckett's mimed plays "Act Without Words I" and "Act Without Words II" use silence to draw out the frustration, pointlessness and endured unendurability of life. His novel "The Unnamable" ends on a similar note (or absence of note): "I'll never know, in the silence you don't know, you must go on, I can't go on, I'll go on." Beckett believed that "every word is like an unnecessary stain on silence and nothingness"; and yet he went on writing them.

Fundamental though it is to some finished art, silence may matter even more as a circumstance for art's creation. "The impulse to create begins—often terribly and fearfully—in a tunnel of silence," wrote the American poet Adrienne Rich. In "The Aesthetics of Silence", the writer and critic Susan Sontag urged artists to maintain a silent "zone of meditation" in order to protect their creative impulses from a world that wants to stifle them.

That said, stifling can be a silence of its own—one imposed through convention or power. In the censor's hands silence can be a brutal intervention. Part of the strength of Harold Pinter's plays, in which characters taunt, worry, threaten and displace each other with unnervingly long pauses, is their ability to dramatise in domestic form the silence imposed by states on many other political artists.

But although silence can be a necessary beginning, a tool of oppression and, properly deployed, a cutting critique of power, it is comparatively rare that it is the essence of an artist's work. Few have trusted their audience to create the art without them, as Cage did; most feel a need to say something. For the deepest human relationships with silence—and also those most widely incorporated into the mundane life—turn not to art, but to religion

### Through the earthquake, wind and fire

Some Christians, Buddhists and, to a lesser extent, Muslims have chosen silence for centuries, and there are rooms like those available in the Mingaladon monastery set aside for those who wish to explore its potential in Buddhist and Christian monasteries around the world. For the religious, silence offers a way to ponder and listen for the divine, the unsayable and inexplicable. Christians commonly choose silence because they believe in a god who speaks. They need to be silent to create a space for him—always at the risk, as in Shūsaku Endō's novel, recently filmed by Martin Scorsese, that the silence remains unfulfilled, an abyss. Silence is also, the religions

“Whereof one cannot speak, thereof one must remain silent”

teach, personally improving. The Prophet Muhammad told Muslims that, “One can greatly beautify himself with two habits: good manners and lengthy silence.” For Buddhists, silence teaches devotees to master their passions.

Silence is often a retreat from worldliness, and the inauthentic. Ignatius of Antioch, an early Church father, advised Christians at Ephesus: “It is better to be silent and be real than to talk and not be real”—foreshadowing by around 1,800 years Mark Twain's advice that it is better to keep one's mouth shut and be thought a fool than to open it and remove all doubt. It is also a way to avoid doing ill. One of the admonitions that comprise Buddhism's eightfold path is to practise *samma vaca*, or “right speech”, which scriptures define as abstaining from false, slanderous, harsh and idle speech; all major religions counsel their adherents to choose their words carefully and use them sparingly. Religions can supplement the self control required for such abstinence in ways that may be helpful or oppressive; if the faithful cannot speak, they can ask no questions, preserving the authority of their superiors.

Many forms of religious practice make use of silence; some, such as that of Quakers, may consist of little else. But there are particular places where it really lives and breathes: in wildernesses like Mr Hempton's; in some monasteries. Benedict, the sixth-century monk seen as the father of Christian monasticism, did not explicitly include silence in his rule, but in the cloistered life speech is widely seen as something requiring permission or exigency. Today monks who live by the Rule of St Benedict in hundreds of (normally small) Trappist monasteries speak only sparingly.

Thomas Merton, an influential American Trappist ►►

The Knife Grinder: Kazimir Malevich



▶ who was ordained in 1949, held that the only words required of a priest were those of the Mass. This disdain for speech (which caused him to agonise about his own copious writings) stemmed in part from his belief that God's words were beyond the scope of "human argument". Some things are mysterious, and not subject to analysis. One must be silent to understand them, and it is better to say nothing than to try to explain them. As Ludwig Wittgenstein, an Austrian philosopher, put it in his "Tractatus Logico-philosophicus": "Whereof one cannot speak, thereof one must remain silent." It is not power that compels silence here, but the inadequacy of any attempt at communication.

The Buddha would have called this practice "Noble Silence". When asked a question the answer to which he believed the questioner incapable of understanding, he said nothing. Usually these questions concerned the world's fundamental nature; perhaps more than any other of the world's great religions, Buddhism prizes the observable, and does not much concern itself trying to define the undefinable. When a disciple asked Buddha whether the universe was infinite or finite; or whether there is a self; or the more plaintive, "Will you tell me the truth?": silence. Better no speech than speech that misleads, or answers that limit.

Buddha himself became liberated through silent meditation. Though Buddhism varies markedly with geography, from the wry, austere Japanese practice of Zen to the rigorous, state-entwined Theravada Buddhism practised in Myanmar and Thailand, silent meditation is generally the central practice of faithful Buddhists, whether monks, students, housewives or fishermen. When Mr Hempton says, of his square-inch of silence deep in the piney wilderness, that its silence "is not the absence of something. Silence is the presence of everything," he is expressing a thought Buddhists would understand perfectly.

But the presence of everything—and of all of one's self—is not always a release. It can be a burden. Around sunset on the second day of his seclusion in speechlessness, your correspondent realised that for all the equanimity offered by Buddhism, the psychological acuity of its founder's teachings and the hospitality of the Mingaladon monks, he would rather be in one of the cars he could hear passing by on Highway Number 3, wherever it was going, than inside the *dhamma* hall, where he was supposed to be meditating. Having booked a seven-day retreat, he lasted a bit less than 70 hours. His still, small voice within, he decided on listening to it, was insufferable.

It is possible that pushing further would have brought a breakthrough, not a breakdown. It is also possible that, for many people, 15 minutes of silent meditation each morning and afternoon can be wonderful while 15 hours of it each day is both a waste of time and a greased slide into insanity.

Discovering the limit to the silence you can bear has its advantages. To some extent it can teach you to appreciate the irksome chaos and noise that led to the original yearning for silence—to realise that just as there can be inner tumult in silence, so there can be tranquillity in the thrum of activity. For all that, in English, the words are so often neighbours, "peace" and "quiet" are not necessarily conducive to each oth-

er. The Hebrew word "shalom" is reasonably translated as "peace", but it has other shades of meaning too: completeness, prosperity, wholeness. These are things that need not be silent. As Diarmuid MacCulloch writes in his quirky, insightful book "Silence: A Christian History", in Old Testament scripture "peace and rest are associated with busy, regulated activity". The preacher in "Ecclesiastes" tells his listener that "Whatsoever thy hand findeth to do, do it with thy might, for there is no work, nor device, nor knowledge, nor wisdom, in the grave, whither thou goest." In its permanence and completeness, the grave is silent. But its peace is not one to seek out too soon.

There is a tradition of silence in those scriptures, too. "Be still before the Lord and wait patiently for Him," the Psalmist says. But it is pulled at by the possibility of worldly, noisy peace, and the tension matters. Rescued from the austerity of the Mingaladon monastery and plunked down in hectic central Yangon, a refugee from silence may jostle less and smile more at the whorling sea of humanity that surrounds and presses in upon him. He may sit down for a steaming bowl of noodles at a packed stall on a narrow patch of pavement and see the customary elbows in the ribs from the diners on either side not as an annoyance to be endured but as signs of brotherhood, community and fellowship, to be received with love. He may even make a joyful noise unto whomever is listening. \*

Untitled 1: Willem de Kooning






---

**Also in this section**


---

**108 A Middle Eastern particle accelerator**


---

**109 How motherhood changes the brain**


---

For daily analysis and debate on science and technology, visit

[Economist.com/science](http://Economist.com/science)

**Driverless cars**

## Eyes on the road

MUNICH

### How to miniaturise laser-scanning devices for cars that drive themselves

**E**XPERIMENTAL self-driving cars continue to make regular forays onto the roads. After a trial in Pittsburgh, Uber, a taxi-hailing-app company, launched several of its “autonomous” vehicles onto the streets of San Francisco on December 14th—and promptly ran into a row with officials for not obtaining an operating permit, which Uber insists is unnecessary as the vehicles have a backup driver to take over if something goes wrong. General Motors said it would begin testing self-driving cars in Michigan. For these and other trials one thing is essential: providing the vehicles with a reliable form of vision.

As no man-made system can yet match a pair of human eyes and the image-processing power of a brain, compromises have to be made. This is why engineers use a belt-and-braces approach in equipping vehicles with sensors that can scan the road ahead. That way, just as your trousers will stay up if one or other of belt and braces fails, if one system misses a potential hazard, such as an oncoming car or a pedestrian, the others might spot it and direct the car to take evasive action.

Three of the sensory systems currently in use in autonomous vehicles—cameras, ultrasonic detectors and radar—are reasonably cheap and easy to deploy. A fourth, lidar, is not. Lidar employs laser scanning and ranging to build up a detailed three-dimensional image of a vehicle’s surroundings. That is useful stuff as the lidar image can be compared with the data being captured by the other sensors. The problems are that lidar is bulky (it hides in the roof

domes of Google’s self-driving cars and, as pictured above, in the revolving beacons that adorn Uber’s vehicles), mechanically complicated and can cost as much as the unadorned car itself.

Smaller, cheaper lidars are being developed. One of the most promising comes in the minuscule form of a silicon chip. Prototypes have been delivered to several big automotive-component suppliers, including Delphi and ZF. If all goes well, within three years or so lidar chips should start popping up in vehicles.

#### A chip off the old block

The company bringing these miniature lidars to market is Infineon, a German chip-maker. This firm is one of the biggest producers of the chips used in radar detectors. Radar works by sending out radio pulses and detecting the reflected signals that have bounced off objects. The time delay between emitting a pulse and noting its reflection is used to calculate how far away the reflecting object is. If that object is moving, then its speed can also be determined. This determination comes from a slight shift in the frequency of the reflected signal, caused by the Doppler effect (the phenomenon that also causes a passing fire-engine’s siren to change pitch).

Around 15 years ago radar sensors were specialised pieces of kit and cost around \$3,000. Infineon found a way to make them using a standard silicon-based manufacturing process and, by integrating many of the functions of a radar onto a single chip, boost performance. That has brought

the price down to a few hundred dollars. As a result, radar chips have become an essential part of an autonomous car and are increasingly used in conventional vehicles too, to provide safety features such as automatic emergency braking.

The race is now on to shrink lidar in a similar way. Lidar was developed as a surveying method following the invention of the laser in the 1960s. It employs a laser beam to scan an area and then analyses the reflections that bounce back. As light has a much shorter wavelength than radio waves do, it is more readily reflected from small objects that radar might miss. Lidar is used to make maps, measure atmospheric conditions and by police forces to scan accident and crime scenes.

Typically, a lidar employs revolving mirrors to direct its laser beam, which is usually in the invisible near-infrared part of the spectrum, rather than the visible part. Commercial lidar can cost \$50,000 or so a pop, but smaller, lower-powered versions are now available for \$10,000 or less. A number of lidar makers, such as Velodyne, a Californian firm, are trying to develop what they call “solid-state” lidars, which are miniaturised versions with no moving parts. Some researchers are using a flash of laser light instead of a beam, and capturing the reflections with an array of tiny sensors on a chip.

Infineon, however, has taken a different tack and is using a micro-electro-mechanical system (MEMS). This particular MEMS was invented by Innoluce, a Dutch firm which Infineon bought in October 2016. The device consists of an oval-shaped mirror, just 3mm by 4mm, contained on a bed of silicon. The mirror is connected to actuators that use electrical resonance to make it oscillate from side to side, changing the direction of the laser beam it is reflecting. This, says Infineon, permits the full power of the laser to be used for scanning instead of its light being dispersed, as it would be in a flash-based system. ▶▶

▶ The MEMS lidar can scan up to 5,000 data points from a scene every second, and has a range of 250 metres, says Ralf Bornefeld, Infineon's head of automotive sense and control. Despite its moving mirror, he thinks it should prove as robust and reliable as any other silicon chip. In mass production and attached to, say, a windscreen, the MEMS lidar is expected to cost a carmaker less than \$250. These tiny lidars would have other applications, too—in robots and drones, for example.

Many engineers, Mr Bornefeld included, reckon autonomous cars of the future will use multiple miniature lidars, radars, ultrasonic sensors and digital cameras. Each system of sensors has advantages and disadvantages, he says. Combining them will provide a "safety cocoon" around an autonomous vehicle.

Radar measures distance and speed precisely, and works in the dark and in fog—conditions in which cameras might struggle—but the images it yields can be difficult to classify. Moreover, some materials (rubber, for example) do not reflect radar waves well, so radar could have difficulty noticing, say, a dangerous chunk of tyre from a blowout lying in the road. With good visibility, the car's cameras should spot the bits of tyre. The cameras capture high-resolution pictures, use artificial-intelligence software to analyse them, and then apply image-recognition techniques to identify objects that need to be avoided. Lidar, with its ability to build detailed images of even small objects and operate in the dark, should spot the tyre, though it, too, might struggle to do so in dense fog. Ultrasonic detectors, meanwhile, will continue to play a part. They have been around for a while and work in a similar way to radar, but instead use high-frequency sound inaudible to humans. They would not see the tyre chunk—at least, not until too late—for they usually lack the range. But they are cheap and make excellent parking sensors.

Google, Uber and most carmakers who aspire to make autonomous vehicles already use lidar. They ought, therefore, to welcome its miniaturisation with open arms. But not everyone is convinced of lidar's worth. Elon Musk, the boss of Tesla, a firm that makes electric cars, has spurned the technology. He has said the camera, radar and ultrasonic systems that provide the Autopilot autonomous-driving mode in Tesla's vehicles are improving rapidly and will be all that is necessary.

### The more eyes, the better

Mr Musk may, though, change his mind. In Florida, in May 2016, the driver of a Tesla using Autopilot at high speed was killed in a collision with a lorry turning across the road in front of him. Although Autopilot users are supposed to keep their hands on the wheel and their eyes on the road (just as, for now, the backup drivers in Google

and Uber cars do), it appears the Tesla's cameras and radar either failed to spot the lorry—which was painted white and set against a brightly lit sky—or thought it was something else, such as an overhead sign. Whether lidar would have made the correct call, as some think it would, no one will ever know. But when more driverless cars venture onto the roads in earnest, having plenty of belts and braces might help reassure their passengers. ■

## Particle accelerators

# Open, Sesame

### A new synchrotron is about to start up in a surprising part of the world

THE hills 30km north-west of Amman, Jordan's capital, are home to a miracle of scientific diplomacy called Sesame. Proposals to build this device, the world's most politically fraught particle accelerator, date back nearly 20 years. The delay is understandable. Israel, Iran and the Palestinian Authority, three of the project's nine members, are better known for conflict than collaboration. Turkey does not recognise the Republic of Cyprus, but both have worked together on the accelerator. As well as Jordan, the other members are Bahrain, Egypt and Pakistan. Nonetheless, Sesame, a type of machine called an electron synchrotron, is about to open for business. The first electrons are expected to complete their initial laps around its 133 metre circumference ring this month.

Electron synchrotrons are smaller cousins of proton synchrotrons such as the Large Hadron Collider (LHC), near Geneva. Instead of probing the frontiers of physics,

they probe the structure of materials. Controlled by giant magnets, the electrons travelling around them emit radiation ranging in frequency from the infrared to x-rays. This can be used to look at anything from metals to biological tissues. Synchrotron radiation is more intense than other available sources, letting researchers collect data faster and from smaller samples. It can also penetrate matter more deeply, and resolve smaller features.

There are around 60 electron synchrotrons in the world, but none before Sesame has been in the Middle East. They are expensive beasts, but Sesame is cheaper than most. The Diamond Light Source, in Britain, which opened nearly a decade ago, cost £260m (\$330m) to build. The cost of building Sesame has been just \$79m. This is, in part, because of Jordan's low labour costs. It is also a consequence of Sesame's less ambitious specifications. But the resourcefulness of Sesame's architects has played an important part as well.

The project has a long history. More than 25 years ago Abdus Salam, a Nobel prizewinning physicist, called for a synchrotron to be built in the Middle East. In 1997 two other physicists, Herman Winick and Gustav-Adolf Voss, suggested moving one intact from Berlin. BESSY I, the machine they had in mind, was to be decommissioned and replaced. It would thus become redundant and available for dispatch elsewhere. In 2002 the Winick-Voss idea was scrapped in favour of building a more powerful Middle Eastern facility from scratch. Yet BESSY I lives on in Sesame. It serves as a booster, giving the electrons an initial kick before they are accelerated to their full energy in the main ring. That, reckons Sir Christopher Llewellyn Smith, Sesame's president, saved the project about \$4m. America, Britain, France, Italy and Switzerland have also donated components from decommissioned synchrotrons. ▶▶



Sesame, opened

▶ Cheap though Sesame may be, scraping the necessary money together in a region enmeshed in conflict has been no mean feat. All nine project members agreed to make annual contributions of different levels. Banks refused to handle those from Iran, for fear of American sanctions. Nonetheless, \$48m of the total has come from the project's members. The European Union has provided more than \$10m, some of which has been used by CERN, the organisation that runs the LHC, to design and oversee the construction of Sesame's corralling magnets. And, in an effort to rein in running costs, the project's bosses hope to build a solar-power plant to supply the synchrotron's electricity. That would make it the first accelerator to be powered solely by renewable energy.

Researchers with expertise in synchrotron engineering have pitched in. Sir Christopher, who was CERN's director-general between 1994 and 1998, knows a thing or two about particle accelerators. And next year one of his successors at CERN, Rolf-Dieter Heuer (D-G from 2009 to 2015), will also succeed him as Sesame's president.

Sesame's electrons will have energies of 2.5bn electronvolts, the units usually used to describe such things. That is a lot. Applying Einstein's famous equation,  $e=mc^2$ , where  $e$  is energy,  $m$  is mass and  $c$  is the speed of light, it means that an electron circulating around Sesame's ring will weigh 5,000 times more than one which is at rest. The radiation they generate is tapped at various points, to create "beam lines" for things like x-ray crystallography. Sesame will open with two beam lines. One will pipe infrared light to a microscope, and the other will pass x-rays through both organic and inorganic samples. Two more beam lines are planned for the next three years, at a cost of \$15m. Sesame can, in theory, host more than 20 of them. One use to which they may be put is the analysis of antiquities. Synchrotron radiation has, for example, been employed to read scrolls too delicate to unfurl.

But beam lines are not Sesame's only draw. The project has involved a huge amount of work from groups within the region. It also acts as neutral ground, on which the Middle East's scientists can meet. As Roy Beck of Tel Aviv University, who sits on the Sesame users' committee, puts it, "We all talk the same language. We all talk science."

Researchers prize the radiation produced by synchrotrons so highly that they will cross the world to clinch some precious time on one. For scientists travelling to such facilities from the Middle East, though, snarl-ups with visas have in the past made such trips difficult or impossible. Now that they have a synchrotron on their doorstep, the inconveniences of Western immigration controls may affect these researchers somewhat less. ■



## Neuroscience

# Grey mater

### Scanning reveals what pregnancy does to a mother's brain

AS ANY parent will tell you, once you have had children nothing is ever quite the same. Including, it seems, their mothers' brains. In a paper just published in *Nature Neuroscience*, a team led by Else-line Hoekzema of the Universitat Autònoma de Barcelona, in Spain, describe for the first time how pregnancy alters women's brains, rewiring them in ways that persist long after a child has been born.

Dr Hoekzema and her colleagues performed detailed brain scans on 65 female volunteers, none of whom had been pregnant before, but hoped to be in the near future, and a further 20 who had no such desire. About 15 months later, by which time 25 of their volunteers had carried babies to term, they repeated the process.

Comparing the scans showed significant reductions in the volume of grey matter in the brains of the new mothers. (Grey matter contains the main bodies of nerve cells; white matter, the brain's other component, consists mostly of the nerve fibres that link those cells together.) The effect was reliable enough that it could be used by itself to predict, with perfect accuracy, which of the women had been pregnant and which had not. And it was persistent, too. When the researchers retested the mothers two years later, most of the alterations were still present.

Dr Hoekzema and her colleagues suspected that something in the biological process of pregnancy itself was causing the changes. To double-check, and to make sure that the experience of preparing for parenthood was not the true culprit, they also compared their women's brains with those of some men—both fathers and

those without children. The men's brains, like those of the childless women, showed no such pattern of changes. And the results fit with studies on animals. Rats that have had pups, for instance, show notable and lasting changes in brain structure. They also tend to be less anxious, better able to cope with stress, and to have better memory than their pupless contemporaries.

Pregnancy, then, does indeed do things to a woman's brain. But what exactly those things mean is hard to tease out. Neuroscientists do not really understand how the brain works. That makes it difficult to predict how a change in the organ's structure will alter the way it functions.

Some of the changes took place in the hippocampi. These are a pair of small, banana-shaped structures buried deep in the brain, one in each hemisphere, that are known to be important for forming memories. Administering a few simple cognitive tests to the new mothers—including tests of memory—revealed no obvious changes in performance. And the hippocampi had partially regrown within two years. But Dr Hoekzema and her colleagues point out that most of the more permanent reductions in grey matter happened across several parts of the brain that, in other experiments, have been found to be associated with the processing of social information, and with reasoning about other people's states of mind.

That would make sense from an evolutionary point of view. Human babies are helpless, and, in order to care for one, a mother must be good at inferring what it needs. The rewiring may also affect how well women bond with their infants. After the women in Dr Hoekzema's study had given birth, the research team administered a standard psychological test designed to measure how attached those women had become to their babies. The ones with the greatest reductions in grey-matter volume were, on the whole, the most strongly bonded.

### Efficient wiring

Ascribing all this to a reduction in grey-matter volume, rather than an increase, sounds counter-intuitive. But Dr Hoekzema reckons it is probably evidence of a process called synaptic pruning, in which little-used connections between neurons are allowed to wither away, while the most-used become stronger. That is thought to make neural circuitry more efficient, not less so. She points out that the surge of sex hormones people experience during adolescence is thought to cause a great deal of synaptic pruning, moulding a child's brain into an adult one. So it is reasonable to assume that the even greater hormonal surge experienced during pregnancy might have a similar effect. When it comes to the brain, after all, bigger is not necessarily better. ■



## Astronomy

## A secret history

## Breaking a glass ceiling

IN THE late 19th century an extraordinary group of women worked at the Harvard College Observatory. Known as “computers”, they charted the position and brightness of stars on a daily basis by applying mathematical formulae to the observations of their male colleagues who watched the sky. Harvard was unique in taking advantage of the burgeoning numbers of educated women in this way. When the observatory’s research was redirected towards photographing the heavens rather than observing them merely by eye, the duties of the “computers” expanded apace. Many of them would go on to extraordinary achievements in astronomy.

The work of Harvard’s female staff was paid for largely by two other women, Anna Palmer Draper and Catherine Wolfe Bruce, heiresses with an enduring interest in astronomy. Dava Sobel, a former science writer for the *New York Times* who made her name with her bestselling first book, “Longitude” (1995), has spent several years poring over letters and studying archives in order to tell the story of the women-astronomers and their benefactors.

The introduction of photography at the Harvard Observatory allowed the firmament to be captured on an unprecedented scale on eight by ten-inch glass plates. These plates, about half a million in all by 1992, when the observatory switched to digital storage methods, comprise the “glass universe” of her book’s title. They

**The Glass Universe: How the Ladies of the Harvard Observatory Took the Measure of the Stars.** By Dava Sobel.

*Viking; 324 pages; \$30. To be published in Britain by 4th Estate in January*

allowed the course of stars to be followed not just for a few nights, but for decades. Discoveries made by astronomers on other continents could be cross-checked with Harvard’s library. Perhaps more important, when starlight was split with the aid of a prism its spectrum could likewise be recorded.

These spectra resemble long rainbow-coloured strips (rendered in black and white on the plates’ photographic emulsion) interspersed with numerous dark lines. Scientists would come to understand that the gaps in a spectrum are due to the absorption of light by the atoms of chemical elements that compose a star’s outer layers. As one astronomer triumphantly declared, the ability to divine a star’s constituents from its spectrum “made the chemist’s arms millions of miles long”. Stellar spectroscopy would also reveal other physical attributes of stars such as their temperature, eventually giving rise to the new field of astrophysics.

This extraordinary photographic record offered the Harvard Observatory team the chance to learn a great deal more about the stars. During routine studies of the plates

## Also in this section

111 An encyclopedia of cheese

111 Killing Rasputin

112 Tehran’s modernist art collection

For daily analysis and debate on books, arts and culture, visit

[Economist.com/culture](http://Economist.com/culture)

in 1893, for example, Williamina Fleming found a nova, only the tenth to have been observed by astronomers in the West. She would go on to discover nine more. Annie Cannon catalogued hundreds of thousands of stars, in the process inventing a stellar classification system that is still in use by astronomers today. The cyclical dimming and brightening of variable stars fascinated Henrietta Leavitt, who became the first person to realise that the frequency of their pulsation was directly related to their brightness. This allowed astronomers to reliably measure how far away they were, to establish the gargantuan dimensions of the Milky Way, and the even greater distances between this galaxy and others. Perhaps most remarkable of all was Cecilia Payne, the first Harvard student (man or woman) to be awarded a PhD in astronomy. Her thesis in 1925 ascertained that, relative to the proportions of other elements, hydrogen is vastly more abundant in stars than it is on Earth.

On seeing her thesis, Henry Norris Russell, an expert on the chemical composition of stars, told her that the result was “clearly impossible”. Four years later, Russell’s own calculations would lead him to admit that Payne had been right after all. The prevalence of hydrogen, he wrote at the end of his paper, “can hardly be doubted”. Unjustly, it was Russell at the time, not Payne, who was frequently credited with the discovery.

The few grumbles expressed by the “computers” of Harvard Observatory will be familiar to many women (and, to be fair, some men) within the academy today. “Sometimes I feel tempted to give up and let him find out what he is getting for \$1,500 a year from me,” Fleming wrote in her journal after unfruitful salary negotiations with the director, “compared with \$2,500 from some of the other [male] assistants.” ▶▶



► Indeed, the directors seemed at times to have something of a sweatshop mentality towards their diligent assistants. Another boss measured computing tasks in units of “girl-hours” and “kilo-girl hours”.

Ms Sobel is keen to absolve the directors of this charge. But there is no getting away from the fact that had they been occupied with fewer humdrum labours, the brilliant women whom she portrays in her book might well have achieved even more than they did. Afficionados of astronomy may be familiar with their names; now it is time they were known to a wider audience. Ms Sobel has drawn deeply from her sources, knitting together the lives and work of the women of Harvard Observatory into a peerless intellectual biography. “The Glass Universe” shines and twinkles as brightly as the stars themselves. ■

### Cheese, glorious cheese

## Many incarnations

**The Oxford Companion to Cheese.** Edited by Catherine Donnelly. OUP; 849 pages; \$65 and £40

OXFORD UNIVERSITY PRESS has an impressive record producing culinary reference books, with their “Companion” food and wine volumes having already come out in several editions. Now it is the turn of cheese to get the same treatment. About 1,500 different varieties of cheese are made around the world, of which 244 are described here. The editor is right to emphasise that anything much more comprehensive than this would be overwhelming, though the book would have benefited from more illustrations. If the reader simply requires a directory of cheese, nothing comes close to Dorling Kindersley’s “World Cheese Book” (2015), with its 750 colourfully presented cheeses from around the globe.

But this is still a delightfully discursive volume for the armchair reader. If you would like to know more about the East Friesian cow (or sheep for that matter); or Sister Noella Marcellino (“the cheese nun”), a world expert on fungal surface-ripened cheese; or Epoisses (a very stinky cheese), this is the book for you.

Where else could you find an entry for the Monty Python television sketch, “Cheese Shop”, in which an aggrieved John Cleese eventually shoots a cheese-monger after failing to find a single piece of cheese in his shop? Non-specialist references extend into the modern era with a scholarly entry on two children’s television characters, Wallace and Gromit, and how their programme caused sales of

Wensleydale to surge. Another entry is on the moon and green cheese, with a string of references to fables about the moon and cheese, from Serbia, France and contemporary America.

France dominated the cheese world for centuries, but is now merely the third largest producer after America and Germany, with other countries such as Australia and Britain diversifying their production in recent years. Curiously, there was no strong tradition of cheese-making or consumption in most of Asia. One Chinese farmer described cheese as “the mucous discharge of some old cow’s guts, allowed to putrefy”. Cheese accounts for a tiny part of the Indian diet, even though India is the world’s largest dairy producer. For centuries Japan never consumed dairy products of any kind; in 1940, individual cheese consumption was estimated to be four grams a year. That has now increased to 2.5kg.

The bias in “The Oxford Companion to Cheese” is definitely towards non-European cheese history, with the entries for Vermont and its cheese rivaling those for Austria or Spain, perhaps because the editor of the book, Catherine Donnelly, is a professor of nutrition at the University of Vermont. She includes an interesting tale about the marketing muscle of cheese-makers in America compared with those in Britain. Cheez Whiz, a post-war cheese dip created by Kraft, has seen better days, though it still generates revenues of \$100m a year. Ever willing to move with the times, it has just been released in spray cans with both Sharp Cheddar and Buffalo Cheddar flavours. Compare this to the fate of Lymeswold, which was created in the 1980s and touted as the first new English cheese in 200 years. It was initially highly successful, but when demand outstripped supply, the manufacturers cut corners and released stocks before they had matured, resulting in its demise less than a decade after its birth. ■



Stinky stuff

### Rasputin’s assassination

## Foul play

### Lost Splendour and the Death of Rasputin.

By Felix Yusupov. Adelphi; 304 pages; 288 pages; £12.99

FEW murderers boast about their crimes. But Prince Felix Yusupov was no ordinary killer, and his prey—the “mad monk” Grigory Rasputin—no ordinary victim. On the centenary of the assassination of the Romanovs’ Svengali on December 30th, the republication of Yusupov’s memoir provides a timely glimpse into the charmed, doomed world of the Russian aristocracy, and its hectic collapse amid the Bolshevik revolution.

His grasp of facts is shaky and his motives self-serving. But the princely capers make a gripping, if sometimes repellent, read. Yusupov’s penchants for transvestite dressing and wild evenings with gypsies show an interestingly unconventional side. His childish pranks (such as letting rabbits and chickens loose in the Carlton Club in London) were much funnier for the perpetrator than the hard-pressed servants who had to clear them up.

The most important part of the book is the description of Rasputin’s assassination. The humble Siberian peasant bewitched Tsar Nicholas II and his wife, the Tsarina, with his apparently miraculous powers. His aristocratic assassins, recruited by Yusupov, believed Russia, misruled to the point of collapse, could be saved only if the royal family could be freed of the faith-healer’s malign influence.

They cast lots, obtained some cyanide, added it to cakes and wine, and tricked Rasputin, whom Yusupov had befriended earlier, into joining them for dinner. The trusting, unarmed guest consumed the poison, but it had no effect. Yusupov, having first advised him to pray, then shot him in the chest at point-blank range. Yet a few minutes later he rose, foaming at the mouth, “raised from the dead by the powers of evil...I realised now who Rasputin really was...the reincarnation of Satan himself.” After several more shots were fired, the assassins dumped the body in a river.

Much of this account, like the prince’s motives, is questionable. The lurid tone may have been useful: the Yusupovs lost most of their vast fortune in the revolution. Other sources suggest that the poison was fake; Rasputin was killed by three shots, but the tale of his satanic resurrection is wholly uncorroborated. Rasputin’s real story is painstakingly told in a compendious new book by Douglas Smith, an American scholar of Russian history. But Prince Yusupov’s account is gripping. ■

## Tehran's Museum of Contemporary Art

## Treasure chest

## The nail-biting diplomacy behind sending a blockbuster exhibition abroad

THE late 1970s were marked by high oil prices and faltering Western economies. For the empress of Iran, though, it was a time of opportunity; she went shopping for art, and in 1977 founded the Tehran Museum of Contemporary Art (TMOCA).

The Islamic Republic of Iran now owns this trove of Western modernism, which is widely held to be the best collection outside Europe and North America. The most important work is Pablo Picasso's masterpiece of 1927, "The Painter and his Model", which one academic calls the missing link between his two greatest paintings, "Les Femmes d'Alger" (1911) and "Guernica" (1937). It also includes Jackson Pollock's "Mural on Indian Red Ground" (1950), as well as works by Mark Rothko, Francis Bacon, Andy Warhol (pictured) and Iranian masters such as Mohsen Vaziri Moghaddam and Faramarz Pilaram.

Spirited away into TMOCA's vaults at the start of the Iranian revolution in 1979, the hoard remained unseen until the first signs of postrevolutionary openness, in 1999, slowly revived the museum's willingness to display its Western art. With the election of the moderate president, Hassan Rohani, in 2013 TMOCA's trustees began discussing a foreign tour, in part to help raise much-needed funds.

European and American museums responded with enthusiasm, enticed by the appeal of a blockbuster show of art unseen in the West for four decades. The Hirshhorn Museum in Washington, DC, tipped its hand, but eventually dropped out. Another early front-runner was the Städel Museum in Frankfurt, which in 2014 offered to put on a show in Germany and in two other countries. But the director, Max Hollein, who now runs the Fine Arts Museums of San Francisco, balked at the asking price of €1m (\$1.04m) per venue.

By this time Joachim Jäger, of the National Gallery in Berlin, was in Tehran curating an exhibition of work by Otto Piene, a German kinetic artist who had recently died. Mr Jäger liked what he saw on TMOCA's walls, in its sculpture garden and in its vaults. He took the idea of mounting an exhibition back to the Prussian Cultural Heritage Foundation, the overseer of his museum, and it, in turn, asked the foreign minister, Frank-Walter Steinmeier, for help.

The Germans were soon joined by the Italians; the museum of 21st-century art, known as the MAXXI in Rome had worked with TMOCA on a show of Iranian art in

Italy in 2014. As the nuclear deal between Iran and the West was falling into place, Italy's then foreign minister, Paolo Gentiloni, visited Tehran. Afterwards, he put the idea of a show to Giovanna Melandri, president of the Fondazione MAXXI. With Iran interested in several venues for financial as much as symbolic reasons, Germany and Italy quickly joined forces.

The German government pledged €2.8m to be the first to show Iran's artworks; Italy would pay €1.5m. Thirty Western and 31 Iranian works, including the Picasso and the Pollock, would go to Berlin for three months, starting in December 2016. Rome would get the show for five months from late March. Announcing the exhibition in early October, Ms Melandri called it "tangible evidence of the new and constructive diplomatic and cultural relations". But history shows that exhibition diplomacy can be fraught; in 2012 a show at the British Museum (BM) about the *haj* almost fell apart when the Turkish government refused at the last moment to allow loans from the Topkapi Palace in Istanbul, forcing the BM to scabble around elsewhere to fill the gaps.

For officials and curators in Berlin and Rome, trouble started in May, when TMOCA's director, Majid Mollanorozi, handed out awards to the winners of a Holocaust cartoon competition organised in Tehran by two officially supported cultural organisations. It provoked complaints from the Israeli government. Ac-

ording to diplomats, the TMOCA project was saved only when the Iranian government agreed to replace Mr Mollanorozi as the tour's chief negotiating partner, while keeping him in his museum post.

Since then, though, the German government has been split. Mr Steinmeier's foreign ministry thinks Iran's reaction was sufficient to save a project that he feels would help foster a vital rapprochement. But Angela Merkel's chancellery, through Monika Grütters, the commissioner for culture and media, distanced itself from the project because it felt Iran had crossed a red line. "The exhibition is being supervised and planned by the foreign ministry," Ms Grütters's spokesman said. The chancellery is also blocking a foreign ministry push for Mr Rohani to visit Germany.

In October, the Iranian culture minister, Ali Jannati, who had backed the exhibition, was forced out of office by hardliners over another issue. At the same time, influential voices in Iran's art world warned that there might be legal claims against the collection and that it risked being seized. Iranian fears were heightened by a German legal quirk which made the city of Berlin, not the federal government, the guarantor of the works' safe return. The show's opening was postponed.

The guarantee issue has now been resolved and the new Iranian culture minister, Reza Salehi Amiri, has approved the tour. But the final decision, diplomats say, lies with President Rohani. Internal politics in Iran in 2017 will focus on the presidential election, due to be held in May. So the window for approving the show, now pencilled in for late January, is narrow. If there are no positive signs from Tehran before Christmas, the National Gallery will cancel the exhibition, leading to the cancellation of the Rome leg, too. Curators in Berlin and Rome are praying for a Christmas miracle. ■



Reading Warhol in Tehran

## Economic data

% change on year ago

	Gross domestic product			Industrial production latest	Consumer prices		Unemployment rate, %	Current-account balance		Budget balance % of GDP 2016 <sup>†</sup>	Interest rates, % 10-year gov't bonds, latest	Currency units, per \$	
	latest	qtr* 2016 <sup>†</sup>	2016 <sup>†</sup>		latest	2016 <sup>†</sup>		latest 12 months, \$bn	% of GDP 2016 <sup>†</sup>			% of GDP 2016 <sup>†</sup>	Dec 19th
United States	+1.6 Q3	+3.2	+1.6	-0.6 Nov	+1.7 Nov	+1.3	4.6 Nov	-476.5 Q3	-2.6	-3.2	2.56	-	-
China	+6.7 Q3	+7.4	+6.7	+6.2 Nov	+2.3 Nov	+2.0	4.0 Q3 <sup>§</sup>	+266.6 Q3	+2.5	-3.8	3.10 <sup>§§</sup>	6.95	6.48
Japan	+1.1 Q3	+1.3	+0.7	-1.4 Oct	+0.2 Oct	-0.2	3.0 Oct	+184.2 Oct	+3.7	-5.6	0.08	117	122
Britain	+2.3 Q3	+2.0	+2.0	-1.2 Oct	+1.2 Nov	+0.6	4.8 Sep <sup>††</sup>	-146.9 Q2	-5.7	-3.7	1.55	0.81	0.67
Canada	+1.3 Q3	+3.5	+1.2	+2.8 Sep	+1.5 Oct	+1.5	6.8 Nov	-53.6 Q3	-3.5	-2.5	1.78	1.34	1.39
Euro area	+1.7 Q3	+1.4	+1.6	+0.6 Oct	+0.6 Nov	+0.2	9.8 Oct	+376.3 Sep	+3.2	-1.8	0.25	0.96	0.92
Austria	+1.2 Q3	+2.4	+1.5	+2.6 Sep	+1.3 Nov	+1.1	5.9 Oct	+8.2 Q2	+2.1	-1.4	0.57	0.96	0.92
Belgium	+1.3 Q3	+0.7	+1.2	+4.4 Sep	+1.8 Nov	+1.9	7.9 Oct	+4.8 Jun	+0.7	-2.8	0.66	0.96	0.92
France	+1.1 Q3	+1.0	+1.2	-1.8 Oct	+0.5 Nov	+0.3	9.7 Oct	-40.0 Oct <sup>‡</sup>	-1.1	-3.3	0.77	0.96	0.92
Germany	+1.7 Q3	+0.8	+1.8	+1.2 Oct	+0.8 Nov	+0.4	6.0 Nov	+296.2 Oct	+8.8	+1.0	0.25	0.96	0.92
Greece	+1.6 Q3	+3.1	+0.4	+6.8 Oct	-0.9 Nov	nil	23.1 Sep	-0.2 Sep	-0.2	-5.6	7.20	0.96	0.92
Italy	+1.0 Q3	+1.0	+0.8	+1.3 Oct	+0.1 Nov	-0.1	11.6 Oct	+47.8 Sep	+2.4	-2.6	1.84	0.96	0.92
Netherlands	+2.4 Q3	+3.0	+2.0	+0.6 Oct	+0.6 Nov	+0.2	6.6 Nov	+59.7 Q2	+8.5	-1.1	0.48	0.96	0.92
Spain	+3.2 Q3	+2.9	+3.2	-2.1 Oct	+0.7 Nov	-0.4	19.2 Oct	+23.5 Sep	+1.6	-4.6	1.45	0.96	0.92
Czech Republic	+1.6 Q3	+0.9	+2.4	-1.7 Oct	+1.5 Nov	+0.6	4.9 Nov <sup>§</sup>	+3.7 Q3	+1.5	nil	0.50	25.9	24.9
Denmark	+1.1 Q3	+1.7	+0.9	-0.3 Oct	+0.4 Nov	+0.3	4.2 Oct	+23.2 Oct	+5.9	-1.0	0.39	7.12	6.88
Norway	-0.9 Q3	-1.9	+0.6	nil Oct	+3.5 Nov	+3.5	4.8 Sep <sup>††</sup>	+18.0 Q3	+4.4	+3.5	1.74	8.66	8.76
Poland	+2.0 Q3	+0.8	+2.6	+3.3 Nov	nil Nov	-0.7	8.2 Nov <sup>§</sup>	-3.4 Oct	-0.5	-2.7	3.41	4.23	3.93
Russia	-0.4 Q3	na	-0.5	+2.6 Nov	+5.8 Nov	+7.0	5.4 Nov <sup>§</sup>	+30.2 Q3	+2.4	-3.7	8.60	61.8	70.7
Sweden	+2.8 Q3	+2.0	+3.1	-0.5 Oct	+1.4 Nov	+0.9	6.2 Nov <sup>§</sup>	+22.2 Q3	+5.0	-0.3	0.64	9.36	8.57
Switzerland	+1.3 Q3	+0.2	+1.4	+0.4 Q3	-0.3 Nov	-0.4	3.3 Nov	+66.1 Q2	+9.4	+0.2	-0.02	1.02	0.99
Turkey	-1.8 Q3	na	+2.9	+0.2 Oct	+7.0 Nov	+7.8	11.3 Sep <sup>§</sup>	-33.8 Oct	-4.8	-1.8	11.33	3.51	2.91
Australia	+1.8 Q3	-1.9	+2.9	-0.2 Q3	+1.3 Q3	+1.3	5.7 Nov	-47.9 Q3	-3.5	-2.1	2.86	1.38	1.39
Hong Kong	+1.9 Q3	+2.5	+1.6	-0.1 Q3	+1.2 Oct	+2.8	3.3 Nov <sup>††</sup>	+13.6 Q2	+2.6	+0.6	1.92	7.77	7.75
India	+7.3 Q3	+8.3	+7.2	-1.9 Oct	+3.6 Nov	+4.9	5.0 2015	-11.1 Q3	-0.9	-3.8	6.51	67.8	66.4
Indonesia	+5.0 Q3	na	+5.0	-2.7 Oct	+3.6 Nov	+3.5	5.6 Q3 <sup>§</sup>	-19.2 Q3	-2.1	-2.6	7.93	13,384	13,915
Malaysia	+4.3 Q3	na	+4.3	+4.2 Oct	+1.4 Oct	+1.9	3.5 Sep <sup>§</sup>	+5.6 Q3	+1.8	-3.4	4.31	4.48	4.29
Pakistan	+5.7 2016**	na	+5.7	+1.9 Sep	+3.8 Nov	+3.8	5.9 2015	-4.1 Q3	-0.9	-4.6	8.03 <sup>†††</sup>	105	105
Philippines	+7.1 Q3	+4.9	+6.9	+8.3 Oct	+2.5 Nov	+1.8	4.7 Q4 <sup>§</sup>	+3.1 Sep	+0.9	-1.0	5.01	50.0	47.4
Singapore	+1.1 Q3	-2.0	+1.3	+1.2 Oct	-0.1 Oct	-0.6	2.1 Q3	+63.0 Q3	+21.5	+0.7	2.49	1.45	1.41
South Korea	+2.6 Q3	+2.5	+2.7	-1.6 Oct	+1.5 Nov	+0.9	3.1 Nov <sup>§</sup>	+99.9 Oct	+7.2	-1.3	2.17	1,187	1,183
Taiwan	+2.0 Q3	+3.9	+1.0	+3.7 Oct	+2.0 Nov	+1.3	3.9 Oct	+74.7 Q3	+14.4	-0.5	1.20	32.0	32.9
Thailand	+3.2 Q3	+2.2	+3.1	+0.1 Oct	+0.6 Nov	+0.2	1.2 Oct <sup>§</sup>	+47.4 Q3	+7.8	-2.3	2.65	35.9	36.2
Argentina	-3.4 Q2	-8.0	-2.0	-2.5 Oct	— ***	—	8.5 Q3 <sup>§</sup>	-15.4 Q2	-2.5	-5.3	na	15.8	13.4
Brazil	-2.9 Q3	-3.3	-3.4	-7.3 Oct	+7.0 Nov	+8.3	11.8 Oct <sup>§</sup>	-22.3 Oct	-1.1	-6.4	11.77	3.38	3.90
Chile	+1.6 Q3	+2.5	+1.8	-7.4 Oct	+2.9 Nov	+3.7	6.4 Oct <sup>§††</sup>	-4.8 Q3	-1.9	-2.7	4.35	678	699
Colombia	+1.2 Q3	+1.3	+1.8	+0.4 Oct	+6.0 Nov	+7.5	8.3 Oct <sup>§</sup>	-13.7 Q3	-5.1	-3.7	7.24	3,020	3,335
Mexico	+2.0 Q3	+4.0	+2.1	-1.4 Oct	+3.3 Nov	+2.8	3.6 Oct	-30.6 Q3	-2.8	-3.0	7.31	20.4	17.0
Venezuela	-8.8 Q4~	-6.2	-13.7	na	na	+424	7.3 Apr <sup>§</sup>	-17.8 Q3~	-2.8	-24.3	10.57	10.0	6.31
Egypt	+4.5 Q2	na	+4.3	-4.9 Oct	+19.4 Nov	+13.1	12.6 Q3 <sup>§</sup>	-18.7 Q2	-7.0	-12.4	na	19.2	7.83
Israel	+5.0 Q3	+3.2	+3.3	+2.6 Sep	-0.3 Nov	-0.5	4.5 Oct	+13.3 Q3	+2.8	-2.4	2.19	3.86	3.91
Saudi Arabia	+3.5 2015	na	+1.1	na	+2.3 Nov	+3.8	5.6 2015	-61.5 Q2	-5.6	-11.7	na	3.75	3.75
South Africa	+0.7 Q3	+0.2	+0.4	-1.3 Oct	+6.6 Nov	+6.3	27.1 Q3 <sup>§</sup>	-12.3 Q3	-4.0	-3.4	9.00	14.1	15.1

Source: Haver Analytics. \*% change on previous quarter, annual rate. <sup>†</sup>The Economist poll or Economist Intelligence Unit estimate/forecast. <sup>§</sup>Not seasonally adjusted. <sup>‡</sup>New series. ~2014 \*\*Year ending June. <sup>††</sup>Latest 3 months. <sup>†††</sup>3-month moving average. <sup>§§§</sup>5-year yield. \*\*\*Official number not yet proved to be reliable; The State Street PriceStats Inflation Index, Nov 35.38%; year ago 25.30% <sup>††††</sup>Dollar-denominated bonds.

## Markets

	Index Dec 19th	one week	% change on Dec 31st 2015	
			in local currency	in \$ terms
United States (DJIA)	19,883.1	+0.4	+14.1	+14.1
China (SSEA)	3,264.7	-1.1	-11.9	-17.6
Japan (Nikkei 225)	19,391.6	+1.2	+1.9	+4.8
Britain (FTSE 100)	7,017.2	+1.8	+12.4	-5.5
Canada (S&P TSX)	15,269.9	-0.1	+17.4	+21.7
Euro area (FTSE Euro 100)	1,103.6	+1.9	+0.8	-3.1
Euro area (EURO STOXX 50)	3,257.9	+1.8	-0.3	-4.2
Austria (ATX)	2,624.6	+0.7	+9.5	+5.2
Belgium (Bel 20)	3,576.2	+0.8	-3.4	-7.1
France (CAC 40)	4,822.8	+1.3	+4.0	-0.1
Germany (DAX)*	11,426.7	+2.1	+6.4	+2.2
Greece (Athex Comp)	627.9	-1.9	-0.5	-4.4
Italy (FTSE/MIB)	18,968.9	+3.3	-11.4	-14.9
Netherlands (AEX)	480.4	+2.1	+8.7	+4.5
Spain (Madrid SE)	941.5	+1.8	-2.4	-6.3
Czech Republic (PX)	912.5	+0.8	-4.6	-8.3
Denmark (OMXC B)	788.0	+2.4	-13.1	-16.2
Hungary (BUX)	31,646.4	+3.4	+32.3	+29.0
Norway (OSEAX)	756.3	-0.8	+16.5	+19.1
Poland (WIG)	51,129.3	+1.4	+10.0	+2.6
Russia (RTS, \$ terms)	1,130.1	-1.6	+26.3	+49.3
Sweden (OMXS30)	1,542.7	+0.3	+6.6	-3.9
Switzerland (SMI)	8,234.5	+2.4	-6.6	-8.7
Turkey (BIST)	77,157.8	+1.2	+7.6	-10.5
Australia (All Ord.)	5,612.8	-0.1	+5.0	+5.4
Hong Kong (Hang Seng)	21,832.7	-2.7	-0.4	-0.6
India (BSE)	26,374.7	-0.5	+1.0	-1.5
Indonesia (JSX)	5,191.9	-2.2	+13.0	+16.4
Malaysia (KLSE)	1,634.3	-0.4	-3.4	-7.4
Pakistan (KSE)	46,584.5	+2.6	+42.0	+41.8
Singapore (STI)	2,913.1	-1.3	+1.1	-0.9
South Korea (KOSPI)	2,038.4	+0.6	+3.9	+2.7
Taiwan (TWI)	9,239.3	-1.2	+10.8	+13.9
Thailand (SET)	1,522.4	-0.3	+18.2	+18.5
Argentina (MERV)	15,996.1	-6.8	+37.0	+12.0
Brazil (BVSP)	57,111.0	-3.5	+31.7	+54.3
Chile (IGPA)	21,010.5	-0.9	+15.8	+21.0
Colombia (IGBC)	10,023.2	+1.4	+17.3	+23.3
Mexico (IPC)	44,895.3	-4.3	+4.5	-11.6
Venezuela (IBC)	28,536.9	-21.5	+95.6	na
Egypt (EGX 30)	11,752.5	+2.7	+67.7	-31.2
Israel (TA-100)	1,277.0	+0.4	-2.9	-2.1
Saudi Arabia (Tadawul)	7,076.9	-1.2	+2.4	+2.5
South Africa (JSE AS)	49,881.0	-1.3	-1.6	+8.3

## Global investment-banking revenue

Worldwide year-to-date revenues from investment banking were \$71bn, down by 7% on the same period a year earlier, according to Dealogic, a data provider. American clients accounted for almost half the total, Europeans for another fifth. Industry revenues from mergers and acquisitions dropped by 3% to \$22.9bn, though this remained the most lucrative area. Fixed income was the only activity to see earnings increase. JPMorgan Chase remains first in the revenue league table; it has taken in \$5.7bn this year. Deutsche Bank has struggled: it has slipped two places in the rankings and revenues are down by \$800m. Equity markets have also been hit: revenues from IPOs have dropped by 29% this year.

## Other markets

	Index Dec 19th	one week	% change on Dec 31st 2015	
			in local currency	in \$ terms
United States (S&P 500)	2,262.5	+0.2	+10.7	+10.7
United States (NAScomp)	5,457.4	+0.8	+9.0	+9.0
China (SSEB, \$ terms)	344.7	+0.6	-13.5	-19.2
Japan (Topix)	1,549.1	+1.2	+0.1	+3.0
Europe (FTSEurofirst 300)	1,422.7	+1.7	-1.0	-4.9
World, dev'd (MSCI)	1,754.7	-0.3	+5.5	+5.5
Emerging markets (MSCI)	856.4	-1.8	+7.8	+7.8
World, all (MSCI)	422.3	-0.5	+5.7	+5.7
World bonds (Citigroup)	871.2	-1.2	+0.1	+0.1
EMBI+ (JPMorgan)	761.8	-0.2	+8.2	+8.2
Hedge funds (HFRX)	1,202.4 <sup>§</sup>	-0.1	+2.4	+2.4
Volatility, US (VIX)	11.9	+12.6	+18.2 (levels)	
CDSs, Eur (iTRAXX) <sup>†</sup>	71.3	+0.7	-7.6	-11.2
CDSs, N Am (CDX) <sup>†</sup>	67.9	+0.2	-23.1	-23.1
Carbon trading (EU ETS) €	5.1	+4.5	-38.6	-41.0

Sources: Markit; Thomson Reuters. <sup>†</sup>Total return index.

<sup>‡</sup>Credit-default-swap spreads, basis points. <sup>§</sup>Dec 15th.

**Indicators** for more countries and additional series, go to: [Economist.com/indicators](http://Economist.com/indicators)

January 1st to December 19th  
2016, \$bn

	% decrease on same period a year earlier						
	0	1	2	3	4	5	6
JPMorgan Chase							-4.5
Goldman Sachs							-13.5
BofA Merrill Lynch							-8.9
Morgan Stanley							-11.3
Citigroup							-9.5
Barclays							-2.3
Credit Suisse							-6.6
Deutsche Bank							-24.0
Wells Fargo							-1.1
RBC Capital Markets							-2.5

Source: Dealogic

## The Economist commodity-price index

2005=100

	% change on		one month	one year
	Dec 13th	Dec 16th*		
<b>Dollar Index</b>				
All Items	144.3	143.3	-0.1	+13.3
Food	155.0	155.2	-1.4	+5.2
<b>Industrials</b>				
All	133.2	131.0	+1.6	+25.3
Nfa <sup>†</sup>	140.4	138.2	+3.7	+25.1
Metals	130.1	127.9	+0.6	+25.4
<b>Sterling Index</b>				
All items	206.9	209.6	-0.1	+35.1
<b>Euro Index</b>				
All items	168.6	171.2	+1.6	+19.4
<b>Gold</b>				
\$ per oz	1,159.8	1,131.6	-6.5	+5.1
<b>West Texas Intermediate</b>				
\$ per barrel	53.0	51.9	+11.1	+46.2

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. <sup>\*</sup>Provisional

<sup>†</sup>Non-food agriculturals.



## A curfew tolls...

**Britain's oldest manufacturing firm, the Whitechapel Bell Foundry, announced its closure on December 2nd**

THE sound of bells weaves through the British landscape as sinuously and naturally as rivers do. Morning bells, smothered by mist and birdsong; evening bells, mellow as the low light that caresses hills, cattle and trees; giddy carillons of change-ringing that mark victories, coronations and weddings, and the slow boom of majestic timekeepers and signallers of death. "The curfew tolls the knell of passing day" begins Thomas Gray's "Elegy", which every schoolchild once learned by heart.

Hundreds of those bells had something to do with the Whitechapel Bell Foundry, which was set up in 1570—possibly as early as 1420—specifically to make and mend them. Their bodies were recast, their clappers remodelled or their frames rebuilt by men working in the once-industrial, then desolate, now gentrified East End of London. From Whitechapel, in 2014, workmen came out to rescue the bells of St Mary Balcombe, in the wooded Weald of Sussex, and those of Holy Trinity Dunton, near the great house at Petworth. That was simply in one county; they would travel the length of the land.

The foundry itself, since 1738, was set in a complex of 17th- and 18th-century brick buildings grouped around a coaching inn called the Artichoke, just off the Whitechapel Road. The founder's house and

shop, in the same old brick, was attached to the place of work; the last founder, Alan Hughes, still lives there, as did his father, grandfather and great-grandfather. Bells were like family: individuals and their moulds, new and old, almost human with their bodies, ears, shoulders and tongues, would stand around the workshop floor in various states of readiness or undress.

The foundry's long role in the making of bells can be hard to detect. Its "three bells" stamp was used early and revived in the 1900s, but in the 18th and 19th centuries Whitechapel bells were marked with the name of the founder, not the company. This was an old tradition anyway; medieval bells often sing out "John made me" or "Peter made me"; so the names Robertus Mot, Jos. Carter, Thos. Lester or Richard Phelps on bells are those of Whitechapel founders, immortalised on their work.

### Pealing for liberty

There was nothing parochial about the business. It shipped bells to Auckland, Sydney, St Petersburg and Montreal. As early as the mid-18th century it was sending peals of bells, or great single bells, to the American colonies. If the antipodean bells stirred sentimental memories of the old country, the American bells, as if galvanised by sharper air, became symbols of freedom

and revolution. The Whitechapel church-and-lookout bells of St Michael's in Charleston, South Carolina were captured by the British in the revolutionary war and seized back again. In Philadelphia in 1776 citizens gathered to the cry of the Liberty Bell, made in Whitechapel, to hear for the first time the Declaration of Independence.

The foundry always insisted that the famously cracked bell came ashore in good order, and was damaged later by incorrect hanging. For bells, despite their solid look, are delicate. A piece one inch thick will break in a man's palm if struck with a two-pound hammer; and it is the very brittleness of their metal that allows them to ring freely, as well as for freedom's sake.

The foundry made other bells: musical handbells, table bells to summon servants or tea (fashionable in the wake of "Downton Abbey"), doorbells and chimes for household clocks. But four-fifths of its business was the casting or repair of big tower bells. Rather than presaging buttered scones or announcing the Amazon man with a parcel, Whitechapel's bells were in the business of summoning souls to prayer, alerting loiterers to curfew and marking the passage of time. The heaviest bell ever made at the foundry was Big Ben, for the Houses of Parliament, in 1858; it weighed over 13 tonnes, and its moulding gauge hung ever after, like the remnant of a dinosaur, on the end wall above the furnaces. Big Ben was intended to be so exact that the whole country would set its watches by the first sonorous stroke of every quarter, and passers-by still instinctively do so.

Time itself moved glacially in the foundry, where the usual gap between order and delivery was around 11 years. The lag was so great, as the present founder, Mr Hughes, told *Spitalfields Life*, that the business almost ran in counterpoint to the economy. In good times, churches ordered bells; when the inevitable downturn arrived they were stuck with the contracts, on which the foundry thrived. War, too, brought compensations. In the 1950s the foundry worked day in, day out to replace bells lost to fires and enemy raids, including the "Oranges and Lemons" peal at St Clement Danes and the great bell at Bow.

By the late 20th century, however, the business was struggling. Church-building had become rare. It was hard to keep up with changing ways, despite the opening of a chime-bell music room and an online shop. The patient art of melting metal, pouring it in moulds, waiting for it to set, hammering, polishing, tuning and inscribing, had never been a craft many learned. Even Mr Hughes's great-grandfather had feared the foundry would go under.

The buildings, being listed, will remain. But their old bricks will no longer carry the echo, heard or imagined, of the history and settlement of England—and beyond. ■